LINK LIGHT RAIL OPERATIONS AND MAINTENANCE SATELLITE FACILITY

DRAFT ENVIRONMENTAL IMPACT STATEMENT

MAY 2014

SOUNDTRANSIT

CENTRAL PUGET SOUND
REGIONAL TRANSIT AUTHORITY

U.S. Department of Transportation
Federal Transit Administration

SOUNDTRANSIT

May 9, 2014

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 Draft Environmental Impact Statement (Draft EIS) on the proposed Link Light Rail Operations and Maintenance Satellite Facility. Sound Transit is the project proponent.

The Draft 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 Link light rail Operations and Maintenance Satellite Facility in the cities of Lynnwood and Bellevue. The Draft EIS examines the project alternatives identified by the Sound Transit Board in December 2012.

The major choices for the project involve the location of a light rail operations and maintenance satellite facility. The Sound Transit Board will consider the Draft EIS, public and agency comments, and other information before identifying a preferred facility location. FTA and Sound Transit will prepare a Final EIS which will respond to comments on the Draft EIS and include an evaluation of impacts and mitigation for the preferred alternative and other alternatives considered. After completion of the Final EIS the Sound Transit Board will select the project to be built. FTA will also issue a Record of Decision, which will state FTA's decision on the project and list Sound Transit's mitigation commitments to reduce or avoid impacts.

The Draft EIS includes appendices and technical reports on the enclosed CD. Please see the Fact Sheet of this Draft EIS regarding document availability and who to contact for further information about the Draft EIS.

Sincerely,

Kent Hale
Environmental Affairs and Sustainability

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King County Executive

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Central Puget Sound Regional Transit Authority • Union Station
401 S. Jackson St., Seattle, WA 98104-2826 • Reception: (206) 398-5000 • FAX: (206) 398-5499
www.soundtransit.org

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LINK LIGHT RAIL OPERATIONS AND MAINTENANCE SATELLITE FACILITY
KING AND SNOHOMISH COUNTIES, WASHINGTON
DRAFT 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
CITY OF BELLEVUE
CITY OF LYNNWOOD
KING COUNTY
SNOHOMISH COUNTY
U.S. ARMY CORPS OF ENGINEERS

4/15/14
Date of Approval

Regional Administrator
For Federal Transit Administration, Region 10

4/15/14
Date of Approval

SEPA Responsible Official
For Central Puget Sound Regional Transit Authority

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State Environmental Policy Act (SEPA) Fact Sheet

Project Title

Link Light Rail Operations and Maintenance Satellite Facility

Proposed Action

The Link Light Rail Operations and Maintenance Satellite Facility (OMSF) project (proposed project) proposes to construct and operate an OMSF to meet the needs of the expanded fleet of light rail vehicles (LRVs) identified in *Sound Transit 2: A Mass Transit Guide, The Regional Transit System Plan for Central Puget Sound* (ST2). The OMSF would be used to store, maintain, and dispatch LRVs for daily service by providing vehicle storage, preventative maintenance inspections, light maintenance, emergency maintenance, interior vehicle cleaning, and exterior vehicle washing. The facility would also be used to accommodate administrative and operational functions, such as serving as a report base for LRV operators. Additional facility elements would include employee parking, operations staff offices, maintenance staff offices, dispatcher work stations, an employee report room, and areas with lockers, showers, and restrooms for both operators and maintenance personnel. Four build alternative sites for the proposed project are evaluated: one in Lynnwood and three in Bellevue, Washington.

Project Proponent and State Environmental Policy Act Lead Agency

Sound Transit
Union Station
401 South Jackson Street
Seattle, Washington 98104
www.soundtransit.org

Dates of Construction and Opening

Sound Transit plans to begin construction of the proposed project by 2017, and expects it to be ready for operations in 2020.

National Environmental Policy Act Lead Agency

Federal Transit Administration (FTA)
915 Second Avenue, Suite 3142
Seattle, Washington 98174

State Environmental Policy Act Responsible Official

Perry Weinberg, Director, Office of Environmental Affairs and Sustainability
Sound Transit
Union Station
401 South Jackson Street
Seattle, Washington 98104

Contacts

Sound Transit

Kent Hale, Senior Environmental Planner
Union Station
401 South Jackson Street
Seattle, Washington 98104
(206) 398-5103

Jenna Franklin, Community Outreach Specialist
Union Station
401 South Jackson Street
Seattle, Washington 98104
(206) 903-7752

Federal Transit Administration

J. Steve Saxton, Transportation Program Specialist, FTA Region 10
915 Second Avenue, Suite 3142
Seattle, Washington 98174
(206) 220-4311

Potential Permits and Approvals

The list below pertains to permits that may be required based on the range of alternatives in this Draft Environmental Impact Statement (Draft EIS).

Permit or Approval	Issuing Agency
Federal	
Section 106 Review	Federal Transit Administration
Section 4(f) Review	Federal Transit Administration
Clean Water Act, Section 404	U.S. Army Corps of Engineers
Federal Endangered Species Act Review	U.S. Fish and Wildlife Service and National Oceanic and Atmospheric Administration Fisheries Service
State and County	
Hydraulic Project Approval	Washington Department of Fish and Wildlife
Public Utility Commission Permits	Washington Public Utility Commission
Section 106 Review	Washington State Department of Archaeology and Historic Preservation
National Pollution Discharge Elimination System Stormwater Discharge Permit	Washington State Department of Ecology
Temporary Modification of Water Quality Criteria	Washington State Department of Ecology
Underground Storage Tank Notification Requirement	Washington State Department of Ecology
Water Quality Certification: Section 401	Washington State Department of Ecology
Cities	
Street Use Permits	Cities of Bellevue and Lynnwood
Construction Permits	Cities of Bellevue and Lynnwood
Right-of-Way Permits or Franchise for Use of City Right-of-Way	Cities of Bellevue and Lynnwood
Environmental Critical Areas/Sensitive Areas Review	Cities of Bellevue and Lynnwood
Development Permits	Cities of Bellevue and Lynnwood
Noise Variance	Cities of Bellevue and Lynnwood
Street Vacations	Cities of Bellevue and Lynnwood
Certificates of Approval	Cities of Bellevue and Lynnwood
Other	
Various Approvals: Planning, Design Review, and Arts Commissions	Cities of Bellevue and Lynnwood
Notification of Intent to Perform Demolition or Asbestos Removal	Puget Sound Clean Air Agency
Pipeline and Utility Crossing Permits	Utility Providers
Utility Approvals: Easements and Use Agreements	Utility Providers

Principal Contributors

This Draft EIS was prepared by consultants at the following firms: ICF International, Huitt-Zollars, Heffron Transportation, Inc., Hart Crowser, and Michael Minor and Associates. See Appendix A, *Document Support Information*, Section A.2, for a detailed list of preparers and the nature of their contributions.

Date Draft Environmental Impact Statement Issued

May 9, 2014

Commenting on the Draft Environmental Impact Statement

A comment period of 45 days will begin May 9, 2014. Comments on the Draft EIS can be made in writing, by email, or at the public hearings. All comments are due by close of business on June 23, 2014. Please send written comments to the following address:

Attention: Sound Transit Link Light Rail OMSF Draft EIS Comments
Sound Transit
Union Station
401 South Jackson Street
Seattle, Washington 98104

Email comments should be sent to OMSF@soundtransit.org. Both written and email comments should include an addressee and return address.

Or please attend one of the following public hearings with open house events and offer your comments at the hearing.

June 3, 2014—Lynnwood
5:00 p.m. to 7:30 p.m.
Lynnwood Convention Center
3711 196th Street SW
Lynnwood, WA 98036

June 5, 2014—Bellevue
5:00 p.m. to 7:30 p.m.
Coast Bellevue Hotel
625 116th Avenue NE
Bellevue, WA 98004

Next Actions

Following publication of the Draft EIS, public hearings will be held and comments will be taken on the proposed project. A Final EIS will be published in mid to late 2015, identifying a preferred alternative and responding to public and agency comments received. Following publication of the Final EIS, the Sound Transit Board of Directors will make a final decision on the OMSF alternative to be built. After publication of the Final EIS, FTA is expected to issue a Record of Decision (ROD) on the proposed project.

Related Documents

Environmental Documents

East Link Project Final Environmental Impact Statement (Sound Transit 2011)

Lynnwood Link Extension Draft Environmental Impact Statement (Sound Transit 2013)

Final Supplemental Environmental Impact Statement on the Regional Transit Long-Range Plan (Sound Transit 2005)

Other Documents

Sound Transit 2: A Mass Transit Guide, The Regional Transit System Plan for Central Puget Sound (Sound Transit 2008).

Cost and Availability of Draft Environmental Impact Statement

This Draft EIS is available for public review in a variety of formats and locations. The Draft EIS is available on the Sound Transit website (http://www.soundtransit.org/omsf); the document is also available on CD at no cost from Sound Transit. Paper copies of the Draft EIS are available for the cost listed below.

- Executive Summary-FREE
- Draft EIS - $25.00
- Technical Background Reports - $11.00–$15.00 each

Copies of the Draft EIS and related documents listed above are available for review or purchase at the office of Sound Transit, Union Station, 401 South Jackson Street, Seattle, Washington 98104. To request any of the documents, please contact Erin Green at (206) 398-5464. To review these documents, please call the Sound Transit librarian at (206) 398-5344 during normal business hours (weekdays from 8:00 a.m. to 5:00 p.m.) to arrange an appointment.

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

- Bellevue Regional Library
- Lynnwood Library
- Washington State Library

Preface

Sound Transit plans, builds, and operates the regional mass transit system for the central Puget Sound region. The system includes light rail, heavy rail commuter trains, and express buses. In 2005, Sound Transit updated the *Sound Transit Regional Transit Long-Range Plan* (Long-Range Plan) using public input to refine the long-term vision of mass transit for the region. The Long Range Plan informed the development of the ST2 program, which provides the foundation for expanding the regional transit system. Since voter financing approval in 2008, Sound Transit has been integrating the new ST2 program with the ongoing light rail, commuter rail, and regional express bus service operations. In addition to added commuter rail and bus service, implementation of ST2 will add approximately 36 miles to the light rail system and increase the existing LRV fleet to approximately 180 vehicles.

Currently, the Link light rail system includes the Forest Street Operations and Maintenance Facility (Forest Street OMF), located at 3407 Airport Way South in the City of Seattle. The Forest Street OMF is configured to serve a maximum of 104 LRVs. The new OMSF is proposed to accommodate the added vehicles required by the ST2 light rail expansion.

Sound Transit, together with FTA, has prepared this Draft EIS for the proposed project in compliance with the National Environmental Policy Act (NEPA) and the Washington State Environmental Policy Act (SEPA). This Draft EIS achieves the following:

- Provides environmental information to assist decision makers in selecting the project alternative to be built.
- Describes the alternatives and their potential environmental impacts.
- Identifies measures to avoid and minimize impacts and, when necessary, mitigate for adverse impact.
- Considers cumulative impacts as part of the environmental review process.
- Provides information for other environmental processes, including compliance with
    - The Endangered Species Act
    - Section 106 of the National Historic Preservation Act of 1966
    - Section 4(f) of the Department of Transportation Act of 1966, 49 United States Code (U.S.C.) 303
    - Section 6(f) of the Land and Water Conservation Funds Act
    - Executive Order 12898 – Environmental Justice

The scope of environmental review and range of alternatives evaluated in this Draft EIS respond to public and agency comments received during the public scoping process that began in September 2012. Two public scoping meetings and one agency meeting were held during the scoping period.

To comply with NEPA and SEPA and to enhance readability, this Draft EIS focuses on the most relevant information regarding project definition, potential adverse impacts, and trade-offs among the alternatives. The study area for this Draft EIS varies by resource and is described within each resource section of the document, as appropriate.

The Draft EIS is organized as follows.

The **Executive Summary** is a separately bound, condensed version of the overall document. It briefly describes the purpose and need for the proposed project, the proposed project's goals and objectives, and the alternatives being considered. It presents the impacts for each alternative and potential mitigation, and briefly evaluates and compares the different alternatives. The Executive Summary concludes by identifying areas of uncertainty and the proposed project's next steps.

Chapter 1. Purpose and Need for the Project, describes the proposed project's purpose and need, provides a brief background of the proposed project, and outlines the proposed project's goals and objectives.

Chapter 2. Alternatives Considered, describes the alternatives evaluated and how they were identified and developed for study in this Draft EIS. A No Build Alternative is also evaluated to serve as a baseline for comparing the potential effects of the build alternatives. This chapter also provides an overview of the construction approach and a comparison of cost estimates by alternative. It concludes by explaining the proposed project's planning and decision-making context, including the major steps in the environmental evaluation and project development process.

Chapter 3. Affected Environment and Environmental Consequences, describes the built and natural environment in the study areas, explains the impacts from construction and operation of the proposed project alternatives, and describes potential avoidance and minimization measures. In the case that adverse impacts cannot be avoided, compensatory mitigation is identified, as appropriate. This chapter includes the following environmental topics.

3.1 Transportation

3.2 Acquisitions, Displacements, and Relocations

3.3 Land Use

3.4 Economics

3.5 Social Impacts, Community Facilities, and Neighborhoods

3.6 Visual and Aesthetic Resources

3.7 Air Quality and Greenhouse Gases

3.8 Noise and Vibration

3.9 Ecosystems

3.10 Water Resources

3.11 Energy

3.12 Geology and Soils

3.13 Hazardous Materials

3.14 Electromagnetic Fields

3.15 Public Services

3.16 Utilities

3.17 Historic and Archaeological Resources

3.18 Parklands and Open Space

Chapter 4. Alternatives Analysis, compares the project alternatives in terms of affected environment and how effectively they meet the project's goals and objectives.

Appendices A through G provide additional details on the project and Draft EIS process. Appendix A includes document support information (references, lists of preparers and recipients, and acronyms), Appendix B provides a summary of public involvement and agency coordination and a list of regulatory information used to prepare this Draft EIS. Appendices C and D provide federally required reports on environmental justice and Section 4(f) and 6(f) resources (park and recreation areas, wildlife refuges, and any facilities that have received Land and Water Conservation Act funding). Appendix E contains the detailed technical reports prepared for the Transportation, Noise and Vibration, Historic and Archaeological Resources, and Ecosystems sections of Chapter 3, Affected Environment and Environmental Consequences. Appendix F contains additional technical data that support the resource analysis sections of Chapter 3. Appendix G provides conceptual plans of the proposed project.

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**Technical reports and background information are provided on CD with the Draft EIS and available on the project website at www.soundtransit.org/Projects-and-Plans/Link-Operations-and-Maintenance-Satellite-Facility. Printed versions are available on request for the cost of reproduction.*

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Summary

Introduction

This draft environmental impact statement (Draft EIS) evaluates the impacts of implementing the Sound Transit Link Light Rail Operations and Maintenance Satellite Facility (OMSF) Project (proposed project). The proposed project consists of the development and operation of a new OMSF to support the expansion of the Central Puget Sound Regional Transit Authority's (Sound Transit) Link light rail transit system. This system-wide expansion is part of *Sound Transit 2: A Mass Transit Guide, The Regional Transit System Plan for Central Puget Sound* (ST2) for transit investments, financing for which was approved by voters in November 2008.

Expanded maintenance base capacity is critical to the system-wide expansion in ST2. This environmental impact statement (EIS) is being prepared to evaluate operations and maintenance needs across the Sound Transit district and is not focused on a specific corridor. The environmental process includes evaluation and screening of sites in all corridors and ultimately advances four build alternatives located in the north and the east. Separate EISs are being prepared to support the alignment and station location decisions for the proposed light rail extension to the north, the Lynnwood Link Extension EIS, and to the south, the Federal Way Link Extension EIS. The alignment and station locations for the light rail extension to the east are addressed in the East Link Final EIS, which was completed in July 2011.

The Draft EIS evaluates four build alternatives that meet the purpose and need for the proposed project and a No Build Alternative, which considers how the transportation system would operate if the proposed project were not built. The No Build Alternative also provides a baseline against which to measure the impacts of the build alternatives.

The discussion that follows states the proposed project's purpose and need, including the goals and objectives the proposed project is designed to achieve. The discussion also compares the level of impact that would result from each build alternative and describes design features and measures that would avoid or reduce impacts. A summary of identified areas of controversy, and a list of the next steps in the environmental review process are also provided.

This Draft EIS is consistent with guidelines of the National Environmental Policy Act (NEPA) and the Washington State Environmental Policy Act (SEPA). Sound Transit is the lead agency under SEPA and the Federal Transit Administration (FTA) is the lead federal agency under NEPA. The environmental analysis provided will assist decision-makers in identifying a preferred alternative for the Final EIS.

Purpose and Need for the Proposed Project

Purpose

The purpose of the proposed project is to enable Sound Transit to meet the maintenance and storage needs of the expanded fleet of light rail vehicles (LRVs) identified in ST2. ST2 includes expansion of Sound Transit's Link light rail transit system, which will require additional operations and maintenance facility capacity to support the added LRVs.

Implementation of the proposed project would:

- Support the intended level of service for expanding the Link light rail system to the Lynnwood Transit Center, Overlake Transit Center and Kent/Des Moines.
- Minimize system annual operating costs and support efficient and reliable light rail service.
- Support regional long-range plans, including the Puget Sound Regional Council's VISION 2040 and Transportation 2040 plans, and the *Sound Transit Regional Transit Long-Range Plan* (Long-Range Plan).

The OMSF is expected to provide service and inspection functions to support a minimum of approximately 80 LRVs with the assumption that Sound Transit's existing light rail operations and maintenance facility (Forest Street Operations and Maintenance Facility [Forest Street OMF]) would continue to provide inspection services as well as heavy repair and overhauls. The OMSF would be used to store, maintain, and dispatch vehicles for daily service.

Need

The Forest Street OMF is located in the industrial area of downtown Seattle and is configured to serve up to 104 LRVs. To implement the ST2 expansion, Sound Transit needs to increase its LRV fleet to approximately 180 vehicles by 2023, which requires the proposed OMSF to be ready for operations in 2020 to accept delivery of new LRVs and support break-in procedures for those LRVs. The need for the proposed project exists because the Forest Street OMF cannot store, maintain, or deploy the vehicles associated with the expanded service called for in ST2. Sound Transit would not be able to provide the system-wide level of service called for by ST2 without adequate maintenance facility capacity. To implement ST2, the light rail system would require more storage and greater capacity for necessary service, maintenance, and inspection functions. The storage and maintenance facility must be sited to support efficient and reliable operations and deployment of LRVs to serve the entire Link light rail system.

Project Goals and Objectives

Based on the project purpose, Sound Transit developed the following goals and objectives to evaluate potential build alternatives. These goals and objectives uphold Sound Transit's legislative mandate to meet public transportation and mobility needs for high-capacity transit infrastructure while also being a responsible steward of the environment and being considerate of affected jurisdictions and the public while planning a fiscally responsible project.

- **Transportation Goal.** Facilitate operation of the expanded regional Link light rail system.
  - Locate a facility to provide efficient and reliable light rail service.
- **Environment Goal.** Preserve environmental quality.
  - Minimize potential adverse impacts on the natural and built environment.
- **Financial Goal.** Achieve financial feasibility.
  - Build, operate, and maintain a facility that minimizes capital, construction, and annual system operating costs.

Project Location

Link light rail extensions of ST2 are planned in King and Snohomish Counties in the metropolitan Puget Sound region. Currently, planned light rail extensions with ST2 funding include the City of Lynnwood in the north, the Cities of Kent and Des Moines in the south, and the Cities of Bellevue and Redmond in the east. The OMSF would be located proximate to either the north or east line to serve the system. The project vicinity is shown in Figure S-1.

Comparison of Alternatives

During the early planning stages of the project, Sound Transit conducted a corridor analysis to identify constraints, benefits, and trade-offs of locating the facility in the north, south, and east corridors. Sound Transit found that sites located in the north and east corridors would meet operational needs. Locating an OMSF south of the junction where the north-south line and the north-east line meet at the International District Station, or expanding the Forest Street OMF (which is also located south of this junction), would not sufficiently support operations for the following reasons (Sound Transit 2012b).

- The time allotted to deploy trains serving the 6:00 a.m. to 10:00 a.m. morning peak period would be exceeded.
- The 4-hour nightly inspection and maintenance window (1:00 a.m. to 5:00 a.m.), when all trains must be off the system, could not be maintained.
- Expansion of the Forest Street OMF would not provide capacity (e.g., number of vehicle bays, operator report facility, parts storage and component repair) to meet the daily and weekly maintenance and inspection needs for the entire fleet of 180 vehicles.
- There is insufficient property to expand the Forest Street OMF to provide these needs without vacating or closing 6th Avenue S and/or Airport Way, which provide for freight mobility in the SODO industrial area.
- If all 180 vehicles were stored on a single site, a system failure during the morning deployment could result in the entire fleet being trapped and unable to begin service.

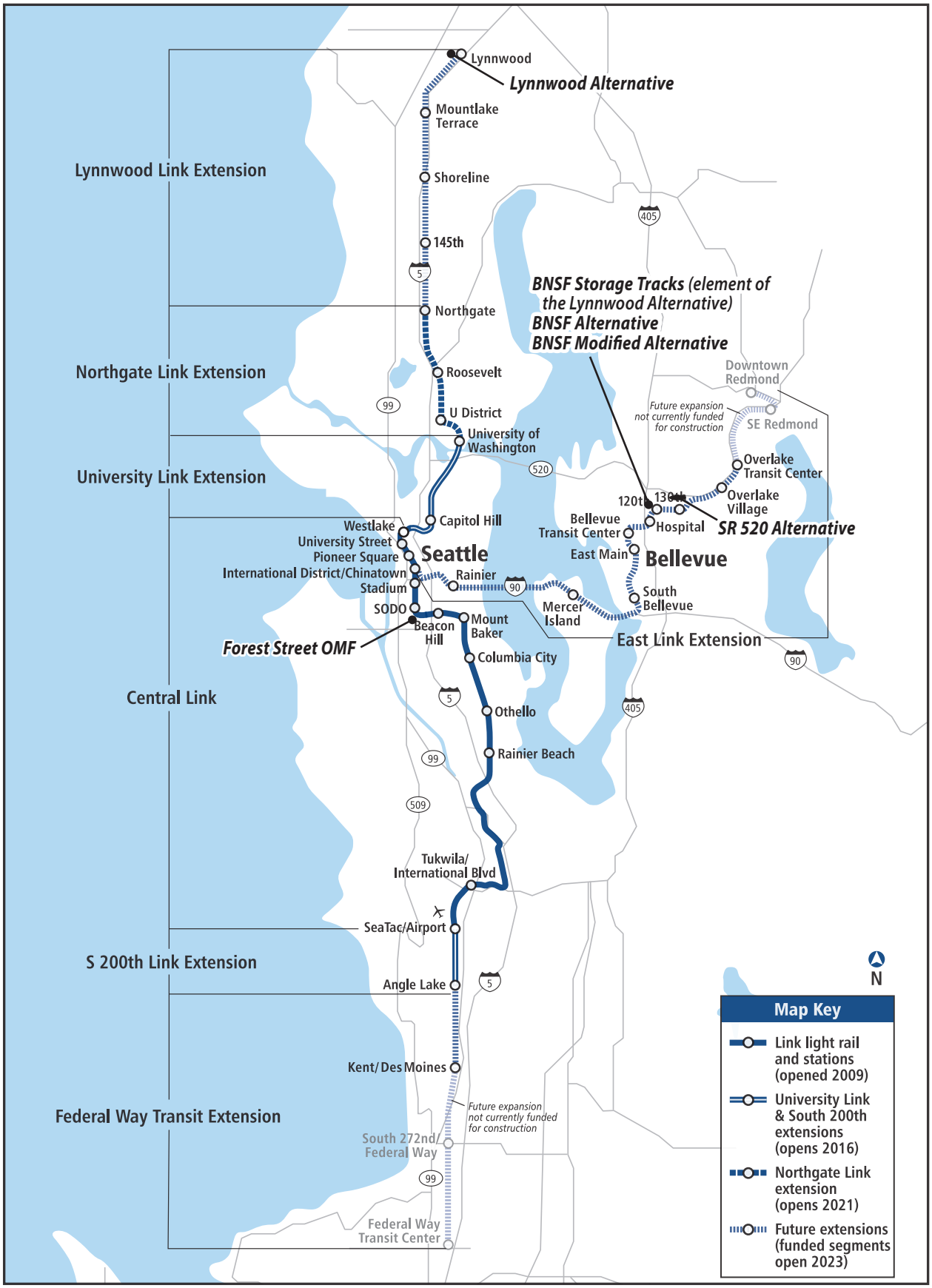

Figure S-1: Regional Setting for the Build Alternatives
Sound Transit Link Light Rail OMSF Draft EIS

The environmental scoping period was held from September 17 to October 22, 2012. During this time, Sound Transit and FTA asked the public to provide comments on the proposed purpose and need statement, environmental issues for evaluation in the Draft EIS, and the potential alternatives being considered for study in the Draft EIS. Scoping was conducted by Sound Transit and FTA in consultation with other agencies, including the Washington State Department of Transportation (WSDOT); Snohomish and King Counties; the Cities of Lynnwood and Bellevue; potentially affected tribes; and other regional, state, and federal agencies.

The Sound Transit Board of Directors considered the project purpose and need; the physical and operational requirements of the OMSF and associated site screening criteria; and scoping comments and suggestions provided by agencies and the public. In December 2012, the Board adopted Motion M2012-82, which identified four build alternatives for detailed evaluation in this Draft EIS.

No Build Alternative

This EIS evaluates a No Build Alternative, as required under NEPA and SEPA, to represent the transportation system and the environment as they would exist without the proposed project. The No Build Alternative also provides a baseline against which the build alternatives can be compared. Under the No Build Alternative, an OMSF would not be built. The operations and maintenance support needs for the existing and currently planned and funded Link light rail system expanded by ST2 would be served exclusively by the Forest Street OMF south of downtown Seattle, which has the capacity to maintain up to 104 LRVs.

Key Operational and Environmental Impacts of the No Build Alternative

Under the No Build Alternative, light rail system service levels would be substantially lower than with the proposed project. With the OMSF, the light rail system would operate at the service levels anticipated in ST2: four-car trains at 8-minute headways (intervals between trains) on each operating line during peak periods (4-minute headways between the Lynnwood Transit Center and the International District Station, which represents the two combined operating lines); and 10 to 15-minute headways in the off-peak and late evenings (5- to 7.5-minute headways on the combined lines). Without the addition of an OMSF, the light rail system would operate using three-car trains at 11-minute headways during peak periods (5.5-minute headways on the combined lines), which would reduce the system's passenger capacity by more than 40% compared to the build alternatives.

Without the OMSF, some trains serving the East Link line would likely be deployed from the Forest Street OMF to establish morning service requiring them to travel north through the Downtown Seattle Transit Tunnel (DSTT) and turn back south at the Northgate Station to reach the East Link line. This level of service across the entire system would not meet projected demand and could result in passenger overcrowding on trains and station platforms. Lower service levels and light rail passenger capacity could result in fewer commuters using transit. These commuters may continue using automobiles instead, resulting in greater vehicular and greenhouse gas emissions. Economic activity and desired land use patterns, particularly those incorporating mixed-use and higher

densities, may occur more slowly near transit stations due to the reduced system capacity. While there would be no effect on ecosystems under the No Build Alternative, none of the benefits of the proposed project would be realized, such as updating stormwater management for improved water quality. Similarly, opportunities to implement seismic and slope stability best management practices (BMPs) may not occur as current land uses would continue. In short, the No Build Alternative would not meet the critical need for expanding LRV operation and maintenance capacity to meet the demands of the expanded ST2 system. Without an OMSF, Sound Transit would have to operate the expanded system at a lower level of service than planned, or delay some or all of the planned ST2 light rail extensions, until it developed additional operations and maintenance capacity.

Build Alternatives

The four build alternatives and their key operational and environmental impacts are described below. Table S-1 identifies the differentiating characteristics and impacts of the build alternatives. Environmental impacts related to transportation; social, community facilities, and neighborhoods; visual and aesthetic resources; air quality and greenhouse gases; energy; hazardous materials; electromagnetic fields; geology and soils; utilities; and historic and archaeological resources would be similar among the build alternatives.

Lynnwood Alternative

Under the Lynnwood Alternative, Sound Transit would construct the OMSF north of I-5 and east of the 52nd Avenue W/Cedar Valley Road intersection in the City of Lynnwood. The proposed Lynnwood Link Extension alignments in the *Lynnwood Link Extension Draft EIS* (Sound Transit 2013) are located along the OMSF Lynnwood Alternative site. A decision on what is to be built for the Lynnwood Link Extension has not yet been made. Therefore, the Lynnwood Alternative for the OMSF includes three design options, each connecting to one of the three build alternatives evaluated in the *Lynnwood Link Extension Draft EIS* (Sound Transit 2013). Design Option C1 would include lead track connecting to Lynnwood Link Extension Alternative C1, Design Option C2 would include lead track connecting to Lynnwood Link Extension Alternative C2, and Design Option C3 would include lead track connecting to Lynnwood Link Extension Alternative C3. The Lynnwood Alternative would require acquiring approximately 37 to 41 acres. The OMSF development footprint would be approximately 24 acres for all three design options, leaving approximately 9 to 13 acres for redevelopment.

The Lynnwood Alternative for the OMSF also includes offsite LRV storage, operator report facilities, and interior cleaning functions for up to 32 LRVs to provide morning service to the Eastside. This would be located north of NE 12th Street and south of State Route (SR) 520 in the City of Bellevue within the Sound Transit-owned Eastside Rail Corridor and on an adjacent property located immediately east of the Eastside Rail Corridor. The design acknowledges the railbanked status of the Eastside Rail Corridor by allowing sufficient width to accommodate a future trail and future freight or passenger rail use of the corridor. Conceptual layouts and bird's eye views of the Lynnwood Alternative site and additional storage area with ancillary facilities in Bellevue (BNSF Storage Tracks) are shown in Figures S-2a through S-2e.

Table S-1. Differentiating Characteristics and Impacts of the Build Alternatives

Differentiating Characteristic	Lynnwood Alternative	BNSF Alternative	BNSF Modified Alternative	SR 520 Alternative
Capital Costs (2013 dollars)				
Million dollars	$350–$355	$345	$415	$385
Operations				
Requires off-site storage tracks	Yes	No	No	No
Annual Facility Operating Costs (constant dollars)				
Million dollars	$66	$63	$63	$63
Acquisitions, Displacements, and Relocations				
Number of parcels acquired	14–15	6	14	13
Number of existing land uses displaced	11–14	14	25	101
Land Use				
Consistent with zoning / comprehensive plan designations	No; would require comp. plan and zoning change and a CUP	No; would require a CUP	No; would require a CUP	No; would require a CUP
Surplus land available for redevelopment	9–13 acres	4 acres	8 acres	0 acres
Economics				
Loss of annual property tax revenue (2012)	$413,100–$450,400	$464,200	$572,400	$630,500
Noise and Vibration				
Affected sensitive receptors and adjacent land uses (number after mitigation)	2 homes (None)	None	None	None
Ecosystems and Water Resources				
Aquatic impacts	≤ 0.1 acre of stream buffer	0 acres of stream buffer	0 acres of stream buffer	Piping approx. 700 feet of Goff Creek and 0.64 acre of stream buffer
Vegetation and wildlife impacts (vegetation removal)	11–12 acres	3 acres	6 acres	2 acres
Wetland impacts (direct)	1.98–2.18 acres	0.07 acre	0.6 acre	0.39 acre
Wetland buffer impacts	1.79 acres	0.25 acre	1.33 acres	0.29 acre
Groundwater and stream baseflow impacts	No	No	No	Yes
Public Services				
Number of direct impacts on essential public facilities	1	0	1	0
Parkland and Open Space				
Number of temporary impacts on park resources	1	0	0	0

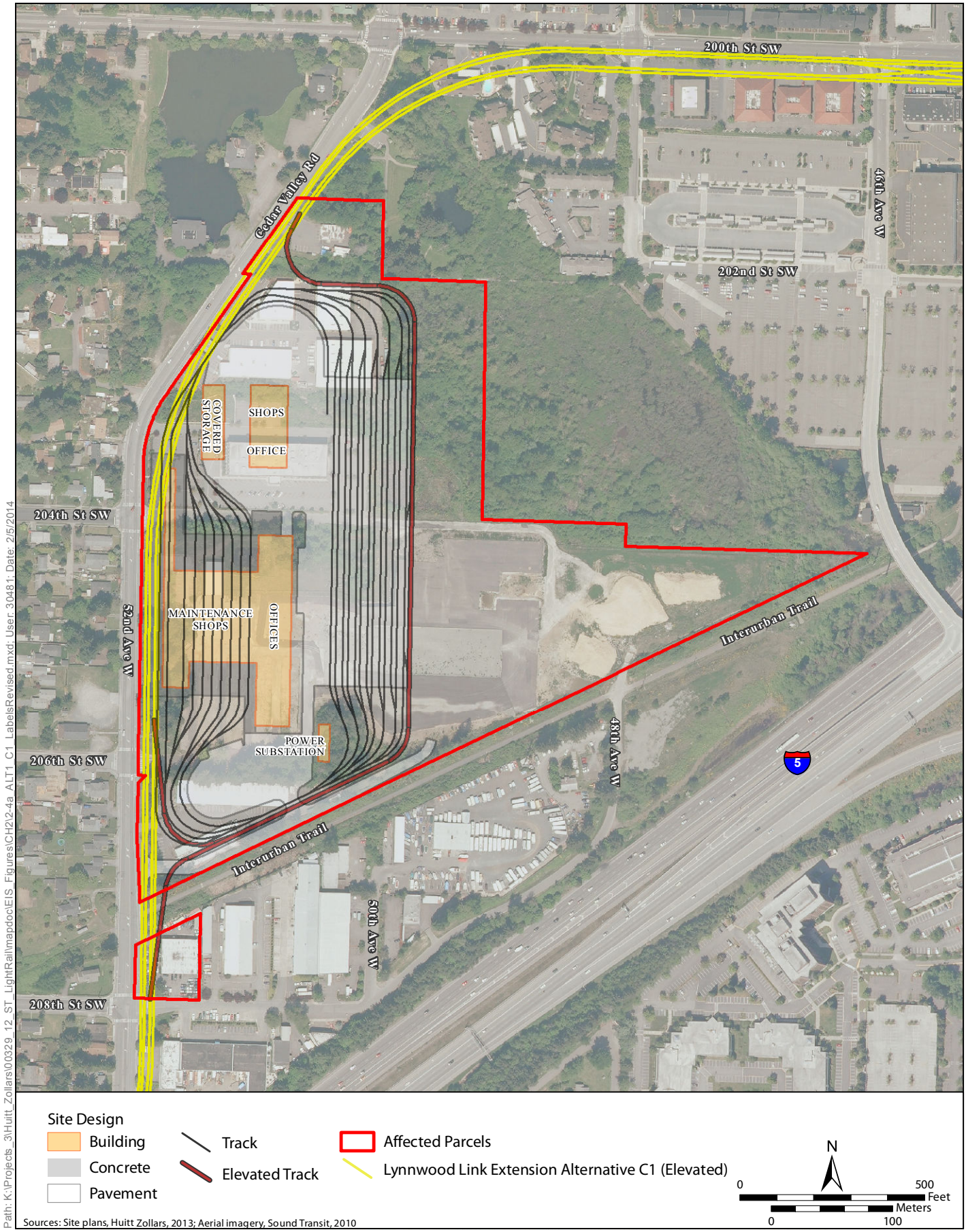

Figure S-2a: Lynnwood Alternative, Design Option C1
Sound Transit Link Light Rail OMSF Draft EIS

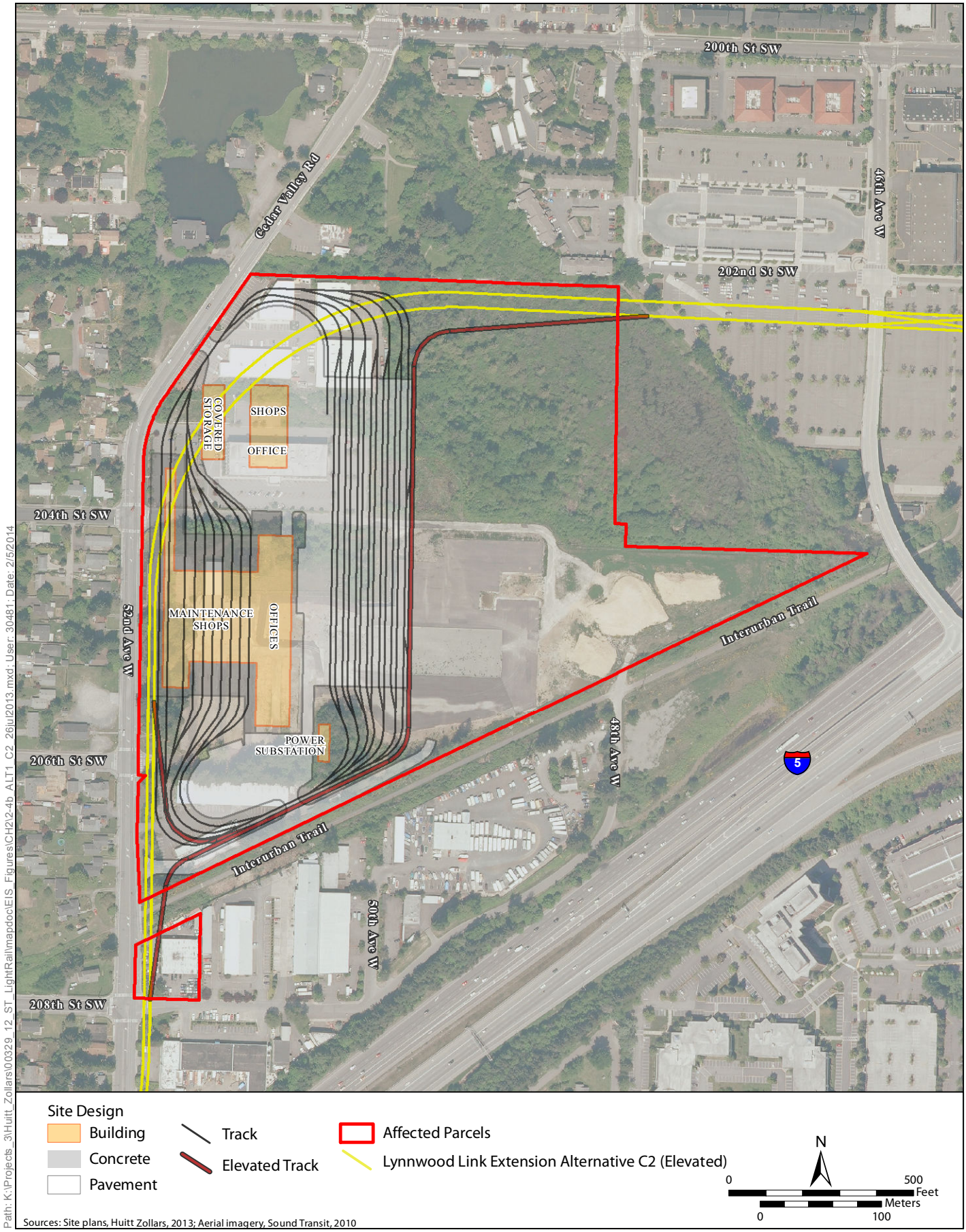

Figure S-2b: Lynnwood Alternative, Design Option C2
Sound Transit Link Light Rail OMSF Draft EIS

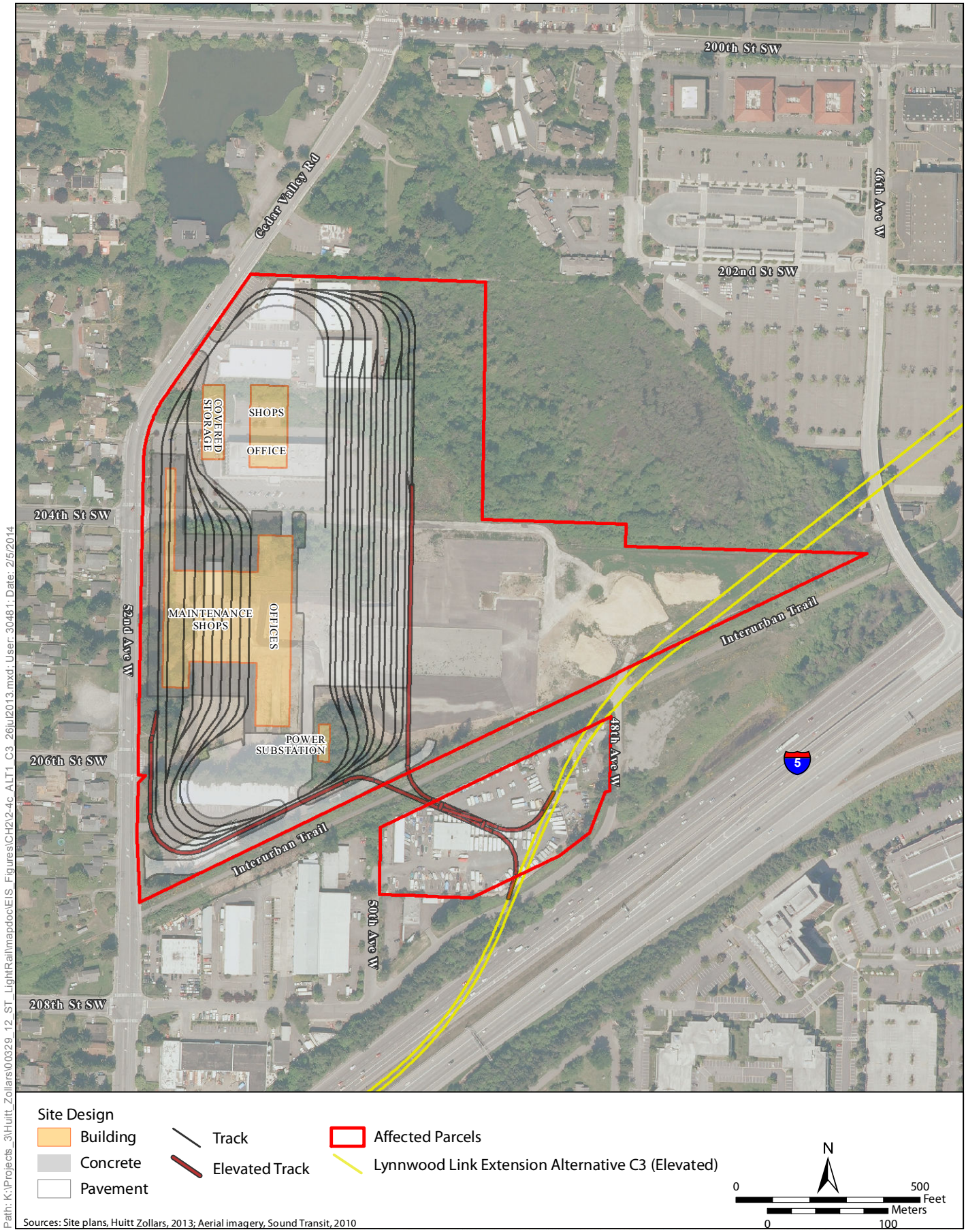

Figure S-2c: Lynnwood Alternative, Design Option C3
Sound Transit Link Light Rail OMSF Draft EIS

Figure S-2d: Lynnwood Alternative, Design Option C3—Bird's Eye View
Sound Transit Link Light Rail OMSF Draft EIS

Figure S-2e: Lynnwood Alternative, BNSF Storage Tracks*
Sound Transit Link Light Rail OMSF Draft EIS
*The BNSF Storage Tracks are located in Bellevue

Key Operational and Environmental Impacts of the Lynnwood Alternative

The Lynnwood Alternative would require off-site storage tracks, duplicating some functions (such as LRV cleaning and operator reporting), and introducing logistical complications in operations (such as introducing the need to rotate LRVs between two separate locations to accomplish all maintenance). The Lynnwood Alternative would result in 15-minute headways after 6:30 p.m. on the Lynnwood to Overlake Transit Center operating line. This would result from the need to provide daily inspection and interior cleaning of 32 LRVs at the BNSF Storage Tracks so those vehicles are ready for the next morning's deployment. The time needed to complete these functions at the BNSF Storage Tracks would require that these vehicles be removed from service earlier in the evening, resulting in longer headways after 6:30 p.m. This headway does not meet Sound Transit's planned off-peak headway of 10 minutes until 10:00 p.m. This could also result in irregular spacing of trains after 6:30 p.m. north of the International District Station, where the two operating lines merge.

The Lynnwood Alternative site is currently zoned for Light Industrial and Business /Technical Park uses. Development of the OMSF is not explicitly addressed in the City's land use code and would require a Conditional Use Permit (CUP) approval from the City of Lynnwood, and an amendment to the City's official zoning map. This is the only alternative that has the potential to affect existing residential uses (the neighborhood west of the Lynnwood Alternative site) due to the increase in noise. However, the increase in noise would be fully mitigated. The Lynnwood Alternative would also result in the highest annual facility operating costs and greatest impacts on ecosystem resources including vegetation, wetlands, and wildlife habitat. The Lynnwood Alternative would also require temporary closure and detour of the Interurban Trail while the elevated lead track is constructed. This alternative would occupy land owned by the Edmonds School District that is planned for a district support center, which would include administrative offices and school bus storage and maintenance facilities. The proposed maximum building height of the OMSF would be approximately 32 feet, consistent with the low profile of the buildings in the surrounding area and, therefore, does not represent a substantial visual change. Additionally, screening fences and landscape elements would be incorporated into the design.

BNSF Alternative

Under the BNSF Alternative, Sound Transit would construct the OMSF on property located between the Eastside Rail Corridor on the west and 120th Avenue NE on the east, south of SR 520 and north of NE 12th Street in the City of Bellevue. This site is approximately 27 acres—2 of which are a former rail spur right-of-way now under ownership of Sound Transit as part of the Eastside Rail Corridor—and is located along the adopted East Link revenue line northwest of the 120th Avenue NE station. The OMSF development footprint on the site is approximately 23 acres leaving approximately 4 acres to remain for redevelopment. Infrastructure for the proposed project would occupy most of the site leaving the southern portion available for other development. A conceptual layout of this site is shown in Figure S-3a and a bird's eye view is shown in Figure S-3b.

Site Design
- Building
- Concrete
- Pavement
- Track

- Affected Parcels
- East Link Extension

N

0 500 Feet

0 100 Meters

Sources: Site plans, Huitt Zollars, 2013; Aerial imagery, City of Bellevue, 2013

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Figure S-3a: BNSF Alternative
Sound Transit Link Light Rail OMSF Draft EIS

Figure S-3b: BNSF Alternative—Bird's Eye View
Sound Transit Link Light Rail OMSF Draft EIS

Key Operational and Environmental Impacts of the BNSF Alternative

The BNSF Alternative would be the least expensive to construct. The BNSF Alternative site is in the Bel-Red Corridor planning area, which is currently zoned for mixed use, office, and residential uses. The BNSF Alternative is not consistent with planned future land uses in the area. The City's land use code would require a CUP approval from the City of Bellevue. This alternative would require relocating existing industrial and commercial uses. The Bel-Red Corridor no longer includes industrially zoned land, but relocation of displaced businesses could occur on industrially zoned land elsewhere in Bellevue. The OMSF is consistent with existing uses and would not result in substantial changes to the existing visual environment because the building mass, size, and use are typical of the surrounding area.

BNSF Modified Alternative

Under the BNSF Modified Alternative, Sound Transit would construct the OMSF on both sides of the Eastside Rail Corridor west of 120th Avenue NE, south of SR 520 and north of NE 12th Street in the City of Bellevue. This site is located along the adopted East Link revenue line and is approximately 34 acres in size, including 2 acres of the Eastside Rail Corridor now under Sound Transit ownership. The OMSF development footprint on the site is approximately 24 acres leaving approximately 8 acres for future redevelopment. The storage tracks would be located on the western portion of the site, west of the rail corridor. Other OMSF facilities would be located adjacent to the east side of the rail corridor, leaving the frontage area along 120th Avenue NE available for other development. A conceptual layout of this site is shown in Figure S-4a and a bird's eye view is shown in Figure S-4b.

Key Operational and Environmental Impacts of the BNSF Modified Alternative

The BNSF Modified Alternative would be the most expensive to construct. Existing topography and the complexity of building on both sides of the Eastside Rail Corridor (with circulating track spanning over the corridor) would require additional structures and retaining walls. This alternative site has the same zoning designations as the BNSF Alternative on the east side of the Eastside Rail Corridor. Properties west of the rail corridor are zoned for medical office uses. The BNSF Modified Alternative is not consistent with future planned land uses in the area. The land use approval process would be the same as the BNSF Alternative. The BNSF Modified Alternative would result in nearly identical impacts as BNSF Alternative except that it would also require the acquisition and relocation of the Bellevue Public Safety Training Center. The OMSF is consistent with existing uses and would not result in substantial changes to the existing visual environment because the building mass, size, and use are typical of the surrounding area.

Figure S-4a: BNSF Modified Alternative
Sound Transit Link Light Rail OMSF Draft EIS

Figure S-4b: BNSF Modified Alternative—Bird's Eye View
Sound Transit Link Light Rail OMSF Draft EIS

SR 520 Alternative

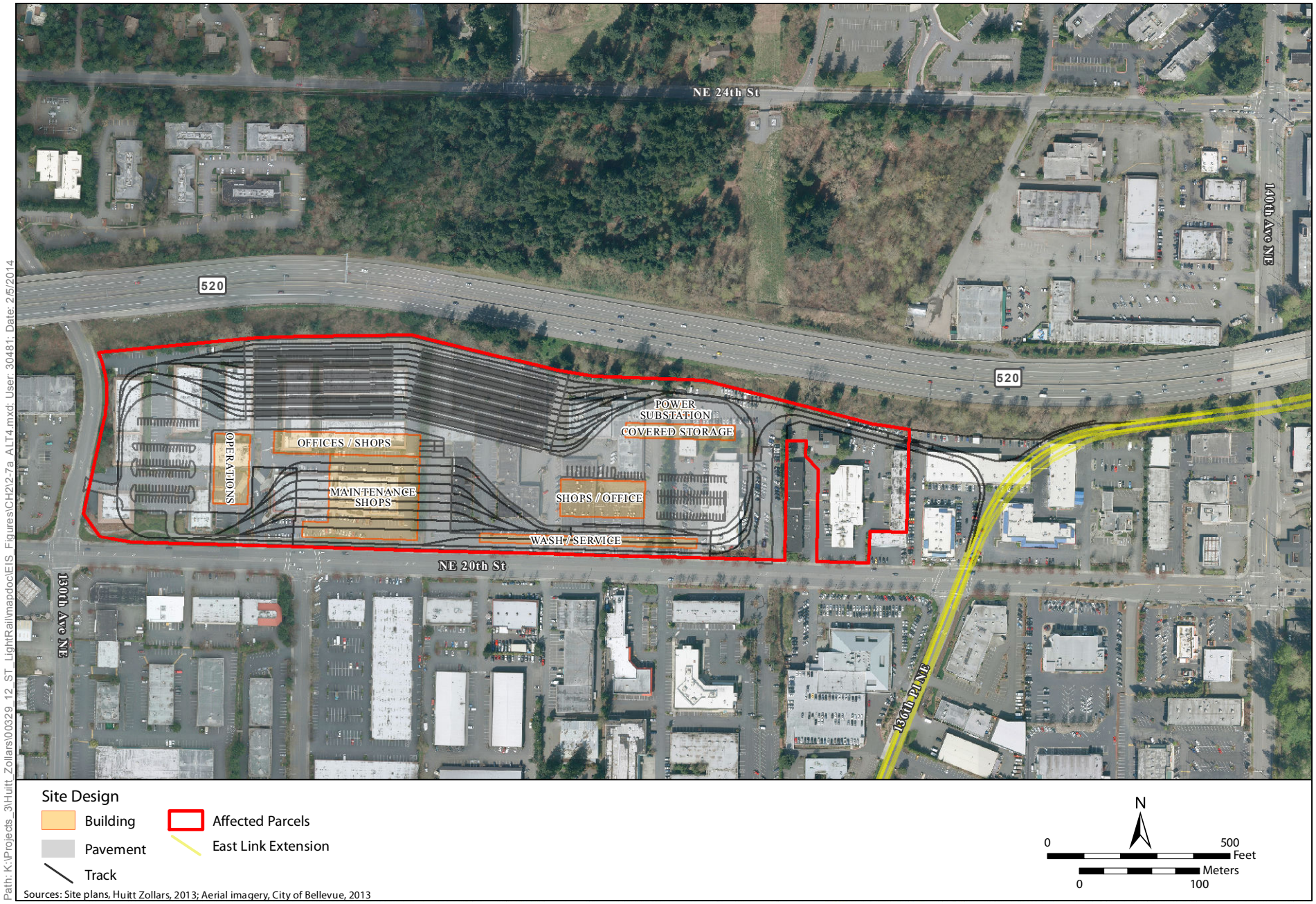
Under the SR 520 Alternative, Sound Transit would construct the OMSF south of SR 520 and north of Northup Way/NE 20th Street, east of 130th Avenue NE and west of 140th Avenue NE in the City of Bellevue. This site is located along the adopted East Link revenue line and is approximately 25 acres. The OMSF development footprint encompasses the entire site, leaving no substantial area for redevelopment. Primary access to the site would be directly off of NE 20th Street west of 136th Place NE. The configuration of buildings under this alternative would vary from the other alternatives in that the operations offices would be in a separate building to the west of the LRV maintenance shops, and the LRV covered wash and service bay would be in a separate building east of the LRV maintenance shops. A conceptual layout of this site is shown in Figure S-5a and a bird's eye view is shown in Figure S-5b.

Key Operational and Environmental Impacts of the SR 520 Alternative

The SR 520 Alternative is the second most expensive alternative to construct. Existing topography would require earthwork and retaining walls along both the SR 520 right of way and along NE 20th Street. This alternative would modify a portion of East Link to accommodate the lead track connection, resulting in reduced operating speed on the mainline. The SR 520 Alternative site is currently zoned for commercial uses and development of the OMSF would require a similar CUP approval as the BNSF Alternative or BNSF Modified Alternative. The SR 520 Alternative would displace the greatest number of commercial businesses. The SR 520 Alternative would also have the greatest aquatic resource impacts related to piping portions of Goff Creek that are currently daylighted through the site. Modifications to the Goff Creek channel would be inconsistent with the *Bel-Red Subarea Plan*, would require mitigation, and may affect shallow groundwater to the degree that it would affect the amount of baseflow entering the creek. The OMSF would not result in substantial changes to the visual environment because the building mass, size, and use are typical of the surrounding area. Views from the Bridle Trails neighborhood north of the site are blocked by existing vegetation and landforms.

Avoidance, Minimization, and Mitigation Measures

Sound Transit is committed to satisfying applicable federal, state, and local environmental regulations to reduce or preclude impacts. In addition, the Draft EIS identifies potential measures to preclude or reduce impacts from project construction and operation, including application of its project commitments and design measures. If impacts remain, Sound Transit would implement mitigation measures to reduce these impacts. These measures would be refined through final design and permitting. A list of all committed mitigation measures will be included in the NEPA Record of Decision (ROD), which will be issued after the final environmental impact statement (Final EIS). The design measures, environmental commitments, and potential mitigation measures are described below.



Sources: Site plans, Huitt Zollars, 2013; Aerial imagery, City of Bellevue, 2013

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Figure S-5a: SR 520 Alternative
Sound Transit Link Light Rail OMSF Draft EIS

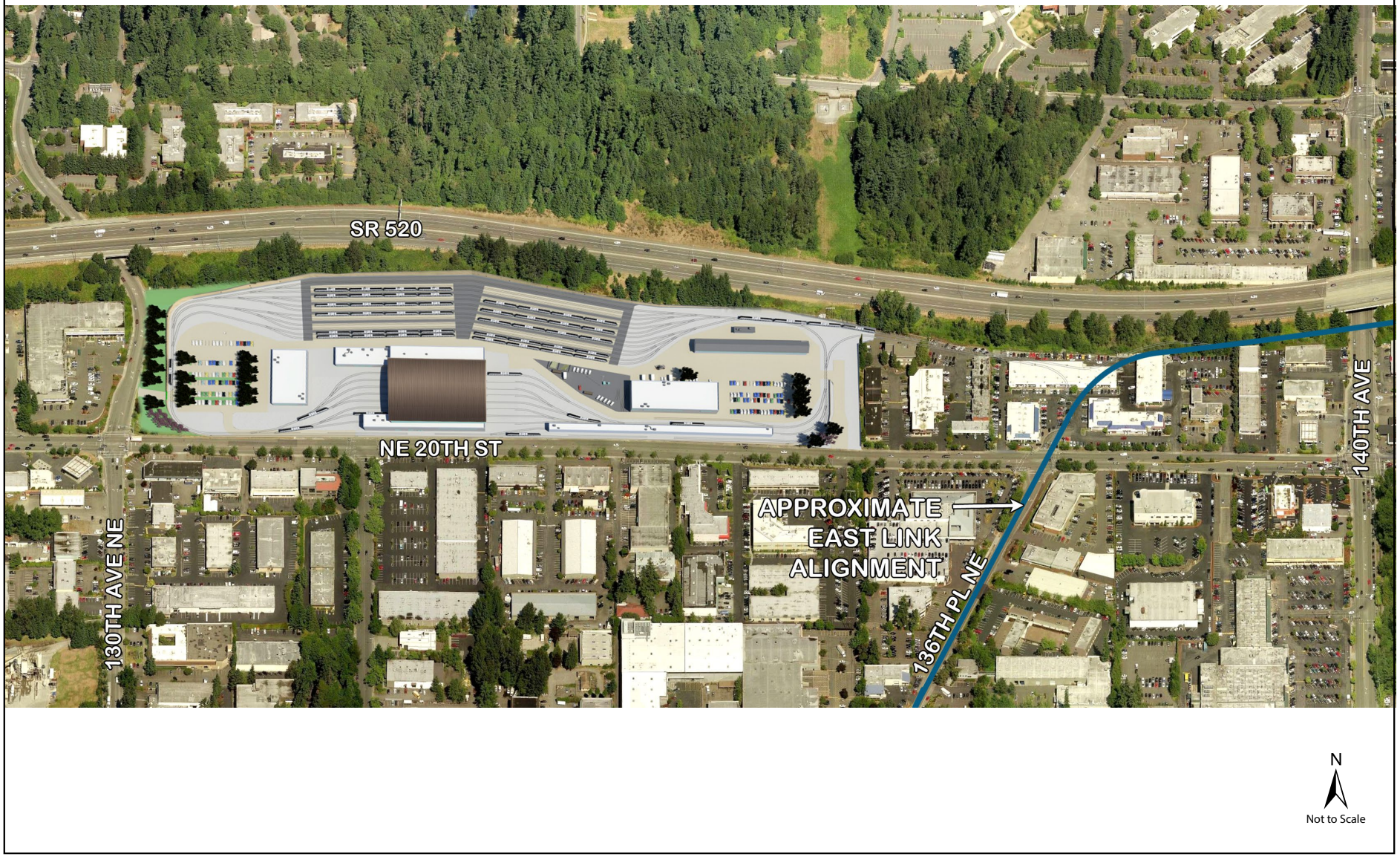


Figure S-5b: SR 520 Alternative—Bird's Eye View
Sound Transit Link Light Rail OMSF Draft EIS

Land Use

All alternatives would require a CUP from local cities. As a condition of the permit, the Cities of Lynnwood and Bellevue may require additional site-specific mitigation measures. Sound Transit will consult with the cities regarding local city requirements. Sound Transit is also exploring the feasibility of incorporating transit-oriented development at or adjacent to the build alternative sites.

Visual

Landscaping would be required by the City of Lynnwood Municipal Code and City of Bellevue Municipal Code to screen the site and soften the visual appearance of the perimeter of the site. The Bel-Red Zoning Code and Ordinance and overlay district requirements also provide design guidance within the Bel-Red corridor. As a condition of a CUP, the Cities of Lynnwood and Bellevue may require additional site-specific mitigation measures such as visual screening. Sound Transit will consult with the cities regarding local city requirements.

Noise

Mitigation for the noise impacts under the Lynnwood Alternative (all design options) would include modifications to the vehicle wash facility, such as enclosing the compressors and shielding the blowers. Additionally, facility design incorporates a combination of long bays and automated doors, which would also reduce noise from the blowers. Sound Transit would work with the manufacturer of the wash facility to ensure that the noise emissions from the blowers meet the project requirements. In addition, mitigation for the noise impacts under the Lynnwood Alternative (only Design Options C1 and C2) includes special track work to reduce noise from the crossovers.

Ecosystems

Sound Transit is committed to no net loss of ecosystem function and acreage on a project-wide basis. To the extent possible, compensatory mitigation that would compensate for lost values in-kind would be identified close to impacts. Mitigation would meet the requirements of local critical area ordinances.

Parklands

Construction of the Lynnwood Alternative would require temporary closure of the Interurban Trail. Sound Transit would coordinate with the City of Lynnwood to develop detours and provide public information and signed detour routes during construction to allow for continued use of the trail. Replacement landscaping would also be provided where vegetated areas would need to be cleared for construction.

Significant Unavoidable Adverse Impacts

With the avoidance, minimization, and mitigation measures listed above, significant adverse impacts would be avoided for all build alternatives.

Other Environmental Considerations

Environmental Justice

Environmental Justice has been addressed in compliance with Presidential Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, dated February 11, 1994, and the U.S. Department of Transportation Order to Address Environmental Justice in Minority Populations and Low-Income Populations (DOT Order 5610.2). The purpose of the analysis was to determine whether the proposed project would result in any disproportionately high and adverse impacts on minority and/or low-income populations.

The analysis concludes that, after proposed mitigation, the proposed project (under any alternative) is not expected to result in any disproportionately high and adverse impacts on minority and low-income populations. For the most part, impacts resulting from the proposed project would be limited in scope and others would be mitigated. Indirect benefits of the proposed project would include improving regional connectivity by providing a reliable, efficient, and affordable means of transportation for populations reliant on public transit.

Section 4(f) Resources

Some of the build alternative sites are situated in proximity to recreational facilities and parklands in the Cities of Bellevue and Lynnwood. Federal regulations specifically protect parklands.

Section 4(f) of the U.S. Department of Transportation Act of 1966 prohibits FTA from approving a project or program that uses land from a public park, recreation area, wildlife or waterfowl refuge, or historic site, unless the following conditions are met:

a) The Administration determines that:
   i. There is no feasible and prudent avoidance alternative to the use of land from the property; and
   ii. The action includes all possible planning to minimize harm to the property resulting from such use; or

b) The Administration determines that the use of the property, including any measure(s) to minimize harm (such as any avoidance, minimization, mitigation, or enhancement measures) committed to by the applicant will have a *de minimis* impact on the property.

c) If the analysis concludes that there is no feasible and prudent avoidance alternative, then the Administration may approve only the alternative that causes the least overall harm in light of the statute's preservation purpose (23 CFR 774).

Each design option under the Lynnwood Alternative would construct new elevated track that would cross over the Interurban Trail. However, the visual intrusion would be minor because users of the trail would cross beneath the track quickly, with little change to the user experience. Additionally, access to the Interurban Trail would remain unaffected by the Lynnwood Alternative and its associated design options. Sound Transit would consult with the City of Lynnwood regarding the temporary occupancy of the Interurban Trail. Therefore, there would be no use of a Section 4(f) resource. None of the other build alternatives would result in direct use, constructive use, and/or temporary occupancy resulting in use of a Section 4(f) resource.

Areas of Controversy and Issues to be Resolved

The following are known areas of controversy and issues to be resolved.

- Determining whether the Edmonds School District could and would develop the portion of the Lynnwood Alternative site not needed for the OMSF to accommodate some functions of the planned district support center.
- Resolving conflicts related to locating the proposed project in areas envisioned for transit-oriented development within the City of Bellevue's Bel-Red Corridor under the BNSF Alternative and BNSF Modified Alternative and near the Lynnwood City Center under the Lynnwood Alternative.

Next Steps

Following publication of this Draft EIS, the following steps are anticipated.

- **Draft EIS Comment Period.** The Draft EIS will be available for public and agency comment for 45 days. This includes a public hearing and other opportunities for the public and agencies to comment in person or in writing.
- **Identification of the Preferred Alternative.** Following the public comment period, and after reviewing the Draft EIS, public and agency feedback, and other relevant information, the Sound Transit Board will identify a preferred alternative.
- **Preparation of the Final EIS.** After the Draft EIS is distributed and comments reviewed, a Final EIS will be prepared. The Final EIS will document and address comments received on the Draft EIS, describe the preferred alternative along with the other alternatives evaluated in the Draft EIS, and describe proposed mitigation commitments associated with the project.
- **Project Decision.** After completion of the Final EIS, the Sound Transit Board will select the alternative to be built.
- **Federal Approval.** FTA will issue a decision document referred to as the federal ROD, which states the administration's decision on the project, identifies the alternatives considered, and itemizes mitigation commitments. Issuance of the ROD is required before any federal funding or approvals.

Chapter 1

Purpose and Need for the Project

1.1 Purpose of the Project

The purpose of the Sound Transit Link Light Rail Operations and Maintenance Satellite Facility (OMSF) project (proposed project) is to enable Sound Transit to meet the maintenance and storage needs of the expanded fleet of light rail vehicles (LRVs) identified in *Sound Transit 2: A Mass Transit Guide, The Regional Transit System Plan for Central Puget Sound* (ST2). ST2, financing for which was approved by voters in November 2008, includes expansion of Sound Transit's Link light rail transit system, which will require additional operations and maintenance facility capacity to support the added LRVs.

Implementation of the proposed project would do the following.

- Support the intended level of service for expansion of the Link light rail system to the Lynnwood Transit Center, Overlake Transit Center and Kent/Des Moines Transit Center.
- Minimize system annual operating costs and support efficient and reliable light rail service.
- Support regional long-range plans, including the Puget Sound Regional Council's *VISION 2040* and *Transportation 2040* plans, and the *Sound Transit Regional Transit Long-Range Plan* (Long-Range Plan).

The OMSF is expected to provide service and inspection functions to a minimum of 80 LRVs with the assumption that the existing Forest Street Operations and Maintenance Facility (Forest Street OMF) would continue to provide inspection services as well as heavy repair and overhauls. The OMSF would be used to store, maintain, and dispatch vehicles for daily service.

1.1.1 Project Vicinity

Link light rail extensions of ST2 are planned in King and Snohomish Counties in the metropolitan Puget Sound region. Currently, planned light rail extensions with ST2 funding include the City of Lynnwood in the north; the Cities of Kent and Des Moines in the south; and the Cities of Bellevue and Redmond in the east. The OMSF would be located proximate to either the north or east line to serve the system. The project vicinity and regional setting is shown in Figure 1-1.

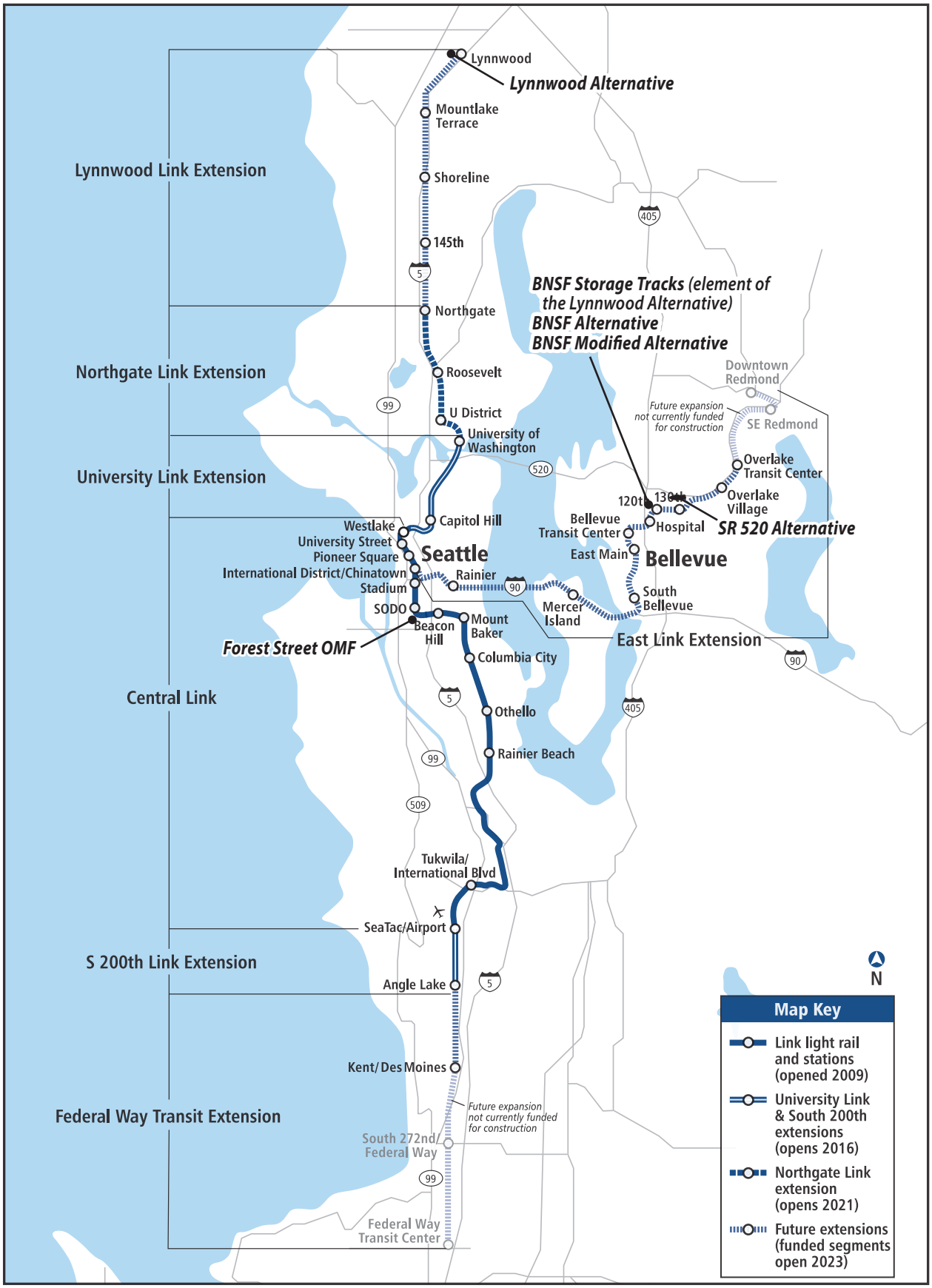


Figure 1-1: Regional Setting for the Build Alternatives
Sound Transit Link Light Rail OMSF Draft EIS

1.2 Need for Project

The Forest Street OMF is located in the industrial area of downtown Seattle and can serve up to 104 LRVs. To implement the ST2 expansion, Sound Transit needs to increase its LRV fleet to approximately 180 vehicles by 2023, which requires the proposed OMSF to be ready for operations in 2020 to accept delivery of new LRVs and support break-in procedures for those LRVs. The need for the proposed project exists since the Forest Street OMF cannot store, maintain, or deploy the vehicles associated with the expanded service called for in ST2. Sound Transit would not be able to provide the system-wide level of service called for by ST2 without adequate maintenance facility capacity. Therefore, to implement ST2, the light rail system would require more storage area and greater capacity for necessary service, maintenance, and inspection functions. Moreover, the OMSF must be sited to support efficient and reliable operations and deployment of LRVs to serve the entire Link light rail system.

1.3 Project Goals and Objectives

Based on the project purpose, Sound Transit developed evaluation criteria consisting of the goals and objectives listed below. Sound Transit applied these goals and objectives to evaluate potential OMSF alternatives. These criteria uphold Sound Transit's responsibility to meet public transportation and mobility needs for high-capacity transit infrastructure while also being a responsible steward of the environment and being considerate of affected jurisdictions and the public while planning a fiscally responsible project.

- **Transportation Goal.** Facilitate operation of the expanded regional Link light rail system.
  - Locate a facility to provide efficient and reliable light rail service.
- **Environment Goal.** Preserve environmental quality.
  - Minimize potential adverse impacts on the natural and built environment.
- **Financial Goal.** Achieve financial feasibility.
  - Build, operate, and maintain a facility that minimizes capital, construction, and annual system operating costs.

Chapter 2

Alternatives Considered

2.1 Introduction

This chapter describes the alternatives evaluated and how they were identified and developed for study in this Draft Environmental Impact Statement (Draft EIS). The alternatives include those reviewed but eliminated from further consideration as well as those that meet the purpose and need for the Sound Transit Link Light Rail Operations and Maintenance Satellite Facility (OMSF) project (proposed project). Four build alternatives are evaluated in this Draft EIS: one alternative in Lynnwood and three alternatives in Bellevue, Washington. A No Build Alternative is also evaluated to serve as a baseline for comparing the potential effects of the build alternatives. This Draft EIS is consistent with guidelines of the National Environmental Policy Act (NEPA) and the Washington State Environmental Policy Act (SEPA).

Sound Transit's existing Forest Street Operations and Maintenance Facility (Forest Street OMF), located at 3407 Airport Way S in the City of Seattle, includes a four-story, 162,000-square-foot building that contains component repair shops, an electronics repair shop, a signals and communications lab, and a communications maintenance shop. This facility can store and maintain up to 104 light rail vehicles (LRVs). Figure 2-1 shows a typical LRV. The Forest Street OMF also houses the backup Link Control Center, training rooms, sheriff offices, and staff offices for maintenance and operations management and administrative personnel.

Figure 2-1. Typical Link Light Rail Vehicle (LRV)

The proposed project would enable Sound Transit to provide service and inspection functions for supporting a minimum fleet of 80 additional LRVs with the assumption that the Forest Street OMF would continue to provide inspection, heavy repair, and overhaul services. The OMSF would be used to store, maintain, and dispatch vehicles for daily service. Activities at the OMSF would include preventative maintenance inspections, light maintenance, emergency maintenance, interior vehicle cleaning, and exterior vehicle washing. The facility would need to accommodate administrative and operations functions and would be used as a report base for LRV operators. Space would be needed for employee parking, operations staff offices, maintenance staff offices, dispatcher work stations, an employee report room, and areas with lockers, showers, and restrooms for both operators and maintenance personnel.

2.2 Background and Project Development

In 2011, Sound Transit conducted a system-wide operations analysis for the implementation of *Sound Transit 2: A Mass Transit Guide, The Regional Transit System Plan for Central Puget Sound* (ST2). The results of this analysis were the *ST2 Operations Plan* (June 2011) and the *ST2 Link Light Rail Fleet Management Plan* (June 2011). Both plans assumed a Sound Transit light rail system that extended north to Lynnwood, south to Kent/Des Moines and east to the Overlake Transit Center in Redmond. The operations plan assumed two lines for the extended light rail system: a north-south line from Lynnwood to Kent/Des Moines and an east-north line that extends from the Overlake Transit Center to Lynnwood. Both lines would travel on the same tracks through the Downtown Seattle Transit Tunnel (DSTT) to Lynnwood. To meet future demand (2035), the plan assumes each line would have four-car trains operating every 8 minutes in the peak periods (10 minutes in the off-peak and evenings). This results in a combined frequency of 4 minutes in the segment through the DSTT to Lynnwood (5 minutes in the off-peak periods).

Beginning in 2012, Sound Transit conducted a three-part study to identify potential alternatives for the proposed project.

1. **Core Light Rail System Expansion Plan Review**. The Core Light Rail System Expansion Plan review looked beyond the operations and facilities needs for ST2 to future expansion of the light rail system to Everett, Tacoma, and downtown Redmond consistent with the *Sound Transit Regional Transit Long-Range Plan* (Long-Range Plan).
2. **Link OMSF Corridor Analysis**. The Link OMSF Corridor analysis identified the constraints, benefits, and trade-offs of locating the OMSF in the north, south, and east corridors.
3. **Identifying Potential OMSF Sites**. Potential OMSF sites were identified in each of the operable light rail expansion corridors and data were collected for each site illustrating land use and environmental and physical site characteristics.

2.2.1 Core Light Rail System Expansion

The Sound Transit Core Light Rail System expansion reviewed extending light rail to Everett, Tacoma, and downtown Redmond. The Core Light Rail System Expansion is a component of the Long-Range Plan, adopted by the Sound Transit Board in 2005, and it has also been adopted as part of the Puget Sound Regional Council (PSRC) *VISION 2040* and *Transportation 2040* regional plans. A review and analysis of the operations plan and the operations and maintenance (O&M) facility needs associated with the Core Light Rail System Expansion concluded that a total of three O&M facilities will eventually be needed. These include the Forest Street OMF, a second OMF, and one satellite O&M facility (i.e., an OMSF). A “satellite” OMSF would not provide the functions or equipment for heavy repairs such as light rail vehicle overhauls, frame straightening, or vehicle painting that a full OMF provides. In addition to the Forest Street OMF south of downtown Seattle, one OMF (or OMSF) will eventually be needed along the north operating line and one along the east operating line (Sound Transit 2012a). However, the ‘third’ OMF will not be required until the light rail system is expanded beyond the light rail extensions identified in ST2.

2.2.2 Link OMSF Corridor Analysis

The Link OMSF Corridor Analysis identified constraints, benefits, and trade-offs of locating an OMSF in the north, south, and east corridors to serve the ST2 expansion, primarily using the operational requirement described below as criteria to determine which corridors would meet the operating needs of the system.

- **Operating Cost.** Located within a transit corridor that minimizes the system operating costs.
- **Reliability.** The transition of light rail vehicles between the OMSF and the revenue line should not negatively affect revenue operations or the available nightly maintenance window for the light rail guideway and systems (1:00 a.m. to 5:00 a.m.).
- **Efficiency.** Site characteristics and location will minimize excessive vehicle maneuvering to position the trains for morning deployment.

The application of the operational requirements found that sites located in the north and east corridors would meet the operational needs. It was also determined that locating an OMSF south of the junction where the north-south line and the north-east line meet at the International District Station (including expansion of the Forest Street OMF) would not be operationally feasible for the following reasons (Sound Transit 2012b).

- The time allotted to deploy trains serving the 6:00 a.m. to 10:00 a.m. morning peak period would be exceeded.
- The 4-hour nightly inspection and maintenance window (1:00 a.m. to 5:00 a.m.), when all trains must be off the system, could not be maintained.
- Expansion of the Forest Street OMF would not provide capacity (e.g., number of vehicle bays, operator report facility, parts storage and component repair) to meet the daily and weekly maintenance and inspection needs for the entire fleet of 180 vehicles.
- There is insufficient property to expand the Forest Street OMF to provide these needs without vacating or closing 6th Avenue S and/or Airport Way, which provide for freight mobility in the SODO industrial area.
- If all 180 vehicles were stored on a single site, a system failure during the morning deployment could result in the entire fleet being trapped and unable to begin service.

2.2.3 OMSF Features

The proposed project would involve construction and operation of the following site features.

- An enclosed LRV maintenance building containing service bays for maintaining LRVs that would include the following activities and equipment.
    - Exterior LRV washing area
    - Interior LRV cleaning area
    - General service, inspection, and repair bays

  - Wheel truing
  - Equipment and parts storage
  - Shipping and receiving
  - Electronics shop
  - Welding and fabrication shop
  - Brake and coupler shop
- Office space attached to the shop building containing the following areas.
  - Individual offices and workspaces
  - Conference rooms
  - Training room
  - Fitness room
  - Lunch/break room
  - Lockers
  - Restrooms
- Track, switches, overhead catenary power lines, a traction power substation, and signals to support movement of LRVs to and from the mainline and around the facility through the LRV maintenance building and LRV storage area.
- Lead track to provide access between the OMSF and light rail system mainline.
- Maintenance of way shops to support maintenance of the infrastructure of the light rail system beyond the LRVs such as track, signals, and power system that would include an attached truck wash.
- Maintenance of way office space attached to the maintenance of way shops that would include office space, conference and training rooms, a lunch/break room, and restrooms.
- Outdoor covered and uncovered storage areas.
- Parking for automobiles and two points of road access to the facility with one to be used as a primary access point for most traffic, and the second to serve as an access point for emergency response vehicles and special deliveries or maintenance activities only.

At approximately 32 feet tall, the LRV maintenance building would be the tallest building at the site. This building height is necessary to allow for overhead equipment necessary to perform work on all sides of an LRV, including the top. The LRV maintenance building would also be the largest building on the site. It would house the LRV maintenance shops but it would also be attached to office space that would be used by operators, dispatchers, and administrative staff.

The OMSF would be fenced for security purposes and access to the facility would be controlled by keycard access at the main entrance gate and at all building entrances. The type of fencing used

along portions of the perimeter would be highly visible outside the facility. The fencing would be selected to aesthetically fit with the OMSF and its surrounding environment and may serve as a partial visual screen obscuring portions of the OMSF from external viewpoints.

Landscaping would also be incorporated into perimeter fence line areas and parking areas as appropriate to diversify the visual landscape of the OMSF. Landscaping would likely include small trees and shrubs as well as lower-profile herbaceous vegetation.

Overhead lighting would be provided across the OMSF for security purposes and allow for nighttime operations, since much of the LRV maintenance would occur at night. Lighting would be directed downward and onto the site to the extent reasonably possible.

2.3 Identifying Potential Alternatives

The identification and evaluation of potential OMSF sites for consideration in the Draft EIS included technical work by Sound Transit as well as suggestions from agencies and the public during the environmental scoping period. The technical work involved development of a site identification and evaluation study (described below) that built on the background studies described above. Twenty-one different locations were considered in total. Screening criteria were developed to evaluate all potential alternatives. The screening criteria were based on the OMSF physical and operational requirements, site and environmental constraints, consistency with regional transportation plans, and the proposed project's purpose and need (see Chapter 1, Purpose and Need). Alternatives that performed poorly against the screening criteria were eliminated from further consideration. The screening criteria include the following.

A build alternative would meet the physical needs of the proposed project by adhering to the following.

- Being proximate to an existing or future light rail segment.
- Being able to accommodate a minimum of 80 LRVs.
- Having 20 to 25 acres of usable land.
- Being generally rectangular in shape.

A build alternative would meet the operational needs of the proposed project by adhering to the following.

- Being located within a transit corridor that minimizes overall system operating costs.
- Preserving the available nightly maintenance window (1:00 a.m. to 5:00 a.m.).
- Minimizing excessive vehicle maneuvering to position the trains for morning deployment.
- Being consistent with adopted regional transportation plans, including Sound Transit's Long-Range Plan, PSRC Vision 2040, and the key strategies of the PSRC Transportation 2040 plan.

Additional details on potential alternatives identified and considered are included in the following documents, which are available on the Sound Transit project website.

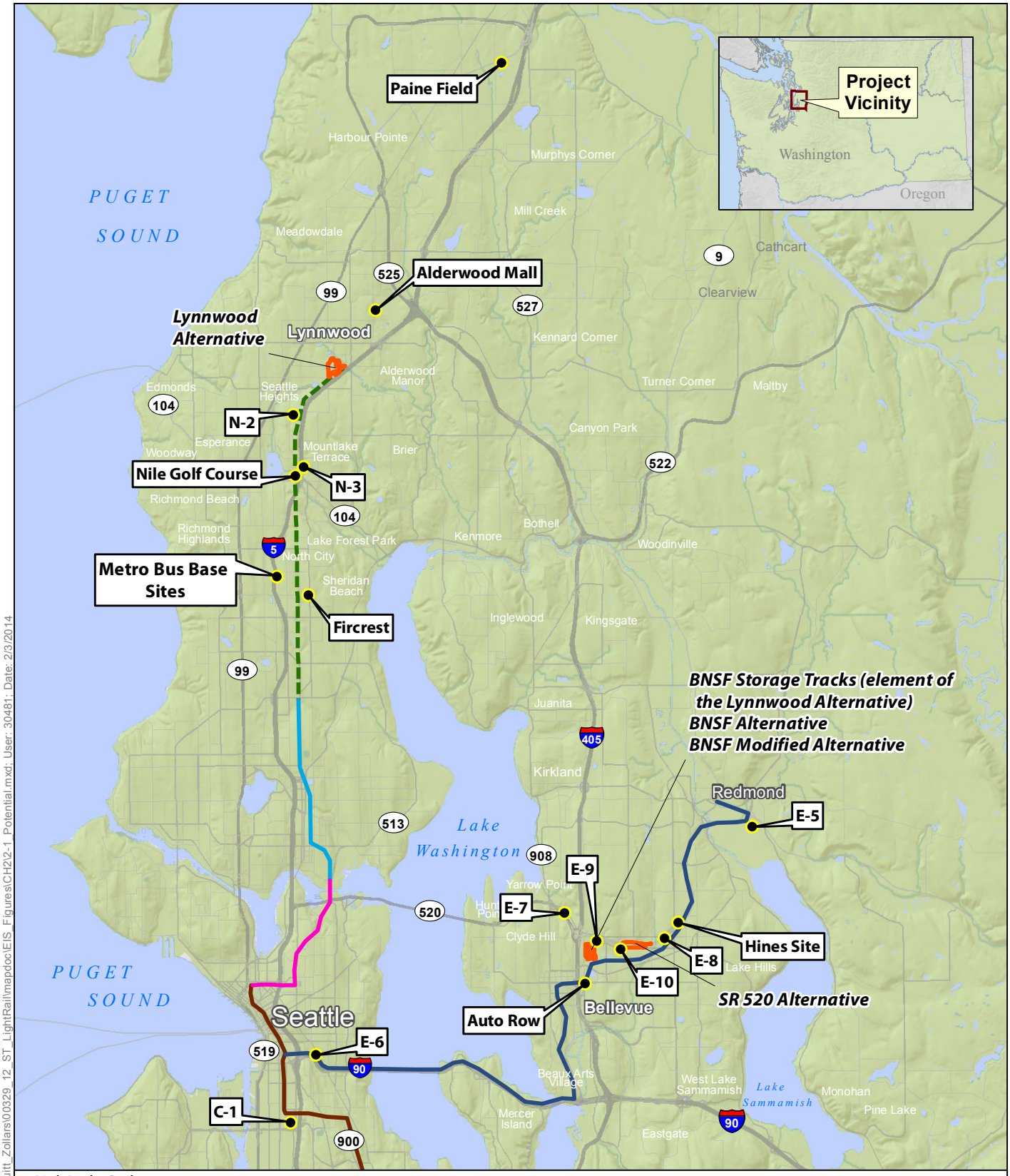
- ***Link OMSF Sites Memo* (September 2012).** This report identifies potential site alternatives and associated information related to the land use, environmental, and physical site characteristics. It also evaluates each potential site with respect to system and facility operations (e.g., operating costs, efficiency, and reliability).
- ***Link OMSF Environmental Scoping Information Report* (September 2012).** This report describes the environmental scoping process and the potential site alternatives presented during the environmental scoping period.
- ***Sound Transit Board Memo OMSF Site Evaluation and Environmental Scoping Summary Report* (November 2012).** This report summarizes the environmental scoping process and public and agency comments received, including suggestions for site alternatives.

All sites identified as potential alternatives are shown in Figure 2-2. As illustrated in the figure, sites indicated with an N, C, or E are described in the *Link OMSF Sites Memo* (Sound Transit 2012c). Other sites were suggested during the environmental scoping period.

2.3.1 OMSF Storage Requirements

Sound Transit's current fleet is 62 LRVs, which are required to serve the extensions to the University of Washington and S 200th Street planned to open in 2016. ST2 light rail expansion to Lynnwood and the Eastside will require a fleet of approximately 180 LRVs. The Forest Street OMF in Seattle has a storage capacity of 104 LRVs. The storage tracks are configured so that each row accommodates two 4-car trains (13 rows with eight cars per row equals 104 vehicles). The future OMSF would need to accommodate a minimum of 80 vehicles (180 needed for ST2, minus the existing capacity [104 LRVs] plus 4 vehicles as contingency). For planning purposes, a contingency of one 4-car train has been assumed. In addition, the Record of Decision (ROD) for East Link includes a future extension from the Overlake Transit Center to downtown Redmond. A condition of the East Link ROD is that before the line can be extended to downtown Redmond, maintenance facility capacity must be identified. It is estimated that 10 additional LRVs will be required to provide service to downtown Redmond. Therefore, the need for a minimum of 90 storage spaces has been assumed for the future OMSF, regardless of its location (76 vehicles plus 4 spares plus 10 for Redmond equals 90 storage spaces).

The dimensions and configuration of a typical light rail operations and maintenance facility is primarily driven by the space required for a runaround track. The runaround track allows vehicles to enter the site and either go directly to the storage area or continue to the maintenance and/or wash bays for service and then return to the storage area directly without the operator changing ends of the train. The size is also driven by the size of the maintenance building and the number of storage tracks needed to accommodate the fleet. As stated previously, the Forest Street OMF has 13 rows with eight cars per row. Assuming the OMSF will need to store and maintain 90 cars, a minimum of 11 rows of eight cars is required. However, 11 rows of eight cars each allow space to store 88 cars.



