September 2024

West Seattle Link Extension

Final Environmental Impact Statement

TRANSPORTATION TECHNICAL REPORT

Appendix N.1

Sound Transit

U.S. Department of Transportation
Federal Transit Administration

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West Seattle Link Extension
Transportation Technical Report

September 2024

Sound Transit

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Acronyms and Abbreviations

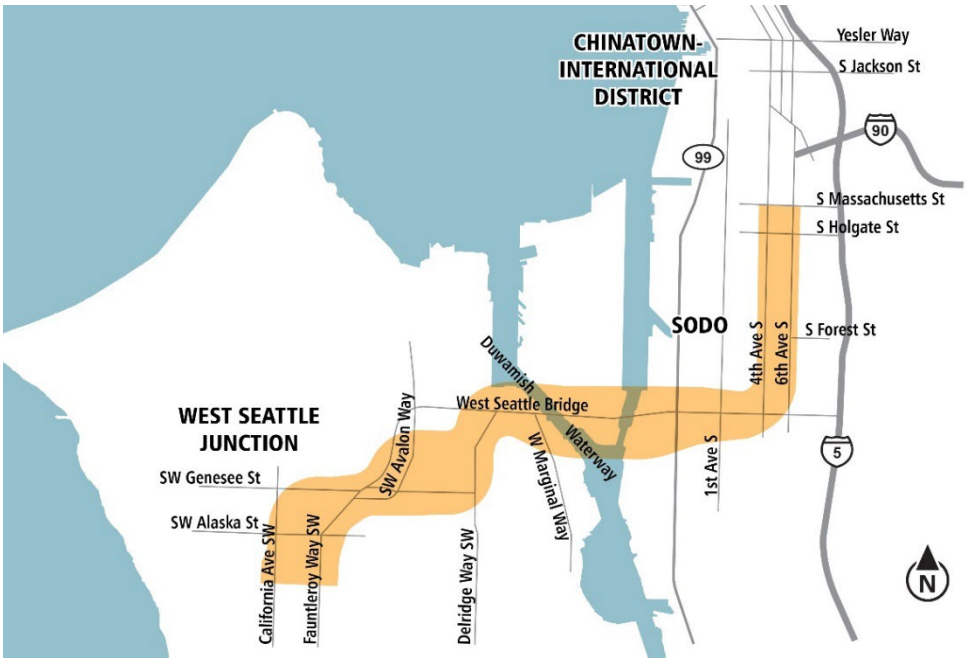
Acronym	Definition
A.D.A	Americans with Disabilities Act
A.D.T.	average daily traffic
Coast Guard	United States Coast Guard
Corps.	United States Army Corps of Engineers
EIS	Environmental Impact Statement
FTA	Federal Transit Administration
Harbor Patrol	Seattle Police Harbor Patrol
L.O.S.	level of service
M.O.S.	minimum operable segment
Metro	King County Metro Transit
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
SEPA	State Environmental Policy Act
Ship Canal	Lake Washington Ship Canal
Sound Transit	Central Puget Sound Regional Transit Authority
TOD	transit-oriented development
WSBLE	West Seattle and Ballard Link Extensions
WSDOT	Washington State Department of Transportation

1 INTRODUCTION

1.1 Overview

Central Puget Sound Regional Transit Authority (Sound Transit) is proposing to expand Link light rail transit service from SODO to West Seattle. The West Seattle Link Extension Project (the project) is a 4.1-mile corridor in the city of Seattle in King County, Washington, the most densely populated county of the Puget Sound region (Figure 1-1). The project would include stations at SODO, Delridge, Avalon, and Alaska Junction. The project is part of the Sound Transit 3 Plan of regional transit system investments, funding for which was approved by voters in the region in 2016.

Figure 1-1. West Seattle Link Extension Project Corridor



The Draft Environmental Impact Statement (EIS) published in January 2022 evaluated both the West Seattle Link Extension and the Ballard Link Extension together as one West Seattle and Ballard Link Extensions (WSBLE) Project. The extensions were evaluated together in the WSBLE Draft EIS because of their location, schedule, and review efficiencies for partner agencies.

In July 2022, the Sound Transit Board directed that further studies be prepared for the Ballard Link Extension, to evaluate additional station options and other refinements (Motion M2022-57). Some of these project options and refinements require additional conceptual engineering and environmental review. Rather than delay completion of the environmental review process for the West Seattle Link Extension while additional review is conducted for the Ballard Link Extension, Sound Transit and Federal Transit Administration (FTA) have decided to move forward under separate environmental reviews for each extension.

As described in the WSBLE Draft EIS, the two extensions will operate as separate lines, and the extensions are standalone projects with independent utility. Proceeding with separate environmental review processes for each extension enables Sound Transit and FTA to minimize delay in delivering the West Seattle Link Extension while further analysis is undertaken on the Ballard Link Extension. Accordingly, this Final EIS is for the West Seattle Link Extension only. The Ballard Link Extension will undergo separate environmental review, building on the analysis that has already been completed.

The West Seattle Link Extension would provide fast, frequent, and reliable light rail in Seattle and connect dense residential and job centers throughout the Puget Sound region. The Puget Sound Regional Council (the regional metropolitan planning organization) and the City of Seattle have designated the following Manufacturing/ Industrial Center and urban village in the project corridor:

- **Manufacturing/Industrial Center.** The project corridor includes the Duwamish Manufacturing/ Industrial Center. SODO Station is in the Duwamish Manufacturing/Industrial Center.
- **Urban Village.** West Seattle Junction is a neighborhood in the project corridor designated by the City of Seattle as an urban village. The Alaska Junction and Avalon stations are in the West Seattle Junction Urban Village.

Puget Sound Regional Council

Puget Sound Regional Council, the regional metropolitan planning organization, develops policies and coordinates decisions about regional growth, transportation, and economic development planning within King, Kitsap, Pierce, and Snohomish counties. Puget Sound Regional Council is composed of over 80 jurisdictions, including all four counties; cities and towns; ports; state and local transportation agencies; and Tribal governments within the region.

These designations indicate that these areas will continue to increase in residential and/or employment density over the next 30 years.

Existing local transit connections in the project corridor include bus and light rail. The King County Metro Transit (Metro) RapidRide C bus line currently provides service between West Seattle, Downtown Seattle, and South Lake Union. The RapidRide H bus line provides service between Burien and Downtown Seattle via Delridge. Other local bus service also operates in the project corridor.

Regional transit service in the project corridor includes regional bus service, ferry service, light rail, Sounder commuter rail, and Amtrak passenger rail service. Light rail currently operates between the Angle Lake Station in the city of SeaTac and Northgate Station in Seattle, traveling through the Downtown Seattle Transit Tunnel. There is an existing light rail station in SODO in the West Seattle Link Extension Corridor.

Extensions of light rail are under construction north to Lynnwood, east to Bellevue and Redmond, and south to Federal Way, all of which are anticipated to be operational by 2026. Additional planned light rail extensions would continue south to the Tacoma Dome, expected to begin service in 2035, and north to Everett, planned to begin service between 2037 and 2041. The Ballard Link Extension is scheduled to begin service between SODO and Ballard in 2039. The West Seattle Link Extension is scheduled to open in 2032 and would include a new SODO station where riders to and from West Seattle could transfer to the existing SODO station and light rail system until the Ballard Link Extension begins operation. The Ballard Link Extension would permanently connect the West Seattle Link Extension to the existing 1 Line, allowing riders to continue north to Everett. Figure 1-2 shows the full system planned for operation in 2042 under the target schedule. Table 1-1 lists the project Build Alternatives.

Figure 1-2. Link Light Rail System Expansion

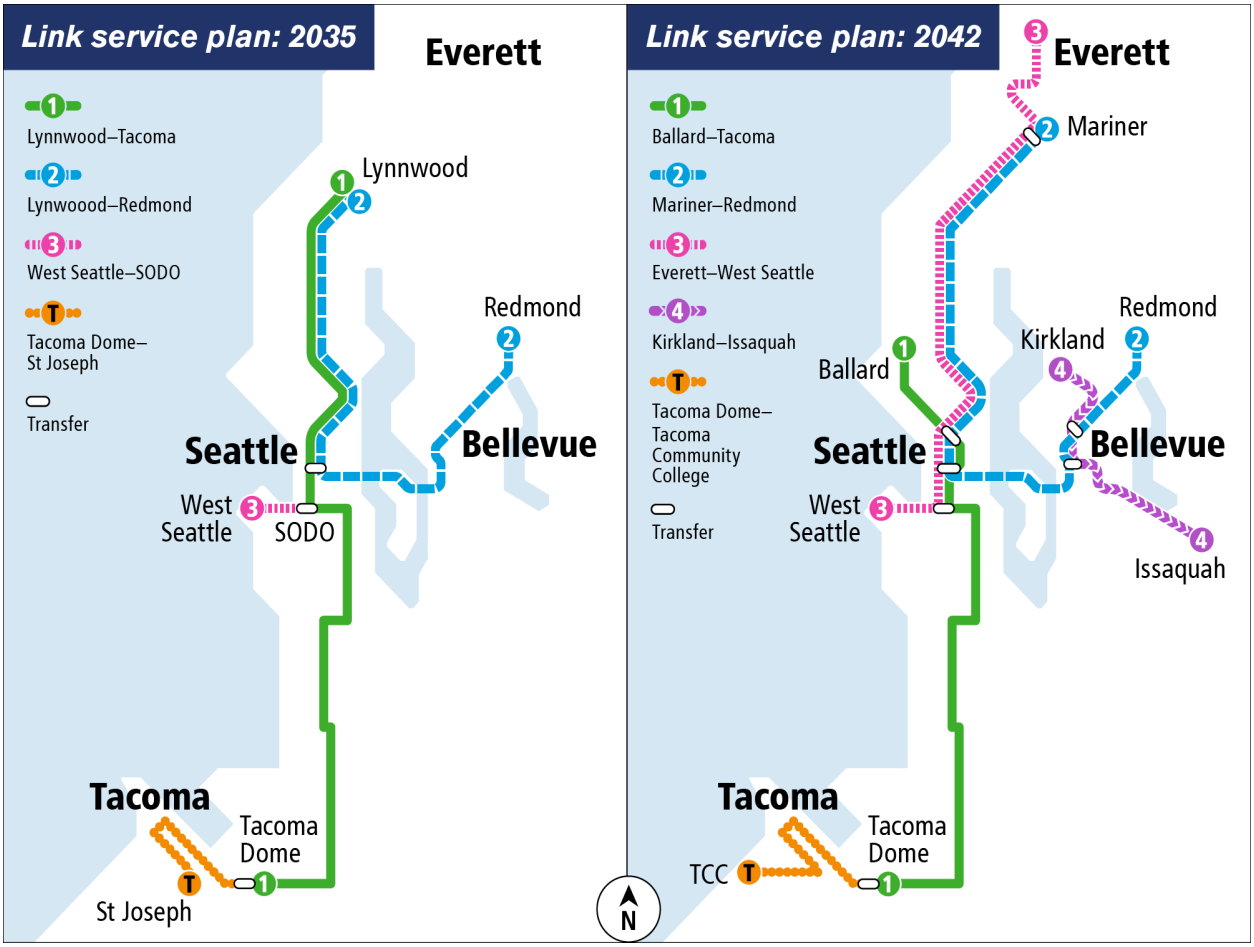


Table 1-1. Summary of West Seattle Link Extension Build Alternatives

Segment	Alternative or Design Option	Abbreviation	Stations (and Station Profile)	Connections
SODO	**Preferred At-Grade Lander Access Station Option**	**SODO-1c**	**SODO (At-Grade)**	**All Duwamish Segment alternatives.**
SODO	At-Grade Alternative	SODO-1a	SODO(At-Grade)	All Duwamish Segment alternatives.
SODO	At-Grade South Station Option	SODO-1b	SODO (At-Grade)	All Duwamish Segment alternatives.
SODO	Mixed Profile Alternative	SODO-2	SODO (Elevated)	All Duwamish Segment alternatives.
Duwamish (DUW)	**Preferred South Crossing Alternative**	**DUW-1a**	**None**	**All SODO Segment alternatives. All Delridge Segment alternatives.**
Duwamish (DUW)	South Crossing South Edge Crossing Alignment Option	DUW-1b	None	All SODO Segment alternatives. All Delridge Segment alternatives.
Duwamish (DUW)	North Crossing Alternative	DUW-2	None	All SODO Segment alternatives. All Delridge Segment alternatives.
Delridge (DEL)	**Preferred Andover Street Station Lower Height South Alignment Option**	**DEL-6b**	**Delridge (Elevated)**	**All Duwamish Segment alternatives. Connects to WSJ-5a and WSJ-5b.**
Delridge (DEL)	Dakota Street Station Alternative	DEL-1a	Delridge (Elevated)	All Duwamish Segment alternatives. Connects to WSJ-1, WSJ-2, and WSJ-4.
Delridge (DEL)	Dakota Street Station North Alignment Option	DEL-1b	Delridge (Elevated)	All Duwamish Segment alternatives. Connects to WSJ-1, WSJ-2, and WSJ-4.
Delridge (DEL)	Dakota Street Station Lower Height Alternative	DEL-2a	Delridge (Elevated)	All Duwamish Segment alternatives. Connects to WSJ-3a and WSJ-3b.
Delridge (DEL)	Dakota Street Station Lower Height North Alignment Option	DEL-2b	Delridge (Elevated)	All Duwamish Segment alternatives. Connects to WSJ-3a and WSJ-3b.
Delridge (DEL)	Delridge Way Station Alternative	DEL-3	Delridge (Elevated)	All Duwamish Segment alternatives. Connects to WSJ-1, WSJ-2, and WSJ-4.
Delridge (DEL)	Delridge Way Station Lower Height Alternative	DEL-4	Delridge (Elevated)	All Duwamish Segment alternatives. Connects to WSJ-3a and WSJ-3b.
Delridge (DEL)	Andover Street Station Alternative	DEL-5	Delridge (Elevated)	All Duwamish Segment alternatives. Connects to WSJ-1, WSJ-2, and WSJ-4.

Segment	Alternative or Design Option	Abbreviation	Stations (and Station Profile)	Connections
Delridge (DEL)	Andover Street Station Lower Height Alternative	DEL-6a	Delridge (Elevated)	All Duwamish Segment alternatives. Connects to WSJ-5a and WSJ-5b.
Delridge (DEL)	Andover Street Station Lower Height No Avalon Station Tunnel Connection Alternative	DEL-7	Delridge (Elevated)	All Duwamish Segment alternatives. Connects to WSJ-6.
West Seattle Junction (WSJ)	**Preferred Medium Tunnel 41st Avenue Station West Entrance Station Option**	**WSJ-5b**	**Avalon (Retained Cut), Alaska Junction (Tunnel)**	**Connects to DEL-6a and DEL-6b.**
West Seattle Junction (WSJ)	Elevated 41st/42nd Avenue Station Alternative	WSJ-1	Avalon (Elevated), Alaska Junction (Elevated)	Connects to DEL-1a, DEL-1b, DEL-3, and DEL-5.
West Seattle Junction (WSJ)	Elevated Fauntleroy Way Station Alternative	WSJ-2	Avalon (Elevated), Alaska Junction (Elevated)	Connects to DEL-1a, DEL-1b, DEL-3, and DEL-5.
West Seattle Junction (WSJ)	Tunnel 41st Avenue Station Alternative	WSJ-3a	Avalon (Tunnel), Alaska Junction (Tunnel)	Connects to DEL-2a, DEL-2b, and DEL-4.
West Seattle Junction (WSJ)	Tunnel 42nd Avenue Station Option	WSJ-3b	Avalon (Tunnel), Alaska Junction (Tunnel)	Connects to DEL-2a, DEL-2b, and DEL-4.
West Seattle Junction (WSJ)	Short Tunnel 41st Avenue Station Alternative	WSJ-4	Avalon (Elevated), Alaska Junction (Tunnel)	Connects to DEL-1a, DEL-1b, DEL-3, and DEL-5.
West Seattle Junction (WSJ)	Medium Tunnel 41st Avenue Station Alternative	WSJ-5a	Avalon (Retained Cut), Alaska Junction (Tunnel)	Connects to DEL-6a and DEL-6b.
West Seattle Junction (WSJ)	No Avalon Station Tunnel Alternative	WSJ-6	Alaska Junction (Tunnel)	Connects to DEL-7.

1.2 Purpose of Report

This report provides information about the potential transportation effects of the West Seattle Link Extension alternatives, allowing alternatives to be compared and mitigation to be identified where potential project impacts are found. The transportation analysis describes and evaluates the project alternatives' potential short-term (construction) and long-term (operations) impacts as follows:

- Chapter 2: Regional transportation, including vehicle miles of travel, vehicle hours of travel, vehicle hours of delay, and mode share.
- Chapter 3: Transit services, including regional and local services, project and station ridership, and transit quality and performance levels of service (L.O.S.).
- Chapter 4: The arterial and local street system, including property access, local traffic circulation, and intersection L.O.S.
- Chapter 5: Parking, including the loss of parking due to project facilities, and potential hide-and-ride parking impacts near stations.
- Chapter 6: Non-motorized facilities (bicycle and pedestrian) around stations and on major bicycle or pedestrian trails affected by the alternative or alternatives.
- Chapter 7: Safety (all modes).
- Chapter 8: Navigation of navigable waterways.
- Chapter 9: Freight (truck, rail, and water).
- Chapter 10: Indirect impacts on transportation.
- Chapter 11: Cumulative impacts on transportation.

The following attachments provide additional information:

- Attachment N.1A, Transportation Technical Analysis Methodology Report
- Attachment N.1B, Existing and Future Transit Routes and Level of Service
- Attachment N.1C, Existing and Future Intersection Levels of Service
- Attachment N.1D, Permanent and Temporary Transportation Facility Closures
- Attachment N.1E, Pedestrian Levels of Service
- Attachment N.1F, Bicycle Master Plan Project List
- Attachment N.1G, Historical Collisions by Collision Type

1.3 Methodology

The methodology and assumptions used to analyze the transportation impacts of the project are detailed in the Transportation Technical Analysis Methodology, which is provided as Attachment N.1A of this report. That report presents the following information:

- Agency guidelines and regulations regarding the transportation analysis.
- Transportation analysis methodology, including relevant definitions, data collection, regional traffic analysis, intersection impact analysis, and safety assessments.
- Methods for traffic forecasting and transit ridership estimates.

- Methods for assessing project impacts related to light rail stations, parking, non-motorized facilities and modes, property access and circulation, freight, transit, navigation, and construction.
- Specific roadways, intersections, and transit facilities analyzed.

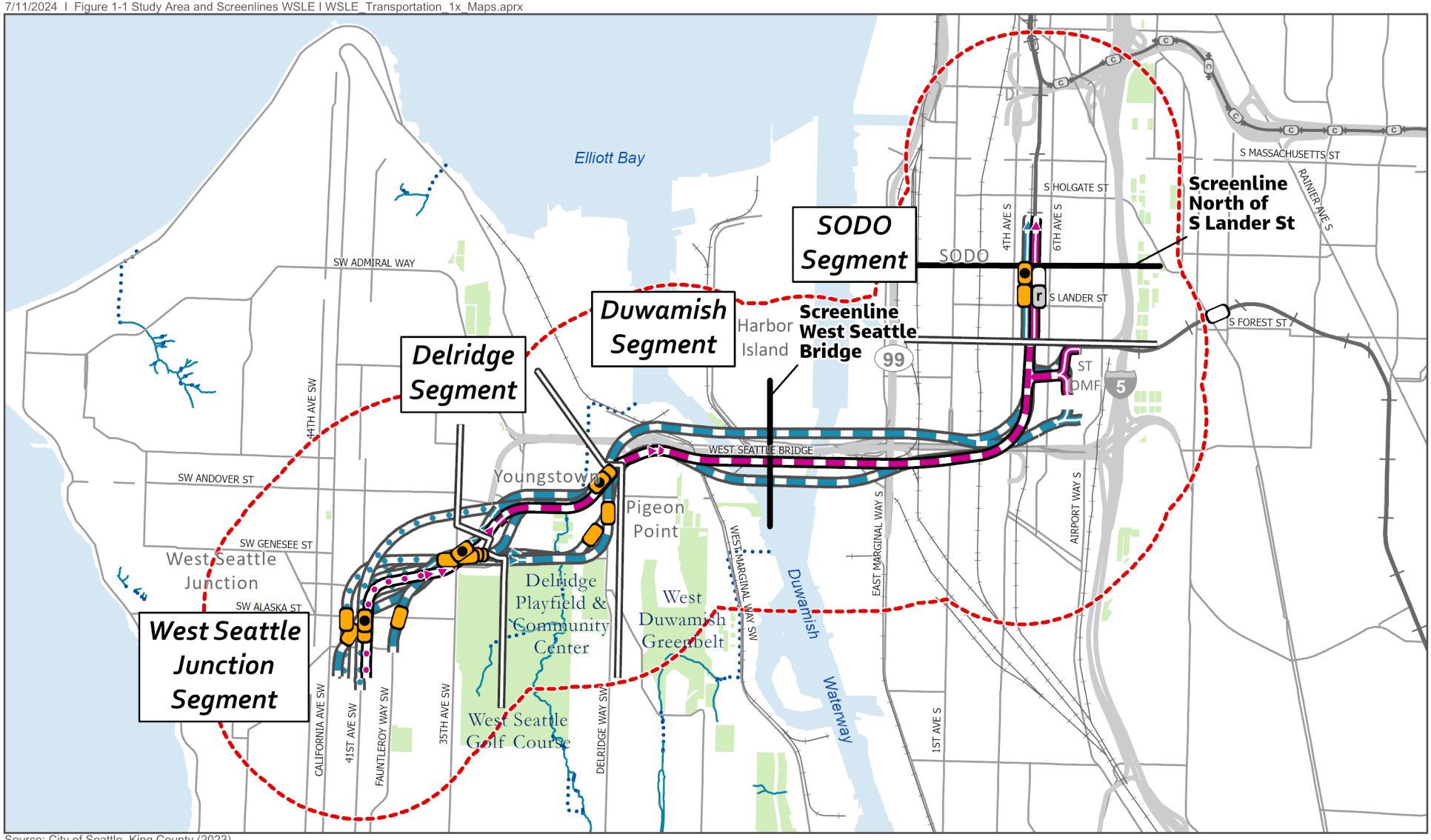
For each of these transportation elements, an affected environment section describes the existing (2019) conditions to provide context. The Draft EIS for this project, published in January 2022, reflected an existing year condition of 2019. For consistency, the Final EIS continues to use 2019 as the base year. The environmental impacts section describes the future conditions as a comparison between the No Build Alternative and the Build Alternatives for the year 2042.

The 2042 future condition for the transportation analysis represents Sound Transit's long-range plans, when the Sound Transit 3 program, including the West Seattle Link Extension, would be complete. Some transportation elements also evaluate 2032 for the construction period analysis. The future analysis considers both long-term (operations) and short-term (construction) impacts. The future long-term analysis considers the fully-built West Seattle Link Extension Project as well as the minimum operable segment (M.O.S.). The Delridge Station would be the West Seattle Link Extension M.O.S. terminus station. Potential mitigation to reduce identified potential project impacts is discussed in each section. For more detail on the various conditions and time periods analyzed, see Chapter 2, Regional Context and Travel.

In addition to the relevant regulations, plans, and policies considered in all environmental analyses, the transportation analysis would be guided by laws and regulations relevant to transportation as well as be informed by the policy direction established in the numerous plans and policy documents adopted within the project corridor.

1.4 Study Area

The study area for this transportation analysis is generally the area within 0.5 mile from the project alternatives (including stations) but varies for some transportation elements. Study areas that are particular to a transportation element are described in that element's section. The study area includes analysis screenlines at the West Seattle Bridge (east/west) and north of South Lander Street (north/south), which are used in the reporting of certain transportation analysis metrics. Figure 1-3 shows the general transportation study area and screenlines for the West Seattle Link Extension. The intersection analysis described in Chapter 4, Arterial and Local Street Operations, focuses on a set of study intersections in each project segment; these are presented in Figures 1-4 through 1-7.



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- Tunnel
- At-Grade
- Retained Cut

Other Alternatives
- Elevated
- Tunnel
- At-Grade
- Retained Cut

Station (● *Indicates Preferred Alternative*)
- New
- Relocated
- Existing

- Segment Line
- Sound Transit Operations and Maintenance Facility (ST OMF)
- Existing Link Light Rail
- East Link Light Rail (Under Construction)
- Railroad
- Stream
- Piped Stream
- Park
- Screenlines
- Study Area

0 0.5 1 Mile

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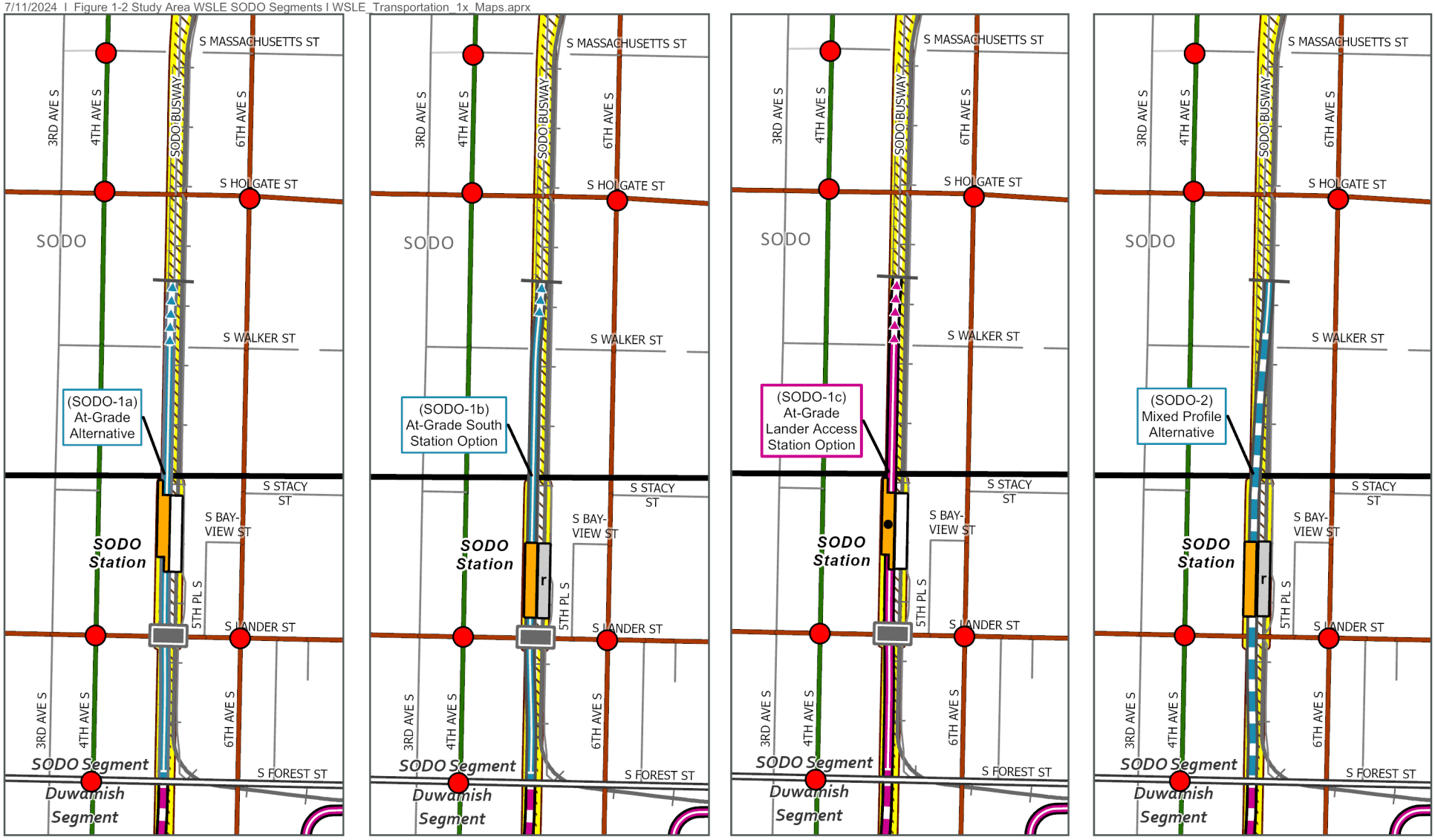
FIGURE 1-3
Study Area and Screenlines

West Seattle Link Extension



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- Retained Cut
- At-Grade

Other Alternatives
- Elevated
- Retained Cut
- At-Grade

Station (● *Indicates Preferred Alternative*)
- New
- Existing
- r Relocated

- Segment Line
- Existing Link Light Rail
- Railroad
- SODO Busway
- Proposed Overpass
- Screenlines
- Study Intersections

Street Functional Classification
- Collector Arterial
- Interstate/Freeway
- Principal Arterial/State Highway
- Minor Arterial
- Local Arterial

FIGURE 1-4
Study Area
SODO Segment

West Seattle Link Extension

0 500 1,000 Feet

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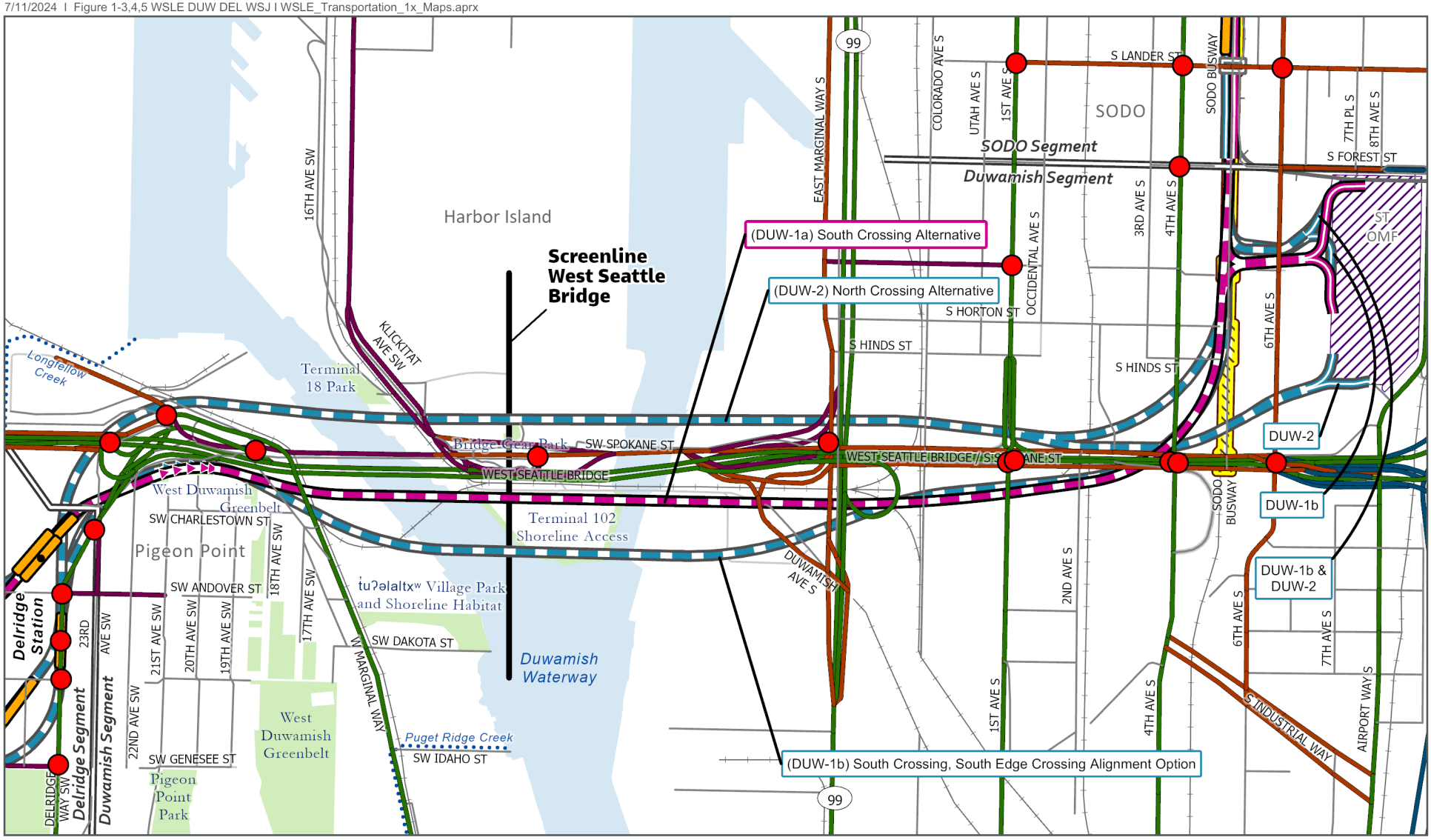


Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- At-Grade
- Retained Cut

Other Alternatives
- Elevated
- At-Grade
- Retained Cut

Station (● *Indicates Preferred Alternative*)
- New

- Segment Line
- Existing Link Light Rail
- Railroad
- SODO Busway
- Proposed Overpass
- Sound Transit Operations and Maintenance Facility (ST OMF)
- Piped Stream
- Park

- Study Intersections
- Screenlines

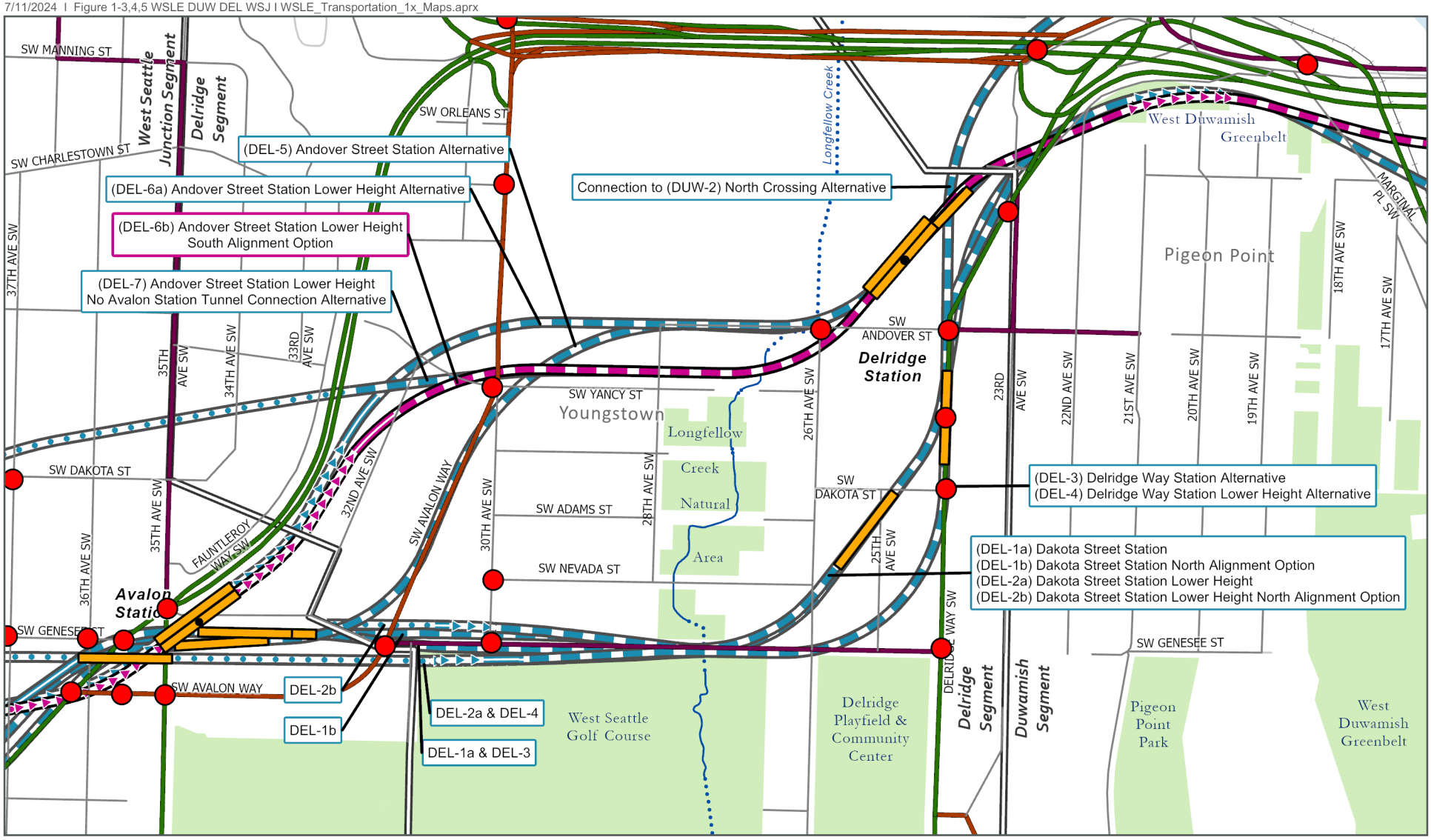
Street Functional Classification
- Collector Arterial
- Interstate/Freeway
- Principal Arterial/State Highway
- Minor Arterial
- Local Arterial

0 500 1,000 Feet

N

FIGURE 1-5
Study Area
Duwamish Segment

West Seattle Link Extension



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- Tunnel
- At-Grade
- Retained Cut

Other Alternatives
- Elevated
- Tunnel
- At-Grade
- Retained Cut

Station (● *Indicates Preferred Alternative*)
- New

- Segment Line
- Railroad
- Stream
- Piped Stream
- Park

- Study Intersections
- Screenlines

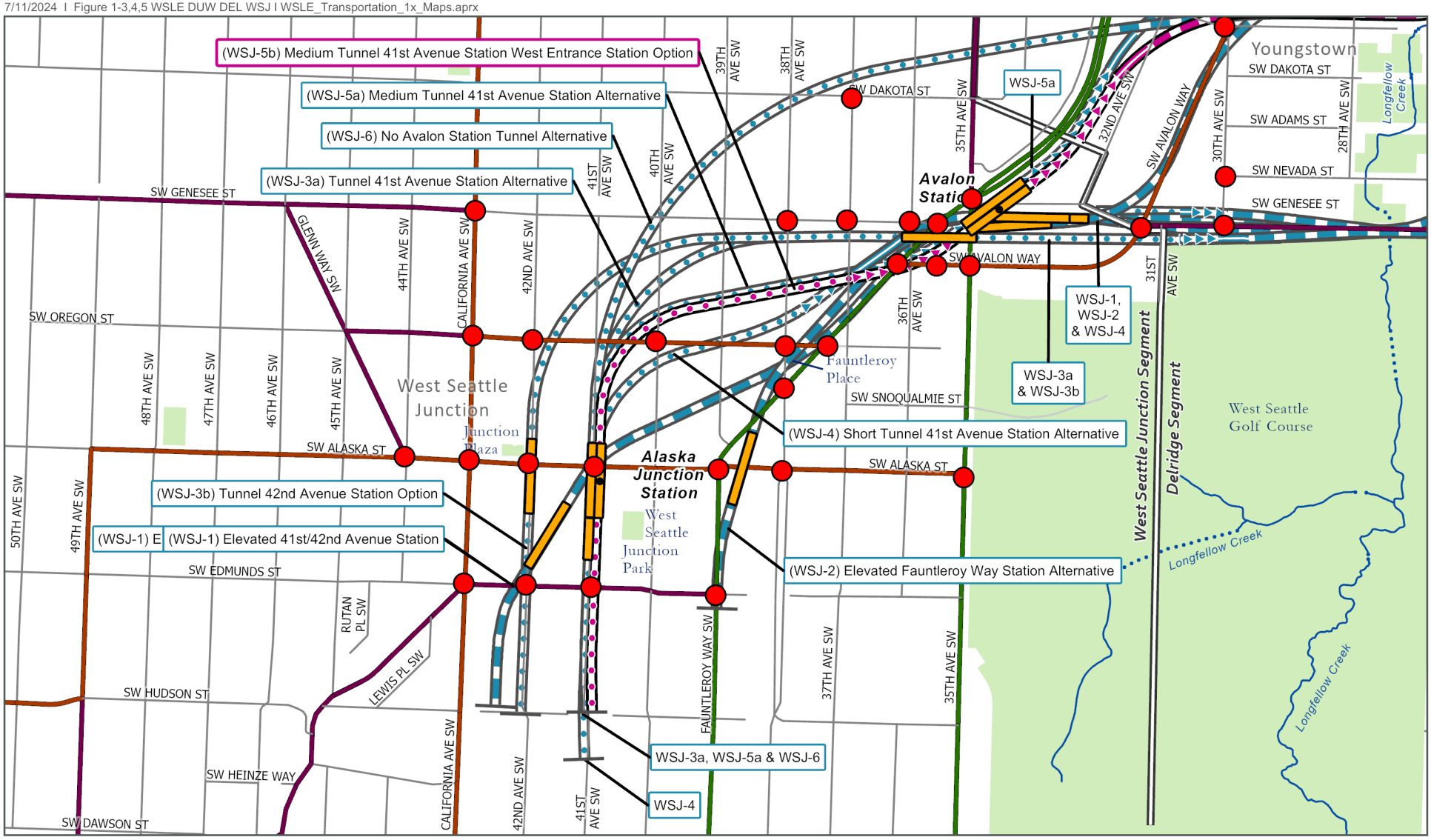
Street Functional Classification
- Collector Arterial
- Interstate/Freeway
- Principal Arterial/State Highway
- Minor Arterial
- Local Arterial

0 500 1,000 Feet

N

FIGURE 1-6
Study Area
Delridge Segment

West Seattle Link Extension



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- Tunnel
- At-Grade
- Retained Cut

Other Alternatives
- Elevated
- Tunnel
- At-Grade
- Retained Cut

Station (● *Indicates Preferred Alternative*)
- New

- Segment Line
- Railroad
- Stream
- Piped Stream
- Park

- Study Intersections
- Screenlines

Street Functional Classification
- Collector Arterial
- Interstate/Freeway
- Principal Arterial/State Highway
- Minor Arterial
- Local Arterial

FIGURE 1-7
Study Area
West Seattle Junction Segment

West Seattle Link Extension

0 500 1,000 Feet
N

2 REGIONAL CONTEXT AND TRAVEL

2.1 Introduction to Regional Facilities and Travel

This section describes the existing and anticipated future conditions of the regional roadway system through the West Seattle Link Extension Project (the project) study area, which includes major highways and arterials such as Interstates 5 and 90, State Route 99, and the West Seattle Bridge. The measures in this section are generally oriented to a regional scale and include analysis for mode share, vehicle miles traveled, vehicle hours traveled, and vehicle hours of delay in the vicinity of the project.

Performance measures include region-wide vehicle miles traveled, vehicle hours traveled, and vehicle hours of delay under base year (2019) conditions and in the future, with and without the project. Roadway performance is also assessed at select locations (screenlines) within the study area, with estimates of total trips at screenlines by mode, person trips, and a comparison of volumes to roadway capacity (i.e., volume-to-capacity ratio). Temporary (construction period) and permanent impacts on regional facilities and travel are discussed, as well as potential mitigation.

The following key findings were determined for regional context and travel:

- The project would result in reductions in vehicle miles traveled, vehicle hours traveled, and vehicle hours of delay across the region in 2042.
- Within the study area, transit mode share is forecast to increase with slight shifts from single-occupancy and high-occupancy automobile trips.
- Volume-to-capacity ratios are anticipated to remain relatively unchanged under the Build Alternatives.

2.2 Affected Environment

The City of Seattle has designated portions of the West Seattle Junction as a hub urban village, and Puget Sound Regional Council has designated Downtown Seattle as a Regional Growth Center, meaning that these areas would continue to add housing and jobs over the next 20 years as a matter of policy. The project corridor also includes the Puget Sound Regional Council- and City-designated Duwamish Manufacturing/Industrial Center.

The regional facilities within the project study area include Interstates 5 and 90, State Route 99, and the West Seattle Bridge. Major arterials include Airport Way, South Jackson Street, South Dearborn Street, South Holgate Street, South Lander Street, 6th Avenue South, 4th Avenue South, 1st Avenue South, Delridge Way Southwest, 35th Avenue Southwest, and Fauntleroy Way Southwest.

The study area is also served by Sound Transit and King County Metro Transit (Metro).

2.2.1 Vehicle Miles Traveled, Vehicle Hours Traveled, and Mode Share

Vehicle miles traveled refers to the total number of miles traveled by vehicles in an area over a given period. Vehicle hours traveled refers to the total operating hours for all vehicles in an area over a given period. These statistics are used to describe the intensity of automobile use in the region, and increases in either or both are usually accompanied by increases in congestion and pollution. Vehicle hours of delay is the difference between forecasted and free-flow travel times, representing the amount of delay attributable to roadway congestion.

In 2019, within the central Puget Sound region, there were over 88 million vehicle miles and 3.1 million vehicle hours traveled daily (King, Kitsap, Pierce, and Snohomish counties), with approximately 815,000 hours of delay for passenger cars and heavy trucks. Approximately 17 million total daily trips were taken, with single-occupancy vehicles and freight making up about half of the travel in the region. Table 2-1 shows existing daily mode share by person trips.

Table 2-1. Daily Trips by Mode for the Central Puget Sound Region (2018)

Mode	Mode Share (Person Trips)
Single-occupancy Vehicles/Freight	43%
Shared Ride	39%
Walk/Bike	14%
Transit	5%
Total	**100%**

Source: Puget Sound Regional Council 2022

2.2.2 Screenline Performance

The following measures were used to assess the existing condition of regional travel on major corridors through the study area:

- Vehicle volume
- Vehicle volume-to-capacity ratio
- Person trips
- Mode share

Vehicle volume is the total number of vehicles passing through a location for a given time. Volume-to-capacity ratio compares the vehicle volume on a roadway to its capacity; a ratio over 1.0 indicates that demand exceeds capacity and that congestion is present as a result. Person trips are the number of discrete trips taken by individual persons regardless of mode. Mode share across screenlines is the percentage of trips by a particular mode (i.e., single-occupancy vehicles, high-occupancy vehicles with two or more persons, and transit [bus and rail][1]). These statistics were calculated at two representative locations along the project corridor: at the West Seattle Bridge and across a screenline north of South Lander Street (Figure 1-3 in Chapter 1, Introduction). Table 2-2 and Table 2-3 show the existing p.m. peak hour and daily performance metrics for these two screenlines, respectively. Existing a.m. peak hour performance metrics are not shown because they would be the inverse of the existing p.m. peak hour metrics.

During the p.m. peak hour, both screenlines are over capacity in the peak travel direction (westbound at the West Seattle Bridge screenline and southbound at the north of South Lander Street screenline), with volume-to-capacity ratios greater than 1.0. Eastbound travel across the West Seattle Bridge also shows a volume-to-capacity ratio greater than 0.9, meaning that vehicles are beginning to experience slowdowns. Transit mode share is relatively high—over 15 percent—in the p.m. peak hour in the peak travel direction.

The daily results include off-peak periods of the day with lower travel demand. Daily volume-to-capacity ratios are less than 0.7, and transit mode shares are between 8 and 11 percent.

[1] The Puget Sound Regional Council travel demand forecast model does not produce link-level non-motorized forecasts, so bicycle and pedestrian volumes are not included in these statistics. For more information about non-motorized volumes and operations, refer to Chapter 6, Non-Motorized Facilities.

Table 2-2. Existing P.M. Peak Hour Volumes, Volume-to-capacity Ratios, and Mode Shares

Screenline (Direction)	Vehicles	Volume-to-capacity Ratio	Persons	Single-occupancy Vehicle	High-occupancy Vehicle	Transit
West Seattle Bridge (Eastbound)	4,600	0.92	6,600	57%	38%	5%
West Seattle Bridge (Westbound)	5,300	1.04	8,700	50%	29%	21%
Lander Street (Northbound)	15,200	0.77	22,500	62%	35%	3%
Lander Street (Southbound)	21,000	1.08	36,000	51%	32%	17%

Source: Puget Sound Regional Council Regional Model and Sound Transit Ridership Model.

Table 2-3. Existing Weekday Daily Volumes, Volume-to-capacity Ratios, and Mode Share

Screenline (Direction)	Vehicles	Volume-to-capacity Ratio	Persons	Single-occupancy Vehicle	High-occupancy Vehicle	Transit
West Seattle Bridge (Eastbound)	58,400	0.65	85,200	57%	32%	11%
West Seattle Bridge (Westbound)	57,300	0.64	83,400	58%	31%	11%
Lander Street (Northbound)	234,200	0.66	352,200	60%	32%	8%
Lander Street (Southbound)	222,700	0.66	336,700	61%	31%	8%

Source: Puget Sound Regional Council Regional Model and Sound Transit Ridership Model.

2.3 Environmental Impacts

2.3.1 No Build Alternative

The No Build Alternative describes anticipated future land use and transportation conditions if the project was not built. Between 2019 and 2042, Puget Sound Regional Council's travel demand forecast model forecasts up to 2.5 percent growth in p.m. peak hour vehicle trips across the screenlines. Total screenline p.m. peak hour person trips are forecasted to increase between 2 and 29 percent. Several planned and funded regional transportation improvements are assumed to be completed during the same timeframe, including the following (for further details on these projects and a complete list of assumed future projects, refer to Attachment N.1A, Transportation Technical Analysis Methodology Report):

- Washington State Department of Transportation (WSDOT) State Route 520 – Interstate 5 to Lake Washington – Rest of the West
- City of Seattle Central Waterfront Improvement Program
- Sound Transit 2 and Sound Transit 3 representative projects light rail extension projects
- City of Seattle and Metro RapidRide G Line (Madison Street), J Line (formerly RapidRide Roosevelt), as well as other bus corridor projects within the city

While the West Seattle Light Rail extension would not be implemented under the No Build Alternative, the Ballard Link Extension, Downtown Redmond Link Extension, Lynnwood Link, Everett Link, Federal Way Link, South Kirkland-Issaquah Link Extension, and Tacoma Dome Link Extension are assumed to be completed by 2042 as part of the No Build Alternative. Transit routing is assumed to generally conform to King County's 2050 Metro Connects long-range service vision, with an average of 1 percent annual growth in service hours per year (the number of hours of active bus service).

2.3.2 Build Alternatives

2.3.2.1 Long-term Impacts

This section discusses regional transportation conditions in 2042 with the project in operation. Because all of the full-build project alternatives would have equivalent effects on travel patterns at the regional scale, a single representative set of analysis results (based on modeling of the Preferred Alternative) is presented here for comparison to the No Build Alternative.

Vehicle Miles Traveled, Vehicle Hours Traveled, and Vehicle Hours of Delay

Table 2-4 shows average weekday vehicle miles traveled, vehicle hours traveled, and vehicle hours of delay for the Build Alternatives and No Build Alternative in year 2042.

With the project, daily vehicle miles traveled, vehicle hours traveled, and vehicle hours of delay are forecasted to decrease compared to the No Build Alternative.

Table 2-4. 2042 Average Weekday Vehicle Miles Traveled, Vehicle Hours Traveled, and Vehicle Hours of Delay

Alternative	Vehicle Miles Traveled	Vehicle Hours Traveled	Vehicle Hours of Delay
No Build Alternative	96,874,600	3,430,600	965,500
Build Alternatives	96,858,000	3,429,800	965,000
Change (#)	*-16,600*	*-800*	*-500*
Change (%)	*-0.02%*	*-0.02%*	*-0.05%*

Source: Puget Sound Regional Council Regional Model.

Note:

Regional measures include travel by passenger vehicles, freight, and buses.

Screenline Performance

In general, the project would shift some trips to transit within the project corridor. The screenline analysis reflects that shift by showing slightly reduced vehicle volumes, lower roadway volume-to-capacity ratios, and increased transit mode share.

Table 2-5 compares the vehicle demand volumes and vehicle volume-to-capacity ratios for the 2042 No Build Alternative and Build Alternatives for the weekday p.m. peak hour and daily time periods. The Build Alternatives show improved performance compared to the No Build Alternative, with slightly fewer vehicles traveling on the roadways and lower roadway volume-to-capacity ratios. Travel during the p.m. peak hour in the peak direction is congested in both alternatives.

Table 2-5. 2042 Vehicle Volumes and Volume-to-capacity Ratios

Screenline (Direction)	P.M. Peak No Build Vehicles	P.M. Peak No Build Volume-to-capacity Ratio	P.M. Peak Build Vehicles	P.M. Peak Build Volume-to-capacity Ratio	Daily No Build Vehicles	Daily No Build Volume-to-capacity Ratio	Daily Build Vehicles	Daily Build Volume-to-capacity Ratio
West Seattle Bridge (Eastbound)	4,500	0.91	4,500	0.91	58,000	0.65	57,700	0.65
West Seattle Bridge (Westbound)	5,200	1.03	5,200	1.02	55,900	0.63	55,800	0.63
North of South Lander Street (Northbound)	15,600	0.81	15,500	0.81	241,600	0.70	241,400	0.70
North of South Lander Street (Southbound)	20,800	1.09	20,600	1.08	230,400	0.70	229,400	0.70

Source: Puget Sound Regional Council Regional Model.

Note: The p.m. peak travel direction is westbound for the West Seattle Bridge screenline and southbound for the north of South Lander Street screenline.

Table 2-6 and Table 2-7 compare year 2042 total person demand volumes and travel mode shares for the No Build Alternative and Build Alternatives for the weekday p.m. peak hour and daily time periods. The Build Alternatives show approximately the same number of people traveling across each screenline, with an increase in the percentage of people using transit across the West Seattle Bridge screenline.

Table 2-6. 2042 P.M. Peak Hour Mode Shares

Screenline (Direction)	No Build Persons	No Build Single-occupancy Vehicle	No Build High-occupancy Vehicle	No Build Transit	Build Persons	Build Single-occupancy Vehicle	Build High-occupancy Vehicle	Build Transit
West Seattle Bridge (Eastbound)	6,700	55%	38%	7%	6,900	52%	38%	10%
West Seattle Bridge (Westbound)	9,600	43%	30%	27%	9,600	43%	28%	29%
North of South Lander Street (Northbound)	26,100	56%	33%	11%	26,100	56%	33%	11%
North of South Lander Street (Southbound)	46,700	40%	26%	34%	46,500	40%	26%	34%

Source: Puget Sound Regional Council Regional Model and Sound Transit Model.

Note: The p.m. peak travel direction is westbound for the West Seattle Bridge screenline and southbound for the north of South Lander Street screenline.

Table 2-7. 2042 Daily Mode Shares

Screenline (Direction)	No Build Persons	No Build Single-occupancy Vehicle	No Build High-occupancy Vehicle	No Build Transit	Build Persons	Build Single-occupancy Vehicle	Build High-occupancy Vehicle	Build Transit
West Seattle Bridge (Eastbound)	89,700	53%	33%	14%	90,200	53%	32%	15%
West Seattle Bridge (Westbound)	86,300	54%	31%	15%	87,400	53%	31%	16%
North of South Lander Street (Northbound)	423,400	53%	29%	18%	423,100	53%	29%	18%
North of South Lander Street (Southbound)	409,000	53%	28%	19%	407,700	53%	28%	19%

Source: Puget Sound Regional Council Regional Model and Sound Transit Model.

Note: The p.m. peak travel direction is westbound for the West Seattle Bridge screenline and southbound for the north of South Lander Street screenline.