Source: Site plans, Huitt Zollars 2013; Link light rail and eliminated alternatives, Sound Transit, 2013 *Alternative alignments are still being studied in the Lynnwood Link Extension EIS
Note: A scoping comment received requested an additional location of an OMSF site in Pierce County; however, no specific location was provided

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Figure 2-2: Potential OMSF Sites
Sound Transit Link Light Rail OMSF Draft EIS

To accommodate 90 cars, 12 rows are needed, and as a result, all OMSF sites assume 12 rows. Adding a twelfth row provides the opportunity to store up to 96 cars. The ability to accommodate 12 rows (or 96 cars) is also important for the future fleet and associated service requirements (see Section 2.2.1 Core Light Rail System Expansion).

The following potential alternatives were evaluated against the screening criteria and eliminated from further consideration in this Draft EIS for the reasons stated. Additional detail on the potential alternatives described in Table 2-1 is included in the *Link OMSF Sites Memo* (Sound Transit 2012c). In addition, some comments received during the environmental scoping process suggested that alternative sites be considered for the proposed project. The alternatives suggested during scoping are also described in Table 2-1, but none of these alternatives meet the OMSF siting criteria applied during the corridor analysis and site identification process.

Table 2-1. Potential and Suggested Alternatives

Potential Alternative	Reason Not Advanced
C-1: Forest Street OMF	Expanding the Forest Street OMF by 10.86 acres could accommodate the additional tracks required for storing an additional minimum of 80 LRVs, but it would not provide the necessary space for maintenance functions. The entire fleet of 180 LRVs planned for in ST2 cannot be reliably or efficiently deployed from an expanded Forest Street OMF because of the limited capacity of accessing the main line and deploying service to the Eastside. Finally, by consolidating the entire fleet at a single site, a system failure during the morning deployment could result in the entire fleet being trapped and unable to begin service.
N-2: 220th St SW and I-5	This potential OMSF site is 17.5 acres, which does not meet the minimum acreage needed for developing the OMSF. Opportunities for acquiring adjacent land are limited because the site is constrained on three sides by public arterial roads and Interstate 5 (I-5) on the east. The site assumes vacating 64th Avenue W between 200th Street SW and 224th Street SW. The site would require extensive grading and retaining walls to achieve topography suitable for the development of an OMSF.
N-3: 236th St SW and I-5	This potential site is 17.8 acres, which does not meet the minimum acreage needed for developing the OMSF. Opportunities for acquiring adjacent land are limited because the site is constrained by I-5 on the west and a public street on the north (overpass to I-5). The site is also constrained by critical areas to the south (wetlands and stream). The irregular shape of this site also constrains development of an OMSF.
E-5: Redmond	The E-5 site is located 4 miles from the main East Link terminus at Overlake Transit Center that will be built during ST2. Developing this site would require building 4 miles of additional guideway with substantial capital and operating costs.
E-6: Dearborn St and Rainier Ave S	Site E-6 is approximately 9.95 acres, which does not meet the minimum acreage needed for developing an OMSF.

E-7: SR 520 & I-405	The E-7 site contains critical areas associated with Yarrow Creek, and steep slopes require extensive grading and recontouring. Access would require a long lead track (approximately 6,900 linear feet, 3,450 feet of track for each direction) that would affect efficiency of operations at this potential OMSF site and would increase capital costs. In addition, developing this site would require relocating and reconfiguring Northup Way.
E-8: 148th Ave NE and 20th Ave NE	Site E-8 is a large, square site, but contains areas of steep slopes and erosion hazard areas. The topography would require substantial earthwork. The site is composed of 11 land parcels in existing commercial retail and office uses, including a large anchor retail store (Fred Meyer) and several other restaurants and retail businesses. Development of this site would require substantial acquisition and relocation efforts. This site had the highest assessed value of all sites identified and evaluated.
E-9: Metro Bus Facility 120th Ave NE	Site E-9 does not have 20 to 25 acres of usable land for development. The site is approximately 22.65 acres; however, a creek (west tributary of Kelsey Creek) meanders through the middle of the site and avoiding this area decreases the usable land by approximately 3.5 acres, which is below the minimum size required for it to be a viable alternative.
E-10: Northup Way and 130th Ave NE	Site E-10 contains some steep slopes, the southwest corner of the site is immediately adjacent to a wetland and stream (west tributary of Kelsey Creek), and substantial grading efforts would be required to facilitate the development of an OMSF. This site is located immediately adjacent to the planned East Link 130th Avenue Station. The portion of the site adjacent to the East Link 130th Avenue Station is zoned for Residential Commercial Node 1, which represents the center of the Bel-Red Subarea, and is zoned for the highest density of transit-oriented mixed-use development. As such, development of the OMSF at this location has the greatest potential for incompatibility with the Bel-Red Subarea redevelopment goals and policies.
Suggested Alternative	**Reason Not Advanced**
Auto Row: An approximately 22-acre site located along 116th Ave NE, south of NE 8th St in the City of Bellevue. The site is proximate to the East Link line.	Although this site is proximate to the East Link revenue line in Bellevue, it is narrow at both ends, making it difficult to accommodate all required OMSF facilities and track work on the site. In addition, the City of Bellevue has secured funding and is advancing work on the NE 4th Street Extension Project, between 116th Avenue NE and 120th Avenue NE. This roadway extension project is part of the City's 2005–2015 Capital Investment Program (#PW-R-160). The project has completed environmental review under SEPA and is currently in final design. Because the roadway extension begins at grade at 116th Avenue NE and will be built on retained fill up to the existing grade at 120th Avenue NE, the roadway will bisect the suggested site into two separate, approximately 10-acre sites, making development of the OMSF at this location infeasible. Therefore, this site was eliminated from further consideration.
Near Alderwood Mall: This site is located north of I-5, south of 184th St SW, and east of 33rd Ave W in the City of Lynnwood.	This site is not proximate to the light rail line (the Alderwood Mall is approximately 1.5 miles or about 8,000 feet north of the Lynnwood Transit Center) and there is no funded light rail line extending north of Lynnwood Transit Center as part of ST2.

Near Paine Field: This site is located west of the Everett Mall in the City of Everett.	This site is not proximate to the light rail line and there is no funded light rail line serving the Paine Field area or other areas of Everett (north of Lynnwood Transit Center) as part of ST2.
Location of an OMSF Site in Pierce County: This site was suggested for somewhere in Pierce County, but specifics on location were not provided.	There is no location in Pierce County that is proximate to the light rail line as part of ST2. There is no funded light rail line in ST2 serving Pierce County other than Tacoma Link, which will not be connected to the greater light rail system as part of ST2.
Hines Site: This site is located northwest of SR 520 and east of 148th St in the City of Redmond.	The Hines Site is located northwest of State Route (SR) 520 on the Microsoft Campus, along East Link between the Overlake Village and Overlake Transit Center. The East Link alignment in this location runs in a retained cut on the southeast side of SR 520. The retained cut passes under the existing NE 31st/NE 36th Street bridge, which passes over SR 520 and provides access to this part of the Microsoft Campus. A connection to this site from the East Link line would necessitate substantial design revisions to the East Link main line guideway profile, such as spanning or tunneling under SR 520 to access this site. A connection to this site from East Link would have high capital costs and would create operational inefficiencies.
Fircrest Residential Habilitation Center for the Developmentally Disabled: This site is located along 15th Ave NE in the City of Shoreline.	This site is located along 15th Avenue NE in Shoreline, approximately 1.5 miles from the Lynnwood Link Extension alignment alternatives, all of which are located along the I-5 corridor. To access the site a lead track would need to be constructed through single-family neighborhoods to the east of the Lynnwood Link Extension alternatives located in the I-5 corridor. A connection to this site from the Lynnwood Link Extension would have high capital costs, create operational inefficiencies, and result in impacts on residential neighborhoods.
Shoreline Metro Bus Base: An approximately 17-acre site located on the west side of I-5 at N 163rd St in the City of Shoreline.	This site is approximately 17 acres, which does not meet the minimum site size requirements. It is located on the west side of I-5 and all of the Lynnwood Link Extension alignment alternatives in this vicinity are located on the east side of I-5. Access to the site would involve lead track spanning over or tunneling under I-5 travel lanes.
Nile Golf Course: This site is located on the west side of I-5 at the Snohomish/King County boundary in the City of Mountlake.	This site is located in the City of Mountlake Terrace on the west side of I-5 and all of the Lynnwood Link Extension alignment alternatives in this vicinity are located on the east side of I-5. Access to the site would involve lead track spanning over or tunneling under I-5 travel lanes, which would have high capital costs and create operational inefficiencies.

Sources: Sound Transit 2012c; 2012d.

Additionally, another alternative suggested during the environmental scoping period involved separating operations and maintenance functions on two smaller sites along each light rail extension north and east (i.e., a two-site OMSF option). Specific locations for two smaller facilities were not suggested. Although this suggestion was not identified for detailed evaluation in this Draft EIS by the Sound Transit Board of Directors, Sound Transit analyzed this suggestion in response to inquiries from partner jurisdictions. The results of this analysis are included in Appendix F.1, *Additional Detail on the Two Site OMSF Option*, of this Draft EIS.

The white paper concludes that the two-site option would require or accomplish the following.

- Require more land in total than the individual site alternatives being studied in this Draft EIS (approximately 34 acres total compared to 22 to 25 acres). This option would have associated increases in property acquisition costs.
- Increase annual operating costs by more than $5 million, due to the need for increased operations and maintenance staff to run the two facilities.
- Necessitate the purchase and maintenance of additional specialized equipment and facility features that become redundant and contribute to the increased annual operating and facilities maintenance costs.
- Increase capital costs for the OMSF by roughly $70 to $110 million.

As a result, the two-site option was not carried forward for review in the Draft EIS.

2.4 No Build Alternative

This EIS evaluates a No Build Alternative, as required under NEPA and SEPA, to represent the transportation system and the environment as they would exist without the proposed project. The No Build Alternative also provides a baseline against which the other alternatives can be compared. The No Build Alternative includes projects and proposals that are reasonably certain to be built by 2035. For transportation improvements, this includes projects identified in regional and local transportation improvement programs with identified funding for implementation. Local land use or site development proposals are considered part of the No Build Alternative by virtue of completed project-level environmental review and land use or building permit approvals.

The No Build Alternative includes light rail transit improvements included in the ST2 Program, including light rail extensions to Lynnwood, Overlake Transit Center, and Kent/Des Moines, but an OMSF would not be built. The operations and maintenance support needs for the existing and currently planned and funded Link light rail system would be served exclusively by the Forest Street OMF south of downtown Seattle, which has the capacity to maintain up to 104 LRVs. Overnight storage of up to 16 LRVs would be built along the Eastside Rail Corridor as currently designed in East Link. The East Link facility would provide for overnight storage and vehicle operator parking, but would not provide LRV maintenance functions. The No Build Alternative assumes a maximum light rail fleet size of 104 LRVs, because this is the design capacity for vehicle maintenance at the Forest Street OMF. The No Build Alternative LRV fleet is approximately 76 fewer vehicles than the

minimum number of LRVs (approximately 180) needed to operate the system at planned service levels under the ST2 Program. The No Build Alternative assumes that all LRVs would be deployed from the Forest Street OMF at the beginning of service each day, with the exception of the 16 LRVs deployed directly from the East Link storage track along the Eastside Rail Corridor.

2.5 Build Alternatives

The Sound Transit Board of Directors considered the proposed project's purpose and need, the physical and operational requirements of the OMSF and associated site screening criteria, and scoping comments and suggestions provided by agencies and the public. In December 2012, the Board adopted Motion M2012-82, which identified four different build alternatives for detailed evaluation in this Draft EIS. The Draft EIS discusses the potential environmental impacts that may result from construction and operation of the proposed project under each of these build alternatives. Chapter 4, Alternatives Analysis, also discusses how each alternative meets the goals and objectives developed for the proposed project. The locations of the four build alternative sites are shown in Figure 2-3. In addition, the potential environmental impacts that may result from the No Build Alternative, the conditions that would exist if the proposed project were not implemented, are also discussed to provide a baseline for comparing the potential impacts of the build alternatives.

Three of the four build alternatives would include high-capacity transit improvements to the Eastside Rail Corridor south of SR 520 and north of NE 12th Street in the City of Bellevue. The Eastside Rail Corridor is "railbanked," which permits interim trail use (and other compatible uses) of the corridor, while keeping it available for reactivation of freight rail service in the future. Sound Transit now owns this portion of the Eastside Rail Corridor subject to King County's trail easement and reactivation rights. Potential high-capacity transit uses in the corridor evaluated in this Draft EIS are consistent with the shared uses allowed under the corridor's easement provisions and envisioned by the Eastside Rail Corridor Regional Advisory Council (2013).

2.5.1 Lynnwood Alternative

Under the Lynnwood Alternative, Sound Transit would construct the OMSF north of I-5 and east of 52nd Avenue/ W Cedar Valley Road in the City of Lynnwood. The OMSF footprint for the Lynnwood Alternative would require approximately 24 acres of land for all three design options. Approximately 37 to 41 acres would need to be acquired, given existing parcel boundaries, leaving approximately 9 to 13 acres for redevelopment. The proposed Lynnwood Link Extension alignment alternatives being evaluated in the *Lynnwood Link Extension Draft EIS* are located along the Lynnwood Alternative site for the OMSF. A decision on what is to be built for the Lynnwood Link Extension has not yet been made. Therefore, the Lynnwood Alternative for the OMSF includes three design options, each connecting to one of the three build alternatives being evaluated in the *Lynnwood Link Extension Draft EIS* (Sound Transit 2013). Design Option C1 would include lead track connecting to Lynnwood Link Extension Alternative C1, Design Option C2 would include lead track connecting to Lynnwood Link Extension Alternative C2, and Design Option C3 would include lead track connecting to Lynnwood Link Extension Alternative C3. The Lynnwood Alternative for the OMSF also includes LRV storage,

operator report facilities, and interior cleaning functions for up to 32 LRVs at a separate location (referred to as the BNSF Storage Tracks, a component of the Lynnwood Alternative). The BNSF Storage Tracks would be located north of NE 12th Street and south of SR 520 in the City of Bellevue, within the Sound Transit-owned portion of the Eastside Rail Corridor and on an adjacent property located immediately east of the Eastside Rail Corridor to provide morning service to the Eastside. The design acknowledges the railbanked status of the Eastside Rail Corridor by allowing sufficient width to accommodate a future trail and future freight or passenger rail use of the corridor. Conceptual layouts of the three design options and a bird's eye view of the Lynnwood Alternative site (Design Option C3) and the BNSF Storage Tracks are shown in Figures 2-4a through 2-4e.

2.5.2 BNSF Alternative

Under the BNSF Alternative, Sound Transit would construct the OMSF on property located between the Eastside Rail Corridor on the west and 120th Avenue NE on the east, south of SR 520 and north of NE 12th Street in the City of Bellevue. This site is approximately 27 acres, including 2 acres of Eastside Rail Corridor now under Sound Transit ownership, and is located along the adopted East Link revenue line northwest of the 120th Avenue NE station. The OMSF development footprint on the site is approximately 23 acres leaving approximately 4 acres for redevelopment. Infrastructure for the proposed project would occupy most of the site leaving the southern portion available for other development. A conceptual layout of this site is shown in Figure 2-5a and a bird's eye view is shown in Figure 2-5b.

2.5.3 BNSF Modified Alternative

Under the BNSF Modified Alternative, Sound Transit would construct the OMSF on both sides of the Eastside Rail Corridor west of 120th Avenue NE on the east, south of SR 520 and north of NE 12th Street in the City of Bellevue. This site is located along the adopted East Link revenue line and is approximately 34 acres, including 2 acres of Eastside Rail Corridor now under Sound Transit ownership. The OMSF development footprint on the site is approximately 24 acres leaving approximately 8 acres for future redevelopment. The storage tracks would be located on the western portion of the site, west of the rail corridor. Other OMSF facilities would be located adjacent to the east side of the rail corridor, leaving the frontage area along 120th Avenue NE available for other development. The design acknowledges the railbanked status of the Eastside Rail Corridor by allowing sufficient width and vertical clearances to accommodate a future trail and future freight or passenger rail use of the corridor. A conceptual layout of this site is shown in Figure 2-6a and a bird's eye view is shown in Figure 2-6b.

2.5.4 SR 520 Alternative

Under the SR 520 Alternative, Sound Transit would construct the OMSF south of SR 520 and north of Northup Way/NE 20th Street, east of 130th Avenue NE and west of 140th Avenue NE in the City of Bellevue. This site is located along the adopted East Link revenue line and is approximately 25 acres. The OMSF development footprint encompasses the entire site, leaving no substantial area for redevelopment. A conceptual layout of this site is shown in Figure 2-7a. Primary access to the site

would be directly off of NE 20th Street west of 136th Place NE. The configuration of buildings under this alternative would vary from the other alternatives in that the operations offices would be in a separate building to the west of the LRV maintenance shops, and the LRV covered wash and service bay would be in a separate building east of the LRV maintenance shops as shown in Figure 2-7a. A bird's eye view is shown in Figure 2-7b.

2.6 Overview of Construction Approach

This section provides an overview of potential construction activities and timing. Construction activities would include civil construction, systems installation, testing, and startup activities. Site preparation, primary construction, and finish construction would take place during the civil construction phase. Major construction activities are as follows.

- Demolition (buildings, pavement)
- Clearing and vegetation removal
- Installing erosion siltation control best management practices (BMPs)
- Fill and excavation
- Utility extensions, relocations, or disruptions
- Drainage changes
- Construction activity in or near a water body or sensitive area
- Elevated structure construction
- Retaining wall construction
- Pile driving or auguring piles
- Temporary partial road or lane closures and detour routes
- Temporary, partial, or limited access
- Delivery of materials and equipment

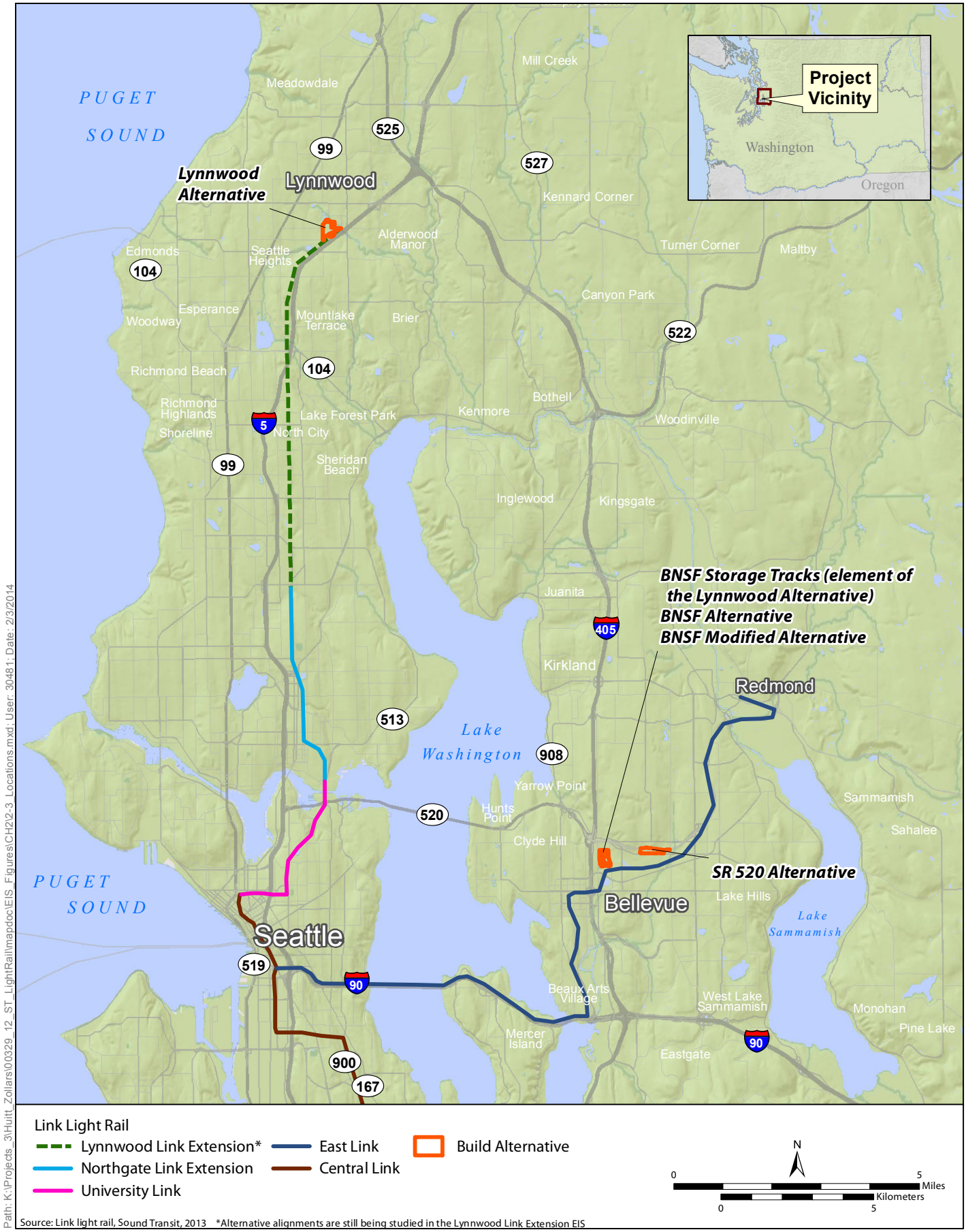

Figure 2-3: Locations of the Build Alternatives
Sound Transit Link Light Rail OMSF Draft EIS

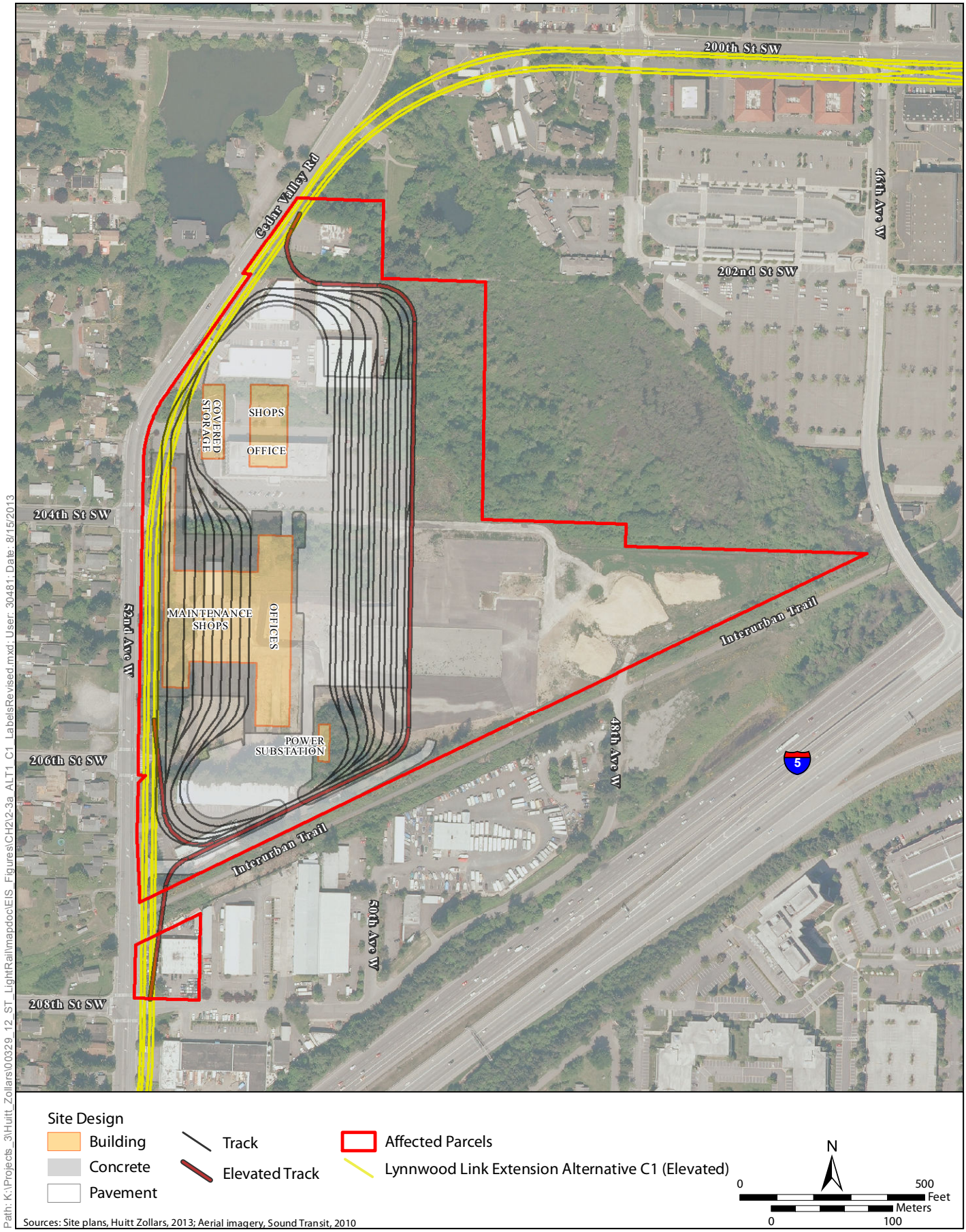

Figure 2-4a: Lynnwood Alternative, Design Option C1
Sound Transit Link Light Rail OMSF Draft EIS

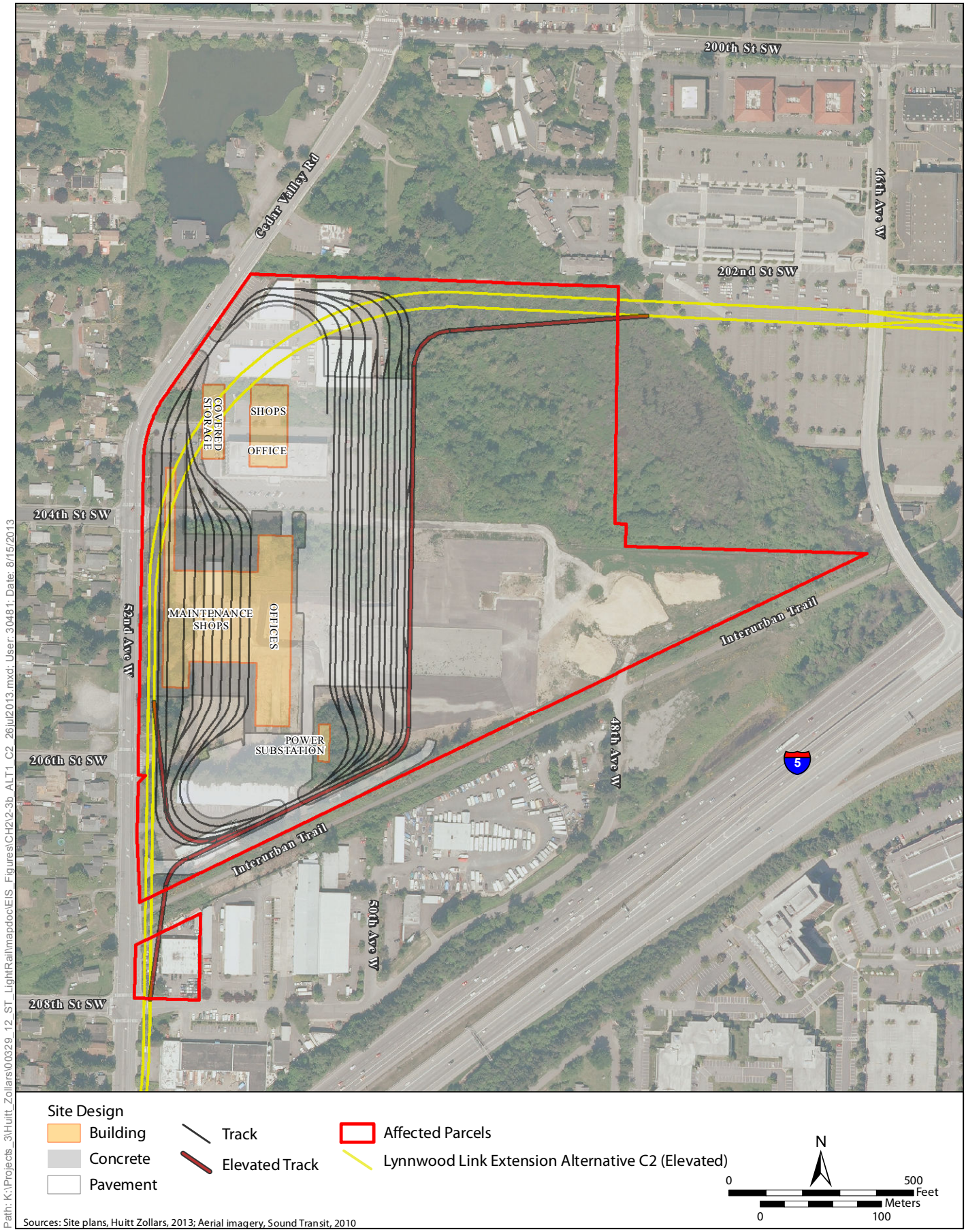

Figure 2-4b: Lynnwood Alternative, Design Option C2
Sound Transit Link Light Rail OMSF Draft EIS

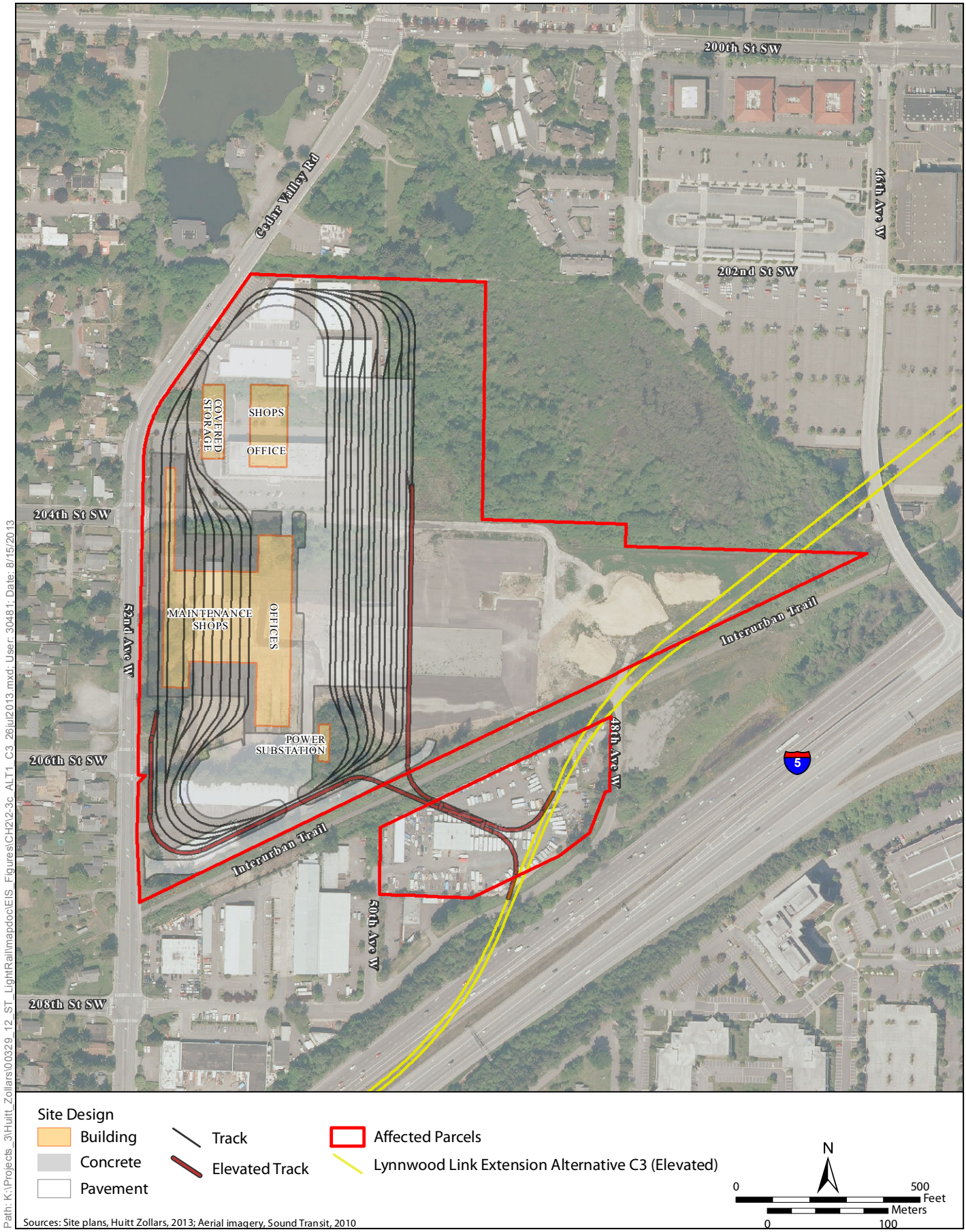

Figure 2-4c: Lynnwood Alternative, Design Option C3
Sound Transit Link Light Rail OMSF Draft EIS

Figure 2-4d: Lynnwood Alternative, Design Option C3—Bird's Eye View
Sound Transit Link Light Rail OMSF Draft EIS

Figure 2-4e: Lynnwood Alternative, BNSF Storage Tracks*
Sound Transit Link Light Rail OMSF Draft EIS
*The BNSF Storage Tracks are located in Bellevue

Sources: Site plans, Huitt Zollars, 2013; Aerial imagery, City of Bellevue, 2013

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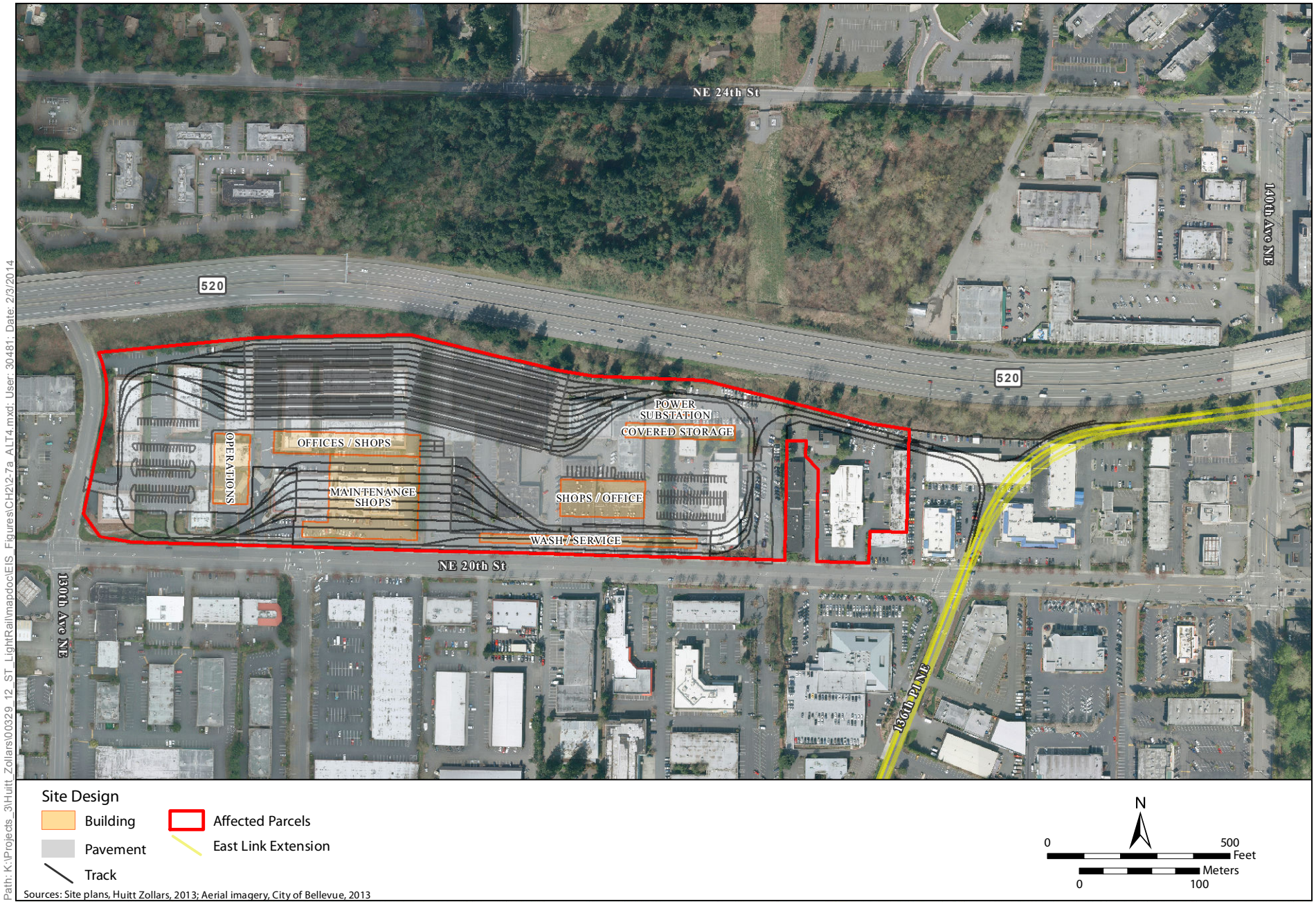
Figure 2-5a: BNSF Alternative
Sound Transit Link Light Rail OMSF Draft EIS

Figure 2-5b: BNSF Alternative—Bird's Eye View
Sound Transit Link Light Rail OMSF Draft EIS

Figure 2-6a: BNSF Modified Alternative
Sound Transit Link Light Rail OMSF Draft EIS

Figure 2-6b: BNSF Modified Alternative—Bird's Eye View
Sound Transit Link Light Rail OMSF Draft EIS



Sources: Site plans, Huitt Zollars, 2013; Aerial imagery, City of Bellevue, 2013

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Figure 2-7a: SR 520 Alternative
Sound Transit Link Light Rail OMSF Draft EIS

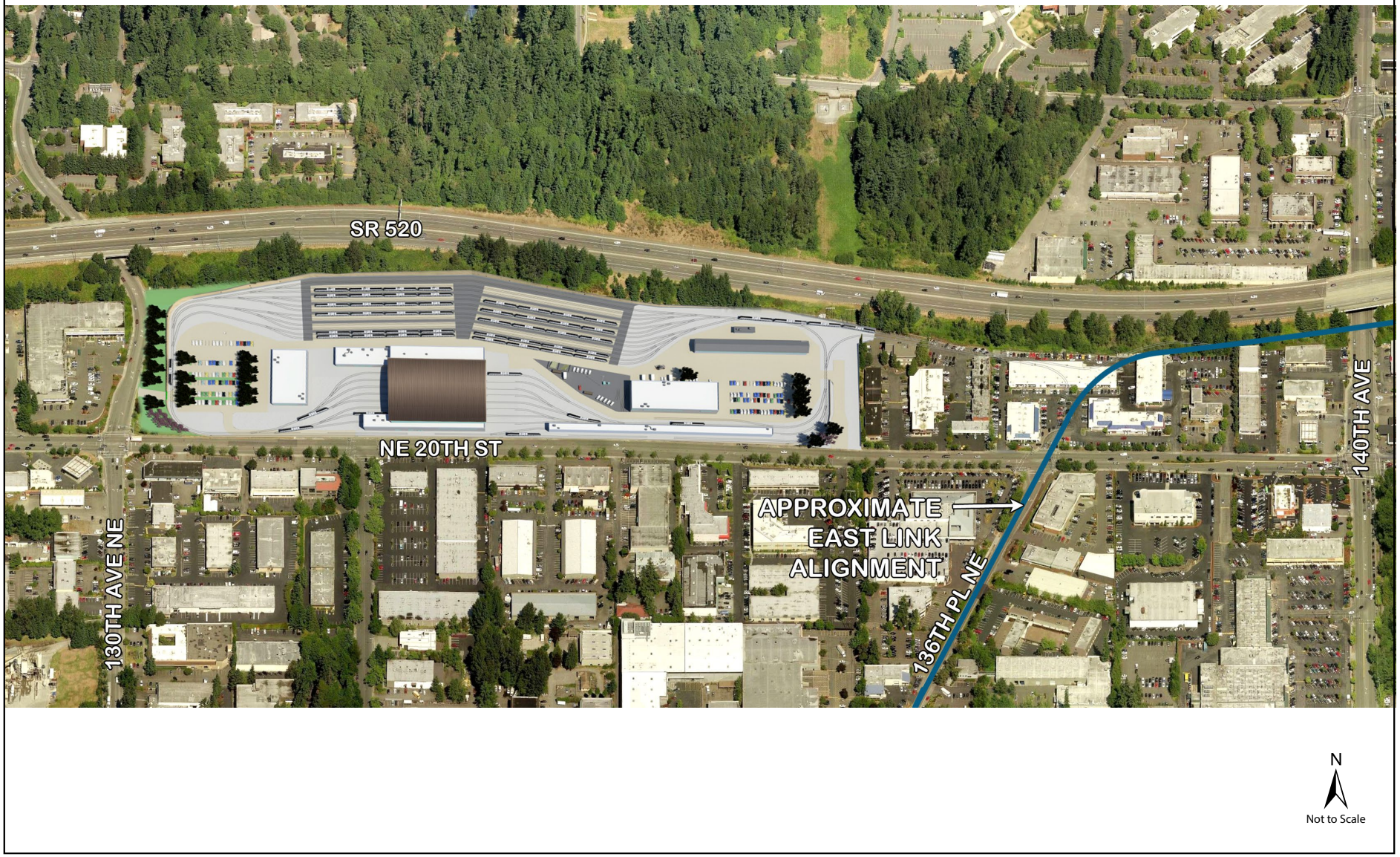


Figure 2-7b: SR 520 Alternative—Bird's Eye View
Sound Transit Link Light Rail OMSF Draft EIS

2.6.1 Construction Sequence and Activities

A construction plan may be developed at the end of the preliminary engineering phase of the project to establish the various construction phases and construction contracts, their estimated schedule and duration, and appropriate sequencing.

Typical construction would occur on a 5- to 6-day work week schedule and would occur primarily between the hours of 7:00 a.m. and 10:00 p.m. In some situations (such as when street detours are involved or when daytime construction periods need to be abbreviated to reduce impacts), additional shifts, all-week, nighttime, or 24-hour construction activities could be necessary.

Excess excavated material would be removed and hauled to a permitted disposal site. Truck hauling would require a loading area, staging space for trucks awaiting loading, and provisions to prevent tracking soil on public streets. Truck haul routes would require approval by local jurisdictions. This would allow surface hauling activities to occur in off-peak periods if necessary, to be concentrated during daytime periods to minimize potential impacts from noise on sensitive receptors such as residences, or to avoid peak traffic periods.

Following excavation and completion of structures, the next phase of construction would include installing track work and electrical systems (overhead catenary system power lines, etc.).

2.6.2 Staging Areas and Construction Easements

No offsite staging areas or construction easements would be required to construct the OMSF for the BNSF Alternative or the BNSF Modified Alternative. Construction of these alternatives is anticipated to take place within the footprint of the property being acquired for the proposed project. The Lynnwood Alternative would require additional staging areas in the form of easements for access, construction work, and placement of support columns, associated footings, and elevated guideway across the Interurban Trail that would provide light rail access between the OMSF and the Lynnwood Link Extension revenue service line. Temporary construction easements from WSDOT may be required for the SR 520 Alternative.

2.7 Consideration of Other Relevant Sound Transit Projects

2.7.1 Lynnwood Link Extension

As part of ST2, Sound Transit is extending the light rail from Northgate to Lynnwood. This 8.5-mile light rail extension, the Lynnwood Link Extension, is currently undergoing environmental review. The *Lynnwood Link Extension Draft EIS* was published and provided to the public for review in July 2013. In November 2013, the Sound Transit Board of Directors adopted Motion No. M2013-96, which identifies the light rail routes and station locations for study in the *Lynnwood Link Extension Final EIS*. The preferred alternative identified in the City of Lynnwood is Alternative C3 with adjustments to better connect to the Lynnwood Transit Center, preserve more redevelopable area, and minimize wetland and stream impacts to the extent feasible. The *Lynnwood Link Extension Final EIS* will evaluate the preferred alternative and all other Lynnwood Link alternatives studied in the Draft EIS.

Preliminary engineering design review is anticipated to occur between 2013 and 2015, with a Final EIS being issued in 2014. Following issuance of the Final EIS, the Sound Transit Board will make a decision on the project to be built. A Federal Transit Administration (FTA) ROD is expected by 2014 or 2015. Final design of the extension is anticipated for 2015 to 2018 and construction is expected from 2018 to 2023. The start of light rail service for this extension is targeted for 2023, and the proposed project for the OMSF would need to be completed prior to the target opening date for the entire system to support the planned levels of light rail service. In addition, for purposes of this Draft EIS and due to Lynnwood Link Extension's geographical location in relation to the proposed OMSF, the environmental impacts determined for the Lynnwood Link Extension are included in the cumulative impact analysis of this Draft EIS. Cumulative impacts are discussed throughout Chapter 3, Affected Environment and Environmental Consequences.

2.7.2 East Link

As part of ST2, East Link will expand light rail from downtown Seattle to the Eastside with stations serving Mercer Island, south Bellevue, downtown Bellevue, Bel-Red, and Redmond's Overlake area. This expansion will connect to the existing Link light rail system between downtown Seattle and Sea-Tac Airport. It will provide storage for up to 16 LRVs in the Eastside Rail Corridor north of NE 12th Street in Bellevue, at the same location identified as the BNSF Storage Tracks under the Lynnwood Alternative site and adjacent to the BNSF Alternative and BNSF Modified Alternative sites for the proposed project. The Final EIS and associated FTA and Federal Highway Administration (FHWA) ROD documents for East Link were issued in 2011, and the project has entered final design. Construction of this extension is planned for 2015 to 2021. For this extension of light rail to deliver its planned level of service, the OMSF would provide the needed LRV maintenance and storage necessary to support the system. Therefore, the proposed OMSF would need to be operational by the end of 2020 to accept delivery of new LRVs and support break-in and testing procedures for those LRVs. Additionally, for purposes of this Draft EIS and due to East Link's geographical location in relation to the proposed OMSF, the environmental impacts that have been determined for East Link will be included in the cumulative impact analysis of this Draft EIS, which is provided throughout Chapter 3, Affected Environment and Environmental Consequences.

2.8 Environmental Commitments and Sustainability

As an agency that has built and operated light rail, commuter rail, and regional express bus service in multiple Puget Sound communities, Sound Transit has established programs, best practices, and policies that are assumed as part of the OMSF. These include the agency's environmental and sustainability program and a commitment to satisfying all applicable laws and regulations and mitigating significant adverse environmental impacts responsibly and reasonably, consistent with Sound Transit's policies.

The key goal of Sound Transit's sustainability and environmental management programs is to protect the environment and create a healthy community and economy. The agency's core mission of moving people on transit is the most important action the agency can take to improve the local

environment, connect communities, reduce sprawl, and enable citizens to thrive within their means by saving dollars on transportation. As the agency delivers transit projects and services, it is also working to conserve resources and incorporate sustainability into everyday operations.

In 2004, the Sound Transit Board adopted an environmental policy for the agency that applies to all activities, from planning and design to construction and operations. The policy commits Sound Transit to protecting the environment for present and future generations by doing the following.

- Be in full compliance with all environmental laws and regulations and strive to exceed compliance by the continual improvement of our environmental performance through cost-effective innovation and self-assessment.
- Restore the environment by providing mitigation and corrective action, and monitor to ensure environmental commitments are implemented.
- Improve our ability to manage and account for environmental risk.
- Avoid environmental degradation by minimizing releases to air, water, and land. Prevent pollution and conserve resources by reducing waste, reusing materials, recycling, and preferentially purchasing materials with recycled content.
- Continue to educate the public about the environmental benefits of our transit system and build relationships with our contractors, vendors, consultants, and transit partners during planning, design, construction, and operation to protect and enhance the environment.

In 2007, the Sound Transit Board approved a sustainability initiative directing the agency's Chief Executive Officer to integrate sustainable practices and strategies throughout the entire agency. In addition to setting yearly targets for sustainability, in 2011, Sound Transit adopted a sustainability plan establishing long-term and short-term priorities. The plan's environmentally focused targets and performance measures include areas such as energy use, water use, stormwater management, wetland mitigation, air quality improvements including greenhouse gas emissions, toxic materials, materials consumption, and solid waste. These areas are to be considered in all of the agency's activities, including planning, design, operation, and maintenance of investments such as the OMSF.

One aspect of Sound Transit's sustainability program is its incorporation of guidelines from the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) certification system into the agency's design and operation standards. The agency's design criteria include a checklist of required and voluntary measures with specific, measurable standards to help maximize sustainability opportunities for the project during design, construction, and operation. While some of these sustainability opportunities may also support permit requirements or help mitigate environmental impacts, others can help maximize and extend the environmental and public benefits of the project.

The sustainability plan is implemented through the agency's internationally certified Environmental and Sustainability Management System (ESMS). Since 2007, Sound Transit has been one of a select number of transit agencies nationwide to achieve certification in the international ISO 14001 standard. This system holds the agency accountable for identifying and controlling environmental

impacts, setting and achieving objectives and targets, and demonstrating continual improvements in performance.

In addition to meeting environmental commitments, Sound Transit will continue to avoid and minimize impacts where possible. Where adverse impacts cannot be avoided at this stage of design, this Draft EIS identifies many potential measures to mitigate the adverse impacts of the proposed project. Sound Transit will integrate some measures into the proposed project; other potential measures are noted that might further reduce or eliminate impacts.

2.9 Funding and Estimated Project Costs

Funding for the proposed project would be provided by ST2 tax revenue. The proposed project would also remain eligible for grant funding through FTA's New Starts Program, as authorized under the Moving Ahead for Progress in the 21st Century Act (MAP-21) or other federal grants. The estimated capital costs for developing each of the build alternatives and the estimated annual cost to operate each alternative are listed in Table 2-2.

The current level of project design includes uncertainties regarding the project scope, engineering data, mitigation requirements, schedule, and project delivery methods. Therefore, the project cost estimates at this stage are conceptual costs. These estimates focus on the project elements that are defined consistently across alternatives, that capture the essential physical features of alternatives, and that help distinguish alternatives from one another.

The project capital cost estimates include the following elements.

- Construction costs for facilities, including demolition and work to prepare the site (e.g., earthwork); trackway/guideway; train control electrical, signal, and communication systems; maintenance and administrative facilities; and associated improvements.
- Property acquisition costs, including relocation assistance.
- Costs for design, permitting, agency administration, and program management.

In addition, costs for construction change orders and an unallocated contingency were estimated as a percentage of the above estimates.

The estimated annual cost to operate the OMSF alternatives reflects facility maintenance staff, utility and mechanical staff, rail operations staff, systems maintenance staff (power and signals), and administrative staff labor costs.

Table 2-2. Estimated Capital and Operating Costs of OMSF Build Alternatives

Alternative	Real Estate and Relocation (million dollars)[a]	Final Design and Construction (million dollars)[a,b]	Total Capital Cost (million dollars)[a]	Annual Operating Cost (million dollars)[c]
Lynnwood Alternative				
Design Option C1	$45	$305	$350	$66
Design Option C2	$40	$310	$350	$66
Design Option C3	$50	$305	$355	$66
BNSF Alternative	$80	$265	$345	$63
BNSF Modified Alternative	$100	$315	$415	$63
SR 520 Alternative	$95	$290	$385	$63

[a] 2013 dollars.
[b] Includes professional services and unallocated contingency.
[c] Annual labor cost in constant dollars to operate the facility.

The annual cost to operate the OMSF is driven primarily by labor costs. Table 2.3 illustrates the facility staffing requirements for each build alternative. The Lynnwood Alternative would require off-site storage tracks in Bellevue, duplicating some of the functions such as LRV cleaning and operator reporting. Due to this, the Lynnwood Alternative requires more operations and maintenance staff than the BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative.

Table 2-3. Staffing Requirements of the Build Alternatives

	Staffing Requirement					
Alternative	Onsite Adminis-tration	Rail Operation	Vehicle Maintenance	Material Handling	Facilities	Total Employees
Lynnwood Alternative	7	73	81	4	40	205
BNSF Storage Tracks	0	31	15	1	6	53
BNSF Alternative	7	98	81	4	40	230
BNSF Modified Alternative	7	98	81	4	40	230
SR 520 Alternative	7	98	81	4	40	230

2.10 Next Steps and Schedule

Following the publication of this Draft EIS, there will be a 45-day public comment period. The Draft EIS will be available at Sound Transit offices, public libraries, and community centers. Additionally, public hearings will be held during the comment period to receive verbal testimony. Comments received from the public, government agencies, and tribal nations will be considered and addressed in a Final EIS. The Final EIS will also include a preferred alternative as identified by the Sound Transit Board along with the other alternatives evaluated in the Draft EIS.

Following publication of the Final EIS, the Sound Transit Board of Directors will make a decision on the OMSF location to be built. FTA is then expected to issue a ROD on the proposed project, which documents the findings by FTA that the proposed project has met the requirements of NEPA and related environmental regulations. The ROD describes the proposed project to be built, alternatives considered, public opportunity to comment, public comments and responses, basis for the decision to approve the proposed project, and mitigation measures required. If one of the build alternatives is selected, property acquisition, final design, permitting, and ultimately construction would begin following the issuance of the ROD.

2.10.1 Project Schedule

The current project schedule is shown in Table 2-4.

Table 2-4. Current Project Schedule

Preliminary Design and Environmental Review	Time Period
Environmental Scoping	Fall 2012
Sound Transit Board Identifies Draft EIS Alternatives	December 2012
Draft EIS Published	Spring 2014
Draft EIS Comment Period	45 days
Sound Transit Board Identifies Preferred Alternative	Summer 2014
Final EIS Published	Summer 2015
Sound Transit Board Selects Project to Build	Fall 2015
Federal Record of Decision	Fall 2015
Final Design, Construction, and Operation Targets	**Time Period**
Final Design and Permitting	2015–2017
Construction	2017–2020
Ready for Operations	2020

2.10.2 Benefits and Disadvantages of Delaying Project Implementation

As required by SEPA (Washington Administrative Code [WAC] 197-11-440(5)(c)), this section discusses the benefits and disadvantages of reserving implementation of the proposed project for some future time, compared to possible approval at this time. The primary benefit of delaying the proposed project would be to postpone the costs and impacts associated with project construction.

There are several disadvantages of delaying implementation of the proposed project.

- A delay would compromise Sound Transit's ability to purchase, test, and commission additional LRVs in advance of opening light rail extensions to Lynnwood, Overlake Transit Center in Redmond, and Kent/Des Moines approved under ST2.
- Delaying the OMSF would require Sound Transit to operate the expanded system at a lower level of service than planned, or delay some or all of the planned ST2 light rail extensions until it developed additional operations and maintenance capacity.

- Delaying the proposed project could result in opening service on these extensions with a fleet size constrained to 104 vehicles, which is the storage, service, and maintenance capacity of the Forest Street OMF in Seattle. Operating the ST2 light rail system from the Forest Street OMF with only 104 vehicles for some period of time until the OMSF is built would result in degraded levels of light rail transit service. This could include increased headways (less frequent trains serving stations) and decreased passenger capacity (operating three-car rather than four-car trains).
- Lower service levels and less light rail passenger capacity could result in fewer commuters using transit, including LRV and secondary impacts on bus transit service in those corridors planned to be served by Link light rail. Those commuters may continue using automobiles instead, resulting in greater vehicular and greenhouse gas emissions.
- A disadvantage of delaying construction would be the delay in construction expenditures within the local and regional economy.
- The potential funding implications associated with delaying the proposed project could result in delays in project construction, which could result in higher construction costs due to inflation in future years. Delays would likely increase overall proposed project costs.

Chapter 3

Affected Environment and Environmental Consequences

This chapter reviews the affected environment and environmental consequences for each resource analyzed. Each subsection describes a pertinent study area, applicable regulations, and the construction, operational, and cumulative effects of each alternative considered, including the No Build Alternative. Where impacts cannot be avoided, potential mitigation measures are identified.

The environmental resources included in this chapter are listed below.

3.1 Transportation

3.2 Acquisitions, Displacements, and Relocations

3.3 Land Use

3.4 Economics

3.5 Social Impacts, Community Facilities, and Neighborhoods

3.6 Visual and Aesthetic Resources

3.7 Air Quality and Greenhouse Gases

3.8 Noise and Vibration

3.9 Ecosystems

3.10 Water Resources

3.11 Energy

3.12 Geology and Soils

3.13 Hazardous Materials

3.14 Electromagnetic Fields

3.15 Public Services

3.16 Utilities

3.17 Historic and Archaeological Resources

3.18 Parklands and Open Space

A cumulative impact assessment for each environmental resource is also included in this chapter. The cumulative impact assessment follows the National Environmental Policy Act (NEPA) 40 Code of Federal Regulations (CFR) 1500-1508. This approach is recommended by the President's Council of Environmental Quality (CEQ) in *Considering Cumulative Effects under the National Environmental Policy Act* (Council of Environmental Quality 1997), which provides the framework for advancing environmental impact analysis by addressing cumulative effects.

According to CFR 1508.7, cumulative impacts on the environment result "from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but cumulatively significant actions taking place over a period of time." Simply put, cumulative impacts evaluate a proposed action and its alternatives in a broad perspective, including how the project might interact with impacts that persist from past actions, present-day activities, and other projects that are planned but have not yet been built. Results from a cumulative analysis can reveal unintended consequences that might not be apparent when the project is evaluated in isolation instead of in a broader context.

The study area for a cumulative analysis is generally a combination of the study areas defined for each environmental resource. Study areas vary between each environmental resource. For example, the ecosystems analysis includes a much broader study area to appropriately account for the larger ecosystem networks than the built environment resources (e.g., hazardous materials, electromagnetic fields, utilities). The study areas for these built environment resources are generally within 0.25 mile or less of the build alternative sites. For resources that pertain to transportation, air quality, greenhouse gases (GHGs), and energy, the Puget Sound region serves as an adequate study area for analyzing cumulative impacts. Social-related resources that could experience a range of cumulative impacts from new infrastructure projects (e.g., land use, economics, social impacts, public services) are within 0.5 to 1 mile of the build alternative sites.

Reasonably foreseeable future actions are future projects that would produce environmental impacts that could add to or interact with the proposed alternatives and other past and present actions to produce cumulative impacts. Reasonably foreseeable future actions are not speculative and are considered regardless of the agency, organization, or person serving as their proponent (Council of Environmental Quality 1997). They must be likely to occur in the reasonably foreseeable future by virtue of being funded, approved, or under consideration for regulatory permitting; the subject of an environmental review process under NEPA or the State Environmental Policy Act (SEPA); or part of an officially adopted planning document or publicly available development plan.

A list of all relevant reasonably foreseeable future projects known in the study areas is shown in Table 3-1. Note that the Lynnwood Link Extension and East Link projects are the most relevant projects when discussing cumulative impacts, since the OMSF build alternatives are located along these Link extensions.

Table 3-1. Reasonably Foreseeable Future Actions in the Study Areas

Name of Project (Sponsor)	Description	Status	Related OMSF Alternative
Sound Transit			
ST2	Extends Central Link light rail to the north, south, and east and increases bus and Sounder service. The Lynnwood Link Extension and East Link are projects under ST2.	Program currently being implemented.	Lynnwood Alternative, BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative
Lynnwood Link Extension	As part of ST2, this project would extend the light rail system from Northgate to Lynnwood.	Construction 2018–2023. Operations to begin 2023.	Lynnwood Alternative
East Link	As part of ST2, this project would extend the light rail system from Seattle to Mercer Island, Bellevue, and Redmond.	Construction 2015–2021. Operations to begin in 2023.	BNSF Storage Tracks component of Lynnwood Alternative, BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative
WSDOT			
SR 520 Bridge Replacement and HOV Program	Project to improve access and mobility from Seattle to Redmond.	Under construction.	BNSF Storage Tracks component of Lynnwood Alternative, BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative
City of Lynnwood			
Interurban Trail Improvement Project – Missing Links	Project to complete two missing links along the Interurban Trail located between 212th Street SW and 52nd Avenue W by constructing a continuous 12-foot-wide non-motorized bicycle/pedestrian trail that is separated from traffic.	In predesign stage.	Lynnwood Alternative

Name of Project (Sponsor)	Description	Status	Related OMSF Alternative
196th Street SW (SR 524) Improvement Project	Project to improve 196th Street SW (SR-524) by providing additional multimodal capacity and safety/aesthetic boulevard features.	Design to begin in early 2013.	Lynnwood Alternative
44th Avenue W, I-5 to 194th Street SW Improvement Project	Project to widen the roadway from seven to eight lanes just south of 196th Street SW and include wider sidewalks and landscape features.	Upcoming project.	Lynnwood Alternative
200th Street SW, 64th Avenue W to 40th Avenue W Improvement Project	Project to add lanes, wider sidewalks, landscape features, and bicycle facilities.	Upcoming project.	Lynnwood Alternative
Edmonds School District, District Support Center	Project to consolidate support functions including administrative offices, bus maintenance facilities, warehouse etc.	• Identified in Master Plan (2004) developed for all district facilities. • Financing plan in place initiated with 2006 bond measure. • SEPA Mitigated Determination of Nonsignificance issued April 2, 2007. • Architectural and engineering plan set completed. • Conditional Use Permit obtained but needs renewal. • Site preparation work has occurred including demolition and ground improvements.	Lynnwood Alternative

Name of Project (Sponsor)	Description	Status	Related OMSF Alternative
City of Bellevue			
Spring District	New urban center located within the Bel-Red Corridor at the intersection of SR-520 and I-405. District will include 16 urban blocks designed to focus on connectivity to downtown Bellevue, surrounding communities, and the greater Eastside; 5,300,000 square feet of mixed-use residential, office, and retail space are proposed.	Master Development Plan approved 2012. Phase 1 construction began in 2013. Phase 2 completion planned for by 2022. Phase 3 completion planned for by 2026.	BNSF Storage Tracks component of Lynnwood Alternative, BNSF Alternative, and BNSF Modified Alternative
Northeast 15th/16th Street Multi-Modal Corridor Project	Corridor project to address planned growth and development in the Bel-Red and Wilburton areas.	In conceptual design engineering phase.	BNSF Storage Tracks component of Lynnwood Alternative, BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative
NE 4th Street Extension – 116th to 120th Avenues NE	Improvement project to implement a new five lane arterial, with two travel lanes in each direction and a center turn lane where necessary, between 116th Avenue NE and 120th Avenue NE.	In final design stage.	BNSF Storage Tracks component of Lynnwood Alternative, BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative
120th Avenue NE Improvements Stages 2 and 3	Improvement project to widen 120th Avenue NE to five lanes just south of NE 8th Street to south of NE 12th Street as part of Stage 2, and from NE 12th Street to Northup Way as part of Stage 3.	In predesign stage.	BNSF Storage Tracks component of Lynnwood Alternative, BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative

Name of Project (Sponsor)	Description	Status	Related OMSF Alternative
120th Avenue NE (Stages 3 and 4)/NE 12th Street to 18th Street and to Northup Way	Improvement project to widen 120th Avenue NE to five lanes from NE 12th Street to NE 16th Street as part of Stage 3 and as part of Stage 4, from NE 16th Street to Northup Way will widen the roadway and transition from a five-lane section to a four-lane section in proximity of NE 18th Street.	In predesign stage.	BNSF Storage Tracks component of Lynnwood Alternative, BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative
NE 15th Street Multi-Modal Corridor (Segment I) – NE 12th Street to 124th Avenue NE	Improvement project to implement a new multi-modal corridor consisting of two general purpose travel lanes in each direction.	In predesign stage.	BNSF Storage Tracks component of Lynnwood Alternative, BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative
Northup Way Corridor Improvements	Improvement project to construct bike lane and sidewalk improvements on Northup Way between NE 24th Street and 108th Avenue NE.	In predesign stage.	BNSF Storage Tracks component of Lynnwood Alternative, BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative
NE 15th/16th Street (Phase II)/124th Avenue NE to 136th Place NE and 136th Place NE/NE 16th to 20th Streets	Improvement project to extend the five-lane roadway from 124th Avenue NE to 136th Place NE with a key intersection at 130th Avenue NE.	In predesign stage.	BNSF Storage Tracks component of Lynnwood Alternative, BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative
130th Avenue NE/NE 20th to NE Bel-Red Road	Improvement project to construct turn lanes, shared bike lanes, on-street parking and sidewalks between NE 16th and NE 20th Streets and widen to three lanes with shared bike lanes and sidewalks between NE 16th Street and Bel-Red Road.	In predesign stage.	BNSF Storage Tracks component of Lynnwood Alternative, BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative

Name of Project (Sponsor)	Description	Status	Related OMSF Alternative
NE 16th Street/130th Avenue NE to 136th Place NE and 136th Place NE/NE 16th to 20th Streets	Improvement project to Construct multimodal corridor from 130th Avenue NE to 132nd Avenue NE. Design as needed for coordination with East Link for segment 132nd Avenue NE to 136th Place and 136th Place to NE 20th Street	In predesign stage.	BNSF Storage Tracks component of Lynnwood Alternative, BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative
130th Avenue NE/NE 20th to NE Bel-Red Road	Improvement project to include two travel lanes, bike lanes, on-street parking, landscape strip and sidewalks both sides of Segment NE 20th Street to NE 16th Street.	In predesign stage.	BNSF Storage Tracks component of Lynnwood Alternative, BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative
Seattle Children's Hospital, Phase II	Proposed building will add 140,000 square feet, three stories, and provide approximately 378 parking stalls. Site design includes landscaping and wetland buffer enhancement.	SEPA Determination of Nonsignificance issued October 20, 2011. Application process for a Master Development Plan and a Critical Areas Land Use Permit	BNSF Storage Tracks component of Lynnwood Alternative, BNSF Alternative, and BNSF Modified Alternative

3.1 Transportation

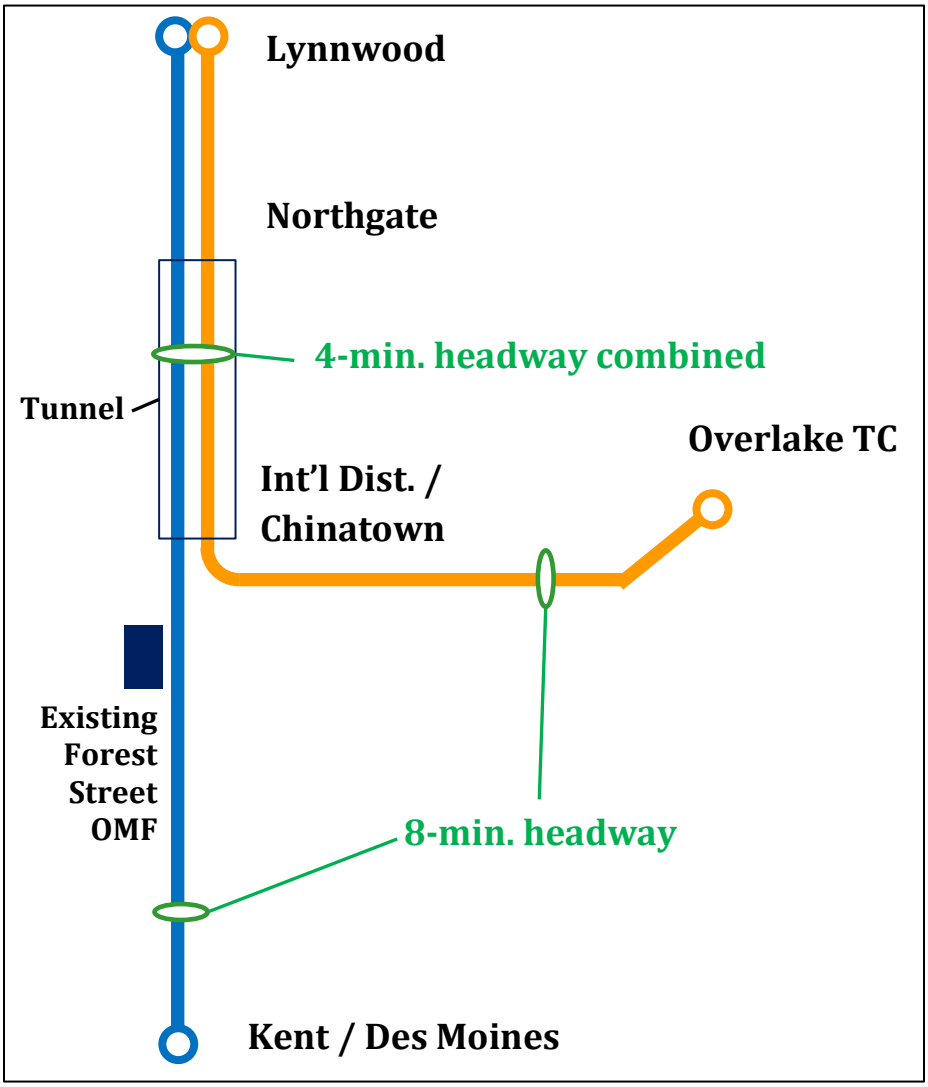
This section describes the existing transportation environment and presents potential impacts associated with the proposed Sound Transit Link Light Rail Operations and Maintenance Satellite Facility (OMSF) (proposed project). This section first discusses Sound Transit's light rail transit operations plan and evaluates impacts on system-wide operations associated with each of the build alternatives. This section then addresses other elements of the transportation system, such as vehicular traffic volumes, site access and parking and construction traffic. Construction, operational and cumulative impacts are also discussed. A more detailed discussion of the transportation analysis is provided in Appendix E.1, *Transportation Technical Report*, of this Draft EIS.

3.1.1 Light Rail Transit Operations

3.1.1.1 Affected Environment—Light Rail Operations Plan

Beginning in 2023, Link will operate with two operating lines, as shown in Figure 3.1-1. One line will operate between Lynnwood and Overlake Transit Center (Overlake TC), and the other line will operate between Lynnwood and Kent/Des Moines. The two lines will merge at the International District/Chinatown Station and share the same tracks between the merge point and Lynnwood. The shared tracks include a tunnel stretching 8.7 miles between the International District/Chinatown Station and the tunnel portal just south of Northgate Transit Center. The two lines will be scheduled to alternate on the shared tracks in both directions. Due to the configuration of tracks, there is no direct operating line between Overlake TC and Kent/Des Moines; therefore, passengers traveling between stations east of downtown Seattle and stations south of downtown Seattle must transfer between lines at International District/Chinatown. Also, trains cannot be deployed from the existing Forest Street Operations and Maintenance Facility (Forest Street OMF) directly to the tracks headed east toward Overlake TC.

Figure 3.1-1. Link ST2 System Peak Period Operating Plan



The Link system uses a fleet of light rail vehicles (LRVs), or cars. The Link LRV is shown in Figure 3.1-2. Each LRV is 95 feet long and can be operated independently or with other LRVs in a multi-car train. The Link system can accommodate trains with up to four LRVs.

Figure 3.1-2. Link Light Rail Vehicle (LRV)

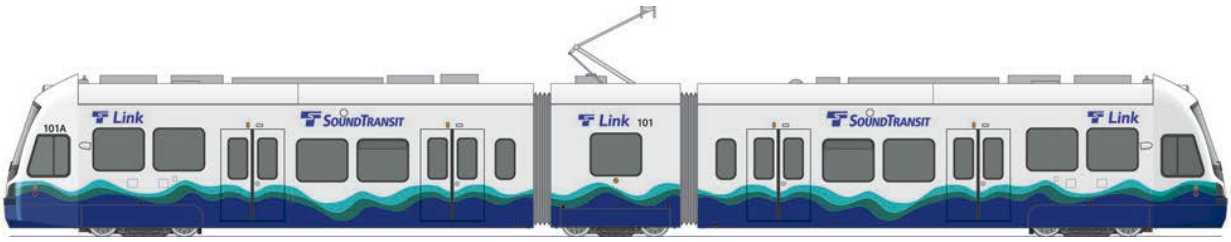


Table 3.1-1 shows key operational characteristics of the planned ST2 Link system. The anticipated headways, hours of operation, travel times, and train lengths are developed for planning purposes based on build-out of the ST2 system and projected ridership demand. Actual operations when service opens on each Link extension (north, east, and south) could differ or be adjusted (e.g., shorter train lengths) from what is shown in Table 3.1-1. The Lynnwood/Kent Des Moines line is planned to operate with 20 trains, which includes one "gap train", or ready reserve train, that is off line but ready for service in case of a disabled train or other disruption on the line. The Lynnwood–Overlake TC line is planned to operate with 19 trains, including one gap train. The fleet also includes a number of spare vehicles that are assumed to be out of service for scheduled and unscheduled maintenance activities.

Table 3.1-1. Link Operational Characteristics

Hours of Operation	**Weekdays and Saturdays** **Sundays and holidays**	**5:00 a.m. to 1:00 a.m.** **6:00 a.m. to 12:00 a.m.**
Headways	Peak (6:00–8:30 a.m. & 3:00–6:30 p.m.)	8 minutes (4 min. on combined section)
	Off-Peak (8:30 a.m.–3:00 p.m. & 6:30–10:00 p.m.)	10 minutes (5 min. combined)
	Early/Late (5:00–6:00 a.m. & 10:00 p.m.–1:00 a.m.)	15 minutes (7.5 min. combined)
Estimated Travel Times (one-way)	Lynnwood – Overlake TC	61 minutes
	Lynnwood – Kent/Des Moines	66 minutes
	Lynnwood – Int'l Dist./Chinatown	32 minutes
	Overlake TC – Int'l Dist./Chinatown	30 minutes
	Kent/Des Moines – Int'l Dist./Chinatown	34 minutes
LRV Fleet	**Lynnwood – Kent/Des Moines**	
	# Trains	20
	Train Length	4-car
	Service LRVs	80
	Lynnwood – Overlake TC	
	# Trains	19
	Train Length	4-car
	Service LRVs	76
	Total Service LRVs	156
	Spare LRVs (15%)	24
	Total Fleet Size	180
Maximum Passenger Load (2030)	Maximum Load Point	Pioneer Square→Int'l Dist./Chinatown
	Passengers per Hour at Max. Load Point	8,680
	Peak Period Capacity per Hour	8,880 (148 passengers per car)

The operation of the Link system is constrained by the following considerations.

- Due to the capacity of lead tracks to deploy trains onto the system, LRVs for the Lynnwood–Kent/Des Moines line would be stored and deployed from the Forest Street OMF. LRVs for the Lynnwood–Overlake TC line would be stored and deployed from the OMSF in Lynnwood and the BNSF Storage Tracks (Lynnwood Alternative) or Bellevue (BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative).
- The light rail guideway and systems (i.e., trackway, signals, and overhead wire) require an overnight time period for maintenance between 1:00 a.m. and 5:00 a.m. Trains generally cannot operate during this period.
- The tunnel between Northgate and International District/Chinatown is closed from 1:00 a.m. to 5:00 a.m. to allow for maintenance activities.
- The signaling system in the light rail tunnel between Northgate and International District/Chinatown is designed to accommodate a 3-minute scheduled headway in the tunnel.
- The tunnel between downtown and Northgate has special operating restrictions near scientific research buildings on the University of Washington (UW) campus related to electromagnetic interference and vibration. Sound Transit entered into a Memorandum of Understanding (MOU) with the UW which creates limitations on moving some disabled trains through this portion of the tunnel.

3.1.1.2 Impacts

Impacts on the operation of the light rail transit system evaluated for each alternative are focused on effects on system-wide operations and service associated with serving the system from each build alternative site.

No Build Alternative

Without the proposed project, the Forest Street OMF would be expected to serve the entire Link light rail system, including the existing Central Link system and extensions to Lynnwood, Overlake Transit Center, and Kent/Des Moines. With this alternative, Sound Transit would be constrained to a fleet of 104 vehicles—the current storage, service and maintenance capacity of the Forest Street OMF. Based on that constraint, Sound Transit developed a “least-worst” light rail operating scenario with a 104-vehicle system, which would consist of the following.

- 3-car trains.
- 11-minute peak headways on each operating line.
- Passenger load factor at maximum passenger load point in 2035 of 4.0 (4 passengers per seat).

With this operating scenario, passenger overcrowding on trains and station platforms would be expected during peak periods at locations with the greatest passenger loads (e.g., downtown Seattle and/or the University of Washington). Under the No Build Alternative, trains would be deployed

from the Forest Street OMF and the storage tracks in the Eastside Rail Corridor, which can accommodate four trains (16 LRVs or cars), as planned under Sound Transit's East Link project. To establish full morning service on the Eastside, it is likely some trains would need to be deployed from Forest Street OMF and turn back south at the Northgate Station to reach the east line, creating operational disruptions and inefficiency. This alternative could result in secondary impacts on bus transit service in those corridors planned to be served by Link light rail. This alternative could result in fewer commuters using transit and instead continuing to use automobiles. Without an OMSF, Sound Transit would have to operate the expanded system at a lower level of service than planned, or delay some or all of the planned ST2 light rail extensions, until it developed additional operations and maintenance capacity.

Lynnwood Alternative

The Lynnwood Alternative would result in 15-minute headways after 6:30 p.m. on the Lynnwood to Overlake TC operating line. This would result from the need for daily inspection and interior cleaning of 32 LRVs at the BNSF Storage Tracks to ready those vehicles for the next morning's deployment. The time needed to complete these functions at the BNSF Storage Tracks would require that these vehicles be removed from service earlier in the evening, resulting in longer headways after 6:30 p.m. This headway does not meet Sound Transit's planned off-peak headway of 10 minutes until 10:00 p.m. as shown in Table 3.1-1. Less frequent headways after the evening peak period would not measurably affect system ridership levels or the ability to meet ridership demand, which is driven by peak period trips.

BNSF Alternative and BNSF Modified Alternative

The BNSF Alternative and BNSF Modified Alternative would operate similarly because the OMSF would be located in the Bel-Red area of Bellevue along the East Link extension. These alternatives would not affect the key operational characteristics of the planned ST2 Link system shown in Table 3.1-1. Less frequent headways after the evening peak period would not measurably affect system ridership levels or the ability to meet ridership demand, which is driven by peak period trips.

SR 520 Alternative

The SR 520 Alternative would operate similarly to the BNSF Alternative and BNSF Modified Alternative because it would also be located in the Bel-Red area along the East Link extension. This build alternative would modify a portion of East Link to accommodate the lead track connection, resulting in reduced operating speed on the mainline. Reduced operating speed on this portion of East Link could affect the estimated travel times shown in Table 3.1-1.

3.1.2 Traffic and Other Transportation Elements

Analysis of the transportation system considers the following elements:

- Construction traffic impacts
- Transportation network serving each build alternative site
- Traffic volumes
- Traffic safety
- Other modes of transit
- Non-motorized facilities
- Freight mobility and access
- Parking
- Site access and driveway operations

Transportation goals and level of service (LOS) standards are developed as part of each agency's comprehensive planning efforts. LOS is a qualitative measure used to characterize traffic operating conditions. Six designations, A through F, are used to define LOS. LOS A is the best and represents good traffic operations with little or no delay to motorists. LOS F is the worst and indicates poor traffic operations with long delays. While each agency accepts different levels of congestion, a delay-based intersection LOS analysis has been preliminarily accepted by each agency. Delay is expressed in terms of average delay per vehicle, in seconds, experienced during an analysis hour. The LOS standards typically apply to the PM peak hour, which is between 4:00 and 6:00 p.m. when weekday traffic is typically highest for the overall roadway network. The LOS standards for the jurisdictions containing the build alternative sites are included in Appendix E.1.

3.1.3 Methods

The study area for the transportation analysis includes the build alternative sites. These study areas were defined based on standard transportation and traffic impact analysis practices, as well as the requirements of the two local jurisdictions where the build alternative sites are located.

The approach to the analysis and study areas for each build alternative site reflects locally adopted impact analysis guidelines. The proposed project is expected to generate lower levels of daily and peak hour traffic than the land uses that would be displaced from each build alternative site. Therefore, the proposed project would result in a net decrease in trips on roadways surrounding each of the sites compared to conditions without the proposed project. As a result, traffic impact analysis standards do not require analysis of off-site intersections, and the operations analyses were limited to the vehicular site access driveways at each build alternative site.

3.1.4 Affected Environment

This section presents a summary of existing conditions at each of the build alternative sites without the proposed project.

3.1.4.1 Transportation Network

Characteristics, such as street classification, speed limits, traffic control, nonmotorized facilities, parking, and other attributes of the key roadways and intersections in the vicinity of the Lynnwood

Alternative site are summarized in Table 3.1-2. Road networks in the City of Lynnwood are illustrated in Chapter 2, Alternatives Considered, Figures 2-4a, 2-4b, and 2-4c.

The *City of Lynnwood Six-Year Transportation Improvement Plan* and *20-Year Long Range Transportation Improvement List* (City of Lynnwood 2011) were reviewed to determine if any planned improvement projects would affect study area roadways or intersections. Within the Lynnwood Alternative site, one nonmotorized improvement is included in the *Six-Year Transportation Improvement Plan*, Interurban Trail Improvement in the vicinity of 208th Street SW and 52nd Avenue W. The 20-year list includes bicycle projects along 52nd Avenue W (#B32 from 204th Street SW to the south city limits) and 208th Street SW (#B106 from State Route [SR] 99 to 52nd Avenue W). No other projects were identified that would alter the existing transportation system near the Lynnwood Alternative site.

Table 3.1-2. Roadway Characteristics—Lynnwood Alternative Site

Characteristic	52nd Avenue W/ Cedar Valley Rd	204th Street SW	208th Street SW	120th Avenue NE (Bellevue)
Street Classification	Minor Arterial[a]	Collector Arterial[a]	Collector Arterial[a]	Collector Arterial[b]
Speed Limit (miles per hour)	30	30	30	30
Lanes	3	2	2/3	2 (1 each direction plus turn lanes added at key intersections)
Street-Edge Condition	Curb, gutter, sidewalk, and bike lanes on both sides	Curb, gutter, and sidewalk on both sides	Curb, gutter, sidewalk and bike lanes on both sides	Mostly paved or gravel shoulder with segments of curb, gutter, and sidewalk on west side
Bike Lanes	Both sides	None	Both sides	None
Parking	None	Parallel both sides	Parallel on north side west of 54th Ave W	Along some segments of gravel shoulder
Lane Restrictions	None	None	None	None
Transit Stops	Both sides at 204th St SW and 208th St SW	None	None	None
Traffic Control and Signal Locations	Signal at 200th St SW	Stop signs at 52nd Ave W	Stop signs at 52nd Ave W	Signals at NE 20th St (Northup Way) and NE 12th St

[a] Source: City of Lynnwood 2011.
[b] Source: City of Bellevue 2009.

Characteristics of the key roadways and intersections in the vicinity of the BNSF Alternative and BNSF Modified Alternative sites, including street classification, speed limits, traffic control,

nonmotorized facilities, parking, and other attributes are summarized in Table 3.1-3. Road networks in the City of Bellevue are illustrated in Chapter 2, Alternatives Considered, Figures 2-5a, 2-6a, and 2-7a. Site access locations for the BNSF Modified Alternative site would be the same as those described for the BNSF Alternative. Therefore, the conditions described for the transportation network, roadway traffic volumes, transit, nonmotorized facilities, parking and site access are also the same.

Table 3.1-3. Roadway Characteristics—BNSF Alternative and BNSF Alternative Sites

Characteristic	120th Avenue NE
Street Classification	Collector Arterial[a]
Speed Limit (mph)	30
Lanes	2 (1 each direction plus turn lanes added at key intersections)
Street-Edge Condition	Mostly paved or gravel shoulder with segments of curb, gutter, and sidewalk on west side;
Bike Lanes	None
Parking	Along some segments of gravel shoulder
Lane Restrictions	None
Transit Stops	None
Traffic Control and Signal Locations	Signals at NE 20th St (Northup Way) and NE 12th St

[a] Source: City of Bellevue 2009.

The *City of Bellevue 2013–2018 Transportation Improvement Program* (City of Bellevue 2012a), *2013–2019 Capital Investment Program Plan* (City of Bellevue 2013), and the *2013–2024 Transportation Facilities Plan: Preliminary Project Priority List* (City of Bellevue 2012b) identify the following projects that could alter the existing transportation network near the BNSF Alternative and BNSF Modified Alternative sites before the 2035 design year (more details about these projects are included in Appendix E.1). Several of the projects are listed in more than one plan, but with different identification numbers as noted.

- 120th Avenue NE Improvements (Stage 2 and 3) – NE 8th Street to Northup Way (Transportation Improvement Project [TIP] #15, CIP #R-164; Transportation Facilities Program [TFP] #208)
- 120th Avenue NE (Stages 3 and 4)/ NE 12th Street to 18th Street and to Northup Way (TC #4, Preliminary TFP Map #RI-157, CIP #R-164)
- NE 15th Street Multi-Modal Corridor (Segment I) - NE 12th Street to 124th Avenue NE (TIP #14, CIP #R-163, TFP #209)

The *City of Bellevue 2013-2018 Transportation Improvement Program* (City of Bellevue 2012a) and the *2013-2024 Transportation Facilities Plan: Preliminary Project Priority List* (City of Bellevue 2012b) identify the following projects that could alter the existing transportation network near the SR 520 Alternative site before the 2035 design year (more details about these projects are included in Appendix E.1).

- Northup Way Corridor Improvements (TIP #8, CIP #R-146, TFP #079)
- NE 15th/16th Street (Phase II)/124th Avenue NE to 136th Place NE and 136th Place NE/NE 16th to 20th Streets (TIP #52, TFP #215)
- 130th Avenue NE/NE 20th to NE Bel-Red Road (TIP #55, TFP #218)
- NE 16th Street/130th Avenue NE to 136th Place NE and 136th Place NE/NE 16th to 20th Streets (TC #7, Prelim. TFP Map #RI-135).
- 130th Avenue NE/NE 20th to NE Bel-Red Road (TC #24, Prelim. TFP Map #RI-137).

Characteristics of the key roadways and intersections in the vicinity of the SR 520 Alternative site are summarized in Table 3.1-4.

Table 3.1-4. Roadway Characteristics—SR 520 Alternative Site

Characteristic	NE 20th Street (Northup Way)	130th Avenue NE	136th Place NE
Street Classification	Minor Arterial[a]	Collector Arterial[a]	Collector Arterial[a]
Speed Limit (mph)	35 in site vicinity	30 in site vicinity	25
Lanes	5 (2 each direction plus center turn lane); turn lanes added at some intersections	3 (1 each direction plus center turn lane); turn lanes added at some intersections	2
Street-Edge Condition	Curbs, gutters, and sidewalks on both sides	Curbs, gutters, and sidewalks on both sides	Intermittent gravel shoulder; grass ditch, small segments of curb, gutter, and sidewalk
Bike Lanes	None	None	None
Parking	None	None	Along some segments of gravel shoulder
Lane Restrictions	None	None	None
Transit Stops	Both sides at 136th Pl NE, 132nd Ave NE, and 130th Ave NE	None	None
Traffic Control and Signal Locations	Signals at 130th Ave NE, 132nd Ave NE, 136th Pl NE, 140th Ave NE, 14300 Block, and 148th Ave NE	Signal at NE 20th St (Northup Way)	Signal at NE 20th St (Northup Way)

[a] Source: City of Bellevue 2009.

3.1.4.2 Traffic

In Lynnwood, north of 208th Street SW, 52nd Avenue W carries an average of about 6,800 vehicles per day. The highest volume on 52nd Avenue W occurs between 4:00 and 5:00 p.m. (the PM peak hour) with 635 vehicles per hour (305 northbound, 330 southbound); the AM peak-hour flow of about 620 vehicles (180 northbound, 440 southbound) occurs between 7:00 and 8:00 a.m. The Lynnwood Alternative site has six or seven buildings estimated to generate 1,240 trips per day,

166 AM peak-hour trips, and 164 PM peak-hour trips. It is also estimated that the office and warehouse uses (currently vacant) that exist at the BNSF Storage Tracks could generate 650 trips per day, 58 AM peak-hour trips, and 61 PM peak-hour trips.

In Bellevue, the highest volumes on 120th Avenue NE, which carries an average of about 4,800 vehicles per day, occur between 1:00 and 2:00 p.m. and again between 5:00 and 6:00 p.m. (the midday and PM peak hours, respectively), about 410 vehicles travel per hour for both directions. The BNSF Alternative and BNSF Modified Alternative sites contain general office space, retail space, warehouse space and parking associated with the adjacent auto dealership. The BNSF Alternative site is estimated to generate 2,020 trips per day, 183 AM peak-hour trips, and 209 PM peak-hour trips. The BNSF Modified Alternative site is estimated to generate 2,100 trips per day, 188 AM peak-hour trips, and 215 PM peak-hour trips. Traffic counts collected on NE 20th Street (Northup Way) west of 136th Place NE on January 22 and 23, 2013, indicate that the roadway carries an average of about 23,220 vehicles per day. The highest volume on NE 20th Street occurs between noon and 1:00 p.m. (midday peak hour) with about 2,090 vehicles per hour in both directions. The PM peak-hour volume is slightly lower (1,975 vehicles per hour between 5:00 and 6:00 p.m.); the AM peak-hour flow from 7:00 to 8:00 a.m. is about 1,075 vehicles per hour (615 westbound, 460 eastbound).

The SR 520 Alternative site contains general office space, retail space, automobile sales space, and automobile care and service space. The site is estimated to generate 6,080 trips per day, 461 AM peak-hour trips, and 638 PM peak-hour trips.

3.1.4.3 Transit

King County Metro Transit (Metro) owns and operates two bus base facilities for dispatch, operations, maintenance, and storage of transit vehicles in the Bel-Red area of Bellevue. Metro's East Base is located between 120th and 124th Avenues NE at approximately NE 18th Place. Metro's Bellevue Base is located on the east side of 124th Avenue NE south of NE 18th Place. Both the East Base and Bellevue Base have primary access from 124th Avenue NE. The East Base also has a secondary gated access on 120th Avenue NE.

3.1.5 Environmental Impacts

This section summarizes the potential transportation impacts that would result from the construction and operation of the proposed project on the surrounding transportation network.

3.1.5.1 No Build Alternative

With the No Build Alternative, the existing land uses would remain at the BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative sites and continue to generate traffic. At the Lynnwood Alternative site, a vacant parcel owned by the Edmonds School District is planned to house the district support center. This facility would provide administrative and training functions, a school bus base and vehicle maintenance facilities, building and facilities maintenance, and district warehouse operations. Under the No Build Alternative, the Edmonds School District would proceed with

construction of a district support center, which would generate traffic at the site associated with approximately 152 school buses, 116 fleet vehicles, and 475 administrative and maintenance personnel (Shockey-Brent, Inc. 2007).

3.1.5.2 Impacts Common to All Build Alternatives

Construction Impacts

Most construction-period traffic would occur during import and export of material to and from the site. All of the build alternatives would require some demolition activities and earthwork that would generate truck trips during the construction effort. The estimated volumes of truck traffic are presented in the following sections for each alternative. The estimates of truck traffic are conservative because at this time it is unknown how much excavated material could be used as fill material elsewhere on the same site. The traffic analysis assumes all excavated material would be transported off site, and all fill material would be imported to the site. Under all build alternatives, the estimated volume of truck traffic represents one truck or less per signal cycle moving through area intersections and would not affect traffic on the surrounding roads. A construction transportation management plan (CTMP) addressing site access, traffic control, hauling routes; construction employee parking, and pedestrian and bicycle control in the area would be prepared for the selected alternative per City of Lynnwood and/or City of Bellevue requirements, as applicable.

Operational Impacts

Transportation Network

None of the build alternatives would change the existing transportation network in their respective site vicinities, and no adverse impacts on the surrounding roadway network are anticipated.

The build alternatives would not result in adverse impacts on the surrounding nonmotorized facilities. Sound Transit would provide frontage improvements along public rights-of-way to meet City of Lynnwood and/or City of Bellevue roadway design standards. Details about the potential frontage improvements are provided in Appendix E.1.

Parking demand models were developed for each build alternative. All build alternatives would satisfy their respective peak parking demand. No parking overspill to on-street or adjacent parking facilities is expected and no adverse parking impacts are expected for any of the build alternatives.

Site Access

The proposed site access driveways that would serve each build alternative site would operate at acceptable levels of service. Details about site access operations are presented in the following sections for each build alternative.

None of the build alternatives would construct any new at-grade crossings of roadways. Lead track configurations for all of the build alternatives would allow LRVs to enter and exit the proposed

project along an exclusive right-of-way. None of the build alternatives would generate additional grade crossings at NE 20th Street in Bellevue because under any alternative, LRVs would be deployed directly into service (no deadheading). Morning deployment would be managed such that LRVs would leave the OMSF and enter service at no greater than peak headway intervals (approximately one train per 8 minutes). In the evening, trains would leave revenue service in stages after the evening peak.

Freight Mobility and Access

All of the build alternatives would result in a net reduction in traffic on study area roadways. None of the build alternatives are expected to result in adverse impacts on freight mobility or access.

Traffic

Sound Transit estimated all vehicle trips expected to be generated by train operators, maintenance employees, visitors, deliveries, and other activities. All of the build alternatives would result in a net decrease in traffic compared to the No Build Alternative. All build alternatives would result in a net decrease in daily and peak-hour traffic on surrounding roadways and would reduce the number of site access driveways serving the sites. Therefore, none of the build alternatives are expected to result in any adverse impacts on traffic.

Traffic Safety

A review of collision data in the vicinities of all build alternative sites (provided in Appendix E.1, *Transportation Technical Report*) did not indicate any unusual traffic safety conditions that would affect or be affected by the proposed project. The proposed OMSF would result in a net decrease in daily and peak hour traffic on roadways surrounding each alternative. Each alternative would also reduce the number of site access driveways that exist along adjacent roadways. As a result, none of the build alternatives are expected to result in any adverse impacts on traffic safety.

Transit

Since all of the build alternatives would generate less traffic than the No Build Alternative, none of the build alternatives would adversely affect bus facilities or operations. Both of Metro's transit bases have primary access on 124th Avenue NE; the small amount of traffic that would enter and exit the OMSF access driveway(s) for any of the build alternatives would not result in any adverse impacts on either base.

3.1.5.3 Lynnwood Alternative

Construction Impacts

Demolition activity would generate about 28 truck trips per day with four truck trips per hour. Up to 19,500 truckloads (39,000 truck trips) could be generated by removal and import of cut and fill material at the Lynnwood site. The excavation and embankment activity is expected to take about 6 months. Assuming an average of about 20 working days in the month and a typical 8-hour construction work day, the excavation and embankment activity could generate about 165

truckloads per day and an average of 21 truckloads per hour. With two truck trips for each truckload (one in and one out), the earthwork activity would generate about 330 truck trips per day with 42 truck trips per hour. Additionally, up to 345 total truck trips could be generated from removal and import of material at the BNSF storage tracks site. Construction haul routes would be determined as part of the CTMP and would depend on the origin and destination of material; however, the routes are likely to include 52nd Avenue W, 200th Street SW, 196th Street SW, 44th Avenue W, 220th Street SW and I-5 in Lynnwood. Routes to and from the BNSF Storage Tracks site are likely to include 120th Avenue NE, Northup Way, and SR 520 in Bellevue.

Operational Impacts

Traffic

A total of 206 employees are expected to work at the Lynnwood Alternative site over three shifts each day. This alternative is expected to result in 520 daily vehicle trips (260 in, 260 out) with 20 trips occurring in the AM peak hour (from 7:00 to 8:00 a.m.), and 15 trips occurring in the PM peak hour (5:00 to 6:00 p.m.). The PM peak hour of the adjacent street occurs from 4:00 to 5:00 p.m.; however, during the 4:00 to 5:00 hour, the proposed project is expected to generate only five trips. Therefore, to provide a worst-case analysis, the higher trip generation from 5:00 to 6:00 p.m. (15 trips) was considered. When compared to the daily and peak-hour traffic estimates for the existing uses at the Lynnwood Alternative site, the Lynnwood Alternative would result in a decrease in daily and peak-hour traffic on the surrounding City of Lynnwood roadway networks.

The BNSF Storage Tracks, with up to 56 employees, is expected to result in 130 daily vehicle trips (65 in, 65 out) with five trips occurring in the AM peak hour (from 7:00 to 8:00 a.m.) and two trips occurring in the PM peak hour (5:00 to 6:00 p.m.). When compared to the daily and peak-hour traffic estimates that could be generated by the existing uses on the site, the proposed project would result in a decrease in daily and peak-hour traffic on the surrounding City of Bellevue roadway network.

Parking

The total peak parking demand could range from 140 to 158 vehicles plus eight maintenance trucks at the Lynnwood site. A total peak parking demand of 44 vehicles is forecast at the BNSF Storage Tracks.

Site Access

The Lynnwood Alternative would eliminate the four existing private site access driveways and the eastern legs of 204th Street SW and 206th Street SW along 52nd Avenue W. This alternative would construct a new primary access driveway on the east side of 52nd Avenue W about 300 feet south of the 206th Street SW intersection. A secondary access would be provided at the northwest corner of the site on Cedar Valley Road about 540 feet north of the 204th Street SW intersection.

LOS analyses were performed for the primary site access driveways that would serve the proposed project (Lynnwood Alternative site and the BNSF Storage Tracks) in accordance with the method outlined in the *Highway Capacity Manual 2010* (Transportation Research Board 2010) using

Trafficware's *Synchro* traffic operations analysis software and the HCM 2010 reporting module. Future year conditions are presented for year 2035, which is the design year for the proposed project. All turning movements at the proposed access are projected to operate at LOS C or better during all peak hours. The BNSF Storage Tracks in Bellevue would be accessed from a single driveway on the west side of 120th Avenue NE at roughly NE 18th Place; all turning movements to and from this driveway are also expected to operate at LOS C or better during all hours (see Appendix E.1 for detailed information on LOS). Therefore, the Lynnwood Alternative is not expected to result in any adverse traffic operational impacts at the site access driveways.

3.1.5.4 BNSF Alternative

Construction Impacts

Demolition activity could generate about 28 truck trips per day with four truck trips per hour. Up to 5,560 truckloads (11,120 truck trips) could be generated from removing and importing cut and fill material at the BNSF Alternative site. The site grading activity is expected to take about 3 months. Assuming an average of about 20 working days per month and a typical 8-hour construction work day, the site grading activity could generate about 95 truckloads per day and an average of 12 truckloads per hour. With two truck trips for each truckload (one in and one out), the earthwork activity would generate about 190 truck trips per day with 24 truck trips per hour. Construction haul routes would be determined as part of the CTMP and would depend on the origin and destination of material; however, the routes are likely to include 120th Avenue NE, Northup Way, and SR 520 in Bellevue.

Operational Impacts

Traffic

Trip generation for the BNSF Alternative is expected to be similar to that presented previously for the Lynnwood Alternative. The BNSF Alternative is expected to employ 230 employees and result in 570 daily vehicle trips (285 in, 285 out) with 20 trips occurring in the AM peak hour (from 7:00 to 8:00 a.m.), and 15 trips during the PM peak hour (5:00 to 6:00 p.m.). When compared to the daily and peak-hour traffic estimates for the existing uses on the BNSF Alternative site, this alternative would result in a decrease in daily and peak-hour traffic on the surrounding City of Bellevue roadway network.

Parking

Parking demand for the BNSF Alternative would be slightly higher than the estimates described for the Lynnwood Alternative. The total peak parking demand could range from 150 to 168 vehicles plus eight maintenance trucks. The BNSF Alternative would be designed to accommodate this parking demand.

Site Access

The BNSF Alternative would eliminate the seven existing private site access driveways along the west side of 120th Avenue NE. A new primary access driveway would be constructed at the northeast corner of the BNSF Alternative site about 820 feet south of the Northup Way intersection. A secondary access would be provided at the southeast corner of the site on 120th Avenue NE about 1,900 feet north of the NE 12th Street intersection.

LOS analyses were performed for the primary site access driveway that would serve the proposed project using the same HCM 2010 method described previously for the Lynnwood Alternative. All turning movements at the proposed access are projected to operate at LOS C or better during all peak hours. Therefore, the BNSF Alternative is not expected to result in any adverse traffic operational impacts at the site access driveway. Since the BNSF Alternative would effectively reduce the volume of PM peak hour traffic generated at the BNSF Alternative site, it would not degrade the mobility management area nor affect the congestion allowance.

3.1.5.5 BNSF Modified Alternative

Construction Impacts

Demolition activity would generate about 28 truck trips per day with four truck trips per hour. Up to 14,155 truckloads (28,310 truck trips) could be generated by removal and import of cut and fill material at the BNSF Modified Alternative site. The site grading activity is expected to take about 5 months. Assuming an average of about 20 working days per month and a typical 8-hour construction work day, the site grading activity could generate about 140 truckloads per day and an average of 18 truckloads per hour. With two truck trips for each truckload (one in and one out), the earthwork activity would generate about 280 truck trips per day with 36 truck trips per hour. Construction haul routes would be determined as part of the CTMP and would depend on the origin and destination of material; however, the routes are likely to include 120th Avenue NE, Northup Way, and SR 520 in Bellevue.

Operational Impacts

Traffic

Trip generation for the BNSF Modified Alternative is expected to be identical to the BNSF Alternative.

Parking

Parking demand for the BNSF Modified Alternative would be identical to the BNSF Alternative.

Site Access

The site access conditions and operations with the BNSF Modified Alternative would be identical to those described for the BNSF Alternative.

3.1.5.6 SR 520 Alternative

Construction Impacts

Demolition activity would generate about 30 truck trips per day with four truck trips per hour. Up to 13,790 truckloads (27,575 truck trips) could be generated by removal and import of cut and fill material at the SR 520 Alternative site. The excavation and embankment activity is expected to take about 5 months. Assuming an average of about 20 working days per month and a typical 8-hour construction work day, the excavation and embankment activity could generate about 140 truckloads per day and an average of 18 truckloads per hour. With two truck trips for each truckload (one in and one out), the earthwork activity would generate about 280 truck trips per day with 36 truck trips per hour. Construction haul routes would be determined as part of the CTMP and would depend on the origin and destination of material; however, the routes are likely to include NE 20th Street (Northup Way), 148th Avenue NE, and SR 520 in Bellevue.

Operational Impacts

Traffic

Trip generation for the SR 520 Alternative is expected to be identical to the BNSF Alternative and BNSF Modified Alternative.

Parking

Parking demand for the SR 520 Alternative would be identical to that described for the BNSF Alternative and BNSF Modified Alternative.

Site Access

The SR 520 Alternative would eliminate the nine existing private site access driveways along the north side NE 20th Street and the two on the east side of 130th Avenue NE. The SR 520 Alternative would include construction of a new primary access driveway on the north side of NE 20th Street about 780 feet west of the 136th Place NE intersection. The secondary access would be provided on the west side of the site on 130th Avenue NE about 180 feet north of the NE 20th Street (Northup Way) intersection.

LOS analyses were performed for the primary site access driveway that would serve the proposed project using the same methodology described previously for the other alternatives. All turning movements at the proposed access are projected to operate at LOS D or better during all peak hours. Since the SR 520 Alternative would effectively reduce the volume of PM peak hour traffic generated at the site, it would not degrade the mobility management area nor affect the congestion allowance. Therefore, the SR 520 Alternative is not expected to result in any adverse traffic operational impacts at the site access driveway.

3.1.6 Indirect and Cumulative Impacts

The proposed project has the potential to result in indirect impacts on transportation. The primary source of potential indirect impacts would likely be related to possible redevelopment of surplus land that would be acquired for the proposed project by Sound Transit but not required for the operation of the OMSF. As outlined in the indirect impacts discussion in Section 3.3, Land Use, all build alternatives, except the SR 520 Alternative, would result in surplus land not required for operation of the proposed project. These surplus lands could be made available for redevelopment consistent with corresponding zoning and/or conditions of the Conditional Use Permit required from the respective local municipality to develop the OMSF. Such future development of surplus property would result in new traffic generation and parking demands that would be evaluated in detail as part of the Washington State Environmental Policy Act (SEPA) review and permitting process at that time.

The transportation access analysis presented in the previous sections reflects conditions with assumed growth between existing conditions and the design year (2035). The traffic growth assumptions also reflect changes in traffic volumes that are projected in the traffic forecasts prepared for the *Lynnwood Link Extension Draft Environmental Impact Statement (Lynnwood Link Extension Draft EIS)* (Sound Transit 2013) and the *East Link Project Final Environmental Impact Statement (East Link Project Final EIS)* (Sound Transit 2011). As a result, the traffic analyses reflect the cumulative impacts of these Link extensions as well as other planned and foreseen development and associated increases in traffic within the study areas for each build alternative. In addition, future trips that would otherwise be generated by the existing uses at the OMSF build alternative sites were not subtracted from the future traffic forecasts; therefore, the analysis represents a worst-case condition in terms of cumulative effects on transportation.

It is possible that construction of the OMSF facility could occur simultaneously with construction of the Lynnwood Link Extension and/or East Link. Construction for the Lynnwood Link Extension is planned to occur from 2018 to 2023 and construction for East Link is planned from 2016 to 2022, both of which would overlap the planned construction period for the proposed OMSF between 2017 and 2020. Based on information from the *Lynnwood Link Extension DEIS* (Sound Transit 2013), potential construction staging areas and truck haul routes for Segments B and C could include the roadway adjacent to the Lynnwood Alternative site (52nd Avenue W) and could include staging areas on the site. Based on information from the *East Link Project Final EIS* (Sound Transit 2011: Appendix H), potential construction impacts within segment D (the segment in which the OMSF build alternatives are located) could include some short-term lane closures, transit route changes, and temporary sidewalk closures near one or more of the OMSF build alternative sites. The haul routes for earthwork and/or construction materials could also be the same as those that could be used for OMSF construction.

3.1.7 Potential Mitigation Measures

With the adherence to permitting requirements and implementation of the CTMP and design standards, impacts on transportation would be avoided. Therefore, no mitigation is required.

Frontage improvements are likely to be required as part of the permitting process. Both the City of Lynnwood and City of Bellevue typically collect transportation impact fees for new development; however, both cities' codes exempt buildings or structures constructed by a regional transit authority pursuant to Revised Code of Washington (RCW) 82.02.090 (Lynnwood Municipal Code [LMC] 3.105.080, Bellevue City Code [BCC] 22.16.070. The proposed facility would be exempt from transportation impact fees.

3.2 Acquisitions, Displacements, and Relocations

This section discusses land that would be acquired to construct the proposed project, existing land uses that would be displaced, and the potential for relocating those uses.

3.2.1 Introduction to Resources and Regulatory Requirements

Sound Transit would obtain the necessary land for the proposed project through either partial or full parcel acquisitions.

- **Partial Acquisition.** Sound Transit would acquire only part of a parcel and would not generally displace the existing use; in limited occurrences, some businesses on a partial acquisition parcel may be displaced.
- **Full Acquisition.** Sound Transit would acquire the entire parcel and displace the current use. Full acquisitions may include parcels that would not be fully needed for the proposed project, but would be affected to the extent that the existing use would be substantially impaired (e.g., the loss of parking or access).

The proposed project must comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (49 Code of Federal Regulations [CFR] 24, as amended). The act and its amendments provide guidance on how federal financial assistance for a project compensates for impacts on property owners or tenants who need to relocate due to being displaced by the proposed project. Sound Transit has also adopted the *Real Property Acquisition and Relocation Policy, Procedures, and Guidelines* to guide the agency's compliance with Chapter 8.26 Revised Code of Washington (RCW) and Chapter 468-100 Washington Administrative Code (WAC). All property acquisitions would be completed consistent with these policies to ensure that property owners are treated uniformly and equitably.

3.2.2 Methods

The study area for acquisitions, displacement, and relocations includes those parcels that would contain elements of the OMSF, or would be necessary for access to construct the OMSF, at the build alternative sites, as well as the land required to develop the lead tracks from the light rail guideway to each alternative site. In addition to the potential property acquisitions described in this section, the OMSF could require permanent easements, temporary construction easements, and the use of public rights-of-way. The area of these easements is not included in the data presented in this section.

The acquisitions analysis involved reviewing the proposed rights-of-way boundaries and parcel data from the King County and Snohomish County Assessors' Offices to identify parcels of property with the potential to be affected by the proposed project. This section summarizes likely property acquisitions based on current conceptual designs and their impacts. The list of acquisitions is representative and should not be considered the final determination regarding property acquisition;

the list could be updated as the project design is refined. Furthermore, the estimates described here reflect the existing conditions at the time the analysis was conducted. Because properties that are currently underdeveloped or vacant could be developed between completion of this Draft EIS and the time of construction, the number and/or type of displacements could vary between what is disclosed in the Draft EIS and what would be actually acquired.

3.2.3 Affected Environment

All build alternative sites are located within the jurisdictions of the Cities of Lynnwood and Bellevue. Figures 3.2-1 through 3.2-4 illustrate the affected environment of the build alternatives. Specific parcels and their existing uses are identified in Appendix F.2, *Land Acquisition Data*.

In April 2012, Sound Transit acquired a 1.1-mile segment of the Eastside Rail Corridor (formerly the BNSF railway corridor) in Bellevue from the Port of Seattle. At the same time, Sound Transit acquired high-capacity transportation easements over other portions of the corridor. With the Federal Transit Administration's (FTA's) approval, Sound Transit acquired the 10.5-acre former International Paper facility parcel in Bellevue as a protective acquisition. The purpose of a protective acquisition is to prevent the imminent development of a parcel that may be needed for a proposed transportation use. Protective acquisitions do not limit the evaluation of alternatives required by the National Environmental Policy Act (NEPA) process. Sound Transit-owned properties, including portions of the Eastside Rail Corridor, a former rail spur, and the former International Paper facility are shown on Figures 3.2-1b, 3.2-2, and 3.2-3.

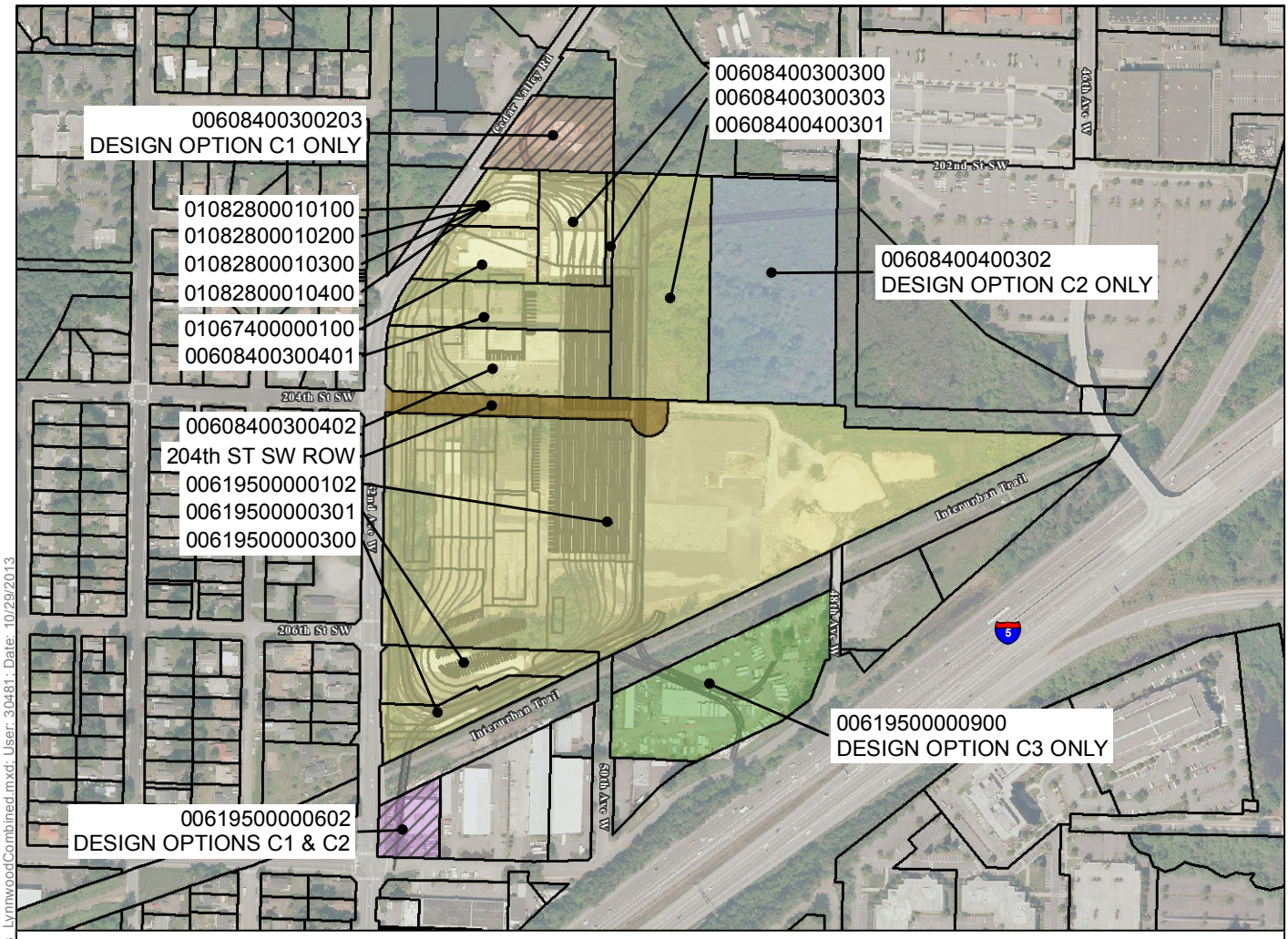
3.2.4 Environmental Impacts

Potential impacts on each parcel have been evaluated to determine if the parcel would need to be fully or partially acquired. Current land use, including the number of existing uses that would be displaced on affected parcels is presented in Table 3.2-1. Other impacts associated with acquisitions and displacements are discussed in Section 3.3, Land Use; Section 3.4, Economics; and Section 3.5, Social Impacts, Community Facilities, and Neighborhoods.

Table 3.2-1. Affected Parcels and Displacements by Generalized Land Use Classification

		Displacements by Land Use Type				
Alternative	**Affected Parcels**	**Commercial – Retail/Service**	**Commercial - Office**	**Industrial**	**Vacant**	**Total**
Lynnwood Alternative[a]						
Design Option C1	15	0	9	2	4	11
Design Option C2	15	0	9	2	5	11
Design Option C3	14	2	9	3	4	14
BNSF Alternative	6	3	5	6	0	14
BNSF Modified Alternative	14	5	13	7	2	25
SR 520 Alternative	13	58	43	0	0	101

[a] Includes one vacant Sound Transit-owned parcel in Bellevue to accommodate the BNSF Storage Tracks.



Parcel Number	608400300203*
Land Use	Partial - No Displacement
Parcel Size	1.36 AC

Parcel Number	1082800010100
Land Use	Commercial - Office
Parcel Size	0.77 AC

Parcel Number	1082800010200
Land Use	Commercial - Office
Parcel Size	0.77 AC

Parcel Number	1082800010300
Land Use	Commercial - Office
Parcel Size	0.77 AC

Parcel Number	1082800010400
Land Use	Commercial - Office
Parcel Size	0.77 AC

Parcel Number	1067400000100
Land Use	Commercial - Office & Vacant
Parcel Size	1.06 AC

Parcel Number	608400300401
Land Use	Commercial - Office
Parcel Size	1.79 AC

Parcel Number	608400300402
Land Use	Commercial - Office
Parcel Size	2.79 AC

Parcel Number	619500000102
Land Use	Vacant
Parcel Size	20.68 AC

Parcel Number	619500000301
Land Use	Industrial
Parcel Size	1.34 AC

Parcel Number	619500000300
Land Use	Industrial
Parcel Size	1.08 AC

Parcel Number	619500000602*
Land Use	Partial - No Displacement
Parcel Size	0.76 AC

Parcel Number	608400300300
Land Use	Industrial
Parcel Size	1.40 AC

Parcel Number	608400300303
Land Use	Vacant
Parcel Size	0.14 AC

Parcel Number	608400400301
Land Use	Vacant
Parcel Size	4.12 AC

Parcel Number	608400400302*
Land Use	Vacant
Parcel Size	4.12 AC

Parcel Number	619500000900*
Land Use	Commercial - Retail/Service & Industrial
Parcel Size	3.90 AC

*Parcel 608400300203 is part of Design Option C1 only.

*Parcel 608400400302 is part of Design Option C2 only.

*Parcel 619500000602 is part of Design Options C1 and C2.

*Parcel 619500000900 is part of Design Option C3 only

Affected Parcels

- All Lynnwood Design Options
- Design Option C1 Only
- Design Option C2 Only
- Design Options C1 & C2
- Design Option C3 Only
- 204th St. SW ROW
- Partially Affected Parcel

N

0 500 Feet

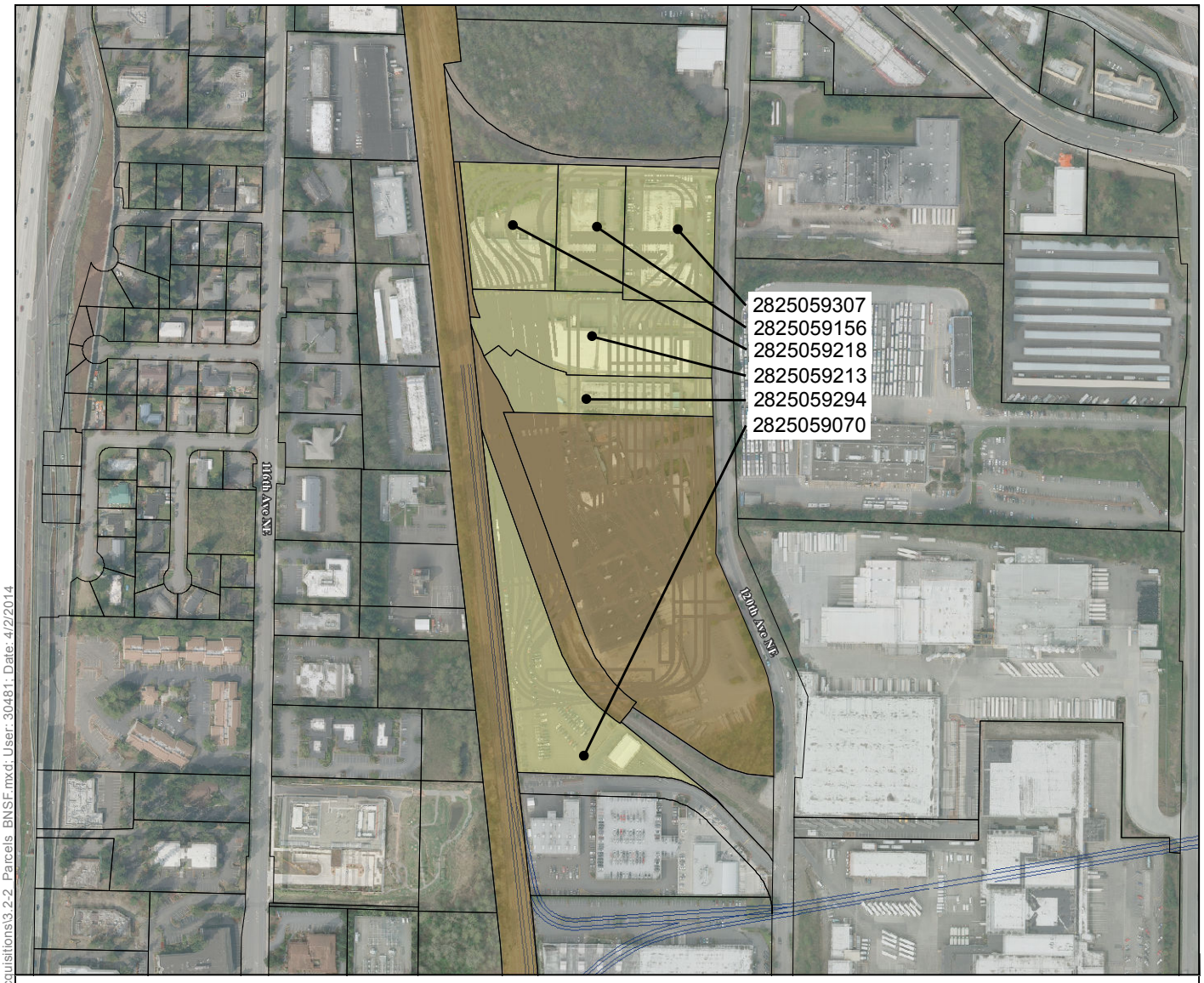
0 100 Meters

Sources: Parcels, Snohomish County, 2013; Site plans, Huitt Zollars, 2013

Path: K:\Projects_3\Huitt_Zollars\00329_12_ST_LightRail\mapdoc\EIS_Figures\CH3\3-2_Acquisitions\Parcels_LynnwoodCombined.mxd; User: 30481; Date: 10/29/2013

Figure 3.2-1a: Lynnwood Alternative—Affected Parcels
Sound Transit Link Light Rail OMSF Draft EIS

Figure 3.2-1b: Lynnwood Alternative, BNSF Storage Tracks*—Affected Parcels
Sound Transit Link Light Rail OMSF Draft EIS
*The BNSF Storage Tracks are Located in Bellevue
* No Affected Parcels



Parcel Number	2825059307
Land Use	Commercial - Office
Parcel Size	2.20 AC

Parcel Number	2825059213
Land Use	Commercial - Office & Industrial
Parcel Size	3.22 AC

Parcel Number	2825059156
Land Use	Commercial - Retail/Service, & Industrial
Parcel Size	1.55 AC

Parcel Number	2825059294
Land Use	Industrial
Parcel Size	1.67 AC

Parcel Number	2825059218
Land Use	Commercial - Retail/Service, Commercial - Office, & Industrial
Parcel Size	2.10 AC

Parcel Number	2825059070
Land Use	Commercial- Retail/Service
Parcel Size	3.42 AC

Affected Parcel
Sound Transit Owned
Parcel
Site Plan
East Link Light Rail

N

0 0.25 Miles

0 0.25 Kilometers

Source: Aerial Imagery and Parcels, City of Bellevue, 2013; Site plans, Huitt Zollars, 2013

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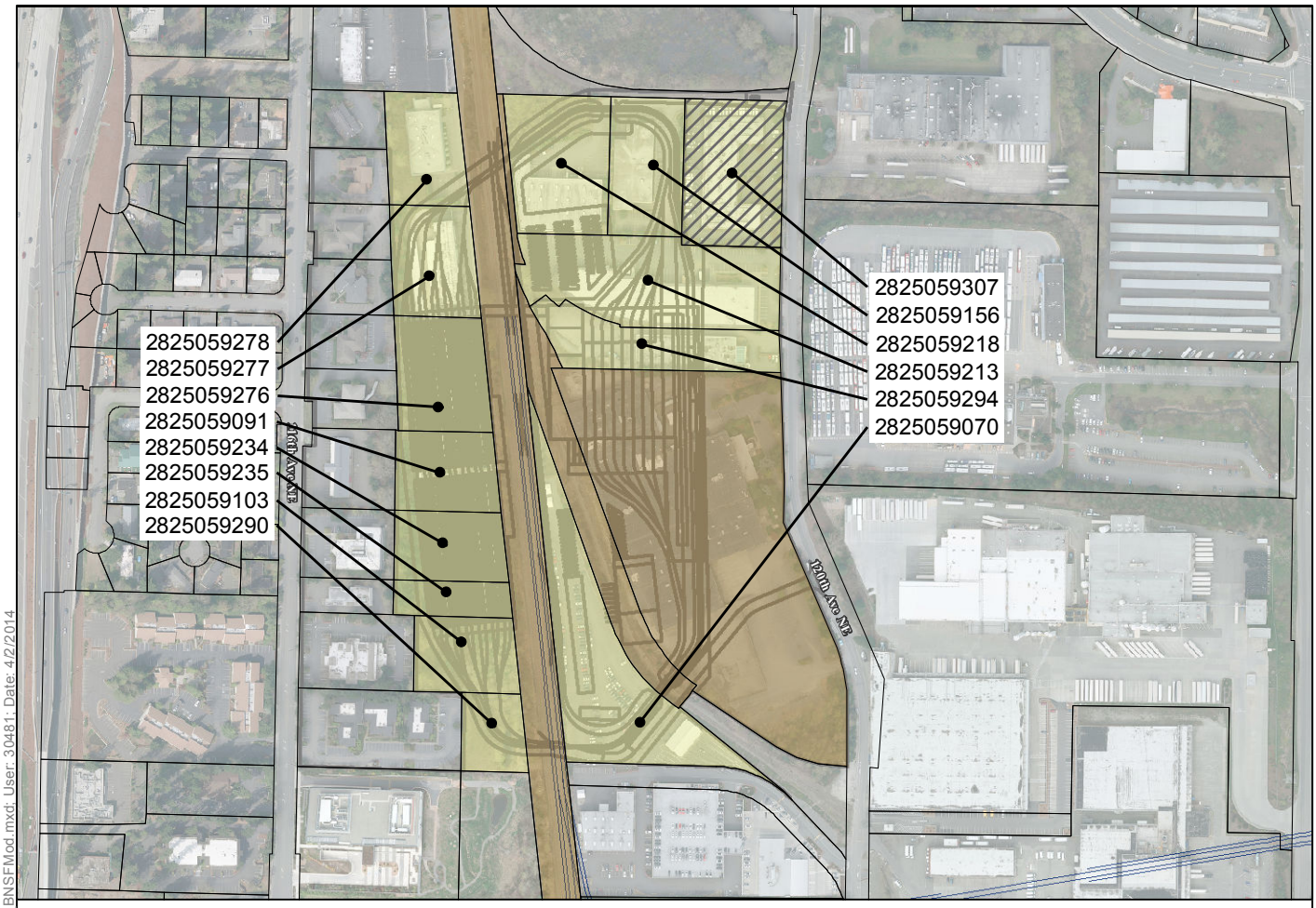
Figure 3.2-2: BNSF Alternative—Affected Parcels
Sound Transit Link Light Rail OMSF Draft EIS



Parcel Number	2825059278
Land Use	Commerical- Retail/Service
Parcel Size	1.32 AC

Parcel Number	2825059277
Land Use	Commerical- Retail/Service
Parcel Size	1.40 AC

Parcel Number	2825059276
Land Use	Commercial - Office & Industrial
Parcel Size	1.58 AC

Parcel Number	2825059091
Land Use	Industrial
Parcel Size	1.22 AC

Parcel Number	2825059234
Land Use	Industrial
Parcel Size	1.17 AC

Parcel Number	2825059235
Land Use	Industrial
Parcel Size	0.62 AC

Parcel Number	2825059103
Land Use	Vacant
Parcel Size	1.17 AC

Parcel Number	2825059290
Land Use	Vacant
Parcel Size	0.76 AC

Parcel Number	2825059307
Land Use	Partial - No Displacement
Parcel Size	2.20 AC

Parcel Number	2825059156
Land Use	Commercial - Retail/Service, & Industrial
Parcel Size	1.55 AC

Parcel Number	2825059218
Land Use	Commercial - Retail/Service, Commercial - Office & Industrial
Parcel Size	2.10 AC

Parcel Number	2825059213
Land Use	Commercial - Office & Industrial
Parcel Size	3.22 AC

Parcel Number	2825059294
Land Use	Industrial
Parcel Size	1.67 AC

Parcel Number	2825059070
Land Use	Commercial- Retail/Service
Parcel Size	3.42 AC

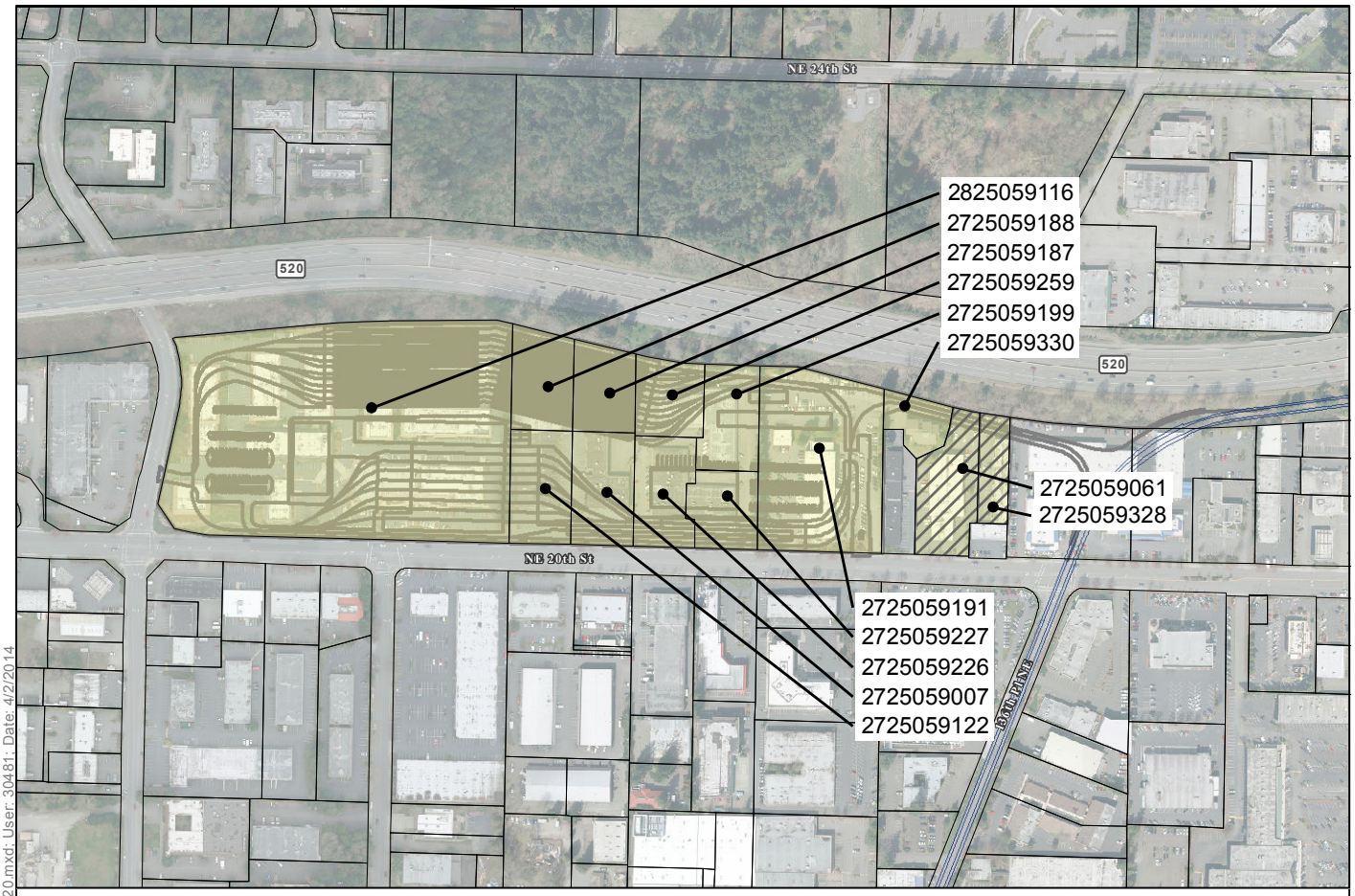
Affected Parcel
Sound Transit Owned
Partially Affected Parcel
Parcel
Site Plan
East Link Light Rail

N
0 0.25 Miles
0 0.25 Kilometers

Source: Aerial Imagery and Parcels, City of Bellevue, 2013; Site plans, Huitt Zollars, 2013

Path: K:\Projects_3\Huitt_Zollars\00329_12_ST_LightRail\mapdoc\EIS_Figures\CH3\3-2_Acquisitions\3.2-3_Parcels_BNSFMod.mxd; User: 30481; Date: 4/2/2014

Figure 3.2-3: BNSF Modified Alternative—Affected Parcels
Sound Transit Link Light Rail OMSF Draft EIS



Parcel Number	2825059116
Land Use	Commercial - Retail/Service & Commercial - Office
Parcel Size	11.60 AC

Parcel Number	2725059188
Land Use	Commercial - Retail/Service & Commercial - Office
Parcel Size	0.99 AC

Parcel Number	2725059187
Land Use	Commercial - Retail/Service & Commercial - Office
Parcel Size	0.85 AC

Parcel Number	2725059259
Land Use	Commercial - Retail/Service & Commercial - Office
Parcel Size	0.84 AC

Parcel Number	2725059199
Land Use	Commercial - Retail/Service & Commercial - Office
Parcel Size	0.99 AC

Parcel Number	2725059330
Land Use	Commercial - Office
Parcel Size	0.50 AC

Parcel Number	2725059191
Land Use	Commercial- Retail/Service
Parcel Size	3.54 AC

Parcel Number	2725059227
Land Use	Commercial - Retail/Service & Commercial - Office
Parcel Size	0.85 AC

Parcel Number	2725059226
Land Use	Commercial - Retail/Service & Commercial - Office
Parcel Size	1.04 AC

Parcel Number	2725059007
Land Use	Commercial - Retail/Service & Commercial - Office
Parcel Size	1.14 AC

Parcel Number	2725059122
Land Use	Commercial - Retail/Service & Commercial - Office
Parcel Size	1.14 AC

Parcel Number	2725059061
Land Use	Partial - No Displacements
Parcel Size	1.20 AC

Parcel Number	2725059328
Land Use	Partial - No Displacements
Parcel Size	0.53 AC

Affected Parcel
Partially Affected Parcel
Parcel
Site Plan
East Link Light Rail

N
0 0.25 Miles
0 0.25 Kilometers

Source: Aerial Imagery and Parcels, City of Bellevue, 2013; Site plans, Huitt Zollars, 2013

Path: K:\Projects_3\Huitt_Zollars\00329_12_ST_LightRail\mapdoc\EIS_Figures\CH3\3-2_Acquisitions\3.2-4_Parcels_SR-520.mxd; User: 30481; Date: 4/2/2014

Figure 3.2-4: SR 520 Alternative—Affected Parcels
Sound Transit Link Light Rail OMSF Draft EIS

3.2.4.1 No Build Alternative

Under the No Build Alternative, Sound Transit would not acquire any parcels that would result in displacing existing land uses.

3.2.4.2 Impacts Common to All Build Alternatives

All build alternatives would require the acquisition of properties that are either vacant or developed.

Construction Impacts

All of the acquisitions and displacements summarized in Table 3.2-1 would be required during construction of the proposed project. No additional parcels would be acquired for construction staging areas. No additional displacements or relocations are anticipated to occur associated with easements required to facilitate construction activities under any of the build alternatives.

Operational Impacts

The acquisitions and displacements summarized in Table 3.2-1 would be permanent to accommodate the proposed project; no residential uses would be displaced. The Lynnwood Alternative, BNSF Alternative, and BNSF Modified Alternative would displace a similar number of existing uses (between 11 and 25). All alternatives, except for the SR 520 Alternative, would have surplus property that could be sold and redeveloped after construction of the proposed project; this is discussed in greater detail in Section 3.3, Land Use. Additional impacts associated with all build alternatives are described in the following sections.

Adequate, decent, safe, and sanitary replacement facilities would be available at market rates in the area around each build alternative site. Relocation assistance would be available to all relocated persons without discrimination following the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, 49 CFR Part 24, as amended, and Sound Transit's *Real Property Acquisition and Relocation Policy, Procedures, and Guidelines* (Sound Transit 2013).

3.2.4.3 Lynnwood Alternative

Construction Impacts

The Lynnwood Alternative may require a temporary construction easement over and adjacent to the Interurban Trail to accommodate construction of the elevated lead track guideway to the OMSF.

Operational Impacts

The Lynnwood Alternative would require acquisition of up to 15 parcels, and a permanent aerial easement would be necessary to accommodate the elevated guideway. These acquisitions would displace industrial and commercial land uses. Use or acquisition of the property owned by the Edmonds School District would affect the district's ability to develop the district support center as planned. The property is currently vacant, but the Edmonds School District has received building permits for the facility. The BNSF Storage Tracks site is currently vacant.

There is currently adequate vacant office space in Lynnwood to accommodate the office uses that would be displaced. The vacancy rate for office uses in Lynnwood was 17.8% in the second quarter of 2012 (Kidder Mathews 2013). It may be difficult to relocate the displaced industrial uses in the vicinity of the site, but there are approximately 104 acres of industrial lands and an estimated 904,145 square feet of industrial building space in the City of Lynnwood. The vacancy rate in Snohomish County for industrial properties was reported as being approximately 12.4% in the third quarter of 2013 (CBRE, Inc. 2013a).

3.2.4.4 BNSF Alternative and BNSF Modified Alternative

Construction Impacts

No construction impacts other than those identified as common to all build alternatives have been identified.

Operational Impacts

The BNSF Alternative would require acquisition of 6 parcels, which would displace 14 industrial and commercial uses. The BNSF Modified Alternative would require acquisition of 14 parcels, which would displace 25 industrial and commercial uses, including the City of Bellevue's Public Safety Training Center, located on three parcels on the west side of the Eastside Rail Corridor.

There is currently adequate vacant office space in Bellevue to accommodate office uses that would be displaced by the BNSF Alternative and BNSF Modified Alternative. The BNSF Alternative and BNSF Modified Alternative sites are located within the SR 520 submarket. In the third quarter of 2013 the SR 520 submarket had a vacancy rate of about 11.2% for office space (CBRE, Inc. 2013b).

It would be difficult to relocate industrial land uses close to the BNSF Alternative and BNSF Modified Alternative sites. While the sites are currently characterized by industrial and commercial uses, the area is zoned for higher density, mixed-use office, retail, and residential development. The Public Safety Training Center would also require identifying a suitable alternative site, which may be difficult due to the unique operations carried out on the property by the Bellevue Fire Department. The vacancy rate for industrial properties in King County was approximately 11.6% in the third quarter of 2013 (CBRE, Inc. 2013a).

Other relocation opportunities exist outside the Bel-Red Subarea. There are approximately 1.8 million square feet of commercial building space over 246 acres and approximately 1.3 million square feet of industrial building space over 175 acres in Bellevue.

3.2.4.5 SR 520 Alternative

Construction Impacts

Construction of this alternative may require a temporary construction and permanent easement within the Washington State Department of Transportation (WSDOT)-owned SR 520 right-of-way to accommodate construction access for OMSF features along the northern side of the facility such as retaining walls and fencing.

Operational Impacts

The SR 520 Alternative would result in the highest number of displacements out of all four build alternatives. Thirteen parcels would be acquired, which would displace approximately 101 commercial land uses. Two of the 13 parcels that would be acquired would be partial acquisitions required for the development of a lead track to the OMSF. The lead track would be located behind the buildings and businesses on these two parcels and would not displace businesses. Some of the displaced uses, while occupying space traditionally used for commercial services, include spaces occupied by congregations for religious practices. However, these spaces house administration offices or weekend youth activities and are not primary places of worship. A permanent easement within the WSDOT-owned State Route (SR) 520 right-of-way may also be required to accommodate subsurface site features such as tiebacks associated with retaining walls. Any easements accommodating subsurface tiebacks would remain through the operation of the proposed project.

The SR 520 Alternative site is located within the SR 520 submarket. There is adequate vacant office space in the SR 520 submarket to accommodate office uses that would be displaced. The vacancy rate for office uses in the SR 520 submarket were approximately 11.2% in the third quarter of 2013 (CBRE, Inc. 2013b). Vacancy rates for retail uses in the SR 520 submarket were approximately 1.6% in the first quarter of 2013 (Kidder Mathews 2013). The Bellevue primary retail market area, consisting of the Bellevue central business district, SR 520 corridor, and suburban Bellevue, had a retail vacancy rate of about 2% in the first quarter of 2013 representing approximately 200,000 square feet of space (Kidder Mathews 2013). Low retail vacancy rates in the SR 520 submarket and Bellevue primary retail market may make it difficult to relocate displaced retail uses in these areas. Retail space users often have specific relocation requirements that must be met to ensure success. Sound Transit would perform a case-by-case assessment to understand how the available inventory could meet the displaced retailer's needs.

3.2.5 Indirect and Cumulative Impacts

The proposed project's impacts resulting from acquisitions, displacements, and relocations would be direct. There could be indirect impacts associated with the change in land use at the build alternative sites to a transportation-related land use; these indirect impacts are discussed in Chapter 3.3, Land Use.

Cumulative impacts would result from acquisition of properties and displacement of existing businesses associated with the Lynnwood Link Extension and East Link projects, along with the development of an OMSF. The greatest potential for cumulative impacts related to acquisition of properties at the Lynnwood Alternative site for the proposed OMSF project would be from the Lynnwood Link Extension. Lynnwood Link Extension Alternative C1 would affect the most properties. Specifically, it would affect the Cedar Creek Condominiums, requiring up to 76 residential relocations. Lynnwood Link Extension Alternative C1 would also fully acquire two properties that both contain an office park; these acquisitions would displace 31 businesses. Lynnwood Link Extension Alternatives C2 and C3 would affect mostly commercial and industrial properties, although only three businesses would be displaced by Lynnwood Link Extension Alternative C2 and one for Alternative C3. There would be no public, institutional, or vacant land displacements in

Segment C. During construction of the Lynnwood Link Extension, properties would be affected by staging area acquisitions and temporary construction easements. In Segment C, staging areas would be in the center median of I-5, on the west side of I-5, and near or within the Lynnwood Transit Center.

In the vicinity of the BNSF Storage Tracks component of the Lynnwood Alternative, BNSF Alternative, BNSF modified Alternative and SR 520 Alternative, acquisitions required for East Link would result in displacements. Eight properties would be fully acquired displacing 34 businesses, most of which are industrial and commercial businesses along NE 15th Street, 130th Avenue NE, and 136th Place NE. The 120th Station would displace one business, and 14 businesses would be displaced by the Overlake Village Station. Temporary construction easements would also be needed along the project corridor on each side of the route.

The City of Bellevue is currently designing improvements to 120th Avenue NE from NE 12th Street to NE 16th Street (and eventually from NE 16th Street to Northup Way), along the eastern-most boundary of the BNSF Alternative and BNSF Modified Alternative sites. Based on preliminary information, this planned project could require approximately 20 feet on the east and west side of 120th Avenue NE, potentially resulting in acquisition of properties. Final design of the 120th Avenue NE improvements is anticipated to be completed by the end of 2015 at which time the acquisitions and displacement as a result of the project would be finalized.

Other development projects such as the Spring District project in the project vicinity of the build alternative sites would acquire properties and displace existing uses. Changes in property ownership due to other developments would be more likely to occur over time as market-driven transactions occur.

3.2.6 Potential Mitigation Measures

As part of the proposed project, Sound Transit would compensate affected property owners according to the provisions specified in Sound Transit's adopted *Real Estate Property Acquisition and Relocation Policy, Procedures, and Guidelines* (Resolution #R98-20-1). Sound Transit would comply with provisions of the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (49 CFR Part 24, as amended), and the State of Washington's relocation and property acquisition regulations (WAC 468-100 and RCW 8.26). Benefits would vary depending on the level of impact, available relocation options, and other factors.

3.3 Land Use

This section discusses existing land uses and current zoning, describes potential changes in land use that could occur as a result of the proposed project, and evaluates the consistency of the proposed project with local and regional planning policies.

3.3.1 Introduction to Resources and Regulatory Requirements

Development of the proposed project could result in direct changes to land use on the build alternative sites, and could indirectly influence changes in land use and land use patterns in the surrounding area. The documents and policies governing land use are listed below.

- State and Regional
  - Washington State Growth Management Act (GMA) 1990, as amended
  - Puget Sound Regional Council (PSRC) *VISION 2040*, 2008
- City of Lynnwood
  - *City of Lynnwood 2020 Comprehensive Plan*, adopted April 10, 1995, amended through July 11, 2011
  - City of Lynnwood Generalized Zoning Map*,* August 24, 2012
  - City of Lynnwood Detailed Zoning Maps, 2012
  - City of Lynnwood Municipal Code, 2013
  - *City Center Sub-Area Plan*, September 2007
- City of Bellevue
  - City of Bellevue, *Bel-Red Subarea Plan*, February 17, 2009
  - *City of Bellevue Comprehensive Plan*, November 2004 updates and subsequent amendments through December 2012
  - *City of Bellevue Comprehensive Plan Future Land Use Map*, August 2008
  - City of Bellevue Detailed Zoning Maps, 2012
  - City of Bellevue Generalized Zoning Map, July 2012
  - City of Bellevue Municipal Code, 2012
  - City of Bellevue, *130th Station Area Plan Report*, March 2012
  - City of Bellevue, *Pedestrian & Bicycle Transportation Plan Report*, 2009

3.3.2 Methods

The land use study area consists of land within a 0.5-mile radius of the build alternative sites.

To assess the environmental impacts related to land use, data were collected from local municipalities, including local and regional land use plans, relevant planning documents, and electronic information from geographic information system (GIS) databases populated from local and regional government sources. Site visits and aerial photographs were used to assess land use compatibility and to identify sensitive land uses such as single-family residences and schools. The quantitative analysis used GIS tools to determine direct impacts related to the conversion of land uses to a transportation-related use and the required property acquisitions for the proposed project. Local plans and zoning were reviewed to determine consistency with plans and policies.

3.3.3 Affected Environment

The build alternative sites for the proposed project are located in King and Snohomish Counties, in the Cities of Lynnwood and Bellevue. They are located along the future Lynnwood Link and East Link light rail guideways. Existing land uses on and in the immediate vicinity of the build alternative sites are urban in nature, composed of a mix of industrial, institutional, commercial, and residential uses, along with some vacant tracts. Parklands, multiuse trails, and a planned multiuse trail are located adjacent to some of the build alternative sites; these are discussed generally here and in detail in Section 3.18, Parklands and Open Space.

Development in the Puget Sound region is strongly influenced by the GMA, adopted by the state legislature in 1990 (Revised Code of Washington [RCW] 36.70 AW). The GMA requires state and local governments to manage Washington's growth by identifying and protecting critical areas and natural resource land, designating urban growth areas, and preparing and implementing comprehensive plans through capital investments and development regulations. The proposed project is within the urban growth boundaries of the Cities of Lynnwood and Bellevue.

The GMA requires that zoning be consistent with comprehensive plans; it also prohibits local governments from precluding the siting of essential public facilities either through comprehensive plans or zoning. The proposed project would be a "regional transit authority facility" and is, therefore, explicitly recognized as an essential public facility by the GMA (RCW 36.70A.200). Once Sound Transit selects the alternative to be built, the local jurisdictions would have a "duty to accommodate" the proposed project in their respective land use plans and development regulations.

Generally, patterns of existing land uses in the study area are typical of urban environments influenced by proximity to high-capacity highways. All build alternative sites are located within 0.5 mile of a future light rail station. In anticipation of the Lynnwood Link Extension and East Link project, both cities have adopted land use regulations and undertaken subarea planning efforts to facilitate higher-density, transit-oriented development adjacent to their future light rail stations.

The following subsections describe existing and future land uses for each build alternative site and land uses within 0.5 mile of the sites, based on the comprehensive plan and zoning maps of corresponding jurisdictions (Figures 3.3-1 through 3.3-4). All land uses have been aggregated into dominant land use categories to present land use consistently across jurisdictions: single-family, multifamily, commercial, office, mixed use, industrial, public/institutional, and parkland.

A discussion on each of the build alternatives sites follows, describing the affected environment, existing land uses at the site and within 0.5 mile, and relevant land use plans and zoning designations.

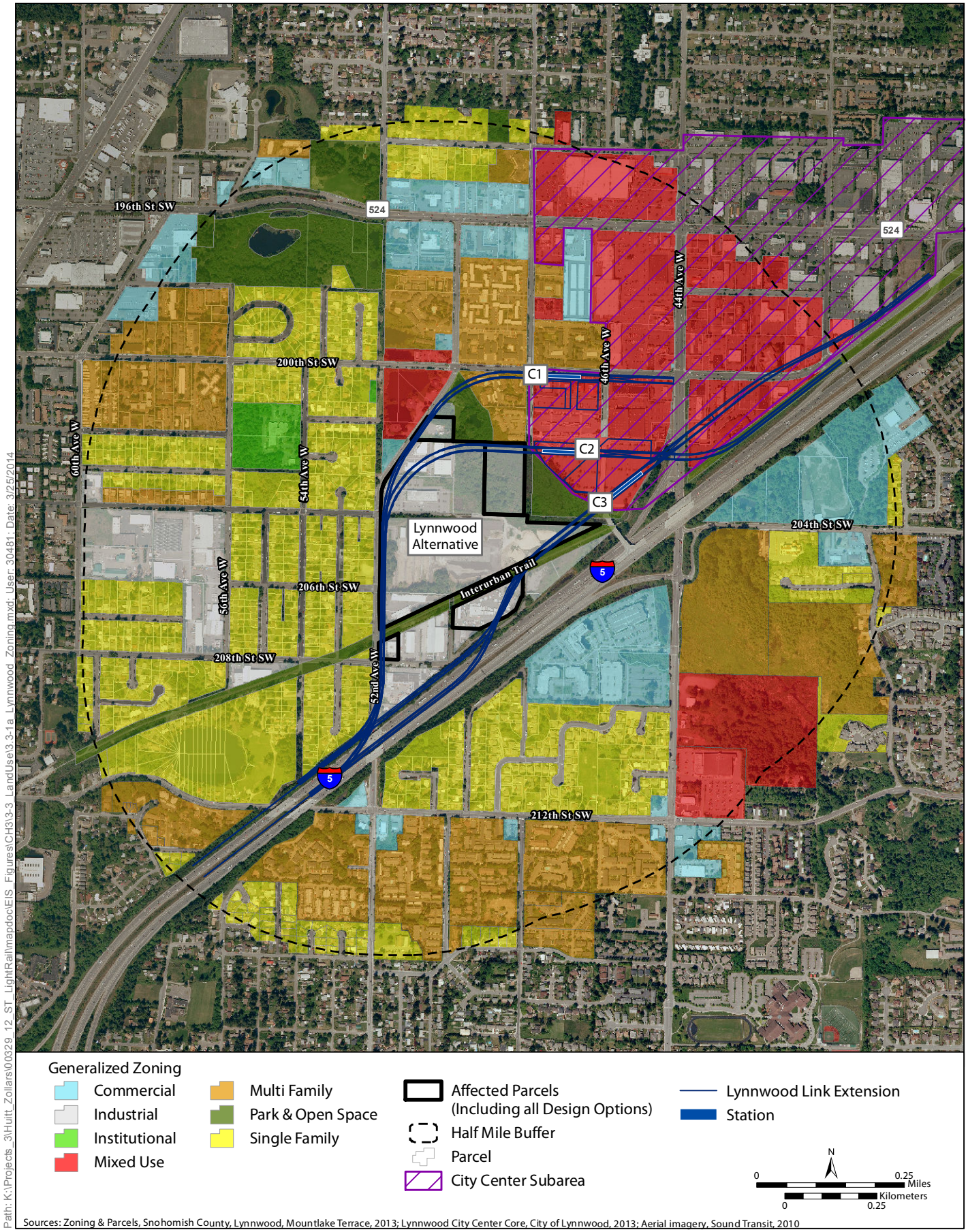
The Lynnwood Alternative site is located west of the City Center Subarea in Lynnwood. The BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative sites, along with the BNSF Storage Tracks (part of Lynnwood Alternative) off the East Link guideway are located within the Bel-Red Subarea in Bellevue. Provided below is a summary of pertinent subarea plans.

3.3.3.1 City of Lynnwood: City Center Subarea Plan

The City Center Subarea, as documented in the *City of Lynnwood 2020 Comprehensive Plan*, is located northeast of the Lynnwood Alternative site, bounded by 194th Street SW on the north, 33rd Avenue W on the east, Interstate 5 (I-5) on the south, and 48th Avenue W on the west close to the Lynnwood Link Extension guideway alternatives. The City Center Subarea is intended to serve as one of the region's urban growth centers. The Lynnwood Alternative site is located outside of but adjacent to the boundaries of the subarea.

The goal of the *City of Lynnwood City Center Sub-Area Plan* is to create a regulatory framework to change land use patterns and restructure the City's growth in a more concentrated, mixed-use, and pedestrian and transit-supported area (City of Lynnwood 2007). The City is to be served by multimodal transit opportunities that include the Lynnwood Transit Center, the Lynnwood (light rail) Station, future bus rapid transit on 196th Street SW, and the Interurban Trail. The City Center Subarea is located east of the future Lynnwood Link Station. The Lynnwood Transit Center/Park and Ride, while in the *City of Lynnwood City Center Sub-Area Plan*, is envisioned to continue to function as a transit center.

The City Center Subarea encompasses a large area with the plan designating districts, each intended to have its own emphasis and character. The West End district is the closest to the Lynnwood Alternative site. The West End district is west of 44th Avenue W, stretching from the current City Center campus on the north, to the Park and Ride facility on the south. Within this district the City has created a regulatory framework to facilitate development of a mixed-use urban neighborhood containing multistory housing, including condominiums, apartments, and townhouses, along with offices, retail shops, and services.



Sources: Zoning & Parcels, Snohomish County, Lynnwood, Mountlake Terrace, 2013; Lynnwood City Center Core, City of Lynnwood, 2013; Aerial imagery, Sound Transit, 2010

Path: K:\Projects_3\Huitt_Zollars\00329_12_ST_LightRail\mapdoc\EIS_Figures\CH3\3-3_LandUse\3.3-1a_Lynnwood_Zoning.mxd; User: 30481; Date: 3/25/2014

Figure 3.3-1a: Lynnwood Alternative—Zoning
Sound Transit Link Light Rail OMSF Draft EIS

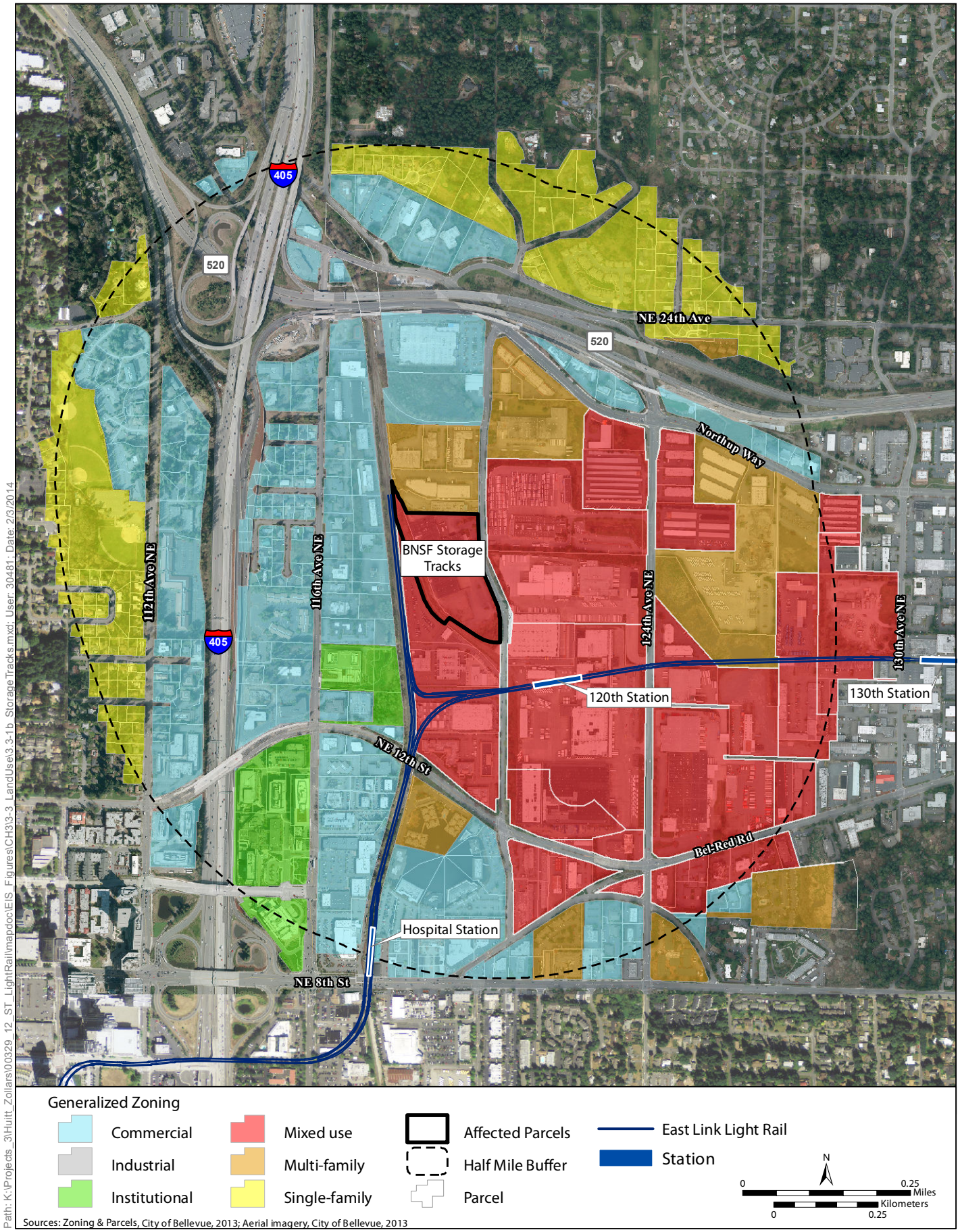


Figure 3.3-1b: Lynnwood Alternative, BNSF Storage Tracks*—Zoning
Sound Transit Link Light Rail OMSF Draft EIS
*The BNSF Storage Tracks are located in Bellevue

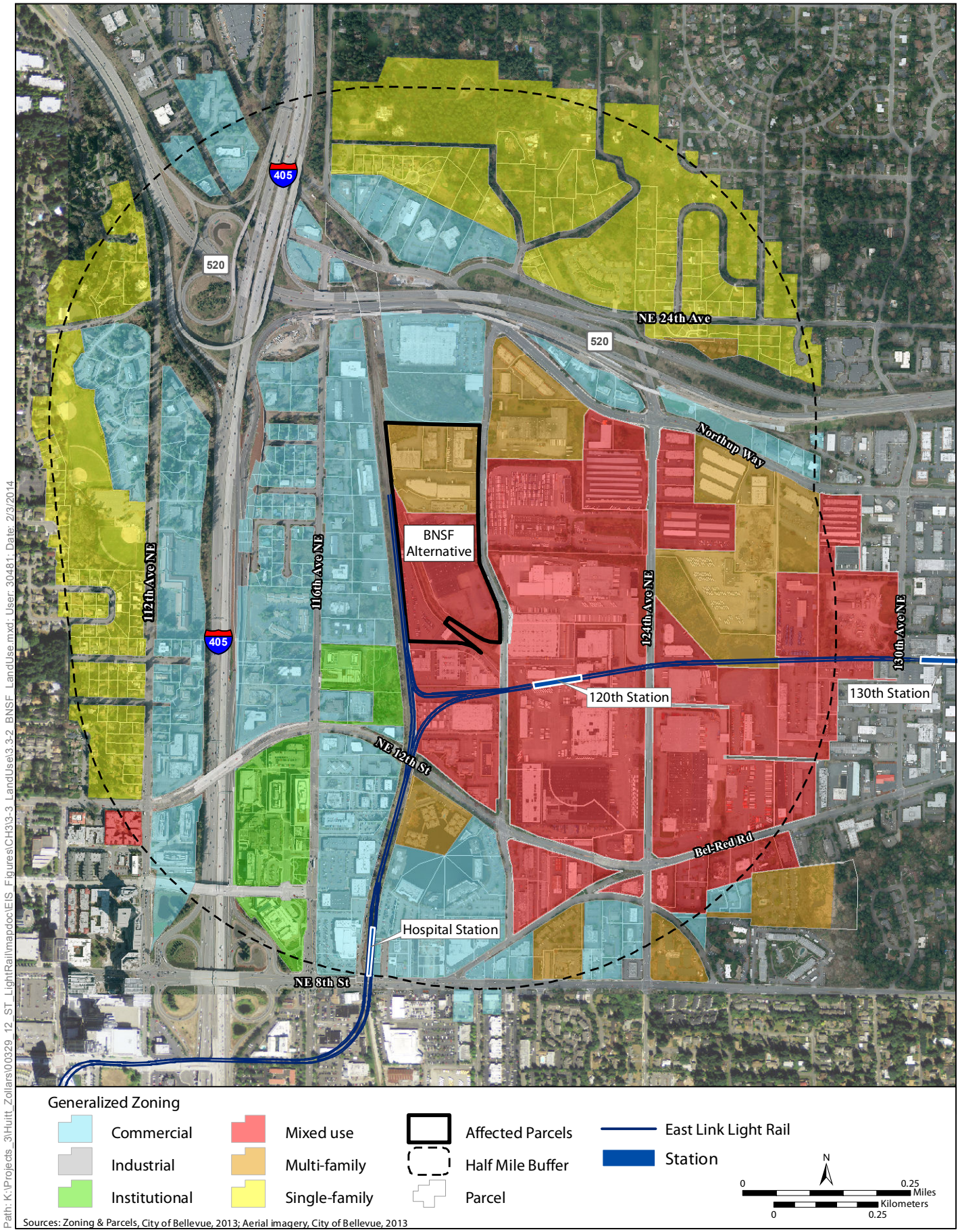


Figure 3.3-2: BNSF Alternative—Zoning
Sound Transit Link Light Rail OMSF Draft EIS

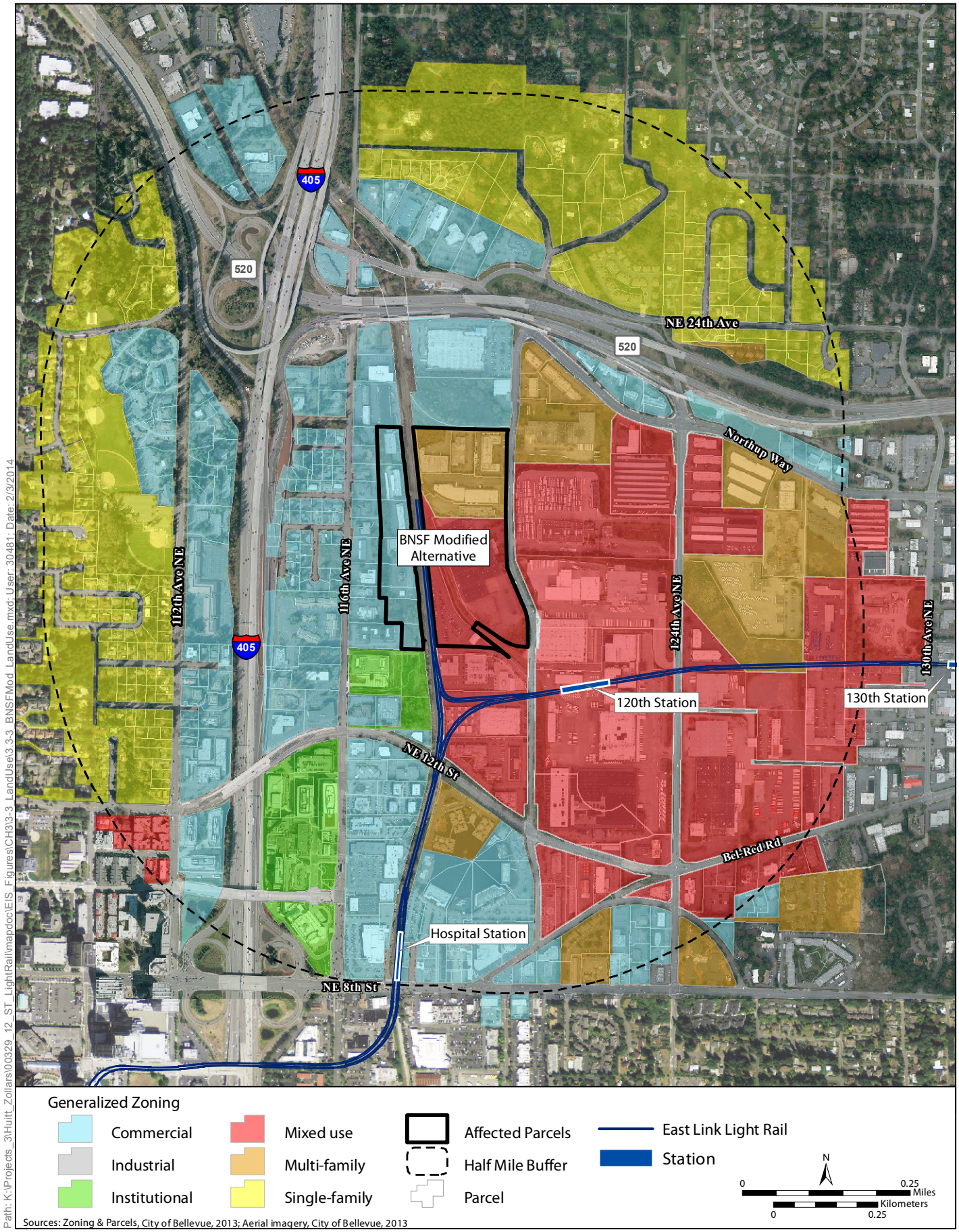


Figure 3.3-3: BNSF Modified Alternative—Zoning
Sound Transit Link Light Rail OMSF Draft EIS

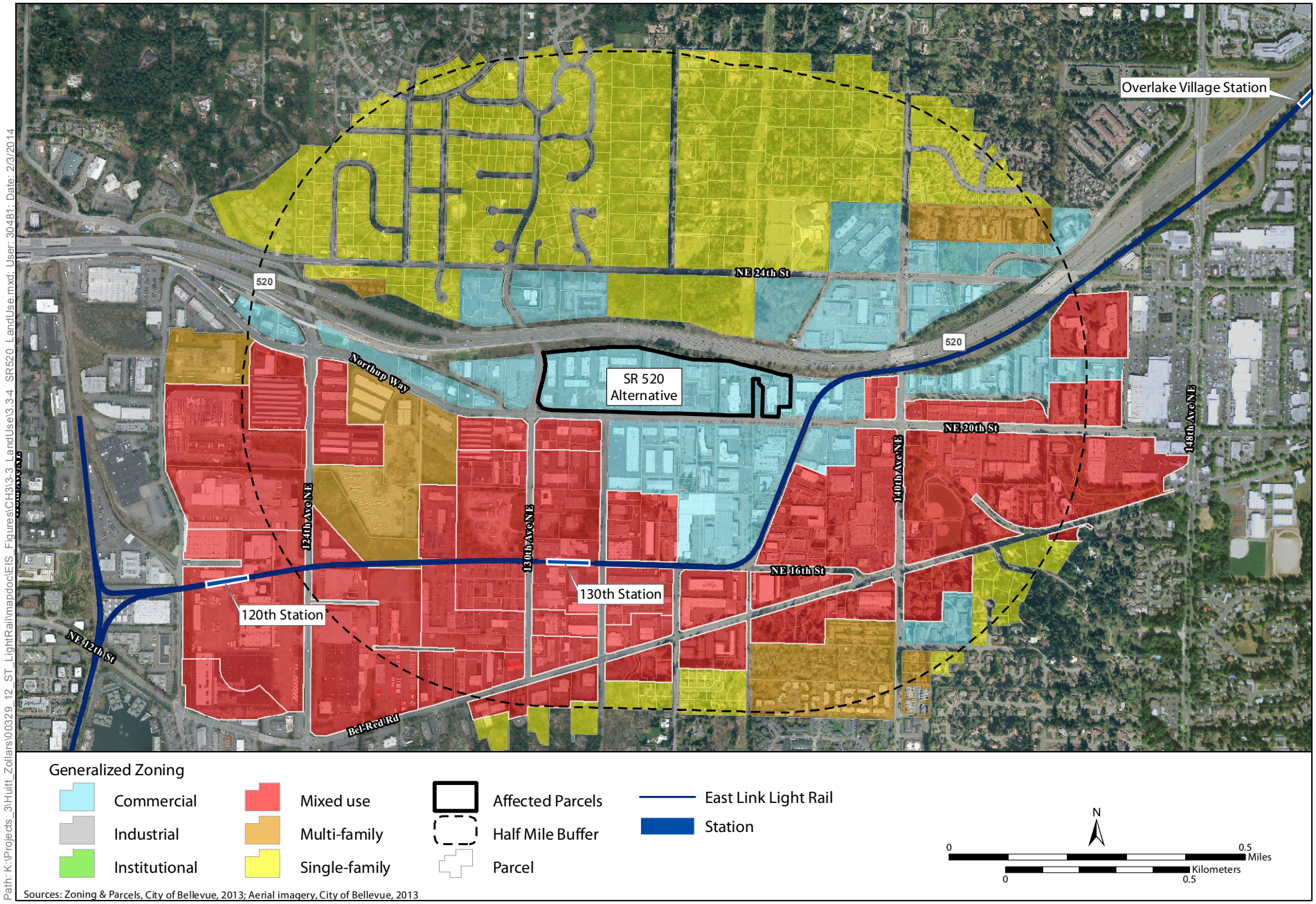


Figure 3.3-4: SR 520 Alternative—Zoning
Sound Transit Link Light Rail OMSF Draft EIS

Over time, it is the City's expectation that land uses oriented to servicing and repairing automobiles will be greatly diminished in this area. The West End district plans for public spaces, at least one of which could be a public square. The square would be linked to the City Center Core on the east and Scriber Lake on the west by a promenade or pedestrian corridor. There will also be connections to the Interurban Trail. Circulation within this area is to be enhanced through the addition of new streets, some of which are to be created as a part of private redevelopment.

3.3.3.2 City of Bellevue: Bel-Red Subarea Plan

The Bellevue City Council adopted a new set of zoning and development regulations for the Bel-Red Subarea on February 17, 2009. The Bel-Red Subarea is 900 acres that stretch between State Route (SR) 520 and Bel-Red Road, extending from Interstate 405 (I-405) to 148th Avenue NE. The Bel-Red Subarea is a major employment area for Bellevue, but some large employers have moved out or reduced operations, in part due to changing market conditions. Historically home to many of Bellevue's light industrial and service businesses, the subarea has been planned for transition to a major mixed-use employment and residential area, partly because of Sound Transit's plans to build a new light rail line through the area. Two of the future East Link Stations will be located in the Bel-Red Subarea.

The *Bel-Red Subarea Plan* contains regulations of the built and natural environment intended to establish the City of Bellevue's vision for new mixed use neighborhoods supported by light rail, new streets, parks and open space. The Bel-Red Subarea is intended to be a major mixed-use employment and residential area of the City of Bellevue characterized by a transit-oriented, nodal development pattern. The City's intent is that over time, the area's existing low-intensity light industrial and commercial land uses will transition to higher density, mixed-use commercial and residential transit-oriented development. It is the City's intent to encourage land uses in the Bel-Red Subarea that promote employment, retail and residential opportunities. New development in Bel-Red Subarea is expected to have a transit-supported and pedestrian-friendly form. The entire subarea is planned to be distinguished by environmental and community amenities that serve residents and employees in the area, as well as nearby neighborhoods and the entire city. New development is expected to make contributions to these amenities, and to the infrastructure needed to support redevelopment. Land Uses in the Bel-Red Subarea are governed by a specific section of the City of Bellevue's Land Use Code.

A major theme of the *Bel-Red Subarea Plan* is the "nodal" development pattern, which concentrates future development in the vicinity of potential future light rail stations. Nodes are envisioned to be areas of sufficient development intensity, amenities, recreational opportunities, and a mix of uses that support a high level of pedestrian activity. The decision to focus new employment-generating and higher density residential uses in the nodes is intended to link development areas to locations where planned transportation facilities will support development, and to protect residential neighborhoods located to the north, south, and east of the corridor from cut-through traffic. Land uses within nodes can reach higher development intensity levels and heights than in the surrounding parts of the subarea. Buildings that are

larger and higher than what the base zoning would allow, both inside and outside of nodes, can only be achieved through participation in an incentive system that will provide a range of public amenities.

The BNSF Storage Tracks, BNSF Alternative site, and BNSF Modified Alternative site are located partly within the Bel-Red Office/Residential Node 2 (BR-OR-2). The purpose of BR-OR-2 zoning designation is to provide a mix of office, housing and retail uses, with office as the predominant use. The area zoned BR-OR-2 is located within a higher land use intensity development node but outside of the node's core; building heights provide for the transition between the node's core and areas outside the node. Bel-Red-OR-2 is located immediately north of the Bel-Red Office/Residential Node 1 (BR-OR-1) where the future East Link 120th Avenue NE light rail station is planned. While the allowed building heights are greater in BR-OR-1 (150 feet) than in BR-OR-2 (125 feet), the maximum density and allowed transit-oriented development uses are the same for BR-OR-1 and BR-OR-2 node zoning designations.

The BR-OR-1 district, located southeast of the BNSF Storage Tracks, BNSF Alternative site, and BNSF Modified Alternative site, is intended to provide the level of intensity appropriate for areas close to the highest levels of transit service within the Bel-Red area. In May 2012, the City of Bellevue approved the Spring District Master Plan, which provides regulatory framework for future development of 36 acres of existing industrial uses to a transit-oriented urban village. The Spring District is planned to contain office space, neighborhood retail space, housing units, a hotel, parks, new roads, and infrastructure facilities. Development of the site is anticipated to occur in seven phases over the next 15 years. Approximately 5.4 million square feet of space in 11- to 14-story buildings and 10,000 parking spaces are planned.

3.3.3.3 Lynnwood Alternative

The Lynnwood Alternative site consists of 14 to 15 parcels depending on the design alternative. The three design options require acquisition of 37 to 41 acres. Existing land uses at the Lynnwood Alternative site include a mix of auto-oriented industrial and commercial developments along with office buildings, including a mid-rise office building that is host to Washington State Department of Social and Health Services offices. The Edmonds School District owns the largest parcel at the site, a 21-acre undeveloped industrial-zoned site. The school district's plan for the site, as documented in its Capital Improvement Program, includes development of a district support center, which would include administrative offices, a school bus base and maintenance facilities, a warehouse, and a fuel and wash island on this parcel. As of early 2014, the Edmonds School District had completed environmental review and obtained land use approvals from the City of Lynnwood for its district support center. The school district, however, has not identified alternative locations for this facility.

Existing land uses within 0.5 mile of the Lynnwood Alternative site include commercial uses such as auto-oriented businesses. There are single-family residential areas located west of the site across 52nd Avenue W and south of the site across I-5. Scriber Creek Park is north of the site; the Interurban Trail (linear parklands) is located immediately to the south. The Lynnwood

Transit Center/Park and Ride is located northeast of the site. Parcels within 0.5 mile of the site are generally zoned as residential, commercial, mixed use, parks and open space, and some industrial use. Single-family and multifamily zones are located primarily south of the site (across I-5) and west of the site. Open space at Scriber Creek Park buffers the Lynnwood Alternative site from the boundaries of the City Center Subarea.

The Comprehensive Plan Map land use designations correspond with the zoning designations at the site. The affected parcels are designated and zoned as Business/Technical Park (BTP) on the northern half of the site and Light Industrial (LI) on the southern half of the site. BTP is intended for business and technical parks and the LI designation is intended for light manufacturing and wholesale operations.

BNSF Storage Tracks

The BNSF Storage Tracks component of the Lynnwood Alternative is located within the Eastside Rail Corridor and on the 11-acre former International Paper facility parcel. Existing land uses adjacent to the proposed BNSF Storage Tracks include various institutional, industrial, and commercial uses. The City of Bellevue's Public Safety Training Center is located immediately west of the site, along with several offices, businesses, and medical services. Seattle Children's Hospital: Bellevue Clinic and Surgery Center and the Overlake Obstetricians and Gynecologists facility are located southwest of the site within the 0.5-mile radius. Single-family and multifamily housing are located on the periphery of the 0.5-mile radius, primarily beyond SR 520 and I-405. The site is within the Bel-Red Subarea and is zoned BR-OR-2. The single parcel of land that makes up the BNSF Storage Tracks is also a component of the BNSF Alternative and BNSF Modified Alternative sites.

3.3.3.4 BNSF Alternative

The BNSF Alternative site is located in the City of Bellevue, approximately 450 feet northwest of the future East Link 120th Avenue Station along the Eastside Rail Corridor west of 120th Avenue NE. The site is situated on 27 acres, 2 of which are right-of-way under ownership of Sound Transit. The largest parcel within the site is the 11-acre parcel previously occupied by the International Paper facility. Other land uses include industrial and commercial uses on adjacent parcels to the north. Existing land uses within a 0.5-mile radius are largely commercial and industrial in nature with single-family residential and multifamily residential areas at the periphery of the study area west of I-405 and north of SR 520. Overlake Hospital and Medical Center and Seattle Children's Hospital are located southwest of the site. The planned NE 15th/16th Avenue corridor is south of the site.

Eleven acres (the former International Paper facility) are zoned BR-OR-2 and 14 acres are zoned Bel-Red Residential (BR-R). The purpose of the Bel-Red-R district is to provide an area for residential uses; limited retail and service uses are permitted secondary to residential use, in order to provide the amenity of shopping and services within easy walking distance of residential structures.

3.3.3.5 BNSF Modified Alternative

The BNSF Modified Alternative would require 34 acres across 15 parcels. Similar to the BNSF Alternative site, existing uses are generally commercial and industrial in nature. However, approximately 3 acres at the BNSF Modified Alternative site are developed with the City of Bellevue's Public Safety Training Center. The additional 9 acres of land, west of the Eastside Rail Corridor, are designated Bel-Red Medical Office (BR-MO); this land use designation is intended for development of office space, with an emphasis on medical office space.