2.3.2.2 Construction Impacts

All Duwamish Segment alternatives would require short-duration (less than 48-hour), partial closures of regional facilities such as State Route 99 and the West Seattle Bridge. The closures would be limited to nights and weekends. Alternative DEL-7 would partially close the West Seattle Bridge south of the Southwest Andover Street pedestrian bridge for up to 6 months. For more details, including exact closure locations, refer to Attachment N.1D, Permanent and Temporary Transportation Facility Closures. For construction impacts to regional transit facilities, see Section 3.3.2.2, Construction Impacts, in Chapter 3, Transit.

Some arterials in the project corridor would be fully or partially closed for longer periods, potentially affecting users of adjacent regional roadways, including general purpose traffic, freight, and buses. The project travel demand model was used to assess potential impacts of closures of a year or longer (refer to Section 4.3.3, Construction Impacts, in Chapter 4, Arterials and Local Street Operations, for more details). The model predicted minimal effects on regional roadway volumes relative to the no build condition, with peak hour volume changes of roughly 10 vehicles on State Route 99 and Interstate 5 and 20 vehicles on the West Seattle Bridge during construction. Therefore, regional transportation facilities and travel would not be noticeably impacted by diverted traffic during the project construction period.

2.4 Potential Mitigation Measures

There are no permanent impacts to regional facilities due to the project, so no long-term mitigation would be needed during light rail operations.

Mitigation for short-term construction closures of regional roadways would consist of Sound Transit providing information to drivers about closure timing and alternate routes (refer to Section 4.4.2, Construction Mitigation, in Chapter 4). Because closures of nearby arterials would not result in impacts to regional facilities, no other mitigation is needed beyond what is identified in Section 4.4, Potential Mitigation Measures, in Chapter 4, for the arterials themselves.

3 TRANSIT

3.1 Introduction to Transit

This chapter describes existing conditions for transit in the West Seattle Link Extension Project (the project) study area and regionally, as well as the anticipated future effects of the project on bus and rail operations. Transit service and facilities, travel times, ridership, and transit L.O.S. are evaluated. L.O.S. measures include frequency, hours of service (span), reliability, and passenger load. Construction impacts to transit facilities and operations are also discussed.

3.1.1 Key Findings

Several deficiencies in transit service were identified in the existing condition and No Build Alternative. Current issues related to transit speed, reliability, and overcrowding will degrade in the future and capacity on the transit system will not be sufficient to support regional growth. The Build Alternatives address many of these deficiencies and support growth in regional connectivity. The following sections describe the primary changes or benefits of the Build Alternatives.

- Travel Time and Reliability – Transit travel times between West Seattle and Downtown Seattle are expected to improve by about 50 percent with light rail under the 2042 Build Alternative compared to a No Build Alternative bus trip. In addition, the project would be fully grade-separated and would provide reliable, high-speed trips regardless of roadway conditions.
- Ridership – Because of improved reliability, additional capacity, and increased service levels, approximately 26,000 riders are forecasted to use the project each day by year 2042.
- Transit Construction – Construction of the guideway, stations, and support infrastructure could disrupt King County Metro Transit (Metro) bus operations and access to transit for several years. Roadway, travel lane, bus stop, layover, and sidewalk and bike facility closures would be coordinated between Sound Transit, Metro, and the City of Seattle to identify alternative bus routes, bus stops, layover areas, and transit access locations. Sound Transit would implement mitigation for adverse impacts to Metro operations and access to transit caused by the construction activities. Construction could also require the closure of the existing 1 Line SODO Station to allow space to construct the new SODO Station. Closure of the SODO Station would reduce light rail access to the SODO area.

3.1.2 Regional Transit Ridership

This section describes the characteristics of the regional transit system as applicable to the project.

In 2019, there were over half a million average daily boardings within the Sound Transit service area (Table 3-1), which includes parts of King, Pierce, and Snohomish counties; by 2042, that number is anticipated to grow by over 50 percent. An average of 72,000 people boarded Link light rail in 2019, and that number is expected to grow substantially by 2042 (under the no build condition) as the light rail system is built out to Ballard, Everett, Tacoma, and Redmond. Future growth in ridership, particularly for light rail, will present capacity challenges, particularly in the segment between the International District and Beacon Hill. Some bus routes in the study area will also experience capacity challenges as ridership increases (see Section 3.3.2.1, Long-term Impacts).

Table 3-1. Regional Transit System Ridership (2019)

Measure	Existing Ridership
Total Daily Transit Trips	467,000
Total Daily Transit Boardings	604,000
Total Daily System-wide Link Boardings	72,000

Note: Transit ridership modeled using the Sound Transit Incremental Ridership Model.

3.2 Affected Environment

3.2.1 Transit Service and Facilities

Metro buses provide the bulk of existing transit service in the project corridor, with Sound Transit running Link light rail and some regional express buses through SODO into Downtown Seattle. Approximately 100 routes operate within the project study area; of those, the 22 routes that most directly serve the core of West Seattle were selected to represent the project corridor (Table 3-2), and the following discussion and analysis describes those routes. The project corridor is also served by King County Water Taxi, which operates between the Downtown Seattle ferry terminal on Alaskan Way and the West Seattle taxi pier on Harbor Avenue Southwest.

All-day service between downtown and West Seattle is provided by the RapidRide C Line, RapidRide H Line, Route 21, and Route 125. The RapidRide C Line runs from South Lake Union, through downtown, across the West Seattle Bridge and south through West Seattle by California Avenue Southwest and Fauntleroy Way Southwest, terminating at Westwood Village. The RapidRide H Line provides frequent service from downtown across the West Seattle Bridge and south through the Delridge neighborhood by Delridge Way Southwest, continuing on to Westwood Village, White Center, and Burien. West Seattle is also served by Route 21, which provides service along 35th Avenue Southwest, connecting downtown to Westwood Village by West Seattle at 15-minute headways. Route 125 travels from Westwood Village to South Seattle College via 16th Avenue Southwest, then on to Downtown Seattle via Delridge Way Southwest, to the West Seattle Bridge and State Route 99.

From SODO, multiple routes along the SODO Busway provide frequent service south to locations like Renton, Tukwila, Kent, and Federal Way, and Link light rail provides service every 6 minutes (peak) and 10 minutes (off-peak) north to the Northgate Station and south to the Seattle-Tacoma International Airport and Angle Lake stations.

Peak period-only bus services connect various portions of West Seattle and Vashon Island to downtown.

Transit facilities in the study area include the SODO Busway, which runs between South Spokane Street and South Royal Brougham Way and includes dedicated right-of-way for light rail and buses; the light rail transitions to the Downtown Seattle Transit Tunnel north of the SODO Busway. The BNSF Railway tracks adjacent to the SODO Busway provide service to freight and commuter trains. In West Seattle, bus-only lanes are provided along portions of the RapidRide C and RapidRide H Line pathways, including portions of Southwest Alaska Street, 35th Avenue Southwest, Southwest Avalon Way, Delridge Way Southwest, and the West Seattle Bridge. There are two park-and-rides within the study area: Southwest Spokane Street under the West Seattle Bridge near Delridge Way Southwest and the Airport & Spokane park-and-ride under the Spokane Street Viaduct. Combined, these park-and-ride lots have 80 spaces, although the 2019 utilization data from Metro indicated light use of both lots (less than 15 vehicles parked on a typical weekday) (Metro 2019a).

Table 3-2. Existing Key Transit Routes

Route	Service Period	Service Type	Average P.M. Peak Period Headway	Service Area
21	Peak	Frequent	15	Westwood Village to Downtown Seattle
22	All-Day	Local	60	Alaska Junction to Arbor Heights
37	Peak	Express	60	Alaska Junction to Alki to Downtown Seattle
50	All-Day	Local	20	Othello Station to SODO to Alki
55	Peak	Express	22	Admiral District to Alaska Junction to Downtown Seattle
56	Peak	Express	30	Alaska Junction/Alki to Admiral District to Downtown Seattle
57	Peak	Express	48	Alaska Junction/Alki to Admiral District to Downtown Seattle
101	All-Day	Frequent	13	Renton Transit Center to Downtown Seattle
102	Peak	Express	20	Fairwood to Downtown Seattle
116	Peak	Express	34	Fauntleroy Ferry to Downtown Seattle
118	Peak	Express	48	Fauntleroy Ferry to Downtown Seattle
119	Peak	Express	60	Tahlequah Ferry to Vashon Ferry
H Line	All-Day	Frequent	9	Burien Transit Center to Westwood Village to Downtown Seattle
124	All-Day	Frequent	14	Tukwila International Boulevard Link Station to Downtown Seattle
125	All-Day	Express	20	Westwood Village to South Seattle College to Downtown Seattle
128	All-Day	Local	20	Southcenter to Admiral District
131	All-Day	Local	30	Burien Transit Center to Highland Park to Downtown Seattle
132	All-Day	Local	27	Burien Transit Center to South Park to Downtown Seattle
150	All-Day	Express	17	Kent Station to Southcenter to Downtown Seattle
177	Peak	Express	27	South Federal Way Park-and-ride to Downtown Seattle
178	Peak	Express	30	South Federal Way Park-and-ride to Downtown Seattle
C Line	All-Day	RapidRide	6	Westwood Village to South Lake Union
Link	All-Day	Rail	6	Seattle-Tacoma International Airport to Seattle

Note: Metro Connects defines frequent service as all-day with headways of 15 minutes or less. RapidRide is Metro's bus rapid transit service that has higher frequencies, transit speed improvements, and enhanced stations. Express service includes limited-stop service to major destinations that can be peak-only or all-day. Local service includes all other all-day service.

3.2.2 Transit Travel Times

There are numerous bus routes within the project corridor, but the RapidRide C Line follows a similar path for a downtown-to-West Seattle trip that could be taken on light rail with the project in place (although it does not serve the Delridge or SODO station areas). Between Downtown Seattle (Westlake Station) and West Seattle (Fauntleroy Way Southwest and Southwest Alaska Street), this trip on the RapidRide C Line takes an average of 22 minutes in the peak direction during the peak period, which is about 50 percent longer than during the off-peak period (Table 3-3). The same trip by private automobile would take about 16 minutes. Due to

congestion and other factors that impact reliability on the route (see Section 3.2.3.3, Reliability), travel times can vary substantially from these averages.

Table 3-3. Existing Transit Travel Times on RapidRide C Line (P.M. Peak Hour)

Trip	Direction	Existing P.M. Peak (minutes)	Existing Unconstrained/ Off-Peak (minutes)	Additional Travel Time due to Congestion (minutes)	Additional Travel Time due to Congestion (%)
3rd Avenue and Pike Street (Westlake Station) to Fauntleroy Way Southwest and Southwest Alaska Street	Outbound	22	15	+7	+47%
Fauntleroy Way Southwest and Southwest Alaska Street to 3rd Avenue and Pike Street (Westlake Station)	Inbound	19	15	+4	+27%

Source: Metro 2019b.

3.2.3 Transit Levels of Service

The performance of existing transit service along the project corridor was evaluated using L.O.S. measures for frequency, span of service, reliability, and passenger load. L.O.S. A reflects ideal conditions for the measure in question (e.g. all-day service, high frequency, ample seating) while L.O.S. F reflects poor conditions (e.g. limited hours, long headways, overcrowding). These measures were adapted from the *Transit Capacity and Quality of Service Manual*, third edition (Transportation Research Board of the National Academies 2013), and more information about how they were applied can be found in Attachment N.1B, Existing and Future Transit Routes and Levels of Service.

Routes were analyzed at two screenline locations along the new alignment: the West Seattle Bridge and north of South Lander Street in SODO (for maps, see Figure 1-5 and Figure 1-4). The a.m. peak period is defined as 5 a.m. to 9 a.m. and the p.m. peak period is 3 p.m. to 7 p.m. (Metro 2019c).

3.2.3.1 Frequency

Frequency L.O.S. is a transit service rating based on headways, or how frequently a bus or train stops at a given location. The better (shorter) the transit headway, the less time a rider must wait between transit arrivals, and therefore the better the frequency L.O.S. Transit routes that have headways of less than 10 minutes are rated L.O.S. A, whereas headways longer than 60 minutes are rated L.O.S. F.

The RapidRide C Line generally follows the path of the project between West Seattle and Downtown Seattle and currently operates at L.O.S. A during the peak and mid-day off-peak (6-minute and 10-minute headways, respectively).

Tables 3-4 and 3-5 show the average headways and corresponding frequency L.O.S. for all-day and peak-only transit routes that cross both screenlines. All-day routes generally have better frequency levels of service. Transit users tend to favor frequent routes: about three-quarters of existing ridership in the corridor is carried by routes operating at L.O.S. A or B. The 1 Line, which crosses the South Lander Street screenline, operates at 8-minute headways in the peak, or L.O.S. A.

Table 3-4. Existing Bus Service Average Frequency (A.M. Peak)

Screenline Location	Average Headway – All-Day Routes (minutes)	Average Frequency L.O.S. – All-Day Routes	Average Headway – Peak-Only Routes (minutes)	Average Frequency L.O.S. – Peak-Only Routes
West Seattle Bridge	12	B	41	D
North of South Lander Street	15	B	36	D

Table 3-5. Existing Bus Service Average Frequency (P.M. Peak)

Screenline Location	Average Headway – All-Day Routes (minutes)	Average Frequency L.O.S. – All-Day Routes	Average Headway – Peak-Only Routes (minutes)	Average Frequency L.O.S. – Peak-Only Routes
West Seattle Bridge	11	B	41	D
North of South Lander Street	17	C	35	D

3.2.3.2 Span

Span L.O.S. is a transit service rating based on the number of hours per day a transit service operates. The longer that transit service operates throughout the day, the more riders and types of trips it can serve—therefore a longer span is reflected in a better span level of service. L.O.S. A reflects service with a span greater than 18 hours, and L.O.S. D or worse indicates 11 hours or less of service.

Routes are typically categorized as all-day or peak-only. All-day routes have the longest span, running in the weekday a.m. and p.m. peaks, as well as during the mid-day, evening, and often late-night periods. All-day routes serve the widest variety of trip types and usually also run on weekends. Peak-only routes have shorter spans because they are structured to accommodate weekday commuter trips and generally lack mid-day and evening service. They are also less likely to run on the weekends. Table 3-2 notes these service types for the select routes operating in study area.

Tables 3-6 and 3-7 show the existing average L.O.S. for all-day and peak-only transit routes crossing the West Seattle Bridge and north of South Lander Street screenlines. The overall average span level of service for all-day routes is A, with the RapidRide C Line providing service 24 hours a day, seven days a week.

Table 3-6. Existing Transit Span of Service – Weekday

Screenline Location	Average Weekday Bus Span of Service – All-Day Routes (hours)	Average Weekday Bus Span L.O.S. – All-Day Routes	Average Weekday Bus Span of Service – Peak-Only Routes (hours)	Average Weekday Bus Span L.O.S. – Peak-Only Routes	Average Weekday Light Rail Span of Service (hours)	Average Weekday Light Rail Span L.O.S.
West Seattle Bridge	20	A	7	D	Not Applicable	Not Applicable
North of South Lander Street	20	A	7	D	20	A

Table 3-7. Existing Transit Span of Service – Weekend

Screenline Location	Average Bus Span of Service – All-Day Routes (hours)	Average Weekend Span L.O.S. – All-Day Routes	Average Weekend Light Rail Span of Service (hours)	Average Weekend Light Rail Span L.O.S.
West Seattle Bridge	19	A	Not Applicable	Not Applicable
North of South Lander Street	19	A	20	A

3.2.3.3 Reliability

Reliability L.O.S. is a transit service rating based on the consistency of a transit line's arrival time. Reliable service is desirable because it provides certainty for users, minimizes passenger waiting, and maximizes the efficiency of the system by evenly loading transit vehicles. Reliability is rated on a scale from A to F, with higher letter grades indicating better on-time performance. Ratings of L.O.S. E or F indicate unreliable service, in which even spacing between buses cannot be maintained. This causes excessive wait times and crowded buses, making transit less appealing for users.

Peak period reliability for bus routes in the project corridor is generally poor in the a.m. and p.m. peaks (L.O.S. D through F) in both the inbound and outbound directions (see Table 3-8).

The buses travel on congested streets for most of their routes. Most lines fail to meet Metro's evaluation threshold of 80 percent on-time trips ("on-time" is defined as a departure up to 1.5 minutes early and up to 5.5 minutes late). The RapidRide C Line, which generally follows the new project alignment, operates at L.O.S. E. In comparison, existing light rail service within the region has a high reliability (L.O.S. A) because it operates in exclusive right-of-way.

Detailed performance analysis by route can be found in Attachment N.1B.

Table 3-8. Existing Bus Service Reliability

Screenline Location	Direction	A.M. Peak Period Level of Service	P.M. Peak Period Level of Service
West Seattle Bridge	Inbound (east)	D	E
West Seattle Bridge	Outbound (west)	E	E
North of South Lander Street	Inbound (north)	E	E
North of South Lander Street	Outbound (south)	E	F

3.2.3.4 Passenger Load

Load L.O.S. measures passenger comfort by comparing the number of passengers on a transit vehicle to its capacity. For buses, this is the ratio between passengers and seats, and for light rail, it is the ratio between passengers and square feet of standing area. L.O.S. A indicates ample room for passengers and their personal items. L.O.S. D or worse indicates overcrowding. In addition to discomfort, overcrowding can cause service slowdowns and reliability problems because of inefficient boarding and alighting. It can also lead to stops being passed up when vehicles are full.

Tables 3-9 and Table 3-10 present average load factors and levels of service at the two analysis screenlines. On average, the bus load factors at the screenline locations are good. However, many of the more frequent, high-ridership routes are more crowded in peak directions during

peak periods. In particular, the RapidRide C Line operates at L.O.S. D, indicating standing room conditions in the peak direction during the peak periods. For detailed route-by-route values, see Attachment N.1B.

Table 3-9. Existing Transit Passenger Load Level of Service (A.M. Peak)

Screenline Location	Direction	Bus Average Load Factor	Bus L.O.S.	Link Light Rail Average Standing Passenger Space (square feet per person)	Link Light Rail L.O.S.
West Seattle Bridge	Inbound	0.9	C	Not Applicable	Not Applicable
West Seattle Bridge	Outbound	0.2	A	Not Applicable	Not Applicable
North of South Lander Street	Inbound	0.7	B	11	A
North of South Lander Street	Outbound	0.3	A	14	A

Table 3-10. Existing Transit Passenger Load Level of Service (P.M. Peak)

Screenline Location	Direction	Bus Average Load Factor	Bus L.O.S.	Link Light Rail Average Standing Passenger Space (square feet per person)	Link Light Rail L.O.S.
West Seattle Bridge	Inbound	0.3	A	Not Applicable	Not Applicable
West Seattle Bridge	Outbound	0.8	C	Not Applicable	Not Applicable
North of South Lander Street	Inbound	0.3	A	7	C
North of South Lander Street	Outbound	0.7	B	8	C

3.3 Environmental Impacts

The transit system was assessed for 2042 under the No Build Alternative and Build Alternatives. Its effects are measured in terms of transit service and facilities; regional, project, and segment/station ridership forecasts; transit travel time; and transit L.O.S. Construction-period impacts are also assessed.

3.3.1 No Build Alternative

The No Build Alternative assumes that the project has not been constructed by 2042, but that other planned Sound Transit system expansion projects are operating. In 2042, this would include the following:

- Ballard Link Extension
- Downtown Redmond Link Extension
- East Link Extension
- Everett Link Extension
- Federal Way Link Extension
- Hilltop Tacoma Link Extension
- Lynnwood Link Extension
- Northgate Link Extension
- Tacoma Community College Tacoma Link Extension
- Tacoma Dome Link Extension

Bus service assumptions for both the No Build Alternative and Build Alternatives were developed by Metro and Sound Transit as part of the project's Transit Service Integration Technical Memorandum, provided as Appendix B to Attachment N.1A, Transportation Technical Analysis Methodology Report. The memorandum was based on Metro Connects (Metro 2021), which provides a long-range plan for bus service in King County, integrating with future Sound Transit light rail and bus rapid transit services. Metro will continue to update the bus network as part of Metro Connects in coordination with agency partners as implementation progresses. The Transit Service Integration technical memorandum considers the bus routing networks as well as the frequency of service consistent with the planned growth in service hours in Metro Connects. With the No Build Alternative, the bus network in West Seattle is similar to existing conditions, although some frequencies are assumed to be higher due to the overall growth in bus service hours planned in Metro Connects.

For land use and trip growth assumptions see Section 2.3.1, No Build Alternative, in Chapter 2, Regional Context and Travel.

3.3.2 Build Alternatives

3.3.2.1 Long-term Impacts

Impacts Common to All Alternatives

All alternatives would increase transit ridership in the study area and region. Bus service would be restructured to integrate with Link, which would result in removing or truncating some lines but generally replacing them with reliable, high-frequency light rail service. Those bus service hours savings would be redeployed in accordance with Metro's service guidelines. The service changes are based on Metro Connects and coordination with Metro regarding this project. Transit travel times would be reduced along the project corridor when compared to surface bus routes, and transit L.O.S. for frequency, reliability, span of service, and passenger load would be improved or remain similar to conditions under the No Build Alternative.

Transit Service and Facilities

This section describes the transit services and facilities in 2042 under the Build Alternatives.

Service

By year 2042, with both West Seattle and Ballard Link light rail service in operation, most RapidRide, frequent, and express routes from Burien, White Center, High Point, and other areas south of the Alaska Junction would end at the Alaska Junction Station, while local routes would connect to all three West Seattle stations.

Route changes for the 2042 Build Alternatives include but would not be limited to the following (additional detail can be found in Attachment N.1A, Appendix B):

- Metro Connects Route 1041 (similar to RapidRide H Line) would follow the current pathway from Burien to Delridge Station, then continue on to serve the Admiral Junction area and Alki. Unlike the no build condition, this route would terminate in West Seattle and would not continue to Downtown Seattle.
- Metro Connects Route 2021 (similar to Route 21 without traveling downtown) would provide a connection between the Kent Station and northern West Seattle from Burien and White Center.

- Metro Connects Route 3034 (similar to Route 50) would provide east-west connectivity between West Seattle and the Mount Baker Station.
- Metro Connects Route 2003 (similar routing to the RapidRide C Line) would continue to serve the Fauntleroy Ferry terminal but then would instead provide express service to South Lake Union by the State Route 99 tunnel, thus bypassing Downtown Seattle. Route 2003 differs from RapidRide C Line in that it would not be an all-day frequent route.

These changes to bus routes would require layover near the Alaska Junction Station, the location of which would be determined in later phases of design in conjunction with the City of Seattle and Metro. Specific routing and layover locations (bus stops where buses stop for driver breaks or changing drivers) would consider adjacent land uses but could impact on-street parking and loading areas.

Under the M.O.S., in year 2042, bus services that would otherwise terminate at the Alaska Junction Station would be revised to serve the Delridge Station. This includes the following routes:

- Metro Connects Route 1043 (similar to Route 128) would serve the Alaska Junction area, but then continue on to the Delridge Station via 35th Avenue Southwest to Southwest Avalon Way to Southwest Genesee Street.
- Metro Connects Route 2003 (similar to the RapidRide C Line) would serve the Fauntleroy Ferry terminal and provide express service to South Lake Union by the State Route 99 tunnel, thus bypassing Downtown Seattle. This route would serve the Delridge Station via Southwest Avalon Way to Southwest Genesee Street.
- Metro Connects Route 2021 (similar to Route 21) would no longer serve Admiral Junction via Southwest Hanford Street, as described in Metro Connects, but would access the Delridge Station via 35th Avenue Southwest to Southwest Avalon Way to Southwest Genesee Street before continuing on to Downtown Seattle. This extension to Downtown Seattle would be a substantial departure from the routing in the full Build Alternatives, but it would provide a single-seat ride for West Seattle residents into downtown as an option to transferring to light rail at the Delridge Station.
- Metro Connects Route 3400 (similar to Routes 37 and 22) would be extended from Alaska Junction to the Delridge Station via 35th Avenue Southwest to Southwest Avalon Way to Southwest Genesee Street.

To accommodate this change in routing, additional active bay (bus stops where passengers board and alight from the bus) and layover spaces would be needed at the Delridge Station. Refer to Attachment N.1A, Appendix B for more information.

Facilities

With the 2042 Build Alternatives, bus stops and select layover areas and comfort stations (a facility used by transit staff) would be relocated to serve new or revised transit routes. This includes waiting areas for riders transferring to buses.

Relocation of existing transit facilities would be focused at the new light rail stations, which would intercept most of the bus routes that would otherwise travel across the West Seattle Bridge under the No Build Alternative. Bus stops and paratransit spaces are proposed to be generally adjacent to the light rail stations to provide safe and efficient transfer access.

Station area layover needs and potential impacts were assessed collaboratively by Sound Transit, Metro, and the City of Seattle and are also summarized in this section. In general, layover space would be allocated near the stations where bus routes terminate, and routing to

access the layover spaces would be kept as short as possible and on streets that can accommodate bus movements. Some streets may require pavement improvements to accommodate bus traffic, as determined in collaboration with Sound Transit and the City of Seattle. For more details, see Attachment N.1A, Appendix B and the conceptual design drawings in Appendix J of the Final EIS.

The information included in this section is based on the conceptual design of the project analyzed in this Final EIS. Sound Transit, Metro, and the City of Seattle will continue to coordinate to refine the design of station areas, bus stops, and layover accommodations as the project advances.

Key facilities affected include the following:

- SODO Station – For Preferred Option SODO-1c, bus stops would be along both sides of 4th Avenue South for north-south routes and in a new bus loop adjacent to the station for east-west routes. For Alternative SODO-1a, the east-west bus stops would have a similar configuration to the Preferred Option SODO-1c, but under this configuration, there would also be direct access to 4th Avenue South from the station. This access would allow north-south buses to serve the station just north of South Stacy Street (by relocating the existing stops near South Lander Street). For Option SODO-1b, the bus stops on 4th Avenue South near South Lander Street would also shift north to South Stacy Street. Terminating bus routes would use a new bus loop located off of 4th Avenue South north of South Lander Street, and Route 3034 (which would not terminate at the station) would use new bus stops near the intersection of South Lander Street and 6th Avenue South. All the bus stops along the SODO Busway near South Lander Street would be permanently closed for the Preferred Option SODO-1c, Alternative SODO-1a, and Option SODO-1b. Routes that used to use the SODO Busway would shift to 4th Avenue South.

  For Alternative SODO-2, north-south buses would stop on 4th Avenue South (with the option to stop along the SODO Busway, if Metro chooses to operate buses along that pathway) and on South Lander Street, just west of the SODO Busway.

  For all alternatives, an off-street loop would also accommodate bus layover spaces, pick-up/drop-off spots, paratransit access, and a driver comfort station. For Preferred Option SODO-1c, Alternative SODO-1a, and Alternative SODO-2, the loop would be east of the station, accessed from 6th Avenue South, although Alternative SODO-1a would also have a cul-de-sac for pick-up and drop-off and pedestrian and bicycle access that accesses 4th Avenue South opposite of South Stacy Street. For Option SODO-1b, the loop would be west of the station and accessed from 4th Avenue South. Option SODO-1c completely separates private vehicle pick-up/drop-off traffic from bus and paratransit areas.

- Delridge Station – For Preferred Option DEL-6b and Alternative DEL-7, bus stops would be located immediately adjacent to the station entrances. This would require northbound buses on Delridge Way Southwest to divert to Southwest Andover Street to access the station via a new transit-only road just west of the station; southbound buses would remain on Delridge Way Southwest. Paratransit would be located on the transit-only road and pick-up/drop-off would be on Southwest Andover Street. Alternative DEL-5 and Alternative DEL-6a would have a similar configuration, but northbound buses would divert to Southwest Dakota Street to access Southwest Andover Street via 26th Avenue Southwest to provide a bus stop immediately adjacent to the station; southbound buses would follow a similar route and have a bus stop on Southwest Andover Street immediately adjacent to the station entrance. This configuration would require a new transit or traffic signal at Southwest Dakota Street and Delridge Way Southwest. Pavement improvements and parking restrictions along 26th Avenue Southwest may be required to accommodate bus traffic. Paratransit access would be

on Southwest Andover Street, immediately adjacent to the station entrance and pick-up/drop-off would also be on Southwest Andover Street but located west of the bus stops.

Alternative DEL-1a and Option DEL-1b would have northbound buses divert to Southwest Genesee Street and 25th Avenue Southwest for a stop immediately adjacent to the station. No diversion would be required for southbound buses. These alternatives would also require a new traffic signal at Southwest Dakota Street and Delridge Way Southwest and potential pavement improvements and parking restrictions along 25th Avenue Southwest. Paratransit would be adjacent to the station entrance on Southwest Dakota Street and pick-up/drop-off would be on 26th Avenue Southwest. Alternative DEL-2a and Option DEL-2b would be similar to Alternative DEL-1a and Option DEL-1b except that northbound buses would access the station via 26th Avenue Southwest, turning to access the bus stop on Southwest Dakota Street. Paratransit and pick-up/drop-off would be on 26th Avenue Southwest.
For Alternatives DEL-3 and DEL-4, the station would straddle Delridge Way Southwest and there would be bus stops on both sides of Delridge Way Southwest, thus requiring no route deviation, although the existing bus stops along Delridge Way Southwest would be relocated to be immediately adjacent to the station entrances. Paratransit and pick-up/drop-off would be on Southwest Dakota Street. There is no layover assumed near the Delridge Station.

All alternatives would require transit priority (e.g., reconfigured bus only lanes, transit signal priority, transit-only signals) to facilitate access to the station for northbound buses on Delridge Way Southwest.

Alternatives DEL-1a and DEL-3 would impact the existing eastbound bus stop on Southwest Genesee Street in the vicinity of 30th Avenue Southwest by removing the sidewalk on the south side of Southwest Genesee Street. Alternative DEL-4 could eliminate the sidewalk east of the bus stop, but any land uses east of where the sidewalk would be removed that would need to be accessed are closer to the bus stop on Delridge Way Southwest; therefore, access would not be affected.

- Avalon Station (all alternatives) – Bus stops would be on Southwest Avalon Way and 35th Avenue Southwest, adjacent to the station. There is no layover identified at the Avalon Station, as no routes would terminate at the station. Paratransit would be immediately adjacent to a station entrance along Southwest Genesee Street for all alternatives (although for the two alternatives that have the station in a tunnel, Alternative WSJ-3a and Alternative WSJ-3b, paratransit would be on Southwest Genesee Street west of Fauntleroy Way Southwest). The pick-up/drop-off location would be north of the station on Southwest Genesee Street.
- Alaska Junction – For Preferred Option WSJ-5b, bus stops would be along Southwest Alaska Street, with westbound stops between 40th Avenue Southwest and 41st Avenue Southwest and eastbound stops between 42nd Avenue Southwest and 41st Avenue Southwest. Paratransit would be adjacent to the station entrance on 41st Avenue Southwest, and pick-up/drop-off would be on 40th Avenue Southwest and 41st Avenue Southwest.

  The bus stop locations for Alternatives WSJ-1, WSJ-2, WSJ-3a, WSJ-4, WSJ-5a, and WSJ-6 and Option WSJ-3b would be similar to Preferred Option WSJ-5b, also along either side of Southwest Alaska Street. Paratransit and pick-up/drop-off would also be generally adjacent to the station on lower-volume north-south streets like 38th Avenue Southwest, 40th Avenue Southwest, 41st Avenue Southwest, and 42nd Avenue Southwest.

  Because there would be two terminating routes at the Alaska Junction Station, there would be the need to accommodate layover space, including a comfort station, at or near the

station. Sound Transit, Metro, and the City of Seattle will continue to coordinate regarding the location of layover space as design advances. Layover space could be either on-street or integrated into the station area. If layover is ultimately located on-street, there could be impacts to parking.

In addition to changes around the station areas, the Build Alternatives would modify the SODO Busway in the SODO Segment. For Preferred Option SODO-1c, Alternative SODO-1a, and Option SODO-1b, the SODO Busway would be permanently closed to accommodate the light rail guideway. For Alternative SODO-2, the busway would remain open to buses after construction.

Metro Connects anticipated the closure of the SODO Busway as part of Sound Transit 3 Plan Link expansion projects and Metro plans to reroute all future active routes (Route 101 and Route 1088) and deadhead routes to 4th Avenue South. However, when compared to the no build condition, closure of the busway would result in active and deadhead buses experiencing increased travel times during the peak hour on 4th Avenue South. These increased travel times are consistent with intersection delay results presented in Chapter 4, Arterial and Local Street Operations, of this report. The SODO Busway also has numerous existing layover areas that would be eliminated by a permanent closure. The total layover space available on the SODO Busway is approximately 1,700 feet, which accommodates 21 articulated buses, based on information from Metro.

Removal of the SODO Busway for Preferred Option SODO-1c, Alternative SODO-1a, and Option SODO-1b could affect formula funding for transit providers that use that facility. Sound Transit will continue to coordinate with the City and Metro to determine how the alternative bus routing on 4th Avenue South would accommodate buses shifting from the Busway to 4th Avenue South. This includes exploring transit treatments such as queue jumps, business access and transit lanes, and freight and bus lanes.

Transfer Environment

Transfers in West Seattle would increase with the 2042 Build Alternatives because some bus passengers originating in West Seattle, White Center, and Burien would transfer to light rail, particularly if they are destined for Downtown Seattle or other points along the light rail network.

There would be more transfers with the Build Alternatives, and the transfer environment would be enhanced to provide for safe and efficient movement between buses and light rail. For many alternatives, bus stops would be immediately adjacent to light rail station entrances. Where a street crossing is required, it would be at an existing, new, or enhanced crossing.

- SODO Station – The SODO Station would be the first opportunity for West Seattle passengers to transfer between the 3 Line from West Seattle and the 1 Line. The light rail stations would be built side-by-side, thus providing a direct transfer environment, though transfer movement patterns would be different between the alternatives due to the varying profiles. For all Build Alternatives, bus transfers to Routes 101 and 1088 would require crossing either 4th Avenue South or South Lander Street, although there are existing or planned signalized crossings near each of the bus stop pairs. For Preferred Option SODO-1c, the walk distance between the 4th Avenue South bus stops and the south SODO Station entrance is approximately one-quarter mile. Sound Transit would continue to explore options to reduce the walk distance through new station access points closer to 4th Avenue South.

  There would be a multi-year period between the opening of the West Seattle Link Extension and the opening of the Ballard Link Extension, which connects the West Seattle Link Extension directly to the existing light rail system. During that period, West Seattle Link Extension riders who wish to continue their trip on light rail would have to transfer to the

1 Line at the SODO Station. After Ballard Link Extension opens, riders from West Seattle could continue north on the 3 Line without a transfer.

- Delridge Station – The Delridge Station would be a major transfer point for bus-to-rail transfers, with about 90 percent of all light rail boardings coming from buses. This translates to more than 5,000 projected daily transfer boardings at Delridge Station. For the Preferred Option DEL-6b and all other station alternatives except Alternatives DEL-5 and DEL-6a, bus-to-rail transfers would occur without the need to cross a street. For Alternatives DEL-5 and DEL-6a, passengers to and from northbound Delridge Way Southwest buses would need to cross Southwest Andover Street.
- Avalon Station – The Avalon Station is not expected to be a major transfer point between buses and trains (fewer than 500 daily transfer boardings). For all West Seattle Junction Segment alternatives, including Preferred Option WSJ-5b, some transfers would require crossing either 35th Avenue Southwest or Southwest Avalon Way at the existing signalized intersection.
- Alaska Junction Station – Like the Delridge Station, Alaska Junction would be a notable transfer point between buses and rail, with more than 3,500 daily transfer boardings forecast under 2042 conditions. For Preferred Option WSJ-5b, bus stops would be adjacent to the station on Southwest Alaska Street and no street crossing would be required. However, for all West Seattle Junction Segment alternatives, some bus routes would not deviate to Southwest Alaska Street and would require crossing either California Avenue Southwest or Fauntleroy Way Southwest at existing signalized intersections.

Transit Travel Time

Table 3-11 presents travel times for a representative trip between the Westlake and Alaska Junction stations with and without the project for all alternatives. Travel times are similar for both directions during the a.m. and p.m. peak periods due to light rail operating within its own right-of-way. In 2042, the project would cut transit travel times by almost half when compared to forecasted bus travel times, thus making a ride on the 3 Line competitive with a private automobile trip (approximately 24 minutes), assuming a 5-minute walk at the start and end of the transit trip. Travel time savings may vary depending on origin and destination and whether transfers are necessary.

Table 3-11. 2042 Transit Travel Times (A.M. and P.M. Peak Period)

Trip	2042 No Build – Bus (minutes)	2042 Build Alternatives (minutes)	Travel Time Change (minutes)	Travel Time Change (%)
Westlake Station to Alaska Junction Station (outbound)	30	16	-14	-47%
Alaska Junction Station to Westlake Station (inbound)	30	16	-14	-47%

Notes:

Modeling for the 2042 alternatives performed using Sound Transit ridership and operational models.

a.m. travel times are the inverse of the p.m. travel times presented here, e.g. p.m. outbound = a.m. inbound

Beyond the in-vehicle rail travel times, a rider's trip time would vary depending on the station platform's vertical distance from the street level. Some of the higher elevated stations (i.e., Alternative DEL-1a or Option DEL-1b) or deeper tunnel stations (i.e., Alternative WSJ-3a or Option WSJ-3b) would take approximately 1 minute to 90 seconds for a rider to walk within the station between the train platform and the ground-level entrance, relative to access times for the

other alternatives in those segments. Use of the elevator can reduce this extra walk time, depending on wait times. In-station travel times were estimated using architectural drawings; see Appendix J, Conceptual Design Drawings.

For Alternative DEL-7, which would not include an Avalon Station or the M.O.S., which would not include the Avalon and Alaska Junction stations, longer trips could occur for riders originating in those station areas who would need to take an additional bus ride to access the light rail system. The extra time would vary depending on the specifics of the trip, but a hypothetical peak period trip on the RapidRide C Line from the Alaska Junction Station area to the Delridge Station terminus could add between 10 minutes and 15 minutes. Riders traveling to or from the Alaska Junction Station could save about 1 minute under Alternative DEL-7 with no Avalon Station.

As noted previously in this section, under Transit Service and Facilities, the RapidRide H Line would be truncated and no longer serve Downtown Seattle under the full build in 2042. This would necessitate a transfer for riders traveling between communities to the south of West Seattle and points along the project corridor that would otherwise be directly served by the RapidRide H Line under the no build condition. However, the project would provide considerable time savings for these riders despite the new transfer. For example, a ride from Southwest 116th Street and Ambaum Boulevard Southwest to the Westlake Station would take 16 to 18 fewer minutes with the project in place, including the transfer at the Delridge Station, when compared to a trip on the RapidRide H Line under the no build condition.

Prior to the opening of the Ballard Link Extension, West Seattle Link Extension riders who wish to continue their trip on light rail to Downtown Seattle would have to transfer to the 1 Line at SODO Station. This would add about 5 minutes on average to their trip. The RapidRide C and H Lines would continue to provide a one-seat ride to Downtown and South Lake Union during this time period. When the Ballard Link Extension project is completed, the 3 Line would extend to Everett, which would provide West Seattle riders direct service to Downtown Seattle and beyond.

Ridership

Ridership forecasts were produced using the Sound Transit Incremental Ridership Model. Forecasts were conducted for the alternatives at the system, project, and segment levels to estimate how ridership would differ between alternatives. In some instances, a single forecasted value is presented for all or a subset of the alternatives, when forecasts for individual alternatives would not notably differ. This is the case for the system and project-level forecasts, and for some of the segment-level forecasts.

For the M.O.S., 2042 ridership forecasts are provided for the project as a whole and for the Delridge Station, its western terminus. The station forecasts in the other segments were lower under the M.O.S. than under the full build and therefore were not included.

System-wide Ridership

Transit ridership was forecasted for the Sound Transit service area in King, Pierce, and Snohomish counties with and without the project in 2042 using the Sound Transit Incremental Ridership Model. Under the “base” land use scenario, about 764,000 trips would be taken on the system with the No Build Alternative, and with the Preferred Alternative there would be 766,000 trips, for a net

Transit Trips

A transit trip is a journey by one person from an origin to a destination that includes at least one leg on bus, rail, or another transit mode. This is different than a boarding, which refers to the act of entering a transit vehicle; a trip may include more than one boarding. Station-level boardings for the project are presented later in this section.

increase of 2,000 daily trips. “Low” and “high” ridership forecasts were also developed to present a reasonable range of potential ridership, given the inherent uncertainty in predicting future travel behavior. The low ridership forecast is 667,000 system-wide trips per day, and the high forecast is 856,000 trips per day.

The COVID-19 pandemic disrupted commute patterns, including transit ridership, beginning in 2020. After the initial steep declines experienced in 2020 and 2021, transit ridership has steadily increased, with 2022 Link light rail ridership only slightly below 2019 levels, in part due to the opening of the Northgate Link extension. While Sound Transit’s ridership forecast model does not explicitly take the pandemic into account, recent ridership data indicate that the variation in ridership attributable to pandemic-related changes in travel patterns is within the range of values presented here under the low to high ridership scenarios. Therefore, the long-range forecasts developed for this Final EIS remain reasonable estimates for planning purposes.

Project Ridership

Between 24,000 and 27,000 riders per day are expected to use the project in 2042 under all full Build Alternatives, with 26,000 forecasted under the “base” ridership scenario. Elimination of the Avalon Station under Alternative WSJ-6 would have a limited effect on project ridership. The M.O.S. would have fewer riders than the full Build Alternatives (about 17,000 trips per day) due to the lack of the Avalon and Alaska Junction stations.

SODO Segment Ridership

The SODO Segment has the existing SODO light rail station, and a second station would be constructed next to it as part of the project.

In 2042, light rail boardings in the SODO Segment are expected to more than triple with the project (Table 3-12). SODO Station is the first stop where Tacoma riders could transfer to reach the Stadium Station, and it is also the first opportunity for 3 Line (West Seattle) riders to transfer to the 1 Line (Ballard-to-Tacoma). Because all the station alternatives are relatively close to each other and have similar transit integration profiles, boardings are forecasted to be similar for all SODO Segment alternatives.

Table 3-12. 2042 SODO Segment Station Daily Boardings by Mode of Access

Station	No Build Alternative	All Build Alternatives Except M.O.S. [a]	M.O.S.
SODO (new station) – Walk, Bike, Pick-up/Drop-off	Not Applicable	1,500	1,400
SODO (new station) – Bus Transfers	Not Applicable	1,300	1,300
SODO (new station) – Light Rail Transfers	Not Applicable	4,500	3,400
SODO (existing station) – Walk/Bike, Pick-up/Drop-off	2,600	1,400	1,400
SODO (existing station) – Bus Transfers	1,900	1,300	1,500
SODO (existing station) – Light Rail Transfers	Not Applicable	4,500	3,400
Segment Total	**4,400**	**14,600**	**12,400**

[a] Includes Preferred Option SODO-1c, Alternative SODO-1a, Option SODO-1b, and Alternative SODO-2

Note: Totals may not exactly equal the sum of addends due to rounding.

Duwamish Segment Ridership

The Duwamish Segment does not include any stations.

Delridge Segment Ridership

In 2042, daily boardings would be similar under all full Build Alternatives (Table 3-13). Alternative DEL-7, which would only connect to Alternative WSJ-6 in the West Seattle Junction Segment, would see slightly fewer transfers because of bus network changes associated with the absence of Avalon Station in the West Seattle Junction Segment. Ridership would be about 50 percent higher under the M.O.S. because the Delridge Station would be the terminus station and would be served by additional bus connections, thus generating more bus-rail transfers.

Table 3-13. 2042 Delridge Segment Station Daily Boardings by Mode of Access

Station	All Build Alternatives Except Alternative DEL-7 and M.O.S. [a]	Alternative DEL-7	M.O.S.
Delridge – Walk, Bike, Pick-up/Drop-off	700	700	700
Delridge – Bus Transfers	4,700	4,600	7,800
Segment Total	**5,400**	**5,300**	**8,400**

[a] Includes Preferred Option DEL-6b, Alternative DEL-1a, Option DEL-1b, Alternative DEL-2a, Option DEL-2b, Alternative DEL-3, Alternative DEL-4, Alternative DEL-5, and Alternative DEL-6a.

Note: Totals may not exactly equal the sum of addends due to rounding.

West Seattle Junction Segment Ridership

In 2042, the number of boardings at the Avalon and Alaska Junction stations with most full Build Alternatives is expected to be similar (see Table 3-14). Of the two, the Alaska Junction Station is forecasted to have higher ridership because of its role as a bus-to-rail transfer hub and the denser land use around the station. Elimination of Avalon Station under Alternative WSJ-6 would shift some riders from that station to Alaska Junction Station, and segment ridership would be modestly higher for Alternative WSJ-2 driven by higher numbers of walk, bike, and drop-off/pick-up trips at Alaska Junction.

Table 3-14. 2042 West Seattle Junction Segment Station Daily Boardings by Mode of Access

Station	All Build Alternatives and Options Except Alternatives WSJ-2 and WSJ-6 [a]	Alternative WSJ-2 -- Elevated Fauntleroy	Alternative WSJ-6 -- No Avalon Station Tunnel
Avalon – Walk, Bike, Pick-up/Drop-off	1,400	800	Not Applicable
Avalon – Bus Transfers	900	400	Not Applicable
Alaska Junction – Walk, Bike, Pick-up/Drop-off	2,100	3,000	3,000
Alaska Junction – Bus Transfers	3,200	3,800	4,500
Segment Total	**7,600**	**8,000**	**7,500**

[a] Includes Preferred Option WSJ-5b, Alternative WSJ-1, Alternative WSJ-3a, Option WSJ-3b, Alternative WSJ-4, and Alternative WSJ-5.

Note: Totals may not exactly equal the sum of addends due to rounding.

Transit Levels of Service

Frequency

Tables 3-15 through 3-18 present the anticipated average bus frequencies at analysis screenlines in the study area for the weekday a.m. and p.m. peak periods (5 a.m. to 9 a.m. and 3 p.m. to 7 p.m.) in 2042. The 3 Line (West Seattle to Everett) would run every 6 minutes (L.O.S. A) during peak periods, and the 1 Line (Tacoma to Ballard), which would also be operating across the north of South Lander Street screenline in 2042, would run every 5 minutes (L.O.S. A). The service restructures associated with the project are expected to slightly improve average bus frequency in the corridor.

Table 3-15. 2042 Transit Frequency – All-Day Routes (A.M. Peak)

Screenline Location	No Build Average Bus Headway (minutes)	No Build Average Bus Frequency L.O.S.	Build Average Bus Headway (minutes)	Build Average Bus Frequency L.O.S.	Build Average Light Rail Headway (minutes)	Build Average Light Rail Frequency L.O.S.
West Seattle Bridge	15	B	13	B	6	A
North of South Lander Street	16	C	14	B	6	A

Table 3-16. 2042 Transit Frequency – All-Day Routes (P.M. Peak)

Screenline Location	No Build Average Bus Headway (minutes)	No Build Average Bus Frequency L.O.S.	Build Average Bus Headway (minutes)	Build Average Bus Frequency L.O.S.	Build Average Light Rail Headway (minutes)	Build Average Light Rail Frequency L.O.S.
West Seattle Bridge	15	B	13	B	6	A
North of South Lander Street	16	C	13	B	6	A

Table 3-17. 2042 Transit Frequency – Peak-Only Routes (A.M. Peak)

Screenline Location	No Build Average Bus Headway (minutes)	No Build Average Bus Frequency L.O.S.	Build Average Bus Headway (minutes)	Build Average Bus Frequency L.O.S.
West Seattle Bridge	30	C	Not Applicable	Not Applicable
North of South Lander Street	31	D	20	C

Table 3-18. 2042 Transit Frequency – Peak-Only Routes (P.M. Peak)

Screenline Location	No Build Average Bus Headway (minutes)	No Build Average Bus Frequency L.O.S.	Build Average Bus Headway (minutes)	Build Average Bus Frequency L.O.S.
West Seattle Bridge	34	D	Not Applicable	Not Applicable
North of South Lander Street	30	C	20	C

Span

In 2042, the average span L.O.S. for buses would improve slightly from B to A with the project (Table 3-19), as service would be restructured to complement the project. The project would provide 20 hours of high-capacity light rail service per day (L.O.S. A), seven days a week, with future bus routes providing up to 19 hours of service a day at both screenlines as well. There would be no peak-only routes at the West Seattle Bridge screenline under the build condition, while the span for these routes would improve slightly at the north of South Lander Street screenline (see Table 3-20).

Table 3-19. 2042 Transit Span of Service – All-Day Routes (Weekdays and Weekends)

Screenline Location	No Build Average Bus Span of Service (hours)	No Build Average Bus Span L.O.S.	Build Average Bus Span of Service (hours)	Build Average Bus Span L.O.S.	No Build Light Rail Span of Service (hours)	No Build Light Rail Span L.O.S.	Build Light Rail Span of Service (hours) L.O.S.	Build Light Rail Span L.O.S.
West Seattle Bridge	17	B	19	A	Not Applicable	Not Applicable	20	A
North of South Lander Street	18	B	18	A	20	A	20	A

Table 3-20. 2042 Transit Span of Service – Peak-Only Routes (Weekdays)

Screenline Location	No Build Average Bus Span of Service (hours)	No Build Average Bus Span L.O.S.	Build Average Bus Span of Service (hours)	Build Average Bus Span L.O.S.
West Seattle Bridge	5	E	Not Applicable	Not Applicable
North of South Lander Street	6	E	7	D

Reliability

Most bus service in the project corridor would operate at L.O.S. E and F in 2042 under the No Build Alternative due to current and expected future traffic congestion in the corridor (refer to Section 4.3.1, No Build Alternative). Even though bus transit speed and reliability improvements are being planned along portions of some roadways in the project corridor, the overall transit reliability is not expected to improve substantially beyond existing conditions, as buses would continue to mainly operate within general traffic.

Under the Build Alternatives, the project would operate at reliability L.O.S. A, as the project would be within exclusive right-of-way separated from vehicle traffic.

Passenger Load

In 2042, project ridership forecasts anticipate ample seating and standing room for passengers on the project (3 Line) (Table 3-21). Passenger load conditions on the 1 Line would be unaffected. Bus passengers would experience similar or improved load conditions with the project in place, as some transit passengers would switch to the 3 Line (Table 3-22).

Table 3-21. 2042 Light Rail Passenger Load Level of Service (Peak Period)

Screenline Location	Direction [a]	No Build L.O.S.	Preferred Alternative Build L.O.S.	Alternative WSJ-6 No Avalon Build L.O.S.	M.O.S. Build L.O.S.
West Seattle Bridge – 3 Line	P.M. Inbound/ A.M. Outbound	Not Applicable	A	A	A
West Seattle Bridge – 3 Line	P.M. Outbound/ A.M. Inbound	Not Applicable	A	A	A
North of South Lander Street – 3 Line	P.M. Inbound/ A.M. Outbound	Not Applicable	A	A	A
North of South Lander Street – 3 Line	P.M. Outbound/ A.M. Inbound	Not Applicable	A	A	A
North of South Lander Street – 1 Line	P.M. Inbound/ A.M. Outbound	A	A	A	A
North of South Lander Street – 1 Line	P.M. Outbound/ A.M. Inbound	E	E	E	E

Notes:

Source of forecasts is the Sound Transit Incremental Ridership Model.

[a] Inbound toward Downtown Seattle, outbound away from Downtown Seattle.

Table 3-22. 2042 Bus Passenger Load Level of Service (Peak Period)

Screenline Location	Direction [a]	No Build L.O.S.	Preferred Alternative Build Bus L.O.S.	Alternative WSJ-6 No Avalon Build L.O.S.	M.O.S. Build L.O.S.
West Seattle Bridge	P.M. Inbound/ A.M. Outbound	A	A	A	A
West Seattle Bridge	P.M. Outbound/ A.M. Inbound	C	A	A	B
North of South Lander Street	P.M. Inbound/ A.M. Outbound	B	A	A	A
North of South Lander Street	P.M. Outbound/ A.M. Inbound	B	A	B	A

Notes:

Source of forecasts is the Sound Transit Incremental Ridership Model.

[a] Inbound toward Downtown Seattle, outbound away from Downtown Seattle.

3.3.2.2 Construction Impacts

Construction activities for the project could affect transit in the following ways:

- Bus operations and routing impacts due to roadway/lane closures
- 1 Line operations and transit access disruptions due to construction of the South Lander Street overpass and SODO Station
- Impacts to transit infrastructure and facilities as well as their access

Transit Operations and Routing Impacts

Roadway and lane closures during construction may impact transit operations by increasing traffic congestion or requiring transit to find an entirely new pathway, which may affect travel times. Sound Transit would work with the City of Seattle and Metro to reduce operations and routing impacts to the extent practical, given other uses of the affected roadway. Rerouting buses to new pathways could also impact pavement conditions. Sound Transit would work with the City of Seattle to implement pavement management and restoration strategies, depending on the duration of the reroute.

Transit Infrastructure and Facilities Impacts

Road, lane, and sidewalk closures may require bus stop, layover, and comfort station relocations during project construction. Sound Transit would maintain access to existing bus stops and layovers/comfort stations to the extent feasible and coordinate with Metro and other transit providers to identify temporary/interim facilities during closures. Information (e.g., rider alerts) would be posted at transit stops before construction at these locations.

Sidewalk closures would also affect pedestrians accessing transit. Sound Transit would maintain pedestrian access, where feasible, through construction areas, such as providing dedicated walkways or alternative pathways around the construction area. Sound Transit would also notify the public of any closures as appropriate.

With Alternative SODO-2, the SODO Busway would close for guideway construction for 5 years. This closure would affect all bus routes that currently use the SODO Busway and would require deviation for active and deadhead routes to adjacent parallel streets. Sound Transit is also planning for the Ballard Link Extension which is a proposed light rail extension from SODO Station to Ballard. If this were constructed, it would create a cumulative closure of the SODO Busway for 10 years.

Impacts Common to All Alternatives

Detailed descriptions of the roadway closures during construction, including extents and closure durations, are provided in Section 4.3.3, Construction Impacts. During construction, there would be temporary impacts to bus pathways, bus travel times and reliability, sidewalks and bike lanes that access transit and layover areas. For areas with construction within the roadway right-of-way, streets may operate with fewer lanes or be temporarily closed, which would affect roadway operations, including bus service along those streets.

Durations of roadway construction closures would vary from nights and weekends to multi-year closures. At locations where roadways would have a full closure, bus routes may need to use alternate pathways and temporary bus facilities may need to be installed. Bus routes could also face delays from increased traffic congestion. In general, project alternatives constructed outside the roadway right-of-way would have minimal impacts on bus routes, although some pedestrian and bicycle access to transit routes may be temporarily affected.

Specific transit services and/or facilities that are expected to be affected by construction for at least 1 year are described in the following segment-specific discussions. Key shorter-duration construction impacts to transit services and facilities (lasting at least 6 months) are also highlighted where there are substantial differences between alternatives or where many transit routes/transit trips would be affected, but the analysis does not consider every short-duration transit impact from construction. See Attachment N.1D, Permanent and Temporary Transportation Facility Closures, for a more complete list of the roadway construction closures expected for each alternative and design option.