3.3.3.6 SR 520 Alternative

The SR 520 Alternative site is located in the City of Bellevue, immediately south of SR 520 and north of Northup Way/NE 20th Street. The site encompasses 25 acres consisting of 13 parcels developed with a broad range of auto-oriented commercial uses. The site is located approximately 0.25 mile north of the future 130th Avenue East Link Station outside of the Bel-Red's higher-density nodal development areas.

Existing land uses at the site include various commercial and retail businesses. Existing land uses within a 0.5-mile radius include mostly commercial and industrial uses south of the site, with residential (primarily low density, single-family residential concentrated north of SR 520) and some commercial uses (north of the site across SR 520).

While industrial and auto-oriented commercial uses exist within 0.5 mile of the site, with the adoption of the *Bel-Red Subarea Plan*, a large concentration of mixed-use zoning designations are planned within 0.5 mile of the SR 520 Alternative site. The *Bel-Red Subarea Plan* includes future development of a multiuse trail along 130th Avenue NE that correlates with plans to improve the riparian area and waterway (Goff Creek) that runs north-south in a constructed covered and open channel through the site east of 130th Avenue NE. All parcels on the site are zoned Bel-Red General Commercial (BR-GC). The BR-GC supports a wide variety of business activities that provide goods and services to other businesses and the public.

3.3.4 Environmental Impacts

This section discusses potential construction and operational impacts of the proposed project on the existing land use patterns and the consistency of build alternatives with local land use policies. Each of the build alternatives and No Build Alternative are discussed regarding construction impacts and operational impacts.

- **Construction Impacts.** These impacts include temporary construction activities and/or use of staging areas that could affect current land uses.
- **Operational Impacts**. Direct land use impacts result from project operations where property acquisition is needed. These property acquisitions would displace existing land uses and convert the sites to a transportation-related use. Indirect land use impacts involve impacts to development and/or redevelopment of land in the vicinity of the proposed project.

Property acquisitions are detailed in Section 3.2, Acquisitions, Displacements, and Relocations. The economic effects of acquisitions and land use conversion are described in Section 3.4, Economics.

3.3.4.1 No Build Alternative

Under the No Build Alternative, the proposed project would not be built and no changes to existing land uses would occur. The Edmonds School District anticipates developing a district support center that would include administrative offices and bus maintenance and storage on a portion of the Lynnwood site. Future population and employment growth would proceed as described in the City's adopted plans.

The Cities of Lynnwood and Bellevue have developed land use plans and regulatory frameworks to foster transit-oriented development near stations. However, without the proposed project the resulting level of service across the entire light rail system would potentially be lower than planned under *Sound Transit 2: Making Connections, The Regional Transit System Plan for Central Puget Sound* (ST2). This could potentially limit one of the driving factors behind land use conversion from existing lower density auto-oriented uses to transit-oriented or higher density uses near light rail stations.

3.3.4.2 Impacts Common to All Build Alternatives

Construction Impacts

Construction activities would not affect land use patterns as all staging and construction activities would occur within the parcels identified for acquisition for the proposed project. During construction, Sound Transit would implement public outreach measures (advertisements and signage, public involvement meetings, and website and telephone communications) to inform and allow residents and businesses to voice their concerns. Additional measures would be implemented to maintain access and reduce potential for construction-related impacts.

Operational Impacts

Consistency with Land Use Plans and Policies

The OMSF, in conjunction with the existing Forest Street OMF, must be capable of supporting the ST2 system build-out in its entirety, in terms of storage capacity, maintenance, and efficient deployment of vehicles. At the regional level, all build alternatives would support the long-range planning and growth management efforts associated with the development of the light rail system and are consistent with regional land use plans and policies. However, use of the build alternatives sites for the proposed project would be generally inconsistent with the corresponding local jurisdiction's adopted plans. The proposed project would be a "regional transit authority facility" and, therefore, would be recognized as an essential public facility (EPF) in the GMA (RCW 36.70A.200). Both the Cities of Lynnwood and Bellevue have adopted processes and regulations to facilitate the development of EPF's within their jurisdictional authority. Development of the OMSF would require Sound Transit to obtain a Conditional Use Permit (CUP) from the respective local jurisdiction to ensure that design criteria are established in collaboration with the affected jurisdiction. The use of the build alternative sites for the proposed project and the

consistency with the corresponding local jurisdiction's adopted plans is discussed in greater detail for each build alternative below.

Conversion of Land Use to Public Transportation Use

All build alternatives would convert existing non-transportation land uses to transportation-related land uses for construction and operation of the proposed project. Section 3.2, Acquisitions, Displacements, and Relocations, identifies the number of parcels that would be acquired and converted to transportation-related land use. These totals are estimates based on the current conceptual engineering for the build alternatives.

Throughout the United States, in cities large enough to support light rail infrastructure and operations, maintenance facilities have been woven into various land use patterns. Facilities are typically located close to rail lines to avoid long lead tracks and improve the overall efficiency of the system. Some OMF sites, such as Boston's Massachusetts Bay Transportation Authority Riverside Yard, are developed in low density residential urban conditions. The Riverside Yard is located adjacent to a river and private golf club. Other facilities, such as the Los Angeles Metro Santa Fe Yard, are located in dense urban downtown areas adjacent to commercial and industrial land uses. The Minneapolis Metro Transit Operations and Maintenance Facility is situated adjacent to the city's Hiawatha Bike Trail and a 30,000-square-foot Community Peace Garden cultivated by the Minneapolis Korean community.

The proposed project would incorporate context-sensitive design considerations. Architectural design for the OMSF would be developed in response to Sound Transit's system-wide design goals and criteria, and the design goals, criteria, and development patterns of the local municipality where it is sited. Community design context would vary according to local comprehensive plans, overlay zones, and development standards that govern items such as, but not limited to, building setbacks, heights and massing, landscaping, facade treatment, and urban design character. All build alternative sites are located near future light rail lines and within 0.5 mile of a future light rail station where the Cities of Lynnwood and Bellevue have planned for higher-density, transit-oriented development. Although light rail transit stations alone do not create new development, with transit-supporting plans and policies in place, the stations can influence the type and location of nearby development and redevelopment.

Both the Cities of Lynnwood and Bellevue have adopted plans to accommodate transit-oriented redevelopment at higher densities adjacent to the future light rail stations. Therefore, developing the proposed project on land envisioned for transit-oriented development would reduce the total amount of land available for such development.

Tables 3.3-1 and 3.3-2 show the amount of land within 0.25 mile and 0.5 mile of a light rail station that would be used by development of each of the build alternatives, respectively. Public right-of-way was excluded from land considered available for redevelopment. Impacts unique to each of the build alternatives are discussed in the subsection corresponding to the build alternative.

Table 3.3-1. Land Occupied by OMSF within 0.25 Mile of a Light Rail Station

Build Alternative	Future Light Rail Station[b]	Total Acres within 0.25-Mile Radius[a]	Total Acres Occupied by OMSF within 0.25 Mile	Percentage (%) of Land Occupied by OMSF within 0.25 Mile
Lynnwood Alternative				
Design Option C1	52nd Ave W to 200th St Station	109	3	3
Design Option C2	52nd Ave W to Lynnwood Transit Center Station	96	8	8
Design Option C3	52nd Ave W to Lynnwood Transit Center Station	84	0	0
BNSF Storage Tracks	120th Station	113	0	0
BNSF Alternative	120th Station	113	5	4
BNSF Modified Alternative	120th Station	113	4	4
SR 520 Alternative	130th Station	114	0	0

[a] Public right-of-way excluded from total acres.
[b] Buffer area configured from center of future Lynnwood Link Extension and East Link rail stations.

Table 3.3-2. Land Occupied by OMSF within 0.5 Mile of a Light Rail Station

Build Alternative[a]	Future Light Rail Station[b]	Total Acres within 0.5 Mile[a]	Total Acres Occupied by OMSF within 0.5 Mile	Percentage (%) of Land Occupied by OMSF within 0.5 Mile
Lynnwood Alternative				
Design Option C1	52nd Ave W to 200th St Station	394	26	7
Design Option C2	52nd Ave W to Lynnwood Transit Center Station	390	24	6
Design Option C3	I-5 to Lynnwood Park & Ride Station	394	24	6
BNSF Storage Tracks	120th Station	435	5	1
BNSF Alternative	120th Station	435	23	5
BNSF Modified Alternative	120th Station	435	26	6
SR 520 Alternative	130th Station	432	25	6

[a] Public right-of-way excluded from total acres.
[b] Buffer area configured from center of future Lynnwood Link Extension and East Link rail stations.

3.3.4.3 Lynnwood Alternative

Construction Impacts

For all the Lynnwood Alternative design options, an aerial easement over the Interurban Trail would likely be required during construction for the development of the lead track from the guideway. This could temporarily affect the use of the trail but would not result in long-term land use changes. Sound Transit would work with the City to develop and implement an effective alternative route prior to construction efforts over the trail to mitigate potential impacts to trail users. Construction impacts for the BNSF Storage Tracks would be the same as those stated in Section 3.3.4.2, Impacts Common to All Build Alternatives.

Operational Impacts

All design options of the Lynnwood Alternative would occupy 24 acres zoned Light Industrial (LI) and Business/Technical Park (BTP). Approximately 9 to 13 acres of surplus lands would be available for redevelopment subsequent to construction of the OMSF. Existing land uses at the site include social service offices and industrial land use operations. The Lynnwood Alternative would affect development of the planned district support center by the Edmonds School District on a vacant industrial tract. For information regarding required parcel acquisitions under each design option for the Lynnwood Alternative, refer to Section 3.2, Acquisitions, Displacements, and Relocations.

The *City of Lynnwood Comprehensive Plan* (City of Lynnwood 1995) and the City's Zoning Map show parcels on the Lynnwood Alternative site are designated with two industrial zoning designations. A mass transit storage and maintenance facility is an allowable use on land designated as LI subject to issuance of a CUP by the City of Lynnwood. A mass transit storage and maintenance facility is not an allowable use in the BTP zoning designation. An amendment to the *City of Lynnwood Comprehensive Plan* (1995) and a change to the city's official zoning map would be required. Parcels within the Lynnwood Alternative site designated BTP would need to undergo a zoning change to the LI designation. Approval of the facility on land zoned LI would then be contingent on Sound Transit obtaining a CUP from the City of Lynnwood.

Approximately 1 acre of the 10-acre parcel for the BNSF Storage Tracks would be used for the development under this build alternative. Following construction, remnant land (approximately 9 acres) not required for project operations could be made available for redevelopment consistent with Bel-Red Office/Residential mixed-use zoning designation. The BNSF Storage Tracks would not be consistent with the *Bel-Red Subarea Plan* land use policies in general and would not be permitted outright under the zoning designations. The OMSF would be required to obtain a CUP from the City of Bellevue to ensure compatibility with adjacent land uses. No amendments to the *City of Bellevue Comprehensive Plan* would be required under this build alternative.

3.3.4.4 BNSF Alternative

Construction Impacts

Construction impacts of the BNSF Alternative would be the same as those stated in Section 3.3.4.2, Impacts Common to All Build Alternatives.

Operational Impacts

The BNSF Alternative would occupy 23 acres zoned BR-OR-2 and BR-R, leaving approximately 4 acres of land available for redevelopment in accordance with the existing BR-OR-2 zoning designation. Properties at the BNSF Alternative site are zoned BR-R and BR-OR-2. The OMSF is generally not consistent with the *Bel-Red Subarea Plan* land use policy. However, the Bel-Red Subarea Plan Policy S-BR-70 states that the City would "work with Sound Transit to determine the need for a future light rail maintenance facility in Bel-Red, and if needed, to locate it where compatible with planned land uses and transportation facilities and services" (City of Bellevue 2009a). The OMSF is not a permitted use in any of the Bel-Red zoning designations. However, the zoning designations conditionally allow "Rail Transportation: right-of-way, yards, terminals, and maintenance shops" subject to Sound Transit obtaining a CUP from the City of Bellevue. The CUP is the mechanism by which the City of Bellevue can require special conditions on development or on the use of the land to ensure that designated uses or activities on the site are compatible with other uses in the same land use district near the proposed project. No amendments to the *City of Bellevue Comprehensive Plan* would be required under this build alternative.

3.3.4.5 BNSF Modified Alternative

Construction Impacts

Construction impacts of the BNSF Modified Alternative would be the same as stated in Section 3.3.4.2, Impacts Common to All Build Alternatives.

Operational Impacts

The BNSF Modified Alternative would occupy 24 acres zoned BR-OR-2, BR-R, and BR-MO. Approximately 8 acres of surplus land zoned BR-OR-2 would be available for redevelopment. As with the BNSF Alternative, the OMSF would not be consistent with the *Bel-Red Subarea Plan* land use policies in general and would not be permitted outright under the zoning designations. The OMSF would be required to obtain a CUP from the City of Bellevue to ensure compatibility with adjacent land uses. No amendments to the *City of Bellevue Comprehensive Plan* would be required under this build alternative.

3.3.4.6 SR 520 Alternative

Construction Impacts

For the SR 520 Alternative, temporary construction easements from Washington State Department of Transportation (WSDOT) may be required; no long-term land use impacts are anticipated.

Operational Impacts

The SR 520 Alternative would occupy approximately 25 acres zoned BR-GC which are currently developed with commercial uses. Following construction, no surplus land would be available for redevelopment. Parcels contained within this site are zoned BR-GC as part of the *Bel-Red Subarea Plan*. Like the other build alternative sites in the Bel-Red Subarea, the proposed project is not consistent with land use or zoning designations, but is conditionally allowed on land zoned BR-GC subject to Sound Transit obtaining a CUP. No amendments to the *City of Bellevue Comprehensive Plan* would be required under this alternative.

3.3.5 Urban Land Institute Analysis

In March 2014, Sound Transit sponsored an Urban Land Institute (ULI) Advisory Services Panel in Seattle. The panel worked over 3 days to identify and document transit-oriented and economic development opportunities and strategies around each build alternative site. The panel's work involved tours of each site and surrounding area and interviews with Sound Transit and city staff from Lynnwood and Bellevue, as well as other stakeholders. The panel was asked to address four questions.

1. What strategies could Sound Transit consider to help integrate an OMSF into the surrounding land use at each location?
2. Please identify potential opportunities for transit-oriented development and/or economic development using surplus property associated with each of the build alternative sites.
3. What insights and suggestions does the ULI panel have regarding the potential for constructing housing or commercial uses over a public facility?
4. What options or strategies should Sound Transit consider to encourage transit-oriented development or other economic development opportunities adjacent to a light rail operations and maintenance facility and nearby station areas?

In preparation for the ULI study, Sound Transit developed a transit-oriented development assessment that considers the physical capacity of surplus lands at each alternative (Table 3.3-3) (Kidder Matthews 2013) and the market potential for such development given current market conditions. Sound Transit also prepared an initial assessment of the feasibility and cost of providing infrastructure at the OMSF up front to accommodate future development on top of the facility (i.e., shared use). The assessment used the SR 520 Alternative site as a representative site for purposes of the assessment, although similar infrastructure could be developed at any of the build alternative sites. The assessment evaluated creating an approximately 5.5-acre building podium over a portion

of the OMSF (e.g., columns, foundation footings, and deck structure plus associated access ramps to the street). The assessment considered the potential for a podium to support development of a car dealership, but it could also accommodate some level of residential or commercial office development. Initial costs to develop a podium and access ramp range between $100 and $125 per square foot (KPFF Consulting Engineers 2014). Based on current market conditions, land in proximity to the Lynnwood Alternative site is assessed at between $10 and $30 per square foot, and land in proximity to the BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative sites in Bellevue is selling for between $50 and $80 per square foot (Kidder Matthews 2013, 2014). This suggests that overbuilding the build alternative sites for potential joint development may be physically possible, but the market feasibility of such development may not materialize until the surrounding land values equal or exceed the additional foundation or podium costs at the OMSF.

The ULI panel provided several observations and recommendations at the conclusion of its work, including identifying opportunities for design modifications at each build alternative site. Suggested modifications were primarily focused on creating more space along street frontages, which would allow for either redevelopment and/or site screening from adjacent properties through preservation of existing vegetation or creation of landscaped area. The panel addressed the potential for joint development, through either public-public or public-private partnerships. Consideration of joint development opportunities addressed overbuilding and decking at the OMSF to create a podium to support future development over portions of the facility. The panel noted that overbuilding may not be financially feasible, although could be considered where the zoning would allow for sufficient height and density to recoup the initial investment in additional costs to construct or allow for a podium. Any future development on the OMSF site or on surplus land not required for the OMSF would undergo a separate environmental review process. The panel noted common community concerns and misperceptions regarding light rail maintenance facilities, such as noise, light, traffic, and 24-hour activity. It also noted the key to addressing these concerns is through collaboration with the community and design strategies such as site orientation and layout, setbacks and landscaping, and architectural materials for buildings. Additional information on the ULI panel findings is available on Sound Transit's OMSF project website.

3.3.6 Indirect and Cumulative Impacts

3.3.6.1 Indirect Impacts

All build alternatives, except the SR 520 Alternative site, would have surplus land not required for operation of the proposed project. These surplus lands could be made available for redevelopment consistent with corresponding zoning ordinance and/or the conditions of the CUP required for the development of the proposed project. Redevelopment of surplus land initially acquired as part of the proposed project would be considered an indirect land use impact, because development would likely occur sometime after the OMSF is built. Development of surplus lands associated with the site alternatives could help serve as a catalyst for other redevelopment efforts in the general vicinity of the proposed project.

Table 3.3-3. Development Potential of Surplus Land

Build Alternative	Assumed Surplus Land (Acres)	Zoning Designation of Surplus Land	Potential Office Development (sq. ft./bldg. height)[a]	*OR*	Potential Residential Development (units /bldg. height)[a]
Lynnwood Alternative					
Design Option C1 Design Option C2	9	LI[b]	300,000–800,0000/ 6 stories		0
Design Option C3	13	LI[b]	425,000–1,100,000/ 6 stories		0
BNSF Alternative	4	BR-OR-2	175,000–350,000/ 6 stories		300–400/5 stories
BNSF Modified Alternative	8	BR-OR-2 and BR-R	325,000–730,000/ 6 stories		575–850/5 stories
SR 520 Alternative	0	BR-GC	0		0

Source: Kidder Matthews 2013.

[a] Range of density represents alternate assumptions of surface parking (low end) and structured parking (high end). In the City of Lynnwood, residential development is not an allowed use on lands zoned LI.

[b] Lynnwood zoning: would allow office development but would need zoning changes to allow residential uses.

LI = Light Industrial; BR-OR-2 = Bel-Red Office Residential Node 2; BR-R = Bel-Red Residential; BR-GC = Bel-Red General Commercial.

Table 3.3-3 summarizes development potential of surplus land associated with each build alternative site. Development potential was estimated as part of a transit-oriented development assessment, which considered each alternative's amount of surplus land, local jurisdictions' zoning regulations, and present-day market conditions (Kidder Matthews 2013). Present day market conditions and site capacity studies were used to estimate the potential of each site to accommodate residential or office space in the future. Densities and uses shown in Table 3.3-3 represent an initial assessment of the physical capacity and feasibility of future development based on the amount of land available, present-day market conditions, and existing zoning that is supportive of transit-oriented development. The market conditions analysis (Kidder Matthews 2013) contains estimates for potential residential development at the Lynnwood Alternative; however, these estimates are not provided in Table 3.3-3 as the current industrial zoning designation does not allow for residential development.

A discussion of indirect land use impacts for each of the build alternative sites is provided below.

Lynnwood Alternative

All design options of the Lynnwood Alternative would occupy 24 acres leaving approximately 9 to 13 acres of land that would be available for redevelopment following development of the proposed

project in accordance with the existing industrial zoning designation. The wetlands immediately south of Scriber Creek Park would be left undeveloped except for the lead track to the guideway associated with Design Option C2.

Approximately 1 acre of the 10-acre parcel for the BNSF Storage Tracks would be used for the development of BNSF Storage Tracks. Following construction, remnant land (approximately 9 acres) not required for project operations could be made available for redevelopment consistent with Bel-Red Office/Residential mixed-use zoning designation.

The Lynnwood Alternative would yield the greatest amount of redevelopment potential at the primary facility site, with 9 to 13 surplus acres in Lynnwood, not including surplus acres at the BNSF Storage Tracks. The 9 to 13 acres at the Lynnwood Alternative site is currently zoned for light industrial, where buildable area is largely dependent on the type of use at the site and the setbacks required. The Edmonds School District would have the potential to use some of the surplus land for school bus storage, fueling, and maintenance operations previously anticipated to be developed at the site. If joint development of the site with the school district were not pursued, between approximately 300,000 and 1,100,000 square feet of office development could be accommodated on the 9 to 13 acres of surplus land (Table 3.3-3; Kidder Matthews 2013).

BNSF Alternative

The BNSF Alternative would occupy 23 acres leaving approximately 4 acres of land available for redevelopment following development of the proposed project in accordance with the existing BR-OR-2 zoning designation. Redevelopment of the 4 acres of surplus land could accommodate approximately 175,000 to 350,000 square feet of office development or approximately 300 to 400 residential units (Table 3.3-3; Kidder Matthews 2013).

BNSF Modified Alternative

The BNSF Modified Alternative would occupy 24 acres leaving approximately 8 acres of surplus land zoned for Office/Residential in Node 2. The 8 acres of surplus land could be developed in accordance with existing zoning regulations and/or the conditions of the CUP; it is estimated that the site could be developed with approximately 325,000 to 730,000 square feet of office space or approximately 575 to 850 residential units (Table 3.3-3; Kidder Matthews 2013).

SR 520 Alternative

There are no surplus lands associated with the development of an OMSF at the SR 520 Alternative.

3.3.6.2 Cumulative Impacts

The discussion below describes the cumulative effects on land use with implementation of the proposed project in conjunction with the Lynnwood Link Extension, East Link, and other planned projects located near the proposed build alternatives. Overall, the proposed project and other planned transportation development projects would help achieve local and regional goals that

encourage high-density, transit-oriented development. However, construction of these projects simultaneously could have some limited cumulative effects, as discussed below.

Alternatives C1, C2, and C3 of the Lynnwood Link Extension would acquire parcels in the vicinity of the Lynnwood Alternative for the proposed project (OMSF). If the Lynnwood Alternative is chosen, it would conflict with an existing master plan by the Edmonds School District to develop a district support center. However, as indicated previously, there would be surplus land available for the school district to potentially build some of its facility at the site.

Construction of the Lynnwood Link Extension would likely occur at the same time as the OMSF, and simultaneous construction activity along 52nd Avenue W and Cedar Valley Road could occur. Although construction activities for the proposed project would be contained within the parcels acquired for construction, there is potential for increased dust, noise and presence of construction equipment on local streets. However, these construction-related disturbances would not result in a change in land use.

The BNSF Storage Tracks component of the Lynnwood Alternative, BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative sites are all located within the Bel-Red Subarea located near the future guideway of the East Link light rail. Therefore, there is a potential for overlap in construction activities for the East Link and OMSF projects. However, these impacts are not anticipated to result in a change in land use.

Construction of the Spring District Master Plan development, located southeast of the BNSF Storage Tracks and BNSF Alternative and BNSF Modified Alternative sites, began in 2013 and is expected to end by 2028. Simultaneous construction activities for the Spring District Master Plan and the OMSF could result in increased construction-period dust, and the presence of construction equipment on local streets in this area. However, these impacts are not anticipated to result in a change in land use.

The proposed project in conjunction with other planned projects near the build alternative sites including the Lynnwood Link Extension and East Link, would cumulatively contribute to conversion of land to transportation uses. However, the land to be acquired by these projects would be negligible when compared to the total residential, commercial, and public land in the project vicinity. Therefore, the cumulative impact of the related projects, when combined with the proposed project, on land use would be limited.

3.3.7 Potential Mitigation Measures

Although disturbances to adjacent land uses cannot be entirely avoided during construction, these impacts are not expected to cause substantial changes in land use. No mitigation related to land use would be required during construction or operation of the proposed project.

3.4 Economics

The analysis of economic resources summarizes the anticipated impacts of the proposed project alternatives on local and regional economies regarding business displacements and changes in tax revenue.

3.4.1 Introduction to Resources and Regulatory Requirements

Maintenance facility projects like the proposed project can affect the size of a region's fleet of transit vehicles, which can change regional and local mobility patterns and access. In turn, changes in these patterns could affect aspects of the regional or local economies such as development patterns, employment opportunities, business accessibility, or retail sales. The economics analysis addresses demographic and economic trends, as well as local revenue sources.

3.4.2 Methods

The study area for the economics analysis includes city and site-specific levels**.** Site-specific impacts were evaluated for a study area consisting of a 0.5-mile radius around each build alternative site. Economic impacts of the proposed project on the tax revenue were assessed for cities with the potential to experience property acquisition (Lynnwood and Bellevue).

The economics analysis was performed by analyzing assessor's data for each affected parcel (including taxable value, square footage of any structures, and type of land use) and using relevant economic research to then calculate the total impact on tax revenue and employment associated with each alternative. Potential job growth and labor revenue from construction expenditures were estimated using the Washington State Input-Output model. The model represents an estimate of the structure of the Washington economy, one for which economists from participating state agencies helped compile, estimate, and review data and industry information to create (Washington Office of Financial Management 2007).

3.4.3 Affected Environment

Table 3.4-1 shows the population, household, and employment trends for each build alternative site and its surrounding Forecast Analysis Zone (FAZ). FAZs are the units of the geographic boundary system used by Puget Sound Regional Council (PSRC) to model and report its small area forecasts of population, households, and employment. FAZ boundaries generally, with few exceptions, line up with census tract boundaries, with each FAZ containing one to nine census tracts.

Table 3.4-1. Population, Household, and Employment Forecasts by Build Alternative

Build Alternative	2010	2035	Average Annual Growth Rate 2010 to 2035 (%)
Lynnwood Alternative (FAZ 7206)			
Population	17,750	18,979	0.3
Households	7,339	8,364	0.6
Employment	10,809	26,886	5.9
BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative (FAZ 5205)			
Population	12,492	21,345	2.8
Households	5,489	10,749	3.8
Employment	25,913	41,641	2.4

Source: Puget Sound Regional Council 2013.
FAZ = Forecast Analysis Zone.

3.4.3.1 Lynnwood Alternative

Demographic and Economic Trends

The Lynnwood Alternative site is located in FAZ 7206; however, PSRC is currently revising its forecast data. The Lynnwood Alternative site is forecast to experience a higher growth rate in employment than the BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative sites.

Local Revenue Sources

The City of Lynnwood relies heavily on property tax and sales tax revenues to fund general services. Revenues collected other than taxes consist of funding from state and local sources, internal transfers, and various types of fees collected from government-operated facilities and from issuing licenses and permits. In addition to funding city programs, property tax levies also provide funds for county programs, fire prevention, libraries, schools, and other governmental services. Table 3.4-2 breaks down funding sources for the city.

Table 3.4-2. Percent of Total Revenues for the City of Lynnwood

City (Budget Year)	Property Tax	Sales Tax	Other Sources
Lynnwood (2012)	22.0	33.0	45.0

Source: City of Lynnwood 2013.

3.4.3.2 BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative

Demographic and Economic Trends

The BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative sites are all located in FAZ 5205. Forecasts for total population, total employment, and total households for each relevant FAZ are provided in Table 3.4-1. As shown in Table 3.4-1, by 2035, the BNSF Alternative, BNSF Modified

Alternative, and SR 520 Alternative sites are forecast to have the largest population (21,345), most households (10,749), and most employees (41,641) of the build alternatives, as well as the most rapid growth in population and households.

Local Revenue Sources

The City of Bellevue also relies heavily on property tax and sales tax revenues to fund general services. Other revenue sources also include funding from state and local sources, internal transfers, and various facility, licensing, and permitting fees. In addition to funding city programs, property tax levies also provide funds for county programs, fire prevention, libraries, schools, and other governmental services. Table 3.4-3 lists funding sources for the City of Bellevue.

Table 3.4-3. Percent of Total Revenues for the City of Bellevue

City (Budget Year)	Property Tax	Sales Tax	Other Sources
Bellevue (2013–2014)	20.0	23.0	57.0
Source: City of Bellevue 2013.			

3.4.4 Environmental Impacts

The proposed project could cause changes in the local business environment and surrounding neighborhoods. These changes, in turn, could alter the success of existing businesses and influence future economic opportunity in the area. Economic impacts of each alternative could include business and employee displacements and the corresponding potential tax impacts from conversion of land use from commercial and industrial uses to a public transportation use. This section evaluates these impacts for each build alternative as well as for the No Build Alternative.

3.4.4.1 No Build Alternative

The No Build Alternative would consist primarily of continuing existing operations. Under the No Build Alternative, future economic development or redevelopment may not be the same as it would be with the proposed project, because Sound Transit would be constrained to a fleet of 104 light rail vehicles (LRVs). A smaller LRV fleet than planned would cause, by 2035, increases in passenger loads above Sound Transit's passenger load standard and design standard for fire/life safety due to increases in passenger demand. Operational disruptions and inefficiencies would also occur due to fleet constraints, which could reduce employees' and customers' ability to move freely throughout Sound Transit's service area.

3.4.4.2 Impacts Common to All Build Alternatives

All build alternatives would result in roughly the same economic impacts by acquiring parcels and displacing businesses and employees, and would affect taxes similarly in their surrounding city.

Construction Impacts

Construction activity could result in impacts on local businesses because of the associated changes in traffic circulation, noise, and visual effects. All build alternatives are likely to generate a noticeable amount of construction-related traffic on surrounding roadways. However, for all build alternatives, the truck traffic is not expected to degrade operations of study area intersections during off-peak hours, and a construction transportation management plan addressing site access would be prepared. Therefore, no negative economic impacts on local businesses in any of the build alternative sites are anticipated during construction.

Construction would bring revenue into the economy with construction jobs, purchasing of local goods and services for construction, and the money spent by construction crews in the community where construction occurs. The proposed project would result in substantial short-term economic activity in the region during construction.

As shown in Table 3.4-4, employment and spending would increase during construction for any of the build alternatives. The extent of these impacts would depend on the source of project funding and the makeup of work crews used during project construction.

Table 3.4-4. Direct Expenditures and Direct Employment from Construction

Alternative	Total Direct Expenditures[a] (million dollars)	Direct Employment (# of jobs)
Lynnwood Alternative		
Design Option C1	219	753
Design Option C2	221	761
Design Option C3	221	761
BNSF Alternative	182	608
BNSF Modified Alternative	223	706
SR 520 Alternative	206	663

[a] Direct expenditures include all expenses associated with construction of the proposed project, including labor and materials costs.

In an economic impact analysis, typically only inflows of funds from outside a region are considered “new money” that would lead to new employment and income in that region. Funds from local or regional sources are considered transfers that could be spent by residents and businesses on other economic activities.

Although the typical method for economic impact analysis would count only the federal grant funding as new spending for the purposes of determining economic impacts, the actual benefits would be greater and are difficult to determine precisely. Regardless of the specific method used to quantify economic impacts, the project would result in substantial short-term economic activity in the region during construction.

Some indication of the magnitude of the economic stimulus as a result of the build alternatives is shown in Table 3.4-4. This table provides an estimate range of the direct expenditures and the proportion of project employment as a result of the build alternatives.

Operational Impacts

Table 3.4-5 provides estimates of the number of businesses located on properties that would be acquired by the build alternatives and lists the estimated number of employees at those businesses. The estimates were prepared based on PSRC employment data and square-foot-per-employee estimates (Pflaum et al. 2004), as well as the current use for each displaced building as determined by Sound Transit.

Table 3.4-5. Property Acquisition Impacts on Businesses and Employees

	Full Displacements[a]	
Alternative	**Businesses**	**Employees**
Lynnwood Alternative		
Design Option C1	11	390
Design Option C2	11	380
Design Option C3	14	380
BNSF Alternative	14	340
BNSF Modified Alternative	25	420
SR 520 Alternative	101	1,060

[a] Estimates are rounded to the nearest 10.

Sound Transit would provide relocation assistance to displaced businesses as described in Section 3.2, Acquisitions, Displacements, and Relocations. Therefore, it is likely that many of the displaced jobs would be relocated and not lost. However, the potential remains for some displaced businesses and jobs to relocate outside the city in which they currently exist. The proposed project would create approximately 230 jobs.

Table 3.4-6 presents the 2012 initial property tax impacts on the Cities of Lynnwood and Bellevue resulting from property acquisitions. Reductions in annual revenue resulting from these property tax impacts are estimates based on 2013 levy rates and assessed values. Under the Lynnwood Alternative and the BNSF Modified Alternative, Sound Transit would acquire tax-exempt properties owned by the Edmonds School District and the City of Bellevue. Acquisition of these publicly owned institutional properties would not cause property tax impacts; only impacts associated with acquisition of commercial and industrial properties are analyzed.

When referring to the property tax impacts of acquisitions, the term *initial property tax impacts* is used because the extent of the long-term fiscal impact of the system is uncertain. Initially, property taxes would no longer be collected from full acquisitions in the build alternative site. As a result, the rates charged to remaining taxpayers could increase slightly to recover budgeted funds, or budgets for essential government services could be reduced accordingly.

Table 3.4-6. Initial Property Tax Impacts for 2012 on Cities by Build Alternative

Alternative	Annual Property Tax Impact ($)	Budgeted City 2012 Property Tax Revenues (%)
Lynnwood Alternative		
Design Option C1	421,100	3.79
Design Option C2	413,100	3.72
Design Option C3	450,400	4.06
BNSF Alternative	464,200	0.63
BNSF Modified Alternative	572,400	0.78
SR 520 Alternative	630,500	0.86

Sources: King County Department of Assessments 2013; Snohomish County Department of Assessments 2013; City of Lynnwood 2013; City of Bellevue 2012.

3.4.5 Indirect and Cumulative Impacts

Indirect economic effects on businesses or other neighboring properties are disturbances that might change access, traffic flow, business sales, or value of adjacent property. Potential adverse indirect effects on neighboring businesses are not anticipated because all build alternatives would be designed to accommodate their respective peak parking demand, and none would change the existing transportation network or access to nearby businesses.

Indirect benefits would occur when the output of firms in other industries increases to supply the demand for inputs to the construction industry. Wages paid to workers in construction trades or supporting industries would be spent on other goods and services; these are referred to as *induced* impacts. Direct, indirect, and induced impacts would occur in the region from project construction. The indirect and induced impacts are often called *multiplier* impacts. The estimated ripple effects on the state economy resulting from an external change can be summarized into the multiplier concept, and Input-Output models can be used to estimate various types of multipliers. Multiplier estimates based on the Washington State Input-Output model suggest that an additional 1.98 new jobs would be created for every direct job associated with the proposed project, increasing the potential number of jobs generated in the region to approximately 1,204 to 1,507.

The proposed project, the Lynnwood Link Extension and East Link projects, and other reasonably foreseeable future actions near the build alternative sites have the potential to stimulate economic growth and provide a beneficial cumulative impact. Construction of infrastructure and development brings jobs and money to the local economy and offsets temporary adverse construction impacts on adjacent businesses that would occur, including potential reductions in off-street parking, increases in noise and dust, traffic congestion, visual intrusion, and difficulty in accessing properties.

Under the Lynnwood Alternative, construction for the Lynnwood Link Extension would likely occur simultaneously with construction of the proposed OMSF project. There would be simultaneous and cumulative construction activity along 52nd Avenue W and Cedar Valley Road. This would potentially exacerbate the increases in construction noise and dust, traffic congestion, and visual

intrusion. Economic impacts resulting from displacements would increase cumulatively as both projects acquire property within the same area. Some of the acquired parcels would be the same for both projects. Parcels identified as partial acquisitions for the Lynnwood Link Extension that would also be used for the OMSF Lynnwood Alternative would likely become full acquisitions. This would increase the number of business displacements as well as increase the amount of lost property tax revenue from the anticipated $33,000 to $66,000.

Coordinating transportation management plans between the two projects during construction would minimize localized impacts on businesses in the area of immediate impact around the projects during concurrent construction periods.

East Link would fully acquire eight to 13 properties in the vicinity of the BNSF Storage Tracks and the BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative sites, which would add to the property acquisition and land use displacements in the same vicinity. This would further reduce property tax revenue from $45,000 to $60,000 anticipated under East Link.

The potential cumulative economic effects of all OMSF build alternatives relative to displacements, development potential, and tax bases would be minor relative to the overall economic conditions in both cities.

3.4.6 Potential Mitigation Measures

Construction might cause adverse impacts on businesses due to reduced access or general construction activity. The Construction Traffic Management Plan (CTMP), to reduce these impacts, is addressed in Section 3.1, Transportation. With implementation of these design measures, mitigation would not be required. Refer to Section 3.8, Noise and Vibration, for design measures that would minimize impacts on adjacent land uses, and Section 3.2, Acquisitions, Relocations, and Displacements, for measures that would minimize impacts associated with required acquisitions, displacements, and relocations.

To minimize or limit impacts, Sound Transit would dedicate staff to work specifically with affected businesses during construction to minimize any associated impacts. Construction mitigation plans would be developed to address the needs of businesses and could include the following elements.

- Provide a 24-hour construction telephone hotline.
- Establish effective communications with the public through measures such as meetings and construction updates, alerts, and schedules.
- Provide a community ombudsman.

3.5 Social Impacts, Community Facilities, and Neighborhoods

This section evaluates how the proposed project could affect communities and neighborhoods. Compatibility with the existing and planned character of neighborhoods, including location, development pattern, demographics, community resources, economic characteristics, safety and security, and accessibility are described.

3.5.1 Introduction to Resources and Regulatory Requirements

Consistent with guidance from the Federal Transit Administration (FTA) and Federal Highway Administration (FHWA), four key neighborhood and community issues are considered when addressing the affected environment and potential impacts of a transportation project: changes in neighborhood quality, barriers to social interaction, impacts on community resources, and impacts on safety and security. This analysis also considers demographics of potentially affected areas.

Generally, neighborhoods and community facilities adjacent to the build alternative sites are most likely to be affected by project construction and operation. Much of the analysis for this section overlaps with issues evaluated in other sections, which may be consulted where appropriate: Section 3.3, Land Use; Section 3.4, Economics; Section 3.7, Air Quality and Greenhouse Gases; Section 3.8, Noise and Vibration; Section 3.15, Public Services; Section 3.18, Parklands and Open Space; Appendix C, *Environmental Justice,* which is summarized in Section 3.5.7, Environmental Justice; and Appendix E.1, *Transportation Technical Report*.

3.5.2 Methods

The study area for social impacts, community facilities, and neighborhoods consists of a 0.5-mile radius from each of the build alternative sites. Neighborhoods located in the study area are identified in Figures 3.5-1 to 3.5-4. These figures also identify community facilities, including parks, schools, religious institutions, social services, and public service facilities.

The demographic makeup of populations (percentage of the total population that is minority, low-income, and considered senior citizens) in the study area is shown in Table 3.5-1. These estimates are based on 2010 Census and 2011 American Community Survey data for the census tracts and blocks within the study area. Population data for residents living in the study area were aggregated to create a demographic profile of the total population that would be affected by the proposed project.

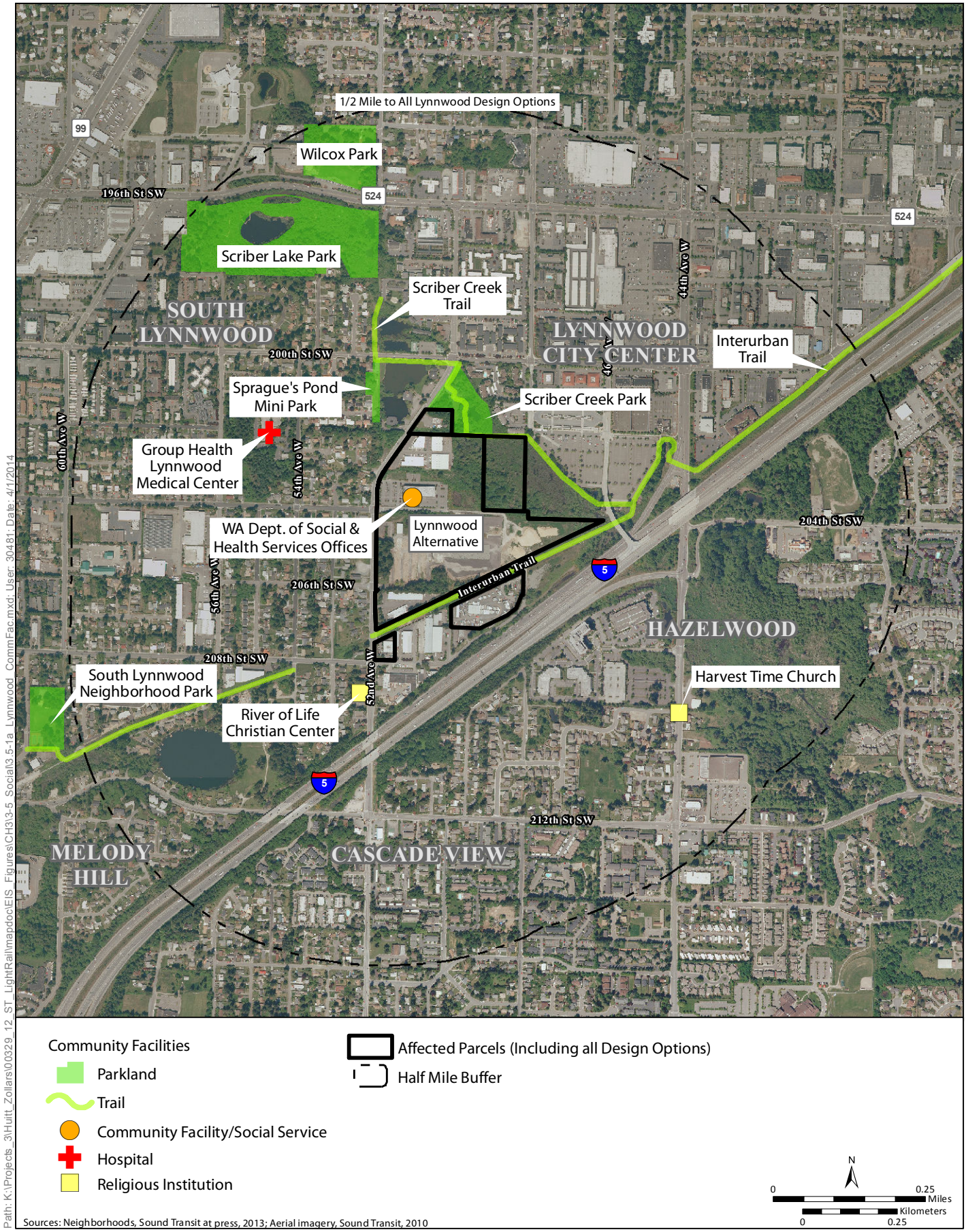


Figure 3.5-1a: Lynnwood Alternative—Community Facilities
Sound Transit Link Light Rail OMSF Draft EIS

Figure 3.5-1b: Lynnwood Alternative, BNSF Storage Tracks*—Community Facilities
Sound Transit Link Light Rail OMSF Draft EIS
*The BNSF Storage Tracks are located in Bellevue

Figure 3.5-2: BNSF Alternative—Community Facilities
Sound Transit Link Light Rail OMSF Draft EIS

Figure 3.5-3: BNSF Modified Alternative—Community Facilities
Sound Transit Link Light Rail OMSF Draft EIS

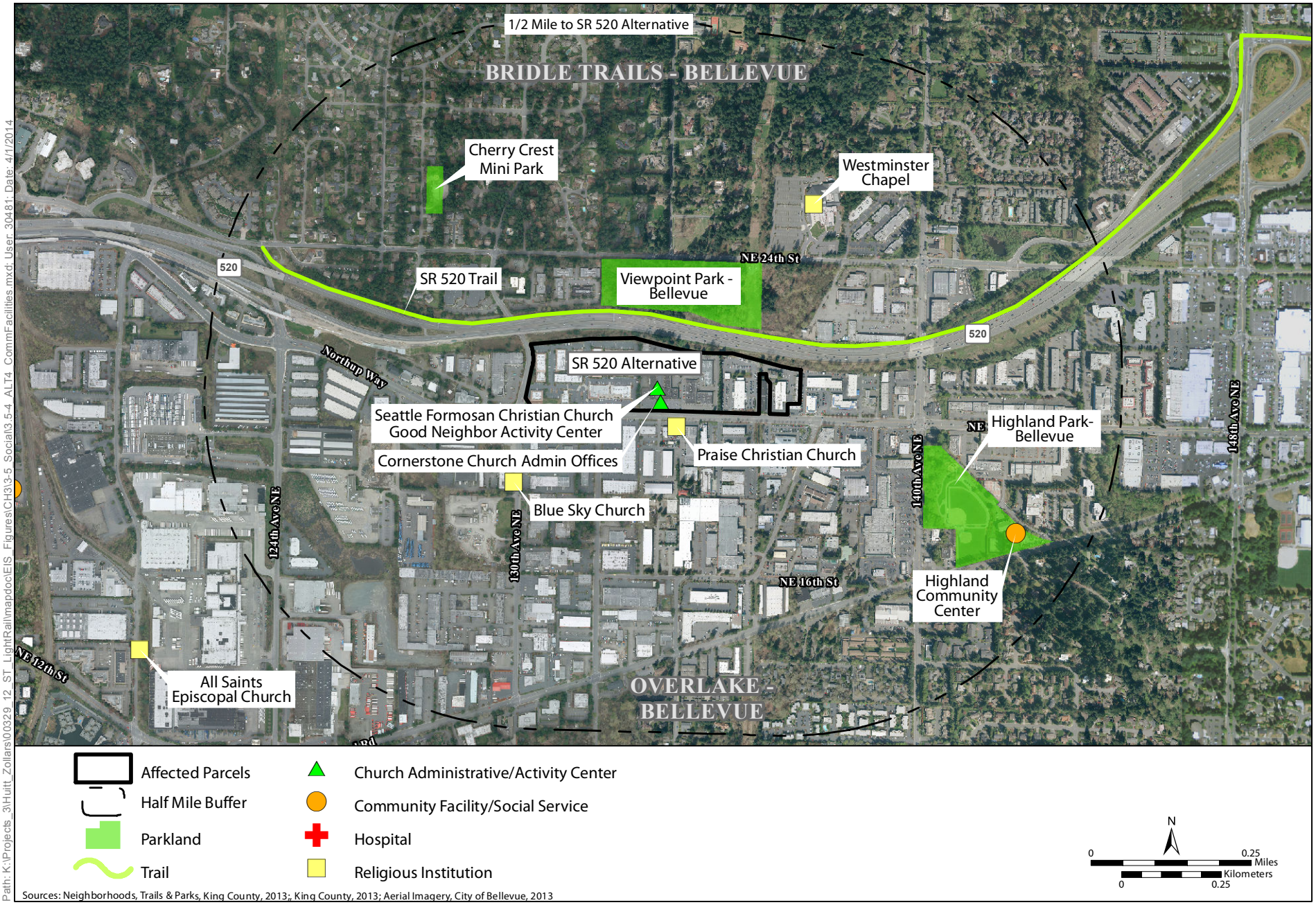


Figure 3.5-4: SR 520 Alternative—Community Facilities
Sound Transit Link Light Rail OMSF Draft EIS

3.5.3 Affected Environment

Each of the build alternative sites has similar proportions of senior citizen residents (Table 3.5-1). The Lynnwood Alternative site contains a relatively smaller minority population as compared to the other alternative sites, but has a higher percentage of low-income residents. The BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative sites are relatively similar to each other demographically, particularly in the areas north of State Route (SR) 520. Furthermore, while the BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative have study areas with minority populations above 50%, much of the populations in these study areas are located along the edges of the alternative sites where development is more oriented toward residential land uses and less toward commercial and industrial land uses. Accordingly, the environmental justice populations in the BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative sites are distant enough from these sites that no impacts would occur (Appendix C). The following is a discussion of the affected social, community, and neighborhood environment of each build alternative.

Table 3.5-1. Demographics within 0.5 Mile of the Build Alternative Sites

Alternative	2010 Study Area Population	2011 Low Income Population Estimates (%)[a]		2010 Minority Population (%)[b]	2010 Senior Citizen Population (%)[c]
Lynnwood Alternative	9,391	Average	12.9	44.9	9.1
		Median	11.9		
		Range	7.2–23.1		
BNSF Alternative BNSF Modified Alternative Lynnwood Alternative BNSF Storage Tracks	8,545	Average	4.6	63.9	11.8
		Median	4.5		
		Range	2.8–6.8		
SR 520 Alternative	8,831	Average	6.5	63.1	10.3
		Median	7.2		
		Range	3.4–8.4		

Source: U.S. Census Bureau 2013.

[a] Percentages represent estimates based on survey data. Survey data are not available at the Census Block level; this data represents the average, median, and range of percentages of all persons below the poverty line in the census tracts within 0.5 mile each build alternative site.

[b] Being of African, Hispanic, Asian-American, American Indian, or Alaskan decent, or Other Race.

[c] People ages 65 or older.

3.5.3.1 Lynnwood Alternative

The Lynnwood Alternative site is adjacent to the southernmost boundary of the City Center neighborhood of the City of Lynnwood. The primary thoroughfare in the area is 52nd Avenue W which runs along the western boundary of the Lynnwood Alternative site. In addition, the Interurban Trail, which runs parallel to Interstate 5 (I-5) in the study area, provides recreational pedestrian connections between the South Lynnwood and the City Center neighborhoods.

The Lynnwood Alternative site is characterized by undeveloped open space areas with office building commercial uses on the north end of the project site, north of 204th Street SW. Part of the undeveloped portion of the site is owned by the Edmonds School District. The Edmonds School District has plans to develop a district support center that would include administrative offices and bus maintenance and storage areas. The surroundings of the site include small-scale commercial businesses to the south and a large residential neighborhood to the west of the site; 52nd Avenue W, a three-lane road, acts as a barrier between this neighborhood and the Lynnwood Alternative site. The residences in this area generally consist of single-family homes that were developed in the 1950s and 1960s. Some small businesses and industrial uses line 52nd Avenue W to the south of the site, and larger, more dense, commercial and multifamily residential development characterize the areas to the northeast of the site in the City Center neighborhood. Community facilities in the Lynnwood portion of the study area include the Interurban Trail, Group Health Lynnwood Medical Center, Scriber Creek Park, Mini Park at Sprague's Pond, Scriber Lake Park, River of Life Christian Center, Harvest Time Church, and Washington Department of Social and Health Services (DSHS) social service offices, which includes the Children's Administration, Community Service Office, Division of Development Disabilities, Home and Community Service, and Vocational Rehabilitation (Figure 3.5-1a). The affected environment for the BNSF storage tracks is discussed below under the BNSF Alternative and BNSF Modified Alternative.

3.5.3.2 BNSF Alternative and BNSF Modified Alternative

The BNSF Alternative and BNSF Modified Alternative sites are located in the Bel-Red Corridor in the City of Bellevue which is planned for mixed-use employment and residential development characterized by a transit-oriented, nodal development pattern. The area is currently characterized mostly by commercial, industrial, and medical-related land uses around the Overlake Hospital Medical Center. The Seattle Children's Hospital: Bellevue Clinic and Surgery Center is the closest medical facility to the study area, approximately 800 feet to the southwest. This area also includes industrial land uses such as the King County Metro bus base and distribution facilities located directly east of the sites. There are a limited number of residents located to the west of the BNSF Alternative site and BNSF Modified Alternative site between 116th Avenue NE and Interstate 405 (I-405); otherwise, there are no residential communities in the immediate vicinity of the study area. Major roadways in the surrounding area include I-405 to the west, SR 520 to the north and Bel-Red Road to the south. The only community facilities in the study area are All Saints Episcopal Church and the Hidden Valley Sports Park located in the Hidden Valley neighborhood.

3.5.3.3 SR 520 Alternative

The SR 520 Alternative site is also located in the Bel-Red Corridor in the City of Bellevue. SR 520 acts as a barrier between the Bridle Trails neighborhood and the SR 520 Alternative site. Generally, land uses surrounding the site include industrial uses or commercial strip malls and office parks. Based on this mix of land uses and lack of a residential component within the immediate vicinity of the SR 520 Alternative site, there is little to no community character in the areas south of SR 520. However, some businesses within the study area do appear to cater to an Asian and Middle Eastern

community. While there is not a strong community or neighborhood character in the immediate surroundings of the SR 520 Alternative site, the Bridle Trails neighborhood located to the north of the site can be classified as a cohesive neighborhood with strong community character based on the availability of community facilities and residential character of the neighborhood. These community facilities include Viewpoint Park, Cherry Crest Mini Park, and Westminster Chapel, all of which are generally located along NE 24th Street. Other community facilities in the study area include the Cornerstone Church administrative offices, Seattle Formosan Christian Church (administrative/activity center), Blue Sky Church, and the Bellevue Highlands Park and Community Center.

3.5.4 Environmental Impacts

The analysis of potential impacts of the proposed build alternatives on neighborhoods considers the following key neighborhood and community issues: changes in neighborhood quality, barriers to social interaction, impacts on community resources, and impacts on public services, safety, and security. As previously stated, much of the impacts evaluation in this section is based on analyses conducted for other sections of this Draft EIS. Impacts from these resources do not automatically constitute an adverse social impact or impact on neighborhood cohesion[1]. Rather, these impacts are evaluated collectively with design and mitigation measures for their impacts on community facilities and neighborhoods.

3.5.4.1 No Build Alternative

The No Build Alternative would avoid property acquisitions and other related changes associated with construction and operation of the OMSF. The Edmonds School District anticipates developing a district support center that would include administrative offices and bus maintenance and storage on a portion of the Lynnwood site. Therefore, neighborhood quality at the Lynnwood Alternative site may change under the No Build Alternative.

3.5.4.2 Impacts Common to All Build Alternatives

Construction Impacts

Construction of any of the build alternatives would temporarily affect neighborhood quality; it would result in the presence and movement of equipment and materials, clearing and exposure of soils, and storage of construction materials. Temporary increases in noise, dust, and traffic (from construction vehicles and haul routes) would occur in the vicinity of each of the build alternative sites, which would be noticeable in neighborhoods and community facilities within the study area. A construction transportation management plan addressing site access, traffic control, hauling routes, construction employee parking, and pedestrian and bicycle control in the area would be prepared.

[1] *Cohesion* is defined as the extent to which residents have a sense of belonging to their neighborhood and considers the interactions between the residents and the resources located in that neighborhood.

Operational Impacts

Once operational, the proposed project would reduce total trips generated from the build alternative sites, resulting in an overall reduction in traffic on surrounding streets. In addition, all of the build alternatives would facilitate extending Sound Transit service in the study area, which would reduce traffic.

Sound Transit would incorporate measures to help minimize impacts of the proposed project on social interaction, community facilities, and neighborhood quality.

- Sound Transit would coordinate with public service providers prior to construction on detour routes and lane closures to ensure access for emergency response vehicles is maintained.
- Sound Transit would compensate the affected property owners and provide relocation assistance.
- Sound Transit would coordinate with the Cities of Lynnwood and Bellevue to ensure that impacts on circulation are minimized and emergency access is maintained.

3.5.4.3 Lynnwood Alternative

Construction Impacts

Construction of the Lynnwood Alternative would temporarily alter access to the Interurban Trail. In addition to being a major recreational resource for the neighborhoods in the study area and throughout Snohomish County, the Interurban Trail also represents a major nonmotorized connection between the study area neighborhoods to the south of the Lynnwood Alternative site and the Lynnwood City Center area, as well as Alderwood Mall, the main commercial center in the city. The trail would be detoured around the construction site with minor effects on accessibility during construction, and connections between communities would be maintained.

There are no residents in the immediate vicinity of the BNSF Storage Tracks. The only community facility in the vicinity is the All Saints Episcopal Church. The church is more than 1,000 feet from where construction would occur and separated by intervening development. No impacts on neighborhoods, residents, or community facilities, would result from construction of the BNSF Storage Tracks.

Operational Impacts

The Lynnwood Alternative would displace the office building located at 20311 52nd Avenue W, which houses Washington State DSHS offices. The DSHS offices would be displaced by the Lynnwood Alternative, but these offices could be relocated. Accordingly, operation of the proposed project would not result in a permanent reduction in the availability of social services. A permanent aerial easement would be required over the Interurban Trail; however, long-term usability of the trail would remain unaffected. Access to surrounding community facilities would not be affected and access for emergency vehicles would remain unchanged. This alternative would also not adversely alter transportation conditions, including neighborhood accessibility or traffic levels.

While no residential displacements would occur, the OMSF would replace the existing commercial and vacant land/open space uses. Noise could increase for residents located closest to the OMSF along 52nd Avenue W. As described in Section 3.8, Noise and Vibration, noise impacts would be mitigated and would not affect the quality of the neighborhood or alter the neighborhood character. Changes to existing settings of recreational resources adjacent to the Lynnwood Alternative site (Scriber Creek Park, Scriber Creek Trail, and the Interurban Trail) would not affect the long-term usability of these resources, and they would continue to function with little effect on the overall character of the surrounding neighborhood.

Operation of the BNSF Storage Tracks would have no impacts on neighborhoods, residents, or community facilities.

3.5.4.4 BNSF Alternative and BNSF Modified Alternative

Construction Impacts

No construction impacts other than those identified as common to all build alternatives have been identified. There are no residences in the vicinity of the BNSF Alternative and BNSF Modified Alternative sites and construction activities in the vicinity of All Saints Episcopal Church would not affect the church because of intervening distance (over 700 feet) and development.

Operational Impacts

Upon completion of construction, the BNSF Alternative or the BNSF Modified Alternative would have little to no impact on neighborhoods due to the distance between the alternative sites and the nearest residences and community facilities. The separation of the OMSF and the Hidden Valley neighborhood near I-405 would make the OMSF not visible or otherwise noticeable to the Hidden Valley neighborhood. No access changes to the Hidden Valley Sports Park would occur and community interaction would remain unaffected. Access and circulation in and around the Overlake Hospital Medical Center would also remain unaffected by OMSF operations under both alternatives, and no impacts on emergency response times would occur. Planned development in the area envisions a mixed use, transit-oriented nodal development area. The OMSF would introduce a land use that would be inconsistent with the planned transit-oriented nodal development. However, the OMSF would replace existing industrial uses with a transportation use, which is compatible with existing surrounding uses, including the King County Metro bus base. Existing community quality and character would not be altered; however, the OMSF would not be consistent with the planned land use for the area.

3.5.4.5 SR 520 Alternative

Construction Impacts

No residences are located close to the SR 520 Alternative site, construction impacts on neighborhoods and communities would be minor.

Operational Impacts

No acquisition of residential property would occur as a result of the SR 520 Alternative. The SR 520 Alternative would result in displacement of two Asian church facilities (Cornerstone Church administrative offices and Seattle Formosan Christian Church, Ministry at Eastside Facility); however, these spaces house administrative offices or weekend youth activities and are not primary places of worship. Several businesses that cater to an Asian and Middle Eastern population (Chinese acupuncturists, Cathay Bank, and Persepolis Specialties Café, a Persian grocer and deli) would also be displaced. While approximately 101 commercial businesses would be displaced under the SR 520 Alternative, the surrounding neighborhoods do not depend on these businesses for employment or community identity, and these businesses and facilities would be relocated or otherwise compensated under the Sound Transit acquisition and relocation policies. The OMSF would replace the existing commercial uses with a transportation use, which is compatible with surrounding uses. Therefore, operation of the SR 520 Alternative would have little impact on the existing neighborhood quality and character of the SR 520 Alternative site, and access to community facilities would be unaffected.

3.5.5 Indirect and Cumulative Effects

Indirect impacts to social, community facilities, and neighborhood resources often relate to changes in land use or other changes that result in effects on the rate or pattern of development in an area. Because the project would result in a change in land use, converting vacant and/or commercial/industrial land to a transportation use there is potential for indirect effects to neighborhood character from changes in development patterns. Please see Section 3-3, Land Use for discussion of these changes and the compatibility of the project with established plans and policies that govern development in the area.

Cumulative impacts could occur if several projects nearby were constructed at the same time, such as in the Bel-Red area where the City of Bellevue has adopted land use plan changes and private development could occur at the same time as the proposed project, as well as the East Link project. The *East Link Project Final EIS* noted that East Link, in conjunction with other projects related to transit-oriented development, would result in primarily beneficial cumulative impacts on neighborhoods (Sound Transit 2011). Areas surrounding the BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative sites do not have strong neighborhood presence and there are few community facilities that could be affected by future development.

The *Lynnwood Link Extension Draft EIS* (Sound Transit 2013) notes that social and neighborhood character adjacent to the project corridor would change only somewhat with the construction and operation of the Lynnwood Link Extension (Sound Transit 2013). The proposed project, as well as the Lynnwood Link Extension, would occur along the I-5 corridor where neighborhoods and community resources are less prevalent. Changes to the neighborhood character would occur from the operation of the proposed project and other foreseeable projects because new transportation/transit networks and their associated support facilities would be introduced to the

area replacing vacant land and commercial office land uses which may result in visual and noise impacts on the neighborhood to the west of the Lynnwood Alternative site.

3.5.6 Potential Mitigation Measures

Specific design features, best management practices (BMPs), project commitments, and mitigation measures for construction and operation of the proposed project are described in detail in other sections of this Draft EIS, including Section 3.3, Land Use; Section 3.4, Economics; Section 3.7, Air Quality and Greenhouse Gases, Section 3.8, Noise and Vibration, Section 3.15, Public Services; Section 3.18, Parklands and Open Space; and Appendix E.1. No additional mitigation measures related to social impacts, community, and neighborhoods would be required.

3.5.7 Environmental Justice

The assessment of environmental justice impacts is required by Presidential Executive Order 12898, Federal Actions to Address Environmental Justice to Minority Populations and Low-Income Populations (February 11, 1994); the U.S. Department of Transportation (USDOT) Order 5610.2, Actions to Address Environmental Justice in Minority Populations (April 1997); and the USDOT Order 5610.2(a) (May 2, 2012), updating the USDOT policy to consider environmental justice principles in all programs, policies, and activities. These orders, along with FTA guidance (FTA Circular 4703.1), requires agencies to (1) avoid, minimize, and mitigate disproportionately high and adverse effects on minority and low-income populations; (2) ensure full and fair opportunities for public involvement by members of minority and low-income populations during project planning; and (3) prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

The discussion below summarizes the environmental justice analysis provided in Appendix C. The purpose of the analysis was to determine whether the OMSF project would result in any disproportionately high and adverse impacts on minority and/or low-income populations. The analysis concludes that, after proposed mitigation and design elements are implemented, the OMSF is not expected to result in any disproportionately high and adverse impacts on minority and low-income populations.

U.S. census data was used to determine the demographic characteristics of each alternative and the surrounding area within a 0.5-mile radius. None of the alternative sites contain residential properties. The BNSF Alternative and BNSF Modified Alternative study areas are industrial or commercial in nature. The Lynnwood Alternative study area has the largest presence of low-income populations, and a small pocket with a high minority population. Construction and operational impacts associated with the Lynnwood Alternative, such as noise, ecosystems, and water resources, would be similar in intensity and scope for all populations. Impacts would be mitigated such that they would not be considered high and adverse for minority and low-income populations. The Lynnwood Alternative would displace a Washington DSHS office that typically serves low-income and other disadvantaged populations throughout the County and State. As described in Section 3.2, Acquisitions, Displacements, and Relocations, Sound Transit would provide relocation assistance,

and current vacancy rates indicate that there is available space in Lynnwood where these offices could be relocated.

The SR 520 Alternative would displace several businesses and two church facilities that serve the Asian population. The church facilities include administrative offices and weekend youth activities and are not primary places of worship. The displaced businesses and church facilities would be compensated and relocation assistance would be provided. Section 3.2 Acquisitions, Displacements and Relocations, discusses these impacts and identifies mitigation measures that would address these property-related impacts. Based on current market vacancy rates, relocation within the City of Bellevue would likely be possible. All other construction and operational impacts identified in the Draft EIS would be mitigated such that they would not be considered high and adverse.

As part of the proposed project public outreach, Sound Transit has engaged diverse minority and low-income populations throughout the planning and development process. Sound Transit has held numerous events and implemented tools to engage and communicate with the public, including scoping meetings, workshops, fact sheets and handouts, posters and display advertisements, stakeholder briefings, and a project website that is regularly updated. Sound Transit has contacted service providers and community groups to help connect with minority and low-income groups, and will continue to engage these groups throughout the project process. Language translations for notices and literature have been offered in Chinese, Mandarin, Hindi, Japanese, Korean, Russian, Spanish, and Vietnamese. Fact sheets, articles for newsletters, websites, or other communication tools used by service providers and community groups can be translated upon request and interpretation services have also been offered on public notices. Public outreach and other tools to identify and engage minority and low-income populations will continue throughout the project during key project milestones. Public involvement in the proposed project is described in Appendix B, *Public Involvement and Agency Coordination*.

The proposed project (under any build alternative) would not result in any effects that would be considered high and adverse under Executive Order 12898 and the DOT Order. Project impacts would be mostly limited in scope and others would be mitigated through implementation of mitigation measures. Indirect benefits of the proposed project would include improving regional connectivity and mobility by a reliable, efficient, and affordable means of transportation for populations reliant on public transit.

3.6 Visual and Aesthetic Resources

This section discusses the potential visual effects of the proposed project. Natural and constructed structures encompass the visual environment and affect the experience of the viewer. The extent to which the viewer's experience and visual environment may be affected by the proposed project is assessed.

3.6.1 Introduction to Resources and Regulatory Requirements

3.6.1.1 Existing Viewer Groups

Viewer groups at the build alternative sites may include bordering residential viewers; recreational viewers using the park, trails, and local roadways; motorists on local roadways; and workers and patrons of businesses adjacent to the build alternative sites. Residential viewers consist of those in one- or two-story single-family homes and in multifamily dwellings such as apartments or condominiums.

Residents are likely to have moderately high sensitivity to visual changes to the build alternative sites because of extended viewing times, a higher sense of ownership of views, and familiarity with the developed landscape.

Recreationists include users of local parks, cyclists, pedestrians, runners, and joggers. Recreationists using local parks, roadways, and sidewalks are more likely to regard the natural and built surroundings as a holistic visual experience. However, they are likely to have moderate visual sensitivity due to the developed nature of the project vicinity and the focus on passing traffic, other recreationists, and other nearby activities.

Motorists use roadways at varying speeds; normal highway and roadway speeds differ based on the traveler's familiarity with the route and roadway conditions (e.g., presence or absence of rain). Viewer sensitivity is moderately low among most motorists in these viewsheds, which become familiar to frequent viewers. Furthermore, at standard roadway speeds, views are of short duration and roadway users are primarily focusing on surrounding traffic, road signs, and their immediate surroundings, with generally fleeting views of visual features.

Businesses are often oriented toward local roadways, surrounded by parking lots that separate the building from the roadways. Few businesses have direct views of the build alternative sites. Local businesses are accustomed to traffic on roadways and activity in the parking lots and on local streets. Workers and patrons are more focused on their daily operations associated with the businesses, as opposed to the surrounding landscape. Because of this, workers and patrons would have low sensitivity to visual impacts from the proposed project.

3.6.1.2 Visual Quality

An evaluative appraisal of the existing visual quality is based on the following three criteria:

- **Vividness.** The memorability of the visual impression received from contrasting landscape elements as they combine to form a striking and distinctive visual pattern.
- **Intactness.** The integrity of visual order in the natural and constructed landscape, and the extent to which the landscape is free from visual encroachment.
- **Unity.** The degree to which the visual resources of the landscape join to form a coherent, harmonious visual pattern. Unity refers to the compositional harmony or compatibility of landscape elements.

Once each landscape unit is evaluated for its vividness, intactness, and unity, it is categorized as having low, moderate, or high visual quality.

- **Low visual quality.** Areas may be visually disjointed, degraded, or jumbled, with no cohesion.
- **Moderate visual quality.** Areas may be pleasing to the eye, but lack dramatic or memorable features. Visual conditions in the region are commonly of moderate quality.
- **High visual quality.** Areas must clearly or dramatically exhibit the character of the region, and be distinct, unique, or memorable. Dramatic terrain or exceptionally memorable urban areas may fall into this category.

3.6.2 Methods

The study area for visual and aesthetic resources consists of the landscape units that encompass each build alternative site. All of the build alternative sites are within an urbanized setting, made up largely of warehouses and commercial and industrial land uses that are bordered by residential land uses and intermixed with small areas of open space. These locations can be characterized as landscape units, which are defined by their similar visual feature and homogeneous character. The landscape units were determined by identifying ridgelines and high points in the immediate area around the build alternative sites.

This assessment of visual impacts was conducted in accordance with the *Visual Impact Assessment for Highway Projects* by the Federal Highway Administration (1988). Impacts were evaluated using computer-generated visual simulations that depict before and after images for the build alternatives, based on the conceptual design plans and profiles provided in Chapter 2, Alternatives Considered (Figures 2-4 through 2-7) and in Appendix G, *Conceptual Plans*. Landscape units were assessed using key observation points (KOPs), which provide representative examples of available views of the build alternative sites and their associated viewsheds (Figures 3.6-1 through 3.6-3).

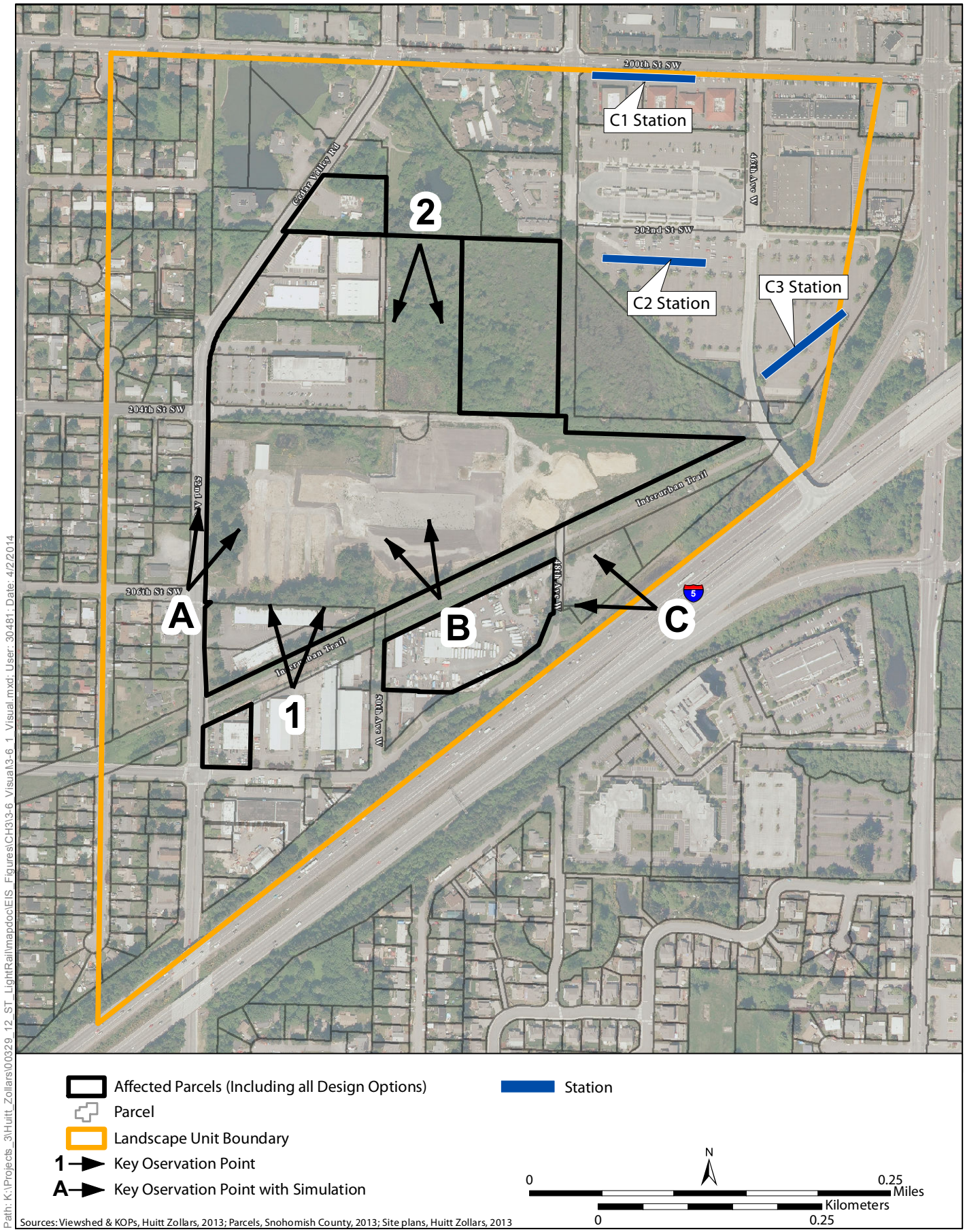


Figure 3.6-1: Lynnwood Alternative—Viewshed and KOPs
Sound Transit Link Light Rail OMSF Draft EIS

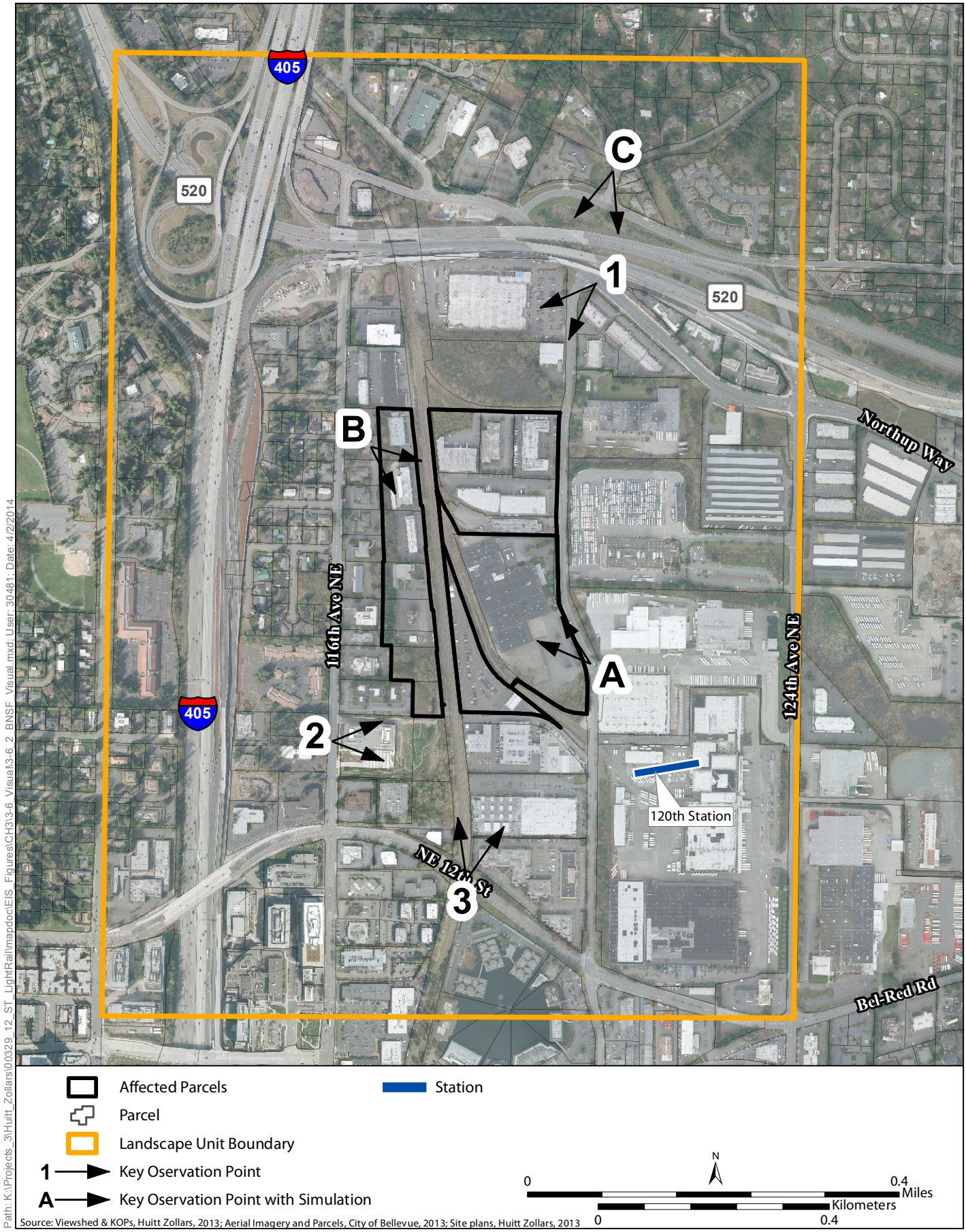


Figure 3.6-2: BNSF Alternative, BNSF Modified Alternative, and BNSF Storage Tracks—Viewsheds and KOPs
Sound Transit Link Light Rail OMSF Draft EIS

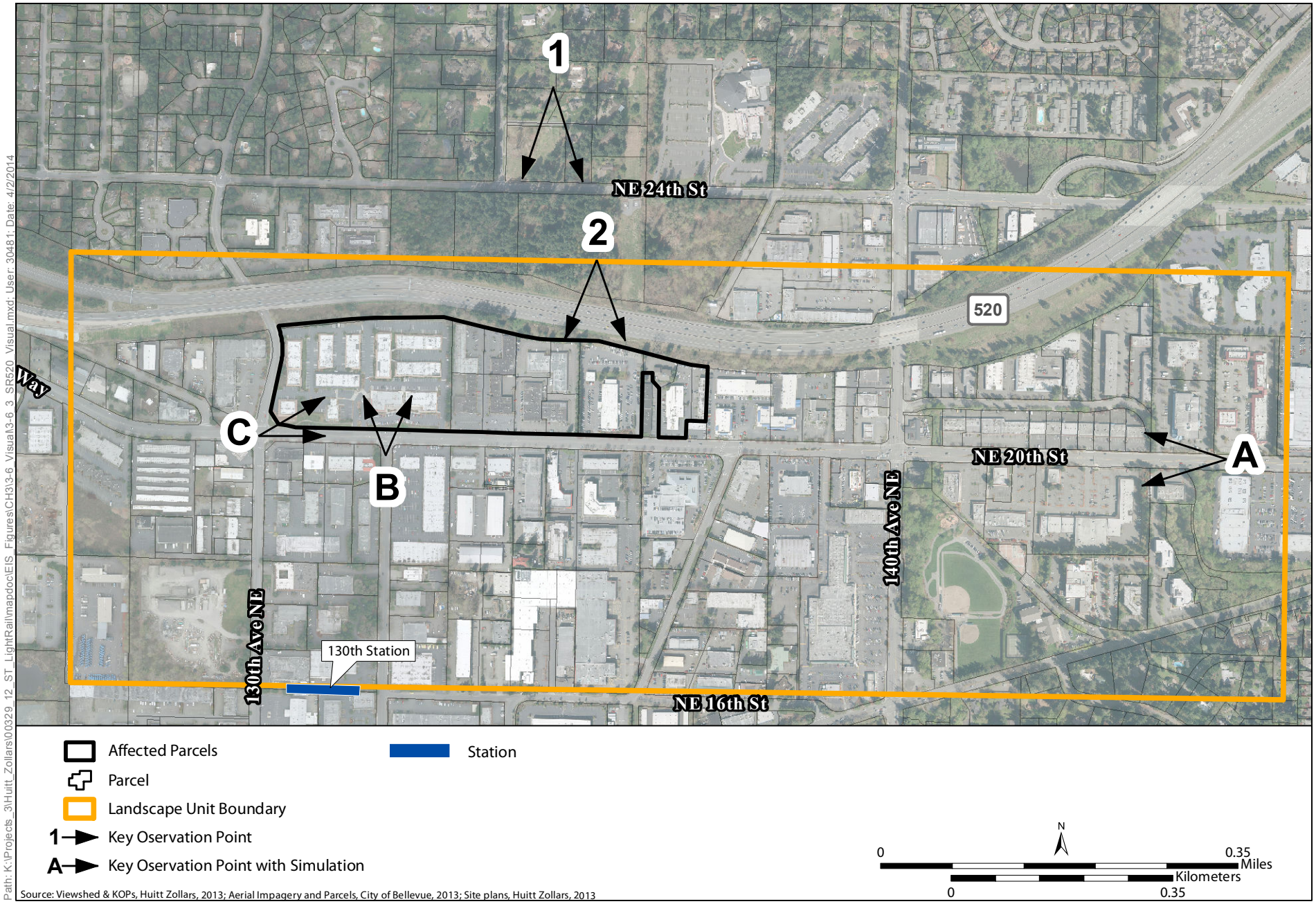


Figure 3.6-3: SR 520 Alternative—Viewshed and KOPs
Sound Transit Link Light Rail OMSF Draft EIS

The KOPs were established considering number of viewers, length of time a typical observer would see the view, and proximity of viewers to the build alternative sites. The presence of vegetation was not considered when identifying the larger landscape unit boundaries because screening provided by vegetation may be altered by human actions such as clearing for development and natural phenomena such as fire. Vegetation was considered in the KOP analysis because of the impact vegetation may have on the viewer's perspective.

Simulated KOPs were chosen to represent the most sensitive views based on number of viewers, length of time a typical observer would see the view, and proximity of viewers to the build alternative site and their locations (Figures 3.6-1 through 3.6-3). Simulated KOPs include conceptual future landscaping because landscape plans have not been developed. The future conditions also represent other proposed light rail alignments such as the Lynnwood Link Extension.

3.6.3 Affected Environment

Viewer sensitivity or concern is based on the visibility of resources in the landscape, the proximity of viewers to the visual resource, the relative elevation of viewers to the visual resource, the frequency and duration of views, the number of viewers, and the types and expectations of individuals and viewer groups. The criteria for identifying the importance of views are related in part to the position of the viewer relative to the resource. Generally, the closer a resource is to the viewer, the more dominant it is and the greater is its importance to the viewer. Also, visual sensitivity is higher for views seen by people who are driving for pleasure and people engaging in recreational activities such as hiking, biking, or camping; and homeowners. Sensitivity tends to be lower for views seen by people driving to and from work or as part of their work (Jones et al. 1975; U.S. Forest Service 1995; Federal Highway Administration 1988; U.S. Soil Conservation Service 1978). Views from recreation trails and areas, scenic highways, and scenic overlooks are generally assessed as having high visual sensitivity.

In general, most views of the build alternative sites are foreground views available from vantages within 400 to 500 feet of, and immediately adjacent to, the sites. Environmental elements such as buildings, vegetation, infrastructure, and terrain act to block views of the sites from foreground vantages beyond 500 feet, and from middle-ground and background vantages. However, the sites are visible from a few higher locations where topography, lack of tall vegetation, or multistory buildings at an elevated vantage allows for such views. Similarly, a small number of views are available from vantages at lower elevations, looking upward.

Three landscape units encompass the four build alternative sites—Lynnwood, BNSF, and SR 520—and are discussed under their respective alternative. Table 3.6-1 lists the landscape units and associated build alternatives, along with their respective visual quality rating and viewer groups.

Table 3.6-1. Landscape Units, Existing Visual Quality Rating, and Existing Viewer Groups

Landscape Unit (Alternatives)	Vividness	Intactness	Unity	Visual Quality Rating	Predominant Viewer Groups
Lynnwood (Lynnwood Alternative)	Low to Moderate	Moderate	Moderate	Moderate	Residents, recreationists, motorists, and workers/patrons
BNSF (BNSF Storage Tracks BNSF Alternative BNSF Modified Alternative)	Low	Low	Low	Low	Workers/patrons
SR 520 (SR 520 Alternative)	Moderate	Moderate	Low to Moderate	Moderate	Workers/patrons

3.6.3.1 Lynnwood Alternative

The Lynnwood landscape unit, which would encompass the Lynnwood Alternative site, is bounded to the north by Cedar Valley Road, Scriber Creek Park, and Scriber Creek Trail; to the east by vacant parcels that are vegetated wetland areas; to the south by the Interurban Trail, warehouse development, and Interstate 5 (I-5); and to the west by residential development. The site is mostly vacant with commercial development located north of 204th Street SW and warehouse development north of the Interurban Trail. Nearby viewers include residents west of 52nd Avenue W; recreationists using the park, trails, and local roadways; motorists on local roadways; and workers and patrons of businesses on and adjacent to the Lynnwood Alternative site.

The landscape unit is partially vegetated with mature trees and shrubs. Portions of the Lynnwood Alternative site and the area surrounding it are gently rolling. Wooden utility poles, overhead streetlights, signage, and various types of fencing are visible in the landscape. Existing lighting within the landscape unit consists of exterior safety and landscape lighting, interior lighting associated with residential and commercial buildings, and lighting associated with parking lots and street and traffic lights. The gently rolling terrain, combined with mature trees and shrubs on the site and lining local roadways, limits views toward the site. However, intermittent views are available from vantages where breaks in vegetation allow for views. Views of the site would be available to viewers traveling south on I-5 (Figure 3.6-1, KOP C). From the existing Lynnwood Transit Center/Park and Ride facility, views of the site are blocked by vegetation, buildings, and the ramp. Viewers may see parts of the site from above as they travel south on the ramp leaving the Park and Ride facility. Views from Scriber Creek Park are also limited and screened by vegetation (Figure 3.6-1, KOP 2). The site is visible to Interurban Trail users as they travel on the portion adjacent to the site (Figure 3.6-1, KOP B). The site is not visible from lower vantage points. See Photographs 1, 3, and 5 in Appendix F.3, *Visual Simulations and Key Observation Point Analysis*, for views of the site from the surrounding area.

This urbanized landscape unit is a mix of residential, industrial (distribution and manufacturing), or commercial (automobile-dependent businesses with parking areas) uses with gently rolling terrain and areas of mature vegetation that is common to the region. These areas are not very distinct within the regional context and are moderately low in memorability or vividness. Scriber Creek Park is a recreational area that has moderate vividness because it offers a valued natural recreational area within an urban setting. Mature trees and shrubs are an attractive element in the landscape unit that helps to soften the appearance of the built environment. However, disjointed land uses and wooden utility poles, overhead streetlights, signage, and various types of fencing detract from the views in the landscape unit and contribute to a moderate intactness and unity. The overall visual quality of the Lynnwood landscape unit is moderate. Table 3.6-1 summarizes the visual quality rating for the Lynnwood landscape unit.

The landscape unit for the BNSF Storage Tracks is discussed under the BNSF Alternative and BNSF Modified Alternative section.

3.6.3.2 BNSF Alternative and BNSF Modified Alternative

The BNSF landscape unit, which would encompass the BNSF Alternative, BNSF Modified Alternative, and BNSF Storage Tracks associated with the Lynnwood Alternative, is bounded on the north by a vacant wooded parcel, on the east by industrial and warehouse uses along 120th Ave NE, to the south by office and industrial uses, and to the west by office uses. Viewers in the area would include workers and patrons at the industrial, warehouse, and office facilities. The site is visible in the background for some viewers traveling out of the Bridle Trails neighborhood at 120th Ave NE and NE 26th Place, which is at higher elevation and north of State Route (SR) 520 compared to the landscape unit (Figure 3.6-2, KOP C). See Photographs 19, 23, and 25 in Appendix F.3 for views of the site from the surrounding area.

This area is characterized by a mix of industrial (distribution and manufacturing) and commercial (numerous automobile-dependent businesses with large parking areas) uses. Office/medical office space is located along 116th Avenue NE, including Children's Hospital southwest of the site. The surrounding topography is hilly. Mature street trees and parking lot landscaping are the primary vegetation. There are tracts of mature vegetation to the north and south of the site. The industrial nature and lack of natural features in the area lead to a generally utilitarian appearance and low memorability or vividness. The disjointed uses and lack of unifying elements such as landscaping and streetscape design lead to a lack of visual cohesiveness and low visual intactness. The overall visual quality of this landscape unit is low. Table 3.6-1 summarizes the visual quality rating for the BNSF landscape unit.

3.6.3.3 SR 520 Alternative

The SR 520 landscape unit, which would encompass the SR 520 Alternative site, is bound on the north by SR 520, and on the east, west, and south by commercial developments. Viewers in the area include workers and patrons of the surrounding commercial developments. The site is in the foreground for viewers traveling along Northup Way and 130th Avenue NE (Figure 3.6-3, KOP C), as well as for employees and patrons of the businesses across the street from the site (KOP B, Figure 3.6-3). Views from areas north of SR 520 are blocked by vegetation and landforms (Figure 3.6-3, KOP 1 and KOP 2). See Appendix F.3, Photographs 33, 35, and 37 for views of the site from the surrounding area.