For all alternatives, there would be potential construction-related impacts to 1 Line operations and access. Details of construction phasing would not be finalized until final design, but a long-term (greater than 1 year) closure of the existing SODO Station may be needed while the 1 Line operates on a temporary track around the construction area. Closure of the SODO Station would reduce light rail access to the SODO area. There could also be short-term service interruptions for 1 Line service to relocate overhead catenary system wires and adjust the track and other related roadway and station construction. These short-term service interruptions could result in longer headways during single-track operations or complete service interruptions during nights and weekends.

SODO Segment

Under Preferred Option SODO-1c, as well as Alternative SODO-1a and Option SODO-1b, South Lander Street between 4th Avenue South and 6th Avenue South would be closed for construction, which would affect Route 50. The SODO Busway would be permanently closed to bus use with these alternatives. In Section 3.3.2.1, the permanent effect of this closure on bus service is described. Construction of the South Lander Street overpass could also cause short-term operations impacts to 1 Line service.

Under Alternative SODO-2, South Lander Street would remain open. The SODO Busway would be closed during the duration of the project construction period (5 years). Sound Transit is also planning for the Ballard Link Extension, which is a proposed light rail extension from SODO Station to Ballard. If this were constructed, it would create a cumulative closure of the SODO Busway for approximately 10 years. The SODO Busway temporary closure would affect 60 to 80 peak hour Metro buses, including both revenue and non-revenue trips (Table 3-23). After this time, the SODO Busway would reopen for bus access. Temporary construction impacts on transit with the SODO Busway closure would be similar to those described in Section 3.3.2.1 for Preferred Option SODO-1c.

Table 3-23. Key Arterial Roadway Closures Affecting Transit Routes – SODO Segment

Alternative	Affected Street	From Street	To Street	Closure Type	# of Affected Buses: Minimal per Hour	# of Affected Buses: 5 to 40 per Hour	# of Affected Buses: 41 to 100 per Hour	# of Affected Buses: 101 to 200 per Hour	# of Affected Buses: >200 per Hour	Frequent/ RapidRide Routes Affected [a]	Express Routes Affected [a]	Local Routes Affected [a]	Non-Revenue Routes Affected [b]
Preferred Option SODO-1c	**SODO Busway**	**South Massachusetts Street**	**South Spokane Street**	**Full**	**Not Applicable**	**Not Applicable**	**Permanent**	**Not Applicable**	**Not Applicable**	**2**	**4**	**1**	**11**
Preferred Option SODO-1c	**South Lander Street**	**4th Avenue South**	**6th Avenue South**	**Full**	**3 years**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**1**	**0**	**0**	**0**
Alternative SODO-1a	SODO Busway	South Massachusetts Street	South Spokane Street	Full	Not Applicable	Not Applicable	Permanent	Not Applicable	Not Applicable	2	4	1	11
Alternative SODO-1a	South Lander Street	4th Avenue South	6th Avenue South	Full	3 years	Not Applicable	Not Applicable	Not Applicable	Not Applicable	1	0	0	0
Option SODO-1b	SODO Busway	South Massachusetts Street	South Spokane Street	Full	Not Applicable	Not Applicable	Permanent	Not Applicable	Not Applicable	2	4	1	11
Option SODO-1b	South Lander Street	4th Avenue South	6th Avenue South	Full	3 years	Not Applicable	Not Applicable	Not Applicable	Not Applicable	1	0	0	0
Alternative SODO-2	SODO Busway	South Massachusetts Street	South Spokane Street	Full	Not Applicable	Not Applicable	5 years	Not Applicable	Not Applicable	2	4	1	11

Notes:

Non-arterial roadway closures are not shown as the potential transit impacts would be expected to be less than an arterial roadway closure.

Most-likely affected roadways are listed. Other roadways could be affected depending on final construction plans.

[a] The type and number of bus routes affected is based on Metro Connects and the assumed frequencies for different types of bus services.

[b] Approximate number of routes based on 2018 routing to bases.

Duwamish Segment

Preferred Alternative DUW-1a would require partial closure of 4th Avenue South for 12 to 18 months. All traffic would be shifted to the other half of the roadway, which would affect Routes 101/102, 131, and 132.

While night and weekend closures are not the focus of transit operations impacts, since they affect fewer patrons, there would be full night and weekend closures of Delridge Way Southwest immediately south of the West Seattle Bridge (to accommodate guideway construction) under the Preferred Alternative DUW-1a if connected to Preferred Option DEL-6b and Alternatives DEL-5, DEL-6a, and DEL-7. Given the limited roadway network and steep grades on alternative transit pathways, these closures could require more substantial reroutes and resulting reduction in transit coverage (bus stops not being served by fixed routes) for Routes 50, 125, and RapidRide H. See Table 4-23 in Section 4.3.3.3, Duwamish Segment, for more detail on night and weekend closures in the Duwamish Segment.

Delridge Segment

With Preferred Option DEL-6b, there would be no long-term roadway closures that would affect transit operations. Alternative DEL-1a, Option DEL-1b, and Alternative DEL-3 would affect Route 50 on Southwest Genesee Street and would require a new transit pathway for the duration of construction (Table 3-24). Given the terrain in the area, there are limited options for rerouting Route 50 in the study area and maintaining a direct connection between the Delridge and Alaska Junction area could be challenging.

Alternatives DEL-1a, DEL-1b, DEL-2a, DEL-2b, DEL-3, and DEL-4 would require full night and weekend closures of Delridge Way Southwest between 23rd Avenue Southwest and Southwest Dakota Street, impacting Routes 50, 125, and RapidRide H. Given the limited roadway network and steep grades on alternative transit pathways, these closures could require more substantial reroutes and result in reduction of transit coverage.

Alternatives DEL-3 and DEL-4 would have the longest construction effects on Delridge Way Southwest (3 years), which could affect Routes 50 and 125 and the RapidRide H Line with partial closures to accommodate station construction.

Under Alternative DEL-5, a full closure of Southwest Avalon Way for 1 year would require the rerouting of up to eight Metro routes, including Routes 21 and 55 and the RapidRide C Line. Given the number of routes and extent of this construction closure, this would be a more substantial construction transit impact than any others in the Delridge Segment.

There would be minimal effects to transit with Alternatives DEL-6a or DEL-7 because there would be no long-term closures of bus pathways with these alternatives.

Table 3-24. Key Arterial Roadway Closures Affecting Transit Routes – Delridge Segment

Alternative	Affected Street	From Street	To Street	Closure Type	# of Affected Buses: Minimal per Hour	# of Affected Buses: 5 to 40 per Hour	# of Affected Buses: 41 to 100 per Hour	# of Affected Buses: 101 to 200 per Hour	# of Affected Buses: >200 per Hour	Frequent/ RapidRide Routes Affected [a]	Express Routes Affected [a]	Local Routes Affected [a]
Alternative DEL-1a	Delridge Way Southwest	23rd Avenue Southwest	Southwest Dakota Street	Partial	Not Applicable	9 months	Not Applicable	Not Applicable	Not Applicable	1	0	2
Alternative DEL-1a	Southwest Genesee Street	26th Avenue Southwest	Southwest Avalon Way	Full	Not Applicable	2 years	Not Applicable	Not Applicable	Not Applicable	0	0	1
Option DEL-1b	Delridge Way Southwest	23rd Avenue Southwest	Southwest Dakota Street	Partial	Not Applicable	9 months	Not Applicable	Not Applicable	Not Applicable	1	0	2
Option DEL-1b	Southwest Genesee Street	26th Avenue Southwest	Southwest Avalon Way	Full	Not Applicable	2 years	Not Applicable	Not Applicable	Not Applicable	0	0	1
Alternative DEL-2a	Delridge Way Southwest	23rd Avenue Southwest	Southwest Dakota Street	Partial	Not Applicable	9 months	Not Applicable	Not Applicable	Not Applicable	1	0	2
Option DEL-2b	Delridge Way Southwest	23rd Avenue Southwest	Southwest Dakota Street	Partial	Not Applicable	9 months	Not Applicable	Not Applicable	Not Applicable	1	0	2
Option DEL-2b	Southwest Genesee Street	26th Avenue Southwest	Southwest Avalon Way	Partial	Not Applicable	9 months	Not Applicable	Not Applicable	Not Applicable	0	0	1
Alternative DEL-3	Delridge Way Southwest	23rd Avenue Southwest	Southwest Dakota Street	Partial	Not Applicable	3 years	Not Applicable	Not Applicable	Not Applicable	1	0	2

Alternative	Affected Street	From Street	To Street	Closure Type	# of Affected Buses: Minimal per Hour	# of Affected Buses: 5 to 40 per Hour	# of Affected Buses: 41 to 100 per Hour	# of Affected Buses: 101 to 200 per Hour	# of Affected Buses: >200 per Hour	Frequent/ RapidRide Routes Affected [a]	Express Routes Affected [a]	Local Routes Affected [a]
Alternative DEL-3	Southwest Genesee Street	26th Avenue Southwest	Southwest Avalon Way	Full	Not Applicable	2 years	Not Applicable	Not Applicable	Not Applicable	0	0	1
Alternative DEL-4	Delridge Way Southwest	23rd Avenue Southwest	Southwest Dakota Street	Partial	Not Applicable	3 years	Not Applicable	Not Applicable	Not Applicable	1	0	2
Alternative DEL-4	Southwest Genesee Street	26th Avenue Southwest	Southwest Avalon Way	Partial	Not Applicable	9 months	Not Applicable	Not Applicable	Not Applicable	0	0	1
Alternative DEL-5	Southwest Avalon Way	Southwest Yancy Street	Southwest Genesee Street	Full	Not Applicable	Not Applicable	1 year	Not Applicable	Not Applicable	1	6	1

Note: Non-arterial roadway closures are not shown, as the potential transit impacts would be expected to be less than an arterial roadway closure.

[a] The type and number of bus routes affected is based on Metro Connects and the assumed frequencies for different types of bus services.

West Seattle Junction Segment

Construction for Preferred Option WSJ-5b would have minimal effects on transit operations (Table 3-25), although the closure of 35th Avenue Southwest between Southwest Avalon Way and the West Seattle Bridge would impact Route 21X. Congestion from closures of 35th Avenue Southwest and the phased closure of the Southwest Avalon Way and Fauntleroy Way Southwest intersection could cause congestion spillback or general purpose traffic diversion that could affect operations of routes along Southwest Avalon Way (e.g., RapidRide C, Route 21, Route 21X, Route 50, and Route 55). Construction closures with Alternative WSJ-3a, Option WSJ-3b, and Alternative WSJ-5a along 35th Avenue Southwest between Southwest Avalon Way and the West Seattle Bridge and at the intersection of Southwest Avalon Way and Fauntleroy Way Southwest would also result in impacts, particularly to Route 21X. The only impact with Alternative WSJ-4 would occur due to the partial construction closure of Fauntleroy Way Southwest between Southwest Avalon Way and 35th Avenue Southwest for less than a year.

With Alternative WSJ-2, part of Southwest Alaska Street between Fauntleroy Way Southwest and 38th Avenue Southwest would be closed for 3 years. This would require rerouting Routes 50, 55, and 773 and the RapidRide C Line to bypass this closure.

While not a long-term closure, construction of Preferred Option WSJ-5b, Alternative WSJ-3a, Option WSJ-3b, Alternative WSJ-4, Alternative WSJ-5a, and Alternative WSJ-6 would require a short-term, partial closure of Southwest Alaska Street (3 months to 6 months) at the cut-and-cover station, which could affect the performance of Routes 50, 55, 57, and 773 and the RapidRide C Line (see Attachment N1.D). Alternative WSJ-1 would not require any long-term or major short-term closures of streets that have transit routes.

Table 3-25. Key Arterial Roadway Closures Affecting Transit Routes – West Seattle Junction Segment

Alternative	Affected Street	From Street	To Street	Closure Type	# of Buses: Minimal per Hour	# of Affected Buses: 5 to 40 per Hour	# of Affected Buses: 41 to 100 per Hour	# of Affected Buses: 101 to 200 per Hour	# of Affected Buses: >200 per Hour	Frequent/ RapidRide Routes Affected [a]	Express Routes Affected [a]	Local Routes Affected [a]
Preferred Option WSJ-5b	**Fauntleroy Way Southwest**	**Southwest Avalon Way**	**Southwest Avalon Way**	**Partial**	**1.5 years**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**0 [b]**	**0 [b]**	**0 [b]**
Preferred Option WSJ-5b	**35th Avenue Southwest**	**West Seattle Bridge**	**Southwest Avalon Way**	**Full**	**1 year**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**0**	**1**	**0**
Alternative WSJ-2	Southwest Alaska Street	38th Avenue Southwest	Fauntleroy Way Southwest	Full	Not Applicable	Not Applicable	3 years	Not Applicable	Not Applicable	2	1	1
Alternative WSJ-3a	Fauntleroy Way Southwest	Southwest Avalon Way	35th Avenue Southwest	Partial	1.5 years	Not Applicable	Not Applicable	Not Applicable	Not Applicable	0 [b]	0 [b]	0 [b]
Alternative WSJ-3a	35th Avenue Southwest	West Seattle Bridge	Southwest Avalon Way	Full	3 years	Not Applicable	Not Applicable	Not Applicable	Not Applicable	0	1	0
Alternative WSJ-3b	Fauntleroy Way Southwest	Southwest Avalon Way	35th Avenue Southwest	Partial	1.5 years	Not Applicable	Not Applicable	Not Applicable	Not Applicable	0 [b]	0 [b]	0 [b]
Option WSJ-3b	35th Avenue Southwest	West Seattle Bridge	Southwest Avalon Way	Full	3 years	Not Applicable	Not Applicable	Not Applicable	Not Applicable	0	1	0
Alternative WSJ-4	Fauntleroy Way Southwest	Southwest Avalon Way	35th Avenue Southwest	Partial	9 months	Not Applicable	Not Applicable	Not Applicable	Not Applicable	0 [b]	0 [b]	0 [b]
Alternative WSJ-5a	Fauntleroy Way Southwest	Southwest Avalon Way	35th Avenue Southwest	Partial	1.5 years	Not Applicable	Not Applicable	Not Applicable	Not Applicable	0 [b]	0 [b]	0 [b]
Alternative WSJ-5a	35th Avenue Southwest	West Seattle Bridge	Southwest Avalon Way	Full	1 year	Not Applicable	Not Applicable	Not Applicable	Not Applicable	0	1	0

Notes:

Non-arterial roadway closures are not shown, as the potential transit impacts would be expected to be less than an arterial roadway closure. Most-likely-affected roadways are listed. Other roadways could be affected depending on final construction plans.

[a] The type and number of bus routes affected is based on Metro Connects and the assumed frequencies for different types of bus services.

[b] This closure would not directly affect Metro bus routes, but traffic congestion spillback and people choosing different routes to avoid the closures could degrade transit speed and reliability. See report text for details – potentially affected routes include Route 21, Route 50, Route 55, and RapidRide C.

3.4 Potential Mitigation Measures

3.4.1 Long-Term Impacts

Sound Transit would lead coordination with transit service providers as the project advances to maintain efficient transit operations, including refinements to the transit service plan as described in the Transit Service and Facilities section of Section 3.3.2.1. Impacts to transit facilities would be addressed through ongoing coordination between Sound Transit, the City of Seattle, Metro, and the Federal Transit Administration to identify capital, routing, and access management strategies that would be implemented before transit service operations would be affected. Sound Transit would implement agreed-upon improvements that mitigate impacts directly associated with the project.

Closure of the SODO Busway with Preferred Option SODO-1c, Alternative SODO-1a, and Option SODO-1b would impact transit speed and reliability, and layover in the SODO area. Sound Transit has coordinated with the City of Seattle and Metro on the following mitigation strategies:

- Implementation of transit speed and reliability strategies on 4th Avenue South between South Spokane Street and South Royal Brougham Way. Potential strategies could include business access and transit lanes, freight and bus lanes, or queue jump lanes.
- Implementation of improved pedestrian access and bus stop passenger amenities at bus stops along 4th Avenue South near the following intersections: South Royal Brougham Way, South Holgate Street, and South Lander Street. Improved bus stop passenger amenities are also identified on South Spokane Street near 4th Avenue South. Potential strategies could include wider sidewalks, moving poles and other obstructions in the bus stop zones, new or relocated transit benches and shelters, and revised curb ramps and crosswalks.
- Replacement layover in the SODO area could use off-street properties currently being used by Sound Transit Express buses that may not be necessary for Sound Transit use in the future and on-street layover near the Atlantic/Central Bus Base.

For Alternatives DEL-1a and DEL-3, Sound Transit would work with Metro and the City of Seattle to either provide a pedestrian crossing to the eastbound bus stop along Southwest Genesee Street that would be isolated by guideway construction or relocate the bus stop.

3.4.2 Construction Impacts

Sound Transit would lead coordination with Metro, the City of Seattle, and the Federal Transit Administration, where appropriate, to identify and confirm to bus service and associated infrastructure modifications and transit facility improvements that maintain transit service and access through construction areas. This would include continuing to coordinate on construction-related impacts to Metro's transit operations to determine the potential mitigation required, as many of the alternatives close roadways served by transit and restrict access to transit facilities for varying durations.

Sound Transit would maintain access to existing bus stops, layover areas, and comfort stations to the extent feasible and coordinate with Metro and the City of Seattle to minimize impacts and disruptions. Where needed, this coordination would include other transit operators. Where bus stops and layover cannot be maintained in existing locations, Sound Transit would implement temporary facilities to maintain service and access. Information would be communicated to riders in advance of construction at these locations.

Sound Transit would maintain non-motorized access to transit, where feasible, through construction areas, such as providing dedicated walkways or alternative bike facilities around the construction area. Where non-motorized access is not able to be maintained through construction areas, Sound Transit would implement temporary non-motorized facilities to maintain non-motorized access to transit. Sound Transit would also notify the public of any closures. Refer to Section 4.4.2, Construction Mitigation, for more information on measures to minimize impacts related to road closures and detours that would also reduce bus service disruptions.

Construction-related transit service impacts such as the SODO Busway closure (whether permanent or temporary) with all SODO alternatives, as well as other transit pathway closures identified in the document, would be coordinated with Metro, the City of Seattle, and other relevant service providers. Sound Transit will coordinate with the City of Seattle, Metro, and other agencies as necessary to develop a transit operations plan for construction-related closures to transit pathways. These transit operations plans would identify bus detour routes and minimize impacts and disruptions to bus facilities and service performance and hours during project construction. This would include identifying associated improvements needed to implement these service and facility modifications, such as speed and reliability treatments (e.g., new transit lanes, transit signal priority, or similar). Sound Transit would continue to coordinate with the City of Seattle and Metro during final design to finalize a construction transit operations plan that would define specific transit reroutes, and identify agreed-upon speed and reliability improvements, bus stop modifications, temporary layover and comfort stations, and pavement management plans

For Preferred Option SODO-1c, Alternative SODO-1a, and Option SODO-1b, Sound Transit is coordinating with Metro and the City of Seattle to refine mitigation strategies for the following construction transit operations and facilities impacts:

- Short-term partial closures of 4th Avenue South to construct the South Lander Street overpass of the new and existing light rail tracks and for the light rail guideway over 4th Avenue South near South Spokane Street.
    - Sound Transit is coordinating with the City of Seattle and Metro to identify ways to shift travel lanes and implement business access and transit lanes, freight and bus lanes, and/or transit queue jump lanes at strategic locations.
- Long-term (2-year) closure of South Lander Street over the light rail tracks and to facilitate construction of the SODO Station.
    - The South Lander Street closure would require the reroute of Route 50 to either 4th Avenue South or 6th Avenue South.

Construction of all alternatives could result in the potential long-term closure of the existing 1 Line SODO Station while the new SODO Station is built.

- Sound Transit is committed to maintaining the regional transit access provided by the SODO Station. Mitigation measures to maintain this access are still being identified by Sound Transit and agency partners, but could include the following:
    - Study the feasibility of building an interim station/platforms in the vicinity of the existing SODO Station with connections to transit routes on 4th Avenue South and South Lander Street. Key factors that require further study are whether there are adequate access routes to an interim station given the construction in the area and the operations/regulatory considerations to build and operate an interim station.
    - Implementing a transit shuttle between the SODO Station area and Stadium Station.

  - Working with Metro to adjust routing of buses near the SODO Station to provide a convenient connection from the SODO Station area to an adjacent 1 Line station (Stadium and/or Beacon Hill stations).

Related to Alternatives DEL-1a, DEL-2a, DEL-3, and DEL-4, and Options DEL-1b and DEL-2b, there would be partial closures of Delridge Way Southwest that would impact route speed and reliability. There would be night and weekend closures of Delridge Way Southwest with all alternatives.

- Sound Transit would work with the City of Seattle and Metro refine traffic signal operations, potentially including new queue jump signals to optimize transit speed and reliability through the construction zone.
- Sound Transit would work with the City of Seattle and Metro to identify night and weekend detour pathways for Routes 50, 125, and RapidRide H.

Alternatives DEL-1a and DEL-3 and Option DEL-1b would completely close Southwest Genesee Street during construction, affecting Route 50.

- Sound Transit would work with the City of Seattle and Metro to identify an alternative pathway for Route 50 that would minimize the loss of transit coverage. Sound Transit may also enhance pedestrian and bicycle access to areas where the alternative pathway does not provide access to facilitate transit access to other nearby routes.

Alternatives WSJ-3a, WSJ-4, WSJ-5a, and WSJ-6 and Options WSJ-3b and WSJ-5b require short-term partial closure Southwest Alaska Street to construct stations and guideways.

- Sound Transit would implement traffic control measures to minimize congestion impacts on bus operations along Southwest Alaska Street.

Alternatives WSJ-3a and WSJ-5a and Options WSJ-3b and WSJ-5b would require a full closure of 35th Avenue Southwest between the West Seattle Bridge and Southwest Avalon Way to construct the Avalon Station.

- Sound Transit would work with the City of Seattle and Metro on construction reroutes for Route 21X to navigate the closure of 35th Avenue Southwest. A potential pathway along Southwest Avalon Way to Southwest Spokane Street would not require any changes to signals or pavement.

4 ARTERIAL AND LOCAL STREET OPERATIONS

This chapter presents the following information for the West Seattle Link Extension Project (the project):

- Existing operations of the arterials and local roadways in the study area and their intersection level of service (L.O.S.)
- Future condition traffic forecasts and light rail station trip generation
- Future No Build Alternative and Build Alternative traffic operations and peak hour intersection L.O.S. compared to project-specific L.O.S. thresholds
- Potential effects on local access to adjacent properties and traffic circulation
- Construction impacts, including road closures, detours, traffic diversions, truck traffic, haul routes, and traffic analysis of long-term construction closures

The arterial and local street analysis evaluates locations where traffic circulation, access, and operations are most likely to be affected by the project. The specific intersections studied vary by time period and alternative, as described further in this section.

4.1 Introduction to Arterial and Local Street Operations

This section describes the arterials and local roadway facilities, and intersection operations within the study area for existing conditions, future no build conditions, and Build Alternatives. The traffic forecasting and operations analysis methods are documented in Attachment N.1A, Transportation Technical Analysis Methodology (Sound Transit 2023). Intersections are typically considered to be failing if they do not meet the L.O.S. threshold set by the agency; however, the City of Seattle does not have an official intersection L.O.S. threshold. For the purposes of this analysis, failing intersections are defined as L.O.S. E or F as agreed to with the City of Seattle. For Build Alternatives, affected intersections are identified and defined as locations expected to degrade from L.O.S. D or better in the No Build Alternative to L.O.S. E or F with the project, or if the intersection already operates at L.O.S. E or F in the No Build Alternative have noticeably worse vehicle delays in the Build Alternative (10 percent or higher vehicle delay than in the No Build Alternative). See Attachment N.1C, Existing and Future Intersection Levels of Service, for more detail. The following sections present key observations related to arterial and local street operations for the project.

4.1.1 Key Findings

- All alternatives would generally result in increased intersection vehicle delays near the stations because of increased activity such as vehicle trips from passenger pick-ups and drop-offs, including transportation network company activity (e.g., Uber, Lyft) and pedestrians and bicyclists. Volumes range from 15 additional p.m. peak hour vehicle trips at the SODO Station to 120 vehicle trips at the Alaska Junction Station. Bus volumes accessing the stations would also increase.
- There are no major traffic operations differentiators at the study intersections for the four SODO Build Alternatives. Preferred Option SODO-1c, Alternative SODO-1a, and Option SODO-1b would construct a new South Lander Street overpass, which would eliminate an at-grade vehicle crossing with the existing 1 Line and would close the SODO Busway. Alternative SODO-2 would allow the SODO Busway to remain open in this segment and maintain the existing at-grade crossing.

- There are no long-term traffic operations impacts with the Build Alternatives in the Duwamish Segment. Delays at the 4th Avenue South and South Spokane Street intersection may be slightly higher for the Preferred Alternative DUW-1a compared to the other Build Alternatives, but it is expected to operate at acceptable L.O.S. D in the p.m. peak hour.
- Within the Delridge Segment, the new traffic signal at Delridge Way Southwest/23rd Avenue Southwest with the Preferred Option DEL-6b and Alternative DEL-7 would provide access for buses, Nucor Steel Plant freight, and potential transit-oriented development (TOD) trips to and from the site. The new signal and site access would improve traffic operations at the Delridge Way Southwest/Southwest Andover Street intersection by allowing for more efficient traffic signal operations, but would slightly increase corridor delay along Delridge Way Southwest. There would also be some local permanent street closures with several of the alternatives, but the street grid network would allow for local rerouting.
- Within the West Seattle Junction Segment, there would be increased traffic delay at intersections adjacent to most of the Alaska Junction Station alternatives as a result of the added vehicle, pedestrian, and bicycle activity generated by the new station. While there would be some local street closures, the street grid network would allow for reroutes.
- In the SODO and Duwamish segments, construction activities would affect traffic operations along the 4th Avenue South corridor, particularly the intersections of 4th Avenue South/South Holgate Street and 6th Avenue South/South Spokane Street with the Preferred Alternative.
- Construction activities would affect traffic patterns and congestion within the Delridge Segment along Delridge Way Southwest, Southwest Genesee Street, Southwest Andover Street, and Southwest Avalon Way. Preferred Option DEL-6b, Alternative DEL-2a, Option DEL-2b, Alternative DEL-6a, and Alternative DEL-7, which lead to tunnel options into the West Seattle Junction, typically have fewer traffic construction effects because more of the alignments are outside of street rights-of-way.
- Construction activities along arterials in the West Seattle Junction Segment would also create substantial traffic diversions and increased congestion levels on arterial streets such as Fauntleroy Way Southwest, Southwest Avalon Way, 35th Avenue Southwest, and Southwest Oregon Street, as well as adjacent side streets.

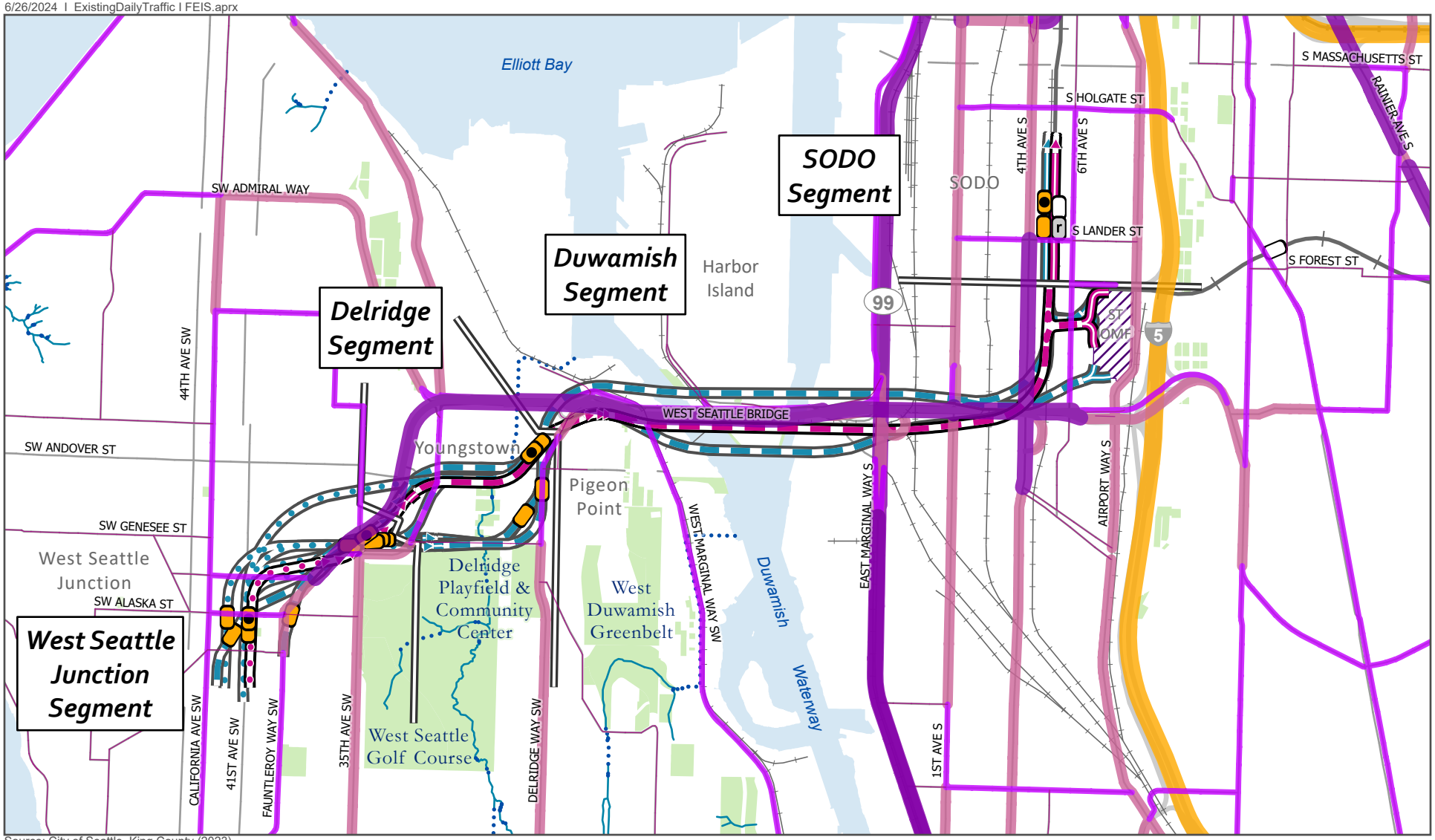
4.2 Affected Environment

The project includes the following segments: SODO, Duwamish, Delridge, and West Seattle Junction. This section includes discussion about vehicle travel patterns through the study area and intersection operations. Roadway network and daily traffic volumes in the study area are shown on Figure 4-1. Additional information about non-motorized facilities is in Section 6.2, Affected Environment, of Chapter 6, Non-motorized Facilities, of this technical report.

4.2.1 Arterials and Local Roadways

4.2.1.1 SODO Segment

The SODO Segment starts at the Link light rail SODO Station and continues south to South Forest Street. The roadway network in the SODO neighborhood consists of a grid of arterials that serve industrial land uses and through movements for vehicles traveling north-south.



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- Tunnel
- At-Grade
- Retained Cut

Other Alternatives
- Elevated
- Tunnel
- At-Grade
- Retained Cut

Station (● *Indicates Preferred Alternative*)
- New
- Relocated
- Existing

- Segment Line
- Sound Transit Operations and Maintenance Facility (ST OMF)
- Existing Link Light Rail
- Railroad
- Stream
- Piped Stream
- Park

Average Annual Weekday Traffic (2018)

≤8,000 17,000 32,000 100,000 > 100,000

0 0.5 1 Mile

N

FIGURE 4-1
Existing Daily Traffic Volumes

West Seattle Link Extension

Important north-south arterials in this segment are 1st Avenue South, 4th Avenue South, 6th Avenue South, and Airport Way South, which provide connections to Downtown Seattle, a major employment center and a Puget Sound Regional Council-designated Regional Growth Center. Among the north-south arterials, 1st Avenue South and 4th Avenue South have higher traffic volumes as they also connect Downtown Seattle to State Route 99, the West Seattle Bridge, and Interstate 90. The east-west arterials of South Spokane Street and South Lander Street are also important connections; South Spokane Street connects to the West Seattle Bridge, Interstate 5, and Beacon Hill, while South Lander Street connects industrial land uses through SODO.

There are at-grade BNSF Railway mainline track and light rail track crossings at these locations, which can cause delays. The South Lander Street overpass was recently constructed between 1st Avenue South and 4th Avenue South to reduce the rail conflict on the BNSF mainline track (after the 2019 base year used in this Final EIS).

The SODO Busway is an important route for King County Metro (Metro) buses. Hundreds of daily active (i.e., routes in service carrying passengers) and non-active (i.e., deadhead) bus trips use the SODO Busway to serve Downtown Seattle or access the Ryerson and Atlantic/Central bus bases. The existing Link light rail tracks are currently east of the SODO Busway, and there is an at-grade crossing with vehicle traffic on South Lander Street between 4th Avenue South and 6th Avenue South. The major existing street facilities and characteristics such as street classification, number of lanes, speed limit, average daily traffic (A.D.T.), and presence of bike lanes or sidewalks are shown in Table 4-1.

Table 4-1. Existing Local Roadway Segments – SODO Segment

Roadway	Arterial Classification	Number of Lanes	Speed Limit (miles per hour)	A.D.T. [a]	Bike Lanes	Sidewalk
1st Avenue South	Principal	4 to 5	30	27,000 to 30,000	No	Yes
4th Avenue South	Principal	6	30	29,000 to 37,000	No	Yes
6th Avenue South	Minor	2	25	5,900 to 8,800	No	Partial
Airport Way South	Principal	4	30	11,200 to 21,100	No	Yes
South Lander Street	Minor	4 to 5	25	5,700 to 12,600	Yes	Yes
South Spokane Street	Minor	4	25	10,000	No	Yes

Note: The table only includes study area roads classified as arterial and above.

[a] A.D.T. based on 2017 to 2018 traffic count information unless otherwise noted (City of Seattle 2018).

4.2.1.2 Duwamish Segment

The east-west connections across the Duwamish Waterway (also known as the Duwamish River) include lower South Spokane Street, which connects West Seattle, Harbor Island, and the Terminal 18 and Terminal 5 Port of Seattle facilities to SODO, and the elevated West Seattle Bridge, which connects West Seattle through Fauntleroy Way Southwest to SODO and Downtown Seattle. Lower Southwest Spokane Street also has a separated bicycle and pedestrian trail between Southwest Avalon Way and East Marginal Way South. The major street facilities and characteristics such as street classification, number of lanes, speed limit, A.D.T., and presence of bike lanes or sidewalks are shown in Table 4-2.

Table 4-2. Existing Local Roadway Segments – Duwamish Segment

Roadway	Arterial Classification	Number of Lanes	Speed Limit (miles per hour)	A.D.T. [a]	Bike Lanes	Sidewalk
Southwest Spokane Street	Principal	2 to 4	25	10,300	Yes	Yes
West Seattle Bridge	Principal	4 to 7	40 to 45	102,600	No	No

Note: The table only includes study area roads classified as arterial and above.
[a] A.D.T. based on 2017 to 2018 traffic count information unless otherwise noted (City of Seattle 2018).

4.2.1.3 Delridge Segment

In the Delridge Segment, the major arterial is north-south Delridge Way Southwest, which is a major transit corridor as well as one of the main access roads to the West Seattle Bridge. East-west travel is limited due to the terrain and park properties. The main east-west street is Southwest Genesee Street, which is a lower volume, 2-lane street. Southwest Andover Street and Southwest Yancy Street are east-west roads that provide access to the Nucor Steel property and connect Southwest Avalon Way and Delridge Way Southwest. Southwest Avalon Way also connects to the West Seattle Bridge, lower Southwest Spokane Street, and the Water Taxi terminal. East of Delridge Way Southwest, there are more residential land uses with relatively lower traffic volumes.

Since publication of the West Seattle and Ballard Link Extensions Draft EIS, Delridge Way Southwest has been modified for the RapidRide H Line. This included removing the center turn lane south of Southwest Dakota Street, converting a parking lane to a business access and transit lane, and decreasing the speed limit. In addition, Southwest Avalon Way was rechannelized to add protected bicycle lanes and remove the center turn lane. Because these projects occurred after the 2019 EIS base year, these assumptions are not included in the existing year analysis.

The major existing street facilities and characteristics such as street classification, number of lanes, speed limit, A.D.T., and presence of bike lanes or sidewalks are shown in Table 4-3.

Table 4-3. Existing Local Roadway Segments – Delridge Segment

Roadway	Arterial Classification	Number of Lanes	Speed Limit (miles per hour)	A.D.T. [a]	Bike Lanes	Sidewalk
Delridge Way Southwest	Principal	4 to 5 [b]	25	17,000 to 23,500	Yes	Yes
Southwest Genesee Street	Collector	2	25	4,000	No	Yes

Note: The table only includes study area roads classified as arterial and above.
[a] A.D.T. based on 2017 to 2018 traffic count information unless otherwise noted (City of Seattle 2018).
[b] Includes one or more transit-only lanes.

4.2.1.4 West Seattle Junction Segment

In the West Seattle Junction Segment, the existing roadway network is a mix of arterials that connect neighborhoods to Alaska Junction and to the West Seattle Bridge, along with local streets that serve the mixed residential and commercial land uses. Fauntleroy Way Southwest is a north-south arterial that provides access to the West Seattle Bridge and connects to most residential neighborhoods in West Seattle. The other north-south arterials are California Avenue Southwest, which provides access to Alaska Junction and Admiral Junction, and 35th Avenue Southwest, which provides access to the West Seattle Bridge from communities to the south.

As noted in Section 4.2.1.3, Delridge Segment, Southwest Avalon Way runs through the Delridge and West Seattle Junction segments and connects to the West Seattle Bridge, lower Southwest Spokane Street, and the Water Taxi terminal. The north-south arterials described are major transit corridors.

Southwest Alaska Street is the main east-west arterial connecting West Seattle neighborhoods to Alaska Junction and Fauntleroy Way Southwest. Southwest Oregon Street is another east-west arterial one block north of Southwest Alaska Street. The major existing street facilities and characteristics such as street classification, number of lanes, speed limit, A.D.T., and presence of bike lanes or sidewalks are shown in Table 4-4.

Table 4-4. Existing Local Roadway Segments – West Seattle Junction Segment

Roadway	Arterial Classification	Number of Lanes	Speed Limit (miles per hour)	A.D.T. [a]	Bike Lanes	Sidewalk
35th Avenue Southwest	Principal	3 to 4	25	5,200 to 22,600	No	Yes
Southwest Avalon Way	Minor	2 to 3	25	14,800 to 20,200	Yes	Yes
California Avenue Southwest	Minor	4	25	10,000 to 13,600	Yes	Yes
Fauntleroy Way Southwest	Principal	3 to 4	25	29,700 to 37,000	Yes	Yes
Southwest Alaska Street	Minor	3 to 4 [b]	25	7,400 to 13,400	No	Yes
Southwest Oregon Street	Minor	2	25	9,500	No	Yes

Note: The table only includes study area roads classified as arterial and above.

[a] A.D.T. based on 2017 to 2018 traffic count information unless otherwise noted (City of Seattle 2018).

[b] Includes one or more transit-only lanes.

4.2.2 Intersection Operations

Key intersections adjacent to potential station areas were evaluated during peak hours to better understand existing traffic operations. All analysis intersections were evaluated during the a.m. and p.m. peak hour. For the a.m. and p.m. peak hour analysis, the peak 1-hour traffic count for each intersection (between 6 a.m. and 8 a.m. and between 4 p.m. and 6 p.m.) was entered into the traffic analysis software. While the p.m. peak hour generally represents the most congested period of the day, some locations have worse a.m. operations as a result of local land uses and traffic patterns.

Intersection operations were evaluated by calculating the average delay (in seconds) per vehicle and translating that delay into a qualitative L.O.S. The L.O.S. ranges from A to F, where L.O.S. A represents little to no congestion with under-used lane capacity and free-flow travel speeds, L.O.S. E represents conditions that are at capacity, and L.O.S. F represents poor operating conditions where demand exceeds the intersection's capacity with vehicle queuing and frequent stop-and-go travel. There are separate L.O.S. delay thresholds for signalized intersections and unsignalized intersections, as defined by the *Highway Capacity Manual 6th Edition* (Transportation Research Board 2016). For additional information, see Attachment N.1C.

Intersections are generally considered to be failing if they do not meet the L.O.S. threshold set by the governing agency; however, the City of Seattle does not have an adopted intersection L.O.S. threshold. In the absence of an adopted City of Seattle L.O.S. threshold, intersections that operate at L.O.S. E and L.O.S. F are identified as failing as agreed upon by the City of Seattle. Attachment N.1C provides a detailed summary of the traffic analysis results for the existing a.m. and p.m. peak hour conditions, signal control, and the applicable L.O.S. threshold.

4.2.2.1 SODO Segment

In SODO, the majority of vehicles travel north in the a.m. peak period towards Downtown Seattle and in the reverse direction during the p.m. peak period. There are three main north-south corridors in SODO that help to ease congestion during peak periods. In the SODO Segment, peak hour analysis was performed at six intersections; the results are shown in Table 4-5. Currently, all intersections operate at L.O.S. D or better during the a.m. and p.m. peak hours. Results for the a.m. and p.m. peak hour traffic operations at the study intersections are shown on Figure 4-2.

Table 4-5. A.M. and P.M. Peak Intersection Level of Service - SODO Segment

Intersection	Existing A.M.	Existing P.M.
4th Avenue South/South Holgate Street	D	C
4th Avenue South/South Lander Street	D	D
6th Avenue South/South Holgate Street	B	C
6th Avenue South/South Lander Street	B	B
6th Avenue South/South Stacy Street	B	B
SODO Busway/South Lander Street	B	B

4.2.2.2 Duwamish Segment

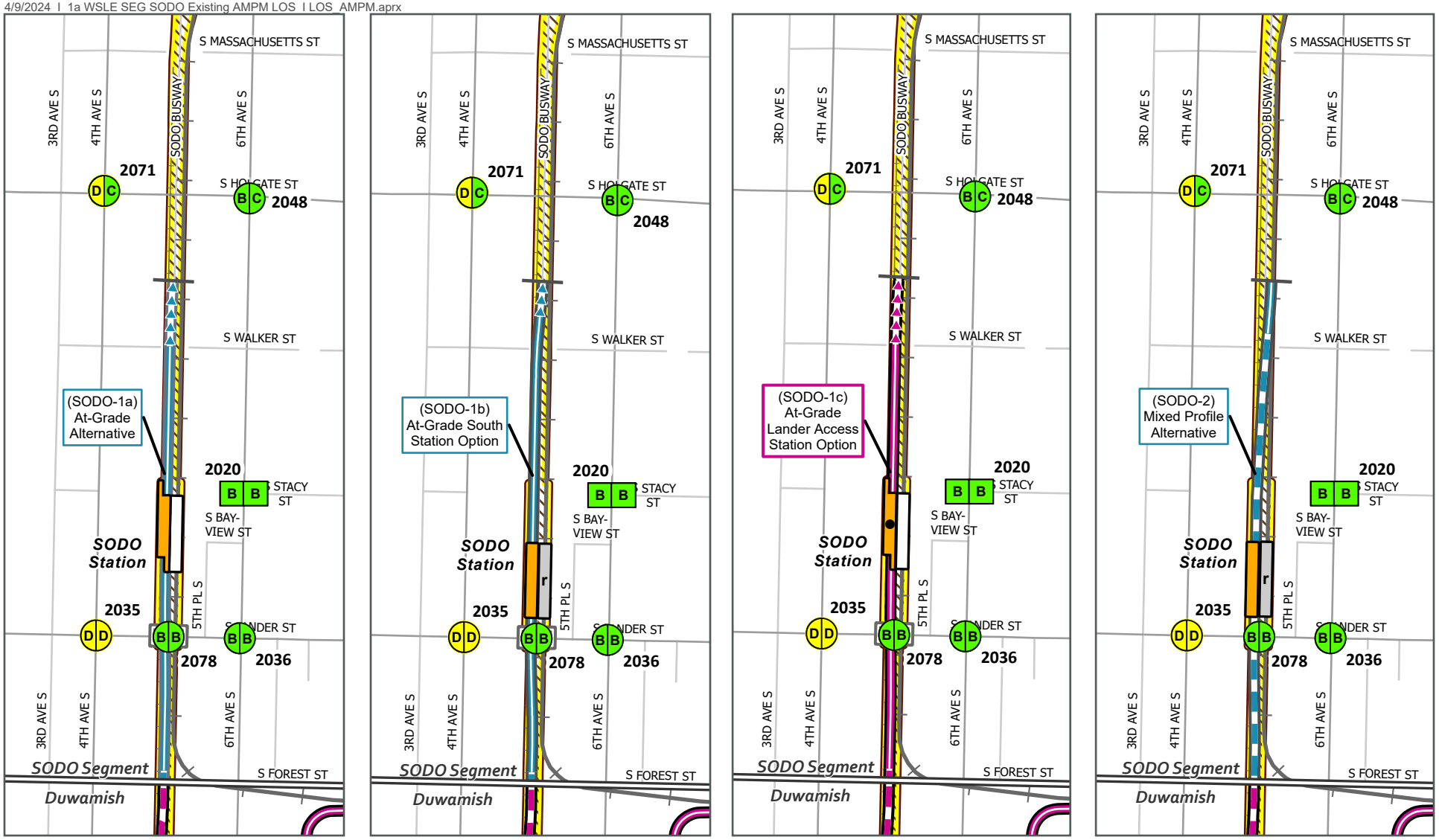
Across the Duwamish Waterway, the seven study intersections currently operate at L.O.S. D or better during both a.m. and p.m. peak hours. Results for the a.m. and p.m. peak hour traffic operations at the study intersections are shown in Table 4-6 and on Figure 4-3.

Table 4-6. P.M. and A.M. Peak Level of Service - Duwamish Segment

Intersection	Existing A.M.	Existing P.M.
4th Avenue South/South Spokane Street (North)	A	A
4th Avenue South/South Spokane Street (South)	D	B
Chelan Avenue Southwest/Southwest Spokane Street	B	B
East Marginal Way South/South Spokane Street [a]	A	A
Southwest Spokane Street/11th Avenue Southwest	A	A
Southwest Spokane Street/West Marginal Way Southwest/Terminal 5	A	A
West Marginal Way Southwest/Chelan Avenue Southwest/ Southwest Spokane Street	D	D

[a] Higher delays can be experienced from nearby port and terminal operations in the area.

4/9/2024 I 1a WSLE SEG SODO Existing AMPM LOS I LOS_AMPM.aprx



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- At-Grade
- Retained Cut

Other Alternatives
- Elevated
- At-Grade
- Retained Cut

Station (● *Indicates Preferred Alternative*)
- New
- Relocated (r)
- Existing

- Segment Line
- Existing Link Light Rail
- Railroad
- SODO Busway
- Proposed Overpass

Intersection Level of Service

AM / PM
- A-C
- D
- E-F

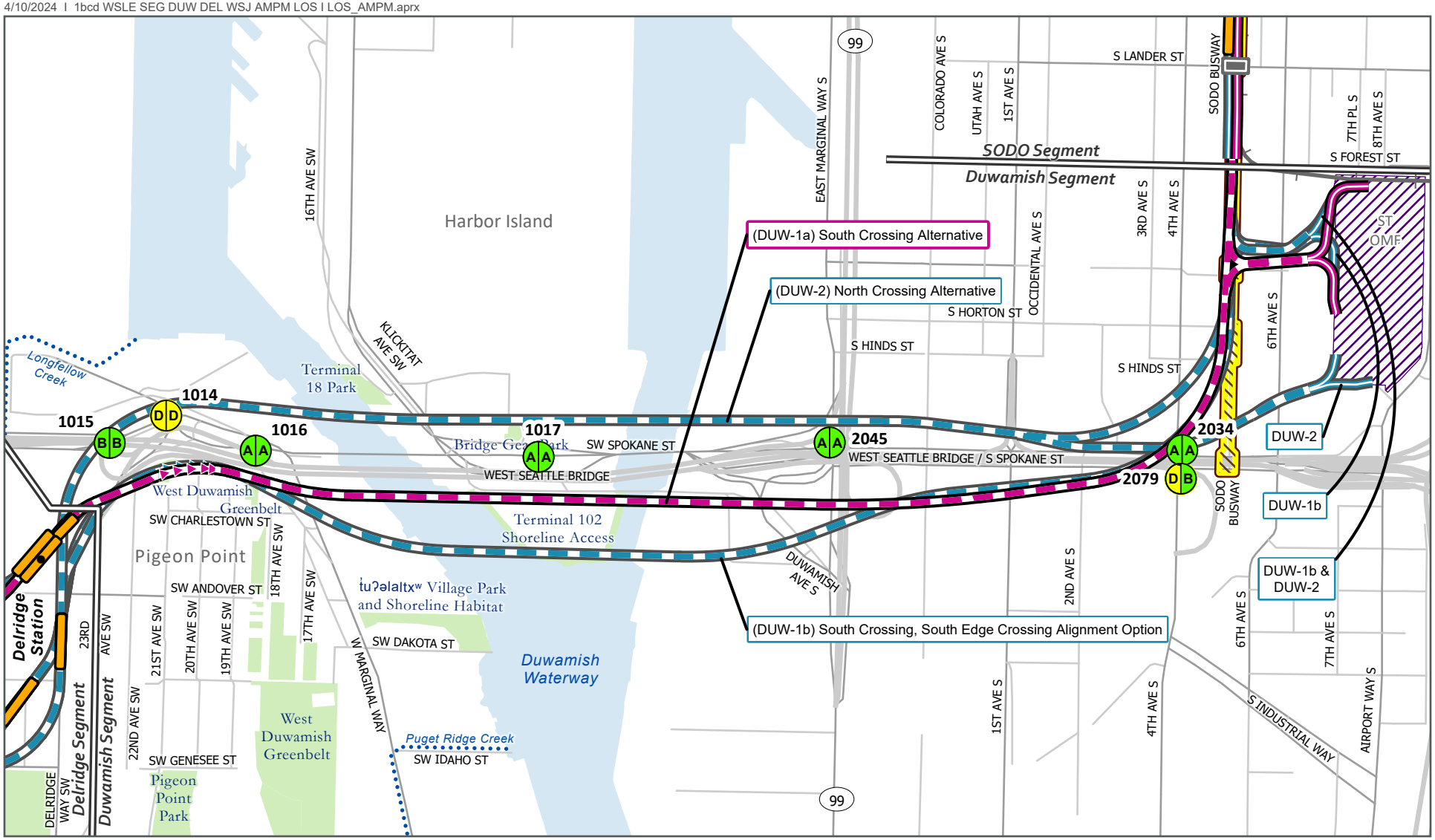
Intersection Type
- Stop-Controlled
- Signalized

FIGURE 4-2
Existing A.M. and P.M. Peak Hour Intersection Level of Service (L.O.S.)
SODO Segment

West Seattle Link Extension

0 500 1,000 Feet

N



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- At-Grade
- Retained Cut

Other Alternatives
- Elevated
- At-Grade
- Retained Cut

Station (● *Indicates Preferred Alternative*)
- New

- Segment Line
- Existing Link Light Rail
- SODO Busway
- Proposed Overpass
- Sound Transit Operations and Maintenance Facility (ST OMF)
- Piped Stream
- Park

Intersection Level of Service

AM / PM
- A-C
- D
- E-F

Intersection Type
- Stop-Controlled
- Signalized

FIGURE 4-3
Existing A.M. and P.M. Peak Hour Intersection Level of Service (L.O.S.)
Duwamish Segment

West Seattle Link Extension

0 500 1,000 Feet

N

4.2.2.3 Delridge Segment

In Delridge, the predominant flow of traffic is along Delridge Way Southwest, northbound in the morning and southbound in the afternoon. Eight study intersections were analyzed in the Delridge Segment. Delridge Way Southwest/Southwest Andover Street and Delridge Way Southwest/Southwest Genesee Street are signalized intersections. Delridge Way Southwest/23rd Avenue Southwest is right-turn-only out of 23rd Avenue Southwest, and the other intersections are side-street stop control or uncontrolled intersections. (Note: 26th Avenue Southwest/Southwest Andover Street was modified to an all-way stop after the 2019 year of analysis.) During the p.m. peak hour, the southbound vehicle queues on Delridge Way Southwest can extend to the West Seattle Bridge. During the a.m. peak hour, the northbound vehicle queues on Delridge Way Southwest can extend multiple blocks to access the West Seattle Bridge. Two intersections operate at L.O.S. E or F in either a.m. or p.m. peak hours: Delridge Way Southwest/Southwest Andover Street (L.O.S. F in both peak hours) and Delridge Way Southwest/Southwest Genesee Street (L.O.S. F in the a.m. peak hour).

Results for the a.m. and p.m. peak hour traffic operations at the study intersections are shown in Table 4-7 and on Figure 4-4.

Table 4-7. A.M. and P.M. Peak Level of Service - Delridge Segment

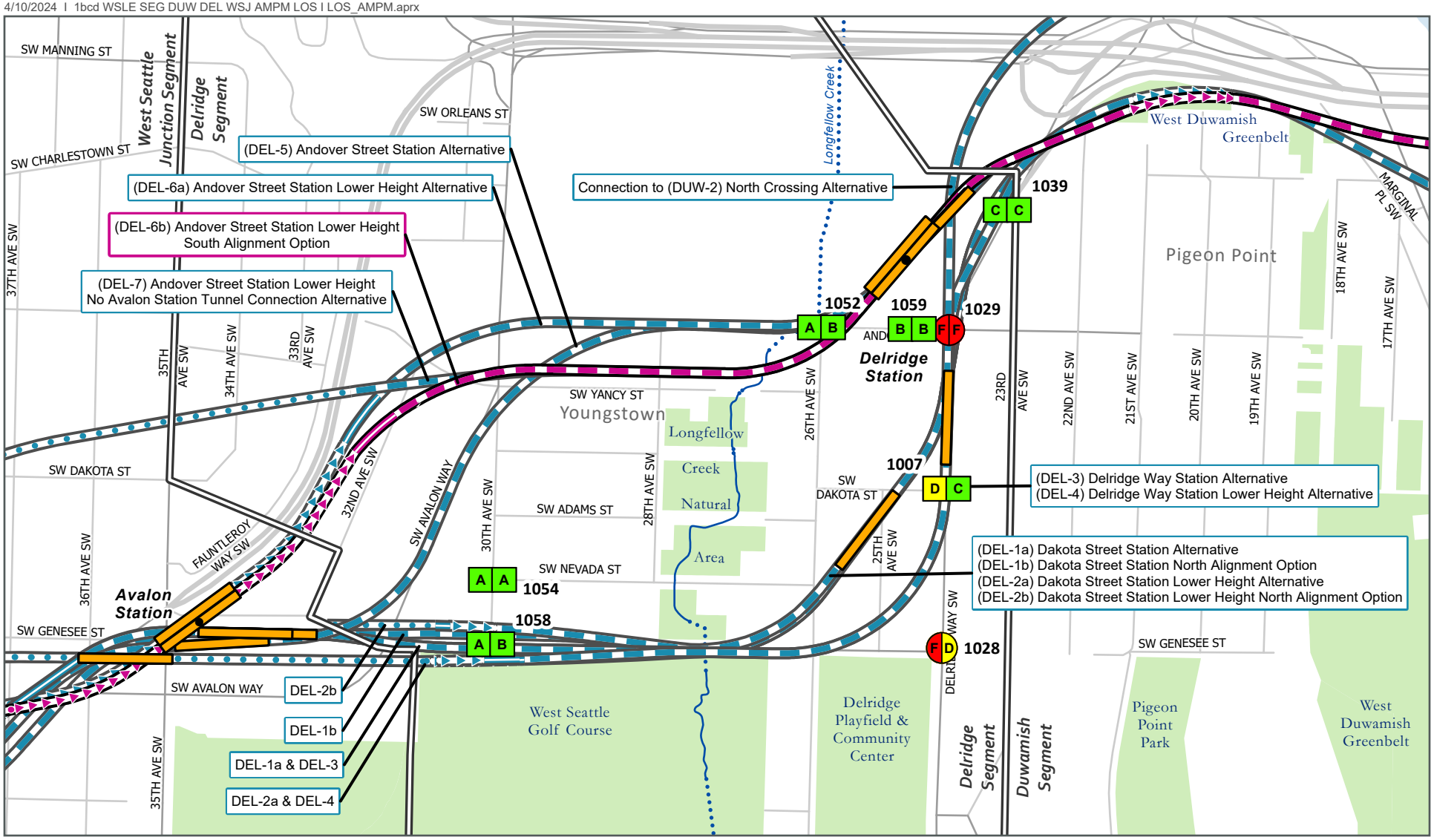
Intersection	Existing A.M.	Existing P.M.
Delridge Way Southwest/23rd Avenue Southwest	C	C
Delridge Way Southwest/Southwest Andover Street	F	F
Delridge Way Southwest/Southwest Dakota Street	D	C
Delridge Way Southwest/Southwest Genesee Street	F	D
26th Avenue Southwest/Southwest Andover Street	A	B
30th Avenue Southwest/Southwest Nevada Street	A	A
30th Avenue Southwest/Southwest Genesee Street	A	B
Southwest Charlestown Street/Southwest Andover Street	B	B

4.2.2.4 West Seattle Junction Segment

In the West Seattle Junction Segment, 19 intersections were evaluated near the Alaska Junction Station and Avalon Station options. During the p.m. peak hour, the peak directional travel is westbound on Southwest Alaska Street and southbound on Fauntleroy Way Southwest and 35th Avenue Southwest. In the a.m. period, most vehicles are traveling northbound towards the West Seattle Bridge to Downtown Seattle or other regional destinations. Five intersections operate at L.O.S. E or F in either a.m. or p.m. peak hours:

- California Avenue Southwest and Southwest Alaska Street (L.O.S. E in p.m. peak hour, L.O.S. F in a.m. peak hour)
- California Avenue Southwest and Southwest Edmunds Street (L.O.S. E in p.m. peak hour)
- Fauntleroy Way Southwest and 35th Avenue Southwest (L.O.S. E in p.m. peak hour, L.O.S. F in a.m. peak hour)
- Fauntleroy Way Southwest and 38th Avenue Southwest (L.O.S. F in p.m. peak hour, L.O.S. E in a.m. peak hour)
- Southwest Avalon Way and Southwest Genesee Street (L.O.S. F in both peak hours)

Results for the a.m. and p.m. peak hour traffic operations at the study intersections are shown in Table 4-8 and on Figure 4-5.



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- Tunnel
- At-Grade
- Retained Cut

Other Alternatives
- Elevated
- Tunnel
- At-Grade
- Retained Cut

Station (● *Indicates Preferred Alternative*)
- New

- Segment Line
- Stream
- Piped Stream
- Park

Intersection Level of Service

AM PM
- A-C
- D
- E-F

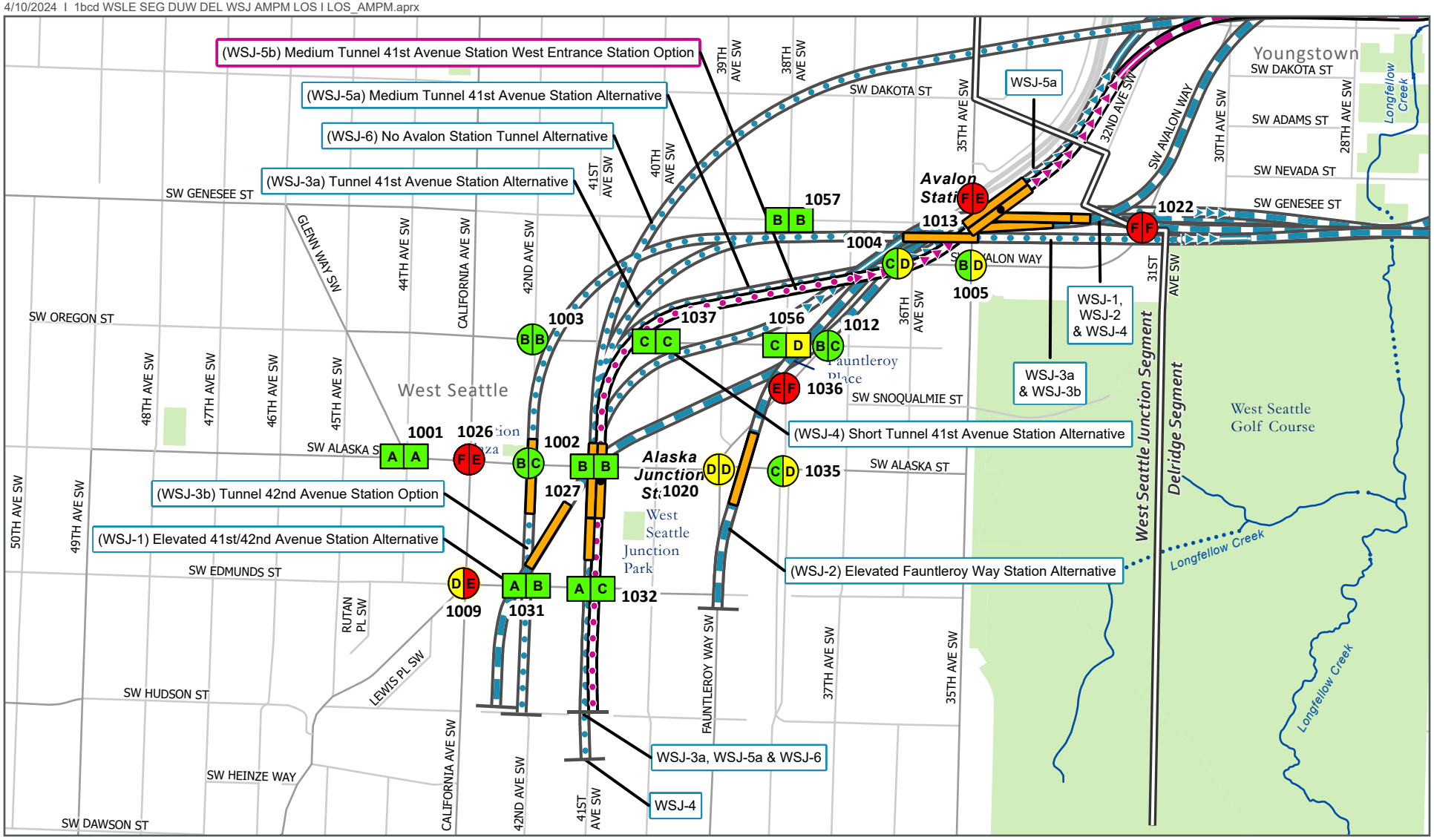
Intersection Type
- Stop-Controlled
- Signalized

FIGURE 4-4
Existing A.M. and P.M. Peak Hour Intersection Level of Service (L.O.S.)
Delridge Segment

West Seattle Link Extension

0 500 1,000 Feet

N



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- Tunnel
- At-Grade
- Retained Cut

Other Alternatives
- Elevated
- Tunnel
- At-Grade
- Retained Cut

Station (● *Indicates Preferred Alternative*)
- New

- Segment Line
- Stream
- Piped Stream
- Park

Intersection Level of Service

AM / PM
- A-C
- D
- E-F

Intersection Type
- Stop-Controlled
- Signalized

FIGURE 4-5
Existing A.M. and P.M. Peak Hour Intersection Level of Service (L.O.S.)
West Seattle Junction Segment

West Seattle Link Extension

0 500 1,000 Feet

N

Intersection queues are evident during the a.m. and p.m. peak hours at the Southwest Alaska Street/Fauntleroy Way Southwest intersection, and during the p.m. peak hour at the Southwest Alaska Street/California Avenue Southwest intersection.

Table 4-8. A.M. and P.M. Peak Level of Service - West Seattle Junction Segment

Intersection	Existing A.M.	Existing P.M.
35th Avenue Southwest/Southwest Avalon Way	B	D
40th Avenue Southwest/Southwest Oregon Street	C	C
41st Avenue Southwest/Southwest Alaska Street	B	B
41st Avenue Southwest/Southwest Edmunds Street	B	C
42nd Avenue Southwest/Southwest Alaska Street	B	C
42nd Avenue Southwest/Southwest Edmunds Street	A	B
42nd Avenue Southwest/Southwest Oregon Street	B	B
44th Avenue Southwest/Southwest Alaska Street	A	A
California Avenue Southwest/Southwest Alaska Street	F	E
California Avenue Southwest/Southwest Edmunds Street	D	E
Fauntleroy Way Southwest/35th Avenue Southwest	F	E
Fauntleroy Way Southwest/38th Avenue Southwest	E	F
Fauntleroy Way Southwest/Southwest Alaska Street	D	D
Fauntleroy Way Southwest/Southwest Avalon Way	B	D
Fauntleroy Way Southwest/Southwest Oregon Street	B	C
Southwest Alaska Street/38th Avenue Southwest	C	D
Southwest Avalon Way/Southwest Genesee Street	F	F
38th Avenue Southwest/Southwest Genesee Street	B	B
38th Avenue Southwest/Southwest Oregon Street	C	D

4.3 Environmental Impacts

This section describes the property access, circulation, roadway and traffic conditions for the Build Alternatives compared to the No Build Alternative, organized by segment as well as during construction.

4.3.1 No Build Alternative

As part of the No Build Alternative, other transportation projects in the study area assumed to be completed include the following:

- The City's Vision Zero project to convert one northbound general-purpose lane of 4th Avenue South to a freight and bus lane from South Holgate Street to South Royal Brougham Way in the SODO Segment
- The Southwest Spokane Street/West Marginal Way Southwest/Terminal 5 intersection modification as part of the Port of Seattle Terminal 5 redevelopment project in the Duwamish Segment

- The recently completed 35th Avenue Southwest/Southwest Avalon Way Repaving project in the Delridge and West Seattle Junction segments
- The completion of the Fauntleroy Way Southwest Boulevard Project in the West Seattle Junction Segment

For a complete list of the background transportation projects assumed for the No Build Alternative, see Appendix A, Future Transportation Project List, in Attachment N.1A.

Traffic volumes for the No Build Alternative were forecasted for the 2042 a.m. and p.m. peak hours using Puget Sound Regional Council's population and land use forecasts. Forecasts within the study area are predicted to have an average annual traffic volume growth rate of up to approximately 0.4 percent during the a.m. and p.m. peak hours. Because of this traffic growth, intersections are expected to operate with more congestion in the future with the No Build Alternative than in existing conditions. By 2042, 12 intersections in the a.m. peak hour and 12 intersections in the p.m. peak hour are expected to operate at L.O.S. E or F in the No Build Alternative. See Figures 4-6, 4-7, 4-9, 4-10, 4-12, 4-13, 4-15, and 4-16; note that these figures only show study intersections for the Preferred Alternative. Maps for all alternatives are included in Attachment N.1C.

4.3.2 Long-term Impacts

The long-term traffic impacts were evaluated using 2042 traffic forecasts and include the effects of additional buses accessing the stations, vehicle traffic (pick-up, drop-off, and transportation network company activity) and non-motorized volumes generated by the Build Alternatives. Sound Transit is also planning for the Ballard Link Extension, which is a light rail extension from SODO Station to Ballard. The 2042 analysis assumes that both the West Seattle Link Extension and Ballard Link Extension are open. However, there would be a multi-year period between the opening of the West Seattle Link Extension and the opening of the Ballard Link Extension, which connects the West Seattle Link Extension directly to the existing light rail system. During that period, West Seattle Link Extension riders who wish to continue their trip on light rail would have to transfer at the SODO Station. Background traffic volumes and station-generated trips would be lower than the 2042 condition with both West Seattle Link Extension and Ballard Link Extension open. After Ballard Link Extension opens, riders from West Seattle could continue north to Everett on the 3 Line without a transfer. Therefore, the period between the openings of the West Seattle Link Extension and Ballard Link Extension is expected to have fewer impacts to the arterial and local streets system than the 2042 condition analyzed in this document.

Beyond the results presented in this section, Attachment N.1C provides a detailed summary of the traffic analysis results for the existing a.m. and p.m. peak hour conditions, signal control, and potentially affected intersections with the project. In general intersections are considered to be failing if they do not meet the L.O.S. threshold set by the agency; however, the City of Seattle does not have an official intersection L.O.S. threshold. For the purposes of this analysis, failing intersections are defined as L.O.S. E or F as agreed to with the City of Seattle.

4.3.2.1 Property Access and Circulation

This section describes the main roadway modifications and traffic circulation changes with the No Build Alternative and proposed with each Build Alternative by segment. For example, roadway modifications may be needed to accommodate elevated guideway columns within the roadway or modifications to the street network surrounding stations. In these situations, left-turn access to properties may be restricted, with guideway columns proposed in the roadway median. To maintain property access, vehicles would either be able to recirculate using the

surrounding street grid system, or U-turn movements, where feasible, would be provided at adjacent intersections. The drawings in Appendix J, Conceptual Design Drawings, of the Final EIS show additional detail about each alternative.

SODO Segment

No Build Alternative

The No Build Alternative includes the Lander Street Bridge project (completed in 2020), which provides a new vehicle overpass between 1st Avenue South and 4th Avenue South and eliminates an at-grade crossing with the BNSF Railway rail line. In addition, it was assumed the City's Vision Zero project to convert one northbound 4th Avenue South general-purpose lane to a freight and bus lane north of South Holgate Street to South Royal Brougham Way.

Preferred Alternative (At-Grade Lander Access Station Option SODO-1c)

Preferred Option SODO-1c would build a new South Lander Street vehicle overpass elevated above the light rail tracks between 4th Avenue South and 6th Avenue South. The overpass would affect access to the adjacent United States Postal Service garage; alternative access and egress from this garage would be provided on 4th Avenue South. Sound Transit is working with the United States Postal Service and the City of Seattle to ensure trucks and other vehicles are able to access the parking garage facility. The South Lander Street overcrossing would eliminate an existing at-grade conflict with the existing 1 Line light rail, which interrupts the traffic flow accessing adjacent properties and east-west traffic circulation at one of the few places to cross existing tracks. A new traffic signal would be added at South Stacy Street and 6th Avenue South to facilitate bus and station access.

Preferred Option SODO-1c would close the SODO Busway permanently. There are fewer revenue bus trips in the future displaced from the busway, as some bus routes will be replaced with the completion of other Link extensions in the region. Permanent closure of the SODO Busway would displace remaining buses to alternate routes along 4th Avenue South and/or 6th Avenue South. See the segment-specific arterial and local street information later in this section for effects to traffic operations, and see Section 3.3.2.1, Long-term Impacts, for detailed information on the long-term effects to transit.

Other Build Alternatives and Design Options (SODO-1a, SODO-1b, and SODO-2)

As with Preferred Option SODO-1c, Alternative SODO-1a and Option SODO-1b would build a new South Lander Street vehicle overpass. Both alternatives provide access to the SODO Station by constructing the east leg of the South Stacy Street/4th Avenue South intersection, as shown in Appendix J of the Final EIS. Alternative SODO-1a would also add a new traffic signal at South Stacy Street and 6th Avenue South.

As with Preferred Option SODO-1c, Alternative SODO-1a and Option SODO-1b would close the SODO Busway permanently. The SODO Busway would be relocated to the west within the existing right-of-way and remain open with Alternative SODO-2.

Duwamish Segment

No Build Alternative

The No Build Alternative assumed the Southwest Spokane Street/West Marginal Way Southwest/Terminal 5 intersection modification, which would remove the north leg. This is assumed to be completed as part of the Terminal 5 redevelopment by 2032.

All Build Alternatives and Design Options (DUW-1a, DUW-1b, and DUW-2)

The Build Alternatives in this segment would not change any existing roadway channelization. All traffic movements would remain along public roadways and at private property access points. Notably, access to Terminal 18 would be the same as current conditions, and there would be no changes in access to the redeveloped Terminal 5 or to properties along West Marginal Way Southwest from the Duwamish River Bridge to Terminal 5, also known as the Quiet Zone project near Terminal 5. There could be some traffic circulation and property access changes after construction related to properties that have been fully or partially acquired during construction including using different streets.

Delridge Segment

No Build Alternative

The No Build Alternative includes the RapidRide H Line Corridor improvements along the Delridge Way Southwest corridor (completed in 2023), which includes rechannelizing portions of the corridor for a business access and transit lane in both the northbound and southbound directions. This segment also assumed completion of the 35th Avenue Southwest/Southwest Avalon Way Repaving project (35th/Avalon Paving project completed in 2020), which extends into the West Seattle Junction Segment, and includes rechannelization of Southwest Avalon Way and turn restrictions closer to Fauntleroy Way Southwest.

Preferred Alternative (Andover Street Station Lower Height South Alignment Option DEL-6b)

Preferred Option DEL-6b would add a new traffic signal at the re-aligned intersection of Delridge Way Southwest with Southwest Charlestown Street and 23rd Avenue Southwest. This would serve as the main access point for freight and employees accessing Nucor as well as potential TOD adjacent to the station. The existing Southwest Charlestown Street and Southwest Andover Street driveway would become one-way northbound and accessible for transit buses and paratransit only. Sound Transit is coordinating with the City of Seattle and Metro to select appropriate transit treatments to facilitate northbound bus movements from the existing bus lanes on Delridge Way Southwest into the Delridge Station, including a transit queue jump at either Southwest Andover Street or Southwest Dakota Street. For analysis purposes, it is assumed the queue jump would be at Southwest Andover Street but the final design would be selected in coordination with agency partners.

The elevated guideway would transition to at-grade track to the west towards the West Seattle Junction Segment at 32nd Avenue Southwest, south of Southwest Andover Street. This would result in permanent cul-de-sacs on 32nd Avenue Southwest to the north and south of the tracks. As a residential street with single-family housing, up to 45 peak hour trips could be shifted to Southwest Genesee Street. Intersection operations are expected to be similar to the No Build Alternative.

Other Build Alternatives and Design Options (DEL-1a, DEL-2a, DEL-1b, DEL-2b, DEL-3, DEL-4, DEL-5, DEL-6a, and DEL-7)

Alternative DEL-1a would construct a median to support the columns under the elevated light rail guideway on Southwest Genesee Street west of 26th Avenue Southwest. Left-turn access could be restricted in these sections with the median, but the street grid network would allow for local rerouting, such as using Southwest Nevada Street to maintain access to the properties.

Alternative DEL-2a would close 25th Avenue Southwest between Southwest Dakota Street and Southwest Genesee Street below the station to through traffic. The street grid network would allow for local rerouting, such as using 26th Avenue Southwest, Southwest Nevada Street, or Delridge Way Southwest to maintain access to properties.

Option DEL-1b would construct a median to support the columns under the elevated light rail guideway along Southwest Genesee Street west of the Longfellow Creek crossing. Left-turn access could be restricted in these sections with the median, but the street grid network would allow for local rerouting, such as using Southwest Nevada Street to maintain access to the properties.

Option DEL-2b would close 25th Avenue Southwest between Southwest Dakota Street and Southwest Genesee Street below the station to through traffic, and close 30th Avenue Southwest north of Southwest Genesee Street. The street grid network would allow for local rerouting, such as using 26th Avenue Southwest, Southwest Nevada Street, or Delridge Way Southwest to maintain access to properties.

Alternative DEL-3 and Alternative DEL-4 are not expected to affect traffic circulation or access.

Alternative DEL-5 would construct guideway columns on the south side of Southwest Andover Street west of 26th Avenue Southwest, but this is not expected to affect traffic circulation. Guideway columns would be within the median or adjacent to Southwest Avalon Way between Southwest Yancy Street and Southwest Genesee Street, which could restrict some left-turn access to properties. The street grid network would allow for local rerouting, such as using 30th Avenue Southwest or 32nd Avenue Southwest to maintain access to properties.

Alternative DEL-6a would construct a new median on Southwest Andover Street west of 26th Avenue Southwest to place guideway columns for the elevated track which would restrict some left-turn access, but the street network would allow for rerouting, such as using Southwest Nevada Street or Southwest Dakota Street to maintain access to properties.

Alternative DEL-7 would be similar to the Preferred Option DEL-6b in the Delridge station area; however, the 32nd Avenue Southwest cul-de-sac would only be on the south side of the guideway crossing and 32nd Avenue Southwest would no longer connect to Southwest Andover Street.

West Seattle Junction Segment

No Build Alternative

The No Build Alternative assumes completion of the Fauntleroy Way Southwest Boulevard project and the 35th Avenue Southwest/Southwest Avalon Way Repaving project.

Preferred Alternative (Medium Tunnel 41st Avenue Station West Entrance Station Option WSJ-5b)

Preferred Option WSJ-5b would close Southwest Genesee Street just east of 35th Avenue Southwest. Station access would occur at Southwest Avalon Way and Southwest Genesee Street at a new road connection between the station and Southwest Avalon Way, east of 35th Avenue Southwest. Preferred Option WSJ-5b, along with all other Build Alternatives except Alternative WSJ-6 which has no Avalon Station, would also modify the northbound approach at the Southwest Avalon Way and Southwest Genesee Street intersection to allow left-turn access to the drop-off and pick-up locations on Southwest Genesee Street near the Avalon Station. A new traffic signal would be installed at Southwest Alaska Street and 41st Avenue Southwest to provide direct access to the Alaska Junction Station.

Other Build Alternatives and Design Options (WSJ-1, WSJ-2, WSJ-3a, WSJ-3b, WSJ-4, WSJ-5a, and WSJ-6)

Alternative WSJ-1 would add a new traffic signal at Southwest Alaska Street and 41st Avenue Southwest intersection to provide direct access to the Alaska Junction Station. Alternative WSJ-2 would construct a median on Fauntleroy Way Southwest north of Southwest Alaska Street. The inside southbound through lane would slightly reduce in length.

Alternative WSJ-3a and Option WSJ-3b would modify the northbound approach at the Southwest Avalon Way/Southwest Genesee Street intersection to allow left-turn access to the drop-off and pick-up locations on Southwest Genesee Street near the station. Alternative WSJ-3a would also include a new traffic signal at Southwest Alaska Street and 41st Avenue Southwest intersection to provide direct access to the Alaska Junction Station.

Alternative WSJ-4 would close 38th Avenue Southwest north of Southwest Oregon Street and 37th Avenue Southwest north of Fauntleroy Way Southwest and create cul-de-sacs to allow vehicles to turn around. These street closures would be needed to accommodate the elevated track's transition to a tunnel Alaska Junction Station. The existing street grid network in this area would allow vehicles to use other streets such as 39th Avenue Southwest to reach their destination.

Alternative WSJ-5a would be the same as Preferred Option WSJ-5b around the Avalon Station.

Both Alternative WSJ-4 and Alternative WSJ-5a would include a new traffic signal at Southwest Alaska Street and 41st Avenue Southwest intersection to provide more direct access to the Alaska Junction Station.

Alternative WSJ-6 is similar to Alternative WSJ-5a; however there would be no Avalon Station.

4.3.2.2 Travel Demand Forecasts

Traffic volumes were forecasted for the 2042 a.m. and p.m. peak hours for the West Seattle Link Extension based on Puget Sound Regional Council's population and land use forecasts. Forecasts within the study area are predicted to have an average annual traffic volume growth rate in the study area of up to approximately 0.4 percent during the a.m. and p.m. peak hours in the No Build Alternative.

For the Build Alternatives, station characteristics and information from the Sound Transit Incremental Ridership Model (Sound Transit 2019) were used to calculate the anticipated vehicular trip generation for each station area. Station forecasts for the a.m. and p.m. peak hour are similar, but the boardings and alightings are inversely related. Three different types of station trips were estimated:

- Passenger drop-off and pick-up (including transportation network companies such as Uber and Lyft)
- Buses
- Walk and bicycle trips (non-motorized trips)

Because the Sound Transit ridership model does not break out pick-up/drop-off access percentages, a post-processing step was conducted to allocate a share of the forecasted trips to that mode based on recent market trends, potential future growth of transportation network company services, and stations' placement on the line. Post-processing was also applied to the bicycle mode to account for variations in the local bicycling infrastructure and station placement.

The calculated increase in vehicle and non-motorized trips at each station were added to the No Build Alternative traffic volume forecasts to estimate traffic volumes with the Build Alternatives. This forecast process is conservative because it does not reduce background traffic growth to account for people changing their travel mode from driving with the No Build Alternative to using transit with the project.

The trips associated with each station were assigned to the surrounding streets based on existing and future travel patterns and the location of the station facilities, such as transit stops, passenger pick-up and drop-off spaces, and entrances. The number of buses with the Build Alternatives were also adjusted based on the plan documented in the Transit Service Integration Technical Memorandum (Appendix B, Transit Service Integration Technical Memorandum, of Attachment N.1A). Beyond the changes to the vehicle trips around the station areas, the walk and bicycle trips generated at the stations were also incorporated into the traffic analysis, because this can affect intersection L.O.S. The walk and bicycle trips forecasted at each station were also an input to the pedestrian L.O.S. assessment in Section 6.3.2, Build Alternatives, in Chapter 6 of this technical report. None of the stations include park-and-ride lots.

Table 4-9 presents forecasts of trip activity for the 2042 p.m. peak hour condition. The SODO Station has the highest number of boardings, but most of these are rail-to-rail transit transfers and do not involve new trips beyond the station area. Among the other stations, the Alaska Junction and Delridge stations have the highest number of new trips, mainly due to the density of surrounding land use and bus-to-rail transfers, respectively. Avalon Station, which is not anticipated to be a transfer hub and has relatively low land use density, has the lowest trip activity of any West Seattle Link Extension station.

The minimum operable segment (M.O.S.) of the West Seattle Link Extension is assumed to have an interim terminus at Delridge Station. Station trip generation was re-evaluated and presented in Section 3.3.2, Build Alternatives, as part of the transit ridership forecasts. Based on those forecasts, the peak hour trips (most notably pick-up, drop-off, and transit transfers) at the Delridge Station would increase in the M.O.S. compared to the full extension. The majority of the increased vehicle trips compared to the full extension are assumed to access the station from the west, because the Avalon and Alaska Junction stations would not be built. Refer to Table 4-9 for the specific Delridge Station trip generation with the M.O.S.

4.3.2.3 Arterial and Local Street Operations

The a.m. and p.m. peak hour analysis for the No Build Alternative was evaluated for all study intersections. The p.m. peak hour generally represents the most congested period of the day and was therefore used for all Build Alternatives; however, some locations may have worse a.m. operations due to local land use and traffic patterns. The No Build Alternative a.m. analysis was one factor used to determine which locations warranted a.m. analysis in the Build Alternatives. See Attachment N.1A for more detail.

Intersections are generally considered to be failing if they do not meet the L.O.S. threshold set by the governing agency; however, the City of Seattle does not have an adopted intersection L.O.S. threshold. In the absence of an adopted City of Seattle L.O.S. threshold, intersections that operate at L.O.S. E and L.O.S. F were identified as failing as agreed upon with the City of Seattle. For Build Alternatives, affected intersections are identified and defined as locations expected to degrade from L.O.S. D or better in the No Build Alternative to L.O.S. E or F with the project, or if the intersection already operates at L.O.S. E or F in the No Build Alternative and have noticeably worse vehicle delays in the Build Alternative (10 percent or higher vehicle delay than in the No Build Alternative). See Attachment N.1C for more detailed intersection L.O.S. and queuing results.

Table 4-9. 2042 P.M. Peak Hour Station Trip Generation Forecasts by Mode (Boardings and Alightings)

Segment	Station	Alternative	Walk and Bike	Drop-off/ Pick-up [a]	Transit Transfers	Total Station Trips [b]
SODO	SODO – Build and (No Build) [c]	All Build Alternatives except M.O.S.	700 (600)	40 (40)	2,900 (400)	3,700 (1,100)
SODO	SODO – Build and (No Build) [c]	M.O.S.	700 (600)	40 (40)	2,300 (400)	3,000 (1,100)
Delridge	Delridge	All Build Alternatives except M.O.S.	150	30	1,200	1,400
Delridge	Delridge	M.O.S.	150	30	1,900	2,100
West Seattle Junction	Avalon	Preferred Option WSJ-5b, Alternative WSJ-1, Alternative WSJ-3a, Option WSJ-3b, Alternative WSJ-4, Alternative WSJ-5a	300	50	250	600
West Seattle Junction	Avalon	Alternative WSJ-2	150	30	100	250
West Seattle Junction	Alaska Junction	Preferred Option WSJ-5b, Alternative WSJ-1, Alternative WSJ-3a, Option WSJ-3b, Alternative WSJ-4, Alternative WSJ-5a	500	100	500	1,200
West Seattle Junction	Alaska Junction	Alternative WSJ-2	700	100	800	1,600
West Seattle Junction	Alaska Junction	Alternative WSJ-6	700	20	900	1,700

[a] Includes transportation network companies (e.g., Uber and Lyft).

[b] Due to rounding, some totals may not exactly match the sum of the values in their rows.

[c] Values in parentheses indicate forecasted ridership for the existing station only under the 2042 no build condition. Values without parentheses represent the build condition and include both the proposed and existing stations.

Impacts Common to All Alternatives

Most intersections affected by the Build Alternatives are a result of increased vehicle trips for pick-up/drop-off and pedestrian and bicycle activity that increase delays near station access points.

SODO Segment

Intersection operation results for the 2042 No Build Alternative and Build Alternatives in the SODO Segment are shown in Table 4-10 and Table 4-11. Intersection operation results for Preferred Option SODO-1c are shown on Figure 4-6 and Figure 4-7; figures for the other Build Alternatives are included in Attachment N1.C.

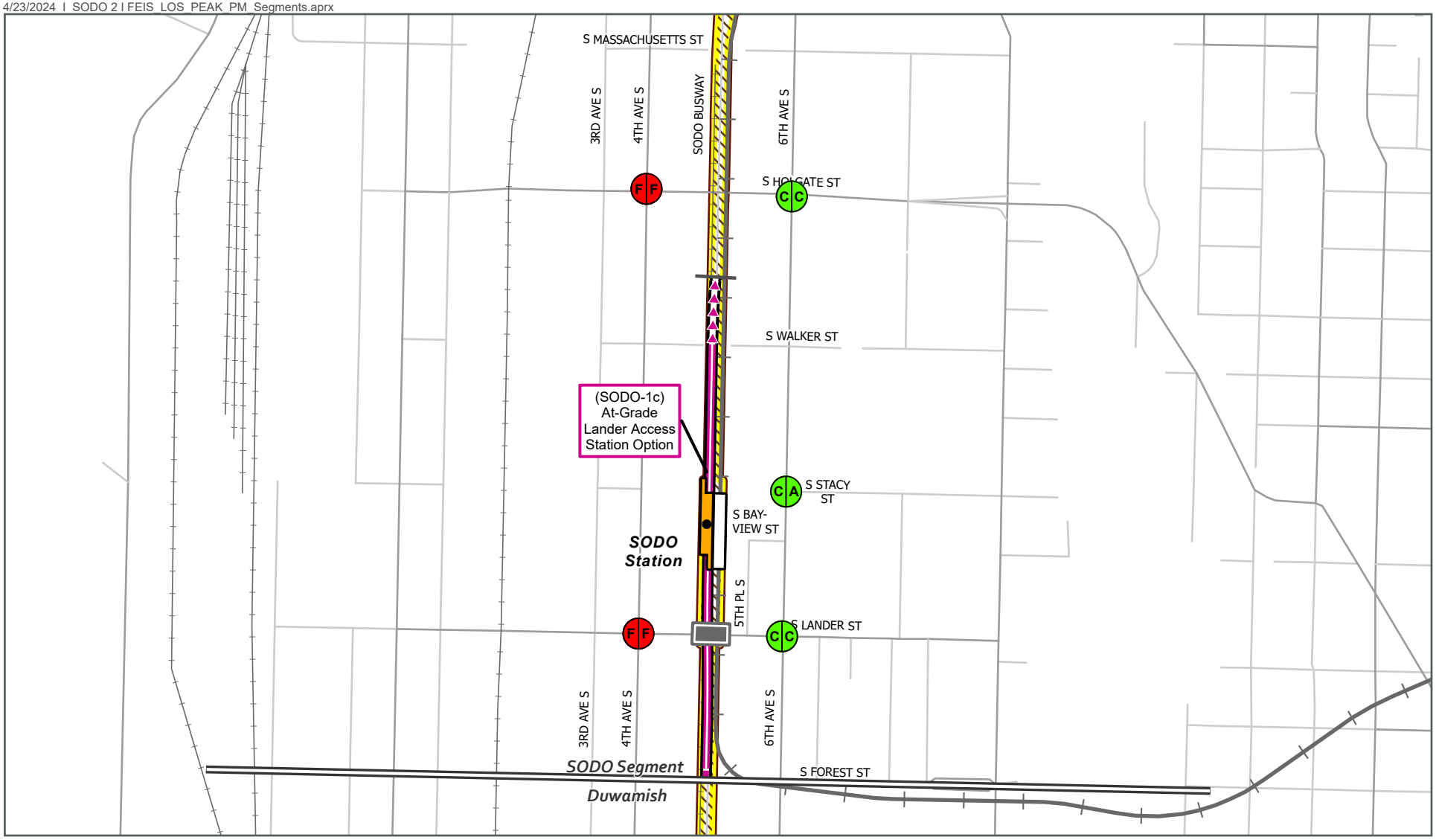
Table 4-10. 2042 P.M. Peak Intersection Level of Service - SODO Segment

Intersection	No Build Alternative	Preferred At-Grade Lander Access Station Option (SODO-1c)	At-Grade Alternative (SODO-1a)	At-Grade South Station Option (SODO-1b)	Mixed Profile Alternative (SODO-2)
4th Avenue South/ South Holgate Street	F	F	F	F	F
4th Avenue South/ South Lander Street	F	F	F	F	F
6th Avenue South/ South Holgate Street	C	C	C	C	C
6th Avenue South/ South Lander Street	C	C	C	C	C
6th Avenue South/ South Stacy Street	C	A	A	Not Analyzed	Not Analyzed
SODO Busway/ South Lander Street	C	Not Analyzed	Not Analyzed	Not Analyzed	C

Table 4-11. 2042 A.M. Peak Intersection Level of Service – SODO Segment

Intersection	No Build Alternative	Preferred At-Grade Lander Access Station Option (SODO-1c)	At-Grade Alternative (SODO-1a)	At-Grade South Station Option (SODO-1b)	Mixed Profile Alternative (SODO-2)
4th Avenue South/ South Holgate Street	E	E	E	E	E
4th Avenue South/ South Lander Street	F	F	F	F	F
6th Avenue South/ South Holgate Street	C	C	C	C	C
6th Avenue South/ South Lander Street	B	B	B	B	B
6th Avenue South/ South Stacy Street	C	A	A	Not Analyzed	Not Analyzed
SODO Busway/ South Lander Street	B	Not Analyzed	Not Analyzed	Not Analyzed	C

Note: Limited a.m. analysis was performed for locations that met the criteria in Attachment N.1A.



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- Retained Cut
- At-Grade

Station (● *Indicates Preferred Alternative*)
- New
- Existing
- Relocated

- Segment Line
- Existing Link Light Rail
- Railroad
- SODO Busway
- Proposed Overpass

Intersection Level of Service

NB ALT
- A-C
- D
- E-F

Figure 4-6
Preferred Option SODO-1c
2042 P.M. Peak Hour Intersection Level of Service (L.O.S.)
SODO Segment

West Seattle Link Extension

0 500 1,000 Feet

N

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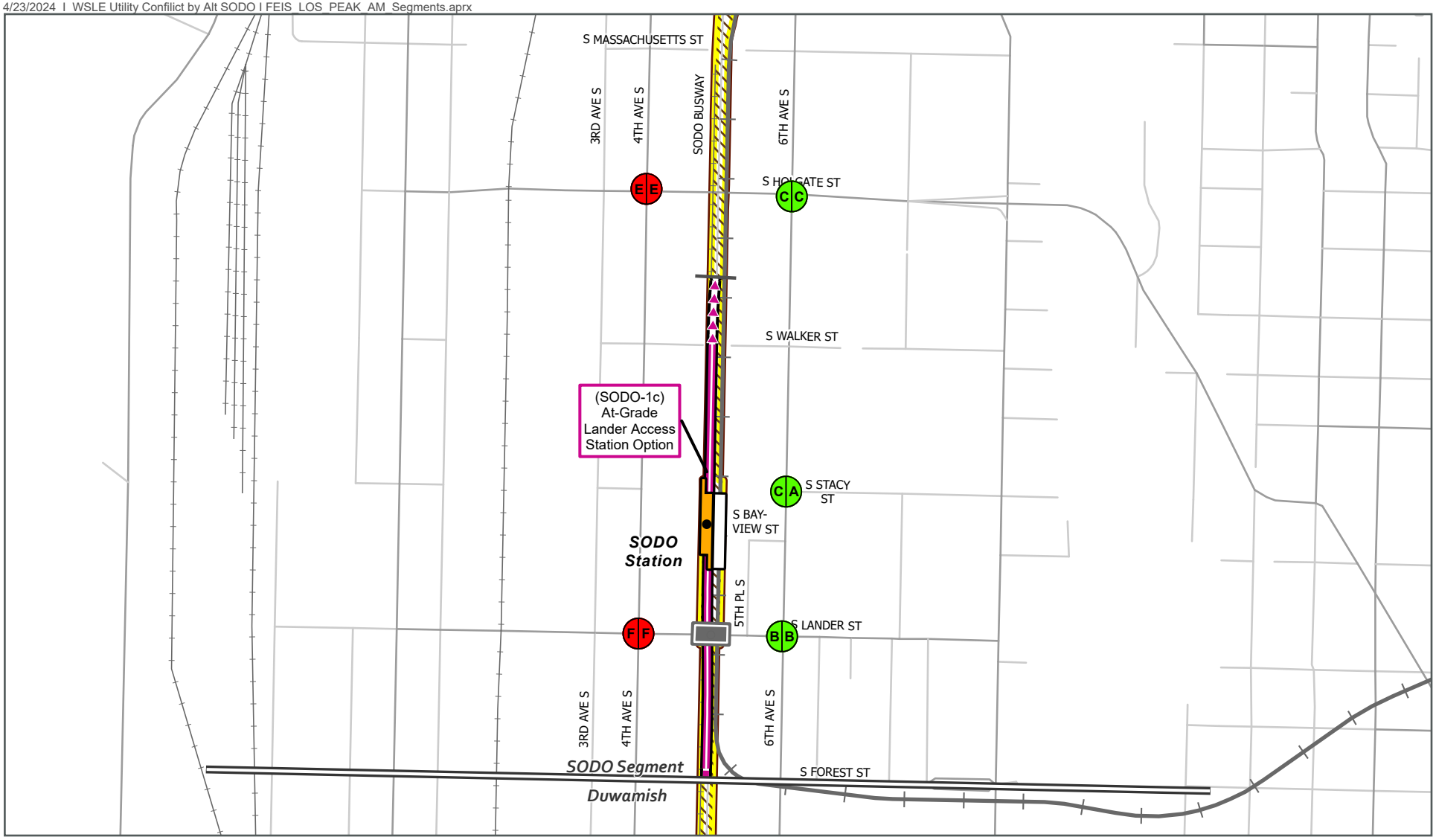


Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- Retained Cut
- At-Grade

Station (● *Indicates Preferred Alternative*)
- New
- Existing
- Relocated

- Segment Line
- Existing Link Light Rail
- Railroad
- SODO Busway
- Proposed Overpass

Intersection Level of Service

NB ALT
- A-C
- D
- E-F

Figure 4-7
Preferred Option SODO-1c
2042 A.M. Peak Hour Intersection Level of Service (L.O.S.)
SODO Segment

West Seattle Link Extension

0 500 1,000 Feet

N

2042 No Build Alternative

With the 2042 No Build Alternative, traffic volumes are expected to increase along 4th Avenue South and South Spokane Street compared to existing conditions. Most study intersections would continue to operate at L.O.S. D or better during both a.m. and p.m. peak periods except for 4th Avenue South and South Holgate Street, which would operate at L.O.S. E in the a.m. peak hour and L.O.S. F in the p.m. peak hour, and 4th Avenue South and South Lander Street, which would operate at L.O.S. F during both a.m. and p.m. peak periods.

2042 Build Alternatives

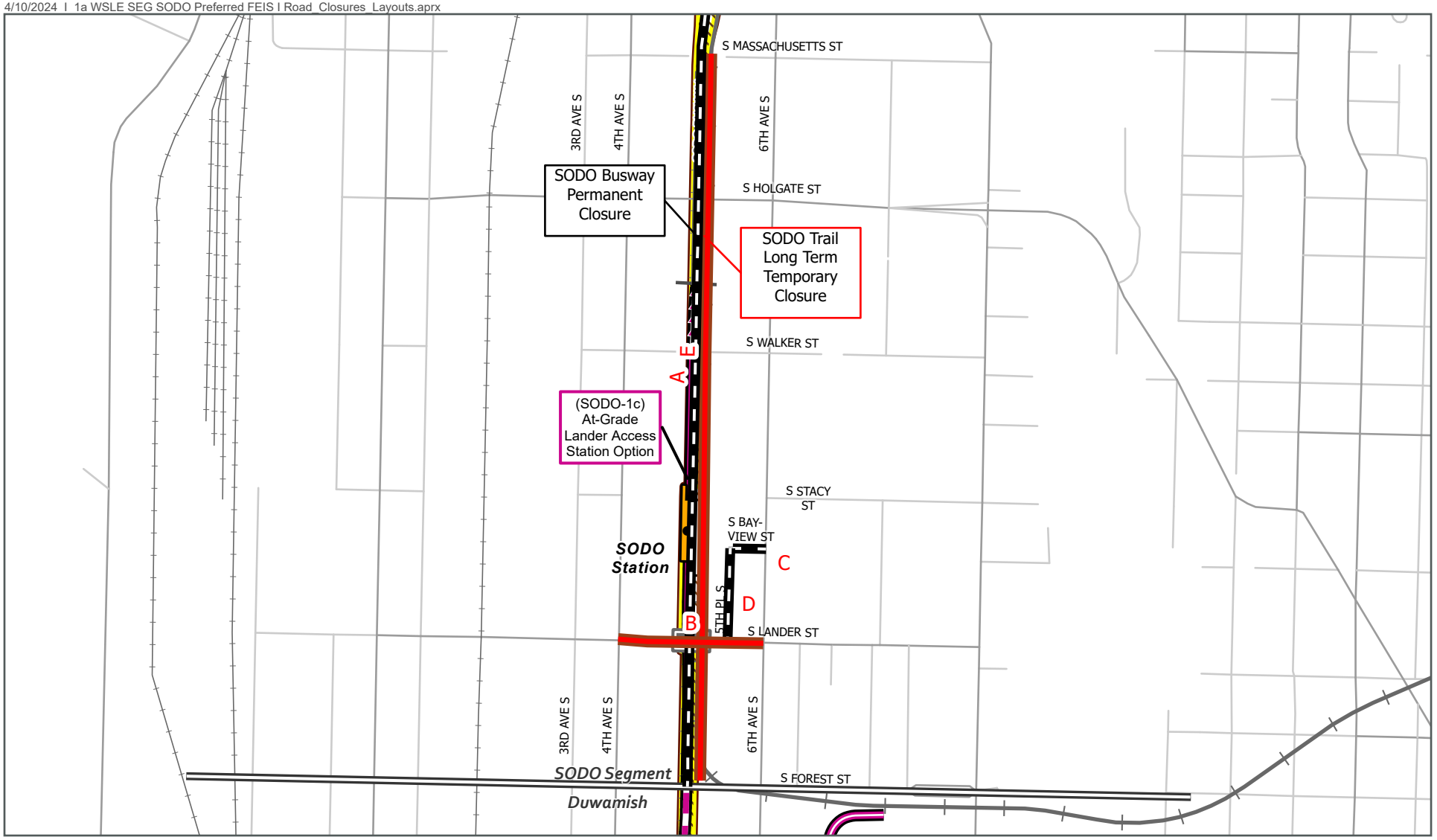
In 2042, Preferred Option SODO-1c, Alternative SODO-1a, and Option SODO-1b would permanently close the SODO Busway, as shown on Figure 4-8 (construction closures also shown on this figure are discussed in Section 4.3.3.2, SODO Segment). The closure of the SODO Busway would displace Metro buses, which use the busway for active bus trips and for buses deadheading (i.e., non-revenue trips) to and from the Ryerson and Atlantic/Central bus bases. These 30 to 40 total buses in the peak hour were assumed to mostly shift to 4th Avenue South and would not result in a noticeable change in traffic L.O.S. relative to the No Build Alternative. See Section 3.3.2.1 for more information on the long-term transit effects of the SODO Busway closure. The new South Lander Street overpass between 4th Avenue South and 6th Avenue South (with Preferred Option SODO-1c, Alternative SODO-1a, and Option SODO-1b) would provide similar capacity to the No Build Alternative, resulting in similar L.O.S. conditions; most of the transit trips at the SODO Station are transfers from other transit routes, bike access, or walk access. The traffic operations results for Alternative SODO-2 would be the same relative to the No Build Alternative at the study intersections.

Although the Stadium Station is north of the SODO Segment with all Build Alternatives, the West Seattle Link Extension would serve this station. Ridership at this station is relatively low today during typical peak hours; ridership surges occur before and after large events as riders walk between nearby event venues and Stadium Station. Therefore, no substantial change in vehicle trips is expected during the peak hour for any of the Build Alternatives compared to the No Build Alternative. Traffic operations around the station are therefore not expected to be impacted by any of the Build Alternatives.

A more detailed traffic microsimulation model, called VISSIM, was created to evaluate 4th Avenue South corridor operations with the permanent SODO Busway closure. Scenarios evaluated included 2042 No Build Alternative and Preferred Option SODO-1c.

The VISSIM model included all signalized intersections along 4th Avenue South from the I-90 Westbound Off-ramp to the West Seattle Bridge Off-ramp. Roadway geometry changes from existing conditions included a City of Seattle project that constructs a northbound freight and bus lane between South Holgate Street and South Royal Brougham Way, and a new signal at the intersection of 4th Avenue South and South Massachusetts Street to facilitate Metro bus access to Ryerson Bus Base. The VISSIM model also incorporated future City of Seattle projects to eliminate right turns on red and add leading pedestrian intervals at all signalized intersections.

With Preferred Option SODO-1c, no study intersections are expected to be affected during the a.m. or p.m. peak hours compared to 2042 No Build. However, an impact to transit travel times is expected with the permanent closure of the SODO Busway, a dedicated transit-only facility, which would require buses to shift to travel with mixed traffic on 4th Avenue South or 6th Avenue South corridors. The mitigation measures being considered for the transit impact would modify arterial configurations and traffic signal operations, potentially resulting in impacts to arterial operations.



Source: City of Seattle, King County (2023).

Preferred Alternative

- Elevated
- Tunnel
- At-Grade
- Retained Cut

- Segment Line
- Railroad
- Existing Link Light Rail
- SODO Busway
- Proposed Overpass

Street Intersection Closures

- Full Closure: Long Term Temporary
- Partial Closure: Long Term Temporary
- Permanent Closure

Street and Trail Closures

- Full Closure: Long Term Temporary
- Partial Closure: Long Term Temporary
- Permanent Closure

FIGURE 4-8

Key Preferred Alternative Construction Facility Closures

SODO Segment

West Seattle Link Extension

0 500 1,000 Feet

N

The mitigation measures being considered include transit queue jumps, business access and transit lanes, and freight and bus lanes. Specific mitigation for the permanent closure of the SODO Busway would be determined through coordination between Sound Transit, City of Seattle, Port of Seattle, Northwest Seaport Alliance, and King County Metro.

For the purposes of this analysis, dedicated freight and bus lanes in both directions along 4th Avenue South between South Spokane Street and South Holgate Street were tested as mitigation for transit impacts. This configuration would require removing all parking along both sides of 4th Avenue South and one northbound general-purpose lane (refer to Section 5.3.2.1, Long-term Impacts, for discussion of parking effects). With this transit mitigation in place, L.O.S. impacts are expected at the intersections of 4th Avenue South/South Lander Street and 4th Avenue South/South Spokane Street during the a.m. peak hour. Both intersections are expected to operate at L.O.S. F due to the reduction in northbound capacity for general-purpose vehicles. Northbound queuing along 4th Avenue South could cause additional delay for vehicles attempting to turn onto 4th Avenue South between the intersections of 4th Avenue South/South Lander Street and 4th Avenue South/West Seattle Bridge Off-ramp. An impact is also expected at 4th Avenue South/South Lander Street during the p.m. peak hour due to the reduction in northbound general-purpose capacity.

Although there would be increases in delay for general-purpose traffic, the freight and bus lanes could save up to 2 minutes of northbound transit travel time along the corridor compared to no mitigation on 4th Avenue South during the a.m. peak hour, and up to 90 seconds of travel time during the p.m. peak hour. Southbound transit could also save up to 2 minutes of travel time during the p.m. peak hour. Northbound freight travel times could save up to 50 seconds in the a.m. peak hour and almost 2 minutes southbound in the p.m. peak hour compared to no mitigation on 4th Avenue South. This potential impact would also occur under Alternative SODO-1a and Option SODO-1b; traffic operations findings are anticipated to be similar to the Preferred Option SODO-1c.

Duwamish Segment

There are no proposed stations in the Duwamish Segment. Preferred Alternative DUW-1a, Option DUW-1b, and Alternative DUW-2 would have no guideway structures within the public street system that would substantively affect traffic operations. However, a minimal increase in traffic volumes for pick-up or drop-off vehicle trips (fewer than 20 vehicles) associated with the SODO Station and Delridge Station would travel through these study intersections in both the a.m. and p.m. peak periods compared to the No Build Alternative. Therefore, the study intersections were evaluated with the SODO and Delridge segments Build Alternatives. All Duwamish Segment alternatives could connect to all SODO Segment alternatives and Delridge Segment alternatives.

Intersection operation results for the 2042 No Build Alternative and Build Alternatives in the Duwamish Segment are shown in Table 4-12 through Table 4-15. Intersection operations results for Preferred Option SODO-1c and Preferred Option DEL-6b are shown on Figure 4-9 and Figure 4-10; figures for the other Build Alternatives are included in Attachment N1.C.