This area is characterized by industrial (distribution and manufacturing) and retail commercial (strip mall) uses. The surrounding topography is hilly. Vegetation primarily consists of street trees and parking lot landscaping. These areas are utilitarian in appearance and have a moderate degree of memorability or vividness. The mix of land uses and their generally homogeneous appearance creates an area that is moderate in visual intactness. SR 520 is a major visual encroachment along the site. The area surrounding the site is low to moderately unified in terms of having a retail character. The overall visual quality of this unit is considered moderate. Table 3.6-1 summarizes the visual quality rating for the SR 520 landscape unit.

3.6.4 Environmental Impacts

The degree of change to the visual environment resulting from the proposed project may be high, moderate, or low. A high degree of change would be the inclusion of a feature that is prominent or incompatible with the surrounding landscape that would substantially lower the overall visual quality. These changes would be visually jarring or intrusive. This may include substantial reduction of a prominent or visually pleasing feature or mature vegetation. A moderate degree of change would be the inclusion of a feature that is noticeable but still compatible with the surrounding area that would lower the overall visual quality. A low degree of change would include additions or revisions to features of the site that are not substantially different from the current visual quality. Low degrees of change would blend in with the current visual quality, would not be intrusive, and would not lower the overall visual quality.

3.6.4.1 No Build Alternative

Under the No Build Alternative, the proposed project would not be built. Future population and employment growth are assumed as described in adopted plans, but without the proposed project. Visual quality within the region may incrementally change as a result.

3.6.4.2 Impacts Common to All Build Alternatives

Construction Impacts

Natural and Constructed Viewscape

Construction impacts would be temporary in nature but would be visible to most viewer groups. Construction is anticipated to last 35 to 45 months, depending on the site and final design. Demolition of existing structures may affect the visual form of the site, including removal of

buildings, trees, and roads. Mature trees or large areas of vegetation may be removed. Staging areas may contain stockpiles of materials, lighting, signage, fences, and presence of large equipment such as cranes, scaffolding, and earth-moving equipment. Additional trucks and equipment may be travelling to and from the site. The construction site would represent a visual nuisance for the surrounding viewers; however, it would be typical of building projects in urban areas.

Measures to reduce construction impacts on the visual environment may include installing visual barriers around construction zones and staging areas to obstruct undesirable views. The visual barrier may be chain-link fencing with privacy slats, fencing with windscreen material, wood or concrete barrier, or another similar barrier like a perimeter wall.

Lighting

Additional lighting may be required to support construction activities. Nighttime construction would be avoided if possible. If nighttime work does occur, the construction contractor would minimize project-related light and glare, given safety considerations. Portable lights may be operated at the lowest allowable wattage and height would be minimized. Lights would be screened and directed downward toward work activities and away from the night sky and nearby residents. The number of nighttime lights used would be minimized.

Operational Impacts

Natural and Constructed Viewscape

Operational impacts would include the visual impacts of the built facilities (maintenance building, office spaces, shops, and covered storage areas) and infrastructure (parking and paved areas, tracks, switches, catenary power lines, a traction power substation, and signals). The following impacts would be common to all build alternatives.

- Changes to landforms through grading and addition of retaining walls.
- Changes to building mass, such as removal of existing buildings and construction of new structures.
- Changes to vegetation, such as removal of existing vegetation and planting of new vegetation.
- Changes to the skyline.

Each site's context with the surrounding community would vary with the comprehensive plans, overlay zones, and development standards that would govern building setbacks, heights and massing, landscaping, facade treatment, urban design character, etc. As described in Chapter 2, Alternatives Considered, landscaping treatments may be used to enhance the visual character of the build alternative site. Such treatments may include incorporating small trees, shrubs, and lower-profile herbaceous vegetation into perimeter fence line and parking lot landscaping, as appropriate, to diversify the visual landscape. Other elements may include treatment of blank walls, incorporation of a variety of architectural finishes and lighting treatments, and using articulation of the building in plan and elevation to break up visual massing of the building elements. These

measures would help to maintain the local character, improve aesthetics, and reduce the visual scale of proposed project. The project designers and contractors would adhere to the landscape guidelines proposed in Sound Transit's *Design Criteria Manual,* and would meet code requirements of each local jurisdiction. Context-sensitive design elements could include the following items.

- Landscaping at the perimeter of the build alternative site.
- Streetscape elements along adjacent frontage streets, such as sidewalks, street trees, and other aesthetic features.
- Architectural features on the buildings, including varying materials and articulation of the plan and elevation to minimize visual massing.
- Screening of parking and storage areas.
- Lighting aimed to reduce spillage onto neighboring properties.

Lighting

Additional lighting would be installed to support traffic, safety, and operations at the site. A lighting plan has not yet been prepared, but it is assumed that minimum lighting standards will be applied. Exterior lighting would be similar to the existing Forest Street Operations and Maintenance Facility (Forest Street OMF), which has light poles up to 80 feet high and exterior lighting on the buildings.

Design measures used to reduce light pollution should employ the technologies available at the time of project design to allow for the highest potential reduction in light pollution.

3.6.4.3 Lynnwood Alternative

Construction Impacts

Construction impacts of the Lynnwood Alternative would be the same as those discussed in Section 3.6.4.2, Impacts Common to All Build Alternatives.

Operational Impacts

The Lynnwood Alternative site is currently partially developed. The Lynnwood Link Extension would dominate the visual landscape from most viewpoints once constructed. Therefore, the OMSF Lynnwood Alternative would not result in a substantial change to the visual environment in most areas, depending on the Lynnwood Link Extension alternative chosen. Most viewers near the site, except for users of the Interurban Trail, have low to moderate sensitivity to change in visual landscape. For the trail users, the visual change that would occur as a result of the proposed project would not be substantial (Appendix F.3, Photographs 4, 10, and 16). Views from Scriber Creek Park are limited, and residential viewers would have moderate sensitivity to change.

Under all design options, the elevated lead tracks would be visible to Interurban Trail users because the tracks cross over the trail. Viewers along I-5 would have limited views of the building under all design options because of landforms and existing structures (Appendix F.3, Photographs 6, 12, and

18). Under Design Option C3, the Lynnwood Link Extension alignment would be in the foreground and would dominate the view from I-5 (Appendix F.3, Photograph 18).

The elevated lead tracks for Design Option C3 would be in the distance and screened by mature vegetation from Scriber Creek Park and the existing residential area along 52nd Avenue W. Along 52nd Avenue W, the Lynnwood Link Extension guideway would travel along I-5 and would not dominate the view under Design Option C3 as it would under the other two design options (Appendix F.3, Photograph 14). Residents on 52nd Avenue W would see tops of the OMSF, trains, and lead tracks. A 6-foot sight-obscuring fence would surround the site and partially obscure the view.

Under Design Options C1 and C2, the elevated lead track would be visible from portions of the Scriber Creek Trail in Scriber Creek Park. Design Option C1's lead track would be partly screened by mature trees and vegetation in the southwest corner of the park. Design Option C2's lead track would be visible, but would be located on the far side of the Lynnwood Link Extension Alternative C2 alignment, which is adjacent to the trail but outside of the park. The surface of the Lynnwood Link Extension guideway traveling along 52nd Avenue W would be approximately 388 feet to 400 feet long for Design Option C1, and 396 feet to 400 feet long for Design Option C2. The guideway would be in the foreground and above the OMSF, dominating the view. The relationship between the buildings and the proposed Lynnwood Link Extension guideway is shown in the simulations along 52nd Avenue W in Appendix F.3, Photographs 2 and 8.

Landscaping would be required per the Lynnwood Municipal Code to screen the site and enhance the visual quality of the perimeter of the proposed project. A sight-obscuring fence is required per the Lynnwood Municipal Code. The proposed maximum building height of the OMSF would be approximately 32 feet, consistent with the low profile of the buildings in the surrounding area (Appendix F.3, Photographs 2, 4, 8, and 10). The top of the building would be at an approximate elevation of 381.5 feet.

The BNSF Storage Tracks would be located in an industrial area. Change in visual impact would be low because the proposed project's appearance would be consistent with existing uses (Appendix F.3, Photograph 20). Future development in this area, such as the Spring District development, may occur under the *Bel-Red Subarea Plan* (City of Bellevue 2009) that would allow higher densities and building heights, making the site visible to a larger group. An expansion of the Children's Hospital facility is also proposed. A chain-link fence would surround the site but not completely obscure visibility. Appendix F.3, Tables 1 and 2, summarize the operational impacts of the Lynnwood Alternative and BNSF Storage Tracks.

3.6.4.4 BNSF Alternative and BNSF Modified Alternative

Construction Impacts

Construction impacts of the BNSF Alternative and the BNSF Modified Alternative would be the same as those discussed in Section 3.6.4.2, Impacts Common to All Build Alternatives. The viewers near BNSF Modified Alternative site may incur additional visual impacts, because construction activity

would be adjacent to and below the rear-facing offices along 116th Avenue NE and the Children's Hospital.

Operational Impacts

Most viewers near the sites have low to moderate sensitivity to change in visual landscape. Additionally, the proposed project would not result in a substantial visual change because the building mass, size, and use are typical of the surrounding area. Therefore, these alternatives would not result in a substantial change to the visual environment. Future development in this area, including the Spring District development, which started construction in fall of 2013, may occur under the *Bel-Red Subarea Plan* (City of Bellevue 2009) that would allow higher densities and building heights, making the site visible to a larger group. An expansion of the Children's Hospital facility is also proposed and may increase visibility from that location. A chain-link fence would surround the sites on most sides; however, chain-link fencing is not allowed on street frontage per Bellevue City Code requirements. Landscaping would be required per Bellevue City Code and the provisions of the Bel-Red subarea plan that would screen the perimeter and enhance the visual quality of the proposed project. Appendix F.3, Table 3, summarizes the operational impacts of the BNSF Alternative and BNSF Modified Alternative. The simulations shown in Appendix F.3, Photographs 22, 24, 26, 28, 30, and 32, indicate that the building mass, size, and use are typical of the surrounding area.

3.6.4.5 SR 520 Alternative

Construction Impacts

Construction impacts of the SR 520 Alternative would be the same as those discussed in Section 3.6.4.2, Impacts Common to All Build Alternatives.

Operational Impacts

Most viewers in the area have a low to moderate visual sensitivity. The simulations shown in Appendix F.3, Photographs 34, 36, and 38, indicate that the building mass, size, and use are typical of the surrounding area. Viewers in the foreground would see the tops of the buildings, whose maximum height would be approximately 32 feet, and the fence surrounding the site. Light poles (approximately 80 feet high) may also be visible. Views from the Bridle Trails neighborhood north of the site are blocked by existing vegetation and landforms. Therefore, the SR 520 Alternative would not result in a substantial change to the visual environment. Landscaping would be required per the Bellevue City Code and the Bel-Red subarea plan that would screen the perimeter and enhance the visual quality of the project. A chain-link fence would surround the sites on some sides.; however chain-link fencing is not allowed on street frontage per Bellevue City Code requirements. Appendix F.3, Table 4, summarizes the operational impacts of the SR 520 Alternative.

3.6.5 Indirect and Cumulative Impacts

No indirect impacts related to visual or aesthetic resources would result from construction and operation of the proposed project.

Under Lynnwood Link Extension Alternatives C1 and C2, the light rail guideway would be elevated along 52nd Avenue W and would have a high visual impact on residents along 52nd Avenue. Alternative C3 would have no visual impact on these residents per the *Lynnwood Link Extension Draft EIS* (Sound Transit 2013). The Lynnwood Link Extension alternatives would dominate the visual change in the Lynnwood landscape unit, and the proposed OMSF project's contribution to this cumulative impact would not be substantial.

The *East Link Project Final EIS* (Sound Transit 2011) notes this project would be compatible with the areas near the storage track location in the Eastside Rail Corridor and would not change the visual quality of these areas. The guideway would be at-grade or in a retained-cut profile in this section. If construction were to overlap between the proposed OMSF project and East Link, there is potential for cumulative construction impacts. However, these impacts would be temporary and not substantial due to the lack of highly sensitive viewer groups in the immediate vicinity of the BNSF Alternative and BNSF Modified Alternative sites for the proposed OMSF project.

As stated in Section 3.6.4, Environmental Impacts, the Spring District development, which started construction in fall 2013, will allow higher densities and building heights, making the OMSF site visible to a larger group. The viewers in the upper floors of the Spring District development would have views of the BNSF Storage Tracks, BNSF Alternative site and BNSF Modified Alternative site. The OMSF would be a small part of the viewshed for these viewers. The proposed OMSF project and the Spring District development would not cumulatively result in any degradation of the existing visual environment. Other mixed-use developments or expansion of office/industrial facilities may occur on surplus lands at the OMSF build alternative sites. Future development would be in accordance with applicable land use and zoning codes that govern height and massing.

3.6.6 Potential Mitigation Measures

The proposed project would not result in visual impacts; therefore, no mitigation would be required.

3.7 Air Quality and Greenhouse Gases

This section includes background information on air quality and greenhouse gases (GHGs), impacts, and potential design and mitigation measures of the proposed project.

3.7.1 Introduction to Resources and Regulatory Requirements

3.7.1.1 Air Quality and Criteria Pollutants

Air quality regulations are developed and implemented at the federal, state, and local levels. At the federal level, the U.S. Environmental Protection Agency (EPA) is responsible for implementation of the Clean Air Act (CAA). State and local air quality regulations are implemented by the Washington State Department of Ecology (Ecology) and the Puget Sound Clean Air Agency (PSCAA), respectively.

The following federal, state, and local air quality and climate change regulations are applicable to the proposed project. Please refer to Appendix F.4, *Air Quality Analysis Details*, for additional information.

- **Clean Air Act and Ambient Air Quality Standards**: The CAA establishes the framework for modern air pollution control. The act directs EPA to establish national ambient air quality standards (NAAQS) for the following six criteria pollutants: ozone (O_3), carbon monoxide (CO), lead, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and particulate matter (PM), which consists of particulate matter 10 microns in diameter or less (PM10) and particulate matter 2.5 microns in diameter or less (PM2.5).
- **Transportation Conformity (40 Code of Federal Regulations [CFR] 51, 93; Washington Administrative Code [WAC]-173-420)**: The transportation conformity regulations ensure that transportation projects, plans, and programs affecting regional and local air quality conform to existing state implementation plans and timetables for attaining and maintaining federal health-based air quality standards.
- **PSCAA Regulation 1, Section 9.15, Fugitive Dust Control Measures**: All construction sites in the Puget Sound region are required to implement rigorous emissions controls to minimize fugitive dust and odors during construction.
- **PSCAA Air Quality Permits**: Facilities with substantial emissions are required to obtain a Notice of Construction air quality permit before construction is allowed to begin.

3.7.1.2 Greenhouse Gas Emissions

While GHG emissions are not regulated pollutants, the following initiatives provide guidance on GHG emissions and their contribution to climate change.

- **Washington State Greenhouse Gas Initiatives.** Washington State has adopted a number of policies and programs to reduce GHG emissions, including Executive Order 07-02 and Senate Bill

6001, which aims to achieve 1990 statewide GHG levels by 2020, a 50% reduction below 1990 levels by 2030, and additional reductions after 2050.

- **Ecology Implementation Working Group.** Ecology initiated a stakeholder process to develop recommendations for ensuring that climate change is considered in the Washington State Environmental Policy Act (SEPA) processes and documents. The Implementation Working Group was established to help clarify the SEPA rules and prepare important guidance information. On June 3, 2011, Ecology issued the paper *Guidance for Ecology Including Greenhouse Gas Emissions in SEPA Reviews* to assist Ecology staff in determining which projects should be evaluated for GHG emissions.

3.7.2 Methods

The study area for air quality and GHG analysis is the metropolitan Puget Sound region. Methods used to analyze the proposed project's effects on air quality are described separately for construction emissions and operational emissions.

3.7.2.1 Construction Emissions

Construction of the proposed project would generate short-term emissions of criteria pollutants (reactive organic gases [ROGs], nitrogen oxides [NO_X], CO, PM10, and PM2.5) and GHGs (carbon dioxide [CO_2], methane [CH_4], and nitrous oxide [N_2O]). Emissions would originate from on-road hauling trips, construction site fugitive dust, off-road construction equipment, and worker commute trips. Actual construction-related emissions would vary substantially depending on the level of activity, specific equipment operations, and meteorological conditions.

Because specific construction data are not yet available, construction criteria pollutant and GHG emissions are estimated separately, using the methods used in the *East Link Project Final EIS* (Sound Transit 2011). GHG emissions from construction were estimated from the diesel use in material transport and construction equipment. The estimate includes the following factors.

- Transportation of construction materials, waste, and fill material.
- Equipment used during construction site preparation.
- Construction of the OMSF facility, including buildings and rail storage and lead track.

3.7.2.2 Operational Emissions

The operational emissions from the proposed project were estimated based on two sources.

- The 2012 operational emissions at the existing Forest Street Operations and Maintenance Facility (Forest Street OMF).
- Daily vehicle trips cited in Appendix E.1, *Transportation Technical Report.*

The California Emissions Estimator Model (CalEEMod Version 2011.1.1), developed by Environ International Corporation and the South Coast Air Quality Management District (2011), was used to quantify emissions from vehicle trips. Operational emissions resulting from natural gas

and electricity were estimated using project-specific consumption data and utility-specific emission factors for the Snohomish County Public Utilities District (SnoPUD) and Puget Sound Energy (PSE), and the Washington State Department of Commerce (Burrell pers. comm.). Emissions from evaporative loss from chemicals used on site were not calculated as part of this assessment.[1] It is assumed that existing land uses at the OMSF build alternative sites would be relocated to other off-site locations within the region. Since there would be a net decrease in the number of vehicle trips (existing land uses at the build alternative sites generate more trips than OMSF operations) from the build alternative sites, it is assumed that there would be a reduction in local levels of criteria pollutants in the vicinity of the build alternative sites. Consequently, this analysis does not quantitatively evaluate criteria pollutant emissions associated with motor vehicle operations. However, GHG emissions from motor vehicles associated with the OMSF are quantified because they contribute at a global and cumulative climate change level.

There are no established state or local thresholds for the evaluation of criteria pollutant or GHG emissions from construction or operational activities. Accordingly, the context and intensity of net emissions associated with implementation of the build alternatives, relative to the No Build Alternative, were evaluated to determine the project's air quality impacts.

3.7.3 Affected Environment

The proposed project would be located between the cities of Lynnwood and Bellevue. Existing air quality conditions in the study area provide a baseline for evaluating impacts of the proposed project.

3.7.3.1 Air Quality and Criteria Pollutants

Climate in the Puget Sound region is typically temperate marine with wet, mild winters and warm, dry summers. The prevailing winds during the winter are typically from the south or southwest; in the summer months, the winds originate from the north or northeast. Wind speeds are generally sufficient to disperse air pollutants released into the atmosphere. Air pollution is most noticeable in the late fall and winter under conditions of clear skies and light winds.

Typical air pollution sources near the study area include vehicular traffic, commercial and retail businesses, light industry, and residential wood-burning devices. While many types of pollutant sources are present, the largest contributors of criteria pollutant emissions are on-road vehicles, which contribute the majority of the CO and ozone precursors (ROG and NO_X). Secondary sources of emissions are commercial and industrial land uses. Additionally, space heating and wood-burning

[1] On-site chemicals and solvents exposed to the atmosphere have the potential to indirectly release volatile organic compounds and toxic air contaminants. Quantification of emissions from evaporative loss would require a detailed inventory of on-site chemicals, as well as daily and annual usage rates for each chemical. Because this information is currently not available, a quantitative analysis to provide an accurate estimate of evaluative loss emissions is not possible and would be speculative. Given the facility size and emissions rates for evaporative loss, emissions from evaporative loss are expected to be minor in relation to emissions from vehicle and equipment use.

appliance emissions contribute to background air quality emissions, including PM. Please refer to Appendix F.4 for additional information on ROG, NO_X, CO, and PM.

Areas that meet the NAAQS for pollutants of concern are deemed *attainment areas;* areas not in compliance with the NAAQS are deemed *nonattainment areas*; areas that were formerly classified as nonattainment areas but have since demonstrated attainment with the NAAQS are classified as *maintenance areas*. Because the Puget Sound region is a maintenance area for CO, the proposed project must conform to the NAAQS for CO. The region is in an attainment area for all of the other criteria pollutants; therefore, further conformity analysis of criteria pollutants (SO_2, NO_2, O_3, particulates, and lead [Pb]) is not required.

The federal Clean Air Act requires states to develop a State Implementation Plan for protecting and maintaining air quality in all areas of the state. Proposed transportation projects requiring federal funding or approval must comply with EPA's Transportation Conformity Rule.

3.7.3.2 Greenhouse Gas Emissions

Global climate change is caused in large part by anthropogenic emissions of GHGs released into the atmosphere through the combustion of fossil fuels and by other activities such as deforestation and changes in land use. Unlike criteria air pollutants, GHGs can persist in the atmosphere for hundreds of years, where they can trap infrared radiation emitted from the Earth's surface. This phenomenon, known as the greenhouse effect, is necessary to keep the Earth's temperature warm enough for successful habitation by humans. Emissions of GHGs in excess of natural ambient concentrations; however, are responsible for the enhancement of the greenhouse effect. This trend of warming of the Earth's natural climate is termed *global warming*. The principal GHGs contributing to global warming are CO_2, CH_4), N_2O, and fluoridated compounds (e.g., sulfur hexafluoride).

3.7.4 Environmental Impacts

This section discusses impacts caused by air pollutant emissions from stationary sources and motor vehicle tailpipes. In addition, the cumulative impacts of the alternatives' contribution to regional growth, travel, and GHG emissions are addressed.

3.7.4.1 No Build Alternative

Under the No Build Alternative, stationary sources and vehicles serving the existing and proposed[2] buildings and facilities at each of the four build alternative sites would continue to emit criteria pollutants and GHGs. Projected emissions from the existing land uses at the sites are estimated from two approaches: modeling the daily trips by land-use type provided in Appendix E.1 with CalEEMod, and modeling electricity and natural gas consumption emissions with CalEEMod based on the land-use type and square footage of the existing buildings. These emissions estimates are based on the design operational year (2035). The CalEEMod model assumes that emissions will tend to decrease over time due to the implementation of improved engine emissions control technology and

[2] Proposed buildings and facilities that are unrelated to the proposed project consist of the Edmonds School District Service Center, which has been proposed to be built at the same location as the Lynnwood Alternative.

increased fuel economy, as well as turnover of older, more highly polluting vehicles for newer, cleaner vehicles. The No Build Alternative would have less light rail passenger capacity, which could result in fewer commuters using transit. These commuters may continue using automobiles instead, which would result in greater vehicular and GHG emissions.

3.7.4.2 Impacts Common to All Build Alternatives

Construction Impacts

Fugitive Dust

During construction, dust from excavation and grading could cause temporary, localized increases in the ambient concentrations of fugitive dust and suspended particulate matter. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. PM10 and PM2.5 emissions would depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operation. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site. Regardless, construction activity could cause localized fugitive dust impacts at homes and businesses near the construction site. The magnitude of potential dust impacts would vary by build alternative depending on location and acres graded.

PSCAA and the Washington State Department of Transportation (WSDOT) require the implementation of best management practices to minimize impacts of fugitive dust resulting from construction activities. Standard practices to control emissions of PM10, PM2.5, CO, and NO_x would be used during construction. These practices may also reduce GHG emissions.

Criteria Pollutants and Greenhouse Gas Emissions

Construction activities would require the use of diesel-powered, heavy trucks and equipment. These engines would emit CO, PM, NO_X, CO_2, CH_4, N_2O, and volatile organic compounds (VOCs) that could degrade local air quality in the immediate vicinity of the activity and contribute to climate change. The criteria pollutant and GHG emissions generated from construction would vary according to each build alternative's total building square footage, layout, and total project footprint.

Emissions of CO, NO_X, and VOCs are best controlled through use of new construction equipment and proper maintenance of this equipment. Use of low-sulfur diesel fuel controls emissions of SO_2. SO_2 and NO_X emissions are considered precursor to PM2.5 emissions; therefore, reductions in SO_2 and NO_X will also help reduce PM2.5 emissions. All design measures and best management practices must comply with local regulations governing air quality, including those for controlling fugitive dust during construction. Although temporary construction impacts on criteria pollutants and GHG emissions may occur, the improved operation of the expanded light rail system, which the OMSF supports, would reduce regional vehicle miles of travel and associated criteria pollutants in the region. The build alternatives would support improvements in air quality that would offset the

temporary impacts of construction. Therefore, no adverse impacts on air quality would result under any of the build alternatives.

Table 3.7-1 summarizes the maximum daily criteria pollutants and GHG emissions that would result from the construction of the build alternatives. Emissions are presented for each year of construction.

Odors

Some construction activities could cause odors detectible to some people near the activity, especially during paving operations using tar and asphalt. Such odors would be temporary and localized, and would be quickly dispersed below detectable thresholds as distance from the sites increases. Stationary equipment used for the construction activities must comply with PSCAA regulations requiring the best available measures to control the emissions of odor-bearing air contaminants (Regulation I, Section 9.11). In addition, no slash burning would be permitted in association with construction activities.

Table 3.7-1. Projected Maximum Daily Construction Emissions for Build Alternatives

	Pounds per Day					MT per year
Alternative/Year	**ROG**	**NO_X**	**CO**	**PM10**	**PM2.5**	**CO_2e**
Lynnwood Alternative						
2016	28.69	203.43	117.73	10.56	8.24	--[a]
2017	40.77	287.93	177.96	14.06	11.75	1,463
2018	53.06	365.34	250.37	17.11	14.76	385
2019	2.87	17.37	11.67	0.67	0.66	--[a]
BNSF Alternative						
2016	16.67	121.34	68.33	12.02	5.76	--[a]
2017	39.64	282.60	181.70	18.34	12.06	1,090
2018	34.23	237.47	160.78	16.46	10.18	378
2019	0.00	0.00	0.00	0.00	0.00	--[a]
BNSF Modified Alternative						
2016	16.67	121.34	71.96	5.02	5.01	--[a]
2017	27.11	184.75	114.57	16.12	8.16	1,655
2018	37.90	260.48	180.05	10.39	10.34	367
2019	21.29	138.60	104.26	14.48	6.51	382
SR 520 Alternative						
2016	16.67	121.34	71.96	5.02	5.01	--[a]
2017	27.68	189.20	116.66	15.27	8.22	1,218
2018	45.50	265.23	219.46	20.31	13.24	394
2019	14.40	88.84	68.49	11.45	4.39	--[a]

[a] GHG emissions were calculated using the same method and modeling tool used in the *East Link Project Final EIS* (Sound Transit 2011). Some auxiliary phases associated with OMSF construction are anticipated to occur in 2016 and 2019. Since they are ancillary, they would likely be below the maximum annual emissions reported for each alternative.

ROG = reactive organic gas; NO_X = nitrogen oxides; CO = carbon monoxide; PM10 = particulate matter more than 10 microns; PM2.5 = particulate matter more than 2.5 microns; CO_2e = carbon dioxide equivalent; MT = metric tons.

Operational Impacts

Operation of the new facility would consume natural gas and electricity. Natural gas consumption would generate criteria pollutant and GHG emissions that could result in air quality impacts. Three of the build alternatives were assumed to have the same annual electricity and natural gas demand, while the Lynnwood Alternative would require an additional 716,257 kilowatt hours (kWh) of electricity and 516 million metric British thermal units (MMBtu) of natural gas to account for the BNSF Storage Tracks. The Lynnwood Alternative would receive power from SnoPUD for the main facility and from PSE for the BNSF Storage Tracks. The BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative would receive power from PSE. Emission factors for SnoPUD and PSE differ based on their generation portfolios, resulting in slightly different emissions estimates.

Tailpipe emissions from vehicles traveling on public roads would be another source of air pollutant emissions associated with employee travel to and from the proposed project site. However, every build alternative would displace some existing commercial or industrial buildings and result in a net decrease in vehicle trips at that particular location (Appendix E.1). Because displaced uses are assumed to be relocated elsewhere, the net decrease in vehicle trips at each build alternative site would not eliminate emissions associated with those trips at a regional scale.

Because the differences in build alternatives would be mainly associated with project siting, and because the Forest Street OMF is used as a proxy for all alternatives,[3] operational impacts are not expected to vary widely between build alternatives. Operation of the OMSF would displace emissions emitted directly or indirectly by the existing commercial and industrial land uses on the build alternative sites, although displaced uses are assumed to be relocated elsewhere. Table 3.7-2 shows the estimated emissions associated with operation of each build alternative. The minor differences in emissions between the build alternatives are discussed below.

Conformity Determination

Conformity to the State Implementation Plan and the Transportation Conformity Rule is required both on a regional and project level. A project demonstrates regional conformity if it is included in a conforming regional transportation plan (RTP) and a regional transportation improvement program (RTIP). If the proposed project is included in PSRC's RTIP in the future, regional conformity would be demonstrated through PSRC's regional air quality conformity analysis at that time. The proposed project would not affect degraded intersections with additional traffic volumes, or worsen congestion or delay (Appendix E.1). Consequently, no evaluation of CO concentrations at intersections (i.e., CO hot-spot analysis) or other quantitative analysis consistent with project-level transportation conformity requirements is required. The traffic associated with the proposed project would not cause or contribute to any new violation of the CO standard, increase the frequency or severity of any existing CO violation, or delay timely attainment of the CO standard.

[3] Operational activities at all of the build alternative sites are assumed to be similar to those at the Forest Street OMF. No vehicle painting would occur at the proposed OMSF.

3.7.4.3 Lynnwood Alternative

Construction Impacts

Because of the various locations and configurations, each build alternative would have unique construction emissions. As shown in Table 3.7-1, construction of the Lynnwood Alternative would generate minor amounts of construction-related criteria pollutant and GHG emissions. These emissions would be short term and cease once construction is complete. There would be no adverse impact on air quality.

Table 3.7-2. Comparison of Projected Maximum Daily Criteria Pollutant Emissions and Annual Greenhouse Gas Emissions from Net Operations by Alternative[a]

	Pounds per Day				MT per year	
Alternative	**VOC**	**NOx**	**CO**	**PM_{10}**	**$PM_{2.5}$[b]**	**CO_2e[c]**
Lynnwood Alternative	0.10	1.75	1.52	0.14	0	1,457
BNSF Alternative, BNSF Modified Alternative, SR 520 Alternative	0.09	1.61	1.40	0.13	0	4,230

[a] GHG emissions include indirect emissions from electricity use. Criteria pollutant emissions do not include the indirect criteria pollutant emissions from electricity use.

[b] EPA reports PM emissions as a combination of all PM to PM10. No emission factors were provided for PM2.5 emissions from natural gas combustion, although PM2.5 is included in the EPA PM emission factor for natural gas.

[c] CO_2 emissions are calculated using the utility-specific emission factors provided by the Washington State Department of Commerce (Burrell pers. comm.) Snohomish County Public Utilities District was assumed to provide electricity for the Lynnwood Alternative and Puget Sound Energy was assumed to provide electricity for the BNSF, BNSF Modified, and SR 520 Alternatives. Emission factor data for CH_4 and N_2O were not available for SnoPUD or PSE. Accordingly, EPA's eGrid2012 emission factors for Washington State were used to calculate CH_4 and N_2O emissions for all alternatives. Note that emission factor data are based on 2011 operating conditions and may not reflect the emission factors for the electric utilities in the build year, 2020. Emission factors will likely reflect a greater amount of renewable resources in future years, suggesting that the GHG emissions may be lower than estimated.

VOC = volatile organic gas; NO_X = nitrogen oxides; CO = carbon monoxide; PM10 = particulate matter greater than 10 microns in size; PM2.5 = particulate matter greater than 2.5 microns in size; CO_2e = carbon dioxide equivalent; MT = metric tons; CH_4 = methane; N_2O = nitrous oxide.

Operational Impacts

The OMSF would consume 8.7 gigawatt hours of electricity and 65,830 therms of natural gas per year, whereas the current and the proposed school district facilities are estimated to consume 3.4 gigawatt hours of electricity and 55,322 therms of natural gas per year. As shown in Table 3.7-2, OMSF operation emissions under the Lynnwood Alternative would generate criteria pollutants, which are primarily associated with on-site natural gas consumption from space and water heaters[4], as well as GHG emissions associated with electricity and natural gas consumption and motor vehicle emissions.

[4] As previously described in Section 3.7.2.2, Operational Emissions, project-related criteria pollutant motor vehicle emissions are not characterized for the proposed project since there would be a reduction in local levels of criteria pollutants in the vicinity of the build alternative sites. Because GHG emissions are more of a global concern, project-related GHG motor vehicle emissions are characterized for the proposed project.

The results presented in Table 3.7-2 indicate the proposed project would result in criteria pollutant emissions equivalent to adding one typical passenger vehicle per year to the road (U.S. Environmental Protection Agency 2008). Given the context and intensity of the emissions presented in Table 3.7-2, they are not anticipated to exceed the NAAQS, which are presented in Appendix F.4. Operation of the Lynnwood Alternative would result in GHG emissions of 1,457 metric tons of carbon dioxide equivalent (CO_2e) per year, which is equivalent to adding 286 typical passenger vehicles per year to the road (U.S. Environmental Protection Agency 2011). These GHG emissions would be less than 0.00144% of the statewide 2008 inventory and less than 0.00002% of the 2011 national GHG inventory (Washington State Department of Ecology 2010; U.S. Environmental Protection Agency 2012).

3.7.4.4 BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative

Construction Impacts

As shown in Table 3.7-1, construction of the BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative would generate slightly fewer construction-related criteria pollutants and GHG emissions than the Lynnwood Alternative. However, there would be no adverse impacts on air quality.

Operational Impacts

As shown in Table 3.7-2, total OMSF operation emissions under these build alternatives would generate criteria pollutants primarily associated with on-site natural gas consumption from space and water heaters[5], as well as GHG emissions associated with electricity and natural gas consumption and motor vehicle emissions. These emissions would be equivalent to adding one typical passenger vehicle per year to the road (U.S. Environmental Protection Agency 2008). Given the context and intensity of the emissions presented in Table 3.7-2, they are not anticipated to exceed the NAAQS, which are presented in Appendix F.4.

Operation of these build alternatives would result in GHG emissions of 4,230 metric tons of CO_2e per year. This is equivalent to adding 829 typical passenger vehicles per year to the road (U.S. Environmental Protection Agency 2011). These GHG emissions would be less than 0.00418% of the statewide 2008 inventory and less than 0.00006% of the 2011 national GHG inventory (Washington State Department of Ecology 2010; U.S. Environmental Protection Agency 2012).

3.7.5 Indirect and Cumulative Impacts

3.7.5.1 Indirect Impacts

The OMSF would use electricity during construction and operations. Electricity usage would not produce any on-site emissions; however, indirect emissions from electricity generation would result

[5] As previously described, project-related criteria pollutant motor vehicle emissions are not characterized for the proposed project since there would be a reduction in local levels of criteria pollutants in the vicinity of the build alternative sites. Because GHG emissions are more of a global concern, project-related GHG motor vehicle emissions are characterized for the proposed project.

in off-site pollutants and GHG emissions. However, these emissions would not be substantial when compared to the No Build Alternative conditions.

3.7.5.2 Air Quality and Criteria Pollutants

Air quality conditions are expected to change because of past, present, and reasonably foreseeable future projects related to population growth and changes in economic activity in the study area. Cumulative impacts on air quality could occur if any of the build alternatives, when combined with emissions generated by nearby projects, contribute to existing or new violations of the NAAQS, or otherwise contribute to worsening air quality.

Implementation of the build alternatives would result in minor long-term criteria pollutant emissions. Operation of the expanded light rail system, which the OMSF supports, would reduce regional vehicle miles of travel and associated criteria pollutants within the region. Therefore, the build alternatives would support improvements in air quality that would offset regional emissions directly generated by the OMSF and other projects in the study area. Accordingly, there would be no adverse cumulative impacts on air quality.

3.7.5.3 Greenhouse Gas Emissions

Unlike criteria air pollutants (e.g., ozone precursors), which are primarily pollutants of regional and local concern, GHGs are global pollutants. Given their long atmospheric lifetimes (Appendix F.4, Table 3), GHGs emitted by countless sources worldwide accumulate in the atmosphere. No single emitter of GHGs is large enough to trigger global climate change on its own. Rather, climate change is the result of the individual contributions of countless past, present, and future sources. Therefore, GHG emissions generated by the proposed project are inherently cumulative.

Operation of these build alternatives would result in GHG emissions. These emissions would be minor in comparison to state and national emissions and would not result in a cumulative impact. In addition, the proposed OMSF project serves as an element of and facilitates efficient operation of the ST2 program. Implementation of the ST2 program of light rail expansion, including the OMSF, would result in a cumulative decrease in regional GHG emissions.

3.7.6 Potential Mitigation Measures

All build alternatives would provide a net benefit in reducing criteria air pollutants and improving air quality. Additionally, all build alternatives would implement best management practices (BMPs); therefore, no mitigation would be required.

3.8 Noise and Vibration

This section includes background information on noise and vibration and a summary of noise and vibration impacts identified, as well as potential mitigation measures.

3.8.1 Introduction to Resources and Regulatory Requirements

3.8.1.1 Noise

What we hear as sound is a series of continuous air pressure fluctuations superimposed on the atmospheric pressure that surrounds us. The amplitude of fluctuation is related to the energy carried in a sound wave; the greater the amplitude, the greater the energy and the louder the sound. Sound pressure levels are quantified by the fundamental descriptor used in acoustics, the sound pressure level, in decibels (dB). When sounds are unpleasant, unwanted, or disturbingly loud, we tend to classify them as noise.

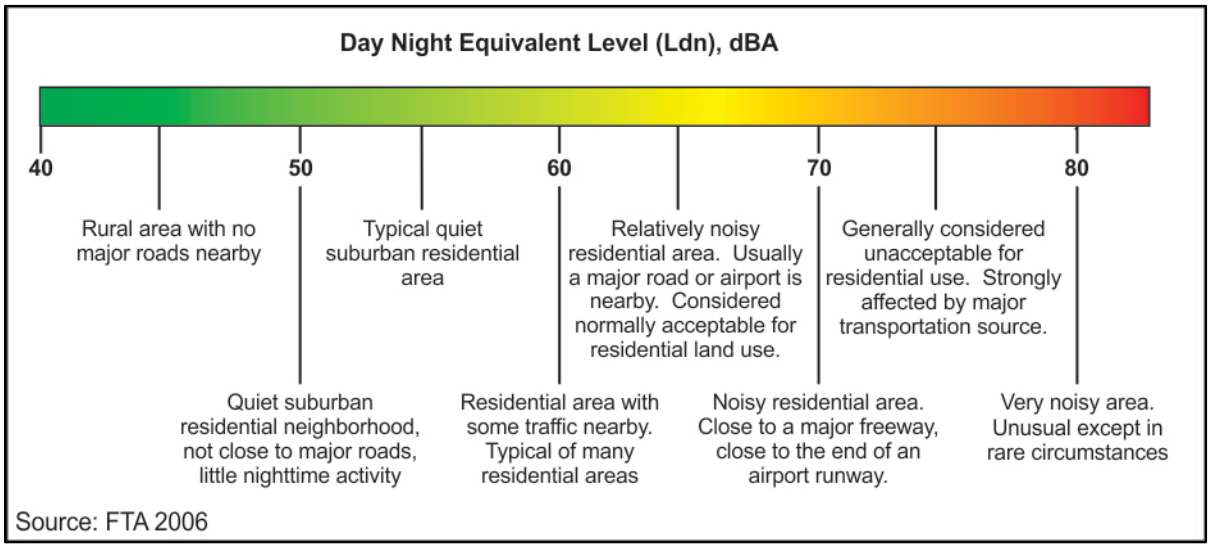
The number of fluctuation cycles or pressure waves per second of a particular sound is the frequency of the sound. The human ear is less sensitive to higher and lower frequencies than to mid-range frequencies. Therefore, sound level meters used to measure environmental noise generally incorporate a weighting system that filters out higher and lower frequencies in a manner similar to the human ear. This system produces noise measurements that approximate the normal human perception of noise. Measurements made with this weighting system are termed A-weighted and are specified as A-weighted decibel (dBA) readings. Community noise is usually characterized in terms of the A-weighted sound level.

When sounds exceed 110 dBA, there is a potential for hearing damage, even with relatively short exposures. In quiet suburban areas far from major freeways, the noise levels during the late night hours will drop to about 30 dBA. Outdoor noise levels lower than this only occur in isolated areas where there is a minimum of natural noises such as leaves blowing in the wind, crickets, or flowing water.

Several noise descriptors are used that take into account the variability of noise over time. The equivalent sound level (Leq) is the level of a constant sound for a specified period of time that has the same sound energy as an actual fluctuating noise over the same period of time. It is an energy average sound level. The day-night sound level (Ldn) is the equivalent sound level for a 24-hour period with an additional 10 dBA added to nighttime sound levels occurring between 10:00 p.m. and 7:00 a.m. Another descriptor, the statistical sound level, is the sound level that is equaled or exceeded for a specified percentage of a given measurement period. For example, L25 is the notation for the noise level within a measurement interval that is equaled or exceeded 25% of the time. The minimum noise level during a measurement period is denoted Lmin. The maximum noise levels that occur during an event, such as the passing of a heavy truck or the flyover of an airplane, is denoted Lmax.

Figure 3.8-1 defines typical community noise levels in terms of Ldn. Most urban and suburban neighborhoods will be in the range of Ldn 50 to 70 dBA. An Ldn of 70 dBA is a relatively noisy environment that might be found at buildings on a busy surface street, close to a freeway or near a busy airport. In recent times, many urban developments have combined retail, light commercial and other nonresidential uses with residential uses in a mixed-use environment. Because of these mixed-use developments, ambient noise levels in some urban environments may be slightly higher than the levels provided in Figure 3.8-1.

Figure 3.8-1. Typical Day-Night Sound Levels



The following list contains some general rules for community noise.

- A 3-dB change is the minimum most people will notice in most environments.
- Under free-field conditions, where there are no reflections or additional attenuations, a point sound source is known to decrease at a rate of 6 dB for each doubling of distance. For example, a sound level of 70 dB at a distance of 100 feet would decrease to 64 dB at 200 feet.
- Sounds such as sirens, bells, and horns are more noticeable than broadband noise sources, such as traffic.
- A 10-dB increase in sound level is perceived as an approximate doubling of the loudness of the sound and represents a substantial change in loudness.
- An important factor to recognize is that noise is measured on a decibel scale, and combining two noises is not achieved by simple addition. For example, combining two 60-dBA noises does not give 120 dBA (which is near the pain threshold), but yields 63 dBA which is lower than the volume at which most people listen to their televisions.

3.8.1.2 Regulatory Noise Requirements and Impact Criteria

Several different noise criteria were evaluated for applicability to the noise and vibration analysis for the proposed project. These include the *Transit Noise and Vibration Impact Assessment* (FTA guidance manual) (Federal Transit Administration 2006) along with the Washington Administrative Code (WAC) and local criteria from the Lynnwood Municipal Code (LMC) and Bellevue City Code (BCC). Applicable noise and vibration criteria and methods used for the noise studies are provided in the following sections.

3.8.1.3 FTA Noise Criteria

Transit noise impacts for this project are determined based on the criteria defined in the FTA guidance manual. The FTA noise impact criteria are based on documented research on community reaction to noise. The criteria are based on a sliding scale that uses the existing noise levels as a basis for setting actual impact levels. Although more transit noise is allowed in neighborhoods with high levels of existing noise, as the existing noise levels increase, a smaller increase in the total noise exposure is allowed when compared to areas with lower existing noise levels. The FTA noise impact criteria also group noise-sensitive land uses into three categories.

- **Category 1.** Tracts of land where quiet is an essential element in their intended purpose. This category includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use. Also included are recording studios and concert halls.
- **Category 2.** Residences and buildings where people normally sleep. This category includes homes, hospitals and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.
- **Category 3.** Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, theaters, and churches where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, museums, campgrounds, and recreational facilities are also considered to be in this category. Certain historical sites and parks are also included.

The criteria do not apply to most commercial or industrial uses because, in general, the activities within these buildings are compatible with higher noise levels. They do apply to business uses which depend on quiet as an important part of operations, such as sound and motion picture recording studios.

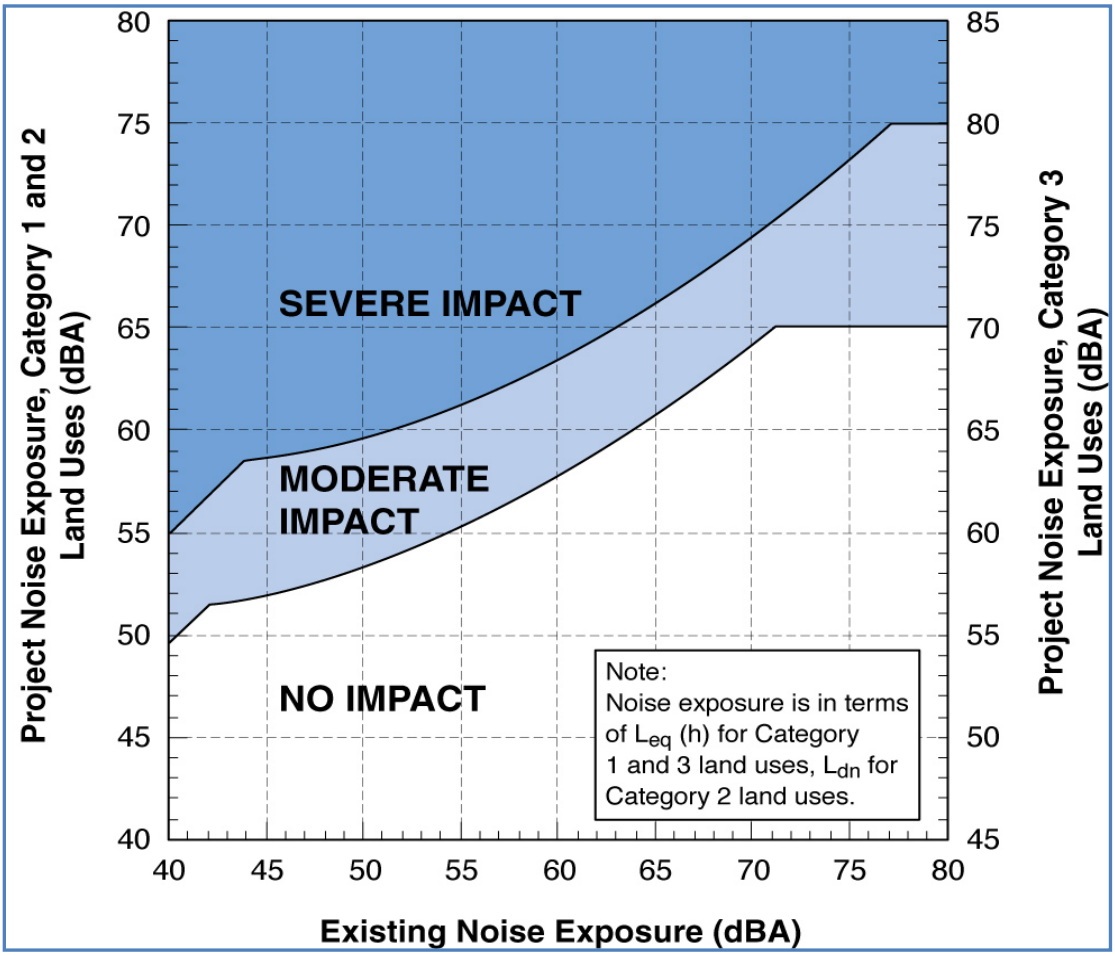
FTA assumes that parks are a special case, and how they are used and where they are located should be considered when considering whether or not a particular park, or an area within a park, is considered noise-sensitive. All parks along the project corridor were evaluated for consideration under the FTA criteria. Based on park location, uses, and existing noise levels, Scriber Creek Park was evaluated under FTA Category 3 criteria. The park's hours of operation are considered when performing the noise analysis per FTA criteria.

The Ldn is used to characterize noise exposure for residential areas (Category 2). For other noise-sensitive land uses, such as outdoor amphitheaters, parks, and school buildings (Categories 1 and 3), the maximum 1-hour Leq during the facility's operating period is used. There are no noise impact criteria for most commercial and industrial land uses. There are two levels of impact included in the FTA criteria: severe and moderate, interpreted as follows.

- **Severe Impact.** Project-generated noise in the severe impact range can be expected to cause a large percentage of people to be highly annoyed by the new noise and represents the most compelling need for mitigation. Noise mitigation will normally be specified for severe impact areas unless there are truly extenuating circumstances that prevent it.
- **Moderate Impact.** In this range of noise impact, the change in the cumulative noise level is noticeable to most people but may not be sufficient to cause strong, adverse reactions from the community. In this transitional area, other project-specific factors must be considered to determine the magnitude of the impact and the need for mitigation. These factors include the existing level, the projected level of increase over existing noise levels, the types and numbers of noise-sensitive land uses affected, the noise sensitivity of the properties, the effectiveness of the mitigation measures, community views, and the cost of mitigating noise to more acceptable levels.

The FTA noise impact criteria are summarized in graphical form in Figure 3.8-2, which shows the existing noise exposure and the additional noise exposure from the transit project that would cause either moderate or severe impact. The future noise exposure would be the combination of the existing noise exposure and the additional noise exposure caused by the transit project.

Figure 3.8-2. FTA Noise Impact Criteria



3.8.1.4 Local Noise Ordinances

Under FTA regulations, local (state, county, and city) noise ordinances must be considered for ancillary facilities and construction. The local regulations for the noise analysis of the proposed project are taken from WAC 173-60, Maximum Environmental Noise Levels. These are the same criteria used by the City of Lynnwood in its noise control ordinance found in LMC 10.12. They are also the same City of Bellevue noise limits as found in BCC 9.18.

This noise control ordinance contains property-line noise limits based on land use (Environmental Designation for Noise Abatement [EDNA]). More details on the EDNA classifications are provided in Appendix E.2, *Noise and Vibration Technical Report*. In general, EDNA Class A is residential property, buildings where human beings reside and sleep. Class B is for commercial uses such as restaurants; retail services; banks; office buildings; community services; educational, religious and governmental facilities; and other miscellaneous commercial services. Class C includes those uses not described above and is primarily for farming, storage, warehouse, distribution and industrial properties. The WAC provides maximum allowable noise levels between any two uses as shown in Table 3.8-1. The

property-line noise limits in Table 3.8-1 are reduced by 10 dBA from 10:00 p.m. to 7:00 a.m. to reflect nighttime sensitivity to noise.

Table 3.8-1. Washington State Noise Ordinance

Property Producing Noise (EDNA)	Maximum Allowable Sound Level (dBA) Property Receiving Noise EDNA		
	Class A (Residential)	Class B (Commercial)	Class C (Industrial)
Class A	55	57	60
Class B	57	60	65
Class C	60	65	70
Note: A reduction of 10 dBA is applicable to the values listed in the table from 10:00 p.m. to 7:00 a.m.			

For construction activities, the noise limits in Table 3.8-1 would be applicable during evening and nighttime hours and on weekends and holidays, as defined under the city codes. In the City of Lynnwood, sounds created by construction are exempt between the hours of 7:00 a.m. and 6:00 p.m. on weekdays. Construction between 6:00 p.m. and 7:00 a.m. on weekdays, and construction on weekends must meet the city code in Table 3.8-1 with the allowable exceedance criteria or obtain a noise variance from the city. In the City of Bellevue, sounds created by construction and emanating from construction sites are exempt between the hours of 7:00 a.m. and 6:00 p.m. on weekdays, and 9:00 a.m. and 6:00 p.m. on Saturdays that are not legal holidays. Construction during nighttime hours (between 6:00 p.m. and 7:00 a.m. on weekdays, and between 6:00 p.m. and 9:00 a.m. on Saturdays) or on Sundays or legal holidays is required to meet the noise regulations provided in Table 3.8-1 with the allowable exceedance unless a noise variance is received from the city.

3.8.1.5 Vibration

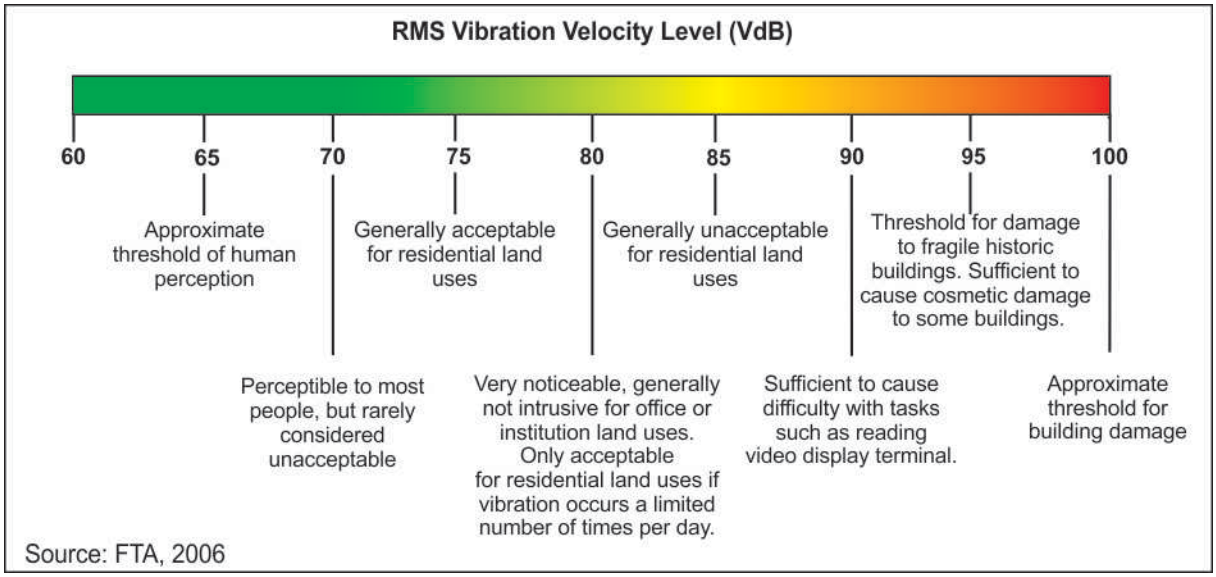
Groundborne vibration consists of oscillatory waves that propagate from the source through the ground to adjacent buildings. On steel-wheel/steel-rail train systems, groundborne vibration is created by the interaction of the steel wheels rolling on the steel rails. Although the vibration is sometimes noticeable outdoors, it is almost exclusively an indoor problem. Trains operating in the OMSF yard would not produce sufficient vibration to cause even minor cosmetic damage to nearby buildings. The primary concern is that the vibration and radiated noise can be intrusive and annoying to building occupants. The building vibration caused by groundborne vibration may be perceived as motion of building surfaces; rattling of windows, items on shelves, or pictures hanging on walls; or as a low-frequency rumbling noise, which is referred to as groundborne noise. Factors that influence the amplitudes of groundborne vibration include vehicle suspension parameters, condition of the wheels and rails, type of track, track support system, type of building foundation, and the properties of the soil and rock layers through which the vibration propagates.

Train vibration is virtually always characterized in terms of the root-mean-square (RMS) amplitude. RMS is a widely used but sometimes confusing method of characterizing vibration and other oscillating phenomena. It represents the average energy over a short time interval; typically, a one

second interval is used to evaluate human response to vibration. RMS vibration velocity is considered the best available measure of potential human annoyance from groundborne vibration.

Figure 3.8-3 gives a general idea of human and building response to different levels of vibration. Existing background building vibration is usually in the range of 40 to 50 velocity decibels (VdB), which is well below the range of human perception. Although the perceptibility threshold is about 65 VdB, human response to vibration is usually not bothersome unless the RMS vibration velocity level exceeds 70 to 75 VdB. This is a typical level 50 feet from a rapid transit or light rail system. Buses and trucks rarely create vibration that exceeds 70 VdB unless there are large bumps or potholes in the road.

Figure 3.8-3. Typical RMS Vibration Levels



Vibration Criteria

FTA has developed impact criteria for acceptable levels of groundborne noise and vibration. Groundborne noise is associated with subterranean transit projects and is therefore not a concern for the proposed project. Experience with groundborne vibration from rail systems and other common vibration sources suggest the following.

- Groundborne vibration from transit trains should be characterized in terms of the RMS vibration velocity amplitude.
- The threshold of vibration perception for most humans is around 65 VdB. Levels in the 70 to 75 VdB range are often noticeable but acceptable, and levels greater than 80 VdB are often considered unacceptable.

For an operations and maintenance facility, which has train movement throughout the day, evening and nighttime hours, the FTA limit for acceptable levels of residential groundborne vibration is 72 VdB. FTA assigns sensitive land uses to the following three categories.

- **Vibration Category 1: High Sensitivity**. This category includes buildings where low ambient vibration is essential for the interior operations in the building. Vibration levels may be below the level of human perception. Typical land uses covered by Category 1 are vibration-sensitive research and manufacturing facilities, hospitals with vibration-sensitive equipment, and university research operations. The degree of sensitivity to vibration will depend on the specific equipment that will be affected by the vibration. Equipment such as electron microscopes and high-resolution lithographic equipment can be very sensitive to vibration, and even normal optical microscopes will sometimes be difficult to use when vibration is well below the human annoyance level. Manufacturing of computer chips is an example of a vibration-sensitive process.
- **Vibration Category 2: Residential.** This category includes residences and buildings where people normally sleep, including private dwellings, hospitals, and hotels where nighttime sensitivity is assumed to be of utmost importance. It is common practice to also use this category as a standard for some special uses such as auditoriums or theaters.
- **Vibration Category 3: Institutional.** This category includes land uses with primarily daytime use including schools, churches, and other institutions and quiet offices that do not have vibration-sensitive equipment. Offices in buildings primarily for industrial use are not included in this category.

Table 3.8-2 summarizes the FTA impact criteria for groundborne vibration. As shown in Table 3.8-2, some land use activities are more sensitive to vibration than others. For example, certain research and fabrication facilities, television and recording studios, and concert halls are more vibration-sensitive than residences and buildings where people normally sleep, which are more sensitive than institutional land uses with primarily daytime use.

Table 3.8-2. FTA Vibration Impact Criteria for Frequent[a] Events

Land Use Category	Category Comment	Groundborne Vibration (VdB re 1 micro in/sec)
1	Low interior vibration is essential	65
2	Residential and sleep	72
3	Institutional and daytime	75
--[b]	Concert hall, TV/recording studio	65
--[b]	Auditorium	72
--[b]	Theatre	72
--[b]	Office use for detailed analysis	84

Source: Federal Transit Administration 2006.

[a] Frequent is defined as greater than or equal to 70 events per day.

[b] Special buildings and office spaces do not fall into any specific FTA land use categories.

Vdb = velocity decibels; in/sec = inch per second

3.8.2 Methods

The noise and vibration study area includes all structures within 225 feet for areas with intervening buildings, extending out to 350 feet in areas with an unobstructed line-of-sight to the OMSF (Federal Transit Administration 2006).

Under FTA criteria, noise impacts are based on the existing noise levels; therefore, ambient noise monitoring was required. The monitoring was used to establish the noise environment at residential land uses near the site. Impacts under the local regulations from the Cities of Bellevue and Lynnwood are property line noise limits that are based on the zoning designations and associated EDNA classifications established by city code.

3.8.2.1 Construction Noise and Vibration

The noise and vibration analysis for project construction follows the FTA guidance manual. The analysis reviews the types of equipment normally used for this type of project and the expected noise levels at nearby noise sensitive properties.

3.8.2.2 Operational Noise

The methods of analysis and the assumptions used are summarized below. Complete details on the noise sources and analysis methodology are provided in Appendix E.2, *Noise and Vibration Technical Report*.

Noise and vibration from OMSF operations were modeled using the methods described in the FTA guidance manual. The operational noise impact assessment includes the analysis of noise from general maintenance operations, train cleaning, the arrival and departure of trains at the OMSF, vehicle movement in the yard, and ancillary equipment including a power substation.

A light rail vehicle (LRV) wash system would be enclosed with openings on each end for LRV access. Blowers, which strip water off the vehicles, would be located inside one end of the LRV wash structure, and automatic doors would be used to allow LRVs to exit the wash facility after the blowers were shut down. The LRV wash system would typically be used for 50 to 60 minutes per-day. Based on measurements of similar wash facilities, and information from wash blower manufacturers, the sound level at a distance of 50 feet from the end of the wash bays, with the doors closed, is assumed to be 59 dBA.

Noise from general maintenance activities inside the shop building would include use of hand tools, continuous operation of compressors and other mechanical equipment, and intermittent operation of equipment such as overhead cranes, vehicle lifts, and the wheel trues. For this analysis, it was assumed that bay doors would be left open for ventilation, making this a worst-case analysis, and the typical sound level would be 65 dBA at 50 feet outside of the work bays.

Once the LRVs arrive at the OMSF, vehicle circulation on site is limited to the speed limit of 8 miles per hour (mph), which produces a noise level of 68 dBA at 25 feet. The noise analysis also includes two chimes of the low bell, producing 72 dBA at 50 feet, whenever a train begins to move. Other

noise-producing sources would include switches, a traction power substation and OMSF personnel and suppliers accessing the site. The analysis uses reference noise levels for operation of a maintenance base taken from the FTA guidance manual and that the OMSF would operate 24 hours per day.

Due to the low speed of 8 mph for LRV operations in the OMSF, wheel squeal noise would not be noticeable. Any wheel squeal on the curves into and out of the storage tracks would be resolved with lubrication or other means. Therefore, wheel squeal was not included in the noise model for the OMSF.

3.8.2.3 Operational Vibration

Light rail vibration was predicted using information from the vibration sections of the *East Link Project Final EIS* (Sound Transit 2011) and the Draft Vibration Technical Report of the *Lynnwood Link Extension Draft EIS* (Sound Transit 2013). Based on these documents and including track type adjustments for ballast and tie, direct fixation and aerial guideway alignment types, vibration impacts could only occur at FTA Category 2 structures located within 70 feet of the Lynnwood Alternative site tracks, and within 100 feet of the BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative site tracks, as well as the BNSF Storage Tracks component of the Lynnwood Alternative. The larger impact distance for these build alternatives would be due to the different vibration propagation characteristics of the soils at the different sites.

3.8.3 Affected Environment

This section provides a summary of the existing land use and noise environment near the build alternative sites.

3.8.3.1 Lynnwood Alternative

Parcels comprising the Lynnwood Alternative site are zoned as Business/Technical Park (BTP) and Light Industrial (LI); these are categorized as Class C EDNA per LMC 10.12.400.Land use near the Lynnwood Alternative site is residential along the west side of 52nd Avenue W. East of 52nd Avenue W, adjacent to Interstate 5 (I-5), there is one single-family residence and then land uses transition to commercial and industrial. East of 52nd Avenue W are several vacant parcels, state and private office buildings, and Scriber Creek Park. Based on the park location, uses and existing noise levels, Scriber Creek Park was evaluated under the FTA Category 3 criteria.

Existing noise levels near the Lynnwood Alternative site range from 72 dBA Ldn near I-5 reducing to 57 to 65 dBA Ldn toward the north end of the alternative site. Existing noise levels near Scriber Creek Park, the Park Five Apartments, and the Cedar Creek Condominiums range from 58 to 62 dBA Leq during peak hours, with Ldn noise levels ranging from 57 to 62 dBA. Figure 3.8-4 provides an overview of the Lynnwood Alternative site, access tracks, monitoring locations, measured noise levels, and area land use near the site.

Source: Michael Minor & Associates 2014.

Graphics ... 0032912 (3-28-2014)

Figure 3.8-4: Lynnwood Alternative—Land Use and Monitoring Locations
Sound Transit Link Light Rail OMSF Draft EIS

3.8.3.3 BNSF Alternative, BNSF Modified Alternative, and BNSF Storage Tracks

Parcels comprising the BNSF Alternative site are zoned as Bel-Red Office-Residential Node 2(BR-OR-2) and Bel-Red Residential (BR-R); these are categorized as Class B EDNA per BMC 9.18.025. Areas west of the Eastside Rail Corridor within the BNSF Modified Alternative site are designated Bel-Red Medical Office (BR-MO), also categorized as Class B EDNA per BMC 9.18.025. The single parcel comprising the BNSF Storage Tracks is zoned BR-OR-2, a Class B EDNA per BMC 9.18.025. Land use north and east of the BNSF Alternative and BNSF Modified Alternative sites is commercial and industrial. West of the sites, along 116th Avenue NE, land use includes the Seattle Children's Hospital: Bellevue Clinic and Surgery Center, several commercial and office spaces, and several single-family residences. The Seattle Children's Hospital has a planned expansion to the east of the existing building, which will include new medical facilities and additional parking.

Within the Bel-Red subarea, the Spring District is a mixed-use transit-oriented development project that has an approved 15-year Master Development Plan. The Spring District is located north of NE 12th Street, between NE 20th and NE 24th Avenues. It will include office space, retail, housing, hotels, parks, and a new road system with the necessary infrastructure. Construction of the hotel is planned for 2022–2024 (Phase 4). Construction of residential structures nearest to 120th Avenue NE and 124th Avenue NE is planned for 2024–2026 (Phase 5) and 2026–2028 (Phase 6).

The two Spring District residential structures and hotel nearest to the BNSF Alternative and BNSF Modified Alternative sites are shown in Figures 3.8-5 and 3.8-6.

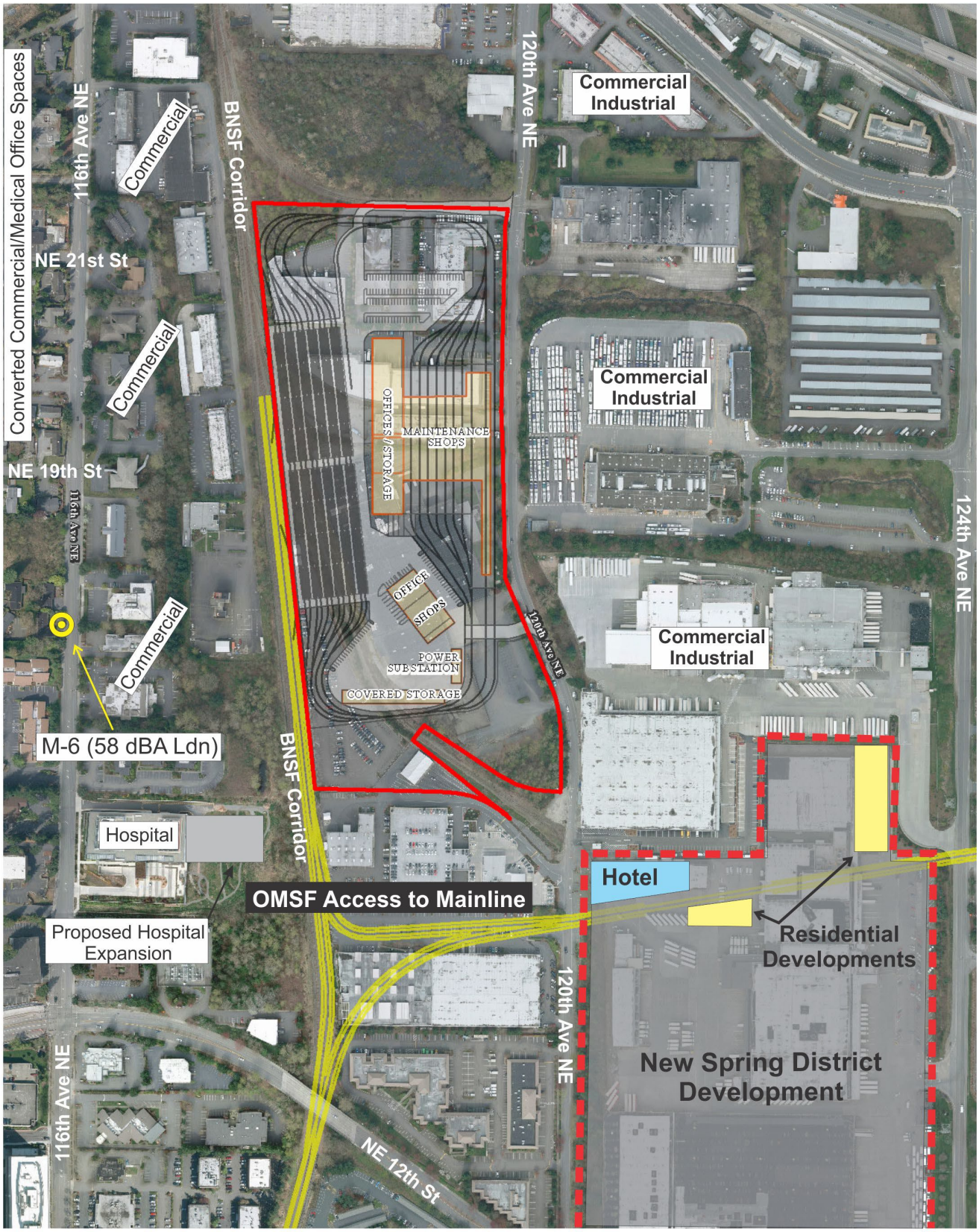
There are no proposed parks or recreational resources near the BNSF Alternative site, BNSF Modified Alternative site, or BNSF Storage Tracks.

Existing noise levels near the alternative sites are dominated by traffic noise from I-405, NE 12th Street, 116th Avenue NE and other arterial roadways in addition to the commercial and industrial activities. Noise levels range from high of 70 dBA Ldn near State Route (SR) 520, reducing to 58 dBA Ldn at single-family residences west of 116th Avenue NE. Figures 3.8-5 and 3.8-6 provide an overview of the BNSF Alternative and BNSF Modified Alternative sites, along with the access tracks, monitoring locations, measured noise levels, and area land use.

3.8.3.4 SR 520 Alternative

Parcels comprising the SR 520 Alternative site are zoned Bel-Red General Commercial (BR-GC) and categorized as Class C EDNA per BMC 9.18.025.

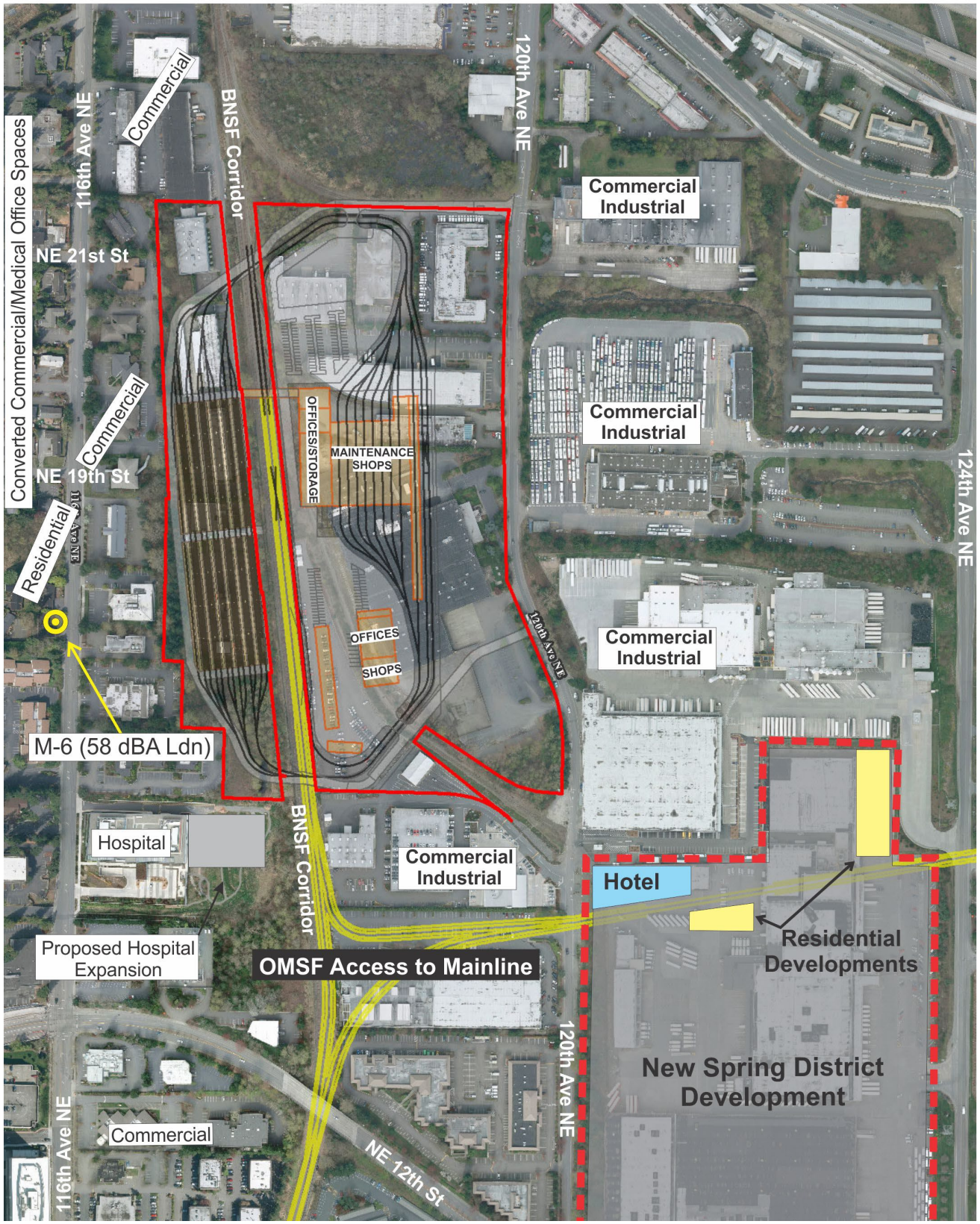
There are no residences within 700 feet of the SR 520 Alternative site boundaries. Noise levels near the site are dominated by traffic on SR 520, NE 20th Street, 130th Avenue NE, along with noise from existing commercial and light industrial activities. Noise levels in this area varied from 71 dBA Leq during peak hours to 60 dBA Leq during nighttime hours, for a 24-hour Ldn of 70 to 72 dBA. Figure 3.8-7 provides an outline of the SR 520 Alternative site, access tracks, monitoring locations, measured noise levels, and area land use.



Source: Michael Minor & Associates 2014.

Graphics ... 0032912 (3-28-2014)

Figure 3.8-5: BNSF Alternative—Land Use and Monitoring Locations
Sound Transit Link Light Rail OMSF Draft EIS



Source: Michael Minor & Associates 2014.

Graphics ... 0032912 (3-28-2014)

Figure 3.8-6: BNSF Modified Alternative—Land Use and Monitoring Locations
Sound Transit Link Light Rail OMSF Draft EIS

0 250 500 1000

Approximate Scale (Feet)

N

Source: Michael Minor & Associates 2014.

Graphics ... 00329.12 (3-28-14)

Figure 3.8-7: SR 520 Alternative—Land Use and Monitoring Locations
Sound Transit Link Light Rail OMSF Draft EIS

3.8.4 Environmental Impacts

This section provides a summary of the noise and vibration impacts expected during construction and operation of the OMSF. Complete details are provided in Appendix E.2.

3.8.4.1 No Build Alternative

Under the No Build Alternative, noise and vibration levels would continue to be dominated by traffic on nearby major highways, commercial and industrial activities and local traffic on nearby arterial roadways.

3.8.4.2 Impacts Common to All Build Alternatives

Construction Noise and Vibration

Noise related to construction activities would be generated by heavy equipment used during construction of the proposed project. Typical construction equipment for this type of project would include air compressors, backhoes, concrete pump, cranes, bulldozers, excavators, flatbed trucks, fork lifts, generators, haul trucks, jack hammers, loaders, paver, pumps, pneumatic tools, service trucks, tractor trailers, utility trucks, vibratory equipment and soil compactors, and welders. Construction activities would occur approximately 100 to 200 feet from the nearest residences under the Lynnwood Alternative (Lynnwood site only). Construction activities would occur within approximately 300 to 400 feet from noise-sensitive properties under the BNSF Alternative and BNSF Modified Alternative, as well as for the BNSF Storage Tracks. Under the SR 520 Alternative, the nearest residences are over 700 feet away, north of SR 520. Table 3.8-3 provides a summary of the equipment used for the two major phases of construction.

Table 3.8-3. Typical Construction Activities and Maximum Noise Levels at 100 Feet

Construction Phase	Typical Equipment	Noise Levels (Lmax) at 100 feet in dBA
Clearing, grubbing earthwork and preparation	Air compressor, back hoe, generator, concrete saws, concrete breakers, jack hammers, haul trucks, loaders and utility trucks	85–89
Building Construction, track installation and Paving	Paver, crane, concrete pumps, haul trucks, concrete mixer, air compressor, back hoe, generator, tractor trailer, jack hammer, pneumatic tools, utility trucks and welders	81–86

Source: U.S. Department of Transportation 1977.

As noted previously, for the City of Lynnwood, sounds created by construction are exempt between the hours of 7:00 a.m. and 6:00 p.m. on weekdays. Sounds created by construction and emanating from construction sites in the City of Bellevue are exempt between the hours of 7:00 a.m. and 6:00 p.m. on weekdays, and 9:00 a.m. and 6:00 p.m. on Saturdays that are not legal holidays. Because most construction activities are exempt during daytime hours, noise and vibration related to project construction—while a potential issue for nearby residences and businesses—is not expected to result in substantial impacts because the majority of construction activity would be

contained on site and would be temporary in nature. Any construction activities outside of these hours are required to meet the state's noise regulations as given in Table 3.8-1, with the allowable exceedance unless a noise variance is received from the City.

There is a potential for pile driving at all of the build alternative sites. Under the Lynnwood Alternatives, pile foundations or drilled piers would likely be required in the northern and eastern parts of the site. At the BNSF Storage Tracks, BNSF Alternative, and BNSF Modified Alternative sites, pile foundations or drilled piers may be necessary to support elevated structures and bridges or where substantial depth of fill placement would occur. At the SR 520 Alternative site, pile foundations may be necessary to support structures where substantial deep fill placement would occur or where the light rail access lines would cross over underground oil pipelines. Average maximum noise levels from pile driving typically ranges from 98 to 105 dBA Lmax at 50 feet. Due to the high noise levels, pile driving is typically limited to daytime hours, and any pile driving would be required to meet the applicable construction noise regulations.

3.8.4.3 Lynnwood Alternative

Construction Impacts

Construction impacts for the Lynnwood Alternative would be the same as those discussed in Section 3.8.4.4, Impacts Common to All Build Alternatives.

Operational Impacts

The Lynnwood Alternative includes three design options (C1, C2, and C3), each connecting to one of the three build alternatives being evaluated in the *Lynnwood Link Extension Draft EIS* (Sound Transit 2013). Noise analysis for the site was evaluated using both FTA criteria and the local noise control ordinance from the City of Lynnwood. The City of Lynnwood ordinance classifies EDNAs based on zoning designations (LMC 10.12.400). The Lynnwood Alternative site is an EDNA Class C (industrial) property. Properties adjacent to the Lynnwood Alternative site are classified as EDNA Class A (residential and park/public) and Class B (commercial).

LRVs being stored at the BNSF Storage Tracks would be restricted to the speed for auxiliary tracks of 8 mph. In addition, the LRV operator would also be required to sound the low bell during initial movement back to service. The combination of noise from the slow-moving LRVs and bells was not predicted to result in any noise impacts due to the distance between the receivers and the storage tracks, which is greater than 300 feet.

Under Design Options C1 and C2, there would be no noise or vibration impacts as identified for the FTA criteria. There would be two residential EDNA noise impacts under the City of Lynnwood noise control ordinance (LMC 10.12). The noise impacts would occur at two residences along 52nd Avenue W that are located next to a crossover and the LRV wash system. The impacts would be related to the added noise from the new crossovers, with contribution from the wash system and maintenance bays. The locations of the two impacts are shown in Figure 3.8-8 and Table 3.8-4, providing the noise levels at these locations with and without noise mitigation.

For Design Option C3, there would be no noise impacts under the FTA criteria or under the City of Lynnwood noise control ordinance (LMC 10.12). Design Option C3 would not result in any impacts because the mainline track access crossovers would be located near I-5, away from the residences. Conversely, under Design Options C1 and C2, the crossovers would be located along 52nd Avenue W near the residential area.

Noise levels within Scriber Creek Park would only be of concern during daytime hours because the park closes at dusk (9:30 p.m. during summer months), and opens at sunrise. Additionally, the park is located on the north side of the Lynnwood Alternative site, and would be shielded from the maintenance bays and the LRV wash system by intervening structures, such as offices and shop buildings. There is an access track proposed along the southern side of the park and a shop facility that would be approximately 500 feet from the park trails.

Operations of the Lynnwood Alternative, including trains accessing the main line tracks during peak hours, would produce noise levels of 58 dBA Leq at the nearest edge of the park. These levels are below the FTA criteria of 62 dBA for a moderate noise impact at a Category 3 use with an existing Leq of 58 dBA.

Furthermore, the 58 dBA Leq is also below the City of Lynnwood daytime criteria of 60 dBA. Therefore, no noise impacts were identified at the Scriber Creek Park under Design Option C1 or C2. Under Design Option C3, noise levels at Scriber Creek Park would be even lower than under Design Options C1 or C2, by 3 to 5 dB, due to the location of the access tracks being closer to I-5. Therefore, there would be no noise impacts at the park under Design Option C3.

The BNSF Storage Tracks component of the Lynnwood Alternative is not predicted to result in a notable increase in the noise environment. LRVs accessing the storage tracks would be limited to the auxiliary track speed of 10 mph and are not predicted to cause an increase in existing ambient noise levels.

The distance from the OMSF tracks on the Lynnwood Alternative site to the nearest residences would be over 130 feet. Because it is projected that vibration impacts could only occur within 70 feet of the Lynnwood Alternative site, no vibration impacts are expected to occur under this alternative.

3.8.4.4 BNSF Alternative and BNSF Modified Alternative

Construction Impacts

Construction impacts for the BNSF Alternative and BNSF Modified Alternative would be the same as those discussed in Section 3.8.4.4, Impacts Common to All Build Alternatives.

Operational Impacts

Noise analysis for the BNSF Alternative and BNSF Modified Alternative sites was evaluated using both FTA criteria and the local noise control ordinance from the City of Bellevue. The City of Bellevue ordinance classifies EDNAs based on zoning designations (BMC 9.18.025). The alternative

sites are EDNA Class B (commercial) properties. Properties directly adjacent to the alternative sites are EDNA Class B (commercial) and Class C (industrial) properties.

No noise impacts would occur under the BNSF Alternative as identified under FTA or City of Bellevue noise criteria. The Seattle Children's Hospital: Bellevue Clinic and Surgery Center—which has planned improvements to expand east toward the BNSF Alternative site—is the nearest noise-sensitive use to the BNSF Alternative site. The new building would be approximately 410 feet southwest of the BNSF Alternative site, and 250 feet west of the access tracks. This property was evaluated using FTA Category 2 and the Bellevue City Code EDNA Class B. The analysis concluded that there would be no noise impacts under either FTA or City of Bellevue noise criteria at the Seattle Children's Hospital: Bellevue Clinic and Surgery Center.

Proposed residential buildings in the Spring District would be 850 to 1,100 feet from the BNSF Alternative site, and the nearest proposed hotel would be approximately 550 feet from the site. No noise impacts would occur at any structures in this new development under FTA or City of Bellevue noise criteria.

The distance from the BNSF Alternative site and access tracks to the Seattle Children's Hospital: Bellevue Clinic and Surgery Center, which is the closest vibration-sensitive use, would be approximately 250 feet. This distance is well beyond the 100-foot limit calculated for potential vibration impacts under the BNSF Alternative. Therefore, no vibration impacts are projected for this alternative at any nearby properties under FTA criteria.

No noise impacts would occur under the BNSF Modified Alternative as identified by either the FTA or the City of Bellevue noise control ordinance criteria. As with the BNSF Alternative, the properties surrounding the BNSF Modified Alternative site are classified EDNA B (commercial) and EDNA C (industrial). The proposed new building that is part of the Seattle Children's Hospital: Bellevue Clinic and Surgery Center would be approximately 200 feet southwest of the BNSF Modified Alternative site, and 250 feet west of the access tracks. Proposed residences at the Spring District would be 700 to 925 feet from the BNSF Modified Alternative site, with the hotel 700 feet from the site. No noise impacts were identified at any of these structures under FTA or City of Bellevue noise criteria.

The distance from the OMSF tracks to the Seattle Children's Hospital: Bellevue Clinic and Surgery Center, the closest vibration-sensitive use, would be approximately 250 feet, which is well beyond the 100-foot distance for potential vibration impacts under this alternative. Therefore, no vibration impacts are projected for the BNSF Modified Alternative at any use under FTA criteria.

3.8.4.5 SR 520 Alternative

Construction Impacts

Construction impacts for the SR 520 Alternative would be the same as those discussed in Section 3.8.4.4, Impacts Common to All Build Alternatives.

Operational Impacts

Noise analysis for the SR 520 Alternative site was evaluated using both FTA criteria and the City of Bellevue noise control ordinance criteria. The City of Bellevue ordinance classifies EDNAs based on zoning designations (BMC 9.18.025). The SR 520 Alternative site is an EDNA Class C (industrial) property. Properties adjacent to the site are classified as EDNA Class B (commercial) and Class C (industrial).

Under the SR 520 Alternative, there would be no residences or other FTA Category 2 or Category 3 uses within 700 feet of the SR 520 Alternative site; therefore, there would be no noise impacts under FTA noise criteria. Under the City of Bellevue noise criteria, no noise impacts were identified at adjacent properties.

No vibration impacts are predicted under this alternative due to the distance from the tracks to the nearest structures.

3.8.5 Indirect and Cumulative Impacts

No indirect noise and vibration impacts would occur as a result of the proposed project.

Provided below is a summary of the cumulative noise levels expected once the East Link, Lynnwood Link Extension, and the proposed OMSF projects are completed. The cumulative impacts analysis assumes that noise mitigation measures proposed for the East Link and Lynnwood Link Extension would be implemented.

3.8.5.1 Lynnwood Alternative

Under the Lynnwood Alternative (Design Options C1 and C2), cumulative noise levels at residences along 52nd Avenue W, between 208th Street and 204th Street, are predicted to range from 58 to 70 dBA Ldn prior to noise mitigation. There are 19 moderate and 19 severe noise impacts predicted in this area from the Lynnwood Link Extension, and the two noise impacts under the Lynnwood Alternative are included with those noise impacts.

The combined noise mitigation measures proposed for each project would reduce noise levels at all residences along 52nd Avenue W to below both FTA and City of Lynnwood noise control ordinance criteria, with future cumulative noise levels ranging from 46 to 59 dBA Ldn. Therefore all cumulative noise impacts would be fully mitigated.

Under the Lynnwood Alternative (Design Option C3), cumulative noise levels would be the same as given for the OMSF alone for properties near the alternative site along 52nd Avenue W, and noise levels along the Lynnwood Link Extension alignment would be the same as those provided in the *Lynnwood Link Extension Draft EIS* (Sound Transit 2013). Because of the location of the Lynnwood Link Extension under Design Option C3, noise from the light rail would not add to the projected noise from the OMSF for residences along 52nd Avenue W. There would also be no increases in noise levels at residences affected by the Lynnwood Link Extension Alternative that would experience a change with the addition of the OMSF Lynnwood Alternative. Under all of the

Lynnwood Alternative design options, cumulative construction noise generated at the properties near the alternative sites would be expected to be the same as the standalone OMSF project. There is a potential for some other local construction projects to overlap with the construction of this project. This would only happen if other unrelated construction projects occur simultaneously with this project. However, because the project's construction noise analysis assumes the worst-case noise levels, the overall maximum noise levels at any one property would remain the same.

3.8.5.2 BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative

Under the BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative, cumulative noise levels would be the same for properties near these alternative sites, as noise levels given for the proposed OMSF project alone. In addition, operational noise levels along the selected East Link alignment would be the same as those provided in the *East Link Project Final EIS* (Sound Transit 2011). Because the location of the East Link project is several hundred feet from all of the OMSF build alternative sites, noise from the light rail would not add to the projected noise from the OMSF. Therefore, no cumulative noise impacts are projected under these alternatives.

Under the BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative, cumulative construction noise generated at properties near these alternative sites is expected to be the same as the standalone OMSF project. There is a potential for other local construction projects to overlap with the construction of the OMSF project; however, worst-case construction noise levels predicted would also account for any other nearby construction project. In most cases, however, because construction noise would be localized, it would not contribute to a cumulative noise impact.

3.8.6 Potential Mitigation Measures

This section describes noise and vibration measures that could be used to mitigate impacts of the proposed project. Mitigation is provided for the impacts related to the short-term project construction and long-term operational impacts.

3.8.6.1 Construction Noise

Under its *Link Noise Mitigation Policy* (Sound Transit 2004), Sound Transit would seek to limit construction noise levels and impacts and meet applicable noise regulations and ordinances. Typical mitigation measures that could be applied are discussed below. Contractors would be required to meet the criteria of City of Lynnwood and City of Bellevue noise ordinances.