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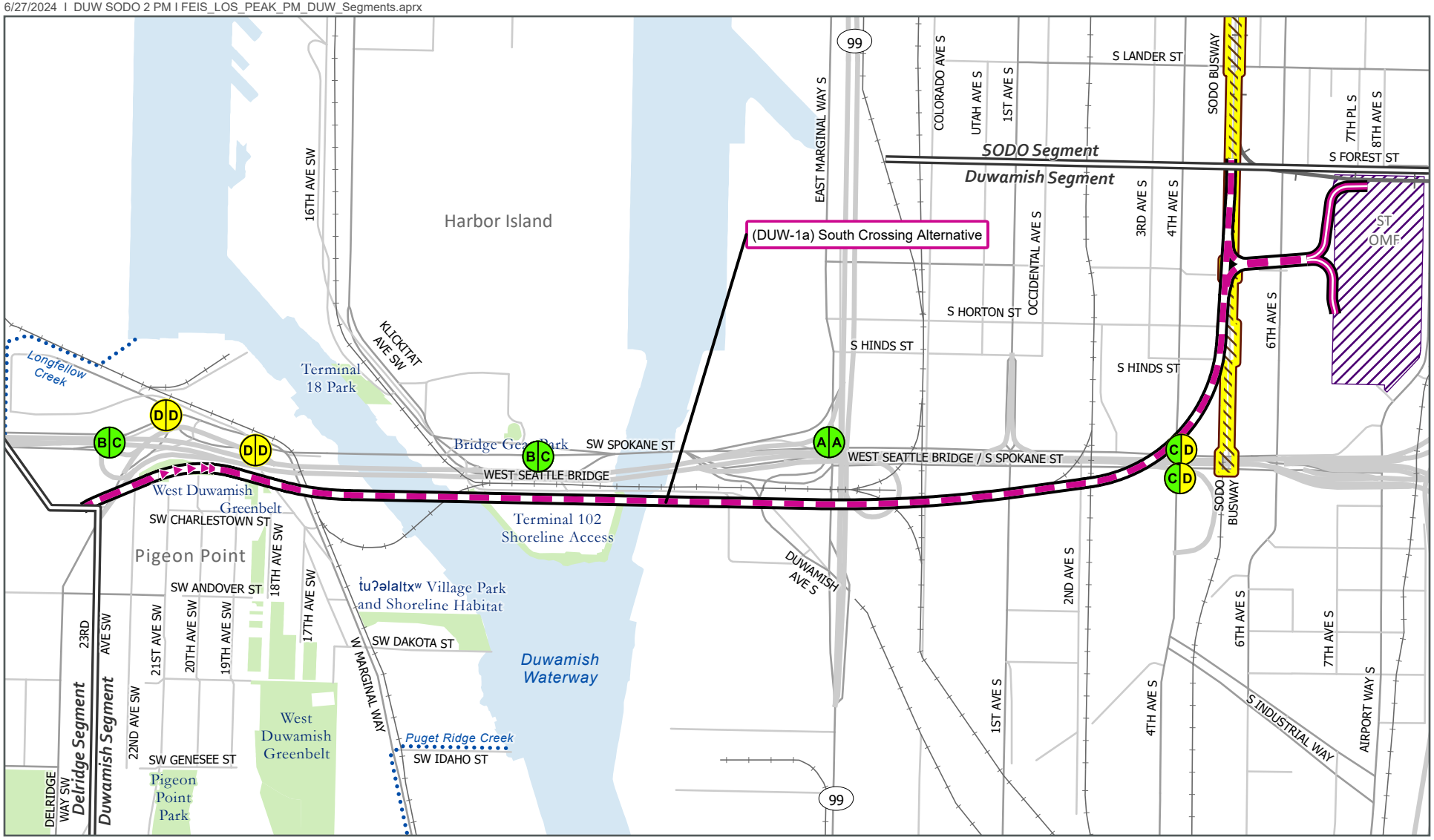


Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- At-Grade
- Retained Cut

- Segment Line
- Existing Link Light Rail
- Railroad
- SODO Busway
- Proposed Overpass
- Sound Transit Operations and Maintenance Facility (ST OMF)
- Piped Stream
- Park

Intersection Level of Service

NB ALT
- A-C
- D
- E-F

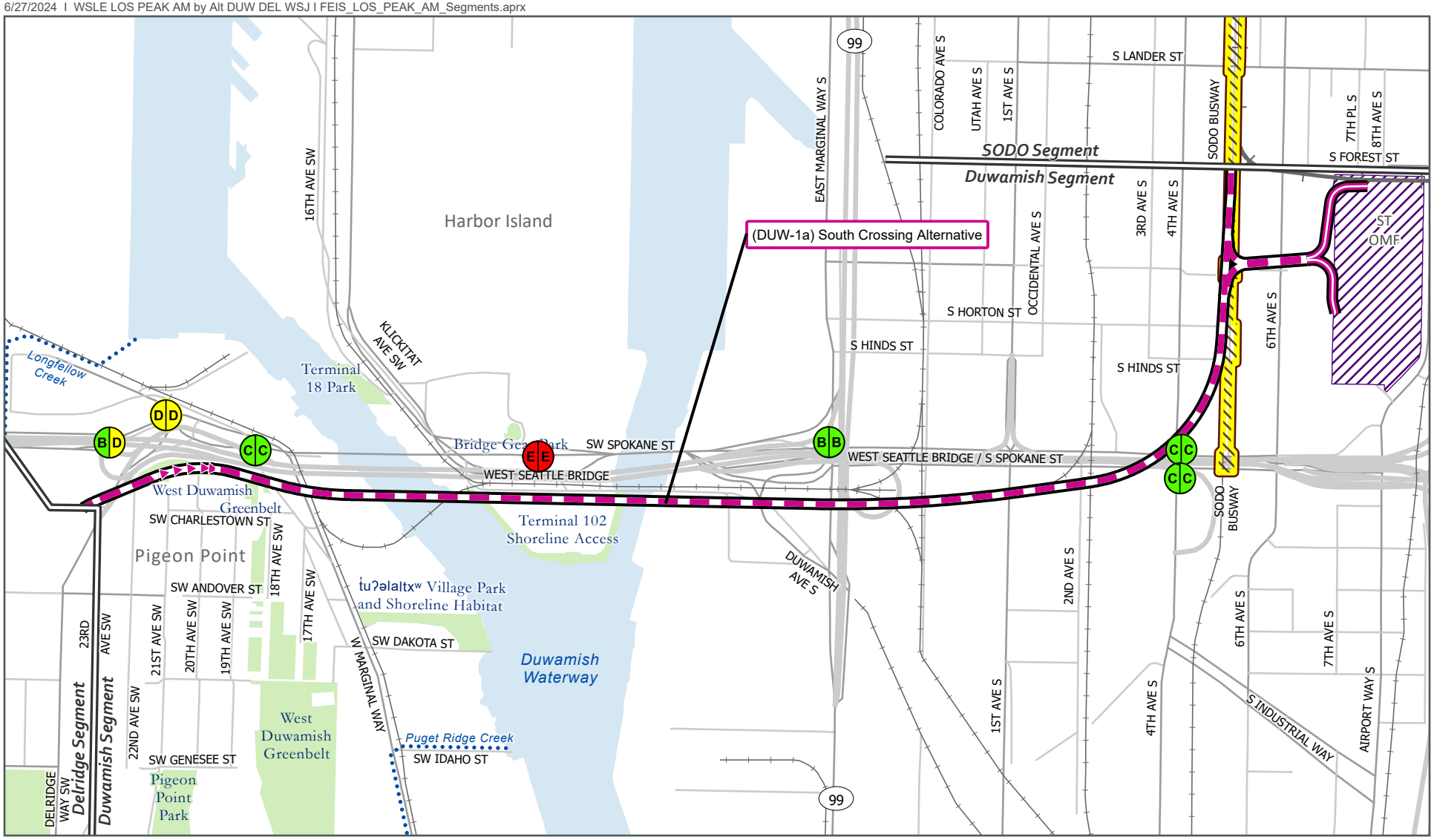
Figure 4-9

Preferred Options SODO-1c/DEL-6b
2042 P.M. Peak Hour Intersection Level of Service (L.O.S.)
Duwamish Segment

West Seattle Link Extension

0 500 1,000 Feet

N



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- At-Grade
- Retained Cut

- Segment Line
- Existing Link Light Rail
- Railroad
- SODO Busway
- Sound Transit Operations and Maintenance Facility (ST OMF)
- Piped Stream
- Park

Intersection Level of Service

NB ALT
- A-C
- D
- E-F

Figure 4-10

Preferred Alternative SODO-1c/DEL-6b
2042 A.M. Peak Hour Intersection Level of Service (L.O.S.)
Duwamish Segment

West Seattle Link Extension

0 500 1,000 Feet

N

Table 4-12. 2042 P.M. Peak Level of Service – Duwamish Study Intersections Evaluated for SODO Segment Alternatives

Intersection	No Build Alternative	Preferred At-Grade Lander Access Station Option (SODO-1c)	At-Grade Alternative (SODO-1a)	At-Grade South Station Option (SODO-1b)	Mixed Profile Alternative (SODO-2)
4th Avenue South/ South Spokane Street (North)	C	D	C	C	C
4th Avenue South/ South Spokane Street (South)	C	D	C	C	C
East Marginal Way South/ South Spokane Street	A	A	A	A	A

2042 No Build Alternative

With the 2042 No Build Alternative, general vehicle and truck volumes increase along Southwest Spokane Street with the planned redevelopment of Terminal 5. Chelan Avenue Southwest/Southwest Spokane Street and Southwest Spokane Street/11th Avenue Southwest would operate at L.O.S. D or better during the p.m. peak period. However, during the a.m. peak period, Southwest Spokane Street/11th Avenue Southwest would operate at L.O.S. E.

As a part of the Terminal 5 Redevelopment, the north approach of the West Marginal Way Southwest/Chelan Avenue Southwest/Southwest Spokane Street intersection will be closed and all Terminal 5 traffic will be rerouted to use the intersection of Southwest Spokane Street/Terminal 5 access ramp. With these access changes and volume increases, the West Marginal Way Southwest/Chelan Avenue Southwest/Southwest Spokane Street intersection is expected to operate at L.O.S. D during both peak hours. Delay also increases at the Southwest Spokane Street/Terminal 5 access ramp, which would operate at L.O.S. D during the p.m. peak hour and L.O.S. C during the a.m. peak hour.

Table 4-13. 2042 P.M. Peak Level of Service - Duwamish Study Intersections Evaluated for Delridge Segment Alternatives

Intersection	No Build Alternative	Preferred Andover Street Station Lower Height South Alignment Option (DEL-6b)	Dakota Street Station Alternative (DEL-1a)	Dakota Street Station North Alignment Option (DEL-1b)	Dakota Street Station Lower Height Alternative (DEL-2a)	Dakota Street Station Lower Height North Alignment Option (DEL-2b)	Delridge Way Station Alternative (DEL-3)	Delridge Way Station Lower Height Alternative (DEL-4)	Andover Street Station Alternative (DEL-5)	Andover Street Station Lower Height Alternative (DEL-6a)	Andover Street Station Lower Height No Avalon Station Tunnel Connection (DEL-7)
West Marginal Way Southwest/ Chelan Avenue Southwest/ Southwest Spokane	D	D	D	D	D	D	D	D	D	D	D
Chelan Avenue Southwest/ Southwest Spokane Street	B	C	C	C	C	C	C	C	C	C	C
Southwest Spokane Street/West Marginal Way Southwest/ Terminal 5	D	D	D	D	D	D	D	D	D	D	D
Southwest Spokane Street/ 11th Avenue Southwest	B	C	C	C	C	C	C	C	C	C	C

Table 4-14. 2042 A.M. Peak Level of Service – Duwamish Study Intersections Evaluated for SODO Segment Alternatives

Intersection	No Build Alternative	Preferred At-Grade Lander Access Station Option (SODO-1c)	At-Grade Alternative (SODO-1a)	At-Grade South Station Option (SODO-1b)	Mixed Profile Alternative (SODO-2)
4th Avenue South/ South Spokane Street (North)	C	C	D	D	C
4th Avenue South/ South Spokane Street (South)	C	C	D	D	C
East Marginal Way South/ South Spokane Street	B	B	B	B	B

Note: Limited a.m. analysis was performed for locations that met the criteria in Attachment N.1A.

Table 4-15. 2042 A.M. Peak Level of Service – Duwamish Study Intersections Evaluated for Delridge Segment Alternatives

Intersection	No Build Alternative	Preferred Andover Street Station Lower Height South Alignment Option (DEL-6b)	Dakota Street Station Alternative (DEL-1a)	Dakota Street Station North Alignment Option (DEL-1b)	Dakota Street Station Lower Height Alternative (DEL-2a)	Dakota Street Station Lower Height North Alignment Option (DEL-2b)	Delridge Way Station Alternative (DEL-3)	Delridge Way Station Lower Height Alternative (DEL-4)	Andover Street Station Alternative (DEL-5)	Andover Street Station Lower Height Alternative (DEL-6a)	Andover Street Station Lower Height No Avalon Station Tunnel Connection (DEL-7)
West Marginal Way Southwest/ Chelan Avenue Southwest/ Southwest Spokane Street	D	D	D	D	D	D	D	D	D	D	D
Chelan Avenue Southwest/ Southwest Spokane Street	B	D	D	D	D	D	D	D	D	D	D
Southwest Spokane Street/ West Marginal Way Southwest/ Terminal 5	C	C	C	C	C	C	C	C	C	C	C
Southwest Spokane Street/11th Avenue Southwest	E	E	E	E	E	E	E	E	E	E	E

2042 Build Alternatives

There are no proposed stations in the Duwamish Segment. Preferred Alternative DUW-1a, Option DUW-1b, and Alternative DUW-2 would have no guideway structures within the public street system that would affect traffic operations. There would be no permanent roadway closures in this segment as shown on Figure 4-11 (construction closures shown on this figure are discussed in Section 4.3.3.3, Duwamish Segment).

Preferred Alternative DUW-1a would locate a guideway column on the west side of 4th Avenue South immediately north of South Spokane Street. This could potentially block the visibility of a pedestrian waiting to cross southbound from a southbound right-turning vehicle. Therefore, a separate pedestrian crossing phase was assumed in this alternative and is reflected in the Preferred Option SODO-1c analysis shown in Table 4-12. The intersection delay would increase to L.O.S. D operations during the p.m. peak hour.

For all Build Alternatives, all study intersections would continue to operate at L.O.S. D or better except for Southwest Spokane Street and 11th Avenue Southwest, which would operate at L.O.S. E during the a.m. peak period with both No Build Alternative and Build Alternatives, but would not meet the threshold for an affected intersection.

Delridge Segment

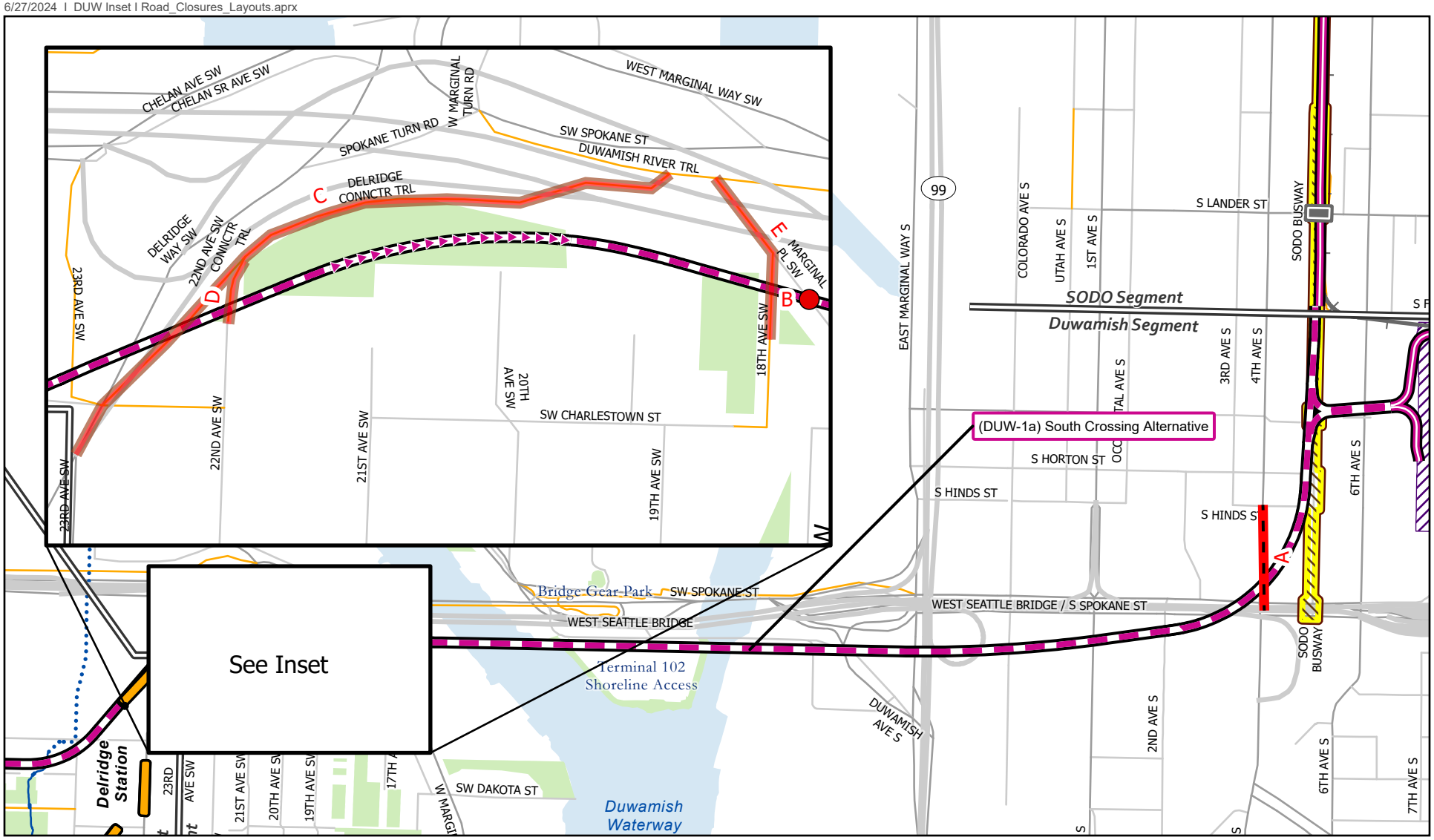
Intersection operation results for the 2042 No Build Alternative and Build Alternatives in the Delridge Segment are shown in Table 4-16 and Table 4-17. Intersection operations results for Preferred Option DEL-6b are shown on Figure 4-12 and Figure 4-13; figures for the other Build Alternatives are included in Attachment N1.C.

2042 No Build Alternative

With the 2042 No Build Alternative, traffic volumes are expected to increase in the Delridge Segment study area. The following intersections would operate at L.O.S. E or F:

- Southwest Andover Street and Delridge Way Southwest (L.O.S. F in both peak hours)
- Southwest Dakota Street and Delridge Way Southwest (L.O.S. E in p.m. peak hour and L.O.S. F in a.m. peak hour)
- Southwest Genesee Street and Delridge Way Southwest (L.O.S. E in a.m. peak hour)
- Southwest Andover Street and 26th Avenue Southwest (L.O.S. F in a.m. peak hour)
- Southwest Andover Street and Charlestown Street (L.O.S. E in both peak hours)

During the p.m. peak period, southbound queues would extend on average from Southwest Andover Street back to the Seattle Fire Station, and under the worst conditions, queues could extend under the West Seattle Bridge overpass. During the a.m. peak period, northbound queues at Southwest Genesee Street/Delridge Way Southwest could extend back to the Delridge Playfield, and at Southwest Andover Street/Delridge Way Southwest, northbound queues could extend through the intersection of Southwest Dakota Street/Delridge Way Southwest.



Source: City of Seattle, King County (2023).

Preferred Alternative

- Elevated
- At-Grade
- Tunnel
- Retained Cut

- Segment Line
- Stairs, Trail, Walkway
- Local Street
- Major Street
- Existing Link Light Rail
- Proposed Overpass
- Sound Transit Operations and Maintenance Facility (ST OMF)
- Stream
- Piped Stream
- Park

Street Intersection Closures

- Full Closure: Long Term Temporary
- Partial Closure: Long Term Temporary
- Permanent Closure

Street and Trail Closures

- Full Closure: Long Term Temporary
- Partial Closure: Long Term Temporary
- Permanent Closure

Figure 4-11

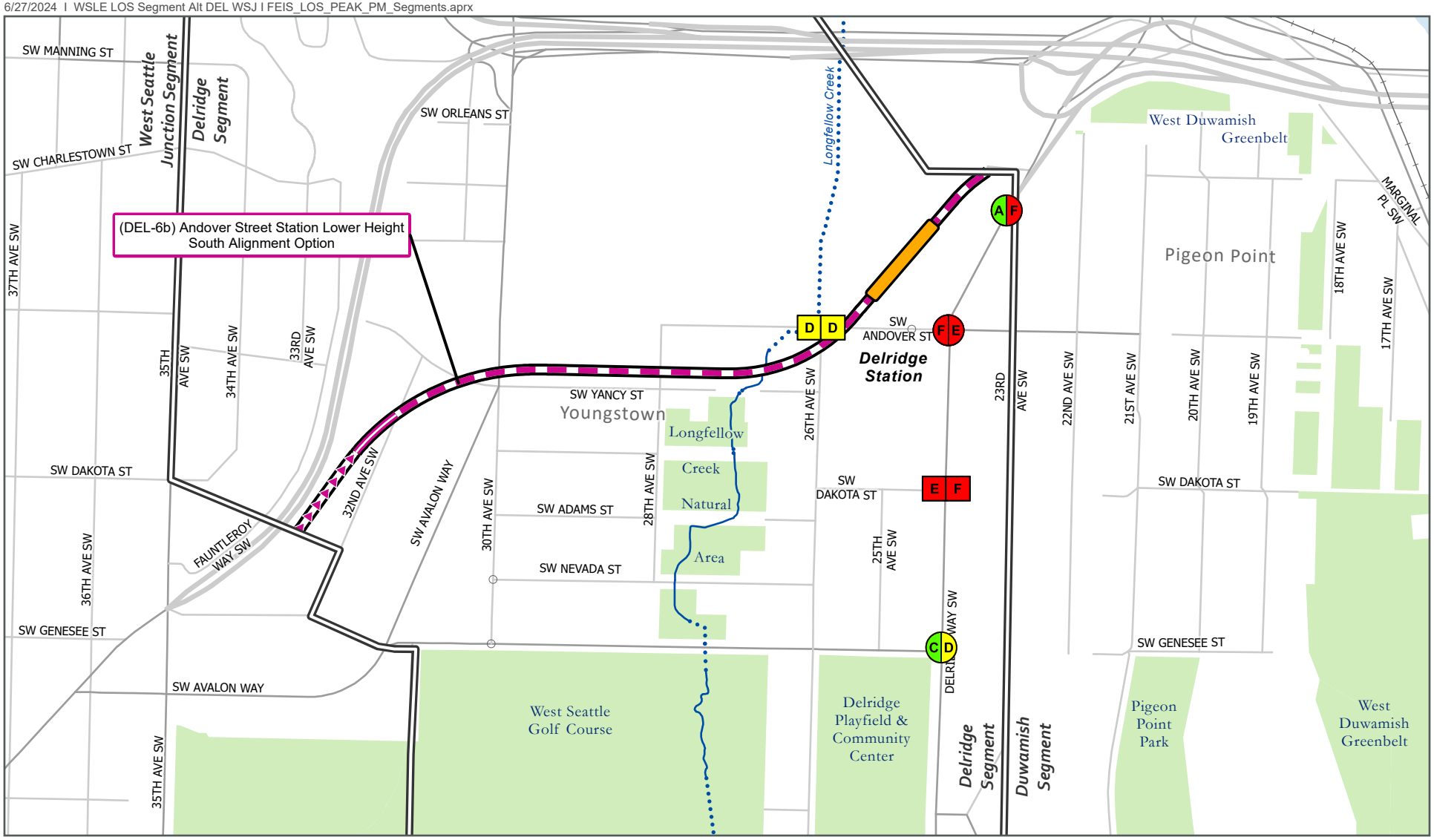
Key Preferred Alternative Construction Facility Closures

Duwamish Segment

West Seattle Link Extension

0 500 1,000 Feet

N



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- At-Grade
- Retained Cut

Station
- New

- Segment Line
- Railroad
- Stream
- Piped Stream
- Park

Intersection Level of Service

NB ALT
- A-C
- D
- E-F

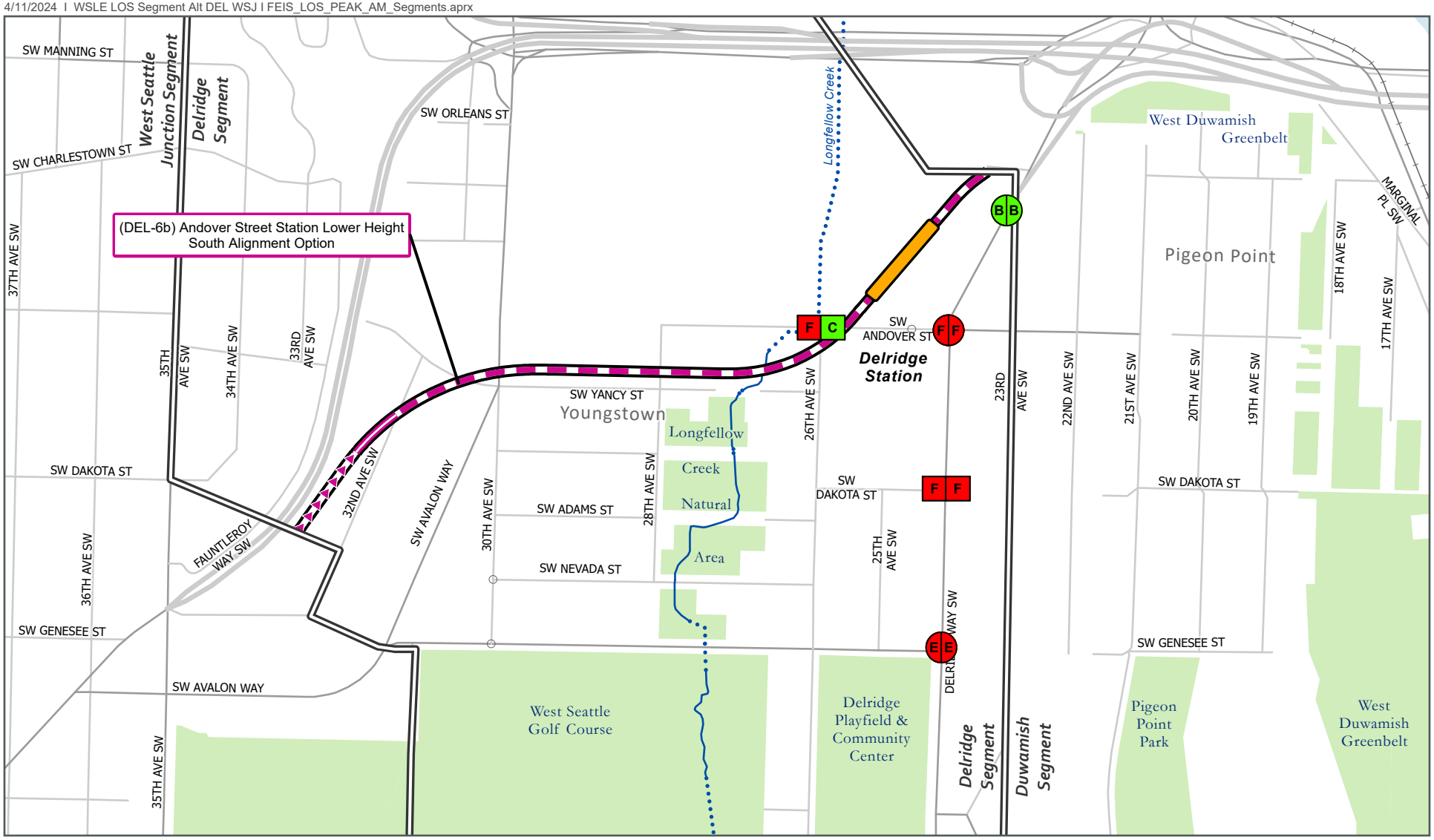
Intersection Type
- Stop-Controlled
- Signalized

Figure 4-12
Preferred Option DEL-6b
2042 P.M. Peak Hour Intersection Level of Service (L.O.S.)
Delridge Segment

West Seattle Link Extension

0 500 1,000 Feet

N



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- At-Grade
- Retained Cut

Station
- New

- Segment Line
- Railroad
- Stream
- Piped Stream
- Park

Intersection Level of Service

NB ALT
- A-C
- D
- E-F

Intersection Type
- Stop-Controlled
- Signalized

Figure 4-13
Preferred Option DEL-6b
2042 A.M. Peak Hour Intersection Level of Service (L.O.S.)
Delridge Segment

West Seattle Link Extension

0 500 1,000 Feet

N

Table 4-16. 2042 P.M. Peak Level of Service - Delridge Segment

Intersection	No Build Alternative	Preferred Andover Street Station Lower Height South Alignment Option (DEL-6b)	Dakota Street Station Alternative (DEL-1a)	Dakota Street Station North Alignment Option (DEL-1b)	Dakota Street Station Lower Height Alternative (DEL-2a)	Dakota Street Station Lower Height North Alignment Option (DEL-2b)	Delridge Way Station Alternative (DEL-3)	Delridge Way Station Lower Height Alternative (DEL-4)	Andover Street Station Alternative (DEL-5)	Andover Street Station Lower Height Alternative (DEL-6a)	Andover Street Station Lower Height No Avalon Station Tunnel Connection (DEL-7)
Delridge Way Southwest/ 23rd Avenue Southwest	A	F [a]	A	A	A	A	A	A	B	B	F [a]
Southwest Andover Street/ Delridge Way Southwest [b]	F	E	F [a]	F [a]	F [a]	F [a]	F [a]	F [a]	F [a]	F [a]	E
Southwest Dakota Street/Delridge Way Southwest	E	F [a]	F [a]	F [a]	F [a]	F [a]	F [a]	F [a]	F [a]	F [a]	F [a]
Southwest Genesee Street/Delridge Way Southwest [b]	C	D	C	C	C	C	C	C	C	C	D
26th Avenue Southwest/ Southwest Andover Street [b]	D	D	D	D	D	D	D	D	D	D	D
30th Avenue Southwest/ Southwest Nevada Street	A	Not Analyzed	A	A	A	A	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
30th Avenue Southwest/ Southwest Genesee Street	B	Not Analyzed	B	B	B	B	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed

Intersection	No Build Alternative	Preferred Andover Street Station Lower Height South Alignment Option (DEL-6b)	Dakota Street Station Alternative (DEL-1a)	Dakota Street Station North Alignment Option (DEL-1b)	Dakota Street Station Lower Height Alternative (DEL-2a)	Dakota Street Station Lower Height North Alignment Option (DEL-2b)	Delridge Way Station Alternative (DEL-3)	Delridge Way Station Lower Height Alternative (DEL-4)	Andover Street Station Alternative (DEL-5)	Andover Street Station Lower Height Alternative (DEL-6a)	Andover Street Station Lower Height No Avalon Station Tunnel Connection (DEL-7)
Southwest Charlestown Street/ Southwest Andover Street [b]	E	Not Analyzed [c]	E	E	E	E	E	E	E	E	Not Analyzed [c]

[a] An affected intersection in the Build Alternative is expected to degrade from L.O.S. D or better in the No Build Alternative to L.O.S. E or F with the project or, if it already operates at L.O.S. E or F in the No Build Alternative, have noticeably worse vehicle delays in the Build Alternative.

[b] VISSIM model results are reported for the No Build and the Preferred Option DEL-6b. Synchro results are reported for all other Build Alternatives.

[c] Charlestown access changed to a northbound only driveway for transit, therefore intersection is no longer controlled or evaluated.

Table 4-17. 2042 A.M. Peak Level of Service – Delridge Segment

Intersection	No Build Alternative	Preferred Andover Street Station Lower Height South Alignment Option (DEL-6b)	Dakota Street Station Alternative (DEL-1a)	Dakota Street Station North Alignment Option (DEL-1b)	Dakota Street Station Lower Height Alternative (DEL-2a)	Dakota Street Station Lower Height North Alignment Option (DEL-2b)	Delridge Way Station Alternative (DEL-3)	Delridge Way Station Lower Height Alternative (DEL-4)	Andover Street Station Alternative (DEL-5)	Andover Street Station Lower Height Alternative (DEL-6a)	Andover Street Station Lower Height No Avalon Station Tunnel Connection (DEL-7)
Delridge Way Southwest/ 23rd Avenue Southwest	B	B [a]	B	B	B	B	D	D	D	D	B
Southwest Andover Street/ Delridge Way Southwest [b]	F	F	F [c]	F [c]	F [c]	F [c]	F [c]	F [c]	F [c]	F [c]	F
Southwest Dakota Street/ Delridge Way Southwest	F	F [c]	F [c]	F [c]	F [c]	F [c]	F [c]	F [c]	F [c]	F [c]	F [c]
Southwest Genesee Street/ Delridge Way Southwest [b]	E	E [c]	E	E	E	E	E	E	E	E	E [c]
26th Avenue Southwest/ Southwest Andover Street [b]	F	C [d]	F	F	F	F	F	F	F	F	C [d]

Intersection	No Build Alternative	Preferred Andover Street Station Lower Height South Alignment Option (DEL-6b)	Dakota Street Station Alternative (DEL-1a)	Dakota Street Station North Alignment Option (DEL-1b)	Dakota Street Station Lower Height Alternative (DEL-2a)	Dakota Street Station Lower Height North Alignment Option (DEL-2b)	Delridge Way Station Alternative (DEL-3)	Delridge Way Station Lower Height Alternative (DEL-4)	Andover Street Station Alternative (DEL-5)	Andover Street Station Lower Height Alternative (DEL-6a)	Andover Street Station Lower Height No Avalon Station Tunnel Connection (DEL-7)
30th Avenue Southwest/ Southwest Nevada Street	A	Not Analyzed	A	A	A	A	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
30th Avenue Southwest/ Southwest Genesee Street	B	Not Analyzed	B	B	B	B	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Southwest Charlestown Street/ Southwest Andover Street [b]	E	Not Analyzed [e]	E	E	E	E	E	E	E	E	Not Analyzed [e]

[a] VISSIM modeling shows lower vehicle delay at the new Charlestown/Delridge Way Southwest/23rd Avenue Southwest intersection as the vehicle demand is metered by the upstream Southwest Andover Street intersection in the a.m. peak hour. Northbound queuing would still be expected to extend beyond the Southwest Dakota Street intersection.

[b] VISSIM model results are reported for the No Build Alternative and the Preferred Option DEL-6b. Synchro results are reported for all other Build Alternatives.

[c] An affected intersection in the Build Alternative is expected to degrade from L.O.S. D or better in the No Build Alternative to L.O.S. E or F with the project or, if it already operates at L.O.S. E or F in the No Build Alternative, have noticeably worse vehicle delays in the Build Alternative.

[d] Trips that used 26th Avenue South/Southwest Andover Street to access the current land uses on the northwest corner of Southwest Andover Street/Delridge Way Southwest under no build conditions shift to use the new access point on Delridge under the Preferred Option DEL-6b and Alternative DEL-7.

[e] Charlestown access changed to a northbound only driveway for transit; therefore, intersection is no longer controlled or evaluated.

2042 Build Alternatives

Preferred Alternative (Andover Street Station Lower Height South Alignment Option DEL-6b)

More detailed microsimulation traffic operations analyses were completed for the Preferred Option DEL-6b using VISSIM. This approach was used as the Preferred Option DEL-6b was assumed to include the following:

- Higher density TOD would be implemented adjacent to the site and sharing the same access road network. Specific development details are unknown, but for the purposes of this analysis it was assumed to include a grocery store, 290 multi-family residential units, small retail, and recreational community center meeting space. This would generate additional peak hour trips entering and exiting the site (note the additional level of detail used for modeling the Preferred Option DEL-6b was not included in the evaluation of other alternatives).
- Transit speed and reliability improvement at the Delridge Way Southwest and Southwest Andover Street intersection in the form of a modified intersection layout and bus queue jump for northbound buses. In the No Build Alternative, all buses would stay on Delridge Way Southwest; however, in the Preferred Option DEL-6b, all transit buses are expected to deviate from Delridge Way Southwest at Southwest Andover Street to serve the station and then return onto Delridge Way Southwest at the proposed new signal at re-aligned Southwest Charlestown Street.

The Preferred Option DEL-6b would affect the side-street stop-controlled Southwest Dakota Street/Delridge Way Southwest intersection as it serves as access for the proposed station pick-up/drop-off zones, and would operate at a worse L.O.S. F condition for both a.m. and p.m. peak periods relative to the No Build Alternative.

Preferred Option DEL-6b would signalize the Delridge Way Southwest and 23rd Avenue Southwest intersection for improved transit circulation, access to the Nucor Steel Plant, and access for potential TOD adjacent to the station. The associated traffic volumes and new signal would increase the intersection delay to L.O.S. F in the p.m. peak hour as it would increase delay for the northbound and southbound through vehicles on Delridge Way Southwest. Long southbound queues extending back to the West Seattle Bridge are expected for both the No Build Alternative and Preferred Option DEL-6b, though they are likely longer with the Preferred Option DEL-6b. In the a.m. peak hour, the VISSIM model shows this intersection operating at L.O.S. B as the upstream queue would be metered by the Southwest Andover Street intersection. Northbound queuing would still be expected to extend past the Southwest Dakota Street intersection, but slightly shorter than the No Build Alternative. The Southwest Andover Street and Delridge Way Southwest intersection would be modified with a northbound bus queue jump to facilitate bus access to the station from Delridge Way Southwest. An eastbound left-turn pocket would be added to remove the existing split traffic signal phasing for more efficient vehicle operations. The intersection would operate at L.O.S. E in the p.m. peak hour and L.O.S. F in the a.m. peak hour and delay would be slightly lower than the No Build Alternative. The intersection of Delridge Way Southwest and Southwest Genesee Street would also be affected.

As noted earlier, 32nd Avenue Southwest south of Southwest Andover Street would be permanently closed, resulting in cul-de-sacs on 32nd Avenue Southwest to the north and south of the tracks, as shown on Figure 4-14 (construction closures also shown on this figure are discussed in Section 4.3.3.4, Delridge Segment). As a residential street with single-family housing, up to 45 peak hour trips could be shifted to Southwest Genesee Street. Intersection operations are expected to be similar to the No Build Alternative.

Other Build Alternatives and Design Options

Similar to Preferred Option DEL-6b, all other Build Alternatives would affect the side-street stop-controlled Southwest Dakota Street/Delridge Way Southwest intersection as pick-up/drop-off trips increase volumes through the intersection, or it serves as access for the proposed station pick-up/drop-off zones, and would operate at a worse L.O.S. F condition for both a.m. and p.m. peak periods relative to the No Build Alternative.

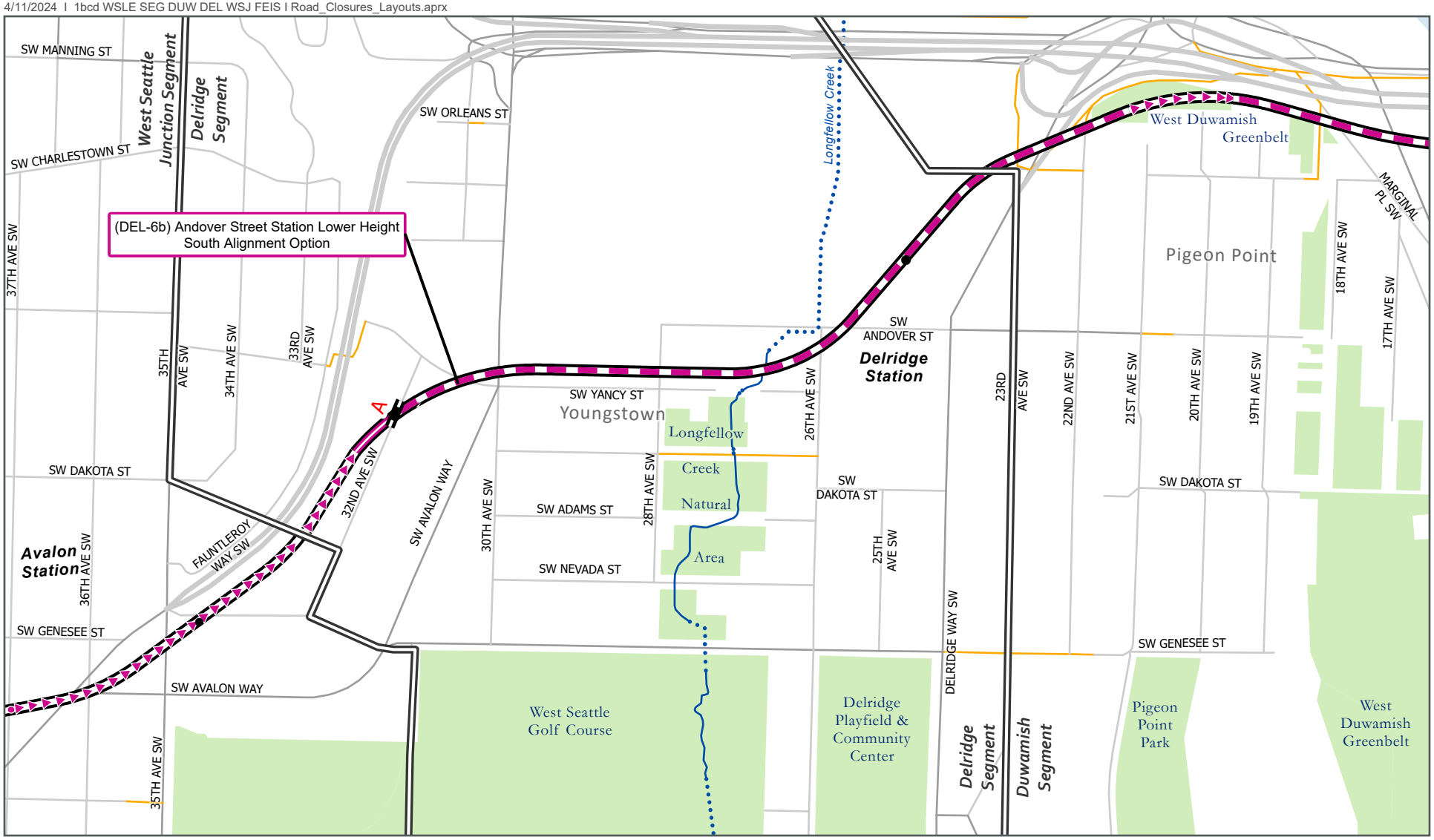
The Delridge Way Southwest/Southwest Andover Street intersection would be affected by the project for all other Build Alternatives except for Alternative DEL-7. This is due to increased traffic volumes to access pick-up and drop-off zones without improvements to the traffic signal operations or intersection layout.

Option DEL-1b and Option DEL-2b would result in either street ends created on 30th Avenue Southwest and/or left-turn restrictions on portions of Southwest Genesee Street. A relatively low number of vehicles are expected to detour using 26th Avenue Southwest or Southwest Nevada Street. Intersection operations are expected to be similar to the No Build Alternative as a relatively low peak hour vehicles trips are expected to divert to other routes. The 30th Avenue Southwest street-end would result in the highest volume diversion of up to 70 peak hour trips shifting to other roads.

Alternative DEL-7 would have the same station access as Preferred Option DEL-6b including the new signal at Delridge Way Southwest/23rd Avenue Southwest. Therefore, Alternative DEL-7 is expected to affect the same intersections as Preferred Option DEL-6b. The Delridge Way Southwest and Southwest Genesee Street intersection would also be affected by Alternative DEL-7 during the a.m. peak hour.

2042 Build Alternatives M.O.S.

The M.O.S. of the West Seattle Link Extension is assumed to have an interim terminus at Delridge Station. Traffic operations analysis for this terminus Delridge Station assumed additional bus service connections at the station and increased pick-up/drop-off and pedestrian activity with increased station ridership compared to the full project extension. For each Build Alternative, the same intersections affected with the full project extension would also be affected with the M.O.S. Preferred Option DEL-6b would affect the Southwest Genesee Street/Delridge Way Southwest intersection during the a.m. period, which would operate at a worse L.O.S. E condition than the No Build Alternative because of increased southbound and eastbound approach vehicle volumes. Alternative DEL-2a, Option DEL-2b, Alternative DEL-3, and Alternative DEL-4 would result in additional buses making turns at the stop-controlled Southwest Dakota Street/Delridge Way Southwest intersection, adding delay while maintaining an L.O.S. F condition. All Build Alternatives would affect the stop-controlled Southwest Dakota Street/Delridge Way Southwest intersection for one or both peak periods. All alternatives except for Preferred Option DEL-6b and Alternative DEL-7 would also affect the Southwest Andover Street/Delridge Way Southwest intersection. Preferred Option DEL-6b and Alternative DEL-7 would affect the 23rd Avenue Southwest/Delridge Way Southwest intersection with the proposed new signal with the M.O.S. More local street intersections adjacent to the station entrances may also experience higher delays with increased vehicle trips.



Source: City of Seattle, King County (2023).

Preferred Alternative

- Elevated
- Tunnel
- At-Grade
- Retained Cut

- Segment Line
- Stairs, Trail, Walkway
- Local Street
- Major Street
- Stream
- Piped Stream
- Park

Street Intersection Closures

- Full Closure: Long Term Temporary
- Partial Closure: Long Term Temporary
- Permanent Closure

Street and Trail Closures

- Full Closure: Long Term Temporary
- Partial Closure: Long Term Temporary
- Permanent Closure

FIGURE 4-14

Key Preferred Alternative Construction Facility Closures

Delridge Segment

West Seattle Link Extension

0 500 1,000 Feet

N

West Seattle Junction Segment

Intersection operation results for the 2042 No Build Alternative and Build Alternatives in the West Seattle Junction Segment are shown in Table 4-18 and Table 4-19. Intersection operation results for Preferred Option WSJ-5b are shown on Figure 4-15 and Figure 4-16; figures for the other Build Alternatives are included in Attachment N1.C.

2042 No Build Alternative

With the 2042 No Build Alternative, there are large volume increases along Southwest Avalon Way, Fauntleroy Way Southwest, and Southwest Alaska Street. Intersections in the vicinity of the Alaska Junction Station and Avalon Station would operate at L.O.S. D or better in the p.m. and a.m. peak hours with the exception of the following intersections:

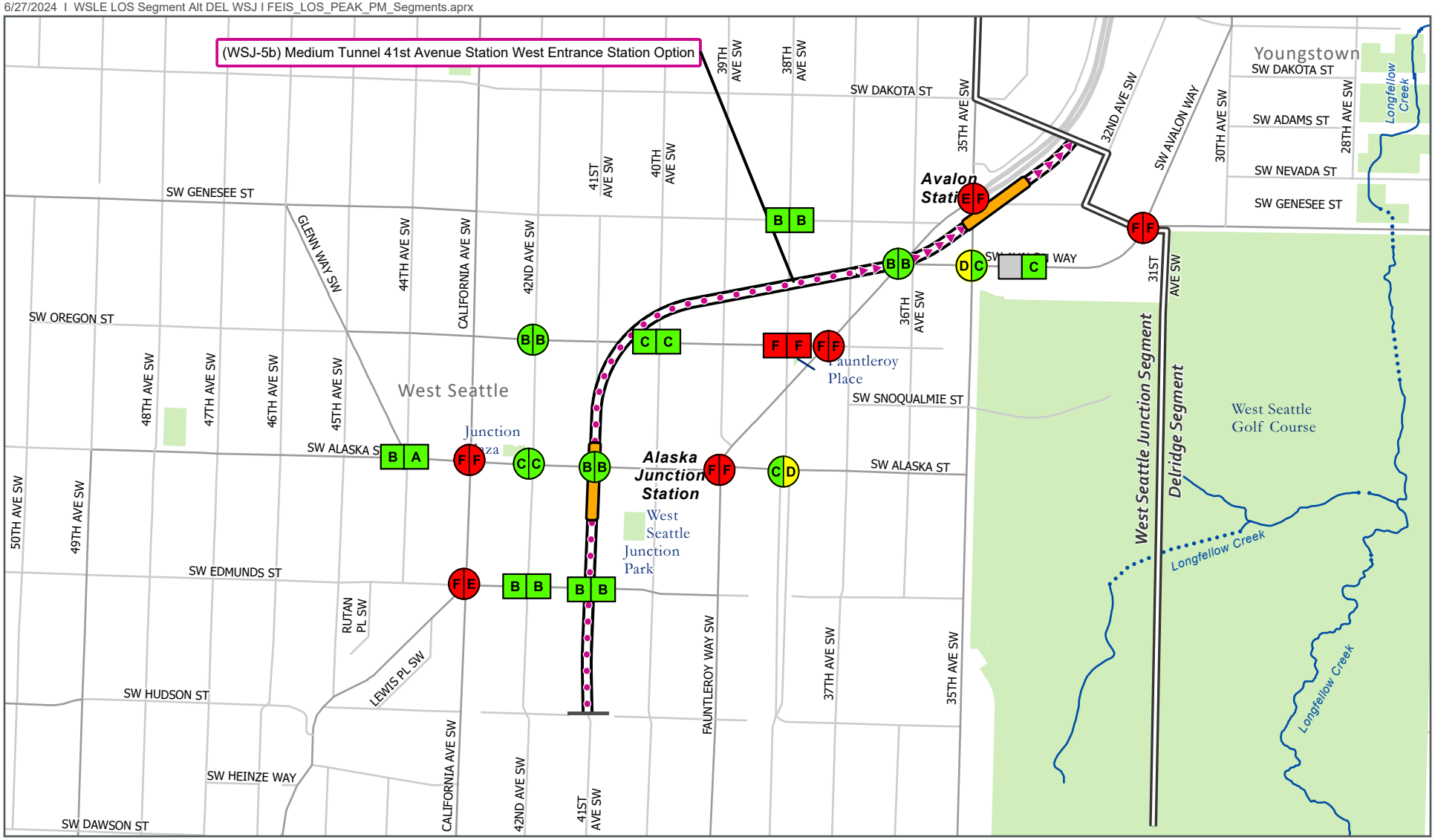
- 38th Avenue Southwest/Southwest Oregon Street (L.O.S. F in the p.m. peak hour)
- California Avenue Southwest/Southwest Alaska Street (L.O.S. F in both peak hours)
- California Avenue Southwest/Southwest Edmunds Street (L.O.S. F in p.m. peak hour and L.O.S. E in a.m. peak hour)
- Fauntleroy Way Southwest/35th Avenue Southwest (L.O.S. E in p.m. peak hour, L.O.S. F in a.m. peak hour)
- Fauntleroy Way Southwest/Southwest Alaska Street (L.O.S. F in both peak hours)
- Fauntleroy Way Southwest/Southwest Oregon Street (L.O.S. F in p.m. peak hour)
- Southwest Avalon Way/Southwest Genesee Street (L.O.S. F in p.m. peak hour)

The Fauntleroy Way Southwest/38th Avenue Southwest intersection operations improved to L.O.S. D compared to existing conditions as it was assumed the Fauntleroy Way Southwest Boulevard project would restrict northbound through movements on 38th Avenue Southwest.

During the p.m. peak hour at the Southwest Alaska Street/Fauntleroy Way Southwest intersection, southbound queues extend halfway up the block on average, and under the worst conditions extend just south of 38th Avenue Southwest. At the Southwest Alaska Street/ California Avenue Southwest intersection, westbound queues can extend through the intersection Southwest Alaska Street/42nd Avenue Southwest under the worst conditions. During the a.m. peak hour at Southwest Alaska Street/Fauntleroy Way Southwest, northbound queues may extend through the intersection of Southwest Edmunds Street/Fauntleroy Way Southwest under the worst conditions.

2042 Build Alternatives

The Avalon Station would generate relatively low pick-up and drop-off trips compared to the Alaska Junction Station. For all Build Alternatives in the West Seattle Segment, except Alternative WSJ–6, the study intersections in the vicinity of the Avalon Station are expected to operate similar to the 2042 No Build Alternative, except for Fauntleroy Way Southwest and 35th Avenue Southwest intersection, which would degrade from L.O.S. E in the No Build Alternative to L.O.S. F for all Build Alternatives in the p.m. peak hour. Intersection delays would increase the most for Preferred Option WSJ-5b and Alternative WSJ-5a as the project would remove the northbound and southbound free right turns to accommodate bus stops serving the station. Southwest Genesee Street would be permanently closed east of 35th Avenue Southwest, as shown on Figure 4-17 (construction closures also shown on this figure are discussed in Section 4.3.3.5, West Seattle Junction Segment).



Source: City of Seattle, King County (2023).

Preferred Alternative
- Tunnel
- Retained Cut

Station
- New

- Segment Line
- Stream
- Piped Stream
- Park

Intersection Level of Service

NB ALT
- A-C
- D
- E-F

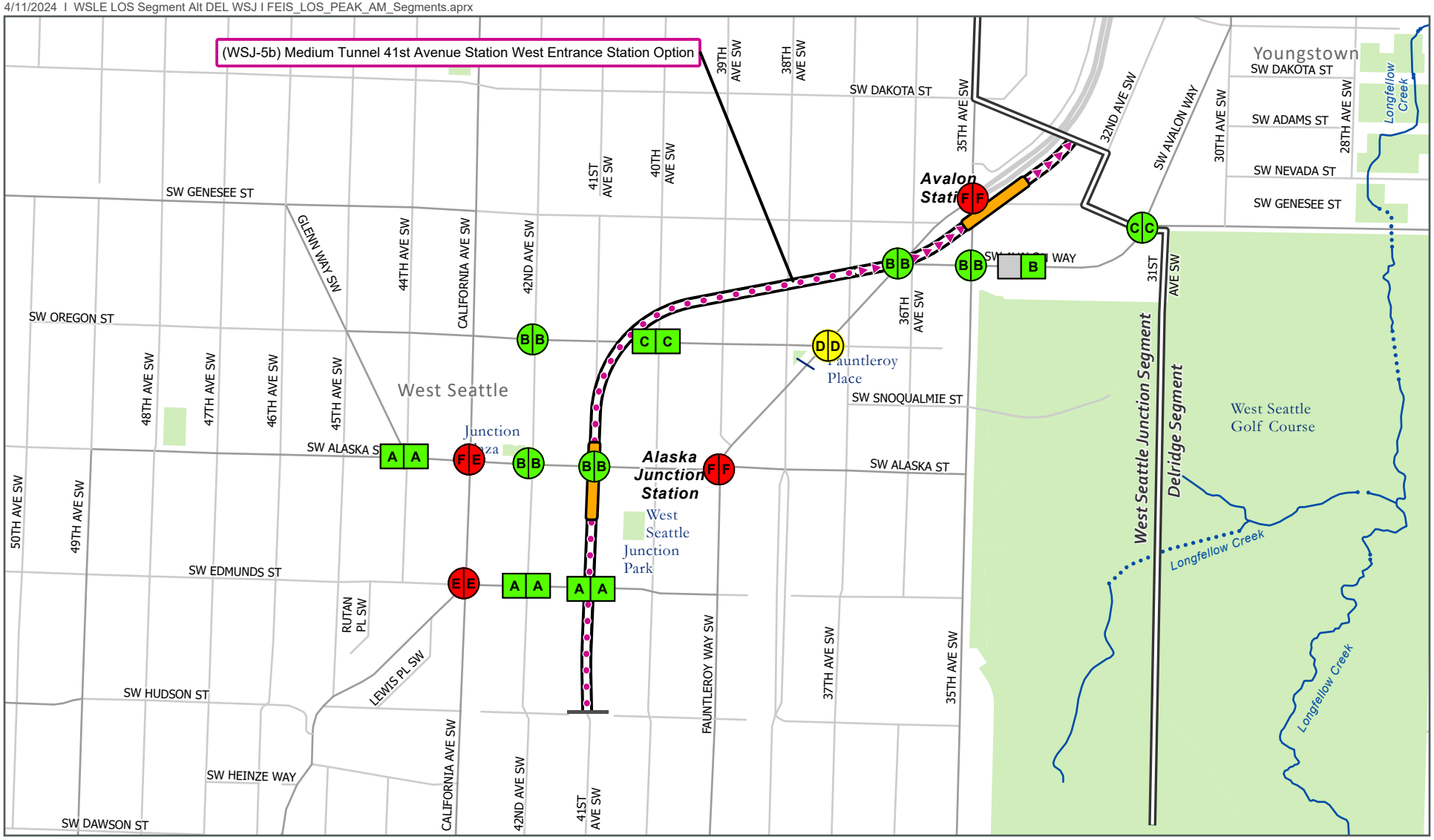
Intersection Type
- Stop-Controlled
- Signalized

Figure 4-15
Preferred Option WSJ-5b
2042 P.M. Peak Hour Intersection Level of Service (L.O.S.)
West Seattle Junction Segment

West Seattle Link Extension

0 500 1,000 Feet

N



Source: City of Seattle, King County (2023).