Several noise-mitigation measures could be implemented to reduce construction noise levels to within the required limits. Sound Transit would, as practical, limit construction activities that produce the highest noise levels during daytime hours, or when disturbance to sensitive receivers would be minimized. For operation of construction equipment that could exceed allowable noise limits during nighttime hours (between 10:00 p.m. and 7:00 a.m.) or on Sundays or legal holidays, Sound Transit would obtain the appropriate noise variance from the City of Lynnwood or the City of Bellevue.

Noise-control mitigation could include the following measures, as necessary, to meet required noise limits.

- Use low-noise emission equipment.
- Implement noise-deadening measures for truck loading and operations.
- Conduct monitoring and maintenance of equipment to meet noise limits.
- Use acoustic enclosures, shields, or shrouds for equipment and facilities.
- Install high-grade engine exhaust silencers and engine-casing sound insulation.
- Minimize the use of generators.
- Use movable noise barriers at the source of the construction activity.

3.8.6.2 Construction Vibration

In general, building damage from construction vibration is not anticipated for this project due to the type of project and distance between the site and any nearby properties. In any locations of concern, preconstruction surveys would be conducted to document the existing condition of buildings, in case there was an issue during or after construction. During final design, a review of construction methods would be performed to determine the potential for construction related vibration impacts and methods to control vibration, which would be included in the contract specifications.

3.8.6.3 Operational Noise and Vibration

This section presents noise and vibration mitigation measures for each of the Build Alternatives. Mitigation measures presented are based on Sound Transit's *Link Noise Mitigation Policy* (Sound Transit 2004). Under this policy, mitigation measures are considered for all noise impacts, both moderate and severe. During final design if additional noise and vibration analysis demonstrates that the relevant noise criterion could be achieved by a less-costly means, or that the noise or vibration impact at that location would not occur even without mitigation, then the mitigation measure could be eliminated or modified as needed. Conversely, if any additional noise impacts are identified during final design, then Sound Transit would provide mitigation that is consistent with the *Link Noise Mitigation Policy* (Sound Transit 2004).

Lynnwood Alternative

Mitigation for the noise impacts under the Lynnwood Alternative (Design Options C1 and C2) could include special track work to reduce noise from the crossover. The potential location of the modified crossover is shown in Figure 3.8-8. With a modified crossover, all noise impacts would be mitigated. Table 3.8-4 provides the noise levels for the sites with impacts with and without the proposed noise mitigation measures.

Source: Michael Minor & Associates 2014.

Graphics ... 0032912 (3-28-14)

Figure 3.8-8: Lynnwood Alternative, All Design Options—Noise Impacts and Mitigation
Sound Transit Link Light Rail OMSF Draft EIS

Table 3.8-4. Noise Impacts and Mitigation for Lynnwood Alternative, Design Options C1 and C2

Address[a]	Project Noise (Leq in dBA)[b]	Noise Impacts[c]	Project w/Mitigation (Leq in dBA)[d]	Impacts w/Mitigation[e]	Mitigation Methods[f]
20504 52nd Ave W	**50**	1	42	0	Special trackwork for new crossover
20430 52nd Ave W	**50**	1	42	0	Special trackwork for new crossover

a. Sites shown in Figure 3.8-8.
a. Lynnwood criteria for EDNA Class A (residential) noise levels is 60 dBA Leq (daytime) and 50 dBA Leq (nighttime).
b. Number of homes with noise levels above the criteria.
c. Project noise levels with proposed noise mitigation measures.
d. Number of homes with noise levels above the criteria with noise mitigation measures.
e. Type of mitigation proposed for the impact.

For Design Option C3, no noise impacts would occur and no mitigation is proposed. There are no vibration impacts predicted under the Lynnwood Alternative (Design Options C1, C2 and C3); therefore, no mitigation would be required.

BNSF Alternative

There are no noise or vibration impacts predicted under the BNSF Alternative; therefore, no mitigation would be required.

BNSF Modified Alternative

There are no noise or vibration impacts predicted under the BNSF Modified Alternative; therefore, no mitigation would be required.

SR 520 Alternative

There are no noise or vibration impacts predicted under the SR 520 Alternative and; therefore, no mitigation would be required.

3.9 Ecosystems

This section addresses the ecosystem components—aquatic resources, vegetation and wildlife, and wetlands—in the vicinity of the build alternatives. Appendix E.3, *Ecosystems Technical Report*, of this Draft EIS provides information about the methods, affected environment, species, habitats, impacts, and mitigation discussed in this section. Appendix E.3 also provides detailed graphics illustrating the extent of aquatic resources, vegetation and wildlife habitats, and wetlands in the affected environment, as well as detailed graphics illustrating the environmental impacts of the build alternatives.

3.9.1 Introduction to Resources and Regulatory Requirements

An *ecosystem* is the interaction between plants, animals, microorganisms, and the physical environment in which they live. Ecosystems are made up of living organisms, including humans, and the environment they inhabit.

Components of ecosystems are protected by federal, state, and local regulations. Such regulations govern planning, land use, and management activities that have the potential to affect ecosystem resources in the study area. The following federal, state, and local laws, regulations, and agency jurisdiction and management guidance documents pertain to aquatic resources; vegetation and wildlife habitat; priority, threatened, and endangered species; and wetlands.

- Critical areas ordinances (CAOs) for the Cities of Lynnwood and Bellevue pursuant to the Washington Growth Management Act (Revised Code of Washington [RCW] 36.70A)
- Endangered Species Act (ESA)
- Executive Orders 89-10, 90-40, and 11990
- Migratory Bird Treaty Act (MBTA)
- Bald and Golden Eagle Protection Act
- Local Agency Shoreline Master Programs (SMPs)
- Magnuson-Stevens Fishery Conservation and Management Act (MSA)
- National Environmental Policy Act (NEPA)
- Sections 404, 402, and 401 of the Clean Water Act (CWA)
- Washington State Water Pollution Control Act
- Shoreline Management Act (SMA)
- State Environmental Policy Act (SEPA)
- Washington Administrative Code (WAC) 222-110
- Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) Management Recommendations

Sound Transit would comply with the requirements of all related laws and regulations related to ecosystem resources through the permit application and approval process once a preferred alternative is selected, including preparation of a biological assessment to meet ESA requirements.

3.9.2 Methods

The study areas for ecosystems include all aquatic resources, vegetation and wildlife, and wetlands according to the following criteria and within the following boundaries. Wetlands are considered separate ecosystem resources from aquatic resources and vegetation because they perform different ecological functions from aquatic systems (i.e., streams) and are typically described not only based on their type of vegetation, but also on their hydrologic and water-quality functions. Wetlands are also regulated as distinct entities by federal, state, and local governments.

- **Aquatic Resources.** The aquatic resources study area was defined as any stream, river, pond, ditch or associated stream buffer/riparian habitat occurring in and within 200 feet of the build alternative sites and extending 100 feet upstream to 300 feet downstream from where the sites cross a stream or other water course. There is no commercial fishing in the aquatic resources study area, either by tribal or nontribal fishers. None of the stream reaches in the aquatic resources study area are regularly accessible to anadromous salmonids, although occasional use has been documented and is possible depending on stream flow conditions.

  Streams in the aquatic resources study area are classified according to existing conditions using the State of Washington Interim Water Typing Criteria (WAC 222-16-031), and the King County, City of Lynnwood, and City of Bellevue classification systems, as detailed in Appendix E.3. All of these stream reaches have limited fish use and poor or fair fish habitat conditions, typically due to urban development.

- **Vegetation and Wildlife**. Sound Transit identified six vegetation categories or cover types appropriate for the nature of the build alternative sites, including three forested categories based on dominant tree type (coniferous, deciduous, or mixed) and one category for developed portions of each site containing little to no vegetation (developed).

  Sound Transit searched WDFW's PHS database (2012) for priority species and DNR's Natural Heritage Inventory (NHI) database of rare plants and native communities (2012) within 0.5 mile of the four build alternative sites. No priority plant species have been recorded in the study area. No federal or state threatened or endangered species are known to exist in the study area based on recorded observations listed in these databases, reconnaissance site observations, and observed habitat conditions. The particular suitability of each alternative site for priority wildlife species is addressed in Appendix E.3.

  The study area was defined as all vegetation and wildlife habitat in the build alternative sites and additional adjacent vegetation or habitat as appropriate to the species or habitat type (e.g., forested areas occurring partially within and partially outside the build alternative sites was treated as a single patch of habitat that could be affected). Habitat for individual wildlife species was assessed as biologically appropriate for that species to meet regulatory requirements specific to the species (e.g., bald eagle nesting or breeding locations within 1 mile). Vegetation areas were classified and mapped regardless of subsequent upland/wetland designation. As a result, vegetation classifications may include areas of wetland vegetation and, therefore, may

overlap with areas also categorized as wetlands. Any such overlap is described and each wetland was specifically differentiated.

- **Wetlands**. Wetlands and potential wetlands were identified during a field reconnaissance effort and from data collected in the wetland study area during delineation work completed as part of the *Lynnwood Link Extension Draft EIS* (Sound Transit 2013) and *East Link Project Final EIS* (Sound Transit 2011). Potential wetlands are areas identified as part of the *Lynnwood Link Extension Draft EIS* (Sound Transit 2013), but were not readily observable and could not be accessed in the field to verify site conditions. Wetlands are classified in terms of the level of wildlife/biological habitat, hydrologic, and water quality function they provide. The degree to which functions are performed by a wetland (e.g., enhancing water quality, reducing floods, and providing fish and wildlife habitat) result in a higher category assignment (Hruby 2006), with Category 1 (I) offering the highest function and Category 4 (IV) offering the lowest. A detailed summary of each wetland's characteristics and level of function based on the rating forms is presented in Appendix E.3. All wetlands identified are expected to be jurisdictional waters of the United States.

  The study area included all wetlands occurring in the build alternative sites and within 200 feet of either side of the sites. Also included are wetlands that are partly within or that cross through the sites and wetland study area. Portions of wetlands that extend beyond the wetland study area and potential wetland areas outside of the field reconnaissance survey area were identified and described based on visual observation from public areas during the field reconnaissance; current local, state, and federal wetland maps; critical area reports; and aerial photograph examination.

  Once the wetland category was determined, the appropriate wetland buffer was added to the mapped configuration of each wetland. In many cases, existing buildings, parking lots, railroad tracks and ballast, and roads are located within the wetland buffer as ascribed based on its regulatory classification. The presence of these developed features reduces buffer functions under existing conditions. Thus, only the functional (i.e., nondeveloped) buffer of each wetland is depicted and was considered during the assessment of potential impacts. In instances where stream and wetland buffers overlap (e.g., along Scriber Creek and the West Tributary of Kelsey Creek), only the widest buffer is shown and was considered during the assessment of potential impacts.

The ecosystems impact analysis relies on literature research; communication with federal, state, and local regulatory agencies; a preliminary field assessment of resources (as allowed from public rights of way); and GIS mapping of resources on aerial photographs. Vegetation in the study areas was classified following the system used by Sound Transit for the environmental review of both the East Link and Central Link projects, which was based on the King County (1987) Wildlife Habitat Profile (Sound Transit 1999, 2011). Under this system, vegetation is given a wildlife habitat value rating of high, moderate, or low. These ratings should only be viewed relative to one another in the study areas, relative to this Draft EIS, and not across the landscape as a whole.

Impacts were determined through geographic information system (GIS) analysis of the configuration of the build alternatives relative to the extent of vegetation and its associated wildlife habitat value, and relative to the delineated or reconnaissance boundary of the wetlands and streams, and their associated functional buffers.

Direct wetland and *direct wetland buffer impacts* reflect direct removal/fill of the wetland's area and the consequent loss of specific functions (e.g., water quality improvement, stormwater detention and erosion reduction, and wildlife habitat), including loss of buffer functions such as screening from disturbance, wildlife habitat, and erosion or sedimentation protection. *Indirect wetland impacts* reflect the effect of direct impacts on a large portion—but not all—of a wetland, on the remaining area of wetland. Such indirect wetland impacts could result from consequent impacts on a wetland's hydrologic characteristics (e.g., the depth and duration of seasonally ponded surface water), or to the portion of the wetland able to support tree and shrub vegetation (such as could occur beneath an elevated section of track), or as a result of isolation of the wetland from other wetlands or areas of valuable upland habitat that contribute to its wildlife habitat functions (such as could occur in areas with a concentration of multiple sections of tracks or other facilities).

3.9.3 Affected Environment

3.9.3.1 Lynnwood Alternative

Aquatic Resources

The Lynnwood Alternative site occurs in the Scriber Creek drainage of the Swamp Creek subbasin, which discharges into the Sammamish River and then into the north end of Lake Washington. Only cutthroat trout, coho salmon, and non-salmonid resident fish have the potential to occur in the portion of Scriber Creek in the aquatic resources study area. River lamprey could also occur throughout Scriber Creek, but there is no available information documenting their occurrence.

The BNSF Storage Tracks site lies primarily in the West Tributary of Kelsey Creek drainage in Bellevue, with a small portion of the southern end of the site in the Sturtevant Creek drainage. No streams occur in the aquatic resources study area for the BNSF Storage Tracks. No salmonids are known to occur within at least 0.4 mile of the aquatic resources study area. However, other resident fish species may be present.

Vegetation and Wildlife

Less than half of the Lynnwood Alternative site is developed (45% under Design Option C1, 38% under Design Option C2, and 47.5% under Design Option C3). The remainder provides vegetation types associated with the wetlands along Scriber Creek, primarily along the northern and eastern portions of the site. The northern portion of the Lynnwood Alternative site includes 6 acres of forest vegetation (11 acres under Design Option C2).

Wetland N1-1, the Scriber Creek wetland (described below) is approximately 17 acres (Sound Transit 2013), and is designated as critical habitat by the City of Lynnwood (Lynnwood Municipal Code [LMC] 17.10) and as a priority habitat by WDFW (2012). Habitat features include snags with pileated woodpecker (*Dryocopus pileatus*) activity, willow with signs of beaver (*Castor canadensis*) activity, and multistoried vegetation comprised largely of native species. Several trees on site most likely qualify as "significant trees" under LMC 17.15, and occur within the patches of forest vegetation. The main significant tree species is Douglas-fir (*Pseudotsuga menziesii*).

Approximately 80% of the BNSF Storage Tracks site is developed. This area supports small, generally isolated areas of vegetation which includes wetland habitats. Existing conditions for wildlife are the same as for the BNSF Alternative and BNSF Modified Alternative sites (as described below). No federal or state threatened or endangered species are known to exist in the Lynnwood Alternative study area.

Wetlands

Two wetlands (N1-1 and N1-3) and two potential wetlands were identified in the Lynnwood Alternative site. Additionally, two wetlands (N1-2 and WLY6) and one potential wetland were identified within 200 feet of the site. All of the wetlands and potential wetlands are small, confined wetlands rated as Category III wetlands with limited functions, except for Wetland N1-1, the approximate 17-acre, Category II wetland located in the northern and eastern portion of the Lynnwood Alternative site associated with Scriber Creek. It is locally referred to as the Scriber Creek Wetland in the city's comprehensive plan and considered one of the "major" wetlands in the City of Lynnwood (City of Lynnwood 2011). This wetland is also described in the *Lynnwood Link Extension Draft EIS* and *Ecosystems Technical Report* (Sound Transit 2013) as Wetland WLY4. The wetland contains three vegetation classes and occupies a broad depression associated with Scriber Creek and the diffuse flow of the creek through the wetland. The buffers of the two western arms of the wetland appear to have been planted with native trees and shrubs, and are signed with Native Growth Protection Area (NGPA) signs. Wetland N1-1 is designated as critical habitat by the City of Lynnwood (City of Lynnwood 2011) and priority habitat by WDFW (2012). Wetland buffers are generally vegetated, but narrow, with extensive development limiting buffer widths and vegetation density around the perimeter of the wetland.

Six wetlands were identified in the BNSF Storage Tracks site. These are described under the BNSF Alternative and BNSF Modified Alternative.

3.9.3.2 BNSF Alternative

Aquatic Resources

The BNSF Alternative site lies primarily in the West Tributary of Kelsey Creek drainage, with a small portion of the southern end of the site in the Sturtevant Creek drainage. No salmonid species are known to occur within at least 0.4 mile of the aquatic resources study area; however, other resident fish species may be present.

Vegetation and Wildlife

The BNSF Alternative site is commercially developed (81%), with small patches of forest (less than 2 acres total) distributed throughout the site. The site is expected to be used by common urban wildlife species. The main habitat features in the vegetation and wildlife study area are two palustrine forested wetlands, both of which are Category III wetlands located at the headwaters of the West Tributary of Kelsey Creek as it flows east between commercially developed areas. Snags in these wetlands may support foraging by pileated woodpeckers. No federal or state threatened or endangered species are known to exist in the BNSF Alternative study area. The BNSF Alternative site lies within 0.8 mile of a known peregrine falcon eyrie (nest) that is periodically used in downtown Bellevue and may be part of the foraging territory used by the falcons. The BNSF Alternative site also lies within approximately 0.3 mile (although on the other side of Interstate 405 [I-405]) of an osprey nest in Hidden Valley Sports Park, but does not support aquatic foraging habitat for ospreys.

Wetlands

Four small, depressional Category III wetlands were identified in the BNSF Alternative site, all located east of the Eastside Rail Corridor. The area east of the Eastside Rail Corridor is also the eastern portion of the BNSF Modified Alternative site, as described below. The wetlands are all located in confined depressions, separated from each other by railroad tracks, and support small areas of either forested or emergent vegetation. In addition, five wetlands and two ditches were identified within 200-feet of the BNSF Alternative site.

3.9.3.3 BSNF Modified Alternative

Aquatic Resources

Aquatic resources for the BNSF Modified Alternative are the same as those for the BNSF Alternative.

Vegetation and Wildlife

The BNSF Modified Alternative site includes most of the area encompassed within the BNSF Alternative site and contains 5 acres of mostly deciduous forest. About 1 acre of this forest also falls within the BNSF Alternative site; the additional 4 acres are situated along the slope west of the railroad tracks. The forested slope west of the railroad tracks provides habitat value for species such as gray squirrel and other small mammals (e.g., mice, rats, and voles), songbirds, raptors, and possibly the Pacific chorus frog (*Pseudacris regilla*) due to its interspersion of vegetation types and ponded areas alongside the railroad tracks. Existing conditions for wildlife are otherwise the same as for the BNSF Alternative. In total, the BNSF Modified Alternative is 77% developed. No federal or state threatened or endangered species are known to exist in the BNSF Modified Alternative study area.

Wetlands

Six wetlands and two ditches were identified in the BNSF Modified Alternative site and three wetlands were identified within 200 feet of the site. Four of the wetlands (E2-1, E2-2, E2-6, and E2-7) in the BNSF Modified Alternative site and three of the wetlands adjacent to the site (E2-3, E2-4, and E2-5) are the same as those identified to be in or adjacent to the BNSF Alternative site. Two wetlands (E2-1a and E2-1b) identified as adjacent to the BNSF Alternative site are within the BNSF Modified Alternative site. Both are long, generally narrow Category III wetlands located along the eastern edge of the western portion of the site, adjacent to the Eastside Rail Corridor. These wetlands total approximate 1.27 acres and support depressional palustrine forested, scrub-shrub, and emergent wetland vegetation. Portions of these wetlands are also within the Lynnwood Alternative BNSF Storage Tracks site.

Three ditches are present in or adjacent to the BNSF Modified Alternative site, all are associated with Wetland E1-1a and E1-1b and convey water outside the wetland study area through linear, channelized swales. The southern portion of Wetland E1-1a appears to drain south via Ditch #1 to the Sturtevant Creek subbasin. Ditch #2 connects the wetlands. Ditch #3 conveys water north out of Wetland E1-1b to the West Tributary of the Kelsey Creek subbasin. These features may be considered Waters of the United States (i.e., not wetlands or streams, but drainage features that convey water to a wetland or stream) because of their characteristics and their connection between the wetlands, the stormwater system, and downstream waterbodies.

3.9.3.4 SR 520 Alternative

Aquatic Resources

The SR 520 Alternative site is bisected by Goff Creek, which varies between a piped channel and a surface channel through the site. No natural riparian habitat is present along the creek in the study area; the stream buffer is pavement, retaining wall, or mowed grass/the emergent vegetation of Wetland E3-2 (described below). Salmonids occur in the lower reaches of Goff Creek downstream of the site below a blocking culvert under Bel-Red Road, about 0.4 miles downstream of the aquatic resources study area. Only cutthroat trout are known to occur upstream of this culvert. The channel segment within the site is not considered suitable habitat for resident fish species because it is separated from other suitable habitats by numerous passage barriers, and because of the lack of aquatic habitat complexity. Despite the already degraded condition of the stream channel and its buffer, it would be expected to provide rearing habitat for some resident fish and potentially anadromous fish, should downstream fish passage barriers be removed in the future.

Vegetation and Wildlife

The SR 520 Alternative site is 92% developed, providing habitat in small, scattered patches for highly adaptable urban wildlife species. The mixed and deciduous forest habitat that exists in the site totals approximately 0.5 acres. Although some of this habitat is small portions of forested wetland, the understory is dominated by nonnative Himalayan blackberry (*Rubus armeniacus*), a species that limits habitat value for native wildlife. There is a large patch of undeveloped, forested habitat to the

immediate north of the site, but it is separated from the site by SR 520, which forms a wildlife movement barrier. The SR 520 site lies within 1.6 miles of a known peregrine falcon eyrie (nest) that is periodically used in downtown Bellevue and may be part of the foraging territory used by the falcons. No federal or state threatened or endangered species are known to exist in the study area for the SR 520 Alternative.

Wetlands

Three wetlands and two ditches were identified in the 520 Alternative site and two wetlands were identified within 200 feet of the site. Three of the wetlands (E3-1, E3-4, and E3-5) are small, forested, Category III or IV wetlands located along the northern edge of the site. Water from these wetlands flows through the riprap retaining wall along the southern toe of the slope and onto the paved parking area and into storm drains; the western end of Wetland E3-1 also flows directly into Goff Creek. Wetland E3-2 is a small Category IV wetland associated with the channel of Goff Creek as it flows adjacent to NE 20th Street, and is bounded by paved sidewalks and road prisms. Wetland E3-3 is a small Category III wetland confined within a stormwater ditch located at the toe of the northern edge of NE 20th Street, and is bounded by vertical concrete walls. The buffer and edges of this wetland appear to have been planted with native trees and shrubs, and are marked with NGPA signs indicating that this wetland may be mitigation constructed to compensate for wetland and/or buffer impacts. The wetland flows into a storm drain and appears to connect with Goff Creek. Wetlands E3-2 and E3-3 are illustrated as “wetland/stream buffer” on figures within the *East Link Project Final EIS* (Sound Transit 2011). Wetland E3-5 continues east outside of the wetland study area and flows to the Valley Creek drainage; it was identified as “Wetland WR11 West of 140th Avenue NE” in the *East Link Project Final EIS* (Sound Transit 2011).

Two ditches are present in the SR 520 Alternative site. These ditches convey water through linear, channelized swales into the stormwater system. They may be considered Waters of the United States (i.e., not wetlands or streams, but drainage features that convey water to a wetland or stream) because of their characteristics and the connection between the stormwater system and Goff Creek.

3.9.4 Environmental Impacts

A summary of impacts of the build alternatives on ecosystems are presented in Tables 3.9-1 through 3.9-3.

Table 3.9-1. Impacts on Aquatic Resources

Alternative	Aquatic Resource	Stream Impacts (linear ft)	Stream Buffer Impacts (acres)	Impacts within 100-Year Floodplain (acres)
Lynnwood Alternative				
Design Option C1	Scriber Creek	0	<0.1	<0.1
Design Option C2	Scriber Creek	0	0.1	0.1
Design Option C3	Scriber Creek	0	0	<0.1
BNSF Storage Tracks	West Tributary of Kelsey Creek	0	0	0
BNSF Alternative	West Tributary of Kelsey Creek	0	0	0
BNSF Modified Alternative	West Tributary of Kelsey Creek	0	0	0
SR 520 Alternative	Goff Creek	700	0.64	0

Table 3.9-2. Impacts on Vegetation and Wildlife

Alternative	Acres within Project Limits[a]	Permanent Operational Impacts (acres)					
		Vegetation Removed by Class					Removed Vegetation
		UMVC	UMVD	UMVM	UMV	USV	
Lynnwood Alternative							
Design Option C1	38	3	3	<1	3	2	11
Design Option C2	42	3	3	<1	3	2	11
Design Option C3	40	3	3	<1	3	2	11
BNSF Storage Tracks	15	0	<1	<1	<1	<1	<1
BNSF Alternative	27	0	1	<1	<1	2	3
BNSF Modified Alternative	39	0	4	<1	<1	2	6
SR 520 Alternative	26	0	<1	<1	0	2	2

[a] Acres within project limits include all parcels plus any construction footprint that may fall outside of these parcels in the ROW which could impact vegetation in these areas. Thus, acres within project limits may be larger than affected parcel acres described in Chapter 2, Alternatives Considered.

UMVC = urban mostly vegetated – coniferous forest; UMVD = Urban mostly vegetated – deciduous forest; UMVM = Urban mostly vegetated – mixed forest; UMV = Urban moderately vegetated; USV = Urban sparsely vegetated.

Table 3.9-3. Impacts on Wetlands and Wetland Buffers

Alternative	Direct Wetland Impacts (acres)	Wetland Buffer Impacts (acres)
Lynnwood Alternative		
Design Option C1	1.9	1.6
Design Option C2	2.1	1.6
Design Option C3	1.9	1.6
BNSF Storage Tracks	0.08	0.19
Subtotal	1.98–2.18	1.79
BNSF Alternative	0.07	0.25
BNSF Modified Alternative	0.6	1.33
SR 520 Alternative	0.39	0.29

3.9.4.1 No Build Alternative

The No Build Alternative would not result in impacts on aquatic resources, vegetation, wildlife, threatened or endangered or priority species, or wetlands. However, ongoing development may affect these resources. The Lynnwood Alternative site is partially developed and the Edmonds School District plans to build a district support center at this location. If constructed, the district support center would increase impervious area on the site, affecting approximately 7,000 square feet of wetland and affecting stream buffers and vegetation. Proposed replanting and construction best management practices (BMPs) would likely avoid, minimize, and mitigate for these potential impacts (Shockey/Brent, Inc. 2007). Urbanized land use is likely to continue on the currently developed western portion of the site for the foreseeable future.

Local improvements related to stormwater treatment and management could result if new development is constructed in the build alternative sites. Such new development would be subject to stormwater permitting and would be required to implement stormwater treatment and management to standards similar to those anticipated for the proposed project.

3.9.4.2 Impacts Common to All Build Alternatives

Figures 3.9-1 through 3.9-5 depict impacts from each of the build alternatives.

Construction Impacts

All upland or wetland/riparian vegetation that is temporarily disturbed outside of the build alternative sites (i.e., within the construction access areas and related rights-of-way) would be restored after construction is completed. Site restoration would include replanting disturbed areas, with appropriate native vegetation, immediately following construction. However, the length of time required for restoration areas to effectively replace preproject functions would vary depending on the type, age, and diversity of the plant community in such areas.

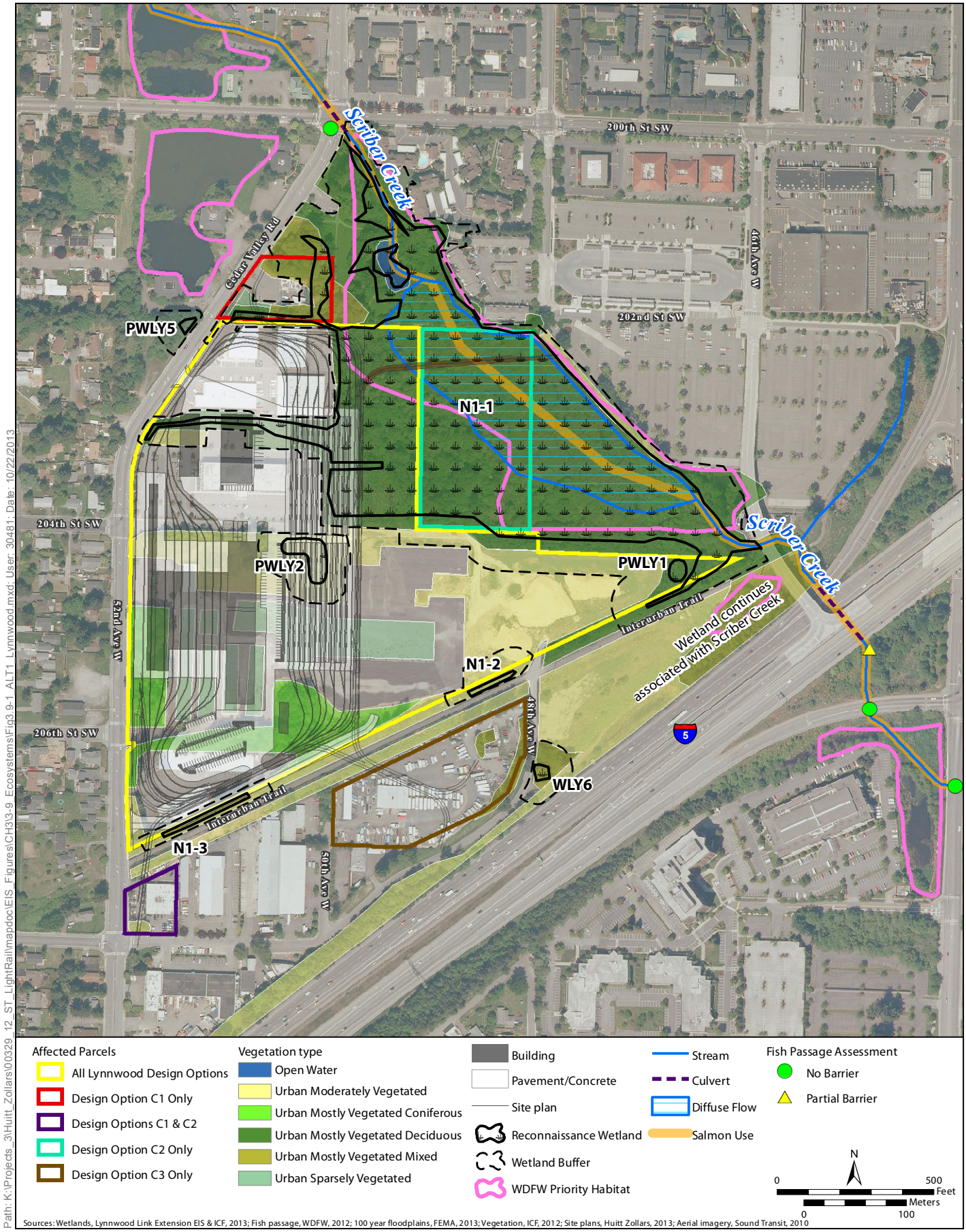


Figure 3.9-1: Lynnwood Alternative—Impacts (Lynnwood Component)
Sound Transit Link Light Rail OMSF Draft EIS

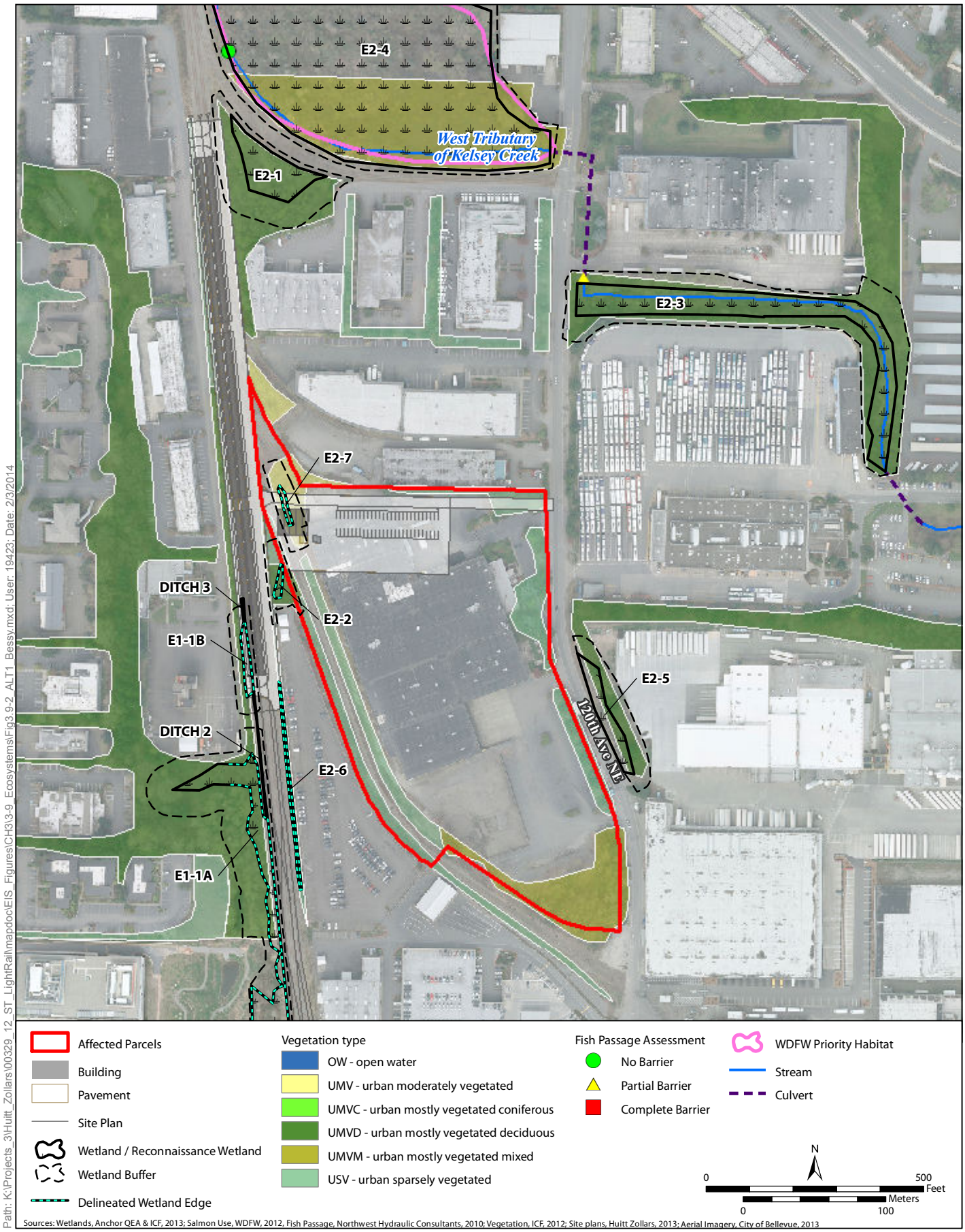
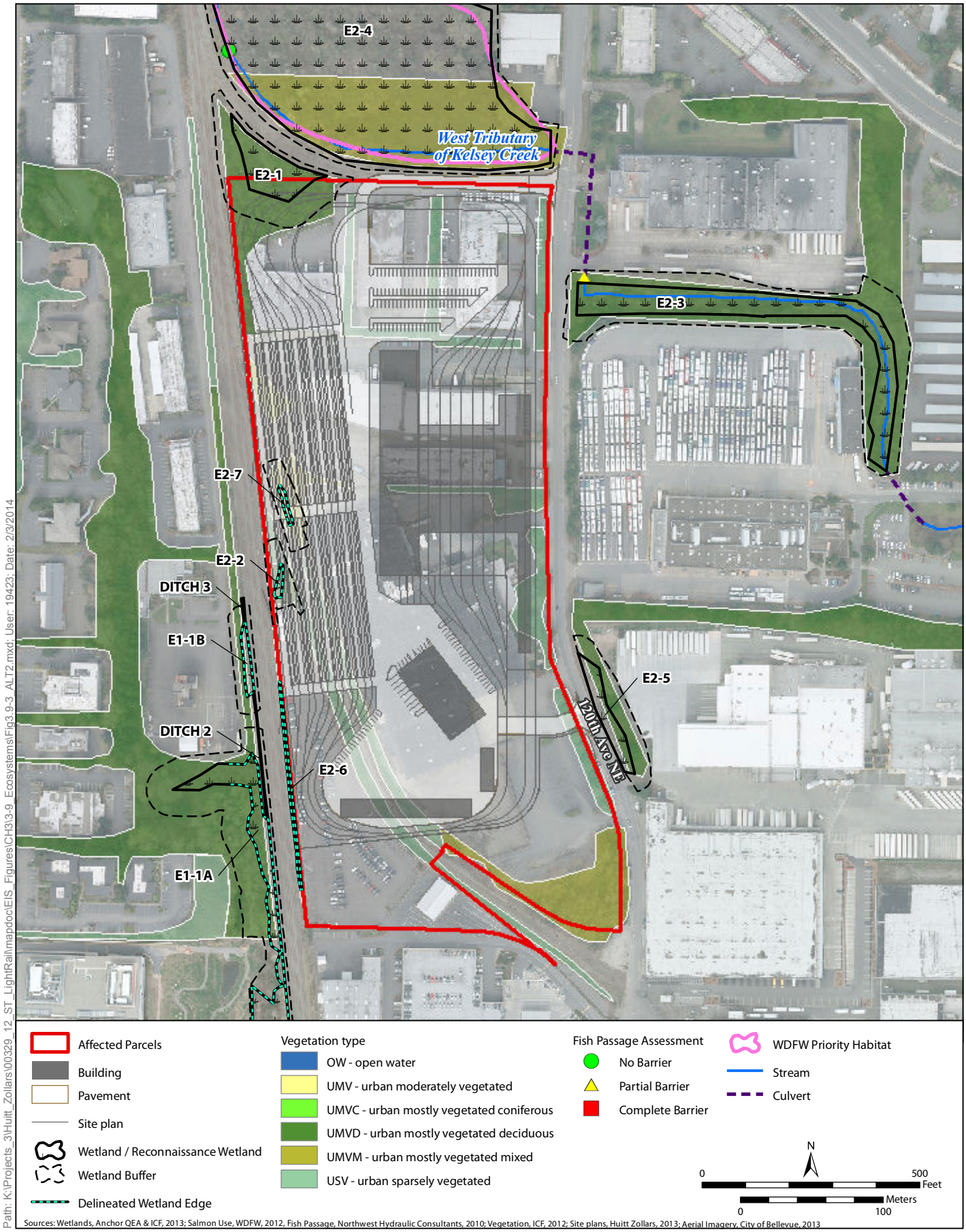


Figure 3.9-2: Lynnwood Alternative—Impacts (BNSF Storage Tracks Component)
Sound Transit Link Light Rail OMSF Draft EIS



Sources: Wetlands, Anchor QEA & ICF, 2013; Salmon Use, WDFW, 2012, Fish Passage, Northwest Hydraulic Consultants, 2010; Vegetation, ICF, 2012; Site plans, Huitt Zollars, 2013; Aerial Imagery, City of Bellevue, 2013

Figure 3.9-3: BNSF Alternative—Impacts
Sound Transit Link Light Rail OMSF Draft EIS

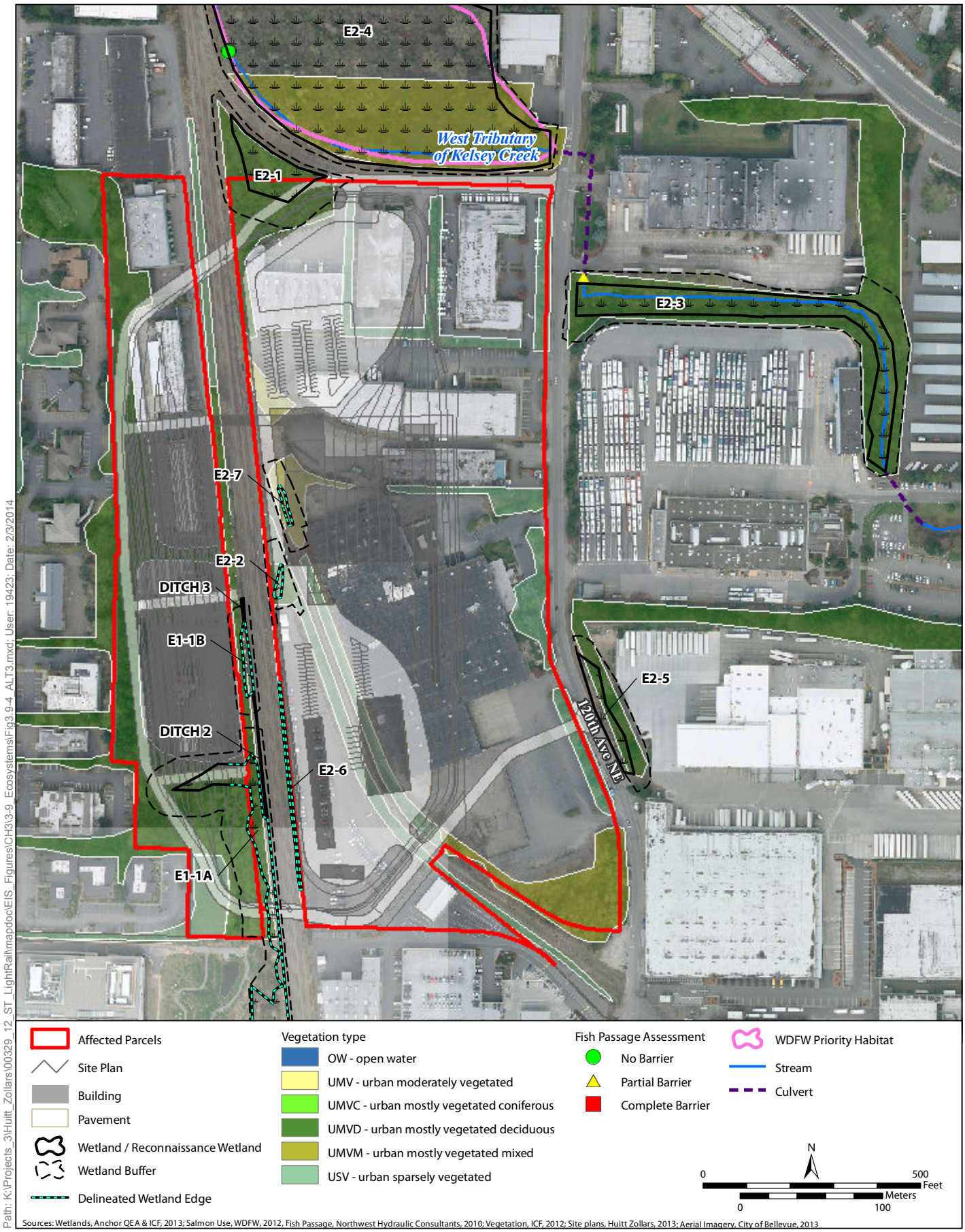


Figure 3.9-4: BNSF Modified Alternative—Impacts
Sound Transit Link Light Rail OMSF Draft EIS

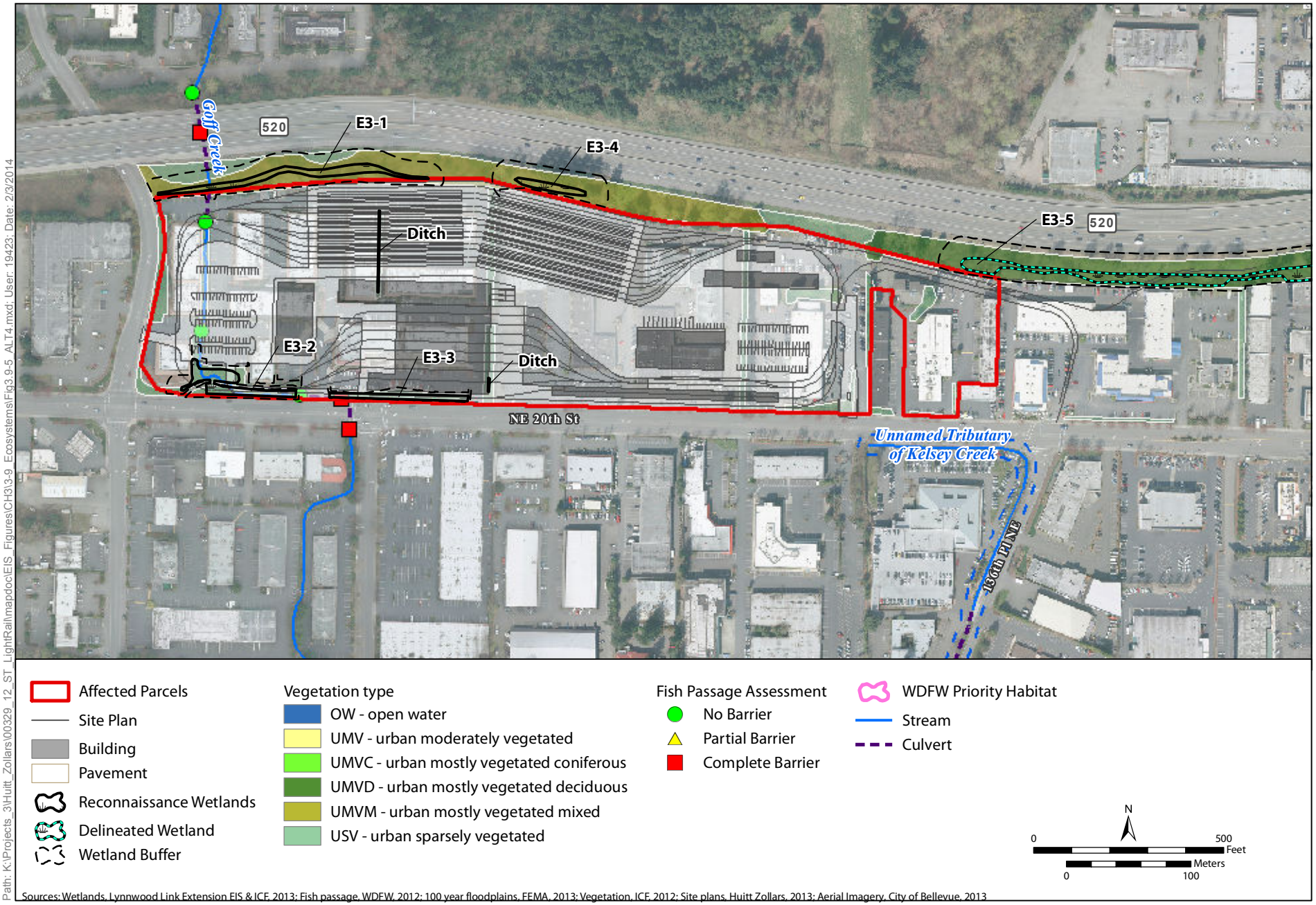


Figure 3.9-5: SR 520 Alternative—Impacts
Sound Transit Link Light Rail OMSF Draft EIS

Land necessary for construction of the elevated guideways, which would provide access between the proposed project and Lynnwood Link Extension or East Link would be temporarily disturbed during construction, and such areas similarly restored following construction. All uplands and wetlands in the construction areas would be disturbed during construction and all vegetation would be temporarily removed. Short-term turbidity impacts may also occur from sedimentation in streams and wetlands resulting from vegetation removal. The duration of the temporary construction impacts would vary with the nature of the activity and the types of BMPs implemented. Recovery time would also vary depending on the affected habitat type.

Construction-related impacts would occur where the build alternative sites cross streams or encroach into stream buffers. Construction impacts would be temporary and limited to the period during and immediately following construction. In addition to the potential impacts of erosion and sediment loading, the use of heavy construction equipment could increase the potential for leakage of fuel, oil, or hydraulic fluids. These impacts may include temporary loss of habitat, temporary reduction of wetland functions, and temporary contamination of surface waters. A spill prevention, control, and countermeasures (SPCC) plan would be developed and implemented, as part of a Stormwater Pollution Prevention Plan (SWPPP), to avoid or minimize construction-related pollutants from entering streams. Construction activities would have temporary impacts on wildlife from vegetation clearing, which could disrupt wildlife breeding, feeding, and travel functions. Increased noise levels during construction could displace wildlife into potentially less-suitable habitats.

Some wildlife species would eventually return to areas that are revegetated after construction; however, reestablishing native vegetation would require 2 to 4 years for herbaceous areas and more years for multilayered vegetation types. Individual animals would be displaced (mobile species such as birds) or destroyed (small, slower-moving species such as amphibians, reptiles, and small mammals) as construction activity occurs. No federal or state threatened or endangered species would be affected during construction because none are known to exist at any of the build alternative sites. Wetland functions could be temporarily reduced by construction activities from reductions in habitat quality, as well as vegetation clearing which can reduce the ability of the wetland to slow down water and remove sediment and contaminants.

Potential temporary construction impacts would be controlled by the types of construction activities and by the implementation of BMPs during construction. These BMPs would be designed to accommodate site-specific characteristics such as widths of wetland and stream buffers and effectively avoid or minimize temporary construction impacts (as well as permanent operational impacts) on all ecosystem resources. These practices are described in detail in Appendix E.3.

Potential BMPs include the following items.

- Delineation of construction limits for vegetated and habitat areas that may be disturbed during construction.
- Development of a Temporary Erosion and Sediment Control (TESC) plan, including BMPs such as silt fences; protective ground covers such as straw, plastic sheeting, or jute mats; and straw bales in drainage features.
- Development of a Construction Stormwater Pollution Prevention Plan, including a TESC; SPCC Plan; Concrete Containment and Disposal Plan; Dewatering Plan; and a Fugitive Dust Plan.
- Use of tracked equipment rather than tire-based equipment in areas that are sensitive to adverse effects from soil compaction. Temporary work bridges could be used in extremely sensitive areas, such as in wetlands or near streams.
- Restoration of areas temporarily affected by construction to pre-construction conditions or better through replanting or reseeding and implementation of a revegetation plan that emphasizes the use of native species as appropriate.
- Any temporary dewatering of the in-water work zone would be preceded by work area isolation and fish removal/relocation (as necessary). Fish handling would be conducted by a trained and qualified biologist.
- Turbid water produced during the course of in-water work would be prevented from discharging to fish-bearing waters or wetlands. Turbid wastewater may be routed to temporary or permanent detention facilities, or to upland areas that provide adequate rates of infiltration.
- Conducting vegetation clearing outside of general migratory bird breeding season, which is typically from March 15 through August 31.

Operational Impacts

All vegetation (and thus, wildlife habitat and wetland functions related to that vegetation) in each of the build alternative sites would be permanently affected and all vegetation, wetlands, and aquatic resources would be removed from the area containing OMSF infrastructure. Consequently, any habitat value of these areas for fish and wildlife would be eliminated and all wetland functions eliminated. However, all direct and indirect wetland and buffer impacts would be mitigated according to local, state, and federal regulations, as described in Section 3.9.6.2, Compensatory Mitigation.

Adverse long-term impacts may include loss of vegetation and wildlife habitat, filling of wetlands, increased stormwater runoff, and degraded surface water quality. However, the proposed project would be developed consistent with current stormwater management regulations. This may provide a beneficial effect in areas that are already built out and were developed prior to modern stormwater treatment requirements. The proposed project would result in overall improvements in streamflows, through the requirement to meet predevelopment conditions for streamflows. Stormwater would be treated to enhanced treatment levels to remove heavy metals. Substantial

permanent impacts on water quality, and therefore aquatic species, would not be expected. While wildlife habitat would be permanently eliminated and habitat value of adjacent areas of vegetation could decline due to the noise and activity inherent in the operation of the OMSF, no adverse effect on essential fish habitat protected by the Magnuson-Stevens Act is expected. No federal or state threatened or endangered species would be affected because none are known to exist at any of the build alternative sites.

Permanent wetland and buffer impacts could result from direct removal/fill. All wetlands identified, as well as the majority of the ditches, are expected to be jurisdictional, and thus, regulated by the local jurisdictions, the Washington State Department of Ecology, and the U.S. Army Corps of Engineers (Corps). Thus, Sound Transit would seek Clean Water Act Section 404 and 401 permits from these jurisdictions (as applicable) for wetland impacts.

3.9.4.3 Lynnwood Alternative

Construction Impacts

- **Aquatic Resources.** Construction activities under this alternative would have a low risk of affecting aquatic resources because no direct temporary impacts on Scriber Creek are expected. Construction impacts on the Scriber Creek floodplain are addressed in Chapter 3.10, Water Resources. Implementation of appropriate BMPs would avoid or minimize impacts during construction, such as turbidity, on any portions of the stream buffer that are not permanently affected by the project footprint.
- **Vegetation and Wildlife.** Design Option C2 would have a greater temporary impact on wildlife than Design Option C1 or C3. Under Design Option C2, the lead track running east from the site would be constructed near the middle of Wetland N1-1 (Figure 3.9-1). Lead tracks for Design Options C1 and C3 follow I-5 and 52nd Avenue W along the edges of the wetland, where noise and human disturbance from traffic are already high. Thus, construction of Design Option C2 has a greater potential to bring noise and disturbance through the middle of the wetland, affecting interior habitats and temporarily displacing wildlife species to the edges of the wetland or other areas of adjacent habitat.
- **Wetlands.** Portions of Wetland N1-1 would be temporarily disturbed during construction. Implementation of appropriate BMPs would avoid or minimize temporary impacts on any portions of the wetlands that are not permanently affected by the project footprint. All temporarily disturbed wetland and wetland buffer vegetation would be revegetated with native vegetation following construction. The short-term impact would be a change in the wetland vegetation type where trees or large shrubs were removed during construction. Temporarily disturbed areas would regain function, although it would be decades before these areas would provide mature forested or scrub-shrub functions.

Design Option C2 would have a greater temporary impact on wetlands than Design Option C1 or C3. Under Design Option C1, three guideway support footings would be constructed in the narrow northwestern arm of Wetland N1-1. Under Design Option C2, the lead track running east from the site and multiple guideway support footings would be constructed across the middle of Wetland N1-1 (Figure 3.9-1). Construction of Design Option C2 has a greater potential for temporary impacts through the middle of the wetland, affecting interior wildlife habitat functions and temporarily reducing the density, diversity, and size of trees and shrubs in the disturbed areas. In contrast, lead tracks for Design Option C1 and Design Option C3 would follow currently developed routes along the edges of the wetland (rather than through its center). Design Option C3 would not include any guideway support footings in wetlands or wetland buffers.

In the BNSF Storage Tracks site, temporary impacts on portions of Wetland E1-1a could occur along the base of the western hillslope and the western side of the tracks. Construction noise could temporarily displace pileated woodpeckers transiting over the site to forage in Wetlands E2-3 or E2-4. Implementation of appropriate BMPs would avoid or minimize temporary impacts during construction activities on any portions of the wetlands that are not permanently affected by the project footprint.

Operational Impacts

- **Aquatic Resources.** The Lynnwood Alternative is not expected to measurably affect aquatic species or aquatic habitat conditions in the site, or in downstream reaches, because of the limited extent and location of potential impacts on Scriber Creek (Figure 3.9-1). Permanent impacts of this alternative on aquatic habitat would likely vary from minimal impacts on fish habitat, to minor adverse impacts requiring mitigation. Permanent impacts would include the placement of approximately 1,000 cubic yards of fill in the Scriber Creek floodplain (under Design Options C1 and C3) or the placement of approximately 1,100 cubic yards of fill in the floodplain under Design Option C2 (due to track footings being placed in the floodplain/Scriber Creek wetland). Impacts associated with the placement of fill in the Scriber Creek floodplain are detailed in Section 3.10, Water Resources. The Lynnwood Alternative would increase impervious surface by 35% but the proportion of the site characterized as pollution generating impervious surface (PGIS) would decrease by 25% (see Section 3.10, Water Quality, Tables 3.10-2 and 3.10-3). To minimize the potential impacts of increased impervious surface area, stormwater detention and treatment facilities would be constructed. These facilities would include stormwater ponds and underground vaults, sized to provide sufficient detention and treatment to offset any increase in impervious surface area. Approximately 0.1 acre of stream buffer would be permanently lost or altered under Design Option C2. This would preclude the development of mature forested vegetation, thereby limiting the future recruitment of large woody debris into this portion of Scriber Creek. No streams or stream buffers would be affected by the BNSF Storage Tracks.
- **Vegetation and Wildlife.** Approximately 6 acres of forested habitat would be permanently removed from the Lynnwood Alternative site, 1.6 to 1.8 acres of which would be forested

wetland habitat (Figure 3.9.1). Impacts would include a decrease in upland forest and wetland habitat patch size, a possible decrease in snags, and decreased snag-recruitment potential (i.e., fewer live trees that can eventually become snags). Loss of snags could affect foraging suitability of Wetland N1-1 for pileated woodpeckers. This alternative would result in the complete loss of Wetland PWLY2 (0.3-acre impact) and Wetland N1-3 (0.1-acre impact), which provide limited wildlife habitat functions due to their small size. For the same reasons as described under the Construction Impacts section, Design Option C2 would have a greater impact on wildlife and result in greater habitat fragmentation and human disturbance of wildlife habitat in Wetland N1-1 than Design Option C1 or C3. Operation of the BNSF Storage Tracks would affect approximately 0.2 acre of forested habitat, some of which is forested wetland habitat along the railroad tracks (Figure 3.9-2). Given the highly (80%) developed character of the BNSF Storage Tracks site and the small amount of high-quality habitat currently present, impacts from operation of the proposed project are expected to be minimal.

- **Wetlands.** The Lynnwood Alternative would result in 1.6 to 1.8 acres of permanent impact on the western side of Wetland N1-1 (reducing the wetland size by 8%) and would place elevated guideways across the center of the wetland including across the area of Scriber Creek's diffuse flow into the wetland (Figure 3.9.1). Impacts would affect the wetland's ability to perform water quality and hydrologic functions, and would reduce the amount of habitat provided for wildlife. All design options of this alternative would affect the areas that appear to be previous mitigation, which could complicate a determination of mitigation for impacts. The NGPA recording certificate for the southernmost portion of the wetland's two western arms specifically prohibits future development and requires any boundary adjustments to the NGPA be approved by the City of Lynnwood through a formal platting process. All design options of this alternative would affect this NGPA and trigger such a process for approval of any modification to the NGPA boundary to allow impacts on this portion of Wetland N1-1.

  Design Option C2 would have a greater impact (0.2 acre) on wetlands than Design Option C1 or C3, based on both area and wetland function, for the reasons stated in the Construction Impacts section. This alternative would also result in the loss of Wetland PWLY2 (0.3-acre impact) and Wetland N1-3 (0.1-acre impact). Approximately 1.6 acres of wetland buffer would also be affected by the Lynnwood Alternative: 1.4 acres of Wetland N1-1 buffer and 0.2 acre of Wetland N1-3 buffer. Impacts would result in the reduction of forested and shrub wetland habitats, as well as potentially surface-flow paths and the ability to store floodwaters associated the with the Scriber Creek floodplain. Wetlands and wetland buffers under the elevated guideway would also be affected through the conversion of forest-dominated wetlands to shrub-dominated wetlands and buffers under and along each side of the elevated guideways to prevent trees and branches from interfering with operation of the light rail.

Operation of the BNSF Storage Tracks would affect approximately 0.08 acre of wetlands (Wetlands E1-1b, E2-2, E2-6, and E2-7) including the complete loss of Wetland E2-7 (Figure 3.9-2). Approximately 0.2 acre of functional wetland buffer would also be affected. Operation of this alternative would also affect approximately 63 linear feet (less than 0.01 acre) of ditches. Wetlands associated with the BNSF Storage Tracks have a limited ability to provide wildlife habitat, water quality, and hydrologic functions due to the surrounding development, which has reduced their size and fragmented their connections. Impacts would affect primarily the wetland's ability to perform water quality and hydrologic functions, while further reducing the habitat that these wetlands currently provide for wildlife. This alternative would not affect snag recruitment or foraging habitat for pileated woodpeckers in Wetlands E2-3 or E2-4.

3.9.4.4 BNSF Alternative

Construction Impacts

- **Aquatic Resources**. No construction impacts would occur on the functional stream buffer of the West Tributary of Kelsey Creek (as it emanates from and flows through Wetland E2-4) as a result of the BNSF Alternative (Figure 3.9-3). Given the anticipated effectiveness of construction BMPs, construction activities under this alternative would have a low risk of adverse impacts on aquatic species, including resident fish. There is no anadromous salmonid spawning or rearing habitat within about 0.4 mile of the construction site; therefore, there would be no adverse impacts on these habitats.
- **Vegetation and Wildlife.** Little, if any, vegetation would need to be removed from outside the BNSF Alternative site for construction purposes. Construction would increase noise levels and human activity temporarily, but the impact is expected to be minimal and no species are expected to be affected. In accordance with the MBTA, Sound Transit would consult with the U.S. Fish and Wildlife Service (USFWS) on methods to implement during construction to avoid impacts on migratory birds. There would be no impacts on the peregrine falcon eyrie at Bellevue Tower, should it become active again, or on the osprey nest at Hidden Valley Sports Park. Construction noise could temporarily displace pileated woodpeckers transiting over the site to forage in Wetlands E2-3 or E2-4.
- **Wetlands.** Project construction activities are expected to include some temporary clearing of wetland vegetation during construction, which could result in the temporary loss of wetland or wetland buffer habitat. Implementation of appropriate BMPs would limit temporary construction impacts. All temporarily disturbed wetland and wetland buffer vegetation would be revegetated with native vegetation following construction. The short-term impact would be a change in the wetland vegetation type where trees or large shrubs are removed during construction, which would have temporary impacts on wildlife habitat functions in these wetlands. Temporarily disturbed areas would slowly regain function, although it would be decades before these areas would provide mature forested or scrub-shrub functions.

Operational Impacts

- **Aquatic Resources.** No operational impacts on the functional stream buffer of the West Tributary of Kelsey Creek would occur as a result of this alternative (Figure 3.9-3). The BNSF Alternative would result in a 3% increase in the impervious area and PGIS would decrease by 21% (see Section 3.10, Water Resources, Tables 3.10-2 and 3.10-3). Retrofitting the stormwater treatment and control measures on the site to meet current regulations is expected to result in measurable improvements in downstream water quality and streamflow characteristics compared to existing conditions.
- **Vegetation and Wildlife**. Less than 2 acres of mostly upland coniferous and deciduous forest habitat would be removed permanently for construction of the BNSF Alternative (Figure 3.9-3). The proposed project would increase the percent of the site that is developed from 81% to 93%. This habitat is currently used by songbirds, small mammals, and other species, and would be lost. Permanent impacts on wildlife are expected to be minimal and there would be no impacts on the peregrine falcon eyrie at Bellevue Tower, should it become active again, or on the osprey nest at Hidden Valley Sports Park.
- **Wetlands.** Impacts on Wetlands E2-1, E2-2, E2-6, and E2-7 would occur under the BNSF Alternative, totaling approximately 0.07 acre of direct wetland impact and approximately 0.25 acre of wetland buffer impact (Figure 3.9-3). This includes the complete fill of Wetlands E2-2 and E2-7, and the partial fill of Wetlands E2-1 and E2-6 and consequent loss of the limited wildlife habitat functions provided by these wetlands. This alternative would not affect snag recruitment or foraging habitat for pileated woodpeckers in Wetlands E2-3 or E2-4. The BNSF Alternative would not affect the ditches along the western side of the BNSF tracks. The character of these wetland impacts would be the same as described under the BNSF Storage Tracks component of the Lynnwood Alternative.

3.9.4.5 BNSF Modified Alternative

Construction Impacts

- **Aquatic Resources.** The potential construction impacts on aquatic resources under this alternative would be similar to those discussed for the BNSF Alternative.
- **Vegetation and Wildlife.** The potential construction impacts on vegetation and wildlife resources under this alternative would be similar to those discussed for the BNSF Alternative.
- **Wetlands.** The potential construction impacts on wetlands under this alternative would be similar to those discussed for the BNSF Alternative, with additional temporary impacts on Wetland E1-1a. Implementation of BMPs described in Appendix E.3 would avoid or minimize temporary construction impacts on any portion of the wetlands not permanently affected.

Operational Impacts

- **Aquatic Resources.** Potential operational impacts of the BNSF Modified Alternative on aquatic resources would be similar to those described above for the BNSF Alternative. The BNSF Modified Alternative would result in a 12% increase in the impervious area and the proportion of the site characterized as PGIS would decrease by 9% (see Section 3.10, Water Resources, Tables 3.10-2 and 3.10-3). Retrofitting the stormwater treatment and control measures on the site, to meet current regulations, is expected to result in measurable improvements in downstream water quality and streamflow characteristics compared to existing conditions.
- **Vegetation and Wildlife.** Approximately 4 acres of mostly deciduous upland forest habitat would be removed permanently under the BNSF Modified Alternative (Figure 3.9-4). These 4 acres are currently used by songbirds, small mammals, and other species, and this habitat would be lost. As described under the BNSF Storage Tracks component of the Lynnwood Alternative and the BNSF Alternative, permanent impacts on wildlife are expected to be minimal, and there would be no impacts on the peregrine falcon eyrie at Bellevue Tower, should it become active again, or on the osprey nest at Hidden Valley Sports Park. This alternative would not affect snag recruitment or foraging habitat for pileated woodpeckers in Wetlands E2-3 or E2-4.
- **Wetlands.** The BNSF Modified Alternative would directly affect approximately 0.6 acre of wetland and approximately 1.3 acres of wetland buffer (Figure 3.9-4). Wetlands that would be affected include E1-1a, E1-1b, E2-1, E2-2, E2-6, and E2-7. Impacts would include 0.4 acre of direct impact on Wetland E1-1a and 1.05 acres of its functional buffer, 0.04 acre of direct impact on Wetland E2-1, and 0.28 acre of its functional buffer, and the complete loss of Wetlands E1-1b, E2-2, E2-6, and E2-7 and consequent loss of the limited wildlife habitat functions provided by these wetlands. The BNSF Modified Alternative would also affect approximately 349 linear feet (0.02 acre) of ditches. The character of these wetland and ditch impacts and the ability to mitigate them would be the same as described under the BNSF Storage Tracks component of the Lynnwood Alternative and the BNSF Alternative.

3.9.4.6 SR 520 Alternative

Construction Impacts

- **Aquatic Resources.** The SR 520 Alternative would require in-water construction activities during relocation of the stream channel or conversion of the surface channel of Goff Creek to a piped reach. Construction activities would be conducted outside of the stream ordinary high water mark (OHWM), until the relocated stream channels or pipes are completed. The streamflows would then be diverted into the new conveyance structures, and the existing channel would be eliminated to grade the site to level condition. This process is expected to avoid or substantially minimize potential temporary degradation of downstream water-quality conditions during the construction phase. Although the existing stream buffer consists primarily of impervious surface areas, there is some limited vegetation immediately adjacent to the channel of Goff Creek at this alternative site. Upland ground disturbances, and activities associated with placing the existing stream channel in an underground pipe, are expected to increase the potential for

temporary sediment delivery to Goff Creek. However, construction BMPs would minimize or eliminate these potential risks.

- **Vegetation and Wildlife**. Short-term vegetation disturbance outside the project footprint is expected to be minimal to none. Temporarily disturbed vegetation would be replanted, with an opportunity to increase native vegetation cover and decrease invasive species cover. Construction noise associated with this alternative would have the least impact on wildlife compared to the other build alternatives, given the current level of noise and development already on site.
- **Wetlands.** Project construction activities are expected to include some temporary clearing of wetland vegetation, which could result in the temporary loss of wetland or wetland buffer habitat. It is expected that the implementation of appropriate BMPs would minimize temporary impacts on wetland resources during construction activities at the site. . Implementation of appropriate BMPs would limit temporary construction impacts, and all temporarily disturbed wetland and wetland buffer vegetation would be revegetated with native vegetation following construction.

Operational Impacts

- **Aquatic Resources.** The SR 520 Alternative would permanently replace approximately 693 feet of open stream channel of Goff Creek, with a similar length of underground pipe, which would permanently degrade aquatic habitat functions provided by this segment of Goff Creek, and would affect approximately 0.64 acre of stream buffer habitat, 0.21 acre of which is also wetland buffer (Figure 3.9-5). This section of stream is highly modified, surrounded by commercial development, and isolated from upstream and downstream habitats. Fish use is expected to be limited and temporary due to the generally poor stream and riparian habitat conditions and isolation from other habitats by numerous passage barriers.

  The resulting direct impacts on fish and other living aquatic resources would be limited because this habitat is degraded, provides limited habitat suitability for native fish species, and is fragmented and isolated from more accessible and productive habitat areas farther downstream in the Goff Creek and Kelsey Creek watersheds. However, the existing open channel provides other important stream functions, including groundwater inputs that support base flows and moderate water temperatures in downstream reaches, and the transportation of nutrients and organic material from upstream to downstream habitats, supporting the aquatic food chain.

  The SR 520 Alternative would improve water quality conditions by reducing the amount of PGIS that drains to surface waters, and by increasing stormwater detention and treatment capacity. While the SR 520 Alternative would result in a 33% increase in the impervious area, the proportion of the site characterized as PGIS would decrease by 18% (see Section 3.10, Water Resources, Tables 3.10-2 and 3.10-3). The SR 520 Alternative would also improve stormwater detention and treatment site-wide relative to current conditions. The SR 520 Alternative would retrofit the entire site with modern stormwater detention and treatment consistent with current regulatory standards. On this basis, this alternative would likely result in an incremental

improvement in water quality conditions in downstream receiving waters relative to current conditions.

The 693 feet of open channel in the SR 520 Alternative site represents about 36% of the total length of open channel habitat available between SR 520 and the accessible anadromous fish habitat in Goff Creek downstream of Bel-Red Road. Anadromous fish access to reaches upstream of Bel-Red Road could be restored in the future. The City of Bellevue has plans to daylight large sections of Goff Creek (City of Bellevue 2012) downstream of the SR 520 Alternative site. The loss of the open channel habitat in the SR 520 Alternative site footprint would likely be considered an adverse impact on aquatic resources in Goff Creek by WDFW. BMPs are expected to prevent any impacts on Valley Creek, which is about 150 feet east of the SR 520 Alternative site.

- **Vegetation and Wildlife.** Due to the limited amount of high-quality habitat and the highly developed nature of the SR 520 Alternative site, this alternative would have the least impact on vegetation and wildlife habitat of the four build alternatives. Approximately 0.5 acre of deciduous and mixed forest (mostly forested wetland) and 2 acres of landscaping would be permanently removed (Figure 3.9-5). The majority of this habitat exists in a linear corridor between SR 520 and commercial development and the understory is thick with Himalayan blackberry. Although this area is mapped as high-value as forested habitat, the habitat value is diminished by small patch size, lack of corridors, noise, and human disturbance. There is no connectivity to larger habitat patches and the highway and other roads make dispersal of amphibians and most small mammals to and from this site unlikely. Birds and larger mammals face the hazard of having to cross roads to reach this habitat. A couple of snags that provide foraging habitat for woodpeckers would be lost. Some large trees that may provide perching and roosting habitat for raptors would be lost.
- **Wetlands.** Wetland impacts associated with the SR 520 Alternative would occur on three of the five wetlands in this alternative site (Figure 3.9-5). This alternative would also substantially modify two ditches in the site, totaling approximately 246 linear feet. This alternative would result in 0.4 acre of direct wetland impact and 0.3 acre of wetland buffer impact. This would include the filling of Wetland E3-2 (0.2 acre) which currently provides a limited floodplain for Goff Creek, and Wetland E3-3 (0.1 acre), which drains through pipes to Goff Creek and impacts on the western end of Wetland E3-5, which continues east outside of the wetland study area. Each of the three affected wetlands provide small patches of wildlife habitat, as well as water quality and hydrologic functions.

3.9.5 Indirect and Cumulative Impacts

As explained in Section 3.9.2, Methods, indirect wetland impacts may occur on the remaining portion of a wetland due to the effect of direct impacts occurring on a large portion of the wetland. Permanent wetland and buffer impacts could result indirectly from grading or placing fill into large portions of wetlands, as well as from grading and placing fill into large portions of a wetland's buffer. Indirect impacts can affect a wetland's hydrologic characteristics (e.g., its capacity to hold

water and ability to slow water flow) as well as its wildlife habitat functions. Both the Lynnwood Alternative and BNSF Alternative would result in such indirect impacts on wetlands and wetland buffers. The BNSF Modified Alternative would indirectly affect much of Wetland E1-1a (Figure 3.9-4).

Cumulative impacts for ecosystem resources were considered within a broader study area to capture how the impacts of reasonably foreseeable future projects—when coupled with the proposed project and past projects—may interact to affect the function of ecosystems at a larger scale than site-specific alternatives. The existence and extent of areas dominated by native plants that could provide wildlife habitat and support wildlife corridors for mobile species, foraging areas for avian and mammal species, and breeding habitats were qualitatively considered at the scale of the Scriber Creek and West Tributary of Kelsey Creek subbasin scale. Stream habitat accessibility and quality were similarly considered at the subbasin scale for qualitative impacts on aquatic resources and fish species. Landscape connectivity within these subbasins was considered for impacts on wetlands based on the degree to which they provide water quality, hydrologic, and habitat functions to their watersheds.

Segment C-Mountlake Terrace to Lynnwood of the Lynnwood Link Extension would result in impacts on ecosystems resources in the Scriber Creek subbasin. Potential stream and wetland impacts from Segment C–Mountlake Terrace to Lynnwood would include impacts on Scriber Creek, the tributary to Scriber Creek, and approximately 0.1 acre to 1.0 acres of wetland impact including impacts on the Scriber Creek Wetland (WLY4 in the Lynnwood Link documents, Wetland N1-1 herein). Impacts on Scriber Creek as it flows and disperses through the wetland are considered wetland impacts in the *Lynnwood Link Extension Draft EIS* (Sound Transit 2013). Lynnwood Link Extension would also result in an estimated 0.06 acre of impact on the North Branch of Thornton Creek and 1.0 acre of impact on McAleer Creek, both of which are tributary streams to Lake Washington (as is Scriber Creek, via Swamp Creek). Vegetation impacts and consequent loss of wildlife habitat as a result of the Lynnwood Link Extension would range from 1 to 2 acres in the Thornton Creek subbasin, 3 to 11 acres in the McAleer Creek subbasin, and 1 to 2 acres in the Scriber Creek subbasin.

The OMSF Lynnwood Alternative's approximate 6 acres of vegetation and wildlife habitat impact, 1.6 to 1.8 acres of wetland impact, and 0.1 acre of aquatic impacts would add to these reasonably foreseeable project impacts from the Lynnwood Link Extension and, thus, contribute to cumulative impacts on the Scriber Creek subbasin, as well as to the greater Lake Washington watershed. These impacts would contribute cumulatively to the loss of area and function currently found in the remaining undeveloped portions of the Scriber Creek subbasins. They would further reduce the area of native vegetation, wetlands, and fish and wildlife habitat and further limit the connectivity of the habitat corridor formed by Scriber Creek and its wetlands and riparian zone through the City of Lynnwood.

Based on the *East Link Project Final EIS* (Sound Transit 2011), the East Link project would result in impacts on ecosystems resources in the same watersheds as the build alternatives, with impacts varying depending on segment and alternative within each segment. The potential stream and wetland impacts from Segment D – Bel-Red/Overlake would include impacts on the unnamed

tributary to Kelsey Creek, a crossing of the West Tributary of Kelsey Creek and Wetland WR-6 (herein referred to Wetland E1-1a). This segment of East Link would also result in vegetation impacts and consequent loss of wildlife habitat in the watershed of 0.9 acre, which would add to the approximate .05 acre to 4 acres of vegetation and wildlife habitat impacts of the BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative in the watershed.

In conjunction with the 2 to 4 acres of vegetation and wildlife habitat impact, the approximately 0.07 to 0.6 acre of wetland impact, 0.33 to 1.96 acres of wetland buffer, and 693 feet of Goff Creek that would be piped under the BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative, these reasonably foreseeable project impacts on the stream, wetland, wetland buffers, and vegetation and wildlife habitat would contribute to the cumulative impacts in the Kelsey Creek subbasin of the Lake Washington watershed.

These impacts would cumulatively contribute to the loss of area and function currently found in the remaining undeveloped portions of the Kelsey Creek subbasin. Due to the highly dispersed and disconnected nature or most of the areas of vegetation and wetlands affected by these projects, the cumulative loss of habitat connectivity and corridors through the city would be less than the cumulative impact of the OMSF's Lynnwood Alternative and the Lynnwood Link Extension on the Scriber Creek subbasin.

3.9.5.1 Beneficial Impacts

Both the Lynnwood Link Extension and East Link would provide mobility options and would help achieve higher-density, transit-oriented development, thereby reducing the area of land development in ways that are consistent with regional and local plans and policies. These projects would support high-density, mixed-use redevelopment, which would be a beneficial cumulative impact by potentially reducing the tendency for urban sprawl through a concentration of development into already developed areas.

New impervious surfaces added by the proposed project and other reasonably foreseeable projects would include appropriate stormwater control and quality treatment in accordance with Ecology regulations. This would improve conditions relative to stormwater detention and treatment in the highly developed portions of the BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative sites. Thus, the proposed project could provide an overall cumulative benefit in terms of stormwater quality.

Positive cumulative impacts could also result from efforts to enhance streams and wetlands in the Scriber Creek and Kelsey Creek subbasins through comprehensive planning and subbasin plans. The proposed project and other reasonably foreseeable development projects would be subject to regulatory review and/or permitting under federal, state, and local regulations and would be required to mitigate impacts on streams, wetlands, and high-value habitats in accordance with federal, state, and local regulations. Project review and permitting processes would trigger the implementation of conservation measures to avoid and minimize impacts on ecosystem resources,

and would require compensatory mitigation for unavoidable impacts. Coordination between project proponents, and across projects proposed by the same proponent, could also help reduce impacts.

3.9.6 Potential Mitigation Measures

Sound Transit's policy (Executive Order No. 1, Establishing a Sustainability Initiative for Sound Transit [2007]) on ecosystem mitigation is to avoid impacts on environmentally sensitive resources and provide adequate mitigation and no net loss of ecosystem function and acreage as a result of agency projects. The proposed project would mitigate impacts to ecosystem resources in accordance with the mitigation sequencing requirements established by NEPA, the CWA, and local CAOs. According to NEPA (40 CFR 1508.20), mitigation for ecosystem impacts is based on a hierarchy of first avoiding the impact, then minimizing the impact by limiting the degree or magnitude of the action, rectifying the impact by restoring, repairing, or rehabilitating the affected environment, reducing or eliminating the impact over time, and finally compensating for any remaining unavoidable adverse impacts by providing substitute resources or environments.

As described below, the build alternatives for the proposed project would avoid or minimize potential impacts on ecosystems resources whenever practicable, and Sound Transit is committed to providing compensatory mitigation when avoidance is not practicable.

3.9.6.1 Avoidance and Minimization

Sound Transit would comply with standard specifications, BMPs, and applicable federal, state, and local mitigation requirements during design, construction, and post construction activities. BMPs typically required for avoidance and minimization of impacts on ecosystem resources are outlined in Appendix E.3. Sound Transit would meet all regulatory requirements and continue to implement proactive avoidance and minimization measures related to these BMPs in adherence with federal, state, and local regulations.

3.9.6.2 Compensatory Mitigation

To the extent that impacts could not be avoided or minimized through BMPs, or rectified after construction, Sound Transit would implement additional measures to reduce impacts and provide compensatory mitigation measures where impacts are unavoidable.

Compensatory wetland mitigation would be conducted in accordance with applicable federal, state, and local requirements and guidelines. These include the federal *Final Compensatory Mitigation Rule* (40 CFR 230); interagency guidance prepared by Ecology, the Corps, and EPA in *Wetland Mitigation in Washington State* (Washington State Department of Ecology et al. 2006); and local CAOs for the Cities of Lynnwood and Bellevue.

Mitigation for unavoidable impacts on other resources (e.g., streams, stream buffers, and fish and wildlife habitat/habitat for species of local importance) that are protected under local CAOs would also be conducted in accordance with the requirements of those ordinances (i.e., Bellevue Municipal Code [BMC] 20.25H.080 and 20.25H.085 for streams and 20.25H.160 for habitat associated with species of local importance; LMC 17.10.064 for streams and 17.10.081 for wildlife). Sound Transit

would also adhere to local ordinances regarding tree replacement ratios (e.g., replacement of significant trees per the LMC).

Sound Transit would work with the Cities of Lynnwood and Bellevue to define appropriate mitigation that is consistent with, and complementary to, local plans for ecosystem restoration. Mitigation could be accomplished through a combination of site-specific actions, and more basin-wide or programmatic actions such as creating wider stream or riparian buffers, restoring native riparian areas, removing nonnative and invasive vegetation, supporting environmental education, and improving stormwater management.

Approved Mitigation Bank

Currently, there are no approved mitigation banks with service areas that include the subbasins in which wetland impacts would occur under the build alternatives. Although it is possible that a bank could become certified with service in the build alternative sites in the future, mitigation banking projects would take considerable lead time for planning and approval.

King County In-Lieu Fee Program (Mitigation Reserves Program)

King County has developed an in-lieu fee program called the Mitigation Reserves Program (MRP), which was approved by the Corps in March 2012 (King County 2013a). As of February 2012, the program is available throughout unincorporated King County. The program may be available to project proponents (such as Sound Transit) working within incorporated cities if the city codes allow it and if the city and King County have an agreement in place. However, as of February 2012, there are no such agreements in place (King County 2013b). The program includes service areas within the King County watersheds affected by the proposed project (i.e., Cedar River/Lake Washington and Sammamish River). Sound Transit would discuss this program with the Cities of Lynnwood and Bellevue to determine whether mitigation through the MRP would be appropriate for the proposed project.

Project-Specific Mitigation Developed by Sound Transit

Lacking an approved mitigation bank, and if agreements to use the King County Mitigation Reserves Program cannot be reached, Sound Transit would mitigate for unavoidable impacts through permittee-responsible, project-specific mitigation in accordance with the mitigation ratios specified in the Lynnwood and Bellevue CAOs and in accordance with the procedures outlined by Ecology and the Corps for selecting mitigation sites using a watershed approach (Hruby et al. 2009). Sound Transit would use the guidance from Ecology, the Corps, and EPA, in conjunction with each jurisdiction's critical areas mitigation ratio requirements, to determine the appropriate amount and types of compensatory mitigation to appropriately compensate for the specific functions and degree of functions provided by the types of wetland impacts (Hruby 2012).

Mitigation for Impacts Resulting from the Lynnwood Alternative

Specific compensatory mitigation sites for unavoidable impacts on wetlands (and other ecosystem resources) would be determined during final design and project permitting. Mitigation would be designed to compensate for impacts on wetland area and functions. The urbanized nature of the Scriber Creek basin limits the size and connectivity of potential mitigation sites to the Scriber Creek corridor. Currently identified opportunities include wetland and stream mitigation opportunities present in the Scriber Creek vicinity near the Lynnwood Transit Center. Mitigation opportunities exist on parcels that are under both public and private ownership, including parcels that could be acquired by Sound Transit because they intersect with areas needed for the Lynnwood Link Extension right-of-way. These mitigation opportunities may include wetland creation, restoration, or enhancement.

Mitigation for Impacts Resulting from the BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative

Specific compensatory mitigation sites for unavoidable impacts on wetlands (and other ecosystem resources) would be determined during final design and project permitting. Currently identified opportunities include the potential for improving fish passage within the Unnamed Tributary of Kelsey Creek and for completing wetland and stream mitigation in conjunction with the City's plans for daylighting and restoring portions of Goff Creek downstream of the SR 520 Alternative site and upstream of Bel-Red Road, and to remove fish passage as part of the city's vision for the Bel-Red corridor (City of Bellevue 2012). NGPA signage and native tree and shrub plantings around Wetland E3-3 indicate this area has potentially been the subject of compensatory stream or wetland mitigation in the past, which could complicate a determination of mitigation for impacts. However, Sound Transit would work with the City of Bellevue during final design and permitting to clarify this issue and determine appropriate mitigation. Mitigation for the SR 520 Alternative could also potentially include rerouting Goff Creek to a partially daylighted channel along the western and southern edges of the SR 520 Alternative site.

3.10 Water Resources

This section analyzes how the proposed project could affect water resources. The discussion addresses surface waters, stormwater, floodplains, and groundwater.

3.10.1 Introduction to Resources and Regulatory Requirements

The following laws, statutes, local ordinances, and guidelines address hydrology, water quality, drainage and flooding issues.

- National Pollutant Discharge Elimination System (NPDES) Permit Regulations and Permits
- Presidential Executive Orders 11988 and 11990
- Washington State Water Quality Standards
- The Washington State Department of Ecology (Ecology)'s *Stormwater Management Manual for Western Washington* (Washington State Department of Ecology 2012)
- Washington State Department of Transportation (WSDOT) *Highway Runoff Manual* (Washington State Department of Transportation 2011)
- Washington Department of Fish and Wildlife (WDFW) Hydraulic Project Approval (HPA) requirements
- National Flood Insurance Protection Act
- Flood Disaster Protection Act
- Sections 401, 402, and 404 of the Clean Water Act (CWA)
- Section 10 of the Rivers and Harbors Act
- City and County floodplain, stormwater, and drainage regulations
- City and County critical areas ordinances
- City Shoreline Master Programs
- King County Industrial Waste Discharge Permit for discharge of operational process wastewater to the sanitary sewer

3.10.2 Methods

The study area for water resources consists of the stream and groundwater basins within which the build alternative sites are located. As part of the conceptual engineering prepared for the proposed project, a conceptual design was developed for the major stormwater detention and treatment facilities required for the build alternatives. In general, a conservative approach was taken when developing drainage concepts. Sound Transit applied the Western Washington Hydrology Model, developed by Ecology, to develop project hydrology and estimate facility sizing. Flow-control facilities were designed to achieve post-project stormwater flows equivalent to forested conditions,

as required by Ecology and the jurisdictions' municipal stormwater discharge permits. The potential for reduced flow control and treatment due to the presence of regional facilities was not accounted for at this stage of design. The potential for use of onsite low-impact development (LID) stormwater management techniques was not thoroughly investigated at this stage of design, because it requires detailed knowledge of site soil conditions which are not yet available. Preliminary observations and the preliminary geotechnical report suggest that opportunities for LID techniques may be limited due to soil and/or high groundwater conditions.

3.10.3 Affected Environment

All build alternative sites for the proposed project are located in Water Resources Inventory Area (WRIA) 8, the Cedar-Sammamish Watershed, as designated by Washington State Department of Natural Resources. Most of the basin areas occupied by the alternative sites are urbanized, with impervious surface cover ranging from approximately 50% to a high of approximately 77%. Notable features in the study area include the heavily developed corridors of Interstate 5 (I-5), Interstate 405 (I-405), and State Route 520 (SR 520) and surrounding suburban development.

The affected environment addresses the surface waters, stormwater, floodplains, and groundwater.

- **Surface Waters**. All four build alternative sites are located in WRIA 8, the Cedar-Sammamish Watershed. All of the surface streams identified here are part of stream systems that ultimately discharge to Lake Washington. Only those streams in the immediate vicinity of the build alternative sites are discussed here. Table 3.10-1 summarizes the surface water bodies in the study area that could be affected by the proposed project, including information related to designated uses, water quality impairments and flooding/drainage issues.

Table 3.10-1. Potentially Affected Surface Water Bodies in the Study Area

Surface Water Body	Relevant Alternative	Water Quality Impairments[a]	Flood Mapping
Scriber Creek	Lynnwood Alternative	None	Zone X, adjacent to Zone AE floodway
West Tributary of Kelsey Creek	Lynnwood Alternative (BNSF Storage Tracks), BNSF Alternative, BNSF Modified Alternative	None (impairments exist downstream in Kelsey Creek mainstem)	Zone X
Goff Creek	SR 520 Alternative	None	Zone X
Kelsey Creek	SR 520 Alternative	Dissolved oxygen, temperature, fecal coliform	Zone X
Valley Creek	SR 520 Alternative	None	Zone X

[a] Source: 2008 303d List, Category 5.

Designated uses for surface waters are established by Ecology and are used to define the applicable water quality standards for the surface water bodies. Each of the water bodies in the study area is designated by Ecology for the following uses: salmonid spawning, rearing, and migration; primary contact recreation; domestic, industrial, and agricultural water supply; stock watering; wildlife habitat; harvesting; commerce and navigation; boating; and aesthetic values (Washington Administrative Code [WAC] 173-201A-600).

Water-quality impaired surface water bodies are identified in the State's CWA Section 303(d) list, based on measurements of water quality in excess of or outside the range of the established water quality standards for a given parameter. Category 5 surface water bodies are those for which Ecology has determined that a Total Maximum Daily Load (TMDL) allocation must be developed. Under a TMDL, discharge limits for pollutants of concern would typically be applied in a discharger's permit, based on studies that determine the pollutant loading that a water body can sustain without causing violations of the water quality standards.