Preferred Alternative
- Tunnel
- Retained Cut

Station
- New

- Segment Line
- Stream
- Piped Stream
- Park

Intersection Level of Service

NB ALT
- A-C
- D
- E-F

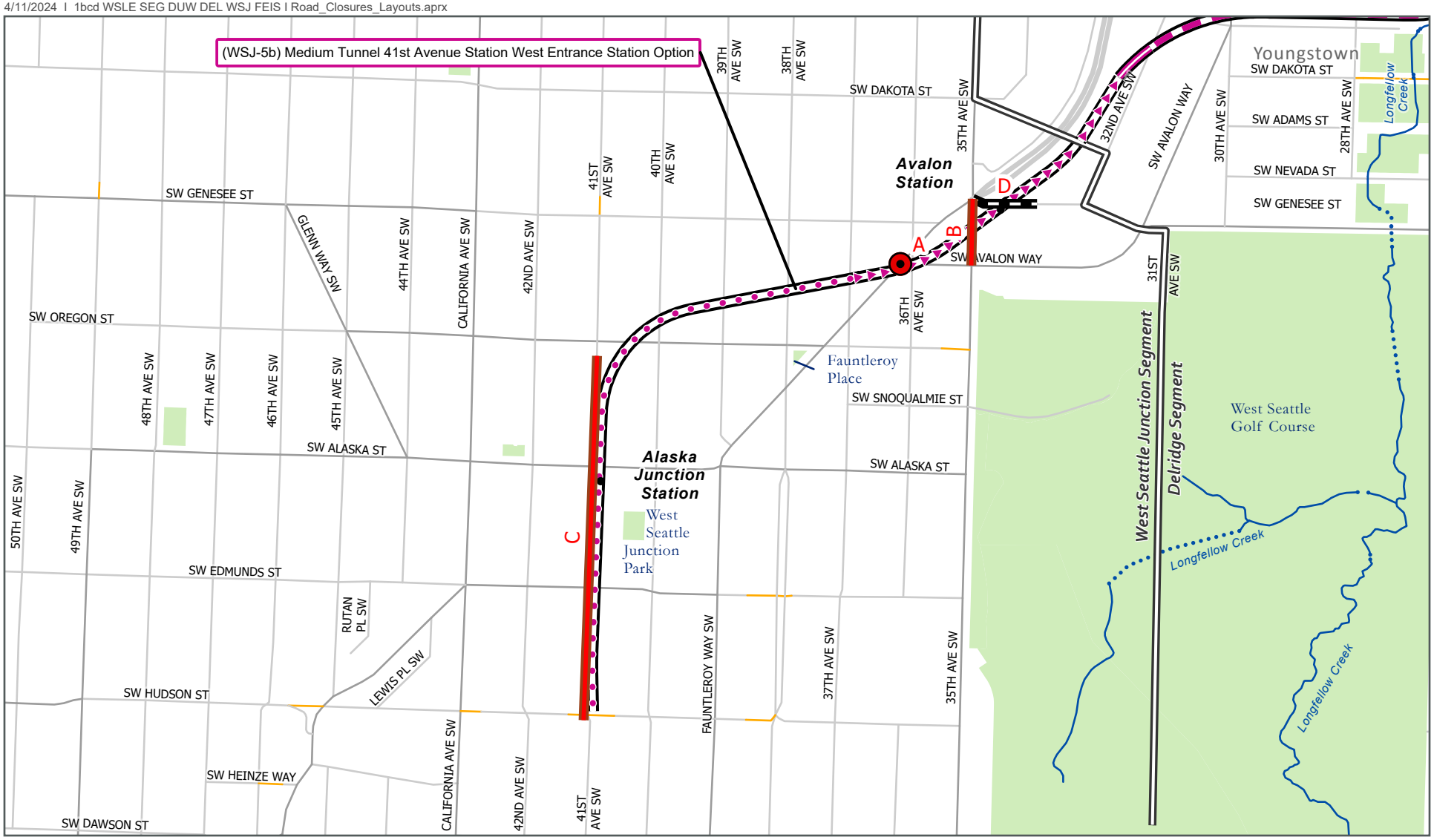
Intersection Type
- Stop-Controlled
- Signalized

Figure 4-16
Preferred Option WSJ-5b
2042 A.M. Peak Hour Intersection Level of Service (L.O.S.)
West Seattle Junction Segment

West Seattle Link Extension

0 500 1,000 Feet

N



Source: City of Seattle, King County (2023).

Preferred Alternative

- Elevated
- Tunnel
- At-Grade
- Retained Cut

- Segment Line
- Stairs, Trail, Walkway
- Local Street
- Major Street
- Stream
- Piped Stream
- Park

Street Intersection Closures

- Full Closure: Long Term Temporary
- Partial Closure: Long Term Temporary
- Permanent Closure

Street and Trail Closures

- Full Closure: Long Term Temporary
- Partial Closure: Long Term Temporary
- Permanent Closure

FIGURE 4-17

Key Preferred Alternative Construction Facility Closures

West Seattle Junction Segment

West Seattle Link Extension

0 500 1,000 Feet

N

Table 4-18. 2042 P.M. Peak Level of Service – West Seattle Junction Segment

Intersection	No Build Alternative	Preferred Medium Tunnel 41st Avenue Station West Entrance Station Option (WSJ-5b)	Elevated 41st/42nd Avenue Station Alternative (WSJ-1)	Elevated Fauntleroy Way Station Alternative (WSJ-2)	Tunnel 41st Avenue Station Alternative (WSJ-3a)	Tunnel 42nd Avenue Station Option (WSJ-3b)	Short Tunnel 41st Avenue Station Alternative (WSJ-4)	Medium Tunnel 41st Avenue Station Alternative (WSJ-5a)	No Avalon Station Tunnel (WSJ-6)
35th Avenue Southwest/ Southwest Avalon Way	D	C	D	D	C	C	D	C	Not Analyzed
38th Avenue Southwest/ Southwest Oregon Street	F	F	F	F [a]	F	F	E	F	F
38th Avenue Southwest/ Southwest Genesee Street	B	B	B	B	B	B	B	B	B
40th Avenue Southwest/ Southwest Oregon Street	C	C	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	C
41st Avenue Southwest/ Southwest Alaska Street	B	B	B	C	B	C	B	B	B
41st Avenue Southwest/ Southwest Edmunds Street	B	B	B	B	B	B	B	B	B
42nd Avenue Southwest/ Southwest Alaska Street	C	C	C	C	C	C	C	C	C
42nd Avenue Southwest/ Southwest Edmunds Street	B	B	B	Not Analyzed	B	C	B	B	B
42nd Avenue Southwest/ Southwest Oregon Street	B	B	B	B	B	B	B	B	B
44th Avenue Southwest/ Southwest Alaska Street	A	A	A	A	A	A	A	A	A
California Avenue Southwest/ Southwest Alaska Street	F	F	F	F	F	F	F	F	F
California Avenue Southwest/ Southwest Edmunds Street	F	E	E	E	E	E	E	E	E
Fauntleroy Way Southwest/ 35th Avenue Southwest	E	F [a]	F [a]	F [a]	F [a]	F [a]	F [a]	F [a]	Not Analyzed

Intersection	No Build Alternative	Preferred Medium Tunnel 41st Avenue Station West Entrance Station Option (WSJ-5b)	Elevated 41st/42nd Avenue Station Alternative (WSJ-1)	Elevated Fauntleroy Way Station Alternative (WSJ-2)	Tunnel 41st Avenue Station Alternative (WSJ-3a)	Tunnel 42nd Avenue Station Option (WSJ-3b)	Short Tunnel 41st Avenue Station Alternative (WSJ-4)	Medium Tunnel 41st Avenue Station Alternative (WSJ-5a)	No Avalon Station Tunnel (WSJ-6)
Fauntleroy Way Southwest/ 38th Avenue Southwest	D	Not Analyzed	Not Analyzed	F [a]	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Fauntleroy Way Southwest/ Southwest Alaska Street	F	F	F	F [a]	F	F	F	F	F
Fauntleroy Way Southwest/ Southwest Avalon Way	B	B	B	B	B	B	B	B	Not Analyzed
Fauntleroy Way Southwest/ Southwest Oregon Street	F	F	F	F	F	F	F	F	F
Southwest Alaska Street/ 38th Avenue Southwest	C	Not Analyzed	Not Analyzed	E [a]	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Southwest Avalon Way/ Southwest Genesee Street	F	F [a]	F	F	E	E	F	F [a]	Not Analyzed
Southwest Avalon Way/ New Driveway	Not Analyzed	C	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	C	Not Analyzed

[a] An affected intersection in the Build Alternative is expected to degrade from L.O.S. D or better in the No Build Alternative to L.O.S. E or F with the project or, if it already operates at L.O.S. E or F in the No Build Alternative, have noticeably worse vehicle delays in the Build Alternative.

Table 4-19. 2042 A.M. Peak Level of Service – West Seattle Junction Segment

Intersection	No Build Alternative	Preferred Medium Tunnel 41st Avenue Station West Entrance Station Option (WSJ-5b)	Elevated 41st/42nd Avenue Station Alternative (WSJ-1)	Elevated Fauntleroy Way Station Alternative (WSJ-2)	Tunnel 41st Avenue Station Alternative (WSJ-3a)	Tunnel 42nd Avenue Station Option (WSJ-3b)	Short Tunnel 41st Avenue Station Alternative (WSJ-4)	Medium Tunnel 41st Avenue Station Alternative (WSJ-5a)	No Avalon Station Tunnel (WSJ-6)
35th Avenue Southwest/ Southwest Avalon Way	B	B	B	B	B	B	B	B	Not Analyzed
38th Avenue Southwest/ Southwest Oregon Street	C	Not Analyzed	Not Analyzed	D	Not Analyzed	Not Analyzed	D	Not Analyzed	Not Analyzed
38th Avenue Southwest/ Southwest Genesee Street	B	Not Analyzed	Not Analyzed	B	Not Analyzed	Not Analyzed	B	Not Analyzed	Not Analyzed
40th Avenue Southwest/ Southwest Oregon Street	C	C	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	C
41st Avenue Southwest/ Southwest Alaska Street	B	B	C	B	B	B	C	C	B
41st Avenue Southwest/ Southwest Edmunds Street	A	A	A	A	A	A	A	A	A
42nd Avenue Southwest/ Southwest Alaska Street	B	B	B	B	B	B	B	B	B
42nd Avenue Southwest/ Southwest Edmunds Street	A	A	A	A	A	A	A	A	A
42nd Avenue Southwest/ Southwest Oregon Street	B	B	Not Analyzed	B	B	B	Not Analyzed	Not Analyzed	B
44th Avenue Southwest/ Southwest Alaska Street	A	A	A	A	A	A	A	A	A
California Avenue Southwest/ Southwest Alaska Street	F	E	F	E	F	E	E	E	E
California Avenue Southwest/ Southwest Edmunds Street	E	E	E	E	E	E	E	E	E
Fauntleroy Way Southwest/ 35th Avenue Southwest	F	F	F	F	F	F	F	F	Not Analyzed

Intersection	No Build Alternative	Preferred Medium Tunnel 41st Avenue Station West Entrance Station Option (WSJ-5b)	Elevated 41st/42nd Avenue Station Alternative (WSJ-1)	Elevated Fauntleroy Way Station Alternative (WSJ-2)	Tunnel 41st Avenue Station Alternative (WSJ-3a)	Tunnel 42nd Avenue Station Option (WSJ-3b)	Short Tunnel 41st Avenue Station Alternative (WSJ-4)	Medium Tunnel 41st Avenue Station Alternative (WSJ-5a)	No Avalon Station Tunnel (WSJ-6)
Fauntleroy Way Southwest/ 38th Avenue Southwest	C	Not Analyzed	Not Analyzed	C	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Fauntleroy Way Southwest/ Southwest Alaska Street	F	F	F	F [a]	F	F	F	F	F
Fauntleroy Way Southwest/ Southwest Avalon Way	B	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Fauntleroy Way Southwest/ Southwest Oregon Street	D	Not Analyzed	Not Analyzed	F [a]	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Southwest Alaska Street/ 38th Avenue Southwest	C	Not Analyzed	Not Analyzed	C	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Southwest Avalon Way/ Southwest Genesee Street	C	C	C	C	C	C	C	C	Not Analyzed
Southwest Avalon Way & New Driveway	Not Analyzed	B	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	B	Not Analyzed

Note: Limited a.m. analysis was performed for locations that met the criteria in Attachment N.1A.

[a] An affected intersection in the Build Alternative is expected to degrade from L.O.S. D or better in the No Build Alternative to L.O.S. E or F with the project or, if it already operates at L.O.S. E or F in the No Build Alternative, have noticeably worse vehicle delays in the Build Alternative.

Preferred Option WSJ-5b and Alternative WSJ-5a would construct a new station access driveway on Southwest Avalon Way east of 35th Avenue Southwest. This right-in, right-out driveway would operate at L.O.S. C.

All Build Alternatives except Alternative WSJ-6 would include a pick-up/drop-off zone on Southwest Genesee Street, requiring a modification to the northbound approach at Southwest Avalon Way/Southwest Genesee Street from a through-only lane (as part of the 35th/Avalon Paving project) to a shared northbound through/left-turn lane to provide access to the pick-up/drop-off zone. Fewer than 30 northbound left turns are expected, and this intersection would continue operating at L.O.S. F during the p.m. peak hour and L.O.S. C during the a.m. peak hour assuming permitted northbound left turns. The increase in p.m. peak hour delay with Preferred Option WSJ-5b and Alternative WSJ-5a would meet the threshold for an affected intersection.

The Alaska Junction Station would generate a substantial number of passenger pick-up and drop-off trips that would increase delay at intersections in the vicinity of the pick-up/drop-off zones. Study intersections for all Build Alternatives (including Preferred Option WSJ-5b) would operate at similar conditions compared to the No Build Alternative except for Alternative WSJ-2. Alternative WSJ-2 would degrade the L.O.S. results and affect the following intersections:

- Fauntleroy Way Southwest/38th Avenue Southwest (L.O.S. F in p.m. peak hour)
- Fauntleroy Way Southwest/Southwest Alaska Street (L.O.S. F in both peak hours)
- Southwest Alaska Street/38th Avenue Southwest (L.O.S. E in p.m. peak hour)
- Southwest Oregon Street/38th Avenue Southwest (L.O.S. F in p.m. peak hour)
- Fauntleroy Way Southwest/Southwest Oregon Street (L.O.S. F in a.m. peak hour)

4.3.3 Construction Impacts

This section describes the potential construction impacts to roadway conditions, including conceptual haul routes; construction traffic; and roadway closures and diversions and their effects on traffic and freight conditions. For alternatives other than the Preferred Alternative, the sequencing of construction activities was not assessed, and some of the impacts described in this section may occur simultaneously. For the Preferred Alternative, construction planning, including sequencing, has been advanced and four construction analysis scenarios have been defined to analyze long-term closures in close proximity that could occur concurrently. The four scenarios represent likely concurrent long-term closures of high volume roadways that would have the most potential effects to arterial operations in the immediate closure area as well as nearby detour routes.

4.3.3.1 Impacts Common to All Alternatives

Haul Routes and Construction Traffic

To construct the project, Sound Transit would primarily use the City of Seattle's Major Truck Streets (see Section 9.2, Affected Environment, for the City's Major Truck Streets) and Washington State Department of Transportation's (WSDOT's) Interstate and State Route facilities, including Interstates 5, 90, and 405 and State Routes 99, 509, 519, 599, and 520. These routes would be used for construction vehicle access to and from the alignments. Some oversize construction vehicles may need to use designated alternative routes.

Certain construction areas are not served by these state and City major truck routes, so other existing streets would be used to access construction areas. These streets would be limited to arterials whenever possible but would sometimes need to include local streets to access construction areas not adjacent to the arterial street system. Construction areas where local streets would be necessary for access include the following:

- Pigeon Point construction staging area for Preferred Alternative DUW-1a and Option DUW-1b in the Duwamish Segment
- Delridge tunnel portals for Alternative DEL-2a, Option DEL-2b, Alternative DEL-4, and Alternative DEL-7 in the Delridge Segment
- Portals for the West Seattle Junction Segment tunnel alternatives (Preferred Option WSJ–5b, Alternative WSJ-3a, Option WSJ-3b, Alternative WSJ-4, Alternative WSJ-5a, and Alternative WSJ-6), and the station areas for all alternatives, including the elevated alternatives

Consistent with City of Seattle regulations, construction and construction traffic management plans (including haul routes) would be prepared in consultation with the City during the project final design and construction phases.

Over the duration of the construction period, the major construction activities would be associated with the station construction, tunneling, and constructing the elevated guideway or bridges. These activities would require between 10 and 35 trucks per hour, with bridge construction and tunnel excavation generating the highest truck activity (20 to 35 trucks per hour) within that range.

Property Access, Roadway Impacts, and Detour Routes

Construction for each alternative would require road and lane closures that could also affect transit, non-motorized travel, and freight, as addressed in Sections 3.3.2.2, Construction Impacts, 6.3.2.2, Construction Impacts, and 9.3.2.2, Construction Impacts, respectively. Sound Transit will coordinate with the City of Seattle as the project advances to identify and finalize proposed detour routes and determine if those roads would be able to accommodate increased volumes. In general, traffic detour routes would be along arterials, where feasible, to discourage traffic on local and collector streets through neighborhoods. Detour routes would be determined during the final design phase and in coordination with the City of Seattle and the contractor.

The following discussion identifies major roadway and lane closures, generally defined as a full or partial closure of roadways for at least 1 year that would affect vehicle, people, and property access on these roadways. Some shorter-term (less than 1 year) closures are also described, as appropriate, to explain the breadth of the construction activities within a segment. Construction flaggers may also occasionally halt vehicle and non-motorized traffic on roadways adjacent to active construction for very short periods. See Attachment N.1D, Permanent and Temporary Transportation Facility Closures, for a more detailed list of the roadway construction closures expected for each alternative.

For long-term (over 1 year on key arterial streets) closures, an analysis of these traffic impacts was performed using 2032 as a representative analysis year for the construction period. Potential diversion routes were identified, and traffic volumes were rerouted to adjacent roadways. The analysis describes locations where there could be additional congestion for vehicles, including freight, as a result of the construction activities. In the SODO Segment, the SODO Busway would be permanently closed or fully closed for more than 1 year for all alternatives. Other segments would experience varied construction closures and diverted traffic, depending on the specific alternative, and are discussed by segment in the following sections.

If property access is restricted, temporary alternate access, if feasible, to these properties would be provided. If alternative access is not available, then the specific construction activity would be reviewed to determine whether it could occur during non-business hours. Additional road or lane closures may be needed for utility relocation, which will be determined during final design in coordination with the utility owner.

In the SODO and Duwamish segments, all project alternatives would require relocation of 26-kilovolt and 230-kilovolt utilities along the SODO Busway and 6th Avenue South. Construction activity would progress in stages along the corridors such that closures would be localized rather than closing the entire corridor at once. South Holgate Street and South Lander Street would each have partial closures at the SODO Busway for up to one month at a time. One to two lanes of 6th Avenue South would be closed at a time, with each closure lasting up to 4 months. Full closures of 6th Avenue South would also occur between South Massachusetts Street and South Spokane Street and between Diagonal Avenue South and South Hinds Street. Intersection closures could also occur during overnight hours. Because these are short-term closures (less than 1 year), they are not quantitatively analyzed in further detail.

Additional construction closures are discussed by segment in the following sections.

4.3.3.2 SODO Segment

Table 4-20 provides a summary of the major construction closures in the SODO Segment for the Preferred Alternative. Figure 4-8 displays major construction closures of roadway and non-motorized facilities for the Preferred Alternative; non-motorized effects are discussed in Chapter 6.

Table 4-20. Key Preferred Alternative Construction Roadway Closures – SODO Segment

Map Key	Affected Street	Extents [a]	Preferred Option SODO-1c
B	South Lander Street	4th Avenue South to 6th Avenue South	Full closure, 3 years [b]

Note: The physical limits of street closures, as well as durations, are approximate and subject to change based on final design and construction planning. Roadways listed typically include designated arterials with closures of 1 year or longer for at least one alternative. For the complete list, see Attachment N.1D.

[a] Extents listed do not include intersections unless specifically stated.
[b] Includes short-term partial closures of intersections with 4th Avenue South and 6th Avenue South.

Table 4-21 compares the key construction roadway closures in the SODO Segment across all alternatives.

Table 4-21. Key Construction Roadway Closures for All Alternatives – SODO Segment

Affected Street	Extents [a]	Preferred At-Grade Lander Access Station Option (SODO-1c)	At-Grade Alternative (SODO-1a)	At-Grade South Station Option (SODO-1b)	Mixed Profile Alternative (SODO-2)
SODO Busway [b]	South Massachusetts Street to South Spokane Street	**Permanently closed**	Permanently closed	Permanently closed	Full closure, 5 years
South Lander Street	4th Avenue South to 6th Avenue South	**Full closure, 3 years [c]**	Full closure, 3 years [c]	Full closure, 3 years [c]	Full closure, nights/weekends

Note: The physical limits of street closures, as well as durations, are approximate and subject to change based on final design and construction planning. Roadways listed typically include designated arterials with closures of 1 year or longer for at least one alternative. For the complete list, see Attachment N.1D.

[a] Extents listed do not include intersections unless specifically stated.

[b] While the full length of the SODO Busway extends beyond the SODO Segment, the SODO Busway closure is described in the SODO Segment.

[c] Includes short-term partial closures of intersections with 4th Avenue South and 6th Avenue South.

Preferred Option (SODO-1c) and Other Options (SODO-1a, SODO-1b)

Preferred Option SODO-1c, Alternative SODO-1a, and Option SODO-1b would close South Lander Street between 4th Avenue South and 6th Avenue South during construction of a new overpass. Option SODO-1b would move the existing SODO Station further south to the new South Lander Street overcrossing, and results in a longer construction period to build the extra structure to connect South Lander Street to the station access at the top of the bridge.

Closing South Lander Street would require diverting a substantial number of peak hour vehicle trips, including relatively high truck volumes. Probable diversion routes would include South Holgate Street and South Spokane Street, along with portions of 4th Avenue South, 6th Avenue South, and Airport Way South. Based on the analysis described in the Preferred Alternative Construction Analysis, the intersections of 4th Avenue South/South Holgate Street and 6th Avenue South/South Spokane Street would be affected by the South Lander Street closure.

The permanent closure of the SODO Busway with Preferred Option SODO-1c, Alternative SODO-1a, and Option SODO-1b would occur at the beginning of construction, as described in the Long-term Impacts section of Section 3.3.2.1.

More detailed traffic operations analysis was completed for potential concurrent roadway closures for the Preferred Option SODO-1c. The analysis includes closures in both the SODO and Duwamish segments due to the proximity of the closures; see the Preferred Alternative Construction Analysis in Section 4.3.3.3 for the analysis results of the concurrent closures.

Other Build Alternative (SODO-2)

Alternative SODO-2 would require the closure of the SODO Busway from South Massachusetts Street to South Spokane Street during the construction period. The closure would displace 60 to 80 peak hour Metro buses to either 4th Avenue South or 6th Avenue South. The effects would be similar to those reported for Preferred Option SODO-1c, Alternative SODO-1a, and Option SODO-1b for a permanent closure (see Section 4.3.2.3, Arterial and Local Street Operations, for effects on general-purpose traffic and Section 3.3.2.1 for effects on transit).

4.3.3.3 Duwamish Segment

Table 4-22 provides a summary of the major construction closures in the Duwamish Segment for the Preferred Alternative. Figure 4-11 displays major construction closures of both roadway and non-motorized facilities for the Preferred Alternative; non-motorized effects are discussed in Chapter 6.

Road closures in the Duwamish Segment would mostly include short-term partial and full roadway closures. One key exception is the partial closure of 4th Avenue South, north of South Spokane Street. This closure was analyzed as a concurrent closure with SODO Segment closures to provide a conservative analysis. Results are summarized for both segments in the Preferred Alternative Construction Analysis section.

Table 4-23 compares the key construction roadway closures in the Duwamish Segment across all alternatives.

Table 4-22. Key Preferred Alternative Construction Roadway Closures – Duwamish Segment

Map Key	Affected Street	Extents [a]	Preferred Option DUW-1a
A	4th Avenue South [b]	4th Avenue South just north of South Spokane Street [c]	Partial closure (3 lanes) 1.5 years
B	Southwest Marginal Place	Southwest Marginal Place south of West Seattle Bridge	Full closure 4.5 years

Note: The physical limits of street closures, as well as durations, are approximate and subject to change based on final design and construction planning. Roadways listed typically include designated arterials with closures of 1 year or longer for at least one alternative. For the complete list, see Attachment N.1D.

[a] Extents listed do not include intersections unless specifically stated.

[b] While this closure is in the Duwamish Segment, the traffic operations were evaluated concurrently with other SODO roadway closures in the SODO Segment.

[c] Although the construction closure would affect the area just north of South Spokane Street, traffic would be diverted to the east side of the street starting in the vicinity of South Hinds Street, as shown on Figure 4-11.

Table 4-23. Key Construction Roadway Closures for All Alternatives – Duwamish Segment

Affected Street	Extents [a]	Preferred Option DUW-1a	Option DUW-1b	Alternative DUW-2
4th Avenue South [b]	4th Avenue South just north of South Spokane Street [c]	**Partial closure (3 lanes) 1.5 years**	Not applicable	Not applicable
Southwest Marginal Place	Southwest Marginal Place south of West Seattle Bridge	**Full closure 4.5 years**	Full closure 4.5 years	Not applicable
Delridge Way Southwest	Delridge Way Southwest south of West Seattle Bridge	**Full closure, nights/weekends when connecting to DEL-5, DEL-6a, DEL-6b, and DEL-7**	Partial closure, 9 months and nights/weekends	Not applicable

Note: The physical limits of street closures, as well as durations, are approximate and subject to change based on final design and construction planning. Roadways listed typically include designated arterials with closures of 1 year or longer for at least one alternative. For the complete list, see Attachment N.1D.

[a] Extents listed do not include intersections unless specifically stated.

[b] While this closure is in the Duwamish Segment, the traffic operations were evaluated concurrently with other SODO roadway closures in the SODO Segment.

[c] Although the construction closure would affect the area just north of South Spokane Street, traffic would be diverted to the east side of the street starting in the vicinity of South Hinds Street, as shown on Figure 4-11.

Preferred Alternative (DUW-1a) and Other Option (DUW-1b)

Preferred Alternative DUW-1a and Option DUW-1b would require short-term (9-month-or-less, and/or night and weekend) partial and full roadway closures for the guideway crossings over several City streets, including Southwest Spokane Street, East Marginal Way South, and West Marginal Way Southwest, and State Route 99. Crossing over the West Seattle Bridge and Delridge Way Southwest would require night and weekend partial closures. Some local street construction access would also be required in the Pigeon Point area. This would result in the full closure of Southwest Marginal Place for over 4 years; however, the location is a dead-end street. No substantive traffic effects are expected. The effects of the long-term partial closure of 4th Avenue South are described in the Preferred Alternative Construction Analysis section.

Other Build Alternative (DUW-2)

Alternative DUW-2 would require full and partial road closures during nights and weekends for the guideway crossings over 6th Avenue South, 4th Avenue South, 1st Avenue South, and State Route 99. Crossing the Duwamish Waterway, the guideway construction would require night and weekend partial closures of Klickitat Avenue Southwest and West Marginal Way Southwest. Crossing over the West Seattle Bridge would require night and weekend partial closures, along with a partial 3-month closure of Chelan Avenue Southwest west of West Marginal Way Southwest/Southwest Spokane Street. Increased traffic congestion is expected along Chelan Avenue Southwest with this partial closure; however, one lane can be maintained in each direction.

Preferred Alternative Construction Analysis (SODO and Duwamish Segments)

Detailed traffic operations analysis was completed for potential concurrent roadway closures for Preferred Option SODO-1c in the SODO Segment and Preferred Alternative DUW-1a in the Duwamish Segment. Two scenarios were evaluated as described in the subsequent sections; traffic operations are analyzed for the year 2032 and compared to conditions for 2032 No Build. For intersections along 4th Avenue South, a VISSIM microsimulation model was used to analyze traffic operations. All other intersections were analyzed using Synchro. An intersection is considered affected by construction if the intersection L.O.S. worsens to L.O.S. E or F, or if the intersection already operates at L.O.S. E or F under 2032 no build conditions and delay increases more than 10 percent.

Some of the expected roadway closures would result in traffic diversions within the SODO and Duwamish segments which may affect freight travel. Table 4-24 summarizes the potential volumes diverted due to long-term arterial roadway closures, along with an estimated range of volumes diverted to other roadways in the study area. The sections following Table 4-24 further describe the traffic effects for each of the scenarios studied in the SODO and Duwamish segments.

Table 4-24. Key Arterial Roadway Closure Traffic Diversion Summary – SODO and Duwamish Segments

Alternative	Arterial Roadway Closure	Potential Volume Diversion (vehicles/hour in 2032 P.M. Peak Hour)	Potentially Affected Roadways [a]
SODO-1c, SODO-1a, SODO-1b	South Lander Street (4th Avenue South to 6th Avenue South)	900 to 1,100	South Holgate Street 4th Avenue South (south of South Lander Street) [b] 6th Avenue South (north of South Lander Street) South Spokane Street Airport Way South
SODO-1c, SODO-1a, SODO-1b, SODO-2	SODO Busway (South Massachusetts Street to South Spokane Street)	60 to 80 buses	4th Avenue South [b] 6th Avenue South
SODO-1c, DUW-1a	4th Avenue South, north of South Spokane Street	200 to 300	6th Avenue South (between South Holgate Street and South Spokane Street) 1st Avenue South (between South Holgate Street and South Spokane Street)

Note: Non-arterial roadway closures are not shown, as the potential volume diversion would be expected to be less than an arterial roadway closure.

[a] Most-likely-affected roadways are listed. Other roadways could be affected depending on final construction plans.

[b] Denotes a street that is anticipated to be at or near capacity during the p.m. peak hour in 2032.

Construction Scenario 1
Under Construction Scenario 1, the SODO Busway would be fully closed and South Lander Street would be fully closed between 4th Avenue South and 6th Avenue South as shown on Figure 4-8. Due to the closure of South Lander Street, the following roadway changes were assumed at the intersections of 4th Avenue South/South Lander Street and 6th Avenue South/South Lander Street:

- 4th Avenue South/South Lander Street
  - The crosswalk across the closed east leg of the intersection would remain open during construction.
  - The eastbound through lane would be converted to a second eastbound left-turn lane.
  - The protected southbound left-turn phase would be removed, allowing more green time for northbound vehicles.
- 6th Avenue South/South Lander Street
  - The crosswalk across the closed west leg of the intersection would remain open during construction.

With No Build, about 1,000 vehicles use South Lander Street between 4th Avenue South and 6th Avenue South during the a.m. and p.m. peak hours. Therefore, with Construction Scenario 1, about 1,000 vehicles were diverted to other streets in SODO. Based on travel demand modeling completed for this scenario, 300 to 400 vehicles were diverted to South Holgate Street, and 100 to 200 vehicles were diverted to South Spokane Street to travel between 4th Avenue South and 6th Avenue South during both the a.m. and p.m. peak hours. Vehicle traffic also increased northbound and southbound on 1st Avenue South, 6th Avenue South, and Airport Way South as vehicles divert to South Holgate Street and South Spokane Street with the South Lander Street closure. The remaining diverted vehicles were assumed to travel northbound and southbound on 1st Avenue South, 4th Avenue South, and 6th Avenue South, and turn east or west outside of the study area. Due to an increase in westbound traffic under Construction Scenario 1, an overlap phase was added to the westbound right-turn phase at 4th Avenue South/South Holgate Street so vehicles could use the additional green time associated with the southbound left-turn phase.

Intersections affected by Construction Scenario 1 would include:

- At 6th Avenue South/South Spokane Street, average delay would increase by about 15 seconds during the p.m. peak hour. The intersection would operate at L.O.S. D under 2032 no build conditions and would degrade to L.O.S. E with Construction Scenario 1.
- At 4th Avenue South/South Holgate Street, average delay would increase by about 10 seconds during the a.m. peak hour. While the intersection continues to operate at L.O.S. E, the change in delay is over 10 percent. During the p.m. peak hour, average delay would increase by about 20 seconds, and the intersection L.O.S. would degrade to L.O.S. E from L.O.S. D under 2032 no build conditions.

Along 4th Avenue South (from south of South Spokane Street to north of the I-90 Westbound Off-ramp), travel times would increase by about 1 minute for northbound vehicles and trucks during both the a.m. and p.m. peak hours, and transit travel times would increase by about 30 seconds. The increase in northbound travel time is mostly concentrated between South Lander Street and South Holgate Street. There is no change in southbound travel time compared to 2032 no build conditions. The primary cause of increased northbound travel times is due to less northbound green time at 4th Avenue South/South Holgate Street, which is reduced to provide

additional green time to the southbound left-turn phase. The southbound left-turn phase facilitates diverted traffic using South Holgate Street instead of South Lander Street to access 6th Avenue South. Northbound queues at 4th Avenue South/South Holgate Street could affect access to businesses between South Holgate Street and South Walker Street.

Intersection operation results for the 2032 No Build Alternative and Construction Scenario 1 in the SODO and Duwamish Segment are shown in Table 4-25.

Table 4-25. 2032 Peak Hour Intersection Level of Service – Construction Scenario 1

Intersection	No Build A.M. Peak Hour	Construction Scenario 1 A.M. Peak Hour	No Build P.M. Peak Hour	Construction Scenario 1 P.M. Peak Hour
4th Avenue South/South Holgate Street	E	E [a]	D	E [a]
6th Avenue South/South Holgate Street	C	C	C	C
4th Avenue South/South Lander Street	E	D	E	D
6th Avenue South/South Lander Street	B	B	C	D
4th Avenue South/South Spokane Street	C	D	C	D
6th Avenue South/South Spokane Street	C	C	D	E [a]

[a] An affected intersection in the Build Alternative is expected to degrade from L.O.S. D or better in the No Build Alternative to L.O.S. E or F with the project or, if it already operates at L.O.S. E or F in the No Build Alternative, have noticeably worse vehicle delays in the Build Alternative.

Construction Scenario 2

Under Construction Scenario 2, all southbound lanes of 4th Avenue South would be closed between 175 feet south of South Hinds Street and South Spokane Street. While this roadway portion is in the Duwamish Segment, this scenario considers concurrent closure of the SODO Busway which spans the Duwamish and SODO segments. To accommodate four lanes of traffic along 4th Avenue South, the bulbout on the northeast corner of 4th Avenue South/South Spokane Street, as well as all parking on the east side of 4th Avenue South between South Spokane Street and South Hinds Street, would be removed. Northbound traffic would use the two eastern lanes, and southbound traffic would use the two western lanes on the east side of 4th Avenue South. Southbound traffic would be shifted to the east side of the median starting just south of South Hinds Street. At the intersection of 4th Avenue South/South Spokane Street, vehicles traveling southbound would be able to access one southbound through/right lane and one southbound left-turn lane. On the northbound approach, the third northbound through lane would be closed to accommodate southbound traffic shifting back to the west side of 4th Avenue South. Two northbound through lanes would remain open, as well as the northbound right-turn lane. The existing northbound bus stop just north of South Spokane Street was assumed to shift to a near-side stop in the northbound right-turn lane approaching the intersection, with a transit queue jump so that buses would not have to merge back into the northbound through lanes.

This closure would result in a one lane reduction for both northbound and southbound traffic on 4th Avenue South between South Spokane Street and South Hinds Street. Based on travel demand modeling completed for this scenario, about 100 northbound and 200 southbound vehicles were diverted from this segment of 4th Avenue South to use 1st Avenue South or 6th Avenue South during the peak hours.

During the a.m. peak hour, average delays would increase by about 30 seconds at the intersection of 4th Avenue South/South Spokane Street would be affected as the intersection operations would degrade to L.O.S. E. The increase in delay is primarily due to the reduced capacity for northbound vehicles. Increased northbound queues at the intersection may cause additional delay for vehicles exiting the West Seattle Bridge Off-ramp.

Intersections affected by Construction Scenario 2 would include:

- At 4th Avenue South/South Spokane Street, average delay would increase by about 25 seconds during the p.m. peak hour. L.O.S. would fall to L.O.S. E, compared to L.O.S. C under 2032 no build conditions. Southbound queuing at the intersection could affect business access between South Horton Street and the closure 175 feet south of South Hinds Street.
- At 6th Avenue South/South Spokane Street, average delay would increase by about 15 seconds during the p.m. peak hour. The intersection would operate at L.O.S. D under 2032 no build conditions and would degrade to L.O.S. E with Construction Scenario 2.

Intersection operation results for the 2032 No Build Alternative and Construction Scenario 2 in the SODO and Duwamish Segment are shown in Table 4-26.

Table 4-26. 2032 Peak Hour Intersection Level of Service – Construction Scenario 2

Intersection	No Build A.M. Peak Hour	Construction Scenario 2 A.M. Peak Hour	No Build P.M. Peak Hour	Construction Scenario 2 P.M. Peak Hour
4th Avenue South/South Holgate Street	E	E	D	D
4th Avenue South/South Lander Street	E	D	E	E
6th Avenue South/South Holgate Street	C	C	C	C
6th Avenue South/South Lander Street	B	B	C	C
4th Avenue South/South Spokane Street	C	E [a]	C	E [a]
6th Avenue South/South Spokane Street	C	C	D	E [a]

[a] An affected intersection in the Build Alternative is expected to degrade from L.O.S. D or better in the No Build Alternative to L.O.S. E or F with the project or, if it already operates at L.O.S. E or F in the No Build Alternative, have noticeably worse vehicle delays in the Build Alternative.

4.3.3.4 Delridge Segment

Local, minor, and principal arterials would be affected by construction in the Delridge Segment. Road closures would range from partial road closures for short-term durations to full road closures for long-term durations depending on alternative. The Preferred Option DEL-6b would not have any long-term roadway closures during construction; however, 26th Avenue Southwest south of Southwest Andover Street would be fully closed during nights and weekends. Alternative DEL-7 would also have a key short-term closure (6 months) that would partially close the West Seattle Bridge at the guideway crossing (just south of the Southwest Andover Street pedestrian bridge).

Table 4-27 compares the key construction roadway closures in the Delridge Segment across all alternatives.

Table 4-27. Key Construction Roadway Closures for All Alternatives – Delridge Segment

Affected Street	Extents [a]	Preferred Andover Street Station Lower Height South Alignment Option (DEL-6b)	Dakota Street Station Alternative (DEL-1a)	Dakota Street Station, North Alignment Option (DEL-1b)	Dakota Street Station (Lower Height) Alternative (DEL-2a)	Dakota Street Station (Lower Height), North Alignment Option (DEL-2b)	Delridge Way Station Alternative (DEL-3)	Delridge Way Station (Lower Height) Alternative (DEL-4)	Andover Street Station Alternative (DEL-5)	Andover Street Station (Lower Height) Alternative (DEL-6a)	Andover Street Station Lower Height No Avalon Station Tunnel Construction Alternative (DEL-7)
Delridge Way Southwest (see Table 4-23 for closures of Delridge Way Southwest north of 23rd Avenue Southwest)	23rd Avenue Southwest to Southwest Dakota Street	**Not applicable**	Partial closure, 9 months Full closure, nights/week-ends	Partial closure, 9 months Full closures, nights/week-ends	Partial closure, 9 months Full closure, nights/week-ends	Partial closure, 9 months Full closure, nights/ weekends	Partial closure, 3 years Full closure, nights/week-ends (extends south of Southwest Dakota Street)	Partial closure, 3 years Full closure, nights/week-ends (extends south of Southwest Dakota Street)	Not applicable	Not applicable	Not applicable
Southwest Dakota Street	25th Avenue Southwest to Delridge Way Southwest	**Not applicable**	Full closure, nights/week-ends	Full closure, nights/ weekends	Full closure, nights/week-ends	Full closure, nights/week-ends	Full closure, 3 years	Full closure, 3 years	Not applicable	Not applicable	Not applicable
25th Avenue Southwest	Southwest Dakota Street to Southwest Genesee Street	**Not applicable**	Full closure, 4 years	Full closure, 4 years	Permanently closed	Permanently closed	Full closure, nights/week-ends	Full closure, nights/week-ends	Not applicable	Not applicable	Not applicable
Southwest Genesee Street	26th Avenue Southwest to Southwest Avalon Way	**Not applicable**	Full closure, 2 years	Full closure, 2 years	Full closure, nights/week-ends (only extends from 26th Avenue Southwest to 28th Avenue Southwest)	Partial closure, 9 months Full closure, nights/ weekends (only extends from 26th Avenue	Full closure, 2 years	Partial closure, 9 months Full closure, nights/week-ends (only extends from 26th Avenue	Not applicable	Not applicable	Not applicable

Affected Street	Extents [a]	Preferred Andover Street Station Lower Height South Alignment Option (DEL-6b)	Dakota Street Station Alternative (DEL-1a)	Dakota Street Station, North Alignment Option (DEL-1b)	Dakota Street Station (Lower Height) Alternative (DEL-2a)	Dakota Street Station (Lower Height), North Alignment Option (DEL-2b)	Delridge Way Station Alternative (DEL-3)	Delridge Way Station (Lower Height) Alternative (DEL-4)	Andover Street Station Alternative (DEL-5)	Andover Street Station (Lower Height) Alternative (DEL-6a)	Andover Street Station Lower Height No Avalon Station Tunnel Construction Alternative (DEL-7)
						Southwest to 30th Avenue Southwest)		Southwest to 28th Avenue Southwest)			
Southwest Genesee Street	Southwest Avalon Way to 32nd Avenue Southwest	**Not applicable**	Full closure, 3 years	Full closure, 3 years	Not applicable	Not applicable	Full closure, 3 years	Not applicable	Not applicable	Not applicable	Not applicable
Southwest Andover Street	26th Avenue Southwest to 28th Avenue Southwest	**Not applicable**	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Full closure, 2 years	Full closure, 2 years	Not applicable
Southwest Avalon Way	Southwest Yancy Street to Southwest Genesee Street	**Full closure, nights/week-ends (north of Southwest Yancy Street/South-west Andover Street)**	Full closure, nights/weekends (Southwest Avalon Way at Southwest Genesee Street intersection)	Partial closure, 9 months and full closure, nights/week-ends (Southwest Avalon Way north of Southwest Genesee Street)	Not applicable	Not applicable	Full closure, nights/week-ends (Southwest Avalon Way at Southwest Genesee Street intersection)	Not applicable	Full closure, 1 year	Full closure, nights/week ends (north of Southwest Yancy Street at Southwest Andover Street)	Full closure, nights/week-ends (north of Southwest Yancy Street at Southwest Andover Street)

Note: The physical limits of street closures, as well as durations, are approximate and subject to change based on final design and construction planning. Roadways listed typically include designated arterials with closures of 1 year or longer for at least one alternative. For the complete list, see Attachment N.1D.

[a] Extents listed do not include intersections unless specifically stated.

Some of the expected roadway closures would result in traffic diversions within the Delridge Segment. Table 4-28 summarizes the potential volumes diverted due to long-term arterial roadway closures, along with an estimated range of volumes diverted to other roadways in the Delridge area. The sections following Table 4-28 further describe the traffic effects for each of the Delridge Segment alternatives.

Table 4-28. Key Arterial Roadway Closure Traffic Diversion Summary – Delridge Segment

Alternative	Arterial Roadway Closure	Potential Volume Diversion (vehicles/hour in 2032 P.M. Peak Hour)	Potentially Affected Roadways [a]
DEL-6b, DEL-7	No long-term arterial closures	Not applicable	Not applicable
DEL-1 [a], DEL-1b, DEL-3	Southwest Genesee Street (26th Avenue Southwest to Southwest Avalon Way; portion from Southwest Avalon Way to 32nd Avenue Southwest is not designated as an arterial)	410 to 500	Southwest Andover Street Southwest Avalon Way Southwest Yancy Street 26th Avenue Southwest
DEL-3, DEL-4	Delridge Way Southwest (23rd Avenue Southwest to Southwest Dakota Street)	420 to 520	West Seattle Bridge [b] Southwest Genesee Street Southwest Avalon Way Southwest Genesee Street Southwest Andover Street 26th Avenue Southwest
DEL-5	Southwest Andover Street (26th Avenue Southwest to 28th Avenue Southwest) Southwest Avalon Way (Southwest Yancy Street to Southwest Genesee Street)	1,600 to 1,900	West Seattle Bridge [b] Delridge Way Southwest [b] Southwest Genesee Street 30th Avenue Southwest
DEL- 6a	Southwest Andover Street (26th Avenue Southwest to 28th Avenue Southwest)	180 to 220	Delridge Way Southwest [b] Southwest Genesee Street 26th Avenue Southwest Southwest Yancy Street

Note: Non-arterial roadway closures are not shown, as the potential volume diversion would be expected to be less than an arterial roadway closure.
[a] Most-likely-affected roadways are listed. Other roadways could be affected depending on final construction plans.
[b] Denotes a street that is anticipated to be at or near capacity during the p.m. peak hour in 2032.

Preferred Option DEL-6b and Alternative DEL-7

No long-term roadway closures are expected for the Preferred Option DEL-6b or Alternative DEL-7.

Other Build Alternatives and Design Options (DEL-1a, DEL-1b, DEL-2a, DEL-2b, DEL-3, DEL-5, DEL-5, DEL-6a)

Alternative DEL-1a would cross over Delridge Way Southwest for construction of the guideway over the street. Portions of Delridge Way Southwest would likely have short-term closures for this construction. The construction of the Delridge Station would require a long-term closure of 25th Avenue Southwest.

The construction of the guideway would require full closure of Southwest Genesee Street between 26th Avenue Southwest and Southwest Avalon Way. While the volumes on Southwest Genesee Street are moderate, this street provides one of the few east-west routes through the Delridge neighborhood. Traffic would likely be diverted to other arterial and local streets within the Youngstown neighborhood. The primary diversion routes would likely be Southwest Andover Street, Southwest Yancy Way, and Southwest Avalon Way, resulting in increased congestion at intersections along these routes. Local streets within Youngstown would also be affected, including 26th Avenue Southwest and 28th Avenue Southwest. Southwest Genesee Street would also be fully closed from Southwest Avalon Way to 32nd Avenue Southwest. This street segment is not designated as an arterial and has low traffic volumes, as it provides residential access to the neighborhood. Traffic would be diverted to either 35th Avenue Southwest to the south or Southwest Andover Street to the north.

Option DEL-1b would have impacts similar to Alternative DEL-1a along Delridge Way Southwest and in the vicinity of the Delridge Station. Although the guideway would be north of Southwest Genesee Street, construction activities would likely require the full closure of this street, including the segment from Southwest Avalon Way to 32nd Avenue Southwest. Diversion routes and affected intersections would be similar to Alternative DEL-1a.

Alternative DEL-2a would have construction activities similar to Alternative DEL-1a, although Southwest Genesee Street would likely only require short-term full closures on nights and weekends.

Option DEL-2b would have impacts similar to Alternative DEL-2a along Delridge Way Southwest and in the vicinity of the Delridge Station. Southwest Genesee Street could remain open except for short-term closures, with construction occurring on properties on the north side of Southwest Genesee Street.

Alternative DEL-3 would require construction closure of one to three lanes on Delridge Way Southwest from 23rd Avenue Southwest to Southwest Dakota Street. These lane closures would potentially divert up to a third of the traffic from Delridge Way Southwest to 35th Avenue Southwest and/or Southwest Avalon Way via the West Seattle Bridge. It is also anticipated that some traffic could divert away from Delridge Way Southwest using the parallel 26th Avenue Southwest to bypass the construction area. These diversions would create additional traffic and congestion along those streets. The two unsignalized intersections at 26th Avenue Southwest/Southwest Genesee Street and Southwest Yancy Street/Southwest Avalon Way would also experience increased delay for turning vehicles. This alternative would require closure of Southwest Genesee Street with impacts similar to those identified for Alternative DEL-1a. Construction of the Delridge Station would also close Southwest Dakota Street during construction, resulting in localized traffic diversions.

Alternative DEL-4 would have impacts similar to Alternative DEL-3 along Delridge Way Southwest. Southwest Genesee Street could remain open except for short-term closures to construct the guideway across this street.

Alternative DEL-5 construction would require a full closure of Southwest Andover Street (26th Avenue Southwest to 28th Avenue Southwest) and Southwest Avalon Way (Southwest Yancy Street to Southwest Genesee Street), likely during overlapping periods. This would result in a substantial diversion of vehicle trips within the Delridge area. The primary diversion routes would include Delridge Way Southwest, Southwest Genesee Street, and the West Seattle Bridge/Fauntleroy Way Southwest. The Southwest Genesee Street corridor would likely experience heavy congestion at both the Delridge Way Southwest and Southwest Avalon Way intersections. Traffic diverted to the West Seattle Bridge would likely increase congestion at the intersections of Fauntleroy Way Southwest with 35th Avenue Southwest and Southwest Avalon Way. Higher volumes on Delridge Way Southwest would also add to congestion at Southwest Andover Street, although volumes on Southwest Andover Street would be reduced. With these closures, access to the Nucor Steel property would be maintained. Southwest Yancy Street and Delridge Way Southwest would also be closed for short periods during nights and weekends for guideway construction over the roadway. Local access to properties within the Youngstown neighborhood would require diversions around the two closure areas.

Alternative DEL-6a would also require the full closure of Southwest Andover Street from 26th Avenue Southwest to 28th Avenue Southwest, although access to Nucor Steel would be retained. Closures to Southwest Avalon Way and Southwest Yancy Street would be short term. The traffic volumes on Southwest Andover Street are relatively low and would likely be diverted to Delridge Way Southwest, Southwest Genesee Street, and Southwest Avalon Way. Congestion could increase at the unsignalized intersections of Southwest Genesee Street/26th Avenue Southwest and Southwest Avalon Way/Southwest Yancy Street for diverted traffic needing to access the properties in the Youngstown neighborhood. Delridge Way Southwest would also be partially closed north of Southwest Andover Street for short periods for guideway construction over the roadway.

4.3.3.5 West Seattle Junction Segment

Construction in the West Seattle Junction Segment would range from partial road closures for short-term durations to potentially full road closures for long-term durations. Table 4-29 provides a summary of the major construction closures in the West Seattle Junction Segment for the Preferred Alternative. Figure 4-17 displays major construction closures for the Preferred Alternative.

Table 4-29. Key Preferred Alternative Construction Roadway Closures – West Seattle Junction Segment

Map Key	Affected Street	Extents [a]	Preferred Medium Tunnel 41st Avenue Station West Entrance Station Option (WSJ-5b)
A	Fauntleroy Way Southwest	At Southwest Avalon Way/Station	Partial closure, 1.5 years
B	35th Avenue Southwest	West Seattle Bridge to Southwest Avalon Way	Full closure, 1 year [b]
C	41st Avenue Southwest	North of Southwest Alaska Street to Southwest Hudson Street	Full closure, 4 years

Note: The physical limits of street closures, as well as durations, are approximate and subject to change based on final design and construction planning. Roadways listed typically include designated arterials with closures of 1 year or longer for at least one alternative. For the complete list, see Attachment N.1D.

[a] Extents listed do not include intersections unless specifically stated.

[b] The 35th Avenue Southwest full closure would be coordinated to not overlap with the partial Fauntleroy Way Southwest closure.

Table 4-30 compares the key construction roadway closures in the West Seattle Junction Segment across all alternatives.

Table 4-30. Key Construction Roadway Closures for All Alternatives – West Seattle Junction Segment

Affected Street	Extents [a]	Preferred Medium Tunnel 41st Avenue Station West Entrance Station Option (WSJ-5b)	Elevated 41st/42nd Avenue Alternative (WSJ-1)	Elevated Fauntleroy Way Alternative (WSJ-2)	Tunnel 41st Avenue Station Alternative (WSJ-3a)	Tunnel 42nd Avenue Station Option (WSJ-3b)	Short Tunnel 41st Avenue Station Alternative (WSJ-4)	Medium Tunnel 41st Avenue Station Alternative (WSJ-5a)	No Avalon Station Tunnel Alternative (WSJ-6)
Fauntleroy Way Southwest	West Seattle Bridge/35th Avenue Southwest to Southwest Avalon Way	**Partial closure, 1.5 years (at Southwest Avalon Way)**	Full closure, nights/weekends (extends from West Seattle Bridge/35th Avenue Southwest to Southwest Oregon Street)	Full closure, nights/weekends	Partial closure, 1.5 years	Partial closure, 1.5 years	Partial closure, 9 months; Full closure, nights/ weekends	Partial closure, 1.5 years (at Southwest Avalon Way)	Not applicable
35th Avenue Southwest	West Seattle Bridge/ Fauntleroy Way Southwest to Southwest Avalon Way	**Full closure, 1 year [b]**	Full closure, nights/weekends	Full closure, nights/weekends	Full closure, 3 years	Full closure, 3 years	Full closure, nights/ weekends	Full closure, 1 year	Not applicable
36th Avenue Southwest	Southwest Genesee Street to Fauntleroy Way Southwest	**Not applicable**	Full closure, 1.5 years	Full closure, 3 years	Full closure, 3 years	Full closure, 3 years	Full closure, 9 months	Not applicable	Not applicable
Southwest Alaska Street	38th Avenue Southwest to Fauntleroy Way Southwest	**Not applicable**	Not applicable	Full closure, 3 years	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

Affected Street	Extents [a]	Preferred Medium Tunnel 41st Avenue Station West Entrance Station Option (WSJ-5b)	Elevated 41st/42nd Avenue Alternative (WSJ-1)	Elevated Fauntleroy Way Alternative (WSJ-2)	Tunnel 41st Avenue Station Alternative (WSJ-3a)	Tunnel 42nd Avenue Station Option (WSJ-3b)	Short Tunnel 41st Avenue Station Alternative (WSJ-4)	Medium Tunnel 41st Avenue Station Alternative (WSJ-5a)	No Avalon Station Tunnel Alternative (WSJ-6)
41st Avenue Southwest	North of Southwest Alaska Street to Southwest Hudson Street	**Full closure, 4 years**	Not applicable	Not applicable	Full closure, 4 years	Not applicable	Full closure, 4 years [c]	Full closure, 4 years	Full closure, 4 years
42nd Avenue Southwest	North of Southwest Alaska Street to Southwest Hudson Street	**Not applicable**	Partial closure, 9 months Full closure, nights/weekends [d]	Not applicable	Not applicable	Full closure, 4 years [e]	Not applicable	Not applicable	Not applicable
Southwest Edmunds Street	At 41st Avenue Southwest	**Full closure, 6 months**	Not applicable	Not applicable	Full closure, 4 years	Not applicable	Full closure, 4 years	Full closure, 4 years	Full closure, 4 years
Southwest Edmunds Street	At 42nd Avenue Southwest	**Not applicable**	Full closure, nights/weekends (west of 42nd Avenue Southwest)	Not applicable	Not applicable	Full closure, 4 years	Not applicable	Not applicable	Not applicable

Note: The physical limits of street closures, as well as durations, are approximate and subject to change based on final design and construction planning. Roadways listed typically include designated arterials with closures of 1 year or longer for at least one alternative. For the complete list, see Attachment N.1D.

[a] Extents listed do not include intersections unless specifically stated.

[b] The 35th Avenue Southwest full closure would be coordinated to not overlap with the partial Fauntleroy Way Southwest closure.

[c] Extends to south of Southwest Hudson Street; includes 1-year partial closure of Southwest Alaska Street east of 41st Avenue Southwest.

[d] Extent limited to block north of Southwest Edmunds Street.

[e] Includes 4-year partial closure of Southwest Hudson Street at 42nd Avenue Southwest.

Some of the expected roadway closures would result in traffic diversions within the West Seattle Segment. Table 4-31 summarizes the potential volumes diverted due to long-term arterial roadway closures, along with an estimated range of volumes diverted to other roadways in the West Seattle area. The sections following Table 4-31 further describe the traffic effects for each of the West Seattle Junction Segment alternatives.

Table 4-31. Key Arterial Roadway Closure Traffic Diversion Summary –West Seattle Junction Segment

Alternative	Arterial Roadway Closure	Potential Volume Diversion (vehicles/hour in 2032 P.M. Peak Hour)	Potentially Affected Roadways [a]
WSJ-2	Southwest Alaska Street (38th Avenue Southwest to Fauntleroy Way Southwest)	500 to 600	Fauntleroy Way Southwest [b] 38th Avenue Southwest
WSJ-3a, WSJ-3b, WSJ-5a, WSJ-5b	Fauntleroy Way Southwest (West Seattle Bridge to Southwest Avalon Way)	1,200 to 1,400	35th Avenue Southwest Southwest Alaska Street [b] Delridge Way Southwest [b] Southwest Avalon Way California Avenue Southwest Southwest Admiral Way West Marginal Way Southwest Highland Park Way Southwest 1st Avenue South Bridge [b]
WSJ-3a, WSJ-3b, WSJ-5a, WSJ-5b	35th Avenue Southwest (West Seattle Bridge to Southwest Avalon Way)	1,500 to 1,900	Fauntleroy Way Southwest [b] Southwest Alaska Street [b] Southwest Avalon Way California Avenue Southwest Southwest Admiral Way West Marginal Way Southwest Highland Park Way Southwest 1st Avenue South Bridge [b]

Note: Non-arterial roadway closures are not shown, as the potential volume diversion would be expected to be less than an arterial roadway closure.