- **Stormwater.** Both the Cities of Lynnwood and Bellevue have active stormwater management regulations and programs. Ecology provides guidelines for stormwater management in its *Stormwater Management Manual for Western Washington* (Washington State Department of Ecology 2005). Stormwater management design guidelines for Lynnwood and Bellevue are generally consistent with the manual, as required by the Phase II Municipal NPDES Storm Water Discharge Permit to which both cities are subject.
- **Floodplains.** Flood mapping information is compiled from the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps adopted by the local jurisdictions, and available in digital data formats. The Zone X designation is for areas outside the 500-year floodplain; within the 500-year floodplain with average flooding depths less than 1 foot; or within the 100-year floodplain with average flooding depths less than 1 foot. The Zone AE designation means an area within the 100-year floodplain and for which the base flood elevation, or 100-year flood, has been established based on hydrologic/hydraulic studies.
- **Groundwater.** Groundwater levels are generally shallow, typical of a site adjacent to a stream/wetland complex. Glacial till underlies much of the area at shallow depth, and water infiltrates slowly through this material. It is not uncommon during the rainy season for groundwater to pond at the surface. During the drier summer months, groundwater plays a critical role in providing base flow to the streams in the area. Infiltration of stormwater runoff is an important source of groundwater recharge to shallow aquifers that sustain base flows in streams.

3.10.3.1 Lynnwood Alternative

Surface Waters

There are no surface water features in the Lynnwood Alternative site, with the exception of some wetlands. Nearby surface water features include Hall Lake to the southwest, Hall Creek which connects Hall Lake to Lake Ballinger farther south, and Scriber Creek to the northeast of the site,

which flows southeast out of Scriber Lake past the site. Both of these drainages discharge into Lake Washington: the outlet from Lake Ballinger continues as McAleer Creek and enters Lake Washington in Lake Forest Park. Scriber Creek flows to the southeast past the site before joining Swamp Creek, which continues south entering the Sammamish River in Kenmore a short distance from the Sammamish River mouth at Lake Washington. The Lynnwood Alternative site is located completely within the Scriber Creek basin, per the Snohomish County Swamp Creek Basin Plan (Snohomish County 2002).

The BNSF Storage Tracks is located in the same area as the BNSF Alternative and BNSF Modified Alternative, described in Section 3.10.3.2 (see Appendix E.3, *Ecosystems Technical Report*, for figures depicting the surface water bodies in the vicinity of the Lynnwood Alternative site).

Stormwater

All of the build alternative sites have existing storm drain infrastructure. Preliminary grading plans call for levels of cut and/or fill that may render use of existing stormwater infrastructure infeasible.

The Cities of Lynnwood and Bellevue operate stormwater systems that only collect and convey stormwater, not sanitary sewage. These stormwater systems discharge to the local streams. Urbanization in Lynnwood and Bellevue has changed many of the historical land uses, from forested areas to urban development. Higher peak-runoff flows and volumes and lower infiltration caused by impervious surfaces has resulted in stream channel and habitat alteration and degradation. To reduce the high flows that would otherwise occur in the streams, both cities operate systems of regional detention ponds and implement development regulations designed to protect the receiving waters. Runoff from developments constructed in the last 15 to 20 years generally receives treatment and detention prior to discharging into the cities' stormwater systems or into receiving waters. Regional systems may have the advantage of allowing new development to discharge stormwater to them with reduced independent stormwater detention and/or treatment requirements.

Floodplains

A portion of the Lynnwood Alternative site, north of 204th Street SW, is mapped as Zone X on the preliminary digital Flood Insurance Rate Map for Snohomish County (Map Number 53061C71310E, effective date November 8, 1999). This designation is for areas within the 500-year floodplain or the 100-year floodplain with average flooding depths less than 1 foot. The eastern part of the Lynnwood Alternative site is adjacent to the mapped floodway for Scriber Creek (Zone AE). The base flood elevation in the vicinity of the Lynnwood Alternative site is approximately 336 feet (NAVD 88).

Groundwater

The City of Lynnwood drinking water supply is provided from the City of Everett's Spada Lake Reservoir at the headwaters of the Sultan River. The Alderwood Water and Wastewater District pumps water, following treatment by the City of Everett, to the Lynnwood reservoirs for distribution. The Alderwood Water and Wastewater District also maintains a single artesian

well/spring located approximately 2.5 miles north of the Lynnwood Alternative site (Well #5, the 164th Street Artesian Well) as a service to residents who prefer to drink untreated water. The well is screened in the Intercity Aquifer over a depth range of 123 to 230 feet. The Lynnwood Alternative site is located outside of the city's Wellhead Protection Area and recharge area, as documented by the Washington State Department of Health.

3.10.3.2 BNSF Alternative and BNSF Modified Alternative

Surface Waters

The upper reaches of the West Tributary of Kelsey Creek flow north of the BNSF Alternative site and BNSF Modified Alternative site from west to east. The tributary, which has been channelized to follow street alignments, flows generally to the southeast into Kelsey Creek, which flows to the Mercer Slough and Lake Washington. (Refer to Appendix E.3 of this Draft EIS for figures depicting the surface water bodies in the vicinity of the BNSF Alternative and BNSF Modified Alternative sites.)

Stormwater

The affected environment regarding stormwater for the BNSF Alternative and BNSF Modified Alternative is the same as described for the Lynnwood Alternative.

Floodplains

FEMA 100-year floodplain maps are not available for the West Tributary of Kelsey Creek or Goff Creek in Bellevue, and there are no formally delineated floodplains in the vicinity of the build alternative sites. The BNSF Alternative and BNSF Modified Alternative sites are mapped in Zone X, outside of the 500-year floodplain of any surface water body (Map Number 53033C0368K).

Groundwater

The City of Bellevue does not use local groundwater resources as a drinking water supply source. Bellevue acquires its drinking water from the City of Seattle through the Cascade Water Alliance. Base flows in streams within Bellevue are supplied by relatively shallow groundwater resources, historically replenished by infiltration of rainfall. This process has been altered by development, which has resulted in increased runoff and reduced groundwater recharge. Stormwater/surface water management programs in Bellevue aim to promote rehabilitation of the local streams by, in part, reestablishing a more natural hydrologic regime.

Groundwater levels vary considerably throughout the build alternative sites. Glacial till underlies much of the area at shallow depth, and water infiltrates slowly through this material. It is not uncommon during the rainy season for groundwater to pond at the surface. During the drier summer months, groundwater plays a critical role in providing base flow to the streams in the area. For both cities, infiltration of stormwater runoff is an important source of groundwater recharge to shallow aquifers that sustain base flows in streams.

3.10.3.3 SR 520 Alternative

Surface Waters

The SR 520 Alternative site is located within three separate City of Bellevue drainage basins: Goff Creek, Kelsey Creek and Valley Creek. Refer to Appendix E.3 of this Draft EIS for figures depicting the surface water bodies in the vicinity of the SR 520 Alternative site.

Goff Creek traverses the SR 520 Alternative site from north to south east of 130th Avenue NE. Goff Creek is a salmonid-bearing tributary of Kelsey Creek, although a fish barrier downstream from the site, at Bel-Red Road, prevents access of anadromous salmonids to the alternative site reach. The 917-foot-long stream reach within the site varies in configuration between a piped channel (224 feet of the total length within the alternative site), a surface channel confined by 3- to 4-foot-high rock walls, and an unconfined channel flowing through landscaped lawn along NE 20th Street.

The central portion of the alternative site is part of the Kelsey Creek drainage basin that separates the Goff Creek basin from the Valley Creek basin. An unnamed, non-salmonid-bearing creek tributary to Kelsey Creek is present near the site, south of NE 20th Street. On the site itself, the stream is entirely conveyed in underground storm drain systems; there are no “daylight” segments of the stream onsite. The site storm drain system discharges to the municipal system, which conveys runoff to this unnamed tributary on the south side of NE 20th Street.

The eastern portion of the SR 520 Alternative site is located in the Valley Creek drainage basin. Surface water runoff from this parcel enters the municipal storm drain system along NE 20th Street, which discharges to Valley Creek.

Stormwater

The affected environment regarding stormwater for the SR 520 Alternative is the same as described for the Lynnwood Alternative.

Floodplains

FEMA 100-year floodplain maps are not available for the West Tributary of Kelsey Creek or Goff Creek in Bellevue, and there are no formally delineated floodplains in the vicinity of the build alternative site. As stated for the BNSF Alternative and BNSF Modified Alternative sites, the SR 520 Alternative site is mapped in Zone X, outside of the 500-year floodplain of any surface water body (Map Number 53033C0368K).

Groundwater

Groundwater for the SR 520 Alternative site is the same as described for the BNSF Alternative and BNSF Modified Alternative. In addition, there is evidence of a very shallow groundwater table (perhaps perched) near Goff Creek. During site visits, groundwater seepage was observed on the surface near the SR 520 embankment. This shallow groundwater may be a significant contributor of cool base flow to Goff Creek.

3.10.4 Environmental Impacts

3.10.4.1 No Build Alternative

Under the No Build Alternative, some redevelopment and new development in the study area would likely occur, according to current city planning. Such actions would have the similar potential to affect surface waters and groundwater as the build alternatives, depending on the actual redevelopment scenario. Stormwater detention and flow-control improvements would likely be delayed until future redevelopment occurred.

3.10.4.2 Impacts Common to All Build Alternatives

Construction Impacts

Potential construction impacts on water resources are similar for each of the build alternatives. The potential construction effects would be primarily on surface and groundwater quality.

Surface Water

Erosion of soil from areas disturbed during construction could adversely affect surface water quality through increases in turbidity, and could cause increased sedimentation in receiving streams. This latter effect could affect aquatic biota and change the geomorphology of a stream. The potential for erosion would be increased at the construction site because soils would be disturbed and directly exposed to the erosive effects of rainfall and surface water runoff.

Erosion and sedimentation could result from a variety of actions associated with construction, including, but not necessarily limited to, the following.

- Removing vegetation that exposes soil to erosion.
- Exposing soil by way of grading, filling, and excavating.
- Tracking soils onto roads and other impervious surface areas by vehicles.
- Constructing and clearing vegetation in or near wetlands, lakes, streams, or drainage courses.
- Grading that concentrates stormwater, increasing the erosive potential of runoff.
- Dewatering excavations such as pier foundations, trenches, and tunnels.

Aside from sediments, erosion could also result in the deposition of increased amounts of organic materials in surface water bodies. Such materials could cause decreases in dissolved oxygen in receiving waters, resulting in potential deleterious effects on aquatic life.

Typical chemical pollutants at the construction site could include fuels, oils, coolants, and other fluids associated with operating construction equipment. If these materials are spilled during handling or transfer, or released during line breaks or due to leaks, the potential effects would be impairments to surface water quality and increases in toxicity to aquatic life in the receiving water.

Runoff from concrete mixing, handling, pouring and newly poured concrete surfaces could pose an additional risk of chemical impacts. Runoff from such operations could have high pH levels, which could degrade water quality and be lethal to many forms of aquatic life including fish. In addition, concrete fines in runoff, could cause exceedance of turbidity standards.

For construction within and over streams or other water bodies, an HPA would be required from WDFW before work begins. The proposed project would comply with the HPA's stream-protection measures, including diverting streamflow around the construction area and limiting the construction period to the required work window, a period of the year identified in the HPA when fish would be minimally affected.

Stormwater

The total amount of ground disturbance during construction would be more than 1 acre for each build alternative; therefore, an NPDES general construction stormwater permit would be required for any of the build alternatives. One of the permit requirements is a project-specific construction stormwater pollution prevention plan (SWPPP). The SWPPP would be developed and implemented in accordance with the Sound Transit Environmental and Sustainability Management System and the permit requirements. This plan would include a temporary erosion and sediment control (TESC) plan, a spill control plan, and a hazardous materials management plan, and would also specify best management practices (BMPs) to be used during construction to minimize the potential for soil erosion and sedimentation and the release of pollutants to receiving surface waters or groundwater. Typical BMPs include the following.

- Minimizing the amount of cleared area at a construction site.
- Stabilizing construction entrances and haul roads using quarry spalls.
- Washing truck tires at construction entrances, as necessary.
- Constructing silt fences downslope from exposed soil.
- Protecting catch basins from sediment.
- Containing and controlling concrete and hazardous materials onsite.
- Installing temporary ditches to route runoff around or through construction sites, with periodic straw bales or rock check dams to slow runoff and settle suspended sediments.
- Providing temporary plastic, seeding or mulch to cover soil stockpiles and exposed soil.
- Using straw wattles to reduce the length of unbroken slopes and reduce concentration of runoff.
- Using temporary erosion control blankets or mulch on exposed steep slopes to reduce erosion before vegetation is established.
- Constructing temporary sedimentation ponds to remove solids from concentrated runoff and dewatering before being discharged.

- Conducting vehicle fueling and maintenance activities no closer than 100 feet from a water body or ditch.

The TESC plan also would include a water quality monitoring plan and a schedule for inspecting the erosion control measures for effectiveness. Water from dewatering activities would be treated to meet discharge requirements identified in the SWPPP or would be transported off site for proper disposal. Pavement slurry and residue from road cutting and grinding would be collected and properly disposed of offsite, and a concrete containment and disposal plan would be prepared. An Ecology-certified erosion and sediment control lead would be employed to conduct the inspections, and deficiencies would be promptly corrected. These measures would reduce the likelihood of causing excursions beyond water quality standards during construction.

Stormwater runoff would be tested, and if excessive levels of pH or turbidity are found, runoff would be treated before being released to storm sewers or a receiving water body. If discharge of treated construction or process water to a sanitary sewer is proposed, approval would be obtained from the King County Industrial Waste Division and the local jurisdiction.

During final design, opportunities for regional management of project stormwater and onsite control of stormwater runoff would be explored. The project design team would work with local jurisdictions to identify opportunities to incorporate LID features into the proposed project. Stormwater management and LID treatment principles would be favored over “traditional” stormwater treatment and applied wherever feasible, as required in the local jurisdiction’s NPDES permit.

Operational Impacts

All of the build alternatives present the potential for similar types of operational effects. All of the alternative sites have the potential to affect surface water quality and quantity, and by extension, stream habitat and groundwater quality and supply.

The scale of the potential impacts for comparison of the build alternatives can most easily be assessed by the increase in impervious surface area and the increase in pollutant-generating surfaces for each build alternative. Table 3.10-2 summarizes existing and proposed project impervious surface areas based on the current conceptual design. The proposed project limits would include the right-of-way for the OMSF lead track from the Eastside Rail Corridor, driveway access, the OMSF, and new parking lots.

Table 3.10-2. Existing and Proposed Impervious Surface Areas by Build Alternative

Alternative	Total Existing Impervious Area (acres)	Total Proposed Impervious Area (acres)	Total Change in Impervious Area (acres)	Total Impervious Area Increase (%)
Lynnwood Alternative[a]	30.3	40.9	10.6	35
BNSF Alternative	20.8	21.4	0.6	3
BNSF Modified Alternative	23.8	26.7	2.9	12
SR 520 Alternative	18.9	25.1	6.2	33

[a] Includes BNSF Storage Tracks in Bellevue.

Depending on the alternative, the proposed project would increase the amount of existing impervious surface area by approximately 1 to 11 acres. The alternative with the lowest absolute increase in impervious surface area is the BNSF Alternative. The Lynnwood Alternative would have the greatest increase in impervious surface area, based on the conceptual designs. The relatively large change in impervious area (an increase of 10.6 acres) for the Lynnwood Alternative compared to the other alternatives is mostly based on the conversion from pervious area to impervious track in the portion of the site south of the existing buildings.

Impervious surfaces can increase stormwater runoff rates, volumes, and pollutant loads. These, in turn, can cause higher flows and degraded water quality in receiving waters such as streams, lakes and wetlands. Impervious surfaces can also result in decreased infiltration and aquifer recharge, which can result in lower stream base flows essential to fish habitat and passage.

New impervious areas from the proposed project would include the OMSF building and tracks leading to the OMSF, roads, and parking areas. Ballasted (graveled) track sections were considered as impervious areas because of the high compaction and low permeability of the subsoils underlying the tracks, and as required by local drainage codes.

Existing impervious area measurements were obtained from reviewing recent aerial photography, as built design drawings, and Sound Transit survey data. The existing condition is important for comparison of impacts, but the flow-control standard requires matching historic (forested condition) flow parameters.

Project pollutant-generating impervious surface (PGIS) area would comprise primarily the OMSF, parking areas, and any roads that would need to be reconstructed following construction. PGIS would also include construction access roads, parking areas, equipment maintenance areas, and fuel and chemical transfer areas. Project trackways are typically considered non-PGIS, and only considered PGIS when combined with roadways, which carry pollutants from vehicular use. If collected and discharged separately from PGIS areas, runoff from the trackways would not require treatment. At this stage of conceptual design of the proposed project, the track runoff was assumed to be segregated from PGIS runoff and it, thus, would not require treatment. Treatment facility sizing is conservatively based on the co-mingling of all paved surfaces (not just PGIS paved surfaces). Stormwater runoff from PGIS would receive water quality treatment per the current treatment

standards. Table 3.10-3 summarizes condition PGIS based on the current conceptual design of the proposed project.

Table 3.10-3. Proposed Pollutant Generating Impervious Areas by Build Alternative

Alternative	Existing PGIS (acres)	Proposed PGIS (acres)	Change in PGIS (acres)	Change in PGIS (%)
Lynnwood Alternative	16.4	12.3	-4.1	-25
BNSF Alternative	11.1	8.8	-2.3	-21
BNSF Modified Alternative	13.6	12.4	-1.2	-9
SR 520 Alternative	13.3	10.9	-2.4	-18

The decrease in PGIS for all build alternatives reflects the conversion of existing PGIS pavement to non-PGIS trackway. By this conversion and by providing water quality treatment for the PGIS runoff, runoff water quality should be improved by the proposed project for each of the build alternatives.

Because all of the build alternatives are proposed at sites with existing commercial or industrial development, all of the build alternatives would present the opportunity to upgrade the sites to meet current stormwater quality and quantity management and groundwater protection standards.

3.10.4.3 Lynnwood Alternative

Construction Impacts

Construction activities in the Scriber Creek basin are expected to include some construction in the adjacent wetland and 100-year floodplain of Scriber Creek. Under Design Option C2 only, the lead track would span Scriber Creek near the junction with the elevated guideway. This overwater work would require an HPA from WDFW. However, the implementation of appropriate BMPs, as described in Appendix E.3, would prevent temporary impacts on surface-water resources during construction activities at the Lynnwood Alternative site.

Minimal temporary construction effects on water resources are expected from constructing the BNSF Storage Tracks in Bellevue (Kelsey Creek basin) due to the limited drainage features within the site, and the implementation of BMPs as previously described.

Overall, construction activities under this alternative would have a low risk of impacts on water resources because any temporary impact footprint would represent a minor portion of the overall drainage basins, and the implementation of construction BMPs.

Operational Impacts

In addition to the operational impacts stated in Section 3.10.4.2, Impacts Common to All Build Alternatives, all three design options of the Lynnwood Alternative would include potential operational impacts on floodplains due to placement of fill within the 100-year floodplain. In addition, under Design Option C2 only, support column footings would be placed within the 100-year floodplain. A floodplain analysis would be necessary to determine the necessity for and extent of mitigation methods, such as compensatory floodplain storage.

The current conceptual design for the Lynnwood Alternative shows an area of approximately 1 acre that would result in fill in Zone X. Zone X refers to areas within the 500-year floodplain, or within the 100-year floodplain with flood depths less than 1 foot. The quantity of fill in the 100-year floodplain in the conceptual design for the OMSF itself is approximately 1,000 cubic yards under all three design options. A detailed survey would be needed to both map the floodplain at the site and to determine precise floodplain fill quantities. Under Design Option C2 only, and as noted above, column footings for the lead track would be placed in the Zone AE floodway. The quantity of fill required would depend on footing and column design, but is conservatively estimated at 100 cubic yards. For Option C2 only, the total floodplain fill is estimated at 1,100 cubic yards. The OMSF facility itself is shown adjacent to Zone AE. No fill in Zone AE is likely per the conceptual design; however, this interpretation would need to be confirmed by a detailed survey.

3.10.4.4 BNSF Alternative and BNSF Modified Alternative

Construction Impacts

Construction impacts for the BNSF Alternative and BNSF Modified Alternative would be the same as those discussed in Section 3.10.4.2, Impacts Common to All Build Alternatives, and would not include in-water or over-water work. Thus, an HPA would not be required.

Operational Impacts

There would be no operational impacts on water resources, including floodplains, under the BNSF Alternative and BNSF Modified Alternative beyond those described in Section 3.10.4.2, Impacts Common to All Build Alternatives.

3.10.4.5 SR 520 Alternative

Construction Impacts

Constructing the SR 520 Alternative would require temporary rerouting and/or piping of Goff Creek to bypass the site, which would require an HPA. The temporary rerouting would likely be accomplished by collecting and pumping Goff Creek flow to a downstream discharge point. Disturbance in and work below the Ordinary High Water Mark (OHWM) of a stream would carry a higher risk of release of sediment downstream compared to work outside and above the OHWM.

Temporarily rerouting the creek would occur within the permitted work window during the summer when flows in the stream are extremely low. After construction of the piped stream conveyance shown in the conceptual design, the stream would be diverted to the new pipe from the temporary route.

Operational Impacts

Under the SR 520 Alternative, Goff Creek would be placed in a pipe beneath the site. Depending on final design grading of the site, the shallow groundwater observed at the site may need to be collected (via trench drains, for example) and drained directly to a stormwater conveyance or to Goff Creek. This could affect the shallow groundwater hydrology and change the timing of delivery

of groundwater to Goff Creek and the downstream stream system. If such a drainage system were installed, less groundwater may be available to provide baseflow during low streamflow periods. There would be no impacts on floodplains under this alternative.

3.10.5 Indirect and Cumulative Impacts

No indirect impacts related to water resources would result from construction and operation of the proposed project.

Historical development throughout Puget Sound has resulted in substantial changes to area drainage basins, including substantial changes in water quality and quantity in the Kelsey Creek and Scriber Creek basins. Logging and land clearing has resulted in sedimentation increases in area streams and lakes. Pesticides and fertilizers from previous farming practices and more recent landscape maintenance activities have contributed to the contamination of runoff entering area surface waters. In addition, substantial increases in impervious surface area, as well as PGIS, have increased overall runoff volumes and contaminant loading to area surface waters.

These past and ongoing actions have resulted in degraded water quality in many of the water bodies in the study area. A 25-year (1979–2004) trend analysis of the Kelsey Creek basin showed some changes in the water quality, including substantial increases in water temperatures and conductivity (King County 2013). Other water quality impacts include a decrease in dissolved oxygen and pH, and an increase in nitrate-nitrogen. Similar changes are likely to have also occurred in the Scriber Creek basin.

The Lynnwood Link Extension and East Link projects are anticipated to have similar impacts on water resources within the drainage basins of the OMSF build alternative sites. None of these potential impacts are anticipated to be adverse. The proposed project and other reasonably foreseeable future actions would be required to mitigate impacts on surface and groundwater in accordance with federal, state, and local regulations. This mitigation would include providing water quality treatment and flow control for impervious surfaces that currently receive no treatment and little or no flow control. Current regulations for runoff from new development or redevelopment projects aim to improve conditions to approach predevelopment conditions. Therefore, small improvements in water quality are expected to occur over time, with or without the proposed OMSF project.

3.10.6 Potential Mitigation Measures

A number of regulatory requirements for addressing water resource impacts would be part of the proposed project design. Where the alternatives would result in impacts after the application of design measures (i.e., stormwater management BMPs, flood hazard mitigation) included in the proposed project design, further mitigation would be necessary. Flood hazard mitigation would be required for the Lynnwood Alternative, due to placement of fill within the 100-year floodplain. The extent and nature of mitigation would be determined on the basis of a detailed floodplain delineation and flood study. Because FEMA floodplain maps are approximate, the detailed delineation would include a survey that maps the regulatory flood elevation on the project site. The flood study would evaluate the proposed project's impacts on flood elevations and mitigation

measures such as compensatory flood storage, to avoid increases in base flood elevation greater than 1 foot (Lynnwood Municipal Code [LMC] 16.46).

For all alternatives that include cut or fill walls, wall drainage systems would be provided to maintain the existing shallow groundwater flow patterns to the adjacent wetlands and streams, which would help sustain wetland hydrology and support base flows in streams.

3.11 Energy

This section evaluates potential energy-related impacts associated with the proposed project by estimating the amount of energy that would be consumed during construction and operation of the proposed project, including electricity, natural gas, and fuel consumption (e.g., gasoline, diesel).

3.11.1 Introduction to Resources and Regulatory Requirements

According to the Energy Information Administration (2012), Washington consumed over 2,037 trillion British thermal units (Btu) of energy in 2010, which is equivalent to 352 million barrels of oil. Total energy consumption per capita in 2010 was 302 million Btu, which ranks 31st among all states in the country. Transportation (30%) accounts for the majority of energy consumption in Washington State, followed by the industrial (28%), residential (24%), and commercial (19%) sectors.

Per capita energy consumption, in general, is declining due to improvements in energy efficiency and design. Despite this reduction in per capita energy use, the state's overall energy consumption is expected to increase over the next several decades due to growth in population, jobs, and demand for vehicle travel. Increased demand for energy is closely tied to energy prices; if prices remain high, the growth in energy demand may be moderated by consumers who purchase fuel efficient vehicles or change personal consumption habits (Washington State Department of Community, Trade, and Economic Development 2007).

Although no laws have been adopted to regulate energy consumption, many federal, state, and local plans and policies identify goals for the efficient use of energy. The following federal and state policies are applicable to the proposed project.

- **Moving Ahead for Progress in the 21st Century (MAP-21**). The Moving Ahead for Progress in the 21st Century Act (MAP-21) authorizes funding for federal transit and highway programs through Fiscal Year 2014 and continues the planning factors passed in 2005 under the Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). MAP-21 promotes the reduction of traffic congestion to improve safety and protect air quality and the environment. The Metropolitan Planning Program under MAP-21 provided funding for the integration of transportation planning processes in the Metropolitan Planning Organizations (MPOs) into a unified metropolitan transportation planning process, and one of the planning factors included the promotion of energy conservation.
- **Requirements for Energy Assessments (49 Code of Federal Regulations [CFR] 622.301)**. Requires an energy assessment for the construction, reconstruction, or modification of buildings for which applications are submitted to the Federal Transit Administration (FTA) after October 1, 1980. The energy assessment must include an analysis of the total energy requirements for the building.

- **Washington Transportation Plan, Washington State Multimodal Transportation Plan.** The Washington Transportation Plan and the Washington State Multimodal Transportation Plan provide a multimodal framework for efficient goods and vehicle movement.
- **Executive Order 07-02, Senate Bill 6001.** State legislation related to greenhouse gas (GHG) emissions and climate mitigation, such as Executive Order 07-02 and Senate Bill 6001, also include performance standards related to energy consumption.

3.11.2 Methods

The study area for the energy analysis includes the build alternative sites.

There are no established federal, state, or local thresholds for the evaluation of energy-related impacts from construction or operational activities. Accordingly, the context and intensity of net energy consumption associated with implementation of the proposed project, relative to the No Build Alternative, was evaluated to determine the potential for adverse effects on energy resources.

3.11.3 Affected Environment

Given the regional nature of energy, this section discusses existing conditions related to energy use at both the state and project level. A general discussion of energy use patterns within the state and Puget Sound region is also included.

Two utilities provide power to the build alternative sites: Snohomish County Public Utilities District (SnoPUD) provides power to the City of Lynnwood and Puget Sound Energy (PSE) is the primary electricity provider in the City of Bellevue. Table 3.11-1 lists the number of customers and energy sales for each utility's service area.

Table 3.11-1. Utility Data for SnoPUD and PSE

Utility Data	SnoPUD	PSE
Service area	2,200 square miles	6,000 square miles
Number of electric customers	322,228	1.1 million
Energy sales	9 million MWh	23.4 million MWh

Source: Snohomish County Public Utilities District 2012; Puget Sound Energy 2012.
SnoPUD = Snohomish Public Utilities District; PSE = Puget Sound Energy; MWh = megawatts per hour.

Both utilities rely on their own generation sources, as well as energy purchases through long- and short-term contracts with other energy producers. In 2011, hydropower represented 50% of PSE's fuel mix, followed by coal (32%), natural gas (16%), nuclear (1%), and other resources (1%). PSE currently owns and operates three large wind farms in central and eastern Washington, and is the second-largest utility producer of wind power in the country (Puget Sound Energy 2012). According to 2011 data, hydropower is the primary generation source for SnoPUD, representing 88% of its fuel mix. SnoPUD's remaining portfolio comprises coal (4%), nuclear (4%), biomass (2%), natural gas (1%), and other resources (1%) (Snohomish County Public Utilities District 2012).

3.11.4 Environmental Impacts

3.11.4.1 No Build Alternative

The No Build Alternative assumes the continuation of existing conditions. Existing land uses would continue to consume electricity and natural gas to support annual operations.

3.11.4.2 Impacts Common to All Build Alternatives

Table 3.11-2 summarizes aggregate annual operational energy consumption data for the proposed project. Table 3.11-3 summarizes estimated energy consumption (i.e., construction equipment fuel consumption, material delivery, and soil import/export) associated with construction of the build alternatives. As indicated in Table 3.11-2, OMSF operations would result in increases in energy consumption associated with all build alternatives. However, given that these increases represent a minute fraction of SnoPUD's and PSE's total energy resources (equivalent to the energy requirement for up to 100 homes), it is anticipated that SnoPUD and PSE would have more than sufficient capacity and energy resources to accommodate these increases in energy consumption, even with expansive growth projected for the Regional Growth Center/City Center.

Table 3.11-2. Aggregate Annual Operational Energy Consumption (Electricity and Natural Gas Consumption and Vehicle Miles Traveled)

			Total	
	Electricity (MMBtu)	Natural Gas Use (MMBtu)	Total[a] (MMBtu)	Equivalent Number of Homes Powered[b]
Build Alternative				
Lynnwood Alternative[c]	31,160	6,583	37,743	100
BNSF Alternative BNSF Modified Alternative SR 520 Alternative	28,716	6,067	34,783	92

[a] Total energy content of unit, including energy used to refine/generate and transport to point of use.

[b] Equivalent number of homes that can be powered for the same energy is based on EPA estimated number of homes per 100,000 Btu of energy use associated with estimated total Btu consumption (Environmental Protection Agency 2011).

[c] The Lynnwood Alternative includes 716,257 kWh of Electricity and 516 MMBtu of natural gas to account for the BNSF Storage Tracks.

MMBtu = million metric British thermal units.

Table 3.11-3. Annual Construction-Related Energy Consumption

Build Alternative	Gallons of Diesel Consumed	MMBtu
Lynnwood Alternative	116,073	16,018
BNSF Alternative	92,193	12,722
BNSF Modified Alternative	150,960	20,832
SR 520 Alternative	101,240	13,971
Average consumption	115,117	15,886

MMBtu = million metric British thermal units.

3.11.4.3 Lynnwood Alternative

Construction Impacts

As indicated in Table 3.11-3 the Lynnwood Alternative is anticipated to result in more fuel consumption relative to the average of the build alternatives.

Operational Impacts

Operational impacts for the Lynnwood Alternative are stated previously in the Impacts Common to All Build Alternatives discussion, which indicates the Lynnwood Alternative would result in energy consumption equivalent to the energy requirement for up to 100 homes. This minor increase would not result in an adverse impact on energy resources.

3.11.4.4 BNSF Alternative

Construction Impacts

As indicated in Table 3.11-3, the BNSF Alternative is anticipated to result in less fuel consumption relative to the average of the build alternatives, and the least fuel consumption relative to all of the build alternatives.

Operational Impacts

Operational impacts for the BNSF Alternative are stated previously in the Impacts Common to All Build Alternatives discussion, which indicates the BNSF Alternative would result in energy consumption equivalent to the energy requirement for up to 92 homes. This minor increase would not result in an adverse impact on energy resources.

3.11.4.5 BNSF Modified Alternative

Construction Impacts

As indicated in Table 3.11-3, the BNSF Modified Alternative is anticipated to result in more fuel consumption relative to the average of the build alternatives and the most fuel consumption relative to all of the build alternatives. As previously discussed, this minor increase would not result in an adverse impact on energy resources.

Operational Impacts

Operational impacts for the BNSF Modified Alternative are stated previously in the Impacts Common to All Build Alternatives discussion, which indicates the BNSF Modified Alternative would result in energy consumption equivalent to the energy requirement for up to 92 homes. This minor increase would not result in an adverse impact on energy resources.

3.11.4.6 SR 520 Alternative

Construction Impacts

As indicated in Table 3.11-3, the SR 520 Alternative is anticipated to result in less fuel consumption relative to the average of the build alternatives.

Operational Impacts

Operational impacts for the SR 520 Alternative are stated previously in the Impacts Common to All Build Alternatives discussion, which indicates the SR 520 Alternative would result in energy consumption equivalent to the energy requirement for up to 92 homes. This minor increase would not result in an adverse impact on energy resources.

3.11.5 Indirect and Cumulative Impacts

No indirect impacts related to energy would result from construction and operation of the proposed project.

The proposed OMSF project would result in net increases in electricity and natural gas consumption and demand under all alternatives, which is equivalent to the energy requirement for up to 100 homes (Table 3.11-2). However, it is anticipated that both SnoPUD and PSE would have sufficient capacity and energy resources to accommodate any increase in energy consumption resulting from the proposed project, as the total energy requirements of the project represent a minute fraction of the total energy provided by SnoPUD and PSE. Consequently, the proposed project is not anticipated to result in cumulative impacts on these electricity and natural gas energy resources.

The Lynnwood Link Extension alternatives would consume less energy compared with the proposed OMSF project No Build Alternative because of a shift in travel mode, which would also reduce traffic congestion (Sound Transit 2013). In addition, the *East Link Project Final EIS* (Sound Transit 2011) notes that East Link would decrease total energy consumption, relative to the proposed OMSF project No Build Alternative, because it would reduce total VMT and East Link's power requirements are less than the vehicles it is replacing. Consequently, the proposed OMSF project would not contribute to a cumulative adverse energy impact.

3.11.6 Potential Mitigation Measures

No impacts on energy resources would occur as a result of the proposed project; therefore, no mitigation would be required.

3.12 Geology and Soils

This section describes the existing geologic conditions that could affect or be affected by the proposed project. The geologic conditions include site topography, regional geology, local soil characteristics, groundwater, seismicity, and potential geological hazards.

3.12.1 Introduction to Resources and Regulatory Requirements

Revised Code of Washington (RCW) 36.70A identifies geological hazards as one of a number of critical areas to be considered for development regulation. Geological hazards include susceptibility to erosion, sliding, earthquake, or other geological events. These hazards need to be appropriately considered in the design, construction, and operation of the proposed project to reduce risks to public health and safety.

3.12.2 Methods

The study area for geology and soils extends approximately 100 feet beyond each build alternative site. When a preferred alternative is identified, additional field studies will be required to assess site-specific geological and geotechnical aspects of the affected environment.

Geotechnical characteristics and groundwater information is based on geological maps and historical subsurface exploration studies near the build alternative sites. Anticipated geological units were identified using regional and site-specific subsurface information, topographic maps, and geologic hazard maps. Sources included the U.S. Geological Survey, U.S. Department of Natural Resources, and the U.S. Department of Agriculture. Available, historical, site-specific studies were also compiled and assessed for the build alternative sites. Historical explorations across the sites included borings, test pits, hand augers, and well installations. This information was obtained from online sources such as GeoMapNW and the U.S. Department of Natural Resources Subsurface Geology System.

3.12.3 Affected Environment

The geologic conditions include site topography, regional geology, local soil characteristics, groundwater, seismicity, and potential geological hazards.

- **Topography and Regional Geology.** The four build alternative sites have generally flat or gradually sloping topography. The overall elevation difference in the study area is approximately 35 feet for the Lynnwood Alternative, BNSF Alternative, and BNSF Modified Alternative, and approximately 50 feet for the SR 520 Alternative.

  Soils in the study area are characterized by geological units typical to the Puget Sound Basin. The geology of the Puget Sound Basin has been shaped by several major glaciations, most recently the Vashon Glaciation which blanketed the Puget Sound region with approximately 3,000 feet of ice.

Past glaciations have left behind a complex sequence of glacially derived and interglacial sediments. These glaciations are characterized by an intricate sequence of lacustrine deposits, glaciomarine drift, till, and recessional outwash. As ice receded during the Vashon Glaciation about 14,000 years ago, vast amounts of glacial till and advance outwash were deposited in the region. Soils that were overridden by the glaciers are typically very dense or hard and underlie loose or soft recessional soils that were deposited by glacial meltwater. Since the last major glaciation, surficial soils across the Puget Sound region have been influenced by erosion and human development. Cut and fill operations have been common across the region to provide more suitable topography and/or to remove unsuitable soil from development sites.

- **Seismicity.** The area of Puget Sound where the build alternative sites are located is known to be seismically active. The seismicity of western Washington is dominated by the Cascadia Subduction Zone, where the offshore Juan de Fuca Plate is subducting beneath the continental North American Plate. Three main types of earthquakes are typically associated with subduction zone environments: crustal, intraplate, and interplate. The Juan de Fuca Plate produces deep subduction zone earthquakes centered offshore. Movement of the subducting Juan de Fuca Plate also produces related intraplate earthquakes approximately 20 to 40 miles beneath the Puget Sound region (e.g., the 1949, 1964, and 2001 earthquakes) and crustal earthquakes at shallower depths near the Washington coast (e.g., the 1700 earthquake with an approximate magnitude of 8 to 9 on the Richter Scale[1]).

  The closest known active source is the Seattle Fault Zone, which is a crustal fault. The Lynnwood Alternative site is approximately 18 miles north of this fault zone, and BNSF Alternative site, BNSF Modified Alternative site, and SR 520 Alternative site in the City of Bellevue are approximately 3.5 miles north of this fault zone.

- **Site Geology and Groundwater Conditions.** None of the build alternative sites and surrounding areas have any known potable water supply derived from groundwater source, and the proposed project would not be located within boundaries of a critical aquifer recharge or wellhead protection area. Estimated distance to nearest U.S. Environmental Protection Agency (EPA)-designated sole source aquifers from the build alternative sites is about 5 miles or more. Section 3.10, Water Resources, provides more detail on surface waters, stormwater, floodplains, and groundwater in the build alternative sites.

- **Potential Geological Hazards.** Table 3.12-1 presents a comparative summary of potential geological hazards in the study area.

[1] The Richter scale assigns a single number to quantify the energy released during an earthquake. The scale is a base-10 logarithmic scale.

Table 3.12-1. Potential Geological Hazards in the Study Area

	Build Alternative		
Geological Hazard	**Lynnwood Alternative**	**BNSF Alternative BNSF Modified Alternative**	**SR 520 Alternative**
Steep Slopes	Low	Low to moderate	Low
Erosion	Low to moderate	Low to moderate	Low to moderate
Landslide	Low	Low	Low
Seismic (Distance from Seattle Fault Zone)	About 18 miles	About 3.5 miles	About 3.5 miles
Liquefaction Susceptibility	Low to moderate	Low to moderate	Low to moderate
Soft Soils	Moderate	Low to moderate	Low to moderate

Source: Hart Crowser, Inc. 2013.

3.12.3.1 Lynnwood Alternative

The Lynnwood Alternative site is located upslope from Scriber Creek along the southern perimeter of the Cedar Valley. The creek runs across the northeast perimeter of the property, along the toe of a gentle slope. The gradual slope that defines the northern half of the Lynnwood Alternative site is expected to consist of fill over native soils. Initial studies indicate no evidence of historical slope instability near the site.

Past land development modified the original site topography, resulting in flatter site conditions; the site originally sloped downward toward the northeast. Native soils upslope from the valley are characterized by glacial till, and surficial soils in the valley are generally recessional outwash deposits consisting of poorly graded sand and gravel. Recessional outwash deposits in the Cedar Valley are typically overlain by soft silt and peat.

The Lynnwood Alternative includes the BNSF Storage Tracks in Bellevue, located along the Eastside Rail Corridor. A service area, operator report facilities, and parking would be located east of the storage tracks. Site geology and groundwater conditions for this part of the Lynnwood Alternative are described under the BNSF Alternative and BNSF Modified Alternative section.

Geotechnical Characteristics

Soils across the southern portion of the Lynnwood Alternative site are characterized by glacial till, while the northern areas may consist of fill soil. Loose fill soils are expected on this site, and tend to increase in depth from the southwest to the northeast. Limited available borings indicate that fill may be from 0 to over 10 feet deep over loose- to medium-dense sand. Test pits and borings just east of the Lynnwood Alternative site contained substantial construction debris, trash, asphalt chunks, and concrete chunks in up to about 40 feet of fill over peat. In general, the site soil likely consists of fill, recessional sand, and Vashon-age glacial till. Extensive pockets of peat may be encountered.

Groundwater Conditions

Previous subsurface explorations indicated that the depth to groundwater might range from 5 to 15 feet below ground surface (bgs). Historical borings indicate that the groundwater is generally perched above the glacial till within the fill and recessional outwash units. Groundwater levels are representative of the time the borings were advanced. Fluctuations in groundwater levels may occur due to variations in rainfall, temperature, seasons, and other factors.

3.12.3.2 BNSF Alternative and BNSF Modified Alternative

The BNSF Alternative site is on the east side of the Eastside Rail Corridor, which runs north-south through this location. The BNSF Modified Alternative site encompasses both east and west sides of the Eastside Rail Corridor, and the west side of the OMSF would be placed at a higher elevation than the east side. The elevation difference would be approximately 29 feet and would require an earth-retaining structure and fill placement.

The BNSF Alternative and the BNSF Modified Alternative sites are located within the Larsen Channel, a shallow depression believed to be part of an ancient glacial melt channel that connected Lake Sammamish and Lake Washington during the Vashon Glaciation. This connection resulted in formation of a valley covered by recessional outwash deposits transported by glacial meltwater. Glacial till and recessional outwash soil units likely comprise most of the sites.

Past explorations across the BNSF Alternative and BNSF Modified Alternative sites indicate that a wetland covered the northern extent of the sites before commercial development. Existing records indicate that soft soil and peat were removed in some areas and replaced with controlled fill. Existing fill soil at the sites has been preliminarily characterized as loose to medium-dense. Past subsurface explorations indicate relatively shallow depths to groundwater.

Geotechnical Characteristics

Past land development has modified the site topography and surficial geology on both sides of the Eastside Rail Corridor. Glacial till is expected to be encountered at the surface or at shallow depths across the southern part of the site because of historical cutting. The northern portion of the sites has been historically characterized by wetlands; some remnants of the wetlands remain along the northernmost site perimeter. Available records indicate that soft peat and silt was removed from some areas and replaced with controlled fill. Historical borings indicate up to 17 feet of fill over medium dense sand in the northern portion of the sites.

Groundwater Conditions

Historical borings and test pits indicate that the depth to groundwater generally ranges from 6 to 25 feet bgs. It is apparent that groundwater exists within the fill and recessional outwash units, perched over glacial till or glaciolacustrine deposits. Fluctuations in groundwater levels can be caused by variations in rainfall, temperature, seasons, and other factors.

3.12.3.3 SR 520 Alternative

Located less than 1 mile east of the BNSF Alternative and BNSF Modified Alternative sites, the SR 520 Alternative site is also believed to be a part of the Larsen Channel. The site geology is generally similar to the BNSF Alternative site and BNSF Modified Alternative site, and glacial till and recessional outwash likely comprise most of the surficial soils. A fill embankment of variable height supporting SR 520 bounds the northern perimeter of the SR 520 Alternative site.

Geotechnical Characteristics

Limited historical subsurface explorations at the site indicate fill soils range from 0 to 4 feet deep. Where present, fill is expected to be underlain by either glacial till or recessional outwash. Historical logs of test pits south of NE 20th Street along the eastern half of the site identify a very soft, dark brown, fibrous peat layer 4 to 5 feet thick under the fill. Peat may also underlie the eastern part of the site.

Groundwater Conditions

Historical exploration logs indicate that the depth to groundwater ranges from 3 to 17 feet bgs. According to historical drilling records, the groundwater is within the fill and recessional outwash layers, perched above the underlying glacial till. Historical records also note that the groundwater tends to flow north to south. Fluctuations in groundwater levels can occur due to variations in rainfall, temperature, seasons, and other factors.

3.12.4 Environmental Impacts

This section summarizes impacts that could result from the four build alternatives and the No Build Alternative, including general impacts that may be common to all alternatives.

3.12.4.1 No Build Alternative

Under the No Build Alternative, the proposed project would not be constructed. The existing geology and soils environment would remain essentially unchanged. The existing risk from seismic hazards would still exist, and new development would continue to take place, thus, resulting in more geologic risk from existing steep slope, erosion, and seismic hazards.

3.12.4.2 Impacts Common to All Build Alternatives

Slope Stability and Landslides

Considering that all build alternatives are planned for generally flat areas, existing slope stability and landslide issues would be minor concerns for onsite project activities, as well as for surrounding properties from construction and operation at the build alternative sites. However, various extents of site regrading and topographical modifications are proposed for the build alternatives. For example, the BNSF Modified Alternative would place the LRV storage area to the west of the Eastside Rail Corridor at a higher elevation (178.5 feet) compared to the remaining OMSF (elevation 150.0 feet), which would require an approximate 29-foot-high earth-retention system. Slope

stability assessments would be conducted in specific areas where substantial fill placement or embankments are planned. Adequate consideration of existing topography and proposed modifications during the design phase would address possible slope instability and landslide issues to reduce risk for onsite project activities and surrounding properties. In general, the risk of instability to existing slopes because of construction activities is considered low.

In areas where construction would expose native soil due to vegetation removal, surface water may transport fine sediments downslope from the sites. However, erosion control best management practices (BMPs) would be put in place to limit surface water from transporting fines downslope from the sites.

There is potential for encountering contaminated soils at the sites. In the event contaminated soil is encountered, excavated soil would be transported off-site for regulated disposal. Further details related to this issue are discussed in Section 3.13, Hazardous Materials.

Glacial till is anticipated at shallow depths below surficial fill soil across the sites. With proper precautions in planning and design, the risk of settling because of construction activities is low.

Based on preliminary project layout, estimated excavation depths, and historical records of groundwater depth at the sites, construction activities may be affected by groundwater. Potential construction dewatering would need to be assessed during final design, but in general, construction dewatering issues are not expected to be a major concern.

Seismic Hazard and Liquefaction

All build alternative sites are within a seismically active area. During construction, the risk of seismic hazard is considered low because of the low probability that a major earthquake would occur during construction. If a major earthquake occurred during construction, the most common impact would be disruption of the construction schedule. In addition, there may be components that have not reached their design strength. For example, if concrete in the superstructure or a foundation has not developed full strength when shaken by a strong tremor, it would be necessary to assess integrity of the structure and address safety concerns.

During operation, major seismic events would cause strong shaking of OMSF structures since seismic motions are transmitted to structures through the ground supporting them. Strong ground shaking could lead to liquefaction of loose, saturated, sandy soil, resulting in a loss of soil-bearing capacity. Strong shaking during an earthquake may also cause settlement, slope instability, or increased lateral earth pressure on retaining walls. It is expected that the proposed project would be designed in accordance with the requirements of the International Building Code. When designed to withstand design-level seismic ground shaking as required by the code, the risk to the proposed project is expected to be low.

For all sites, there is a low to moderate likelihood of seismically induced liquefaction of loose, saturated, cohesionless soils. Areas within the site where soil may be susceptible to liquefaction

would be assessed during final design based on additional exploration, and adequately considered in analysis and design.

Groundwater Flow Alteration

Groundwater flow paths are sometimes altered by major subsurface construction affecting large volumes of earth. Considering the relatively light construction planned and comparatively shallow depth expected to be affected by the build alternatives, the risk of substantial groundwater flow alteration would generally be considered low. However, some limited groundwater flow alteration may result locally depending on the volume of earth movement. For example, the BNSF Modified Alternative would involve placing about 29 feet of retained fill at the base of an existing slope, which may result in some groundwater flow alteration locally. However, appropriate design measures, such as providing rainwater infiltration systems and allowing permeable pathways to existing groundwater flow, would be implemented to minimize the potential to alter flows.

Export/Import of Material for Earthwork

The volume of earthwork required for the build alternatives depends on the existing site topography, proposed site regrading, and suitability of existing site soil for reuse. Actual reuse of excavated soil as structural fill would depend on the nature and composition of excavated soil and the time of year construction occurs. Excavated soil not suitable for reuse as structural fill would need to be removed off site, although it may be possible to use some of it for landscaping. For a relative comparison between build alternatives, cut and fill volume estimates summarized in Table 3.12-2 are based on the assumptions that all cut soils can be reused. Based on this assumption, the SR 520 Alternative would involve exporting material, while all other build alternatives would involve importing soil to achieve proposed site grading. The BNSF Alternative and BNSF Modified Alternative would require the least and largest amount of soil, respectively, to be imported for site regrading.

Table 3.12-2. Comparative Estimate of Earthwork Quantities in Cubic Yards

Alternative	Cut Volume	Fill Volume	Cut/Fill Balance	Remarks[a]
Lynnwood Alternative				
Design Option C1	191,455	201,920	-10,465	Import
Design Option C2	191,455	201,920	-10,465	Import
Design Option C3	193,890	202,945	-9,055	Import
BNSF Alternative	55,335	55,855	-520	Import
BNSF Modified Alternative	67,965	215,090	-147,125	Import
SR 520 Alternative	190,600	85,150	+105,450	Export

[a] Actual export/import of material at particular build alternative would depend on the suitability of excavated soils for reuse.

3.12.4.3 Lynnwood Alternative

Construction and Operational Impacts

Construction and operational impacts would be the same as those described under Section 3.12.4.2, Impacts Common to All Build Alternatives. Impacts for the BNSF Storage Tracks in Bellevue are expected to be similar to those stated for the BNSF Alternative and BNSF Modified Alternative.

3.12.4.4 BNSF Alternative and BNSF Modified Alternative

Construction Impacts

The BNSF Alternative site is limited to the east side of the Eastside Rail Corridor, which is relatively flat. The BNSF Alternative and the BNSF Storage Tracks would require relatively minor alteration of existing topography where potential slope instability and landslide hazards are almost nonexistent.

The BNSF Modified Alternative site encompasses both the east and west sides of the Eastside Rail Corridor. The proposed development footprint along the west side of the corridor would be on newly placed retained fill of greater depth located at the base of a relatively steep slope of variable height. The risk of construction-induced slope instability to the existing upward slope on the west side of the Eastside Rail Corridor would depend on the type of earthwork operations conducted, as well as their proximity to the toe of the existing slope. Historical studies and a preliminary site reconnaissance indicate no evidence of existing slope instability issues near these sites. With proper buffer and setback for structures located in front of the existing slope toe, any construction-induced instability hazards to the existing slope would be considered minor.

All other construction impacts would be the same as those described under Section 3.12.4.2, Impacts Common to All Build Alternatives.

Operational Impacts

Operational impacts would be the same as those described under Section 3.12.4.2, Impacts Common to All Build Alternatives.

3.12.4.5 SR 520 Alternative

Construction Impacts

The SR 520 Alternative site is not near any natural geographical features that could pose concerns for construction-induced landslide hazards. However, the site would be located adjacent to the south base of a relatively steep fill embankment that supports SR 520. Slope stability analysis of the embankment would be conducted, and other geotechnical design considerations would be employed to assess potential construction impacts on SR 520. All other construction impacts would be the same as those described under Section 3.12.4.2, Impacts Common to All Build Alternatives.

Operational Impacts

Operational impacts would be the same as those described under Section 3.12.4.2, Impacts Common to All Build Alternatives.

3.12.5 Indirect and Cumulative Impacts

No indirect impacts related to geology and soils would result from construction and operation of the proposed project.

Build alternative site-specific aspects of geotechnical hazards are summarized above considering the site geology identified based on existing information. All build alternatives would be subject to uniform site development and construction standards relative to prevalent seismic and geotechnical engineering considerations. Other developments that could occur nearby from the preferred build alternative would also be built to meet current design standards and permit requirements. Geotechnical engineering design criteria for the preferred build alternative would be developed based on the results of a detailed site investigation.

The Lynnwood Link Extension alternatives under consideration and the East Link design would be subject to the same standards, would be required to address known hazards, and would not result in adverse impacts regarding geology and soils. By implementing suitable grading and construction techniques that are consistent with the geotechnical design recommendations on all projects, no adverse cumulative impacts would occur.

3.12.6 Potential Mitigation Measures

With the implementation of design standards and best management practices BMPs described above for the geotechnical engineering design and construction, it is expected that geology and soil impacts would be avoided and minimized. Therefore, no mitigation would be required.

3.13 Hazardous Materials

This section describes existing conditions and applicable regulatory requirements for hazardous materials relating to the proposed project and the proposed project's potential to result in impacts by introducing new sources of hazardous materials.

3.13.1 Introduction to Resources and Regulatory Requirements

A hazardous material is any substance that—because of its quantity, concentration, or physical or chemical properties—may pose a hazard to human health and the environment. Hazardous materials in various forms can cause death, serious injury, long-lasting health effects, and damage to buildings, homes, and other property. Hazards to human health and the environment can occur during production, storage, transportation, use, or disposal of hazardous materials.

Applicable laws and regulations regarding hazardous materials include the following.

- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S. Code [U.S.C.] 103)
- Superfund Amendments and Reauthorization Act (SARA)
- Federal Resource Conservation and Recovery Act (RCRA) (42 U.S.C. 6901 *et seq.*)
- Clean Water Act (CWA) (33 U.S.C. 1251 *et seq.*)
- Toxic Substances Control Act (TSCA) (15 U.S.C. 2601–2629)
- Department of Transportation Hazardous Materials Regulations (49 Code of Federal Regulations [CFR] 100–185)
- Spill Prevention Control and Countermeasure Plans (40 CFR 112.7)
- Dangerous Waste Regulations (Washington Administrative Code [WAC] 173–303)
- Model Toxics Control Act (MTCA) and its implementing regulations (Revised Code of Washington [RCW] 70.105D and WAC 173-340)
- Underground Storage Tank Statute and its implementing regulations (RCW 90-76 and WAC 173-360)
- Sediment Management Standards (WAC 173–204)

3.13.2 Methods

The study area for the hazardous materials analysis includes the build alternative sites and the area within a one-eighth-mile radius of each build alternative site. Properties farther than one-eighth of a mile from the build alternative sites were not considered for further analysis because they present a low probability of having releases that could affect the study area.

The hazardous materials analysis was developed primarily from analysis contained in the *Lynnwood Link Extension Draft EIS* (Sound Transit 2013), *East Link Project Final EIS* (Sound Transit 2011), and conducting an environmental database search via the Environmental Data Resources Inc. (EDR) Radius Map™ Report with Geocheck® EDR database. The EDR reports summarize database information for the areas located within a one-eighth-mile radius of each build alternative site. This information—along with the *Lynnwood Link Extension Draft EIS* (Sound Transit 2013) and *East Link Project Final EIS* (Sound Transit 2011), and the Washington State Department of Ecology (Ecology) Cleanup Site Search database for the Bellevue build alternatives—was used to evaluate the study area.

The regulatory database records search included, but was not limited to, reviewing the following federal, state, and local databases.

- Federal National Priorities List (NPL)
- Federal Proposed NPL
- Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)
- Federal CERCLIS No Further Remedial Action Planned (NFRAP)
- Federal Corrective Action Sites (CORRACTS)
- Federal Emergency Response and Notification System (ERNS)
- Leaking Underground Storage Tank Incident Report
- Underground Storage Tank (UST)
- Ecology's ALLSITES
- Confirmed and Suspected Contaminated Sites – No Further Action (CSCSL NFA)
- Voluntary Cleanup Program (VCP)

3.13.3 Affected Environment

One of three risk categories was assigned to sites with known contamination (either presently or in the past), within the study area: high risk, medium risk, and low risk.

- **High Risk**. The high-risk level identifies sites that might be substantially contaminated and might create liability for Sound Transit either due to construction activities or by virtue of acquiring all or a portion of the site, such as for a maintenance facility. High-risk sites typically involve open groundwater remediation sites within the proposed project footprint, sites with contaminants that are difficult to treat, (e.g., perchloroethylene [PCE]), have large volumes of contaminated materials, or have long histories of industrial or commercial use.
- **Medium Risk**. The medium-risk level identifies sites where the nature of potential contamination is known based on existing investigation data, the potential contaminants are not extremely toxic or difficult to treat, and probable remediation approaches are straightforward. It

typically involves sites located within or adjacent to project construction limits that have soil contaminated with petroleum products or nonadjacent sites that have groundwater contaminated with petroleum products.

- **Low Risk**. The low-risk level identifies sites where the nature of potential contamination is known based on existing investigation data, and the sites are not expected to have noticeable impacts on the project due to their location. It typically involves sites that are not directly adjacent to the alternative sites and do not have groundwater contamination.

As further described in Section 3.13.3, Methods, the hazardous materials analysis was developed from analysis contained in the *Lynnwood Link Extension Draft EIS* (Sound Transit 2013) and *East Link Project Final EIS* (Sound Transit 2011), and by conducting an environmental database search via the EDR report.

Table 3.13-1 identifies properties found during the regulatory records search within one-eighth of a mile from the build alternative sites and assigns a risk category based on the sites' potential for impact.

Table 3.13-1. Number of Hazardous Material Sites within One-Eighth Mile of the Build Alternative Sites

Alternative	High Risk	Medium Risk	Low Risk
Lynnwood Alternative	0	1	2
BNSF Storage Tracks	1	3	0
BNSF Alternative	1	3	0
BNSF Modified Alternative	1	3	0
SR 520 Alternative	0	1	2

3.13.3.1 Lynnwood Alternative

There is one medium-risk and two low-risk hazardous materials sites within a one-eighth-mile radius (Figure 3.13-1). Both hazardous materials sites were found in multiple databases.

Medium Risk

Rimpac Steel, Inc. (20311 52nd Avenue W)

The hazardous materials site is located on 52nd Avenue W, between 200th Street SW and 204 Street SW. It is listed in the RCRA-Non Generators, FINDS, ALLSITES, Confirmed and Suspected Contaminated Sites List No Further Action (CSCSL NFA), ICR (environmental remedial action reports), and VCP databases. The site is currently included in the NFA-Voluntary Cleanup Program database. Contamination included metals and petroleum impacted soil and groundwater. The No Further Action designation was granted in 1999.

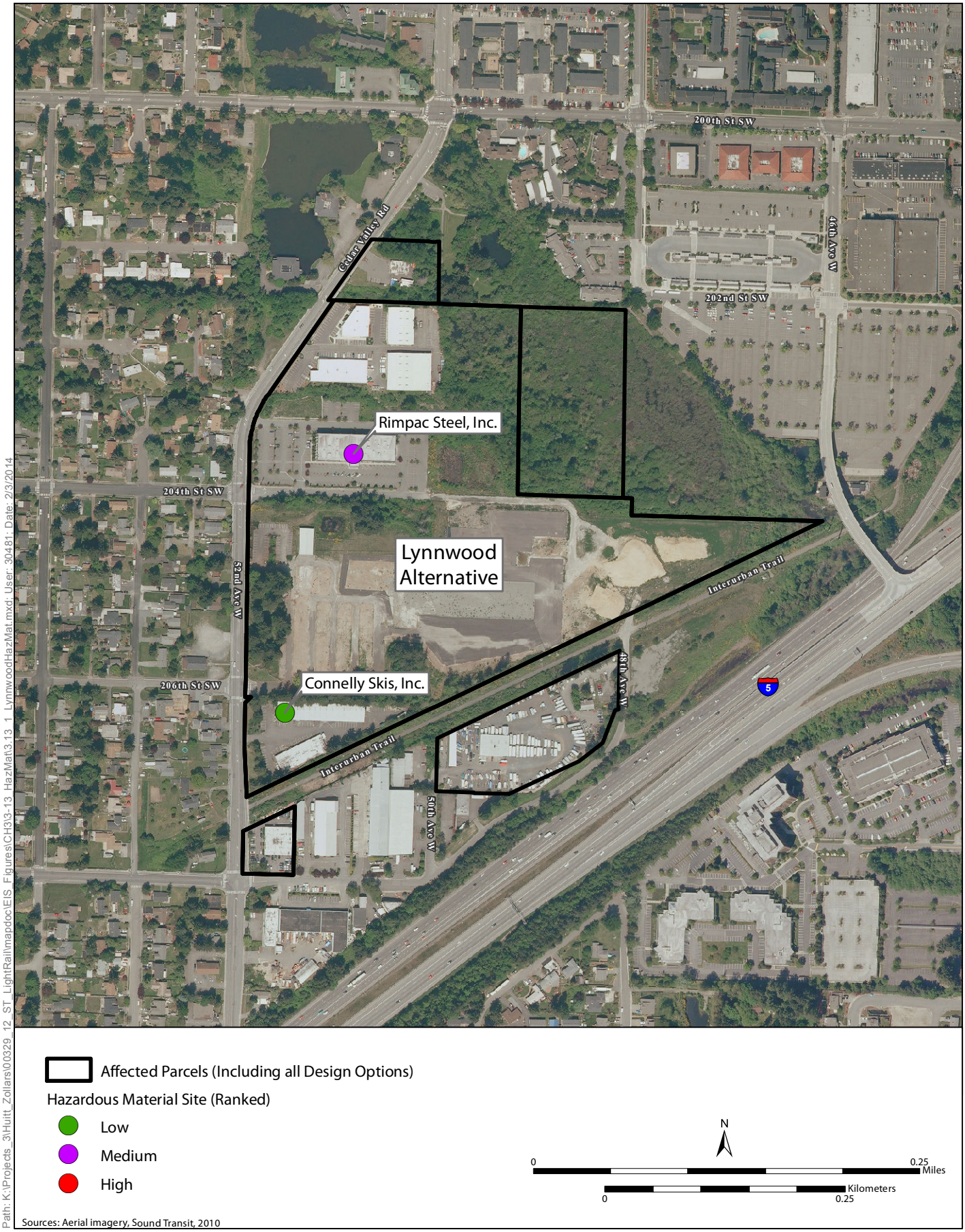


Figure 3.13-1: Hazardous Material Sites (Ranked) within One-Eighth Mile—Lynnwood
Sound Transit Link Light Rail OMSF Draft EIS

Low Risk

Connelly Skis, Inc. (20621 52nd Avenue W)

The hazardous materials site is located on 52nd Avenue W, between 206th Street SW and 208 Street SW. It is listed in the Resource Conservation and Recovery Act-Conditionally Exempt Small Quantity Generator (RCRA-CESQG), ALLSITES (Ecology information on facilities and sites of interest), SPILLS (hazardous materials onsite spills), FINDS (environmental interest and information system) and MANIFEST (hazardous waste manifest information) databases. The information found in the SPILLS database indicates that in 2005 there was a minor onsite mineral oil spill. No other violations were reported.

C Martin Trucking (20631 48th Avenue W)

This hazardous materials site is located on 48th Avenue W, just northeast of 50th Avenue W. The site was listed in various databases including ALLSITES, CSCSL NFA, UST, and ICR. The site was granted "No Further Action" status as of 1997. Remediated media included petroleum impacted soil.

3.13.3.2 BNSF Alternative, BNSF Modified Alternative, and BNSF Storage Tracks

One high-risk and three medium-risk hazardous materials sites exist within a one-eighth-mile radius of the build alternative sites (Figure 3.13-2). The hazardous materials sites were found in multiple databases and are discussed below.

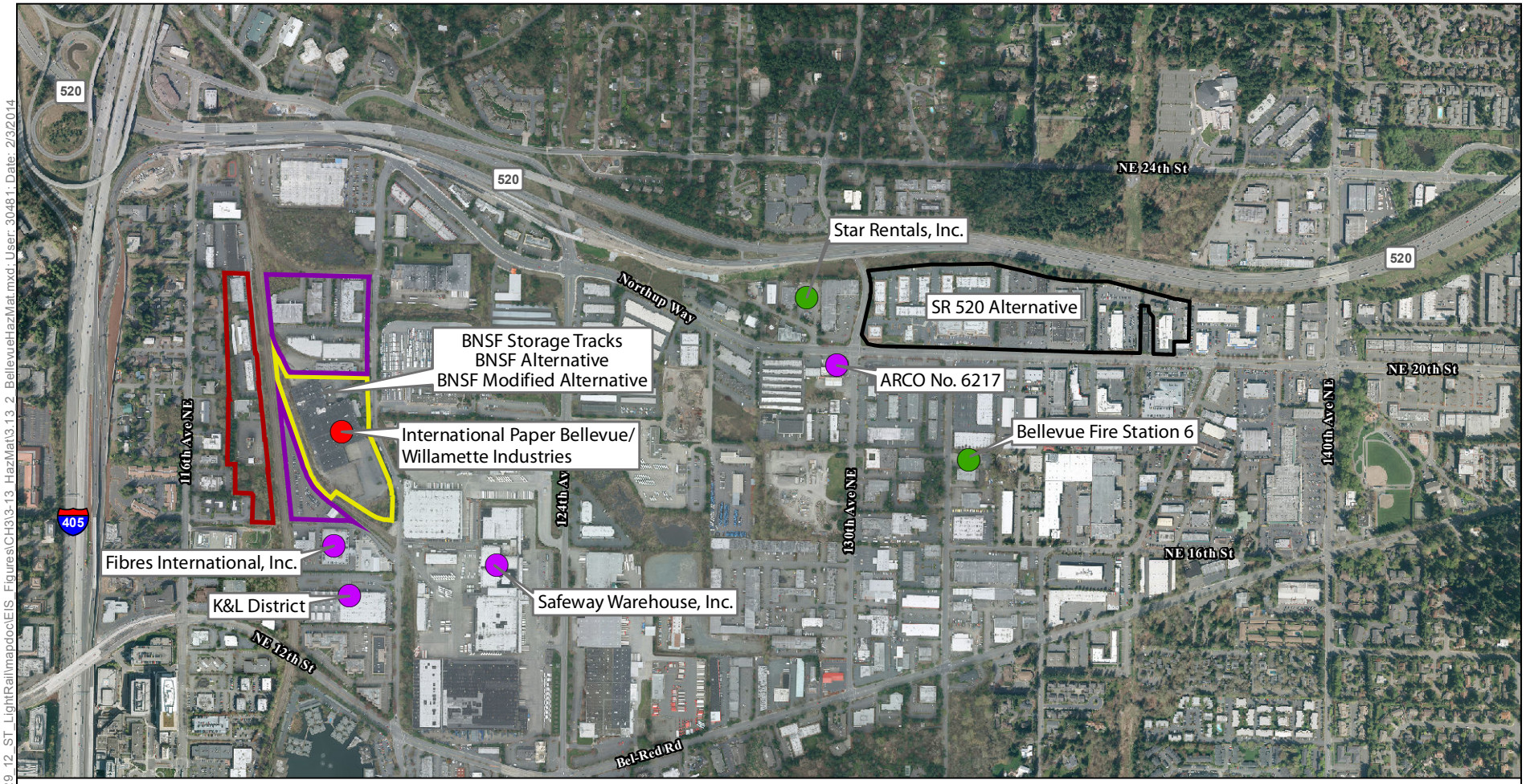
High Risk

International Paper Bellevue/Willamette Industries, Inc. (1899 120th Avenue NE)

This hazardous materials site is located on 120th Avenue NE, and is bounded by NE 12th Street to the south and SR 520 to the north. At the completion of the *East Link Project Final EIS* (Sound Transit 2011) the site was listed in the ICR, LUST, and UST databases. As of 2011, Weyerhaeuser used this site as a manufacturing facility for corrugated containers. The site was occupied by Willamette Industries and used as a forest product manufacturing facility prior to being purchased by Weyerhaeuser in 2002. Petroleum impacted soil was reportedly cleaned up (RCU) as of 2002.

The EDR search conducted in April 2013 revealed that International Paper (Willamette Industries) is currently listed in the aforementioned ICR, LUST, UST databases along with ALLSITES, RCRA NonGen and MANIFEST databases.

Further research conducted in July 2013 (via Ecology's Cleanup Site Search database) revealed an RCU Status Update letter from Ecology (dated April 16, 2013) informing the property owner that the site is not officially a case-closed site and is currently listed as contaminated in their Hazardous Sites List database. According to this document, groundwater contamination remains above regulatory levels near a former underground storage tank area.



Affected Parcels

- BNSF Storage Tracks, BNSF, and BNSF Modified
- BNSF Modified Alternative Only
- BNSF & BNSF Modified Alternatives
- SR 520 Alternative

Hazardous Material Site (Ranked)

- Low
- Medium
- High

N

0 0.5 Miles

0 0.5 Kilometers

Sources: Aerial imagery, City of Bellevue, 2013

Path: K:\Projects_3\Hutt_Zollars\00329_12_ST_LightRail\mapdoc\EIS_Figures\CH3\3-13_HazMat\3.13_2_BellevueHazMat.mxd; User: 30481; Date: 2/3/2014

Figure 3.13-2: Hazardous Material Sites (Ranked) within One-Eighth Mile—Bellevue
Sound Transit Link Light Rail OMSF Draft EIS

Medium Risk

Safeway Warehouse, Inc. Distribution Center (1723 124TH Avenue NE, 2009)

This site is located on 124th Avenue NE, and is bounded by NE 12th Street to the south and NE 18th Place to the north. At the time of the *East Link Project Final EIS* (Sound Transit 2011), the site was listed in ERNS, FINDS, Federal Insecticide, Fungicide & Rodenticide Act and Toxic Substances Control Act Tracking System (FTTS), ICR, LUST, MANIFEST, National Pollutant Discharge Elimination System (NPDES), and RCR databases. It is currently found in the NFA-Voluntary Cleanup Program database. Contamination included gasoline and diesel impacted soil. The No Further Action designation was granted in 2009.

The 3.5-acre site was formerly used by Safeway as a warehouse and distribution center. This five-building complex included a retail and warehouse building, cross dock, cold storage, office building, and a former vehicle maintenance shop. As of August 2013, many of the Safeway facility operations had been consolidated and moved elsewhere; however, some operations related to Safeway Bellevue Beverage, Safeway Ice Cream and the Safeway bread production plant exist on the site.

Fibres International, Inc. (1533 120th Avenue NE)

This site is located on 120th Avenue NE, and is bounded by NE 12th Street to the south and SR 520 to the north. At the time of the *East Link Project Final EIS* (Sound Transit 2011), the site was listed in the FINDS, ICR, LUST, RCRIS-SQG, and UST databases. The site is currently included in the NFA-Voluntary Cleanup Program database. Contamination included gasoline, diesel and benzene impacted soil and groundwater. The No Further Action designation was granted in 2011.

K&L District, North Bellevue Facility (1445 120th Avenue NE)

This site is also located on 120th Avenue NE, and is bounded by NE 12th Street to the south and SR 520 to the north. At the time of the *East Link Project Final EIS* (Sound Transit 2011) completion, the site was listed in the CSCSL NFA, FINDS, ICR, RCRIS-SQG, UST, and VCP databases. The site is currently included in the NFA-Voluntary Cleanup Program database. Contamination included petroleum impacted soil and groundwater. The No Further Action designation was granted in 1998.

3.13.3.3 SR 520 Alternative

The EDR database search and *East Link Project Final EIS* (Sound Transit 2011) analysis surrounding the SR 520 Alternative site revealed one medium-risk and two low-risk hazardous materials sites within a one-eighth-mile radius of the build alternative site (Figure 3.13-2).

Medium Risk

ARCO No. 6217 (12903 NE 20th Street)

This site is located on NE 20th Street, and is bounded to the east by 130th Avenue NE and NE 20th Place to the west. At the time of the *East Link Project Final EIS* (Sound Transit 2011) completion, the site was listed in the FINDS, ICR, LUST, MANIFEST, RCRIS-SQG, and UST databases. The site is

currently included in the NFA-Voluntary Cleanup Program database. Contamination included metals and petroleum impacted soil and groundwater. The No Further Action designation was granted in 1998.

Low Risk

Star Rentals, Inc. (12900 Northrup Way)

This site is located on Northrup Way, and is bounded to the east by 130th Avenue NE and NE 20th Place to the west. At the time of the *East Link Project Final EIS* (Sound Transit 2011), the site was listed in the FINDS, ICR, LUST, and UST databases. Site is currently under awaiting clean up status. Contamination includes gasoline, diesel and benzene impacted soil only.

Bellevue Fire Station 6 (1850 132nd Avenue NE)

This site is located on 132nd Avenue and is bounded by NE 20th Street to the north and NE 16th Street to the south. The site was listed in the ALLSITES, CSCSL NFA, UST and ICR databases. Contamination included petroleum impacted soil only. The No Further Action designation was granted in 2011.

3.13.4 Environmental Impacts

In addition to potential impacts common to all build alternatives, the ensuing sections discuss site-specific potential impacts from known contaminated sites to the build alternative sites. Potential impacts are based on the hazardous materials site's location relative to the build alternative site. As previously stated, the focus of the discussion is on hazardous materials sites located within a one-eighth-mile radius of the build alternative sites because they present a higher probability of affecting implementation of the proposed project. High-risk sites could also have long-term impacts if they involve remediation actions after the proposed project is constructed.

3.13.4.1 No Build Alternative

Under the No Build Alternative, disturbance, removal, or cleanup of potentially hazardous materials, including contaminated soil and/or groundwater, would not occur.

3.13.4.2 Impacts Common to All Build Alternatives

All of the build alternatives would involve similar construction and operational features.

To minimize the potential for impacts from all potential sites, Sound Transit would perform a level of environmental due diligence appropriate to the size and presumed past use of the property at all properties before they are acquired. Environmental site assessments would be conducted where appropriate. Where known hazardous sites are present, Sound Transit would remediate any contaminated soil and groundwater, including those previously unknown and found during construction. To the extent practical, Sound Transit would limit construction activities that might encounter contaminated groundwater or soils. Impacts can be minimized by avoiding contaminated sites, particularly when other options or alternatives are being considered.

Construction Impacts

For all build alternatives, construction impacts could result from misuse, improper storage, and accidental spills of hazardous materials. Construction impacts could also result from encountering contaminated soil or groundwater (found on or adjacent to contaminated sites) during construction activities (such as grading, excavating, dewatering and demolition). In addition to residual soil and groundwater contamination as a potential impact, and to the extent that existing edifices, structures, bollards, etc. would be demolished as part of proposed project construction, exposure to lead-based paint and asbestos-containing materials could create additional construction impacts. Additionally, construction activities such as drilling, excavating, or demolition can be a cause of accidental damage of hazardous material containers such as aboveground and underground storage tanks and utility infrastructure such as pole-mounted electrical transformers.

It is expected that construction activities for all build alternatives would involve the routine transport, use, storage, and disposal of hazardous materials such as fuels, solvents, paints, oils, and grease. Such transport, use, storage, and disposal would be compliant with applicable regulations such as the RCRA, U.S. Department of Transportation Hazardous Materials Regulations, and any local regulations, mentioned previously in Introduction to Resources and Regulatory Requirements. Additionally, hazardous materials likely to be transported, used, stored, and disposed of during construction of the proposed project would be materials typical of construction projects and would be generally used and handled in small quantities.

Potential construction impacts could result from accidental releases of typical hazardous construction materials over water or in areas where stormwater runs off into water bodies. Spills, if not contained, could harm water quality, vegetation, and wildlife in the immediate area and downstream; large spills could require emergency response. While the potential for this type of release exits, typical construction hazardous material products would be generally used in small, localized amounts, and any spills that may occur would be immediately contained and cleaned up as soon as they occur. Furthermore, it is anticipated that construction personnel would follow applicable construction BMPs via the Construction Stormwater General Permit issued by Ecology (see Section 3.10, Water Resources, for details).

The proposed project construction contractor would have certified personnel and a Health and Safety Plan (HASP) that comply with the Occupational Safety and Health Administration's (OSHA) Hazardous Waste Operations and Emergency Response Standard (HAZWOPER). Also, during construction the contractor would employ BMPs to minimize human exposure to suspected contaminants.

In the event that disturbed soil is suspected to be contaminated, construction BMPs can include but are not limited to the following.

- Water or mist soil as it is being excavated and loaded onto transportation trucks.
- Place any stockpiled soil in areas shielded from prevailing winds.
- Cover the bottom of excavated areas with sheeting when work is not being performed.

In addition to these measures, it is expected that the construction contractor would adhere to all existing federal, state, and local regulations during all construction activities. Compliance with these regulations, requirements and implementation of these measures would preclude any potential hazards encountered.

Operational Impacts

Routine office maintenance activities could result in the use of solvents, cleaning agents, paints, etc. Some of these materials can be classified as hazardous. These hazardous material products would generally be used in small amounts, and any spills that may occur would be limited in scope and spill area and typically would be cleaned up soon after they occur.

Light rail vehicle (LRV) maintenance activities conducted in the OMSF could result in operational impacts; however, since LRVs operate on electricity and not fuel, large spills are not likely to occur. Hazardous materials releases could occur during track maintenance or other fleet vehicle maintenance. A spill response program and hazardous material handling plan has been created by Sound Transit for existing maintenance locations and where appropriate, would be implemented during operations of the proposed OMSF.

OMSF activities would generate hazardous material waste due to the use of lubricants, solvents, etc. Hazardous waste generated at the OMSF would be managed according to all applicable regulatory requirements, which would minimize the exposure risk to all Sound Transit personnel and the surrounding environment. Additionally, it is expected that the OMSF would be constructed with engineering controls to limit and contain releases and spills, thus, further minimizing the potential for operational impacts. Operational impacts could occur if any of the properties acquired for the project are contaminated. The acquisition of contaminated properties could require remediation activities.

3.13.4.3 Lynnwood Alternative

Construction Impacts

One medium-risk and one low-risk hazardous materials sites are located in the Lynnwood Alternative site. Based on the records available, the medium-risk site is considered to be remediated. However, because of its past history of groundwater and soil contamination and its location directly within the Lynnwood Alternative site, there is potential to encounter previously undiscovered contaminated media during construction. The records review for the low-risk site indicated that there was a minor mineral oil spill onsite in 2005. No agency follow-up was indicated in the report, and no other reports of violations were found in any of the other databases for this site.

Construction impacts for the BNSF Storage Tracks would be the same as those discussed for the BNSF Alternative and BNSF Modified Alternative.

Operational Impacts

Operational impacts for this alternative would be the same as those discussed in Section 3.13.4.2, Impacts Common to All Build Alternatives.

3.13.4.4 BNSF Alternative and BNSF Modified Alternative

The analysis for the BNSF Storage Tracks, BNSF Alternative and BNSF Modified Alternative was combined due to the sites having similar conditions. The EDR radius analysis was conducted to include all sites within one-eighth of a mile of the BNSF Alternative and BNSF Modified Alternative sites.

Construction Impacts

Three medium-risk sites and one high-risk site are located within a one-eighth-mile radius of the BNSF Alternative and BNSF Modified Alternative sites. A No Further Action determination for the three medium-risk sites (located outside of the proposed project footprint) has been made by Ecology. There were no other reports of violations found during the database search. Therefore, there is low potential to encounter existing contamination in the soil and groundwater from these sites. The high-risk site (International Paper Bellevue/Willamette Industries, Inc. (1899 120th Avenue NE) is of some concern because of its past operations and location directly within the BNSF Alternative and BNSF Modified Alternative sites. The most recent information provided by Ecology denotes the site as having contaminated groundwater and, therefore, the potential to encounter contaminated media during construction of the proposed project is high.

Operational Impacts

Operational impacts for these alternatives would be the same as those discussed in Section 3.13.4.2, Impacts Common to All Build Alternatives.

3.13.4.5 SR 520 Alternative

Construction Impacts

There is one medium-risk site and two low-risk sites within a one-eighth-mile radius of the SR 520 Alternative site. A No Further Action determination has been made by Ecology for the medium-risk site and one of the low-risk sites. The remaining low-risk site status is open and awaiting remediation. However, the affected media was soil only and is not likely to affect the proposed project. There were no other reports of violations found during the database search.

Operational Impacts

Operational impacts for the SR 520 Alternative are discussed in Section 3.13.3.2, Impacts Common to All Build Alternatives.

3.13.5 Indirect and Cumulative Impacts

No indirect impacts related to hazardous materials would result from construction and operation of the proposed project.

For other transit projects in the build alternative sites, such as the Lynnwood Link Extension and East Link, Sound Transit would adhere to applicable regulations regarding the handling and treatment of contaminated materials during construction and long-term operation of the projects. As a result, the proposed project would not have an adverse effect and could have a net beneficial impact on the environment. Similarly, all other related projects' development would require the remediation of any contaminated sites encountered in compliance with state and federal environmental regulations, consequently improving overall environmental quality. Therefore, there would be no cumulative impacts of the related projects, when combined with the proposed project, on hazardous materials in the build alternative sites.

3.13.6 Potential Mitigation Measures

As mentioned, it is possible that unanticipated residual soil contamination may be encountered during construction activities in portions of the build alternative sites. To mitigate potential impacts from all potential hazardous material sites, Sound Transit would perform a level of environmental due diligence appropriate to the size and presumed past use of the property at any properties in the study area before they are acquired. Phase 2 Environmental Site Assessments would be conducted where appropriate. Where known hazardous sites are present, Sound Transit would be responsible for the remediation of any contaminated soil and groundwater, including that which would be previously unknown and found during construction. Sound Transit would also limit construction activities that might encounter contaminated groundwater or contaminated soil.

3.14 Electromagnetic Fields

Electrical systems produce both electric and magnetic fields. Electric fields result from the strength of the electric charge, while magnetic fields result from the motion of the charge. Together these fields are referred to as *electromagnetic fields* (EMFs). EMFs are invisible, nonionizing, low-frequency radiation.

3.14.1 Introduction to Resources and Regulatory Requirements

EMFs are present around all electrical equipment and facilities, including the electrical power lines and electrical equipment for the proposed project, and wherever electricity is used. Common EMF sources in households and workplaces include microwave ovens, vacuum cleaners, copy machines, and fax machines. EMFs are also produced from electric rail power lines and maintenance facilities, which would include the facilities associated with the proposed project.

EMFs result in *electromagnetic interference* (EMI), which can cause disruptions and possibly malfunctions in sensitive equipment. In certain situations with sufficiently high exposure, EMFs can also result in adverse effects on human health. The potential for EMI and adverse human health effects depends on the location of EMF-sensitive receptors in relation to light rail equipment. In general, EMI and associated effects decrease as a function of distance from the source.

Table 3.14-1 lists common sources of EMFs and the corresponding median field strengths at a source-receptor distance of 6 inches (National Institutes of Environmental Health Sciences and National Institutes of Health 2002). Magnetic fields are typically measured in units of milligauss, while electric fields are typically measured in volts per meter or kilovolts per meter.

Table 3.14-1. Common EMF Sources and Median Corresponding Field Strengths

Source	Median Magnetic Field at 6 Inches from Source (milligauss)
Copy Machines	90
Fax Machines	6
Fluorescent Lights	40
Microwave Ovens	200
Washing Machines	20
Vacuum Cleaners	300

Source: National Institute of Environmental Health Sciences and National Institute of Health 2002.

Concern over EMF exposure generally pertains to human-made sources of electromagnetism, such as the electrical conveyance lines and electrical devices associated with the proposed project. Cables emerging from the electrical substation would carry direct current power, creating primarily EMFs in the static (0 to 3 hertz) frequency range. At a typical electrical substation, EMFs would be generally low or nonexistent beyond the substation's perimeter fence.

The National Institute for Occupational Safety and Health measured the daily exposure of workers who service the tracks of electric rail lines. The average exposure of EMFs that these workers experience ranged from 3 to 18 milligauss per day (National Institutes of Environmental Health Sciences and National Institutes of Health 2002). The study also found that electric train operators experience 0.4 to 31.1 milligauss of EMF exposure on a daily basis (National Institutes of Environmental Health Sciences and National Institutes of Health 2002). Table 3.14-2 summarizes the exposures measured in the studies of track maintenance workers and train operators.

Table 3.14-2. Ranges of EMF Exposure to Electric Rail Workers

Receptor	Range of Average Daily EMF Exposure (milligauss)
Electric Rail Line Workers	3–18
Electric Train Operators	0.4–31.1
Source: National Institute of Environmental Health Sciences and National Institute of Health 2002.	

Neither the federal government nor State of Washington has set standards for EMF exposure. Although there are no regulatory requirements for EMFs, EMF exposure guidelines have been developed by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). The ICNIRP guidelines address known human biological effects resulting from exposure of the public to EMFs by establishing reference levels of EMF exposure. For frequencies of 60 hertz, ICNIRP has established a reference level for occupational and public exposure to EMFs at 4,167 milligauss and 833 milligauss, respectively (Table 3.14-3). These referenced levels represent guidelines for the amount of EMFs to which a receptor can be exposed without experiencing adverse effects. The likelihood of adverse effects occurring increases in a receptor that is exposed to EMFs above these reference levels (International Commission on Non-Ionizing Radiation Protection 1998). Reference levels for exposure of potentially sensitive equipment to EMFs, such as magnetic resonance imaging machines (MRIs) or defibrillators, however, are not included in the ICNIRP guidelines.

Table 3.14-3. ICNIRP Reference Levels for EMF Exposure at 60 Hertz

Type of Exposure	Electric Field (Kilovolts/meter)	Magnetic Field (milligauss)
Occupational	8.3	4,167
Public	4.2	833
Source: International Commission on Non-Ionizing Radiation Protection 1998.		

3.14.2 Methods

The EMF study area is the area immediately adjacent (300 feet) to the build alternative sites. Facilities with potentially EMI-sensitive equipment within 300 feet of the build alternatives were identified using a review of aerial photographs and contacting identified potential EMF-sensitive facilities to determine whether they have equipment sensitive to EMF.

3.14.3 Affected Environment

EMF-sensitive receptors typically include hospitals and laboratories that use equipment that is sensitive to EMI (e.g., MRI). Pipes and cable utilities commonly located under and along roadways can also be susceptible to stray currents. There are no EMF-sensitive receptors in the study area for the Lynnwood Alternative, BNSF Alternative, and SR 520 Alternative.

There are three facilities with equipment that may be sensitive to EMFs in the study area for the BNSF Modified Alternative.

- **Overlake Obstetricians and Gynecologists.** The Overlake Obstetricians and Gynecologists facility has ultrasound equipment and other electronic medical equipment that may be sensitive to EMFs. The facility would be located approximately 150 feet from the OMSF under this alternative.
- **Specialty Eyecare Centre.** The Specialty Eyecare Centre has a surgery center with electronic equipment that may be sensitive to EMFs. This facility would be located approximately 150 feet to the west from the OMSF under this alternative.
- **Seattle Children's Hospital: Bellevue Clinic and Surgery Center.** Seattle Children's Hospital: Bellevue Clinic and Surgery Center has an MRI unit located in a magnetically shielded room on the second floor of the building. The facility would be located approximately 300 feet to the southwest from the OMSF under the BNSF Modified Alternative.

3.14.4 Environmental Impacts

EMFs could pose certain health effects on humans and interference with electrical medical devices used by some individuals, such as shock or burns. Interference with medical pacemakers and other electrical devices could also occur.

3.14.4.1 No Build Alternative

The No Build Alternative would not introduce new sources of EMI related to the proposed project into the study area; therefore, no impacts would result from this alternative.

3.14.4.2 Impacts Common to All Build Alternatives

At each build alternative, light rail vehicles (LRVs) and overhead wires used to provide power to the LRVs would be sources of EMFs. When LRVs accelerate or are in motion, more energy is required (and more EMFs are produced) than when the vehicles are stationary or moving slowly. Consequently, EMFs at the OMSF at all build alternative sites would be relatively low due to the low rate of speed (no greater than 8 miles per hour) as the LRVs enter, exit, and circulate within the OMSF, and because the LRVs would be stationary for a substantial portion of the time. Some equipment used to provide maintenance for the LRVs would also be sources of EMFs, such as any electrical equipment and on-site traction power substation facility. It is unlikely that EMFs from any of this equipment would reach levels higher than the LRVs; however, the LRVs would require more electrical current, which would produce higher levels of EMFs, than the maintenance equipment.

Stray currents could result if electrical current traveling through the LRVs or overhead wires were to jump to nearby cables that are buried in the ground. Control measures preventing stray currents would be developed by Sound Transit, if necessary, in coordination with the operators of electric and other utility lines.

As shown in Table 3.14-2, the ranges of EMF exposure to track maintenance workers and train operators are below the guidelines established by the ICNIRP. Because maintenance workers and operators would be in the immediate vicinity of electrical equipment generating EMFs, the EMF exposure to the public in surrounding land uses from the build alternative sites would be lower than train-worker exposure. Therefore, the build alternatives would not likely result in any health impacts on facility employees, visitors, or the surrounding public.

3.14.4.3 Lynnwood Alternative, BNSF Alternative, and SR 520 Alternative

Construction Impacts

While equipment used to construct the Lynnwood Alternative, BNSF Alternative, and SR 520 Alternative would generate EMFs, these EMFs would not be substantially higher than the EMFs generated at a typical construction site. Consequently, no impacts from EMFs on nearby sensitive facilities are anticipated during construction of these alternatives.

Operational Impacts

There are no potentially EMF-sensitive sites located within 300 feet of the Lynnwood Alternative, BNSF Alternative, and SR 520 Alternative sites. Therefore, there would be no impacts from EMF operation of these alternatives.

3.14.4.4 BNSF Modified Alternative

Construction Impacts

While construction equipment used to construct the BNSF Modified Alternative would generate EMFs, these EMFs would not be substantially higher than those generated at a typical construction site. Consequently, no impacts from EMFs on nearby sensitive facilities are anticipated during construction of the BNSF Modified Alternative.

Operational Impacts

Although the three identified facilities (Overlake Obstetricians and Gynecologists, Specialty Eyecare Centre, and Bellevue Clinic and Surgery Center) have potentially EMF-sensitive equipment, there would likely be no interference caused by the electrical equipment at the BNSF Modified Alternative site because these facilities are over 150 feet away, which is adequate for the field strength to weaken to negligible levels. The MRI unit at the Children's Hospital Bellevue Clinic and Surgery Center is located close to moving cars in a shielded room immediately above the ground-level parking garage beneath the hospital. Since the Bellevue Clinic and Surgery Center is a new facility specifically designed for this location, it is not thought that these EMF sources would cause any malfunctions for the MRI unit. Given the existing exposures from sources in or near the Bellevue

Clinic and Surgery Center, especially from cars moving in the parking garage immediately below the MRI unit (approximately 20 milligauss), EMFs from OMSF operations are not expected to have an impact on the facility.

3.14.5 Indirect and Cumulative Impacts

No indirect impacts related to electromagnetic fields would result from construction and operation of the proposed project.

The *Lynnwood Link Extension Draft EIS* (Sound Transit 2013) notes that there are no potentially sensitive electronic or electrical receptors closer than 1,000 feet to the Lynnwood Link Extension alternative alignments (Sound Transit 2013). The *East Link Project Final EIS* (Sound Transit 2011) notes that the projected EMF from the East Link extension is lower than the existing EMF environment. Sound Transit did not identify any areas where EMI would combine with past, present, or future actions to result in human health effects or effects to facilities with equipment sensitive to EMI. Therefore, no EMI cumulative impacts would result from the proposed project.

3.14.6 Potential Mitigation Measures

No adverse impacts related to EMI/EMF have been identified; therefore, no mitigation would be required.

3.15 Public Services

This section discusses the existing conditions and potential impacts on the public services that would serve the proposed project.

3.15.1 Introduction to Resources and Regulatory Requirements

Public services that are considered in this analysis are fire and emergency medical services (including hospitals), police services, schools (public and private), and solid waste and recycling collection. Libraries are not included in this analysis because none are located in the study areas.

3.15.2 Methods

The study area for the public services analysis is defined as the area within 0.5 mile of each build alternative site. The study area is within Lynnwood's and Bellevue's city jurisdictions.

The public services analysis was conducted by reviewing design drawings and construction documentation to identify what could cause changes in response times for fire/medical and police services, travel times for school bus and solid waste collection routes, and overall demand for all public services. Acquisition and displacement data were also reviewed to see if any public services facilities would be acquired or if emergency access would be interrupted.

3.15.3 Affected Environment

3.15.3.1 Lynnwood Alternative

Fire and Emergency Medical Services

The Lynnwood Fire Department provides fire and emergency medical services to the City of Lynnwood. The department consists of 50 full-time employees comprising career firefighters, emergency medical technicians (EMTs), paramedics, and fire inspectors that work to protect over 35,000 residents in a 7-square-mile area (City of Lynnwood 2013a). The Lynnwood Fire Department is staffed by two stations (Stations 14 and 15) from which firefighters and EMTs respond to an average of 6,000 alarms annually, approximately 75% of which are emergency medical calls. The average response time for all emergencies is 5 minutes and 7 seconds (City of Lynnwood 2013b).

Emergency medical services are also provided by the Swedish Medical Center at the Edmonds Campus. This regional medical center is located at 21601 76th Avenue W, less than 3 miles from the Lynnwood Alternative site.

Police

The Lynnwood Police Department is the primary law enforcement agency serving the City of Lynnwood. The department has 42 sworn-in personnel who respond to emergency calls within Lynnwood's city limits. In 2011, the department responded to 32,270 calls (approximately 768 calls

per officer) with average response times for high-priority calls at 4 minutes and 38 seconds, and 5 minutes and 13 seconds for medium-priority calls (City of Lynnwood 2012).

The Washington State Patrol also responds to calls in Lynnwood. This department has over 600 state troopers patrolling approximately 17,000 miles of interstate and state highways. The state patrol is responsible for traffic law enforcement, collision investigation, criminal interdiction, terrorism prevention, and motorist assistance, and does not keep record or maintain response time statistics (Washington State Patrol 2013).

Schools

The Edmonds School District is located in the City of Lynnwood and owns a 20-acre vacant parcel in the study area. The parcel was previously occupied by the Scriber Lake Alternative School and is currently planned to house the district support center. The Harvest Time Church School, a private school, is located at the intersection of Scriber Lake Road and 196th Street SW. Additionally, Kepler College, an unaccredited astrological college, is located at 200th Street SW and 45th Avenue W. There are no public schools in the study area.

Solid Waste and Recycling Collection

The City of Lynnwood does not provide solid waste services such as curb-side pickup. Solid waste and recycling services in the study area are provided by Waste Management Northwest, a private waste management company that provides services throughout Washington, Oregon, and Idaho. It owns and operates 55 sites, 26 collection districts, 14 transfer stations, two recycling centers, four construction and demolitions recovery facilities, two renewable energy plants, and seven landfills (Waste Management Northwest 2013).

3.15.3.2 BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative

Fire and Emergency Medical Services

The Bellevue Fire Department provides fire suppression and education, and rescue and emergency medical services to the City of Bellevue and is a regional provider of advanced life-support services for King County. The department consists of 241 personnel, including 199 emergency medical service personnel, working at nine stations located throughout the Bellevue region (City of Bellevue 2013). The average response time to emergencies is approximately 7 minutes (International City/County Management Association 2011).

The City of Bellevue's Public Safety Training Center is located at 1838 116th Avenue NE, Bellevue, within the BNSF Modified Alternative site. This facility is jointly shared between Bellevue Fire and Police Departments and hosts several safety training courses including first aid and cardiopulmonary resuscitation (CPR) classes. The training facility includes a six-story emergency response training tower and surrounding drill grounds. The training facility also has previously hosted other local jurisdictions' emergency responders training.

There are several medical centers that provide emergency medical services to the Bellevue region. These facilities include Overlake Hospital Medical Center, a regional medical center located at 1035 116th Avenue NE; Group Health Cooperative: Bellevue Medical Center, an emergency and urgent care facility located south of the Overlake Hospital Medical Center at 11511 NE 10th Street; and the Seattle Children's Hospital: Bellevue Clinic and Surgery Center, a family medical center located at 1500 116th Avenue NE.

Police

The City of Bellevue Police Department responds to calls within the Bellevue city limits. The department has 178 commissioned police officers and 41 professional support staff (City of Bellevue 2013). In 2011, the average response time for Priority-1 emergencies (i.e., life-threatening emergencies) was 3 minutes and 33 seconds (City of Bellevue 2011). The department has a target to reduce Priority-1 call response times to 3 minutes and 28 seconds by 2014 (City of Bellevue 2012).

Schools

The Bellevue School District serves the City of Bellevue. No schools are located in the study area; however, the Academic Institute, a private high school, is located at 13400 Northeast 20th Street, in the SR 520 Alternative site. School enrollment in 2012 was approximately 30 students.

Solid Waste and Recycling Collection

The City of Bellevue contracts with Allied Waste, a private company, for residential and commercial solid waste and recycling services. Allied Waste collects solid waste, recycling, and yard debris from thousands of residents and businesses in the Puget Sound region. The operations facility is located less than 0.5 mile east of the BNSF Alternative and BNSF Modified Alternative sites and BNSF Storage Tracks, and less than 0.5 mile south of the SR 520 Alternative site.

3.15.4 Environmental Impacts

3.15.4.1 No Build Alternative

Under the No Build Alternative, the proposed project would not be constructed and public services in the study area would presumably continue to operate as they do currently. Additionally, parcels containing public service facilities, including the parcel owned by the Edmonds School District and the City of Bellevue Public Safety Training Center, would not be acquired under any of the build alternatives. Therefore, the No Build Alternative would not result in impacts on public services.

3.15.4.2 Impacts Common to All Build Alternatives

Construction Impacts

Implementation of any of the build alternatives would temporarily affect the roadways in the study area and vicinity, resulting in short-term impacts on all public services. Construction activities would result in short-term increased traffic congestion due to added construction vehicles. However, no road closures or detours are anticipated. Additionally, as discussed in Section 3.1, Transportation, any construction-related traffic impacts would be minimized with implementation of a construction transportation management plan prepared per City of Lynnwood and City of Bellevue requirements. Coordination between Sound Transit and potentially affected public service providers before and during construction would minimize delays in emergency response times and disturbance to school bus and solid waste collection routes.

Operational Impacts

No operational impacts on fire, police, or emergency response access or school bus and solid waste/recycling collection routes would occur under any of the build alternatives. Increased demand for police services would not occur because security measures for the OMSF would be similar to the existing Forest Street OMF including on-site security personnel that reduces demands on local law enforcement. Additional security measures would include placing a fence surrounding the site perimeter, installing electronically controlled gates, and security patrol in the evenings from 5:00 p.m. to 5:00 a.m. 7 days a week (Cummins 2013). Regarding other public services, the build alternatives would not include features that would increase the population, thus, creating an increased demand. Therefore, impacts related to access interruption and increased public services demand during operation of any of the build alternatives would not occur.

3.15.4.3 Lynnwood Alternative

Construction Impacts

Construction impacts for this alternative are the same as those discussed in Section 3.15.4.2, Impacts Common to All Build Alternatives.

Operational Impacts

Operation of the Lynnwood Alternative would include acquiring an undeveloped, industrial-zoned parcel owned by the Edmonds School District. The district's current planning efforts for the parcel include developing it into a district support center. The school district would be required to reassess its plans for administrative, bus maintenance, and bus storage facilities at the site; however, this would not represent impacts on any existing schools. No other acquisition of a public-service facility at the Lynnwood Alternative site would occur. Additionally, as discussed in Section 3.15.4.2, Impacts Common to All Build Alternatives, no impacts on public services related to access interruption or increased demand are anticipated during operation.

3.15.4.4 BNSF Alternative

Construction and Operational Impacts

Construction and operational impacts for this alternative are the same as those discussed in Section 3.15.4.2, Impacts Common to All Build Alternatives.

3.15.4.5 BNSF Modified Alternative

Construction Impacts

Construction impacts for this alternative are the same as those discussed in Section 3.15.4.2, Impacts Common to All Build Alternatives.

Operational Impacts

Operation of the BNSF Modified Alternative would require relocating the Bellevue Public Fire Training Center at 1828 116th Avenue NE. This facility is used by the City of Bellevue as a training facility for police and fire department staff. Sound Transit would work with the City of Bellevue to minimize the disruptive effect of the relocation. Coordination between Sound Transit and applicable agencies prior to implementation is part of the proposed project's planned commitments. No other impacts on public services are anticipated during operation, as discussed in Section 3.15.4.2, Impacts Common to All Build Alternatives.

3.15.4.6 SR 520 Alternative

Construction Impacts

Construction impacts for this alternative are the same as those discussed in Section 3.15.4.2, Impacts Common to All Build Alternatives.

Operational Impacts

Operation of the SR 520 Alternative would require relocating the private school, the Academic Institute. As part of the proposed project's planned commitments prior to development of the proposed project, Sound Transit would work with the school to minimize disruptive effects of moving academic operations to another site. No other impacts on public services are anticipated during operation, as discussed in Section 3.15.4.2, Impacts Common to All Build Alternatives.

3.15.5 Indirect and Cumulative Impacts

No indirect impacts related to public services would result from construction and operation of the proposed project.

Sound Transit would coordinate with public service agencies regarding construction of the proposed project and other proposed developments being built at the same time, thereby minimizing cumulative construction-related impacts on emergency response services.

3.15.6 Potential Mitigation Measures

The OMSF would be designed within a framework of standards that addresses emergency, safety, and security at the facility. Operations at the OMSF would be performed in accordance with a facility operations plan that would ensure safety and security at the site. Also, Sound Transit would work with local jurisdiction where the OMSF is sited to develop an emergency response, safety, and security plans.

Given these commitments, along with implementation of the project commitments stated in Chapter 3.2 Acquisitions, Displacements, and Relocations, no mitigation for public services would be required.

3.16 Utilities

This section analyzes the utility providers and systems that would serve or could be affected by the proposed project.

3.16.1 Introduction to Resources and Regulatory Requirements

Utilities considered in this analysis include natural gas, electricity, water, sanitary sewer, storm sewer, cable/communications, and petroleum systems and/or pipelines within the jurisdictions of Lynnwood and Bellevue. Utilities within the build alternative sites for the proposed project are regulated by local policies and procedures for the Cities of Lynnwood and Bellevue, as well as Washington Administrative Code (WAC) 468-34 and Washington State Department of Transportation (WSDOT) policies within the sites.

3.16.2 Methods

The study area for the utilities analysis is defined as the area within 100 feet of the build alternative sites. Information on relocated or protected utility lines was compiled from several sources, including Sound Transit geographic information system (GIS) data, utility maps, and in some cases, as-built drawings obtained from private and public utility companies (excluding municipal services), GIS data available on City of Lynnwood and City of Bellevue websites, and Huitt-Zollars civil engineering plans depicting OMSF layouts. Sound Transit identified utility conflicts for each build alternative site by determining where underground or overhead utilities were within the project limits of each site. The goals of identifying the conflicts are as follows.

- Plan for relocating the utilities during construction and, therefore, remove conflicts with construction.
- Prevent disturbing the build alternative sites during future maintenance of underground utilities.
- Keep the project elements (i.e., buildings, tall structures) clear of the minimum required distance of overhead utilities.
- Account for relocation costs.

3.16.3 Affected Environment

Utility providers in the study area include municipal agencies, public utility districts, and private companies. Existing and planned utilities in the study area have been identified by Sound Transit. Table 3.16-1 summarizes the utility providers in each jurisdiction.

Table 3.16-1. Utility Providers in the Study Area

Jurisdiction	Utility	Provider
Lynnwood	Gas	Snohomish Public Utility District
	Electricity	Snohomish Public Utility District
	Water, Sewer	City of Lynnwood
	Stormwater	City of Lynnwood
	Cable	Comcast
	Communications	Frontier, Black Rock Cable
	Petroleum Products	None
Bellevue	Gas	Puget Sound Energy
	Electricity	Puget Sound Energy
	Water, Sewer	City of Bellevue, King County Wastewater
	Stormwater	City of Bellevue
	Cable	Comcast
	Communications	Century Link, Verizon, Integra, Allstream
	Petroleum Products	Olympic (British Petroleum)

3.16.4 Environmental Impacts

3.16.4.1 No Build Alternative

Under the No Build Alternative, the OMSF would not be constructed and land use on the build alternative sites would develop based on current demand and in concert with existing planning and development guidelines. The Edmonds School District is planning to develop a district support center on the parcel it owns within the Lynnwood Alternative site, and it is reasonable to assume utilities for the site would be developed to accommodate the Edmonds School District's needs.

3.16.4.2 Impacts Common to All Build Alternatives

Construction Impacts

Potential construction impacts common to all build alternatives would include relocating utility poles that support overhead lines; relocating aerial utilities to taller or different types of poles; constructing new distribution lines to provide power to substations; relocating underground utilities from under the build alternative sites; and inspecting, repairing, and encasing underground utilities at yard track crossings. In general, water lines and high-pressure gas mains would be located approximately 3 to 6 feet underground and sewer pipes 6 or more feet below grade. Smaller pipes, fiber optic cables, telephone lines, and other utilities would likely be located less than 3 feet below grade. Water, sewer, and storm drain pipes would likely run parallel under streets placed in various locations ranging from the center of the roadway to its periphery, while fiber optic cables, telephone lines, underground electrical conduits, and smaller pipes would be located beneath sidewalks. The effect on these utilities is dependent on their depth and material, as well as excavation and fill limits of the build alternative sites. Underground utilities would be relocated or protected to allow for

excavation and/or fill and to minimize load impacts on existing utilities from the weight of the light rail vehicles (LRVs) and building foundations. Disruptions to utility service during utility relocations would be minimal because temporary connections to customers would typically be established before the start of the relocation process. Inadvertent damage to underground utilities could occur during construction if utility locations are uncertain or misidentified. Such accidents could temporarily affect service to the utilities' customers. Potholing, preconstruction surveys, and outreach measures to inform customers of potential disruptions would be used to minimize these impacts. Table 3.16-2 summarizes the conflicts for each build alternative and information on utility lines to be relocated or protected.

Construction of distribution systems within the site boundaries for electric, natural gas, water, communications, sanitary sewer and stormwater will be achieved through relocation and reuse of existing systems as well as installation of new systems. Specific requirements for the on-site distribution systems would be determined during final design.

Operational Impacts

Natural Gas, Cable/Communications, and Petroleum

Operation of the proposed project at any of the build alternative sites would result in a negligible increased demand for natural gas, cable/communications systems, and petroleum products.

Electricity

Each build alternative site would require a traction power substation (TPSS) to power the LRVs and for substations in the vehicle maintenance shops for tools and machinery and at the storage yard for lighting, etc. The TPSS would be powered by 26-kilovolt electric lines connecting to the nearest power pole. Increased electricity demand at the OMSF would require additional distribution lines to be constructed and maintained by the Snohomish County Public Utility District or Puget Sound Energy. At this time it is not anticipated these utilities would require additional energy resources to meet the demand. The specific needs would be determined during final design. For further information on energy demands of the OMSF and any additional infrastructure required, see Section 3.11, Energy.

Water Conveyance

While water demand at the build alternative sites would increase, a majority of the base water demand would be for vehicle washing and a high percentage of this washwater would be recycled on site. The additional water demand would not greatly affect the water providers' existing and projected water supplies and would not likely compromise flow for fire protection. Water demand would be coordinated with fire departments and water suppliers to avoid impacts. The OMSF drainage system would be designed to filter and recycle a high percentage of the wash and rinse water. Solids, oils, soaps, and other contaminants would be filtered, settled into a sludge tank and periodically removed for disposal in accordance with applicable regulations.

Table 3.16-2. Utility Conflict Summary with Approximate Length of Utility Lines to be Relocated or Protected[a]

Alternative	Natural Gas	Electricity	Water Conveyance	Sewer	Stormwater	Cable/ Communications	Petroleum Products
Lynnwood Alternative	770 feet (relocated)	600 feet (T) 1 crossing (relocated)	160 feet (relocated)	None	1,000 feet (relocated)	1,420 feet (relocated)	None
BNSF Storage Tracks	None	500 feet (D) (relocated)	680 feet (relocated)	1,400 feet (protected)	Unknown	1,320 feet (protected)	None
BNSF Alternative	None	1,800 feet (D) (relocated)	2,830 feet (relocated)	240 feet (relocated) 780 feet (protected)	Unknown	None	None
BNSF Modified Alternative	None	1,800 feet (D) (relocated)	4,130 feet (relocated)	240 feet (relocated) 2,100 feet (protected)	Unknown	1,320 feet (protected)	None
SR 520 Alternative	1,150 feet (relocated)	480 feet (T) 1 crossing (relocated)	2,500 feet (relocated)	750 feet (relocated)	3,800 feet (relocated)	Unknown	960 feet (protected)

[a] For purposes of this analysis, *protected* means structurally supported or isolated from future loading, which may damage the OMSF.
D = Electrical Distribution, T = Electrical Transmission

Sewer

Some disposal to the local sanitary sewer system would be expected from the recycled, filtered washwater. The water discharged to the sanitary sewer system would be disposed in accordance to local and state regulations. For the potential sites, existing sewer lines on adjacent streets are available for sewer connections. Nonrecycled vehicle washwater disposal volumes would be compared with conveyance capacity of the existing system. Onsite filtering and recycling capacity would be developed in more detail during the final design to ensure compatibility with the existing system.

Stormwater

For all of the build alternatives, any required stormwater detention facilities and infrastructure to collect storm and wastewater would connect to both the existing sewer system and stormwater conveyances. Operational impacts on stormwater are discussed in Section 3.10, Water Resources.

3.16.4.3 Lynnwood Alternative

Construction Impacts

Natural Gas

Grading of the Lynnwood Alternative site may create a conflict with approximately 770 feet of a 2-inch-diameter, medium-density polyethylene natural gas pipeline owned by Snohomish Public Utility District and located in the vicinity of 204th Street SW within the site boundaries. Relocation of this pipeline portion has been assumed to provide service to the OMSF buildings, but additional length of distribution piping may be required for this purpose. No natural gas pipelines were identified at the BNSF Storage Tracks, requiring construction of new distribution pipelines within the site boundaries to serve the OMSF building.

Electricity

The elevated lead track entering the south boundary of the Lynnwood Alternative site may create a vertical conflict with the Snohomish County Public Utility District's 115-kilovolt transmission lines along with aerial communications and cable facilities connected to the transmission towers. The track would run under the transmission lines and would require raising the transmission lines over a distance of approximately 600 feet to maintain the minimum vertical clearance. This activity would also affect the Comcast and Frontier facilities attached to the towers.

There are approximately 500 feet of electrical distribution ducts and conductors at the BNSF Storage Tracks, which are owned by Puget Sound Energy and serve existing buildings within site boundaries that are to be removed. This infrastructure would be relocated to provide service to the new OMSF office and support building. Additional electrical distribution infrastructure within the site boundaries may be required for this building and storage track canopy lighting.

Water Conveyance

Construction of the Lynnwood Alternative may conflict with a 160-foot section of 16-inch-diameter cast iron water pipe owned by the City of Lynnwood at the northern boundary of the Lynnwood Alternative site. The line may be abandoned in place, but for the purposes of this Draft EIS, it is assumed the pipe would be relocated in kind to provide service to the new buildings. Additional water main may be required.

At the BNSF Storage Tracks, approximately 680 feet of 12-inch-diameter water line, owned by the City of Bellevue, enters the site in the southwest corner along the rail corridor. It is assumed this water line would be relocated to provide service to the proposed building. It is not known at this time whether demolition and grading in this area would require the line to be relocated.

Sewer

No sewer pipes were identified within the boundaries of the Lynnwood Alternative site. New sewer distribution piping within the site boundaries will be constructed to service the OMSF buildings.

The addition of a third track and maintenance road within and to the east of the Eastside Rail Corridor for the BNSF Storage Tracks, may place additional loading on the 80-foot section of King County Waste Water's 54-inch- diameter reinforced concrete pipe trunk sewer, which crosses the rail corridor. Additional loading for the full development of the rail corridor may have been anticipated in the design of the original sewer (which as approximately 10 feet of cover), but protection has been assumed for the purposes of this EIS. Additionally, the 54-inch-diameter trunk sewer connects to another King County Waste Water trunk sewer to the west of the rail corridor. This sewer, which runs parallel to the rail corridor, consists of 60-inch-diameter and 72-inch-diameter reinforced concrete pipe. The BNSF Storage Tracks would be located in proximity to and directly over this sewer for approximately 1,320 feet. Protection has been assumed.

Stormwater

Approximately 1,000 feet of unknown diameter and material storm drain is located in the Lynnwood Alternative site. It may be possible to abandon the pipe in place, but for purposes of this EIS, it has been assumed to be relocated and reused for stormwater conveyance within the site boundaries.

Cable/Communications

A fiber optic communications line, owned by Black Rock Cable, extends 220 feet into the Lynnwood Alternative site along 204th Street SW. It is assumed the line would be relocated to avoid conflicts with grading, yard track construction, and building foundations. Additional fiber optic lines may also be required. Approximately 1,200 feet of aerial communication facilities owned by Comcast and Frontier (600 feet for each facility) will be relocated as part of the electrical transmission line raising. A fiber optic communications line at the BNSF Storage Tracks, owned by MTS Allstream, runs parallel to the rail corridor along the west boundary. This line is located directly beneath the additional third track for approximately 1,320 feet. Protection of this facility has been assumed.

Petroleum

No pipelines for liquid petroleum were identified in the Lynnwood Alternative site or BNSF Storage Tracks.

Operational Impacts

Operational impacts resulting from the Lynnwood Alternative would be the same as those discussed in Section 3.16.3.2, Impacts Common to All Build Alternatives.

3.16.4.4 BNSF Alternative and BNSF Modified Alternative

Construction Impacts

Natural Gas

No conflicts associated with natural gas were identified for the BNSF Alternative and BNSF Modified Alternative. New gas distribution piping will be constructed within the site boundaries to service the OMSF buildings.

Electricity

Approximately 1,800 feet of electrical distribution ducts and conductors owned by Puget Sound Energy serve existing buildings in the BNSF Alternative and BNSF Modified Alternative sites. This infrastructure would be demolished under these alternatives and would be relocated to provide service to the new buildings. Additional electrical distribution infrastructure within the site boundaries may be required to service the OMSF buildings.

Water Conveyance

Approximately 1,400 feet of 8-inch-diameter and 1,430 feet of 12-inch-diameter ductile iron water pipe are owned by the City of Bellevue and located in the BNSF Alternative site. Approximately 2,700 feet of 8-inch-diameter and 1,430 feet of 12-inch-diameter ductile iron water pipe is owned by the City of Bellevue and located within the BNSF Modified Alternative site boundaries. These pipes would be relocated to provide service to the new buildings. Additional length of water main distribution piping within the site boundaries may be required to service the OMSF buildings.

Sewer

The addition of a lead track, maintenance road, storage tracks, and maintenance building within and to the east of the Eastside Rail Corridor may place additional loading on the 780-foot section of King County Waste Water's 54-inch-diameter reinforced concrete pipe trunk sewer, which crosses the BNSF Alternative and BNSF Modified Alternative sites. Additional loading for the full development of the rail corridor may have been anticipated in the design of the original sewer, which has approximately 10 feet of cover. However, the section between the corridor and 120th Ave NE—which would experience loading from tracks as well as from foundations of the maintenance building—would be protected. Additionally, approximately 240 feet of 8-inch-diameter polyvinyl chloride (PVC) sanitary sewer pipe within the site boundary would be relocated to provide service to

the new buildings. Additional new sanitary sewer distribution piping within the site boundaries may be required to service the OMSF buildings. At the BNSF Modified Alternative site, approximately 720 feet of 60-inch-diameter and 600 feet of 72-inch-diameter reinforced concrete pipe trunk sewer will be protected. Coordination with the King County Wastewater Treatment Division would be required for these regional wastewater conveyance lines.

Stormwater

The locations of stormwater drains in the BNSF Alternative and BNSF Modified Alternative study area are unknown; however, any storm drains found in the study area would be protected or relocated to avoid disruptions to the existing stormwater system. New piping may be constructed for adequate stormwater conveyance within the site boundaries.

Cable/Communications

No conflicts associated with cable or communications lines were identified for the BNSF Alternative. For the BNSF Modified Alternative, a fiber optic line, owned by MTS Allstream, runs parallel to the rail corridor along the west boundary of the alternative site for approximately 1,320 feet. Protection of this facility has been assumed.

Petroleum

No conflicts associated with liquid petroleum pipes were identified for the BNSF Alternative and the BNSF Modified Alternative.

Operational Impacts

Operational impacts resulting from the BNSF Alternative and BNSF Modified Alternative would be the same as those discussed in Section 3.16.3.2, Impacts Common to All Build Alternatives.

3.16.4.5 SR 520 Alternative

Construction Impacts

Natural Gas

Approximately 1,150 feet of 2-inch-diameter medium-density polyethylene natural gas pipeline, owned by Puget Sound Energy, is located within the SR 520 Alternative site boundaries and would be relocated to provide service to the new buildings. Additional gas distribution piping within the site boundaries may be required to service the OMSF buildings.

Electricity

The lead track passes under two pair of Puget Sound Energy's 115-kilovolt transmission lines at the east end of the SR 520 Alternative site. The lead track is also close to a pair of transmission towers that support the transmission lines and are located within the site limits. There may be a vertical clearance conflict with the transmission lines as a required clearance of 35 feet from top of rail is required for this voltage. Horizontal clearance with the track is also tight and may require relocation

of the towers if a minimum horizontal clearance of 12 feet from center of track or adequate protection cannot be provided. Adjustment of the transmission lines to provide adequate vertical clearance has been assumed, which would require construction of new towers. Location of the new towers would be coordinated with the horizontal clearance requirements with the lead track. The entire 480 feet of transmission lines crossing the SR 520 Alternative site would be adjusted. The adjustment would comply with the City of Bellevue's permitting requirements for a sensitive electrical facility.

Water Conveyance

Approximately 2,500 feet of 8-inch-diameter ductile iron water pipe, owned by the City of Bellevue, is located within the SR 520 Alternative site boundaries and would be relocated to provide service to the OMSF buildings.

Sewer

Approximately 750 feet of 8-inch-diameter PVC sanitary sewer pipe in the SR 520 Alternative site boundary would be relocated to provide service to the OMSF buildings. Additional sanitary distribution piping within the site boundaries may be required to provide adequate service to the OMSF buildings.

Stormwater

Approximately 3,800 feet of unknown diameter and composition storm drain pipe located within the site boundaries would likely be removed or abandoned in place, in lieu of relocation as the redeveloped site drainage pattern may not be consistent with existing pipe locations. New piping will be constructed for adequate stormwater conveyance within the site boundaries.

Cable/Communications

The locations of cable or communication lines in the SR 520 Alternative study area are unknown; however, any cable or communications lines found in the study area would be protected or relocated to avoid disruptions to the existing cable/communications system.

Petroleum

The lead track would be located over two high pressure liquid petroleum pipelines owned by Olympic Pipeline at the east end of the SR 520 Alternative site, which runs parallel to and on both sides of the 115-kilovolt transmission lines. The pipelines are 20-inch and 16-inch-diameter steel pipe. It is anticipated that protection would be provided for the entire 480-foot length of each pipe (960 feet total). An access road, lead track, and yard tracks would be constructed above and in proximity to the pipelines.

Operational Impacts

Operational impacts resulting from the SR 520 Alternative would be the same as those discussed in Section 3.16.3.2, Impacts Common to All Build Alternatives.

3.16.5 Indirect and Cumulative Impacts

No indirect impacts related to utilities would result from construction and operation of the proposed project.

The availability of light rail service resulting from the Lynnwood Link Extension and East Link could encourage development of property in the vicinity of the proposed project build alternative sites. This could increase the demand for utility services in the project vicinity. However, local governments have already accounted for this in their adopted local land use plans and utilities anticipate serving this future demand since all of the OMSF build alternatives are located entirely within the urban growth boundaries of the Cities of Lynnwood and Bellevue, and any development near the project footprint would be no more intense than what is allowed in the adopted land use plans of these local governments.

Puget Sound Energy's Energize Eastside project would increase power capacity to the Eastside area, and the project's anticipated design and construction schedule would overlap with the OMSF. Realignment of the 480 feet of transmission lines crossing the SR 520 Alternative site would likely be included in the Energize Eastside project.

Similar to the proposed project, the Lynnwood Link Extension and East Link would require relocating some utilities. Cumulatively, however, these projects would not require substantial disruptions in service or place demands on existing utilities that would exceed projected supply, based on routine planned upgrades to keep pace with planned growth. Utility infrastructure in the project limits, such as electric, water, sewer, gas, petroleum, or communications service lines, that would conflict with any of the OMSF build alternatives would be relocated before or during project construction. Other reasonably foreseeable future actions in the project vicinity would also be responsible for providing similar relocations where utility conflicts occur. Relocating utilities can provide utility providers a cost-efficient opportunity to upgrade infrastructure, thereby reducing maintenance costs and potentially resulting in a beneficial cumulative impact.

3.16.6 Potential Mitigation Measures

None of the build alternatives for the proposed project would result in impacts on or conflicts with utilities; therefore, no mitigation would be required.

3.17 Historic and Archaeological Resources

This section summarizes the proposed project's affected environment and potential impacts on cultural resources, which include historic and archaeological resources and culturally significant properties. Please see Appendix E.4, *Historic and Archaeological Resources Technical Report*, of this Draft EIS for details regarding the methods and findings of the cultural resources studies.

3.17.1 Introduction to Resources and Regulatory Requirements

Several laws and executive orders deal with particular kinds of *resources* that are *cultural* in character and applicable under the National Environmental Policy Act (NEPA). These regulations each use different terms to define these resources. Resource types referred to in this section include *archaeological resources*, *historic resources*, and *culturally significant properties*. These resources are all considered to be *cultural resources*, the term typically used under NEPA to consider a project's effects on such resources.

Cultural resources for the proposed project are regulated and protected by the following federal, state, and local codes and regulations.

3.17.1.1 Federal Regulations

NEPA requires federal agencies to consider the effects that plans and programs may have on important historic, cultural, and natural aspects of our national heritage by considering, among other things, unique characteristics of the geographic area such as proximity to cultural resources (40 Code of Federal Regulations [CFR] 1508.27(b)(3)) and the degree to which actions may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places (NRHP) (40 CFR 1508.27(b)(8)). Although NEPA does not define standards specific to cultural resource impact analyses, the implementing regulations of NEPA (40 CFR 1502.25) state that, to the fullest extent possible, "agencies shall prepare draft environmental impact statements concurrently with and integrated with environmental impact analyses and related surveys and studies required by…the National Historic Preservation Act of 1966 (16 United States Code [U.S.C.] 470 *et seq*.) …and other environmental review laws and executive orders."

Section 106 of the National Historic Preservation Act (NHPA) (Public Law 88-655, 16 U.S.C. 470 *et seq*.) ensures that federal agencies consider cultural resources in any funded, licensed, or permitted undertaking prior to initiation, and provide the State Historic Preservation Officer (SHPO), affected Native American tribes, and other interested parties an opportunity to comment on these actions. Section 106, therefore, typically forms the crux of federal agencies' NEPA cultural resources impact analyses, although other federal cultural resources regulations must also be considered. Similar processes for the identification, consultation, evaluation, affects assessment, and mitigation of cultural resources are required for both NEPA and Section 106, and compliance should be coordinated and completed simultaneously.

Section 4(f) of the Department of Transportation Act of 1966 (Section 4(f)) (23 U.S.C. 138) also prohibits the Federal Transit Administration (FTA) from approving a project or program that uses land from a significant historic site or other specified areas, with the following exceptions.

- There is no feasible and prudent alternative to the use of the land.
- The project includes all possible planning to minimize harm to the property.

As described in Appendix D, *Section 4(f) and 6(f) Evaluation*, none of the build alternatives would result in a use under Section 4(f). Because the proposed project would not affect any identified cultural resources eligible for listing in the NRHP, FTA determined no further analysis of historic and archaeological resources for the purpose of Section 4(f) is required.

3.17.1.2 State Regulations

The Washington State Environmental Policy Act (SEPA) requires that all major actions sponsored, funded, permitted, or approved by state and/or local agencies be planned so that environmental considerations—such as impacts on cultural resources—are considered when state-agency-enabled projects affect properties of historical, archaeological, scientific, or cultural importance (Washington Administrative Code [WAC] 197-11-960). Under SEPA, the Washington State Department of Archaeology and Historic Preservation (DAHP) is the designated agency with the technical expertise to consider the effects of a proposed action on cultural resources and to provide formal recommendations to local governments and other state agencies for appropriate treatments or actions. DAHP does not regulate the treatment of cultural resources found to be significant. A local governing authority may choose to uphold the DAHP recommendations and may require mitigation of adverse effects on significant cultural resources.

Other state laws that govern the protection of archaeological resources include the following.

- **RCW 27.44, Indian Graves and Records.** Revised Code of Washington (RCW) 27.44 provides protection for Native American graves and burial grounds, encourages voluntary reporting of said sites when they are discovered, and mandates a penalty for disturbance or desecration of such sites.
- **RCW 27.53, Archaeological Sites and Resources.** RCW 27.53 governs the protection and preservation of archaeological sites and resources and establishes DAHP as the administering agency for these regulations.
- **RCW 36.70A.020, Growth Management Act.** RCW 36.70A.020 includes a goal to “Identify and encourage the preservation of lands, sites, and structures that have historical, cultural, and archaeological significance.” Cities planning under the Washington State Growth Management Act must consider and incorporate this historic preservation goal.
- **RCW 68.60, Abandoned and Historic Cemeteries and Historic Graves.** RCW 68.60 provides for the protection and preservation of abandoned and historic cemeteries and historic graves.

3.17.1.3 Local Regulations

The City of Lynnwood regulates the impacts of projects on cultural resources within the city (Lynnwood Municipal Code Chapter 21.80), and maintains a register of locally recognized cultural resources and regulates changes to these properties. The City of Bellevue has no applicable ordinances regarding cultural resources. In addition, the codes of Snohomish County (Chapter 30.32D) and King County (Title 20.62) provide for the protection and preservation of recognized cultural resources, including designated buildings, sites, objects, and districts.

3.17.2 Methods

The study area for the cultural resources analysis—referred to as the Area of Potential Effects (APE) under Section 106 of the NHPA—encompasses the archaeological resources, historic resources, and culturally significant properties that could be affected by construction or operation of the proposed project. The APE is considered to be the legal parcels that comprise the footprint of each build alternative site, plus a 200-foot buffer surrounding each site. This area includes locations of potential ground-disturbance at each build alternative site where project activities would be conducted, such as areas for demolition, construction, staging, equipment storage locations, and stormwater management facilities. The depth of potential ground disturbance may vary according to construction practice—deeper for excavation areas and shallower for at-grade construction—and depending on the subsurface limits of known human use or occupation where the project feature occurs.

A cultural resources records search, a landform history analysis, and a historic resources survey were conducted in and within 0.5 mile of the APE to determine if significant cultural resources were located in the APE. The records search was conducted in December 2012 using DAHP's Washington Information System for Architectural and Archaeological Records Database (WISAARD) to identify previously documented cultural resources in the APE. The landform history analysis used the Washington Statewide Archaeological Predictive Model (WSAPM) to assess the extent to which the local geology and development history affects the potential for encountering archaeological deposits near each build alternative site. The historic resources survey involved a reconnaissance-level examination of all buildings and structures in the APE determined to be 45 years of age or older. Historic resources 45 years of age or older were evaluated to determine their eligibility for listing in the NRHP.

3.17.3 Affected Environment

3.17.3.1 Archaeological Resources

No known archaeological resources eligible for listing in the NRHP were identified in any portion of the APE. The archaeological landform history analysis revealed that the Lynnwood Alternative, BNSF Alternative, and BNSF Modified Alternative sites all contain areas with moderate archaeological sensitivity. Given the limited coverage of previous subsurface investigations at these sites; however, it is impossible to define precisely the vertical and horizontal boundaries of these areas. In comparison, the SR 520 Alternative is considered to have low archaeological sensitivity due

to the absence of post-glacial deposits and extensive development in its vicinity. These findings roughly corroborate each alternative site's anticipated archaeological potential as defined by the WSAPM, with minor variations likely owing to the low-resolution geology and soils data used by the WSAPM.

3.17.3.2 Culturally Significant Properties

A search was conducted using information presented by Waterman (Hilbert et al. 2001) and Buerge (1984) to determine whether Traditional Cultural Properties (TCPs), as defined under Section 106 of the NHPA, or other culturally significant locations are located in the vicinity of the APE. FTA conducted government-to-government consultation with potentially concerned tribes. Sound Transit and FTA consulted with all Section 106 consulting parties to obtain input on the proposed project and have provided initial project information by mail. Consultation with the tribes has revealed no TCPs in the project vicinity.

No ethnographic place names have been recorded in the Lynnwood Alternative site or SR 520 Alternative site. A single ethnographically named place, *Tc!u* (Northup Creek), is located in the vicinity of the BNSF Storage Tracks, BNSF Alternative site, and BNSF Modified Alternative site, (Hilbert et al. 2001).

3.17.3.3 Historic Resources

A historic resources survey was conducted in December 2012. Nearly all of the properties in the APE that are 45 years of age or older were previously evaluated for NRHP eligibility through the environmental review processes for the Lynnwood Link Extension and East Link projects. Based on results of the survey, FTA determined that no historic resources eligible for listing in the NRHP are located in the APE. The Washington SHPO concurred with this determination on August 22, 2013.

3.17.4 Environmental Impacts

The proposed project would result in an adverse impact under Section 106 of the NHPA, as outlined in 36 CFR 800, if it were to alter, directly or indirectly, any characteristic of a cultural resource (archaeological, historical, or culturally significant) that qualifies it for inclusion in the NRHP. Adverse effects could include direct effects resulting from construction and reasonably foreseeable effects caused by the proposed project that could occur later in time, be farther removed in distance, or be cumulative. Those impacts considered adverse would need to be mitigated.

3.17.4.1 No Build Alternative

Under the No Build Alternative, the use of each alternative site would be developed in accordance with local plans and policies. Therefore, no impacts on any significant cultural resources would be expected as a result of this alternative.

3.17.4.2 Impacts Common to All Build Alternatives

No cultural resources eligible for listing in the NRHP are known to exist in any part of the APE. Therefore, future development at any of the build alternative sites would not be expected to affect

any significant cultural resources. Because the APE has been subject to limited or no subsurface archaeological investigations, it remains possible that previously unknown archaeological resources might be discovered in the APE. The landform history analysis concluded that the Lynnwood Alternative site, BNSF Alternative site, and BNSF Modified Alternative site each have moderate archaeological sensitivity because they retain areas with post-glacial sediments, despite extensive development. The SR 520 Alternative site is considered to have low archaeological sensitivity because of the absence of post-glacial sediments. Based on the landform history analysis, the potential for affecting undiscovered archaeological resources is comparable for the Lynnwood Alternative, BNSF Alternative, and the BNSF Modified Alternative. The possibility for affecting undiscovered archaeological resources by the SR 520 Alternative site is lower, when compared to the other build alternatives.

3.17.5 Indirect and Cumulative Impacts

No indirect impacts related to historic and archaeological resources would result from construction and operation of the proposed project.

No significant cultural resources were identified in the APE, and no impacts on cultural resources are expected from any of the four build alternatives. Because of this circumstance, the proposed project would have no cumulative impact on cultural resources.

3.17.6 Potential Mitigation Measures

No significant cultural resources were identified in the APE. Therefore, none of the four build alternatives are expected to have direct, indirect, or cumulative impacts on cultural resources and no potential mitigation measures are recommended. Nevertheless, it remains possible that unknown archaeological resources could be discovered through the course of the proposed project. Because the APE has been subject to limited or no subsurface archaeological investigations, FTA and Sound Transit would conduct archaeological monitoring or review boring logs of project-related geotechnical boreholes to characterize the extent of archaeologically sensitive deposits. The results of this monitoring effort would then be used to determine the need for any additional preconstruction subsurface archaeological investigations for the proposed project. An Unanticipated Discovery Plan would also be prepared to address previously unidentified archaeological resources should any be discovered during construction.

3.18 Parklands and Open Space

This section describes the parklands and open space that could be affected by the proposed project.

3.18.1 Introduction to Resources and Regulatory Requirements

For the purposes of this analysis, parklands and open space resources are defined as including the following types of facilities.

- Existing and proposed parks, playgrounds, recreation centers, and other public recreation facilities, such as golf courses and pools in the Cities of Lynnwood and Bellevue.
- Designated public open spaces and greenbelts.
- Existing and planned recreational trails.

Impacts on parklands and open space are also evaluated under two federal statutes: Section 4(f) of the U.S. Department of Transportation Act of 1966 (23 Code of Federal Regulations [CFR] 774), and Section 6(f) of the 1965 Land and Water Conservation Fund Act (36 CFR 59). These statutes require specific analysis of and avoidance or mitigation for certain direct impacts on some properties with parks and recreational uses. The analysis of parks, trails, and other recreational resources that may be covered by these statutes is provided in Appendix D, *Section 4(f) and 6(f) Evaluation*. As described in Appendix D, none of the build alternatives would result in a use under Section 4(f). As described in Appendix D, the records of grants under the Land and Water Conservation Fund Act were reviewed to confirm that there are no properties in the study area that were developed with monies from the Land and Water Conservation Fund. No further evaluation is needed for the project to comply with Section 6(f) requirements.

3.18.2 Methods

The study area for parklands and open space resources consists of facilities and land within 0.25 mile of each build alternative site.

Data collection for parks, recreation, and open space consisted of a review of the plans and policies and the use of geographic information system (GIS) data banks to determine the locations, size, boundaries, and use of each park, recreation, or open space resource. Based on the information collected, the impact analysis evaluated all aspects of the proposed project that have the potential to affect the use or enjoyment of existing and planned parks and recreation resources including instances where the project location could affect property, access, or functions of the resource, or instances where proximity impacts of the project could affect access, usage, or the character of the resource.

3.18.3 Affected Environment

The following is a discussion of the parklands and open-space resources located in the Cities of Lynnwood and Bellevue.

3.18.3.1 Lynnwood

The Lynnwood Alternative site is surrounded to its south, east, and north by recreational trails, one park, and open-space areas. The Interurban Trail—a paved regional trail that travels from North Seattle through Shoreline, Edmonds, Mountlake Terrace, Lynnwood, unincorporated Snohomish County, and Everett along the Public Utilities District/Pacific Northwest (PUD/PNW) traction right-of-way—is close to the Lynnwood Alternative site, running along the southern boundary of the site between 52nd Avenue W to 44th Avenue W. To the east of 46th Avenue W, the Interurban Trail connects with Scriber Creek Trail, which is a soft-surface pedestrian trail that travels from the Interurban Trail west, along Scriber Creek and the Lynnwood Transit Center, where it connects with Scriber Creek Park on the northern boundary of the site.

Scriber Creek Park is a 3.8-acre park surrounding Scriber Creek. The park includes forested wetland areas, wildlife habitats, and nature trails including Scriber Creek Trail which runs along the southern boundary of the park. A large, forested, and open-space area surrounding Scriber Creek to the southeast of the park forms the eastern boundary of the Lynnwood Alternative site. As described in Section 3.8, Noise and Vibration, Scriber Creek Park was evaluated as a noise-sensitive park. This area is zoned Business/Technical Park (BTP) immediately adjacent to the site and zoned Public (P1) with a future land use designation of Parks, Recreation, and Open Space (PRO) to the east (Figure 3.18-1). Other parks in the vicinity of the Lynnwood Alternative site include the Mini Park at Sprague's Pond located south of 200th Street SW approximately 0.1 mile northwest of the Lynnwood Alternative site, and Scriber Lake Park located approximately 0.3 mile northwest of the Lynnwood Alternative site.

No parks, recreational areas, trails, open space, or other recreational facilities are located within 0.25 mile of the BNSF Storage Tracks. The Eastside Rail Corridor is "railbanked," which keeps the corridor available for interim trail use or for the reactivation of freight rail service in the future. Sound Transit now owns this portion of the Eastside Rail Corridor; King County owns a trail easement over the Eastside Rail Corridor.

Sources: Parks & Trails, City of Lynnwood Parks Map, 2013; Open Space, Lynnwood 2020 Comprehensive Plan; Site plans, Huitt Zollars, 2013; Aerial imagery, Sound Transit, 2010

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Figure 3.18-1: Lynnwood Alternative—Parklands
Sound Transit Link Light Rail OMSF Draft EIS

3.18.3.2 Bellevue

There are no parks, recreational areas, trails, open space, or other recreational facilities located within 0.25 mile of the BNSF Alternative site or BNSF Modified Alternative site (Figure 3.18-2).

The Eastside Rail Corridor described in the BNSF Storage Tracks component of the Lynnwood Alternative is located adjacent to the BNSF Alternative and the BNSF Modified Alternative. The City of Bellevue also owns a small parcel, which was a former rail spur associated with the former BNSF Rail Corridor, just south of the BNSF Alternative and BNSF Modified Alternative sites. The parcel is identified in the *Parks and Open Space System Plan* (City of Bellevue 2010) as open space owned by the City. This property is currently undeveloped, and there are no specific plans or funding development of this property as a park resource. In addition, the *Spring District Master Development Plan* (City of Bellevue 2012) includes approximately 2.2 acres of parks and open space to be developed over the next 15 years in the Spring District, which is located southwest of the BNSF Alternative and BNSF Modified Alternative sites.

Three parks and two trails are located within 0.25 mile of the SR 520 Alternative site (Figure 3.18-3). Viewpoint Park is the nearest park approximately 200 feet north of the site, on the opposite side of SR 520 and south of NE 24th Street. Viewpoint Park is a 24-acre natural green space featuring a 0.6-mile trail that loops through the space and a clearing with log benches providing views to the south. The SR 520 bicycle trail also runs along the north side of State Route (SR) 520.

Cherry Crest Mini Park and Bellevue Highlands Park are the other parks within 0.25 mile of the SR 520 Alternative site. Cherry Crest Mini Park is approximately 0.25 mile northwest of the site along the east side of 127th Avenue NE. The park is a 5-acre mini park consisting of playground equipment, picnic tables, a tennis court, and a basketball court. There is no direct access to Viewpoint Park, Cherry Crest Park, or the SR 520 bicycle trail from the SR 520 Alternative site, because they are separated from each other by SR 520. The other park within 0.25 mile of the SR 520 Alternative site is Bellevue Highlands Park, which is approximately 0.1 mile southeast of the SR 520 Alternative site along the east side of 140th Avenue NE and along the north side of Bel-Red Road. The park consists of a lighted baseball field, a softball field, two tennis courts, picnic areas, and a playground. The SR 520 bicycle trail is a paved trail that runs along the north side of SR 520 from 124th Avenue NE, through the SR 520 Alternative site vicinity, and northeast to its terminus at W Lake Sammamish Parkway. An off-street pedestrian and bicycle facility runs along the western edge of Bellevue Highlands Park and connects to a city-designated bicycle corridor that runs along NE 140th Avenue. In addition, the City of Bellevue plans to construct an off-street bicycle and walking trail along the east side of 140th Avenue NE from NE 24th Street to Bel-Red Road.

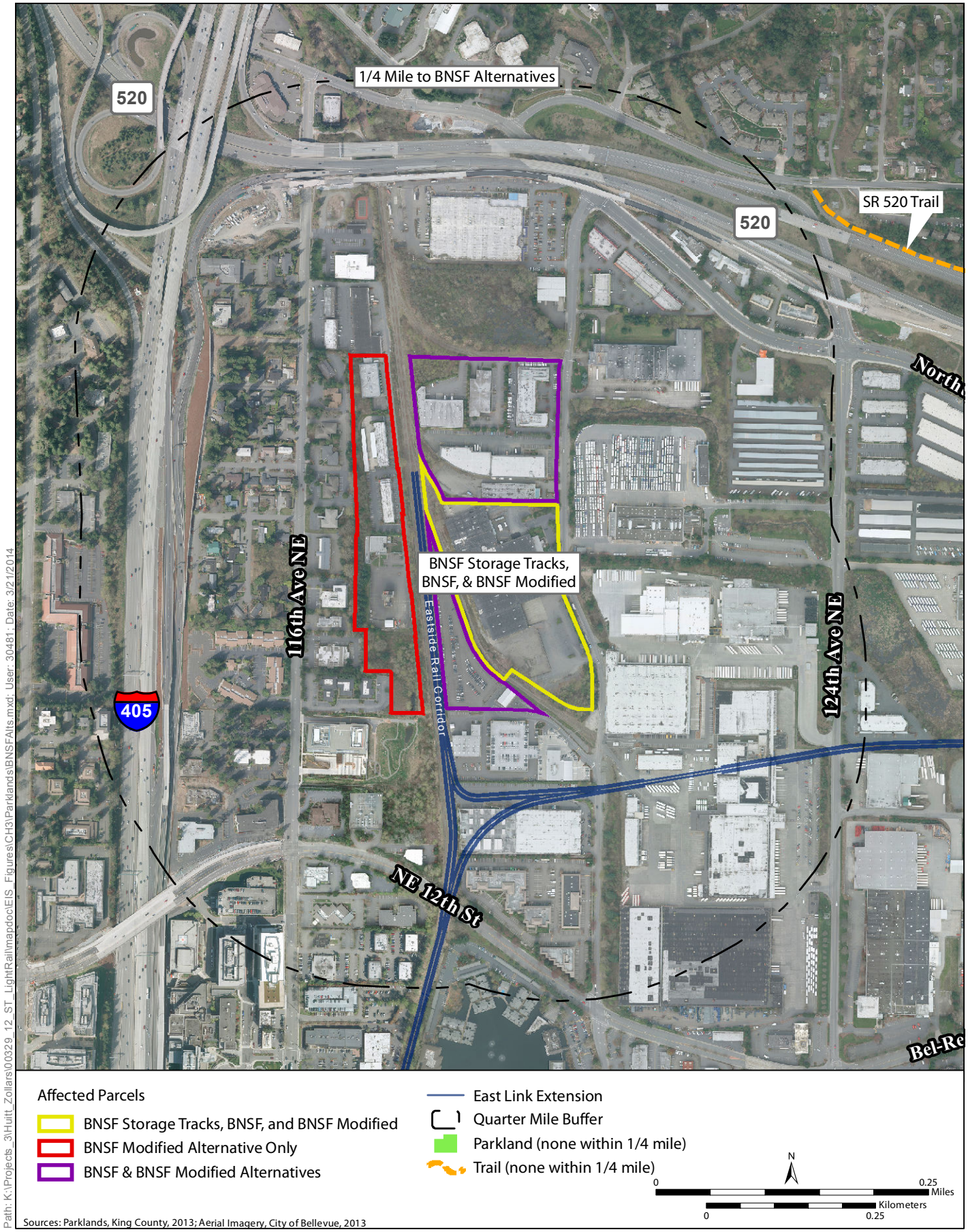


Figure 3.18-2: BNSF Alternative, BNSF Modified Alternative, and BNSF Storage Tracks—Parklands
Sound Transit Link Light Rail OMSF Draft EIS

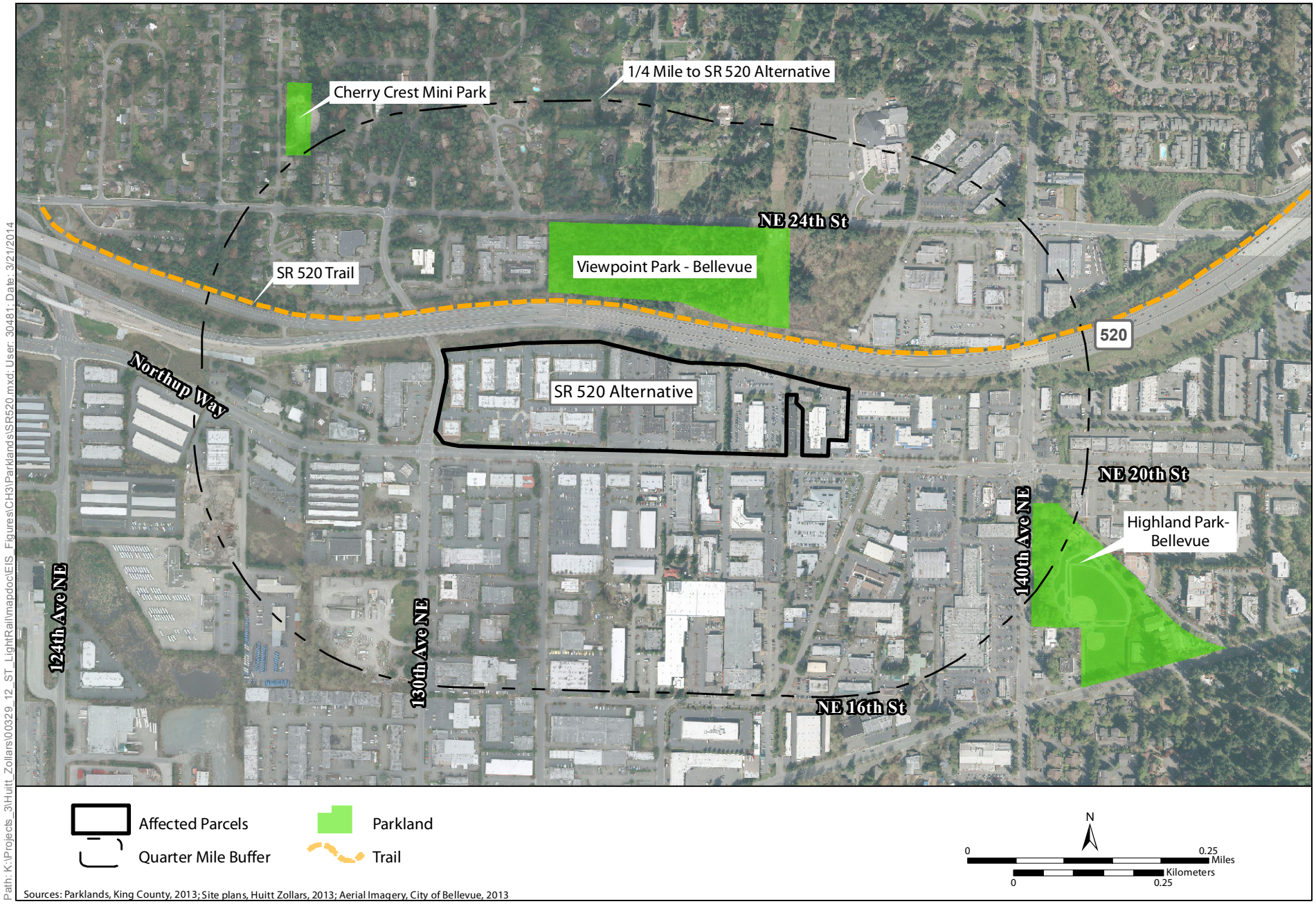


Figure 3.18-3: SR 520 Alternative—Parklands
Sound Transit Link Light Rail OMSF Draft EIS

The *Bel-Red Subarea Plan* (City of Bellevue 2009) provides a range of actions by both public and private entities that support the vision for the Bel-Red corridor in 2030. The plan includes an east-west bike pathway along the NE 15th Street/NE 16th Street Corridor from 116th Avenue NE to 136th Place NE. It also includes a potential future paved trail along the West Tributary of Kelsey Creek, which is located north of the BNSF Alternative and BNSF Modified Alternative sites and a potential future paved trail along Goff Creek, which travels through the west portion of the SR 520 Alternative site. Funding and timing for development of trails along Goff Creek and the West Tributary of Kelsey Creek have not been identified.

3.18.5 Environmental Impacts

Impacts on parklands and open spaces as a result of proposed project operation or construction can be categorized as direct operational impacts, indirect operational impacts or construction impacts.

- **Construction impacts.** These impacts include construction activities and/or use of staging areas within or near recreational facilities that create impacts such as noise or air pollution, detours that change access to or from the park, or visual clutter.
- **Direct operational impacts.** Direct impacts during operation could include permanent acquisition of all or part of a park or open-space property to accommodate the proposed project, changing or reducing access affecting park usage, relocating trails, or noise impacts affecting passive park uses.
- **Indirect (proximity) operational impacts.** Indirect impacts during operation could include changes in the nature of surrounding land uses, increased noise and/or vibration, visual intrusion, or a general increase in the level of activity near the alternative sites that could diminish or affect the continued availability, integrity, usage, or value of the specific park or recreational facility and degrade the overall recreational experience.

Potential construction and operational impacts were identified based on the definitions above and the current use of parklands and/or open-space resources. If a recreational facility is not mentioned, no impacts would occur for that facility. Proximity impacts are based on the findings of other environmental elements such as Section 3.6, Visual and Aesthetic Resources; Section 3.7, Air Quality and Greenhouse Gases; and Section 3.8, Noise and Vibration.

3.18.5.1 No Build Alternative

The No Build Alternative would not affect any parklands or open-space resources in the study area because no project-related changes would be made to any parklands or park usage or to any open-space areas.

3.18.5.2 Impacts Common to All Build Alternatives

No parklands would be acquired and converted from recreational use for construction and operation under any build alternative.

3.18.5.3 Lynnwood Alternative

Construction Impacts

Construction activities and staging for the Lynnwood Alternative would occur entirely within the proposed site. Construction would not inhibit normal use of Scriber Creek Park or Scriber Creek Trail since access to and use of these park resources would not be affected. Construction would result in impacts such as noise, dust, and traffic from movement of haul trucks transporting construction materials in proximity to Scriber Creek Park, Scriber Creek Trail, and the Interurban Trail. Dust from construction would be mitigated using dust-control measures described in Section 3.7, Air Quality and Greenhouse Gases.

Construction of the elevated lead track on the south side of the Lynnwood Alternative site (under all design options) would likely require a temporary detour of the Interurban Trail since the proposed track would cross the trail.

Operational Impacts

A new elevated track would cross over the Interurban Trail, which would result in a change to the visual character of the trail environment but would not directly affect recreational use of the trail. The elevated track and OMSF would be prominent for trail users; however, the trail is already located in a visually complex urban setting, adjacent to and crossing existing transportation facilities. Facilities associated with the OMSF operation would not result in a substantial change to the visual environment or affect the trail's use and enjoyment.

No portion of the OMSF would occupy or cross over Scriber Creek Park or Scriber Creek Trail. Scriber Creek Park is the only park in the study area determined to be noise sensitive. Under all design options, the noise levels at Scriber Creek Park would not exceed the noise impact criteria established by FTA or the City of Lynnwood. Therefore, noise as a result of the Lynnwood Alternative (all design options) would not disrupt activities at the park. See Section 3.8, Noise and Vibration, for a detailed noise analysis.

The design of the BNSF Storage Tracks acknowledges the railbanked status of the Eastside Rail Corridor by allowing sufficient width to accommodate a future trail or future freight or passenger rail use of the corridor. According to the *King County Comprehensive Plan 2012* (King County 2013), the Eastside Rail Corridor trail plans are listed as "not prioritized" projects, which denotes the lowest priority project under the County's comprehensive plan. The design of light rail facilities in this corridor would not preclude development of an interim trail or possible reactivation of freight rail operations.

3.18.5.4 BNSF Alternative and BNSF Modified Alternative

Construction and Operational Impacts

There are no parklands, recreational, or open-space resources within 0.25 mile of the BNSF Alternative and BNSF Modified Alternative sites. No impacts, either during construction or

operation, would occur as a result of these alternatives. The design acknowledges the railbanked status of the Eastside Rail Corridor by allowing sufficient width and vertical clearances to accommodate a future trail or reactivation of freight rail operations in the corridor. Similarly, the BNSF Alternative and BNSF Modified Alternative would not preclude development of the City of Bellevue-owned parcel for recreational or other uses in the future.

3.18.5.5 SR 520 Alternative

Construction Impacts

Construction of the SR 520 Alternative would not result in direct impacts on any parklands, recreational, or open-space facilities. The SR 520 Alternative would not be visible from Viewpoint Park, nor from the SR 520 bicycle trail. Cherry Crest Mini Park is separated by SR 520 and is located too far from the proposed construction activities under this alternative to experience any noticeable increase in noise, dust, or other construction disturbances. Bellevue Highlands Park and the existing 140th Avenue NE Trail would not be affected by construction activities since no changes to the sidewalk on the east side of 140th Avenue NE would occur.

Operational Impacts

Operation of the SR 520 Alternative would not result in direct impacts on any parklands, recreational, or open-space facilities.

3.18.6 Indirect and Cumulative Impacts

The elevated lead track under the Lynnwood Alternative would be visible to users of the trail in Scriber Creek Park, but would not restrict recreational activities or otherwise diminish the integrity of the user experience inside the park. The BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative would not result in any indirect impacts related to parklands and open space. Potential for cumulative impacts on parks or recreational resources in the vicinity of the OMSF build alternative sites would be limited. While the Lynnwood Link Extension and the OMSF Lynnwood Alternative would both include crossings of the Interurban Trail, these crossings would be elevated and would require air rights only and not acquisition of land from the trail. The crossing of light rail over the trail would not permanently impair the activities, characteristics, or features of the trail.

One of the Lynnwood Link Extension Alternative C1 would introduce an elevated guideway along the western entrance of Scriber Creek Park with support columns directly affecting less than 1 acre of the park. The elevated guideway would be a prominent feature of the parking area, crossing directly overhead and changing the experience of the parking lot, which is currently buffered from the surrounding street and neighborhoods by established vegetation.

Lynnwood Link Extension Alternative C1 would be visible from the short nature trail and picnic areas in the park but would not be as prominent as it would be from the parking area, and would not restrict recreational activities inside the park. Lynnwood Link Extension Alternative C2 would be located in Scriber Creek Park but would have visual impacts that would change the user experience in the park and along Scriber Creek Trail. The Lynnwood Link Extension Alternative C3 would have no

direct effects on Scriber Creek Park or Trail but would be visible from a distance; therefore, potential for cumulative impacts associated with the Lynnwood Link Extension Alternative C3 would be limited.

The Lynnwood Alternative for the proposed OMSF project would have no visual impacts on Scriber Creek Park, but elements of the elevated lead track under all design options would be visible from portions of Scriber Creek Park and Scriber Creek Trail. These elements may contribute to the cumulative effects on Scriber Creek Park and Trail that would occur with the Lynnwood Link Alternative C1 or C2.

3.18.7 Potential Mitigation Measures

Construction of the Lynnwood Alternative would require temporary closure of the Interurban Trail. Sound Transit would coordinate with the City of Lynnwood to develop a detour and to provide public information and signed detour routes during construction to allow for continued use of the trail. Replacement landscaping would also be provided if vegetated areas needed to be cleared for construction.

No other impacts on parklands, open space, or recreational resources would occur under the build alternatives; therefore, no mitigation would be required.

Chapter 4

Alternatives Analysis

This chapter compares the Sound Transit Link Light Rail Operations and Maintenance Satellite Facility (OMSF) alternatives and their effectiveness in addressing the proposed project's goals and objectives. This evaluation takes into account differences in the alternative locations and facility designs described in Chapter 2, Alternatives Considered, and potential effects on the environment, including the ability to avoid or mitigate environmental impacts described in Chapter 3, Affected Environment and Environmental Consequences.

4.1 Effectiveness at Meeting the Goals and Objectives

Chapter 1, Purpose and Need for the Project, applies goals and objectives that form the basis for the evaluation of alternatives presented in this chapter. These goals and objectives uphold Sound Transit's legislative mandate to meet public transportation and mobility needs for high-capacity transit infrastructure while also being a responsible steward of the environment and being considerate of affected jurisdictions and the public while planning a fiscally responsible project. These goals and objectives include the following.

- **Transportation Goal.** Facilitate operation of the expanded regional Link light rail system.
  - Locate a facility to provide efficient and reliable light rail service.
- **Environment Goal.** Preserve environmental quality.
  - Minimize potential adverse impacts on the natural and built environment.
- **Financial Goal.** Achieve financial feasibility.
  - Build, operate, and maintain a facility that minimizes capital, construction, and annual system operating costs.

4.1.1 Transportation Goal: Facilitate Operation of the Expanded Regional Link Light Rail System

4.1.1.1 No Build Alternative

Under the No Build Alternative, an OMSF would not be built, and light rail service would rely on the Forest Street OMF, which lacks the capacity to maintain and operate a light rail fleet at planned service levels under *Sound Transit 2: A Mass Transit Guide, The Regional Transit System Plan for Central Puget Sound* (ST2). The Forest Street OMF would be expected to serve the entire Link light rail system including the existing Central Link, and ST2 extensions to Bellevue and Redmond, Lynnwood, and Kent/Des Moines. The East Link storage track would be built to provide overnight storage and morning deployment of up to 16 light rail vehicles (LRVs), but would not provide maintenance functions.

The No Build Alternative does not meet the goal of facilitating operation of the expanded light rail system and locating a facility to provide efficient and reliable light rail service. Based on a fleet constrained to 104 LRVs operating principally from one location (Forest Street OMF), light rail service would include fewer train cars, longer headways between trains, and decreased passenger capacity. Without the addition of an OMSF, the light rail system would operate using three-car trains at 11-minute headways during peak periods, which would reduce the system's passenger capacity by more than 40% compared to the build alternatives. The lower level of service across the entire system would not meet projected demand and could result in passenger overcrowding on trains and station platforms. To establish full morning service on the Eastside, it is likely some trains would need to be deployed from the Forest Street OMF and turn back at the Northgate Station to reach the east line, creating operational disruptions and inefficiency.

Under the No Build Alternative, the 4-hour nightly inspection and maintenance window (1:00 a.m. to 5:00 a.m.), when all trains must be off the system, could not be maintained and the time allotted to deploy trains serving the 6:00 a.m. to 10:00 a.m. morning peak period would be exceeded. If all vehicles were stored on a single site, a system failure during the morning deployment could result in the entire fleet being trapped and unable to begin service.

4.1.1.2 Build Alternatives

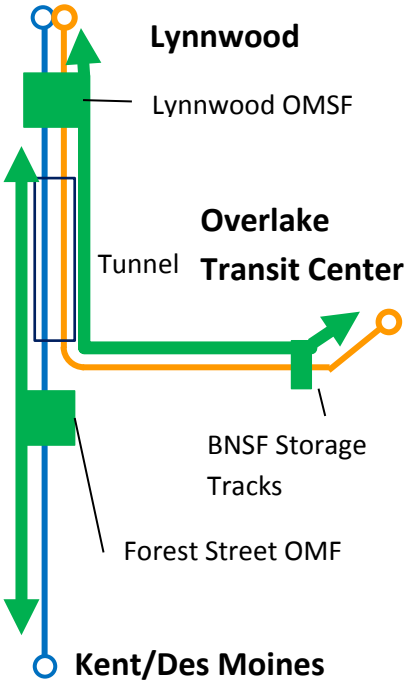
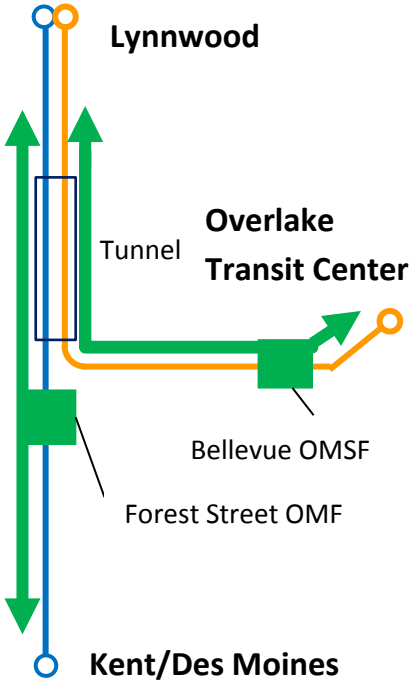
Each of the build alternatives would enable Sound Transit to support a fleet of at least 80 additional LRVs with the assumption that the Forest Street OMF would continue to provide inspection, heavy repair, and overhaul services. In combination with the Forest Street OMF, the OMSF would enable operations and maintenance of the ST2 light rail fleet needed to meet planned service levels. The OMSF would be located on either the north operating line or the east operating line to provide efficient and reliable light rail service. Locating an OMSF south of the junction where the north-south line and the north-east line meet at the International District Station (including expansion of the Forest Street OMF) would not be operationally feasible. Below is a description of the advantages and disadvantages of each build alternative in supporting the operation of the expanded regional Link light rail system. The advantages and disadvantages are focused on distinctions between alternatives related to site operations and deployment of LRVs.

Table 4-1 shows the number of LRVs planned to be stored at each of the build alternative sites. LRVs for the Lynnwood–Kent/Des Moines line would be stored at the Forest Street OMF. The Forest Street OMF would store enough LRVs to provide service for the Lynnwood–Kent/Des Moines line plus spare LRVs: it would store 20 four-car trains (80 LRVs) and 12 spare LRVs, for a total of 92 LRVs. LRVs for the Lynnwood–Overlake Transit Center line would be stored at the Lynnwood OMSF and BNSF Storage Tracks or the OMSF in Bellevue (BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative).

At the beginning of service, one or more trains from the Forest Street OMF could be deployed out of service (deadhead) northbound toward the International District/Chinatown Station. Those trains would then begin service southbound from the International District/Chinatown Station. This would provide a transfer opportunity for passengers arriving by bus or train from the north and east in the

early morning to reach points south, including SeaTac/Airport Station. The remaining Forest Street OMF trains would be deployed both northbound toward Lynnwood and southbound toward Kent/Des Moines.

Table 4-1. Fleet Storage and Deployment by Alternative

	Lynnwood Alternative, BNSF Storage Tracks			BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative		
						
	Forest Street OMF	**Lynnwood OMSF**	**BNSF Storage Tracks**	**Forest Street OMF**	**Lynnwood OMSF**	**Bellevue OMSF**
Peak service trains stored (4-car trains)	20	11	8	20	-	19
Spare LRVs stored	12	12	0	12	-	12
Total LRVs stored	92	56	32	92	-	88
Establish 4-min headway toward Downtown Seattle from the north	5:30 a.m.			5:30 a.m.		
Off-Peak headway after 6:30 p.m. for the Lynnwood – Overlake Transit Center Line	15 minutes			10 minutes		

At Overlake Transit Center, morning service would start at approximately the same time regardless of alternative. For the Lynnwood Alternative, trains beginning service at Overlake Transit Center would be deployed from the BNSF Storage Tracks, whereas under the BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative, trains would deploy from the OMSF in Bellevue.

For trains headed toward downtown Seattle from the north, the morning peak period headway would be established about the same time, regardless of alternative. The first trains serving the SeaTac/Airport Station would also arrive about the same time in the morning, regardless of alternative.

Lynnwood Alternative

The Lynnwood Alternative would store enough LRVs for the peak service requirement for the Lynnwood–Overlake Transit Center line plus spares. The Lynnwood OMSF would store 11 four-car trains (44 LRVs) and 12 spare LRVs, for a total of 56 LRVs. The BNSF Storage Tracks would store eight four-car trains for a total of 32 LRVs.

All service trains at the Lynnwood OMSF would be deployed first toward the north (deadhead) to reach the Lynnwood Transit Center, and then turn back to begin service toward the south. All service trains at the BNSF Storage Tracks would be deployed first toward the east to reach Overlake Transit Center, and then head west toward downtown Seattle and then north to Lynnwood.

Advantages

- **Earlier Lynnwood Service.** Because LRVs would be stored very close to the terminus of the system in Lynnwood and deployed first toward the station at the Lynnwood Transit Center, this alternative would allow service to begin in Lynnwood for the Lynnwood–Overlake Transit Center line about 30 minutes earlier than the BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative.

Disadvantages

- **Reduced Evening Headways.** For the Lynnwood–Overlake Transit Center line, the evening headway would need to be reduced to 15 minutes after 6:30 p.m., in order to bring trains back to the Lynnwood OMSF to facilitate daily inspections and preparation for the next morning's deployment. The time needed to complete these functions at the BNSF Storage Tracks would require that these vehicles be removed from service earlier in the evening, resulting in longer headways after 6:30 p.m. This headway would not meet Sound Transit's planned off-peak headway of 10 minutes until 10:00 p.m. as shown in Section 3.1, Transportation (Table 3.1-1).
- **Vehicle Rotation Inefficiency.** Because the BNSF Storage Tracks would only accommodate daily vehicle inspections and cleaning, special consideration would need to be given to rotate LRVs to the Forest Street OMF or Lynnwood OMSF for other scheduled or unscheduled maintenance, inspection and washing. This could introduce inefficiency in the system.

- **Tunnel Restrictions.** The tunnel between downtown and Northgate has special operating restrictions near scientific research buildings on the University of Washington (UW) campus related to electromagnetic interference and vibration. These restrictions could disrupt deployment and recovery of trains to the Lynnwood OMSF, especially a disabled train. Also, there would be no pocket track between International District/Chinatown Station and Northgate Station to temporarily store a disabled train.
- **Overburden of Forest Street OMF.** Some disabled trains would not be taken to the Lynnwood OMSF, potentially causing the Forest Street OMF to become overburdened with unscheduled maintenance activities. For example, wheel defects would cause vibration and could not be moved through the tunnel underneath the UW campus. If the defect was detected south or east of UW Station, the train would need to be moved to the Forest Street OMF. Additionally, disabled trains on the eastside would not likely be taken all the way to the Lynnwood OMSF, but rather they would be taken to the Forest Street OMF because of its proximity.
- **Service Disruption from Mainline Turnback Track.** Movements from the eastside to the Forest Street OMF would require a turnback on the mainline tracks north of the merge point, causing service disruption along the highest-ridership segments in the system. If the disruption occurred during the peak period, the peak headway could not be maintained, causing trains and platforms to become overloaded and potentially resulting in crowds that exceed the fire/life safety design of the stations.
- **Evening Irregular Train Spacing.** After 6:30 p.m., the Lynnwood–Overlake Transit Center line would operate with a different headway (15-minute headway) than the Lynnwood–Kent/Des Moines line (10-minute headway) until 10:00 p.m. Because these lines merge together at International District/Chinatown Station, the uneven headways would create irregular spacing between trains along the shared tracks after 6:30 p.m. This could result in operational disadvantages, such as the arrival of two consecutive trains from the same line, or trains from the two lines arriving at the merge point at the same time.

BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative

The BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative would operate similarly because in all cases the OMSF would be located in the Bel-Red area of Bellevue along the East Link extension. The OMSF in Bellevue would store enough LRVs to provide service for the Lynnwood–Overlake Transit Center line plus spares. It would store 19 four-car trains (76 LRVs) and 12 spare LRVs, for a total of 88 LRVs. All service trains at the OMSF in Bellevue would be deployed first toward the east to reach the Overlake Transit Center, and then would turn back, heading west toward downtown Seattle and Lynnwood.

Advantages

- **Ability to Maintain Off-Peak Headways.** Off-peak 10-minute headways could be maintained on both operating lines until 10:00 p.m. as planned.

- **Limited Service Disruptions.** If the Interstate 90 (I-90) floating bridge is closed, full service could be maintained between Mercer Island and the Overlake Transit Center. If there is a disruption on the line between Lynnwood and Kent/Des Moines, limiting the ability to access the tunnel, full service could be maintained between the Rainier Station and the Overlake Transit Center.
- **No Mainline Turnback Track.** For any recovery of a disabled train to the Bellevue OMSF or Forest Street OMF, there would not be a turnback north of the merge point, and there would not be a service disruption in the highest ridership segments of the system with the most frequent combined headway.

Disadvantages

- **East Link Operating Speed.** The SR 520 Alternative lead track connection to the East Link mainline would reduce the operating speed through this portion of the mainline. Modifications to the profile and geometry of this portion of the East Link mainline would be required to accommodate the lead track connection, and would result in a reduction in operating speed on the mainline.

4.1.2 Environmental Goal: Preserve Environmental Quality

4.1.2.1 No Build Alternative

The No Build Alternative supports the goal of preserving environmental quality by minimizing potential adverse impacts on the natural and built environment; however, beneficial impacts of the proposed project would not be realized. To address future population and employment growth, regional, state, and local land use and transportation plans include a goal of improving transit accessibility and encouraging transit use. In addition, economic development plans call for reducing congestion to increase the mobility of goods and services. Enabling planned service levels on light rail system extensions under ST2 would increase transit accessibility and reduce congestion, thereby reducing overall vehicle emissions and improving freight mobility. The No Build Alternative would not support planned service levels and would limit the light rail system's ability to support these changes.

4.1.2.2 Build Alternatives

Impacts concerning transportation; social, community facilities, and neighborhoods; visual and aesthetic resources; air quality and greenhouse gases; energy; hazardous materials; electromagnetic fields; geology and soils; utilities; and historic and archaeological resources would be similar among the build alternatives and would not differentiate them from one another. Although noise impacts would vary among alternatives, they could also be fully mitigated. The types of impacts relative to each resource area that differentiate the alternatives are summarized in Table 4-2.

Table 4-2. Differentiating Characteristics and Impacts of the Build Alternatives

Differentiating Characteristic	Lynnwood Alternative	BNSF Alternative	BNSF Modified Alternative	SR 520 Alternative
Capital Costs (2013 dollars)				
Million dollars	$350–$355	$345	$415	$385
Operations				
Requires off-site storage tracks	Yes	No	No	No
Annual Facility Operating Costs (constant dollars)				
Million dollars	$66	$63	$63	$63
Acquisitions, Displacements, and Relocations				
Number of parcels acquired	14–15	6	14	13
Number of existing land uses displaced	11–14	14	25	101
Land Use				
Consistent with zoning / comprehensive plan designations	No; would require comp. plan, zoning change and a CUP	No; would require a CUP	No; would require a CUP	No; would require a CUP
Surplus land available for redevelopment	9–13 acres	4 acres	8 acres	0 acres
Economics				
Loss of annual property tax revenue (2012)	$413,100–$450,400	$464,200	$572,400	$630,500
Noise and Vibration				
Affected sensitive receptors and adjacent land uses (number after mitigation)	2 homes (None)	None	None	None
Ecosystems and Water Resources				
Aquatic impacts	≤ 0.1 acre of stream buffer	0 acres of stream buffer	0 acres of stream buffer	Piping approx. 700 feet of Goff Creek and 0.64 acre of stream buffer
Vegetation and wildlife impacts (vegetation removal)	11–12 acres	3 acres	6 acres	2 acres
Wetland impacts (direct)	1.98–2.18 acres	0.07 acre	0.6 acre	0.39 acre
Wetland buffer impacts	1.79 acres	0.25 acre	1.33 acres	0.29 acre
Groundwater and stream baseflow impacts	No	No	No	Yes
Public Services				
Number of direct impacts on essential public facilities	1	0	1	0
Parklands and Open Space				
Number of temporary impacts on park resources	1	0	0	0

Lynnwood Alternative

The Lynnwood Alternative site is currently zoned for Light Industrial and Business/Technical Park uses. Development of the OMSF is not explicitly addressed in the City's land use code and would require a Conditional Use Permit approval from the City of Lynnwood, and an amendment to the City's official zoning map. This is the only build alternative that has the potential to affect existing residential uses (the neighborhood west of the Lynnwood Alternative site) due to the increase in noise. However, the increase in noise would be fully mitigated. The Lynnwood Alternative would also result in the greatest impacts on ecosystem resources including vegetation, wetlands, and wildlife habitat. The Lynnwood Alternative would also require temporary closure and detour of the Interurban Trail while the elevated lead track is constructed. This alternative would occupy land owned by the Edmonds School District that is planned for the district support center, which would include administrative offices and school bus storage and maintenance facilities. The proposed maximum building height of the OMSF would be approximately 32 feet, consistent with the low profile of the buildings in the surrounding area and, therefore, does not represent a substantial visual change. Additionally, screening fences and landscape elements would be incorporated into the design.

BNSF Alternative

The BNSF Alternative would require relocating existing industrial and commercial uses. The BNSF Alternative site is in the Bel-Red area zoned for mixed use, office, and residential uses. The City's land use code would allow an OMSF with a Conditional Use Permit approval from the City of Bellevue. The Bel-Red Corridor no longer includes industrially zoned land, but relocation of displaced businesses could occur on industrially zoned land elsewhere in Bellevue. The OMSF is consistent and compatible with existing uses and would not result in substantial changes to the visual environment because the building mass, size, and use are typical of the surrounding area. However, the OMSF would be inconsistent with the Bel-Red land use plans and zoning designations in this location, which anticipate a transition over time from the current industrial character to a transit-oriented, higher density mixed-use development pattern of retail, office, and residential uses near the East Link 120th Avenue Station.

BNSF Modified Alternative

The BNSF Modified Alternative site has the same zoning designations as the BNSF Alternative on the east side of BNSF corridor. Properties west of the rail corridor are zoned for medical office uses. The land use approval process would be the same as the BNSF Alternative, and the BNSF Modified Alternative would result in nearly identical impacts as BNSF Alternative except that it would also require the acquisition and relocation of the Bellevue Public Safety Training Center. The OMSF is consistent with existing uses and would not result in substantial changes to the visual environment because the building mass, size, and use are typical of the surrounding area. However, the OMSF would be inconsistent with the Bel-Red land use plans and zoning designations in this location. Compared to the BNSF Alternative, the BNSF Modified Alternative is configured to be farther away

from the East Link 120th Avenue Station. The OMSF configuration would better accommodate future mixed-use development, consistent with land use plans nearest to the light rail station.

SR 520 Alternative

The SR 520 Alternative site is currently zoned for commercial uses and development of the OMSF would require a similar Conditional Use Permit approval as the BNSF Alternative or BNSF Modified Alternative. However, the SR 520 Alternative site is located furthest away from the future East Link stations, outside of Bel-Red land use designations for mixed-use, transit-oriented development. The SR 520 Alternative would require the greatest number of commercial business displacements. Based on the City of Bellevue's noise ordinance, there is potential for noise impacts on neighboring commercial businesses, but these impacts would be mitigated. The SR 520 Alternative would also have the greatest aquatic resource impacts related to piping portions of Goff Creek that are currently daylighted through the site. Modifications to the Goff Creek channel would require mitigation and may affect shallow groundwater to the degree that it would affect the amount of baseflow entering the creek. The OMSF would not result in substantial changes to the visual environment because the building mass, size, and use are typical of the surrounding area. Views from the Bridle Trails neighborhood north of the site are blocked by existing vegetation and landforms.

4.1.3 Financial Goal: Achieve Financial Feasibility

4.1.3.1 No Build Alternative

Under the No Build Alternative, there would be no capital cost or operating cost because the proposed project would not be implemented. Without expanded operations and maintenance capacity, there could be an effect on the competitiveness of the ST2 Link light rail extensions for federal grant funding.

4.1.3.2 Build Alternatives

All build alternatives are financially feasible and could be developed and supported by ST2 tax revenue. Capital costs of the proposed project (including property acquisition, relocation, construction, and design/permitting/administrative costs) are estimated to range from $345 million (BNSF Alternative) to $415 million (BNSF Modified Alternative), as described in Chapter 2, Section 2.9, Funding and Estimated Project Costs and as shown in Table 4-3. The Lynnwood Alternative would have the lowest property and relocation costs, but the second highest construction costs. This is due to costs to design and construct two separate facilities and the length of elevated lead track. The BNSF Alternative would have the second lowest property and relocation costs and the lowest design and construction costs. This is due to the relatively flat site topography and limited number of properties and businesses that would be displaced. The BNSF Modified Alternative would have the highest capital costs, due to higher property and relocation costs and the structural complexity of this alternative (e.g., need for earthwork and retaining walls and elevated track work spanning the Eastside Rail Corridor). The SR 520 Alternative would have the second highest property and

relocation costs due to the large number of businesses that would be displaced, but the second lowest costs for design and construction.

Table 4-3. Estimated Capital and Operating Costs of the Build Alternatives

Alternative	Real Estate and Relocation (million dollars)[a]	Final Design and Construction (million dollars)[a,b]	Total Capital Cost (million dollars)[a]	Annual Operating Cost (million dollars)[c]
Lynnwood Alternative				
Design Option C1	$45	$305	$350	$66
Design Option C2	$40	$310	$350	$66
Design Option C3	$50	$305	$355	$66
BNSF Alternative	$80	$265	$345	$63
BNSF Modified Alternative	$100	$315	$415	$63
SR 520 Alternative	$95	$290	$385	$63

[a] 2013 dollars.
[b] Includes professional services and unallocated contingency.
[c] Annual labor cost in constant dollars to operate the facility.

Annual OMSF operating costs (i.e., facility maintenance and labor costs) are estimated to range between $63 million (BNSF Alternative, BNSF Modified Alternative, and SR 520 Alternative) and $66 million (Lynnwood Alternative). The increased annual operating costs for the Lynnwood Alternative relate directly to the need for a separate storage track facility in Bellevue. The added annual operating costs are primarily labor costs driven by the additional staff needed to operate and maintain the two separate facilities under the Lynnwood Alternative.

4.2 Commitment of Resources

If built, the proposed project would have irreversible and irretrievable commitments of property and natural resources. Private properties with industrial and commercial uses would be converted to transit use. The conversion of lands to light rail use would change the character of the Lynnwood Alternative site. The proposed project would affect wetlands, wildlife habitat, and aquatic resources to varying degrees, depending on the alternative selected and built. Mitigation measures would be implemented, but some of these resources would be irretrievably altered. Construction of the proposed project would also require the irretrievable commitment of resources such as fuel and construction materials (e.g., aggregate for concrete, wood for forms and frames, and steel for rebar and rails).

4.3 Areas of Controversy and Issues to be Resolved

The following are known areas of controversy and issues to be resolved.

- Determining whether the Edmonds School District could and would develop the portion of the Lynnwood Alternative site not needed for the OMSF to accommodate some functions of the planned district support center.
- Resolving conflicts related to locating the proposed project within areas envisioned for transit-oriented development within the City of Bellevue's Bel-Red Corridor under the BNSF Alternative and BNSF Modified Alternative.