[a] Most-likely-affected roadways are listed. Other roadways could be affected depending on final construction plans.

[b] Denotes a street that is anticipated to be at or near capacity during the p.m. peak hour in 2032.

Preferred Option WSJ-5b Construction Analysis

Detailed traffic operations analysis was completed for potential concurrent roadway closures for Preferred Option WSJ-5b. Two scenarios were evaluated in the West Seattle Junction Segment. A SimTraffic simulation model was created for the subarea to analyze traffic operations that allow for detailed representation of intersection delays and queuing along corridors when vehicles are diverted during roadway closures. Seventeen signalized or all-way stop intersections were evaluated within the study area. An intersection is considered affected by construction if the intersection L.O.S. worsens to L.O.S. E or F, or if the intersection already operates at L.O.S. E or F under 2032 no build conditions and delay increases more than 10 percent.

For the no build conditions scenario, SDOT's Fauntleroy Way Southwest Boulevard project was not assumed to be complete by the 2032 construction year. Two second leading pedestrian intervals were included in the pedestrian crossing timings at all signalized intersections.

Construction Scenario 3

Under Construction Scenario 3, the following concurrent construction-related closures are assumed:

- Partial closure of Southwest Alaska Street between 42nd Avenue Southwest and 40th Avenue Southwest to remove one bus-only travel lane in each direction
- Full closure of 41st Avenue Southwest from north of Southwest Alaska Street to south of Southwest Hudson Street, while allowing east-west through traffic on Southwest Alaska Street and Southwest Edmunds Street
- Full closure of 35th Avenue Southwest between Southwest Avalon Way and Fauntleroy Way Southwest

The route diversions for these closures are shown in Table 4-31 and include the conservative assumption that drivers would not divert outside of the study area nor shift to other travel modes or times of day. Depending on the closure, drivers are assumed to divert to California Avenue Southwest, Fauntleroy Way Southwest, or Southwest Avalon Way depending on their ultimate destination.

The following intersection and roadway changes were assumed in the analysis to accommodate the movement of vehicular traffic during the construction closures:

- Signal timing (cycle lengths and coordination offsets) were retimed and optimized along Fauntleroy Way Southwest and 35th Avenue Southwest to prioritize northbound traffic during the a.m. peak hour and southbound during the p.m. peak hour.
- 35th Avenue Southwest and Southwest Avalon Way:
    - Eliminated eastbound left-turn pocket
    - Reconfigured northbound approach with a single left-turn lane and single right-turn lane
    - Reconfigured westbound approach as a left-turn lane, shared through-left lane, and through lane; westbound left operates with protected-permitted signal phasing
- 35th Avenue Southwest and Fauntleroy Way Southwest:
    - Eliminated westbound left-turn pockets
    - Reconfigured southbound approach as a right-turn pocket and shared left-right-turn lane
- Southwest Avalon Way/Southwest Spokane Street:
    - Added protected phase for southbound left turning vehicles
- 42nd Avenue Southwest/Southwest Alaska Street:
    - Added protected-permitted phase for westbound left turning vehicles

Table 4-32 shows the L.O.S. and affected intersections for the a.m. peak hour and p.m. peak hour for Construction Scenario 3.

Table 4-32. 2032 Peak Hour Level of Service – West Seattle Junction Segment Construction Scenario 3

Intersection	No Build Scenario: A.M. Peak Hour	Construction Scenario 3: A.M. Peak Hour	No Build Scenario: P.M. Peak Hour	Construction Scenario 3: P.M. Peak Hour
44th Avenue Southwest/Southwest Alaska Street	A	A	A	A
42nd Avenue Southwest/Southwest Alaska Street	C	D	D	E [a]
42nd Avenue Southwest/Southwest Oregon Street	B	B	C	D
Fauntleroy Way Southwest/Southwest Avalon Way	C	B	C	C
35th Avenue Southwest/Southwest Avalon Way	F	E	E	C
California Avenue Southwest/Southwest Edmunds Street	D	D	F	F
Fauntleroy Way Southwest/Southwest Edmunds Street	B	E [a]	C	C
California Avenue Southwest/Southwest Oregon Street	C	C	C	C
Fauntleroy Way Southwest/Southwest Oregon Street	D	D	C	D
35th Avenue Southwest/Fauntleroy Way Southwest	D	C	D	F [a]
35th Avenue Southwest/Southwest Alaska Street	D	C	D	C
Fauntleroy Way Southwest/Southwest Alaska Street	D	E [a]	D	E [a]
Southwest Avalon Way/Southwest Genesee Street	C	D	D	F [a]
Southwest Avalon Way/Southwest Spokane Street	C	E [a]	C	D
California Avenue Southwest/Southwest Alaska Street	D	D	D	E [a]
42nd Avenue Southwest/Southwest Edmunds Street	A	A	D	C

[a] An affected intersection in the Build Alternative is expected to degrade from L.O.S. D or better in the No Build Alternative to L.O.S. E or F with the project or, if it already operates at L.O.S. E or F in the No Build Alternative, have noticeably worse vehicle delays in the Build Alternative.

Three intersections are affected during the a.m. peak hour. The increased demand on Fauntleroy Way Southwest would increase the congestion and queuing northbound at Southwest Alaska Street. The queuing extends back through Southwest Edmunds Street increasing the delay at that intersection. Operations would improve along 35th Avenue Southwest due to the diverted volumes to Fauntleroy Way Southwest. There would be increased queuing and congestion along Southwest Avalon Way because of the increased demand and the intersection of Southwest Avalon Way and Southwest Spokane Street would also be affected.

Five intersections would be affected during the p.m. peak hour. The increased demand on the West Seattle Bridge and Southwest Avalon Way would increase the congestion and queuing on these roadways. On Southwest Avalon Way, the rolling southbound queue from Southwest Genesee Street could extend back to Southwest Spokane Street at times during the p.m. peak hour. At 35th Avenue Southwest and Fauntleroy Way Southwest, the southbound queue could extend beyond Southwest Manning Street. On the West Seattle Bridge, the westbound queue extends more than a half mile from the intersection at 35th Avenue Southwest. The intersections of 42nd Avenue Southwest/Southwest Alaska Street and California Avenue Southwest/Southwest Alaska Street would also be affected.

In the simulation model, about 95 percent of the vehicles are able to enter the study area during the p.m. peak hour. This suggests that several hundred vehicles would likely switch travel modes, change travel times, or divert out of the study area to avoid congestion related to the closure. The potential diversion routes include Southwest Admiral Way, Delridge Way Southwest, West Marginal Way Southwest, Highland Park Way Southwest, and the 1st Avenue South bridge.

Construction Scenario 4

Under Construction Scenario 4, the following concurrent construction-related closures are assumed:

- Partial closure of Southwest Alaska Street between 42nd Avenue Southwest and 40th Avenue Southwest to remove one bus-only travel lane in each direction.
- Full closure of 41st Avenue Southwest from north of Southwest Alaska Street to south of Southwest Hudson Street, while allowing east-west through traffic on Southwest Alaska Street and Southwest Edmunds Street.
- Partial closure of the intersection at Fauntleroy Way Southwest and Southwest Avalon Way. One approach lane and one departure lane were assumed at each leg of the intersection. (Construction activities would close one quadrant of the intersection at a time; this analysis assumes that a consistent amount of vehicular capacity would be maintained during each quadrant closure).

The route diversions for these closures are shown in Table 4-31 and include the conservative assumptions that drivers would not divert outside of the study area nor shift travel modes or time of day. Depending on the closure, drivers are assumed to divert to California Avenue Southwest, 35th Avenue Southwest, or Southwest Avalon Way depending on their ultimate destination.

The following intersection and roadway changes were assumed in the analysis to accommodate the movement of vehicular traffic during the construction closures:

- Signal timing (cycle lengths and coordination offsets) were retimed and optimized along Fauntleroy Way Southwest and 35th Avenue Southwest to prioritize northbound traffic during the a.m. peak hour and southbound during the p.m. peak hour.
- 35th Avenue Southwest and Southwest Avalon Way:
    - Reconfigured westbound approach with a dual-left-turn pocket and shared through-right travel lane
- Southwest Avalon Way/Southwest Spokane Street:
    - Added protected phase for southbound left turning vehicles
- 42nd Avenue Southwest/Southwest Alaska Street:
    - Added protected-permitted phase for westbound left turning vehicles

Table 4-33 shows the L.O.S. and affected intersections for the a.m. peak hour and p.m. peak hour for Construction Scenario 4.

Table 4-33. 2032 A.M. Peak Level of Service – West Seattle Junction Segment Construction Scenario 4

Intersection	No Build Scenario: A.M. Peak Hour	Construction Scenario 4: A.M. Peak Hour	No Build Scenario: P.M. Peak Hour	Construction Scenario 4: P.M. Peak Hour
44th Avenue Southwest/Southwest Alaska Street	A	A	A	A
42nd Avenue Southwest/Southwest Alaska Street	C	C	D	E [a]
42nd Avenue Southwest/Southwest Oregon Street	B	B	C	C
Fauntleroy Way Southwest/Southwest Avalon Way	C	E [a]	C	F [a]
35th Avenue Southwest/Southwest Avalon Way	F	F [a]	E	F [a]
California Avenue Southwest/Southwest Edmunds Street	D	D	F	E
Fauntleroy Way Southwest/Southwest Edmunds Street	B	F [a]	C	D
California Avenue Southwest/Southwest Oregon Street	C	B	C	C
Fauntleroy Way Southwest/Southwest Oregon Street	D	F [a]	C	F [a]
35th Avenue Southwest/Fauntleroy Way Southwest	D	D	D	F [a]
35th Avenue Southwest/Southwest Alaska Street	D	F [a]	D	F [a]
Fauntleroy Way Southwest/Southwest Alaska Street	D	F [a]	D	F [a]
Southwest Avalon Way/Southwest Genesee Street	C	F [a]	D	F [a]
Southwest Avalon Way/Southwest Spokane Street	C	D	C	F [a]
California Avenue Southwest/Southwest Alaska Street	D	D	D	D
42nd Avenue Southwest/Southwest Edmunds Street	A	A	D	C

[a] An affected intersection in the Build Alternative is expected to degrade from L.O.S. D or better in the No Build Alternative to L.O.S. E or F with the project or, if it already operates at L.O.S. E or F in the No Build Alternative, have noticeably worse vehicle delays in the Build Alternative.

Seven intersections would be affected during the a.m. peak hour. Due to the routing changes, 650 additional vehicles are routed onto 35th Avenue Southwest between Southwest Alaska Street and Southwest Avalon Way. Even with these shifts, Fauntleroy Way Southwest and 35th Avenue Southwest would be over capacity and queuing and congestion would spill back throughout the study network. Lengthy queuing is expected at the following locations with the queue lengths extending through multiple upstream intersections:

- Northbound on Fauntleroy Way Southwest at Southwest Edmunds Street
- Northbound on 35th Avenue Southwest at Southwest Alaska Street
- Westbound on Southwest Avalon Way at 35th Avenue Southwest
- Southbound on 35th Avenue Southwest at Fauntleroy Way Southwest

In the simulation model, about 90 percent of the vehicles are able to enter the study area during the a.m. peak hour. This suggests that as many as 500 vehicles would likely switch travel modes, change travel times, or divert out of the study area to avoid congestion related to the closure. The potential diversion routes include Southwest Admiral Way, Delridge Way Southwest, West Marginal Way Southwest, Highland Park Way Southwest, and the 1st Avenue South bridge.

Similar to the a.m. peak hour, nine intersections would be affected during the p.m. peak hour. Due to the routing changes, there would be additional congestion and queuing westbound on the West Seattle Bridge. During the construction closure, the average delay for drivers would be over 4 minutes with extensive queuing onto the West Seattle Bridge from the intersection at 35th Avenue Southwest.

In the simulation model, about 90 percent of the vehicles are able to enter the study area during the p.m. peak hour. This suggests that as many as 500 vehicles would likely switch travel modes, change travel times, or divert out of the study area to avoid congestion related to the closure. The potential diversion routes include Southwest Admiral Way, Delridge Way Southwest, West Marginal Way Southwest, Highland Park Way Southwest, and the 1st Avenue South bridge.

Other Build Alternatives (WSJ-1, WSJ-2, WSJ-3a, WSJ-3b, WSJ-4, WSJ-5a, WSJ-6)

With Alternative WSJ-1, the short section of 36th Avenue Southwest between Southwest Genesee Street and Fauntleroy Way Southwest would be closed during construction. Traffic could be diverted to 37th Avenue Southwest, the adjacent street, for access to southbound Fauntleroy Way Southwest.

Sections of Fauntleroy Way Southwest between 35th Avenue Southwest and Southwest Oregon Street would be closed on nights and weekends for guideway construction. Traffic effects would likely be minimal during these low volume times, although access to the West Seattle Bridge would be restricted, with trips likely diverted to 35th Avenue Southwest for this purpose. Short sections of Southwest Oregon Street, 39th Avenue Southwest, 40th Avenue Southwest, and 42nd Avenue Southwest would also have short-term closures with minimal effect on traffic conditions.

Alternative WSJ-2 would have similar construction effects as Alternative WSJ-1 except at the Alaska Junction Station area. Southwest Alaska Street would be closed during station construction between 38th Avenue Southwest and 39th Avenue Southwest. This section of Southwest Alaska Street has relatively low traffic volume but serves as a roadway connection between Alaska Junction and 35th Avenue Southwest. With the closure, a majority of the traffic would likely travel along Fauntleroy Way Southwest between Southwest Alaska Street and 35th Avenue Southwest, resulting in higher congestion levels at intersections with 38th Avenue Southwest, Southwest Oregon Street, and Southwest Avalon Way.

With Alternative WSJ-3a, there would be multiple roadway closures. 35th Avenue Southwest would be closed between Fauntleroy Way Southwest and Southwest Avalon Way and would divert over 1,700 p.m. peak hour vehicles. This roadway section is a key connection between the West Seattle Bridge and areas to the south along 35th Avenue Southwest and for north-south connections across Fauntleroy Way Southwest. The primary diversion routes could include Southwest Alaska Street, Southwest Avalon Way, and California Avenue Southwest. Vehicles could connect to either 37th Avenue Southwest or 38th Avenue Southwest for access to Fauntleroy Way Southwest. Intersections along these routes, several of which are unsignalized, would likely experience substantial increases in traffic delay. Increases in volumes along Fauntleroy Way Southwest between 38th Avenue Southwest and 35th Avenue Southwest would add to congestion in that corridor, which is a major freight and transit route. Traffic that normally would use 35th Avenue Southwest to travel into the North Admiral neighborhood would also likely divert across Southwest Alaska Street through the Alaska Junction. Traffic congestion would likely increase along these routes.

One to three lanes on Fauntleroy Way Southwest would be closed between the West Seattle Bridge and Southwest Avalon Street. Up to 1,300 p.m. peak hour vehicle trips would likely divert from Fauntleroy Way Southwest, which is a major truck street and provides access to the Fauntleroy – Vashon Island Ferry Terminal. Primary diversion routes would likely be along 35th Avenue Southwest (if open, depending on construction schedules) from Fauntleroy Way Southwest to Southwest Alaska Street and along Southwest Alaska Street from 35th Avenue Southwest to Fauntleroy Way Southwest. Efforts would be made to minimize any simultaneous closures of 35th Avenue Southwest and Fauntleroy Way Southwest. Delridge Way Southwest could also be a diversion route for traffic coming from the West Seattle Bridge heading further south within West Seattle. Congestion could increase at the Southwest Andover Street and Southwest Genesee Street intersections along this route. Traffic heading towards Alaska Junction could also divert from Fauntleroy Way Southwest west along Southwest Genesee Street and/or Southwest Dakota Street to California Avenue Southwest. However, if Alternative WSJ-3a connects to Option DEL-2b, there would be a multi-year full closure of Southwest Genesee Street between Fauntleroy Way Southwest and 37th Avenue Southwest.

The closures of the non-arterial roadways, 36th Avenue Southwest, 41st Avenue Southwest, and Southwest Edmunds Street, would create localized traffic diversions that could be adequately handled within the adjacent street system. Southwest Alaska Street at 41st Avenue Southwest would be partially closed for a few months during the construction of the cut-and-cover West Seattle Junction Station, although traffic along Southwest Alaska Street could be maintained.

The construction effects of Option WSJ-3b would be similar to those described for Alternative WSJ-3a except that the Alaska Junction effects would be along 42nd Avenue Southwest.

Alternative WSJ-4 would have similar construction effects as Alternative WSJ-3a. The partial closure of Fauntleroy Way Southwest and the full closure of 36th Avenue Southwest at the Avalon Station would be shorter in duration. 35th Avenue Southwest would also be closed, but only during nights and weekends, with fewer traffic effects. Closures and traffic effects at the Alaska Junction Station would be similar to Alternative WSJ-3a.

41st Avenue Southwest between Southwest Alaska Street and Southwest Hudson Street would be closed, creating localized traffic diversions. Southwest Edmunds Street at 41st Avenue Southwest would also be closed. There would be short-term partial closures of Southwest Alaska Street at the station location. Fauntleroy Way Southwest would also have closures of two to three lanes at the Avalon tunnel station. Traffic effects would be similar to Alternative WSJ-3a. Construction of this short section would add to localized peak hour congestion at this location, with some potential diversions to Delridge Way Southwest or Southwest Avalon Way.

With Alternative WSJ-5a, the roadway closures on 35th Avenue Southwest and Fauntleroy Way Southwest at the Avalon cut-and-cover station and on 41st Avenue Southwest at the Alaska Junction Station would result in traffic diversion effects similar to Preferred Option WSJ-5b.

With Alternative WSJ-6, there would be a full closure of 41st Avenue Southwest, which would create localized traffic diversions that could be adequately handled within the adjacent street system. Southwest Alaska Street at 41st Avenue Southwest would be partially closed for several months during the construction of the cut-and-cover Alaska Junction Station, although traffic along Southwest Alaska Street could be maintained.

4.4 Potential Mitigation Measures

4.4.1 Long-term Mitigation

Mitigation could be required at intersections where the intersection L.O.S. would not meet agreed-to project-specific L.O.S. thresholds when compared to the No Build Alternative. For Build Alternatives, affected intersections are identified and defined as locations expected to degrade from L.O.S. D or better in the No Build Alternative to L.O.S. E or F with the project, or if the intersection already operates at L.O.S. E or F in the No Build Alternative have noticeably worse vehicle delays in the Build Alternative (10 percent or higher vehicle delay than in the No Build Alternative). Intersections that would be considered for potential mitigation measures would vary depending on the alternative in each segment and are noted in Table 4-34. In addition to the impacted intersections, the transit treatment measures that could be implemented to mitigate the permanent closure of the SODO Busway with Preferred Option SODO-1c, Alternative SODO-1a, and Option SODO-1b could potentially impact the arterial street system.

Sound Transit will continue to work with the City of Seattle and the Federal Transit Administration as project design progresses to minimize project-related intersection delays. Where additional project-related delays are unavoidable, Sound Transit will work with the City of Seattle to identify potential mitigation at the intersections identified in Table 4-34, with the intent of either meeting agreed-upon L.O.S. thresholds during the a.m. and p.m. peak hours or attaining a similar vehicle delay as the No Build Alternative.

The intersection mitigation treatments would likely vary depending on the intersection location and cause of the increased vehicular delay. At intersections or movements where the delay is the result of vehicular operations such as pick-up/drop-off activity or additional transit buses, mitigation measures could include corridor signal optimization, upgraded signal technologies, implementation of corridor intelligent transportation system strategies, traffic movement and turn restrictions, or added intersection capacity, where feasible. For intersections or movements where increased delay is due primarily to increased non-motorized activity associated with the station, mitigation could be focused instead on strategies such as signal optimization for pedestrians, intersection crossing enhancements, pedestrian and/or bicycle facility modifications, reducing conflicts between vehicles and non-motorized users, or wayfinding, with the goal of improving safety and providing more efficient movement of pedestrians and cyclists.

Final mitigation would be determined and agreed upon by Sound Transit and the City of Seattle, in coordination with the Federal Transit Administration, and may include Sound Transit contributing a proportionate share of costs to improve intersections based on the project's proportionate ratio of trips at the intersection or another equitable method.

The following sections describe mitigation measures that are being considered for specific impacted locations associated with all Build Alternatives including the Preferred Alternative. Mitigation measures to address that impact are described in Section 4.4.1.1, SODO Segment.

Table 4-34. Potentially Impacted Intersections to be Considered for Mitigation

Segment	Intersection	Alternative	Primary Cause(s) of Impact	Potential Mitigation
Delridge Segment	Southwest Dakota Street/Delridge Way Southwest	All Full Build Alternatives; All Alternatives (M.O.S.)	Increased pick-up/drop-off activity	See Section 4.4.1.2.
Delridge Segment	23rd Avenue Southwest/Delridge Way Southwest	Full Build and M.O.S.: Preferred Option DEL-6b, and Alternative DEL-7	New signal	See Section 4.4.1.2.
Delridge Segment	Southwest Genesee Street/Delridge Way Southwest	Full Build and M.O.S.: Preferred Option DEL-6b and Alternative DEL-7	Increased pick-up/drop-off activity	See Section 4.4.1.2.
Delridge Segment	Delridge Way Southwest/Southwest Andover Street	Full Build and M.O.S.: Alternative [a] DEL-1a, Option DEL-1b, Alternative [a] DEL-2a, Option DEL-2b, Alternative DEL-3, Alternative DEL-4, Alternative DEL-5, and Alternative [a] DEL-6a	Increased pick-up/drop-off activity	See Section 4.4.1.2.
West Seattle Junction Segment	Fauntleroy Way Southwest/ 35th Avenue Southwest	All Build Alternatives except WSJ-6	Increased pick-up/drop-off activity	See Section 4.4.1.3.
West Seattle Junction Segment	Southwest Genesee Street/Southwest Avalon Way	Preferred Option WSJ-5b and Alternative WSJ-5a	Intersection revision to accommodate pick-up/drop-off activity	See Section 4.4.1.3.
West Seattle Junction Segment	Fauntleroy Way Southwest/ Southwest Alaska Street, Southwest Alaska Street/38th Avenue Southwest, Fauntleroy Way Southwest/38th Avenue Southwest, Southwest Oregon Street/38th Avenue Southwest, and Fauntleroy Southwest/Southwest Oregon Street	Alternative WSJ-2	Increased pick-up/drop-off activity	See Section 4.4.1.3.

4.4.1.1 SODO Segment

As described in Section 4.3.2.3, the mitigation measures being considered for 4th Avenue South to address the transit travel time impact of closing the SODO Busway could impact arterial operations. This impact could be avoided by implementing transit treatment measures that do not reduce the general-purpose traffic capacity of 4th Avenue South though that may result in trade-offs in the extent to which the transit travel time impact could be mitigated. Specific mitigation for the permanent closure of the SODO Busway would be determined through coordination between Sound Transit, City of Seattle, and King County Metro.

4.4.1.2 Delridge Segment

This section identifies potential mitigation measures for intersections that are expected to be impacted by the project. Potential intersection mitigation options below apply to the Build Alternatives identified in Table 4-34 including in the Preferred Alternative. While these measures could reduce the magnitude of the impact, any modifications would be coordinated with the City of Seattle to determine whether they are consistent with City priorities and preferrable given other trade-offs and modal priorities:

- Delridge Way Southwest and 23rd Avenue Southwest (Preferred Option DEL-6b and Alternative DEL-7)
    - The main cause of the traffic operations impact at this location is southbound delay during the p.m. peak hour as high volumes of vehicles exit the West Seattle Bridge. With the No Build Alternative, that southbound delay is associated with the Delridge Way Southwest/Southwest Andover Street signal as it is the first signalized intersection after exiting the bridge. By implementing a new signal upstream at 23rd Avenue Southwest, the southbound delay assigned to the Southwest Andover Street only includes the stretch of roadway between Southwest Andover Street and 23rd Avenue Southwest and the remaining delay is shifted to the 23rd Avenue Southwest signal. In other words, while the Preferred Alternative includes a new impact to this location, the broader effect on traffic operations would not differ substantially.
    - Although this intersection would experience increased levels of delay by becoming the new access point for Nucor Steel, the station area, and any associated TOD, it is expected to provide better circulation, safety, and traffic operations than if the Preferred Alternative did not include this new signal and circulation concept. This circulation concept has been developed in coordination with the City of Seattle and Metro and any modifications could create secondary impacts to other modes or conflict with agency priorities or policies. Sound Transit will continue to refine the station concept through final design in partnership with the City of Seattle and Metro and determine whether further mitigation to reduce vehicle delay is included in the project.
- Delridge Way Southwest and Southwest Andover Street (Alternatives DEL-1a, DEL-1b, DEL-2a, DEL-2b, DEL-3, DEL-4, DEL-5, and DEL-6a)
    - The main cause of the traffic operations impact at this location is northbound delay during the a.m. peak hour as high volumes of vehicles access the West Seattle Bridge. To mitigate this impact, a second northbound lane south of Southwest Andover Street would be required. However, that may not be consistent with the City's priorities and preferrable given secondary effects to other modes. Sound Transit will continue to work with the City of Seattle and Metro regarding transit treatments and signal operations at this location and determine whether further mitigation to reduce vehicle delay is included in the project.
- Delridge Way Southwest and Southwest Dakota Street (All alternatives)
    - Vehicles turning from Southwest Dakota Street onto Delridge Way Southwest at this side-street stop control intersection would experience increased delay as they wait for gaps in traffic on Delridge Way Southwest. This impact could be mitigated by adding a signal at this location. Sound Transit will continue to work with the City of Seattle and Metro regarding transit treatments and signal operations at this location and determine whether further mitigation to reduce vehicle delay is included in the project.

- Delridge Way Southwest and Southwest Genesee Street (Preferred Option DEL-6b and Alternative DEL-7)
    - Adding an eastbound right-turn pocket on Southwest Genesee Street to allow more vehicles to move through the intersection during the eastbound green time would mitigate this impact.

4.4.1.3 West Seattle Junction Segment

This section identifies potential mitigation measures for intersections that are expected to be impacted by the project. Potential intersection mitigation options below apply to the Build Alternatives identified in Table 4-34 including the Preferred Alternative. While these measures could reduce the magnitude of the impact, any modifications would be coordinated with the City of Seattle to determine whether they are consistent with the City's priorities and preferrable given other trade-offs and modal priorities:

- Fauntleroy Way Southwest and 35th Avenue Southwest (Preferred Option WSJ-5b, and Alternatives WSJ-1, WSJ-2, WSJ-3a, WSJ-3b, WSJ-4, and WSJ-5a)
    - Adding an overlap phase to the northbound right turn during the westbound left phase, modifying the signal cycle length to 120 seconds, and/or maintaining a channelized right turn could potentially mitigate this impact. Sound Transit is coordinating with the City of Seattle and King County Metro to refine the intersection layout and signal operations to balance the needs of all modes. Effects to adjacent intersections whose signals are coordinated with this location would also need to be considered.
- Southwest Genesee Street and Southwest Avalon Way (Preferred Option WSJ-5b and Alternative WSJ-5a)
    - Revising the intersection to allow northbound left turns into the station area would result in increased delay for vehicles on Southwest Avalon Way. Modifying the signal cycle length to 120 seconds would mitigate the additional delay.

Five other intersections would be impacted only with Alternative WSJ-2. The locations and potential mitigation options are described below:

- Fauntleroy Way Southwest and Southwest Alaska Street
    - Intersection delays would increase with the additional pick-up/drop-off trips to and from the Alaska Junction Station. Increasing the westbound approach capacity from a shared westbound through/left-turn lane to a westbound left and separate westbound through lane would mitigate the additional delay.
- Southwest Alaska Street and 38th Avenue Southwest
    - Increased pick-up/drop-off trips would result in increased delay for vehicles turning from 38th Avenue Southwest onto Southwest Alaska Street. This could be mitigated by converting the intersection from side-street stop-controlled to all-way stop-controlled.
- Fauntleroy Way Southwest and 38th Avenue Southwest
    - Increased delays would be expected for vehicles turning left from 38th Avenue Southwest onto Fauntleroy Way Southwest. The increased intersection delays could be mitigated by restricting left turns from 38th Avenue Southwest.

- Southwest Oregon Street and 38th Avenue Southwest
    - Increased delays would be experienced by vehicles turning left from 38th Avenue Southwest onto Southwest Oregon Street. Converting the intersection from side-street stop-controlled to all-way stop-controlled would mitigate the delay.
- Fauntleroy Southwest and Southwest Oregon Street
    - Increasing the signal cycle length to 120 seconds would mitigate the impact of added delays from additional pick-up/drop-off vehicle trips through the intersection.

4.4.2 Construction Mitigation

4.4.2.1 Mitigation for All Build Alternatives

Sound Transit will develop a Construction Access and Traffic Management Plan for the project for whichever Build Alternative is selected. The plan would be developed as the project advances and include the overarching goals and objectives for the project's construction and the approach to partner agency coordination. It would include applicable mitigation commitments to be built by Sound Transit, finalized as part of the environmental documentation, as well as additional detail reflecting continued design for the project after the Final EIS. Components likely to be addressed in detail include maintaining business access; minimizing construction disruption during large events; providing alternate routes for freight, general traffic, and non-motorized access; parking management; pavement restoration as appropriate; and maintaining transit operations (such as bus and light rail).

Potential construction mitigation measures will be consistent with the applicable City requirements. Sound Transit would prepare traffic control plans during subsequent design phases to coordinate on how all modes of transportation would be maintained and address pedestrian and bicycle access and safety. Mitigation measures will follow the *Manual on Uniform Traffic Control Devices for Streets and Highways* (Federal Highway Administration 2009) and the City of Seattle *Traffic Control Manual* (City of Seattle 2012) for maintenance of traffic plans. Potential measures to minimize construction traffic impacts could include the following practices:

- Install advance warning signs and highly visible construction barriers and use flaggers where needed.
- Consider a variety of traffic and travel demand management strategies, such as supporting employer incentives or programs to use transit.
- Clearly sign and provide detour routes when streets are fully or partially closed for elevated guideway and trench construction. The contractor would be required to keep nearby parallel facilities open to facilitate access and mobility.
- For extended closures requiring substantial traffic detours, Sound Transit would coordinate with the City of Seattle to consider temporary physical treatments such as roadway rechannelization, traffic signals, and transit priority treatments.
- Use lighted or reflective signage to direct drivers to truck haul routes to ensure visibility during nighttime work hours. Use special lighting for work zones and travel lanes, where required.
- Communicate public information through tools such as print, radio, posted signs, websites, and email to provide information regarding street closures, hours of construction, business access, and parking impacts.

- Coordinate access closures with affected businesses and residents. If access closures are required, property access to residences and businesses would be maintained to the extent possible. If access to the property cannot be maintained, the specific construction activity would be reviewed to determine if it could occur during non-business hours, or if the parking and users of this access (e.g., deliveries) could be accommodated at an alternative location.
- Post advance notice signs prior to construction in areas where construction activities would affect access to surrounding businesses.
- Provide regular updates to schools, emergency service providers, local agencies, solid waste utilities, and postal services, and assist school officials in providing advance and ongoing notice to students and parents concerning construction activity near schools.
- Schedule traffic lane closures and high volumes of construction truck traffic during off-peak hours to minimize delays, where practical. In addition, closures of parallel arterials or access points would be coordinated with the goal of avoiding simultaneous closures.
- Cover potholes and open trenches, where possible, and use protective barriers to protect drivers from open trenches.
- To minimize potential freight impacts, coordinate with affected businesses throughout the construction period to notify them of lane and access closures and maintain business access as much as possible.
- Provide construction information to WSDOT for use in the state's freight notification system when construction activities could affect state facilities, such as State Route 99. Sound Transit would provide information in the format required by WSDOT.
- Coordinate with the City of Seattle and other relevant agencies to disseminate construction closure information to the public.

The above mitigation measures could decrease vehicle demand, particularly peak hour demand, through the construction areas. The travel demand management strategies would help to mitigate the traffic operations impacts expected during construction. In addition to the measures described above which apply to all Build Alternatives, the following section describes mitigation measures that are being considered for specific locations expected to be impacted by the Preferred Alternative. Although the following discussion reflects the construction closures expected with the Preferred Alternative, the types of measures would also apply to other alternatives, for example, signal timing revisions, lane reconfigurations, and transit treatments such as queue jumps.

4.4.2.2 Mitigation for the Preferred Alternative

SODO and Duwamish Segments

A VISSIM traffic microsimulation model was used to evaluate 4th Avenue South corridor operations under Construction Scenario 1 and 2. The results of the Construction Scenario 1 and 2 evaluations are described in Section 4.3.3.3.

For Construction Scenario 1, travel times on 4th Avenue South from South Spokane Street to the I-90 Westbound Off-Ramp could increase by 1 minute for vehicles, freight, and transit due to increased congestion between South Lander Street and South Holgate Street. Based on the mitigation options tested for the 2042 Build conditions in Section 4.3.2.3, a potential measure to minimize construction traffic impacts for buses could include constructing a northbound transit queue jump at 4th Avenue South/South Holgate Street, and a southbound transit queue jump at 4th Avenue South/South Lander Street. The VISSIM model indicated that the transit queue

jumps could reduce transit travel time by about 30 seconds, and result in up to 30 seconds of delay for vehicle and freight travel times along 4th Avenue South. The impact to 6th Avenue South/South Spokane Street may be mitigated with signal timing revisions including lengthening the cycle from 110 to 130 seconds.

For Construction Scenario 2, a transit improvement was incorporated into the analysis. The existing northbound bus stop just north of South Spokane Street was assumed to shift to a near-side stop in the northbound right-turn lane approaching the intersection, with a transit queue jump so that buses would not have to merge back into the northbound through lanes. With this transit treatment in place, travel times along 4th Avenue South for vehicles, freight, and transit were similar to no build conditions.

Delridge Segment

No location-specific construction impacts are expected with the Preferred Option DEL-6b and therefore no mitigation measures are identified.

West Seattle Junction Segment

The construction analysis described in Section 4.3.3.5 incorporates a variety of lane configuration and signal timing measures to improve traffic flow and minimize delay during the roadway closures required for Preferred Option WSJ-5b. As the project advances, Sound Transit will continue to refine its construction approach and seek ways to limit impacts on traffic operations. However, there are no additional location-specific mitigation measures identified at this time beyond those already included in the analysis.

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5 PARKING

5.1 Introduction

This chapter describes existing on- and off-street parking and curb use conditions along the West Seattle Link Extension Project (the project) corridor and around stations. It describes changes in parking supply or curb use restrictions with the No Build Alternative and Build Alternatives and documents parking supply and occupancy along streets in each station's vicinity to identify unrestricted parking that could be affected by light rail riders who park and commute by light rail (also known as hide-and-ride). Hide-and-ride parking could adversely affect local businesses and residents who rely on that parking. It also discusses temporary construction impacts such as loss of on- and off-street parking and construction worker parking.

Two study areas were evaluated to assess parking impacts: a near-project study area and a "hide-and-ride" study area. The near-project study area included streets within one block of the light rail alignment as well as within one block of each station. Potential permanent or temporary changes to curb use functions were assessed for the near-project study area. The hide-and-ride study area included all street segments and publicly available off-street lots (both paid and free parking) within a 0.25-mile walking distance from the Build Alternative stations. Parking data for this analysis were collected in fall 2019, prior to the COVID-19 pandemic. These included a detailed parking inventory (number of spaces by type) and midday occupancy surveys (number of vehicles parked) during the weekday.

The long-term parking effects analysis considered two types of parking impacts: (1) the amount of on-street parking eliminated by an alternative's station or alignment and (2) the potential for hide-and-ride parking near stations. Parking supply temporarily displaced by construction activities and restored after construction would be in addition to any parking identified to be permanently displaced. Potential mitigation measures to address parking impacts are also identified.

The project would result in temporary (construction period) and long-term impacts to parking supply along the project alignment. The following sections summarize the findings of this chapter.

5.1.1 Long-term Impact Key Findings

- The SODO Segment has the greatest number of potential permanent parking space removals from building the station and light rail alignment: 80 to 180 parking spaces, depending on the alternative. For Preferred Option SODO-1c, Alternative SODO-1a, and Option SODO-1b, transit improvements on 4th Avenue South would be implemented to accommodate buses diverted from the SODO Busway. These transit improvements could remove 25 to 175 parking spaces on 4th Avenue South between South Holgate Street and South Spokane Street, which spans the SODO and Duwamish segments.
- Consistent with local comprehensive planning, Sound Transit will not construct park-and-ride facilities at any of the stations; therefore, there is a potential for hide-and-ride parking impacts. To mitigate the possibility of hide-and-ride impacts, Sound Transit would work with the City of Seattle to implement curb use management in proposed station areas where it does not already exist. This could include designating new Americans with Disabilities Act-compliant and loading spaces, or implementing restrictions to deter long-term parking.

5.1.2 Construction Impact Key Findings

- Most of the Build Alternatives would temporarily remove on-street parking spaces during construction of the guideway and stations.
- The greatest number of temporary parking removals (up to 260) would take place in the West Seattle Junction Segment.
- While some on-street truck parking would be temporarily removed in the Duwamish Manufacturing/Industrial Center, the preferred alternative would not affect the Port of Seattle's designated off-street truck parking lot at Terminal 25 South (with capacity for about 140 truck tractors).
- Early utility work to relocate the 230-kilovolt power lines from the SODO Busway to 6th Avenue South would temporarily remove parking along 6th Avenue South between South Spokane Street and South Massachusetts Street while new power poles are installed. A total of 363 parking spaces could be affected along the entire length of street, but only one block of spaces would be removed at any one time. This could be up to 100 spaces at a time in the SODO Segment and up to 85 spaces at a time in the Duwamish Segment.
- For Alternative SODO-2, transit improvements on 4th Avenue South would be implemented to accommodate buses diverted from the SODO Busway for the duration of construction on the SODO Busway. The closure period would be 5 years for West Seattle Link Extension construction; see Chapter 11, Cumulative Impacts, for a discussion of the combined effect with the Ballard Link Extension on the SODO Busway. These transit improvements could remove 25 to 175 parking spaces on 4th Avenue South between South Holgate Street and South Spokane Street, which spans the SODO and Duwamish segments. Note that the same effects would also apply to the other SODO alternatives discussed in Section 5.1.1, Long-term Impact Key Findings, but would be permanent in nature under those alternatives.
- Sound Transit would work with private parties and partner agencies to mitigate construction-period impacts. This could include Americans with Disabilities Act space relocation, increases to bus service, coordination with private lot owners, and management of construction worker parking.

5.2 Affected Environment

As noted in Section 5.1, Introduction, the project assessed parking conditions in a near-project study area and a hide-and-ride study area. The near-project study area included streets within one block of the light rail alignment and of each station, and the hide-and-ride study area extended 0.25-mile walking distance from the Build Alternative stations and included all on-street parking as well as off-street parking lots that the public could use for long-term parking. This included both facilities that are free or require payment. Parking lots that are reserved for a particular use, such as signed for customer or resident only, were not studied.

Within the hide-and-ride study area, Sound Transit collected detailed on-street and publicly available off-street parking inventory by space type and midday parking occupancy data on weekdays to assess the potential for hide-and-ride activity. This included detailed parking inventory (number of spaces by type), and midday occupancy surveys (number of vehicles parked) during the weekday. Parking data for this analysis were collected in fall 2019, prior to the COVID-19 pandemic.

Special-use curb zones in the near-project study area were documented to assess potential temporary or permanent loss of parking due to the project. The special-use curb zones studied include the following restriction types:

- Disabled parking space: Restricts space use to vehicles displaying a state disabled parking permit.
- General load zone: Allows loading/unloading people and/or goods by any vehicle.
- Commercial vehicle load zone: Restricts zone use to loading/unloading goods by vehicles with a commercial permit.
- Truck-only load zone: Restricts zone use to loading/unloading goods by vehicles licensed as trucks.
- Passenger load zone: Restricts zone use to loading/unloading passengers, and the driver must stay in the vehicle.

5.2.1 SODO Segment

The parking inventoried for the SODO Segment is shown on Figure 5-1. Table 5-1 presents the on-street parking supply and occupancy inventoried for the SODO Segment station areas, by alternative.

Table 5-1. Inventoried Station Area On-street Parking Supply and Occupancy in the SODO Segment

Alternatives and Design Options	Unrestricted Spaces	Restricted Spaces [a]	Total Spaces	Percent Occupied
Preferred At-Grade Lander Access Station Option (SODO-1c)	**173**	**65**	**238**	**65%**
At-Grade Alternative (SODO-1a)	173	65	238	65%
At-Grade South Station Option (SODO-1b)	245	71	316	64%
Mixed Profile Alternative (SODO-2)	245	71	316	64%

[a] Restricted spaces are signed to limit parking duration or type of vehicle.

Note: Reflects number of parking or loading stalls within 0.25 mile of each station alternative.

Within the near-project study areas, the special-use curb zone inventory identified ten general load zone spaces and four truck-only load zone spaces; there were no disabled parking space, commercial vehicle load zone, or passenger load zone spaces.

Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- Retained Cut
- At-Grade

Other Alternatives
- Elevated
- Retained Cut
- At-Grade

Station (● *Indicates Preferred Alternative*)
- New
- Existing
- r Relocated

- Segment Line
- Existing Link Light Rail
- Railroad
- SODO Busway
- Proposed Overpass
- On-Street Parking Study Area

FIGURE 5-1
Parking
SODO Segment

West Seattle Link Extension

0 500 1,000 Feet

N

5.2.2 Duwamish Segment

Only the near-project streets were inventoried in the Duwamish Segment because there would be no stations to induce hide-and-ride parking. Within the near-project study areas, the special-use curb zone inventory identified one disabled parking space, two general load zone spaces, and three truck-only load zone spaces. Trucks and trailers are allowed to park on-street in the Duwamish Manufacturing/Industrial Center.

The Port of Seattle owns a surface truck parking lot at the south end of Terminal 25. Port-related tractors (the engine component of a tractor-trailer truck) are allowed to park in the lot between shifts and overnight. The lot has capacity for about 140 truck tractors, and an overnight count performed in January 2018 observed it to be 96 percent occupied (Heffron Transportation, Inc. 2018).

5.2.3 Delridge Segment

The parking study area for the Delridge Segment is shown on Figure 5-2. Table 5-2 presents the on-street parking supply and occupancy inventoried for the Delridge Segment station areas, by alternative.

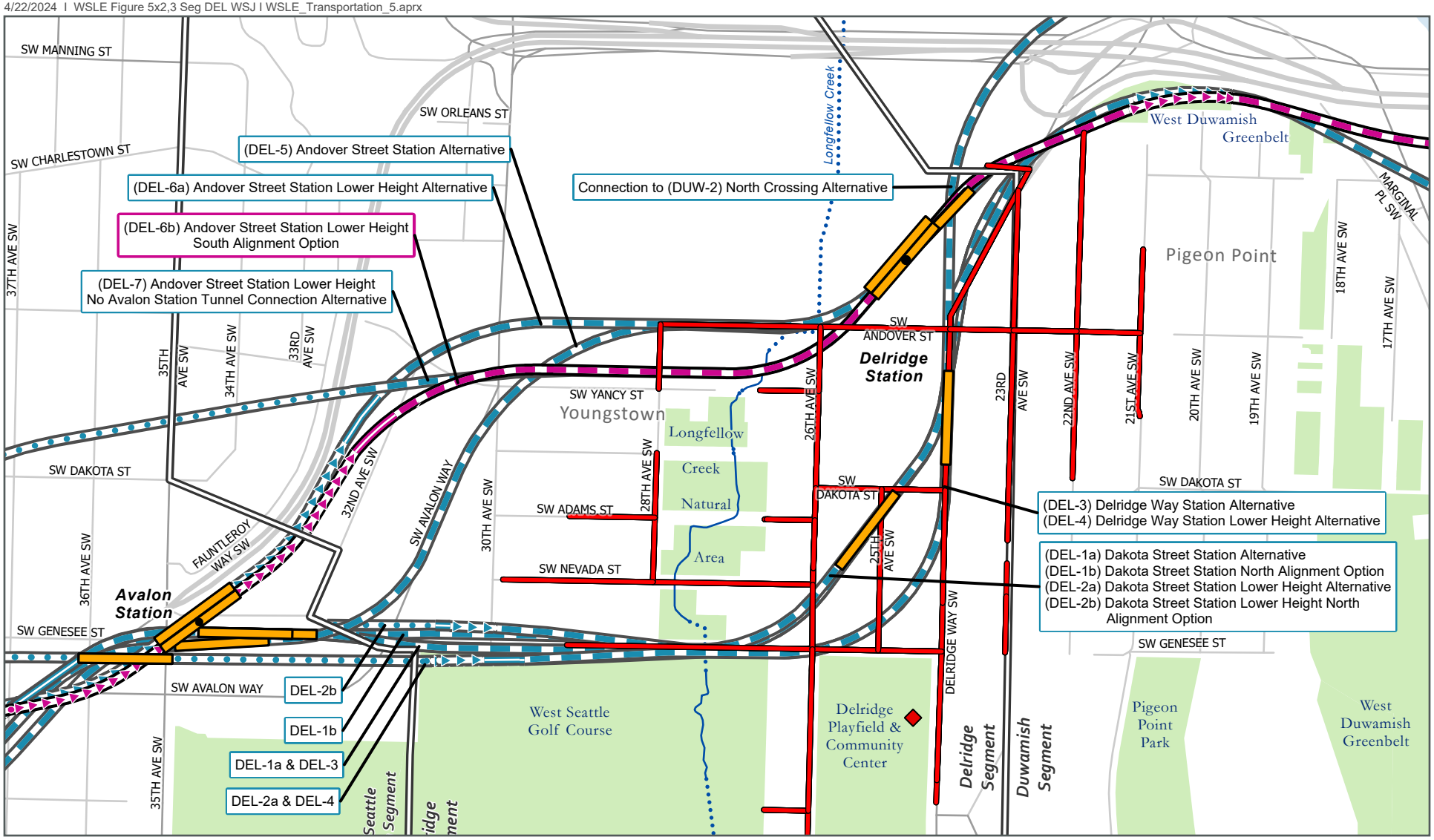
Table 5-2. Inventoried Station Area On-street Parking Supply and Occupancy in the Delridge Segment

Alternatives and Design Options	Unrestricted Spaces	Restricted Spaces [a]	Total Spaces	Percent Occupied
Preferred Andover Street Station Lower Height South Alignment Option (DEL-6b)	**359**	**33**	**392**	**50%**
Dakota Street Station Alternative (DEL-1a)	353	73	426	59%
Dakota Street Station North Alignment Option (DEL-1b)	353	73	426	59%
Dakota Street Station Lower Height Alternative (DEL-2a)	353	73	426	59%
Dakota Street Station Lower Height North Alignment Option (DEL-2b)	353	73	426	59%
Delridge Way Station Alternative (DEL-3)	324	73	397	57%
Delridge Way Station Lower Height Alternative (DEL-4)	324	73	397	57%
Andover Street Station Alternative (DEL-5)	359	33	392	50%
Andover Street Station Lower Height Alternative (DEL-6a)	359	33	392	50%
Andover Street Station Lower Height No Avalon Station Tunnel Connection Alternative (DEL-7)	359	33	392	50%

[a] Restricted spaces are signed to limit parking duration or type of vehicle.

There is one off-street 38-space public parking lot in the study area, at the Delridge Community Center and Skate Park.

Within the near-project study areas, the special-use curb zone inventory identified up to one disabled parking space, one general load zone space, no commercial vehicle load zone spaces, one truck-only load zone space, and two passenger load zone spaces.



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- Tunnel
- At-Grade
- Retained Cut

Other Alternatives
- Elevated
- Tunnel
- At-Grade
- Retained Cut

Station (● *Indicates Preferred Alternative*)
- New

- Segment Line
- Railroad
- Stream
- Piped Stream
- Park
- Public Off-Street Parking
- On-Street Parking Study Area

FIGURE 5-2
Parking
Delridge Segment

West Seattle Link Extension

0 500 1,000 Feet

N

5.2.4 West Seattle Junction Segment

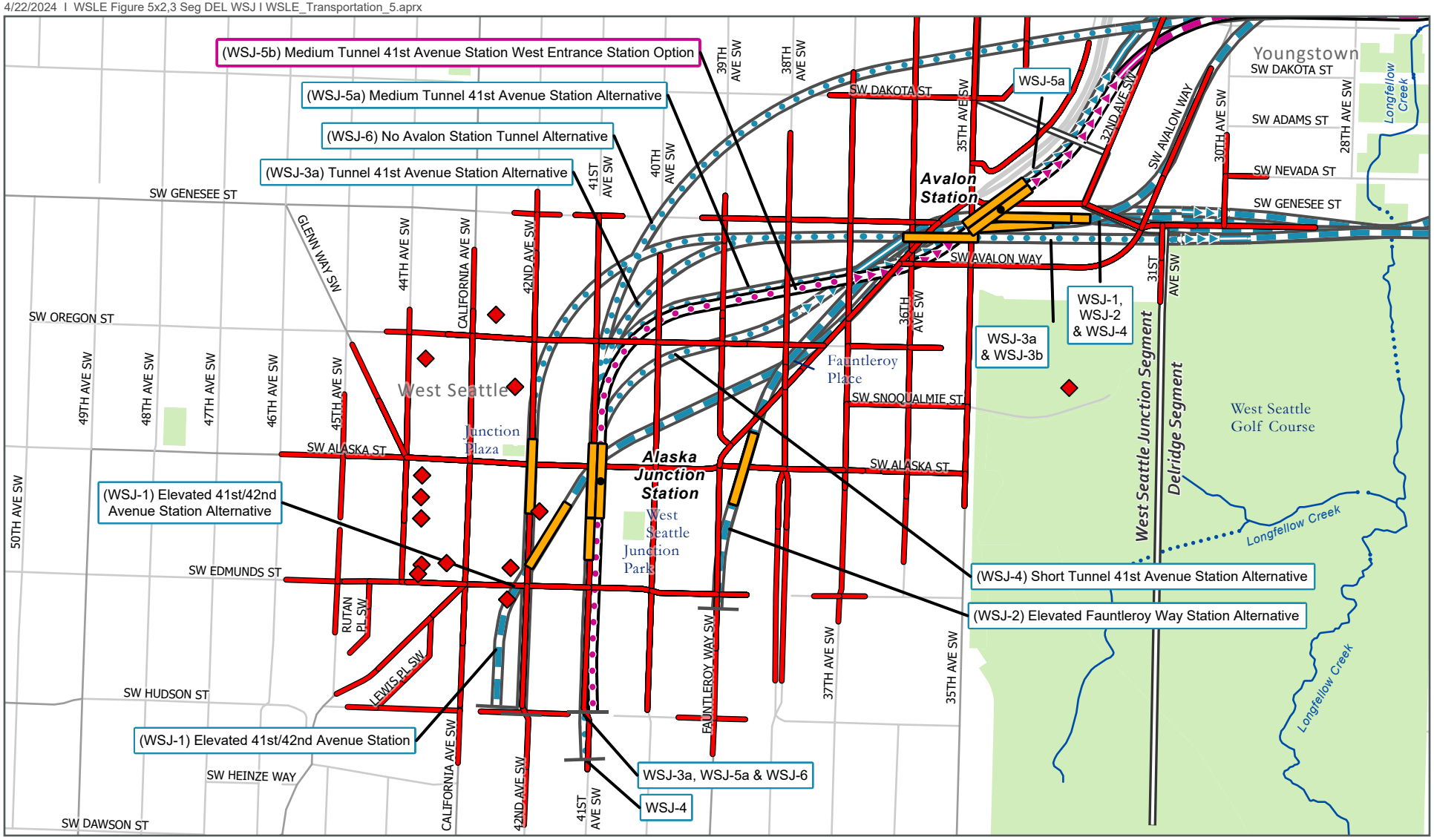
The parking study area for the West Seattle Junction Segment is shown on Figure 5-3. This segment includes the Avalon and Alaska Junction stations. Table 5-3 presents the on-street parking supply and occupancy inventoried for the West Seattle Junction Segment station areas by alternative.

Table 5-3. Inventoried Station Area On-Street Parking Supply and Occupancy in the West Seattle Junction Segment

Alternatives and Design Options	Unrestricted Spaces	Restricted Spaces [a]	Total Spaces	Percent Occupied
Preferred Medium Tunnel 41st Avenue Station West Entrance Station Option (WSJ-5b): Avalon Station	**590**	**277**	**867**	**55%**
Preferred Medium Tunnel 41st Avenue Station West Entrance Station Option (WSJ-5b): Alaska Junction Station	**263**	**756**	**1019**	**64%**
Elevated 41st/42nd Avenue Station Alternative (WSJ-1): Avalon Station	629	102	731	52%
Elevated 41st/42nd Avenue Station Alternative (WSJ-1): Alaska Junction Station	242	731	973	62%
Elevated Fauntleroy Way Station Alternative (WSJ-2): Avalon Station	629	102	731	52%
Elevated Fauntleroy Way Station Alternative (WSJ-2): Alaska Junction Station	471	507	978	67%
Tunnel 41st Avenue Station Alternative (WSJ-3a): Avalon Station	590	277	867	55%
Tunnel 41st Avenue Station Alternative (WSJ-3a): Alaska Junction Station	263	756	1019	64%
Tunnel 42nd Avenue Station Option (WSJ-3b): Avalon Station	590	277	867	55%
Tunnel 42nd Avenue Station Option (WSJ-3b): Alaska Junction Station	132	851	983	61%
Short Tunnel 41st Avenue Station Alternative (WSJ-4): Avalon Station	629	102	731	52%
Short Tunnel 41st Avenue Station Alternative (WSJ-4): Alaska Junction Station	263	756	1019	64%
Medium Tunnel 41st Avenue Station Alternative (WSJ-5a): Avalon Station	590	277	867	55%
Medium Tunnel 41st Avenue Station Alternative (WSJ-5a): Alaska Junction Station	263	756	1019	64%
No Avalon Station Tunnel Alternative (WSJ-6): Alaska Junction Station [b]	263	756	1019	64%

[a] Restricted spaces are signed to limit parking duration or type of vehicle.

[b] Parking information for Alternative WSJ-6 is only provided for the Alaska Junction Station because the alternative does not include an Avalon station.



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- Tunnel
- At-Grade
- Retained Cut

Other Alternatives
- Elevated
- Tunnel
- At-Grade
- Retained Cut

Station (● *Indicates Preferred Alternative*)
- New

- Segment Line
- Railroad
- Stream
- Piped Stream
- Park
- Public Off-Street Parking
- On-Street Parking Study Area

FIGURE 5-3
Parking
West Seattle Junction Segment

West Seattle Link Extension

0 500 1,000 Feet

N

There is one public parking lot within the Avalon Station study area of all eight segment alternatives. The 249-space lot serves users of the West Seattle Stadium and Golf Course. It has restrictions such as time limits or payment requirements.

Within the near-project study areas, the special-use curb zone inventory identified up to 10 disabled parking spaces, 20 general load zone spaces, no commercial vehicle load zone spaces, 3 truck-only load zone spaces, and 10 passenger load zone spaces.

5.3 Environmental Impacts

Potential long-term parking impacts for the project alternatives would be from the potential for hide-and-ride parking near light rail stations and the removal of parking along the alternative alignments and near the stations, both permanently and temporarily during construction.

5.3.1 No Build Alternative

The No Build Alternative would not remove on-street or off-street parking or change parking characteristics in the study area.

5.3.2 Build Alternatives

5.3.2.1 Long-term Impacts

Impacts Common to All Alternatives

All the proposed West Seattle Link Extension stations are currently surrounded by areas of unrestricted parking that could be used by light rail riders to park and commute elsewhere. This hide-and-ride parking could adversely affect local businesses and residents who rely on that parking for other purposes. Consistent with current practice in Seattle's existing light rail station areas, Sound Transit expects that the Seattle Department of Transportation would manage parking within the vicinity of new stations by placing restrictions (including time limits or permit restrictions) where they do not already exist. Operators of off-street parking facilities near stations might choose to change their pricing structures or implement parking management strategies to ensure an adequate supply of parking for their tenants and customers.

Sound Transit would not create new parking at any stations to accommodate light rail riders. Trip generation and traffic analysis performed for the project assumes no long-term parking by commuters and that curb use management in the vicinity of new light rail stations would discourage such parking. Therefore, long-term parking impacts surrounding the stations could occur if existing unrestricted parking accommodates hide-and-ride parking or if there is permanent removal of parking spaces by the project.

Sound Transit identified potential long-term parking impacts, where parking spaces would be permanently removed for project use at the new station locations and along the alignments. These are described further in the following segment-specific discussions.

All Build Alternatives would remove parking along 4th Avenue South between South Holgate Street and South Spokane Street in the SODO and Duwamish segments, where new transit improvements would be implemented to accommodate buses diverted off of the SODO Busway. As discussed in Chapter 3, Transit, the different types of improvements being considered include queue jump lanes, business access and transit lanes, and freight and transit lanes. The number of parking stalls affected by the transit improvements could range from 25 to 175 on-street parking spaces, including up to four general load zone spaces. The removal could be permanent for Preferred Option SODO-1c, Alternative SODO-1a, and Option SODO-1b,

because the rail alignment would eliminate the SODO Busway. For Alternative SODO-2, parking on 4th Avenue South would be a long-term construction-related removal for the duration of construction on the SODO Busway. The closure period for Alternative SODO-2 would be 5 years for construction of the West Seattle Link Extension. Sound Transit is also planning the Ballard Link Extension, which is a light rail extension from SODO Station to Ballard that would require a closure of the SODO Busway during construction. See Chapter 11 for a discussion of the combined effect on the SODO Busway. Chapter 3 provides further information about the transit improvements on 4th Avenue South.

SODO Segment

Table 5-4 shows the number of on-street parking spaces that would be permanently removed by the SODO Segment alternatives.

Table 5-4. Permanent Parking Removal in the SODO Segment

Alternatives and Design Options	On-street Parking Permanently Removed (Spaces)
Preferred At-Grade Lander Access Station Option (SODO-1c)	**80 to 180** [a]
At-Grade Alternative (SODO-1a)	85 to 195 [a]
At-Grade South Station Option (SODO-1b)	55 to 155 [a]
Mixed Profile Alternative (SODO-2)	25 to 35

[a] Includes parking spaces permanently removed on 4th Avenue South between South Holgate Street and South Forest Street due to transit improvements. The various treatments could remove between 25 and 110 spaces in the SODO Segment.

Preferred Option (SODO-1c)

Preferred Option SODO-1c would permanently remove 55 to 70 spaces removed on 5th Place South, South Bayview Street, and South Lander Street to accommodate the station and rail alignment. No public off-street parking would be removed with this alternative. The preferred option would permanently remove ten general load zone spaces and four truck-only load zone spaces in the station area.

For Preferred Option SODO-1c, transit improvements on 4th Avenue South would be implemented to accommodate buses diverted from the SODO Busway. Freight and transit lanes in both directions could permanently remove up to 110 parking spaces on 4th Avenue South between South Holgate Street and South Forest Street; transit queue jump lanes at select intersections could eliminate up to 75 parking spaces, and a northbound bus and transit lane with southbound queue jump lanes could remove 25 parking spaces. This includes up to four general load zone spaces.

Other Build Alternatives (SODO-1a, SODO-1b, and SODO-2)

Alternative SODO-1a removes slightly more parking than Preferred Option SODO-1c; it would remove an additional 5 to 15 spaces that would be converted to station passenger or bus load zones on 4th Avenue South and 5th Place South. Alternative SODO-1a would remove the same number of special-use spaces as Preferred Option SODO-1c: it would permanently remove eleven general load zone spaces and four truck-only load zone spaces.

Option SODO-1b would remove slightly fewer parking spaces than Preferred Option SODO-1c. It would convert 10 to 15 spaces to station passenger or bus load zones on 4th Avenue South and 5th Place South and would remove 20 to 30 spaces on South Holgate Street and South Lander Street to accommodate the station and rail alignment. This option would remove two general load zone spaces and one truck-only load zone space near the station, as well as one general load zone on 4th Avenue South.

Alternative SODO-2 would convert 25 to 35 spaces on 4th Avenue South and 5th Place South to station passenger or bus load zones. However, it would not affect other on-street parking in the station area. No special-use spaces would be permanently affected.

No public off-street parking would be removed with these alternatives.

Duwamish Segment

Table 5-5 shows the number of on-street parking spaces that would be permanently removed by the Duwamish Segment alternatives.

Table 5-5. Permanent Parking Removal in the Duwamish Segment

Alternatives and Design Options	On-street Parking Permanently Removed (spaces)
Preferred South Crossing Alternative (DUW-1a)	**Up to 65 [a]**
South Crossing South Edge Crossing Alignment Option (DUW-1b)	Up to 65 [a]
North Crossing Alternative (DUW-2)	5 to 80 [a]

[a] Includes up to 65 parking spaces permanently removed on 4th Avenue South between South Forest Street and South Spokane Street due to transit improvements if Preferred Option SODO-1c, Alternative SODO-1a, or Option SODO-1b is selected.

Preferred Alternative (DUW-1a)

If Preferred Option SODO-1c, Alternative SODO-1a, or Option SODO-1b is selected, there would be permanent parking removal within the Duwamish Segment regardless of which Duwamish Segment alternative is selected. With those SODO Segment alternatives, transit improvements on 4th Avenue South would be implemented to accommodate buses diverted from the SODO Busway. These transit improvements could permanently remove up to 65 parking spaces on 4th Avenue South between South Forest Street and South Spokane Street. No special-use spaces would be permanently affected. No other spaces would be permanently removed with Preferred Alternative DUW-1a.

Other Build Alternatives (DUW-1b and DUW-2)

Option DUW-1b would have the same permanent parking removals as Preferred Alternative DUW-1a. In addition to the potential parking removal resulting from the SODO Segment alternatives, Alternative DUW-2 would remove 5 to 15 on-street spaces on South Hinds Street to accommodate the rail alignment. No special-use spaces would be permanently affected.

Delridge Segment

Table 5-6 shows the number of on-street parking spaces that would be permanently removed by the Delridge Segment alternatives.

Table 5-6. Permanent Parking Removal in the Delridge Segment

Alternatives and Design Options	On-street Parking Permanently Removed (spaces)
Preferred Andover Street Station Lower Height South Alignment Option (DEL-6b) [a]	**30 to 40**
Dakota Street Station Alternative (DEL-1a)	5 to 15
Dakota Street Station North Alignment Option (DEL-1b)	5 to 15
Dakota Street Station Lower Height Alternative (DEL-2a)	15 to 25
Dakota Street Station Lower Height North Alignment Option (DEL-2b)	20 to 30
Delridge Way Station Alternative (DEL-3)	5 to 15
Delridge Way Station Lower Height Alternative (DEL-4)	5 to 15
Andover Street Station Alternative (DEL-5) [a]	0
Andover Street Station Lower Height Alternative (DEL-6a) [a]	0
Andover Street Station Lower Height No Avalon Station Tunnel Connection Alternative (DEL-7) [a]	20 to 30

[a] Since parking data were collected in 2019, the Seattle Department of Transportation has reconfigured Southwest Andover Street, Southwest Yancy Street, and Southwest Avalon Way. The resulting parking changes along these streets were taken into consideration when determining long-term impacts.

Preferred Option (DEL-6b)

Preferred Option DEL-6b would remove 30 to 40 on-street parking spaces on 32nd Avenue Southwest. No public off-street parking would be removed with this alternative and no special-use spaces would be permanently affected.

Other Build Alternatives (DEL-1a, DEL-1b, DEL-2a, DEL-2b, DEL-3, DEL-4, DEL-5, DEL-6a, and DEL-7)

Alternative DEL-1a and Option DEL-1b would convert 5 to 15 spaces on Southwest Dakota Street, 26th Avenue Southwest, and 25th Avenue Southwest to station passenger or bus loading zones at the station.

Alternative DEL-2a would convert up to 5 spaces on Southwest Dakota Street to station passenger or bus loading zones at the station and would remove an additional 10 to 20 spaces on 25th Avenue Southwest south of Southwest Dakota Street to accommodate the rail or station alignment. Option DEL-2b would remove these same spaces plus up to 5 more spaces along 25th Avenue Southwest south of Southwest Dakota Street.

Alternative DEL-3 and Alternative DEL-4 would convert 5 to 15 spaces on Southwest Dakota Street and 23rd Avenue Southwest to station passenger or bus loading zones at the station.

Sound Transit expects that Alternative DEL-5 and Alternative DEL-6a would not result in any parking removed to accommodate the station or rail alignment.

Alternative DEL-7 is expected to remove 20 to 30 spaces along 32nd Avenue Southwest to accommodate the rail alignment.

None of the alternatives would remove public off-street parking spaces or special-use spaces.

West Seattle Junction Segment

Table 5-7 shows the number of on-street parking spaces that would be permanently removed by the West Seattle Junction Segment alternatives. Off-street parking impacts are also noted in the table footnotes.

Table 5-7. Permanent Parking Removal in the West Seattle Junction Segment

Alternatives and Design Options	On-street Parking Permanently Removed (spaces)
Preferred Medium Tunnel 41st Avenue Station West Entrance Station Option (WSJ-5b)	**10 to 20**
Elevated 41st/42nd Avenue Station Alternative (WSJ-1)	10 to 20 [a]
Elevated Fauntleroy Way Station Alternative (WSJ-2)	10 to 20
Tunnel 41st Avenue Station Alternative (WSJ-3a)	10 to 20
Tunnel 42nd Avenue Station Option (WSJ-3b)	15 to 25 [b]
Short Tunnel 41st Avenue Station Alternative (WSJ-4)	45 to 60
Medium Tunnel 41st Avenue Station Alternative (WSJ-5a)	Up to 10
No Avalon Station Tunnel Alternative (WSJ-6)	Up to 10

[a] An additional 210 public off-street parking spaces would also be removed with Alternative WSJ-1.

[b] An additional 230 public off-street parking spaces would also be removed with Option WSJ-3b.

Preferred Option (WSJ-5b)

Preferred Option WSJ-5b would convert 10 to 20 spaces to station passenger or bus loading zones along 41st Avenue Southwest and 40th Avenue Southwest. No public off-street parking spaces would be removed. No special-use spaces would be permanently affected.

Other Build Alternatives (WSJ-1, WSJ-2, WSJ-3a, WSJ-3b, WSJ-4, WSJ-5a, and WSJ-6)

Alternative WSJ-1 would convert 10 to 20 spaces to station passenger loading zones on Southwest Genesee Street, 42nd Avenue Southwest, and 41st Avenue Southwest. This alternative would also remove 210 public off-street spaces: 174 spaces in the 4704 42nd Avenue Southwest lot, 8 spaces in the 4200 Southwest Edmunds Street lot, and 28 spaces in the 4810 42nd Avenue Southwest lot.

Alternative WSJ-2 would convert 10 to 20 spaces to station passenger loading zones on Southwest Alaska Street and 38th Avenue Southwest. No public off-street parking would be removed with this alternative.

Alternative WSJ-3a would convert 10 to 20 spaces to station passenger loading zones on Southwest Genesee Street and 40th Avenue Southwest. No public off-street parking would be removed with this alternative.

Option WSJ-3b would convert 15 to 25 spaces to station passenger loading zones on 41st Avenue Southwest and 42nd Avenue Southwest. This option would also remove 230 public off-street spaces: 174 spaces in the 4704 42nd Avenue Southwest lot and 56 spaces in the south section of the parking lot just north of 4545 Alaska House.

Alternative WSJ-4 would convert 15 to 20 spaces to station passenger loading zones on 40th Avenue Southwest, 41st Avenue Southwest, and Southwest Genesee Street. This alternative would also remove 30 to 40 spaces along 37th Avenue Southwest and 38th Avenue Southwest along the guideway. No public off-street parking would be removed with this alternative.

Alternative WSJ-5a and Alternative WSJ-6 would convert up to 10 spaces to station passenger loading zones along 41st Avenue Southwest and 40th Avenue Southwest. No public off-street parking would be removed with these alternatives.

No special-use spaces would be permanently affected by these alternatives.

5.3.2.2 Construction Impacts

This section identifies potential temporary parking impacts during construction with each project Build Alternative, as well as the potential for construction workers to park near the construction areas. The temporary parking impacts are in addition to permanent parking losses described in Section 5.3.2.1, Long-term Impacts, or parking lost through property acquisition. Tables 5-8 through 5-11 present the potential temporary removal of parking during construction of the guideway and stations, which also includes parking that may be used as staging or storage areas. The number of spaces listed is the total amount that could be removed during construction, even if those removals do not occur simultaneously. Additional short-term removal of parking could be needed during night or weekend construction beyond those areas depending on the construction activities. Parking would be restored after construction is complete. For information on key roadway construction closures, including extents and durations, refer to Section 4.3.3, Construction Impacts.

Impacts Common to All Alternatives

Sound Transit expects that construction employee vehicles could park within the construction staging areas. Without mitigation, construction workers could also park on local streets and arterials near construction sites where parking is unrestricted.

All alternatives would temporarily remove on-street parking spaces along 6th Avenue South between South Massachusetts Street and South Spokane Street during relocation of the 230-kilovolt power lines. This portion of 6th Avenue South, which is in both the SODO and Duwamish segments, has an estimated 363 parking stalls on both sides of the street and includes 12 general load zone spaces, 2 truck-only load zone spaces, and 1 disabled parking space. Parking would likely be temporarily removed for each block while new power pole foundations are installed, and access to all spaces on a block could be restricted when the street is closed to erect the poles using a crane. Each affected street segment could have up to 100 stalls that are removed simultaneously. Parking would be restored after construction is complete.

SODO Segment

Table 5-8 shows the number of on-street parking spaces that would be temporarily removed by the SODO Segment alternatives. These are in addition to the permanent parking removals described in Section 5.3.2.1.

Table 5-8. Temporary Parking Removal in the SODO Segment

Alternatives and Design Options	On-street Parking Temporarily Removed during Construction (spaces) [a]
Preferred At-Grade Lander Access Station Option (SODO-1c)	**0 to 105**
At-Grade Alternative (SODO-1a)	0 to 105
At-Grade South Station Option (SODO-1b)	15 to 125
Mixed Profile Alternative (SODO-2)	25 to 225 [b]

[a] Includes parking spaces temporarily removed on 6th Avenue South for 230-kilovolt relocation for all alternatives. Approximately 280 parking spaces in the SODO Segment could be affected, but only about 100 spaces at a time would be removed.

[b] Includes parking spaces temporarily removed on 4th Avenue South between South Holgate Street and South Forest Street due to transit improvements. The various treatments could remove between 25 and 110 spaces in the SODO Segment.

Preferred Option (SODO-1c)

Preferred Option SODO-1c would temporarily remove up to 100 parking spaces at a time during relocation of the 230-kilovolt power lines, plus 5 on-street parking spaces near the station.

Other Build Alternatives (SODO-1a, SODO-1b, and SODO-2)

Alternative SODO-1a would have similar parking removals as Preferred Option SODO-1c.

Option SODO-1b would remove slightly more parking during construction than Preferred Option SODO-1c, with an additional 15 to 20 on-street parking spaces removed along both sides of 5th Place South between South Lander Street and South Bayview Street during construction. This includes removal of four general load zone spaces and three truck-only load zone spaces.

Potential mitigation for Alternative SODO-2 would implement temporary transit improvements on 4th Avenue South to accommodate buses diverted from the SODO Busway for the duration of construction. The closure period would be 5 years for West Seattle Link Extension construction. Note that the same effects would also apply to the other SODO alternatives, but would be permanent in nature under those alternatives. Sound Transit is also planning the Ballard Link Extension, which is a light rail extension from SODO Station to Ballard that would require a closure of the SODO Busway during construction. See Chapter 11 for a discussion of the combined effect on the SODO Busway. These transit improvements could remove up to 110parking spaces on 4th Avenue South between South Holgate Street and South Forest Street. In addition to removals described for Preferred Option SODO-1c, Alternative SODO-2 would temporarily remove up to 10 on-street parking spaces along the east side of 5th Place South between South Lander Street and South Bayview Street during construction.
This includes removal of four general load zone spaces and three truck-only load zone spaces.

Duwamish Segment

Table 5-9 shows the number of on-street parking spaces that would be temporarily removed by the Duwamish Segment alternatives.

Table 5-9. Temporary Parking Removal in the Duwamish Segment

Alternatives and Design Options	On-street Parking Temporarily Removed during Construction (spaces) [a]
Preferred South Crossing Alternative (DUW-1a)	**40 to 205** [b]
South Crossing South Edge Crossing Alignment Option (DUW-1b)	40 to 205 [b]
North Crossing Alternative (DUW-2)	90 to 275 [b, c]

[a] Includes parking spaces temporarily removed on 6th Avenue South for 230-kilovolt relocation for all alternatives. About 85 parking spaces in the Duwamish Segment could be affected at one time.

[b] Includes up to 65 parking spaces temporarily removed on 4th Avenue South between South Forest Street and South Spokane Street due to transit improvements if Alternative SODO-2 is selected.

[c] Alternative DUW-2 would temporarily displace the Terminal 25 South truck parking lot, which can accommodate about 140 truck tractors.

Preferred Alternative (DUW-1a)

Preferred Option DUW-1a would temporarily remove up to 85 parking spaces at a time during relocation of the 230-kilovolt power lines, plus 40 to 55 on-street parking spaces along 6th Avenue South between South Forest Street and South Horton Street during construction of the rail alignment. There would be no additional removals of special-use spaces during construction. If Alternative SODO-2 is selected, there would be temporary parking removal in the Duwamish Segment regardless of which Duwamish Segment alternative is selected. Alternative SODO-2 would implement temporary transit improvements on 4th Avenue South to accommodate buses diverted from the SODO Busway for the duration of construction. These transit improvements could remove up to 65 parking spaces on 4th Avenue South between South Forest Street and South Spokane Street.

Other Build Alternatives (DUW-1b and DUW-2)

Similar to Preferred Alternative DUW-1a, Option DUW-1b and Alternative DUW-2 would temporarily remove up to 85 parking spaces at a time during relocation of the 230-kilovolt power lines, plus an additional 40 to 55 on-street parking spaces along 6th Avenue South between South Forest Street and South Horton Street during construction of the rail alignment. Alternative DUW-2 would also temporarily remove 50 to 70 on-street parking spaces under State Route 99 north of South Spokane Street during construction and would also temporarily displace the Terminal 25 South truck parking lot, which can accommodate about 140 truck tractors. There would be no additional removals of special-use spaces during construction. The temporary parking removals described for Option DUW-1b and Alternative DUW-2 would be in addition to the potential parking removal resulting from the SODO Segment alternative.

Delridge Segment

Table 5-10 shows the number of on-street parking spaces that would be temporarily removed by the Delridge Segment alternatives.

Table 5-10. Temporary Parking Removal in the Delridge Segment

Alternatives and Design Options	On-street Parking Temporarily Removed during Construction (spaces)
Preferred Andover Street Station Lower Height South Alignment Option (DEL-6b) [a]	**15 to 25**
Dakota Street Station Alternative (DEL-1a)	60 to 85
Dakota Street Station North Alignment Option (DEL-1b)	115 to 155
Dakota Street Station Lower Height Alternative (DEL-2a)	30 to 40
Dakota Street Station Lower Height North Alignment Option (DEL-2b)	30 to 40
Delridge Way Station Alternative (DEL-3)	75 to 105
Delridge Way Station Lower Height Alternative (DEL-4)	70 to 90
Andover Street Station Alternative (DEL-5) [a]	55 to 75
Andover Street Station Lower Height Alternative (DEL-6a) [a]	0
Andover Street Station Lower Height No Avalon Station Tunnel Connection Alternative (DEL-7) [a]	15 to 25

[a] Since parking data were collected in 2019, the Seattle Department of Transportation has reconfigured Southwest Andover Street, Southwest Yancy Street, and Southwest Avalon Way. The resulting parking changes along these streets were taken into consideration when determining construction impacts.

Preferred Option (DEL-6b)

In addition to the parking spaces that would be permanently removed, Preferred Option DEL-6b would temporarily remove 15 to 25 on-street parking spaces on Southwest Andover Street between 32nd Avenue Southwest and Southwest Avalon Way during construction. There would be no additional removals of special-use spaces during construction.

Other Build Alternatives (DEL-1a, DEL-1b, DEL-2a, DEL-2b, DEL-3, DEL-4, DEL-5, DEL-6a, and DEL-7)

Alternative DEL-1a would temporarily remove an additional 60 to 85 on-street parking spaces on 25th Avenue Southwest, 26th Avenue Southwest, Delridge Way Southwest, Southwest Dakota Street, and Southwest Genesee Street during construction.

Option DEL-1b would temporarily remove an additional 115 to 155 on-street parking spaces on Southwest Avalon Way, 25th Avenue Southwest, 26th Avenue Southwest, Delridge Way Southwest, and Southwest Genesee Street during construction.

Alternative DEL-2a would temporarily remove an additional 30 to 40 on-street parking spaces on Southwest Dakota Street, 26th Avenue Southwest and Delridge Way Southwest during construction.

Option DEL-2b would temporarily remove an additional 30 to 40 on-street parking spaces on Southwest Dakota Street, 26th Avenue Southwest, and Delridge Way Southwest during construction.

Alternative DEL-3 would temporarily remove an additional 75 to 105 on-street parking spaces on Delridge Way Southwest, 25th Avenue Southwest, Southwest Dakota Street, and Southwest Genesee Street during construction.

Alternative DEL-4 would temporarily remove an additional 70 to 90 on-street parking spaces on Delridge Way Southwest, 25th Avenue Southwest, and Southwest Dakota Street during construction.

Alternative DEL-5 would temporarily remove an additional 55 to 75 on-street parking spaces on Southwest Yancy Street and Southwest Avalon Way during construction.

Alternative DEL-6a would not remove additional on-street parking spaces during construction.

Alternative DEL-7 would temporarily remove an additional 15 to 25 on-street parking spaces on Southwest Andover Street between 32nd Avenue Southwest and Southwest Avalon Way during construction.

None of these alternatives are expected to remove public off-street parking during construction. All other Build Alternatives would temporarily remove up to one disabled parking space, one general load zone space, and one passenger load zone space during construction.

West Seattle Junction Segment

Table 5-11 shows the number of on-street parking spaces that would be temporarily removed by the West Seattle Junction Segment alternatives.

Table 5-11. Temporary Parking Removal in the West Seattle Junction Segment

Alternatives and Design Options	On-street Parking Temporarily Removed during Construction (spaces)
Preferred Medium Tunnel 41st Avenue Station West Entrance Station Option (WSJ-5b)	**190 to 260**
Elevated 41st/42nd Avenue Station Alternative (WSJ-1)	100 to 135
Elevated Fauntleroy Way Station Alternative (WSJ-2)	70 to 95
Tunnel 41st Avenue Station Alternative (WSJ-3a)	185 to 245
Tunnel 42nd Avenue Station Option (WSJ-3b)	80 to 110
Short Tunnel 41st Avenue Station Alternative (WSJ-4)	95 to 130
Medium Tunnel 41st Avenue Station Alternative (WSJ-5a)	190 to 260
No Avalon Station Tunnel Alternative (WSJ-6)	165 to 225

Preferred Option (WSJ-5b)

In addition to the parking spaces that would be permanently removed, Preferred Option WSJ-5b would temporarily remove an additional 190 to 260 on-street parking spaces, including 165 to 225 spaces along 41st Avenue Southwest and 25 to 35 spaces along 37th Avenue Southwest. Construction activities would not remove public off-street parking with these alternatives. During construction, up to two disabled parking spaces, one general load zone space, and two passenger load zone spaces would be temporarily removed.

Other Build Alternatives (WSJ-1, WSJ-2, WSJ-3a, WSJ-3b, WSJ-4, WSJ-5a, and WSJ-6)

During construction, Alternative WSJ-1 would temporarily remove an additional 100 to 135 on-street parking spaces on 40th Avenue Southwest, 42nd Avenue Southwest, Fauntleroy Way Southwest, 36th Avenue Southwest, 38th Avenue Southwest, Southwest Edmunds Street, and 39th Avenue Southwest. Alternative WSJ-2 would temporarily remove 70 to 95 on-street parking spaces on Fauntleroy Way Southwest, 37th Avenue Southwest, 38th Avenue Southwest, Southwest Alaska Street, Southwest Genesee Street, 36th Avenue Southwest, and Southwest Oregon Street during construction. Off-street parking would not be removed by project construction activities with either of these alternatives. These alternatives would temporarily remove up to three disabled parking spaces, three general load zone space, three truck-only load zone spaces, and two passenger load zone space during construction.

Alternative WSJ-3a would temporarily remove an additional 185 to 245 on-street parking spaces during construction, 170 to 220 spaces along 41st Avenue Southwest, and 15 to 25 spaces on Southwest Genesee Street and 36th Avenue Southwest. Option WSJ-3b would temporarily remove 80 to 110 spaces on 42nd Avenue Southwest during construction. Neither alternative would remove public off-street parking during construction. These alternatives would temporarily remove up to one general load zone space and one passenger load zone space during construction.

Alternative WSJ-4 would remove an additional 95 to 130 spaces on 41st Avenue Southwest during construction. Alternative WSJ-5a would temporarily remove 190 to 260 on-street parking spaces, 165 to 225 spaces along 41st Avenue Southwest, and 25 to 35 spaces along 37th Avenue Southwest. Alternative WSJ-6 would temporarily remove an additional 165 to 225 on-street parking spaces along 41st Avenue Southwest. Construction activities would not remove public off-street parking with these alternatives. During construction up to two disabled parking spaces, one general load zone space, and two passenger load zone spaces would be temporarily removed.

5.4 Potential Mitigation Measures

5.4.1 Long-term Impacts

All of the segments have areas of unrestricted parking that could be affected by light rail riders parking near the station. To mitigate this potential impact, Sound Transit would work with the City of Seattle to consider appropriate on-street parking measures within a 0.25-mile radius of each station to discourage hide-and-ride activity while retaining curb use functions to support area businesses or residents. Sound Transit would inventory on-street parking around each station before and after the start of light rail revenue service, and would then work with the City to determine where mitigation measures would be needed. Potential parking control measures include parking meters, restricted parking signage, time-limit signs, passenger and truck load zones, and restricted parking zone programs. Sound Transit would be responsible for the cost of installing the signage or other parking controls for 1 year after the light rail extension begins operation. The local jurisdiction would be responsible for monitoring, enforcing, and maintaining the parking controls. In addition, Sound Transit would coordinate with the City of Seattle to relocate affected Americans with Disabilities Act parking spaces.

5.4.2 Construction Impacts

Through the permit process, Sound Transit would coordinate with the City of Seattle on measures to address temporary curbside management and project parking impacts during construction, in conjunction with the other infrastructure and development projects in the study area. This would include temporarily relocating affected Americans with Disabilities Act stalls or load zones that would continue to serve adjacent land uses. Increased bus service (such as bus bridges) implemented as mitigation for interruptions to transit service during construction could affect parking supply and would be coordinated with the City of Seattle and other relevant parties.

Sound Transit would work with owners and operators of garages where parking could be removed or where ingress or egress could be blocked during construction.

Sound Transit would prohibit construction worker parking on City streets outside of the staging areas and require the contractor to develop a Parking Plan describing where construction worker parking would be allowed.

For Alternative DUW-2, Sound Transit would work with the Port of Seattle to temporarily relocate or reconfigure the Terminal 25 South truck parking lot.

6 NON-MOTORIZED FACILITIES

This chapter describes the existing and planned pedestrian and bicycle conditions and facilities within the West Seattle Link Extension (the project) study area, especially near stations, and expected project changes to these facilities. This includes facilities such as sidewalks, stairways, multi-use paths, bicycle lanes, cycle tracks, and neighborhood greenways. Walksheds and bikesheds were used to show the areas around each station that are accessible to pedestrians and bicyclists. The "sheds" are defined as the distance a person can walk or bicycle in 10 minutes around each station. This translates to roughly a 0.5-mile walk distance and a 1.5-mile bicycle distance to or from a station by streets and trails. The bikeshed methodology assumes an average speed consistent with traditional bicycles; riders using electric-assist bicycles could travel longer distances within 10 minutes. Signalized crossing delay at arterial intersections and topography were factored into the analysis because they affect travel times and travel choices.

Pedestrian level of service (L.O.S.) at sidewalks, crosswalks, and intersection corners within one block of each station entrance was evaluated using methods consistent with the Highway Capacity Manual (Transportation Research Board 2016). The methodology considers the number of pedestrians using the facility, the width or area of the facility, and crosswalk signal timings. The study facilities include a combination of existing infrastructure and new improvements that would be made as part of station construction. Forecasted pedestrian volumes under build conditions account for background growth in pedestrian activity plus additional trips made by light rail riders accessing stations. This Final EIS analyzes p.m. peak hour pedestrian L.O.S. because the p.m. peak hour would have higher pedestrian volumes than the a.m. peak hour. The analysis identifies sidewalk and crosswalk facilities performing at L.O.S. F and intersection corners with less than 4 square feet of waiting space per person. Because the 2042 ridership forecasts are higher than the 2032 ridership forecasts, 2042 is used for analysis to provide a more conservative assessment of potential impacts. Project impacts to pedestrian and bicycle facilities during construction such as closures and detours are described, along with potential mitigation measures. More details can be found in Attachment N.1A, Transportation Technical Analysis Methodology Report.

6.1 Key Findings

- Some street connections would be permanently closed, requiring pedestrians and/or bicyclists to use other streets under Preferred Option DEL-6b and Preferred Option WSJ-5b as well as Option DEL-2b, Alternative DEL-7, Alternative WSJ-4, and Alternative WSJ-5a.
- There would be no long-term impacts to *Pedestrian Master Plan* (City of Seattle 2017a) projects, sidewalks, school access, or safety because any affected facilities would be rebuilt to meet Americans with Disabilities Act requirements as well as applicable design standards at the time of permitting (such as Seattle Streets Illustrated [City of Seattle 2020] and Standard Plans for Municipal Construction [City of Seattle 2023]) or standards as agreed to by Sound Transit and the City of Seattle.
- No *Seattle Bicycle Master Plan* (City of Seattle 2014) or *Bicycle Master Plan 2021-2024 Implementation Plan* (City of Seattle 2021) projects would be adversely affected by the Build Alternatives.
- All sidewalks, crosswalks, and corners are expected to have sufficient capacity to serve demand.

- All alternatives could temporarily affect non-motorized facilities and Americans with Disabilities Act accessibility during construction. Sound Transit would work with the City of Seattle and other partner agencies to develop and implement a construction management plan to provide alternate facilities to the extent feasible.
- Construction activity within the transportation roadway system would result in closed or modified non-motorized facilities of various durations throughout the project. These would include regional facilities such as the SODO Trail, West Seattle Bridge Trail, Delridge Connector Trail, Alki Trail, Southwest Marginal Place connection to the West Seattle Bridge Trail, and the staircase through the West Duwamish Greenbelt connecting Southwest Charlestown Street and Southwest Marginal Place. Americans with Disabilities Act-compliant access or detours would be provided.

6.2 Affected Environment

This section describes existing non-motorized facilities within the project study area.

6.2.1 Sidewalks and Crosswalks

Existing sidewalks, trails, marked crosswalks, and curb ramps were inventoried within the 10-minute station walksheds of the Preferred Alternative. The general condition of the sidewalks and curb ramps was noted, with each side of the block and curb ramp qualitatively rated as "good," "needs improvement," or "no sidewalk." This assessment was based on completeness of the sidewalk along the block, pavement condition, and width, and was informed by City of Seattle Geographic Information System data as well as field observations. Most of the streets around proposed stations have sidewalks on both sides, as discussed below. Marked crosswalks are generally provided at intersections on arterial and collector streets.

6.2.1.1 SODO Segment

The SODO Segment is characterized by industrial and commercial land use patterns. There are generally sidewalks and curb ramps on both sides of the roadway near the new SODO Station, but there are gaps in coverage, as shown in Figure 6-1. For example, South Stacy Street has sidewalk gaps east of 6th Avenue South. Many streets in the area have impediments or conditions not conducive to walking. Impediments include sidewalk obstructions (including parked cars), lack of a curb, long block lengths, high truck volumes, and barriers such as railroad tracks and fencing that limit connectivity and increase walking distances. The pedestrian facilities on 6th Avenue South near South Lander Street have many of these challenging characteristics. Marked crosswalks exist at most key intersections on arterial and collector streets, but due to long block lengths, they can be more than 0.25 mile apart—a 5-minute walk for most people.

Figure 6-2 shows the condition of sidewalks within the Preferred Option SODO-1c walkshed (Section 6.3.2.1, Long-term Impacts, describes the walksheds for all station alternatives). The current condition of sidewalks around the SODO Station varies; there are some in good condition along South Lander Street, 4th Avenue South, and sections of the north side of South Holgate Street. However, many of the smaller street connections, as well as the south side of South Holgate Street, lack sidewalks. Curb ramps are generally in good condition along South Lander Street and 4th Avenue South, but many are missing or in poor condition on 6th Avenue South.

Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- Retained Cut
- At-Grade

Other Alternatives
- Elevated
- Retained Cut
- At-Grade

Station (● *Indicates Preferred Alternative*)
- New
- Existing
- r Relocated

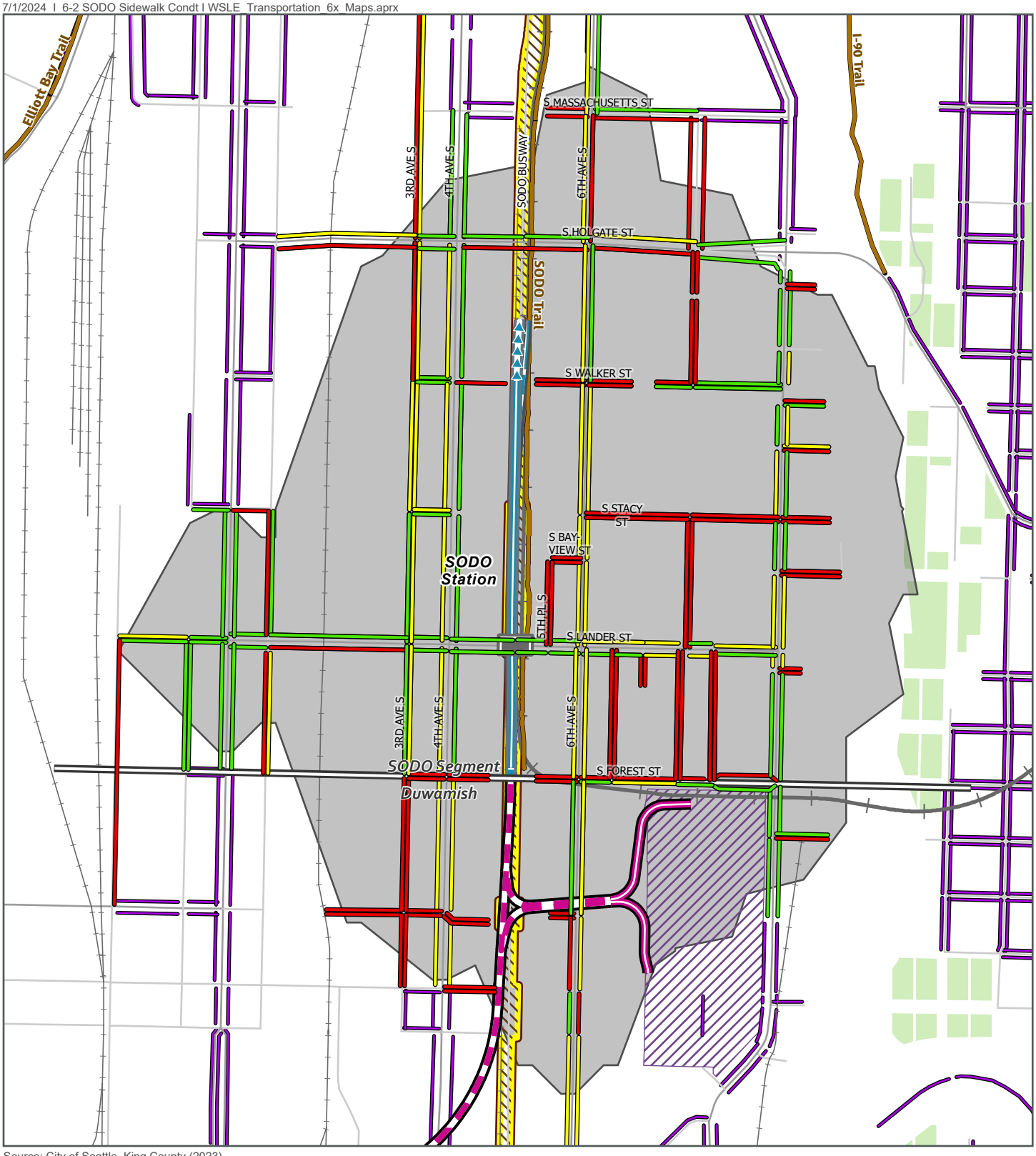
- Segment Line
- Existing Link Light Rail
- Railroad
- SODO Busway
- Proposed Overpass
- Sidewalks
- Existing Trail

FIGURE 6-1
Existing Pedestrian Facilities
SODO Segment

West Seattle Link Extension

0 500 1,000 Feet

N



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- Retained Cut
- At-Grade

Other Alternatives
- Elevated
- Retained Cut
- At-Grade

Station (● *Indicates Preferred Alternative*)
- New
- Existing
- Relocated

- Segment Line
- Existing Link Light Rail
- Railroad
- SODO Busway
- Proposed Overpass
- Park
- Sound Transit Operations and Maintenance Facility (ST OMF)

Sidewalk Condition
- Good/Sufficient
- Needs Improvement
- No Sidewalk
- SODO Station Walkshed (Preferred Alternative)
- Sidewalks
- Existing Trail

FIGURE 6-2
Sidewalk Condition
SODO Segment

West Seattle Link Extension

0 500 1,000 Feet

N

6.2.1.2 Duwamish Segment

The Duwamish Segment is characterized by industrial and commercial land use patterns east of the Duwamish Waterway, and by residential, industrial, and commercial uses to the west. Major arterials generally have sidewalks on both sides, but there are gaps in coverage, particularly on the east side of the waterway (Figure 6-3). For instance, there are sidewalk gaps on 6th Avenue South, south of South Forest Street, and along South Horton Street. Pedestrian challenges are similar to those in the SODO Segment. Staircases provide pedestrian connections between some facilities at different grades. These include a staircase through the West Duwamish Greenbelt from Southwest Charlestown Street to Southwest Marginal Place and a staircase from 22nd Avenue Southwest to Delridge Way Southwest, which provides access from the Pigeon Point neighborhood to roadways to the east and west.

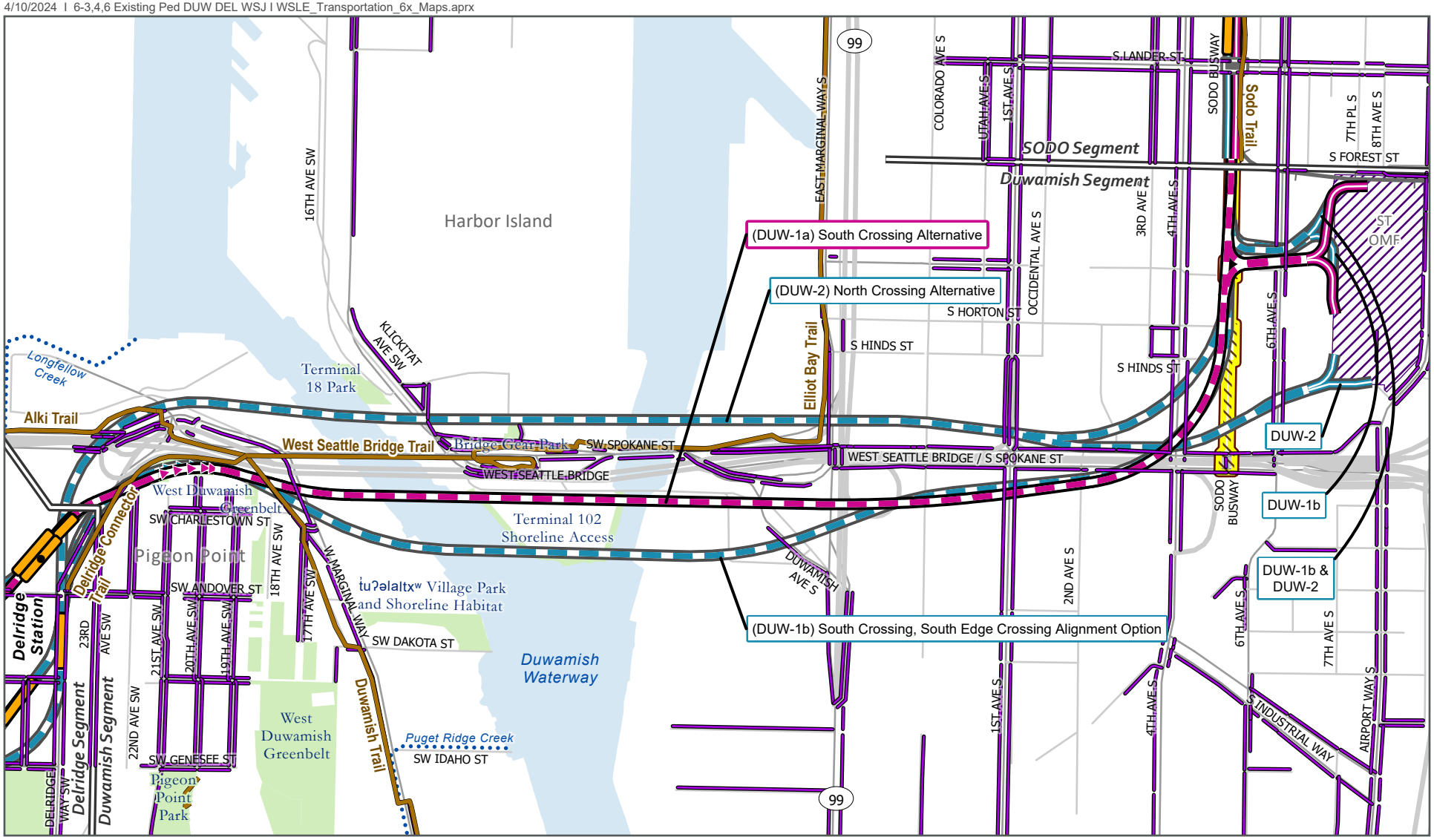
6.2.1.3 Delridge Segment

The Delridge Segment is predominantly residential or commercial in character, with industrial areas north of the West Seattle Bridge. There are generally sidewalks on both sides of the roadway near the location of the future Delridge Station with a few short gaps in coverage and curb ramps missing in several locations. As shown in Figure 6-4, gaps include nearby residential streets such as Southwest Andover Street, 22nd Avenue Southwest, 28th Avenue Southwest, and 30th Avenue Southwest, which provide access to commercial areas on Delridge Way Southwest and bus stops on Southwest Genesee Street and Southwest Avalon Way. There are also sidewalk gaps within industrial areas north of the West Seattle Bridge. Marked crosswalks exist at most intersections on arterial and collector streets but are not typically found on low speed and low volume residential streets.

Figure 6-5 shows the condition of sidewalks within the Preferred Option DEL-6b walkshed (Section 6.3.2.1 describes the walksheds for all station alternatives). Sidewalks along Delridge Way Southwest, the south side of Southwest Andover Street, 26th Avenue Southwest, Southwest Dakota Street, and the northern section of 22nd Avenue Southwest are in good condition. Sections of sidewalk and the curb ramps on 23rd Avenue Southwest need improvement, and 22nd Avenue Southwest south of Southwest Andover Street lacks sidewalks.

6.2.1.4 West Seattle Junction Segment

The West Seattle Junction Segment is predominantly residential or commercial in character, with sidewalks on both sides of the roadway throughout the Alaska Junction and Avalon station areas, as shown in Figure 6-6. Fauntleroy Way Southwest is missing many curb ramps, as are sections of 28th Avenue Southwest, Southwest Oregon Street, and Southwest Edmunds Street, among others. Figure 6-7 and Figure 6-8 show the condition of sidewalks within the Preferred Option WSJ-5b walksheds around the location of the future Avalon and Alaska Junction stations (Section 6.3.2.1 describes the walksheds for all station alternatives). Most of the sidewalks around the future Avalon Station are in good condition, including on key access routes like Southwest Genesee Street, Southwest Avalon Way, and 35th Avenue Southwest. Sidewalks are only present on one side of the street along Fauntleroy Way Southwest east of 35th Avenue Southwest. Many of the curb ramps along Fauntleroy Way Southwest and 35th Avenue Southwest need improvement. Most sidewalks around the future Alaska Junction Station are in good condition. There are some missing curb ramps on Southwest Alaska Street and on Southwest Edmunds Street.



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- Retained Cut
- At-Grade

Other Alternatives
- Elevated
- Retained Cut
- At-Grade

Station (● *Indicates Preferred Alternative*)
- New

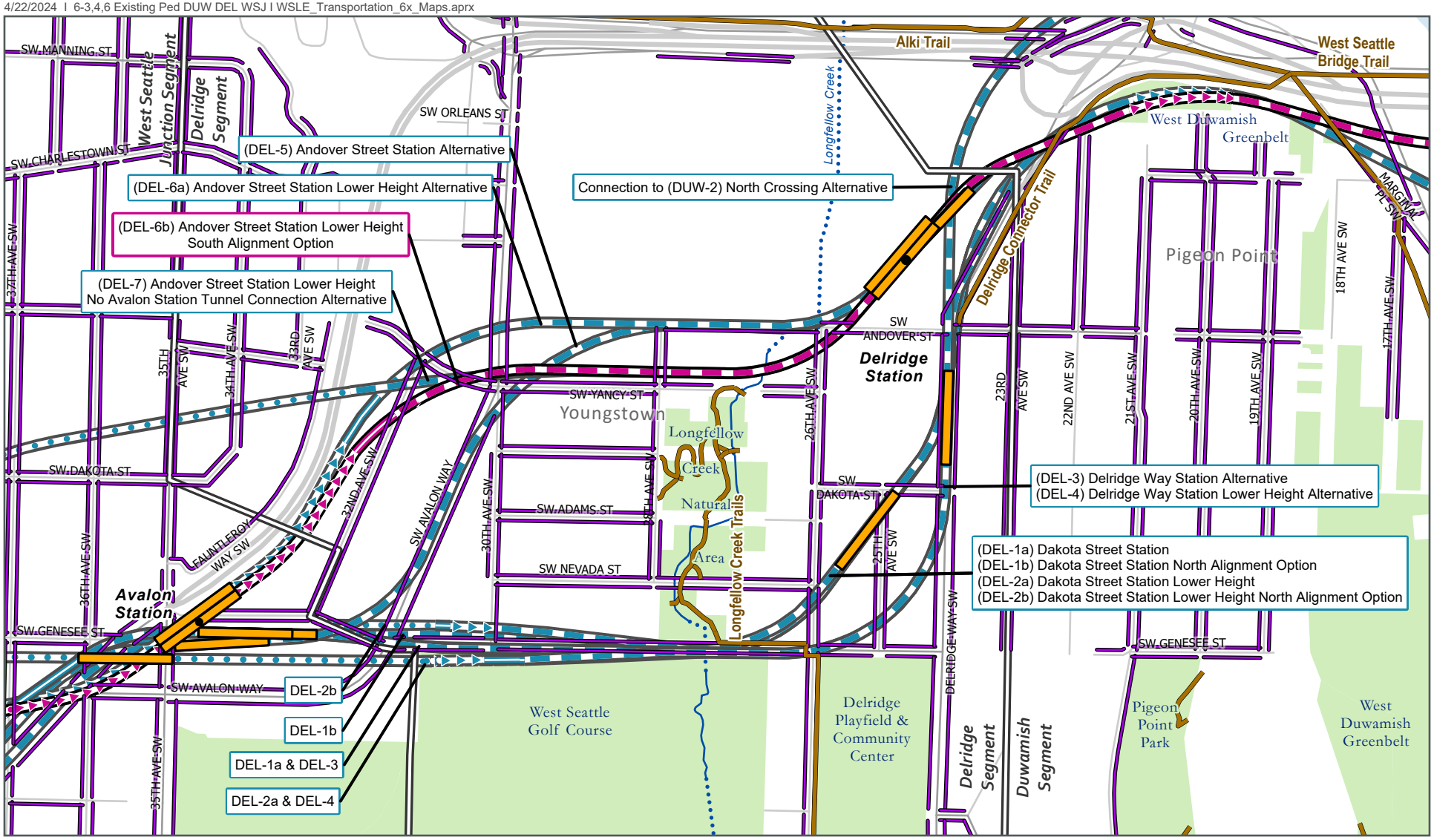
- Segment Line
- Existing Link Light Rail
- SODO Busway
- Proposed Overpass
- Sound Transit Operations and Maintenance Facility (ST OMF)
- Piped Stream
- Park
- Sidewalks
- Existing Trail

FIGURE 6-3
Existing Pedestrian Facilities
Duwamish Segment

West Seattle Link Extension

0 500 1,000 Feet

N



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- Tunnel
- At-Grade
- Retained Cut

Other Alternatives
- Elevated
- Tunnel
- At-Grade
- Retained Cut

Station (● *Indicates Preferred Alternative*)
- New

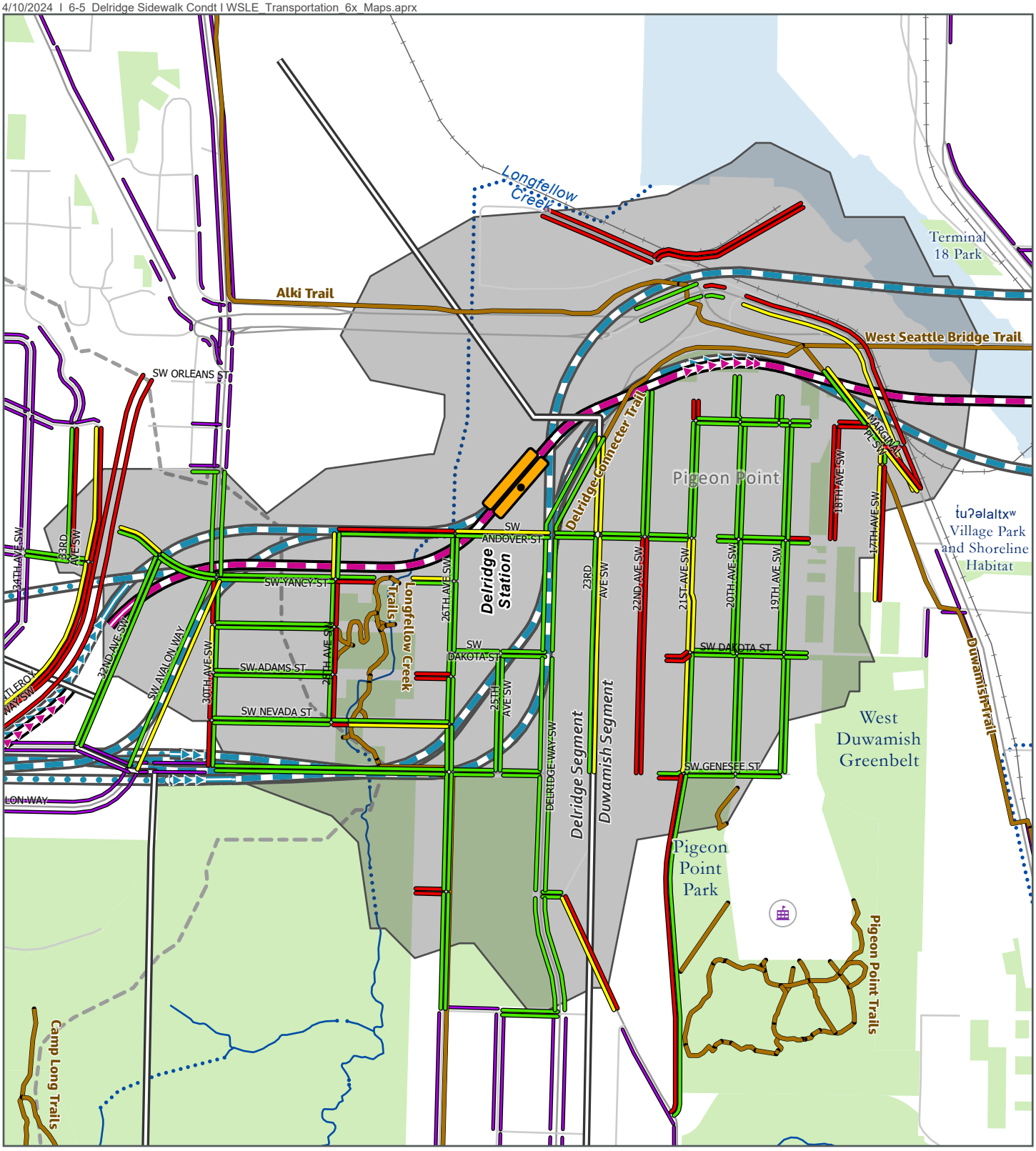
- Segment Line
- Stream
- Piped Stream
- Park
- Sidewalks
- Existing Trail

FIGURE 6-4
Existing Pedestrian Facilities
Delridge Segment

West Seattle Link Extension

0 500 1,000 Feet

N



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- Retained Cut
- At-Grade

Other Alternatives
- Elevated
- Retained Cut
- At-Grade

Station (● *Indicates Preferred Alternative*)
- New

- Segment Line
- Railroad
- Stream
- Piped Stream
- Park
- Sidewalks
- Existing Trail
- Schools

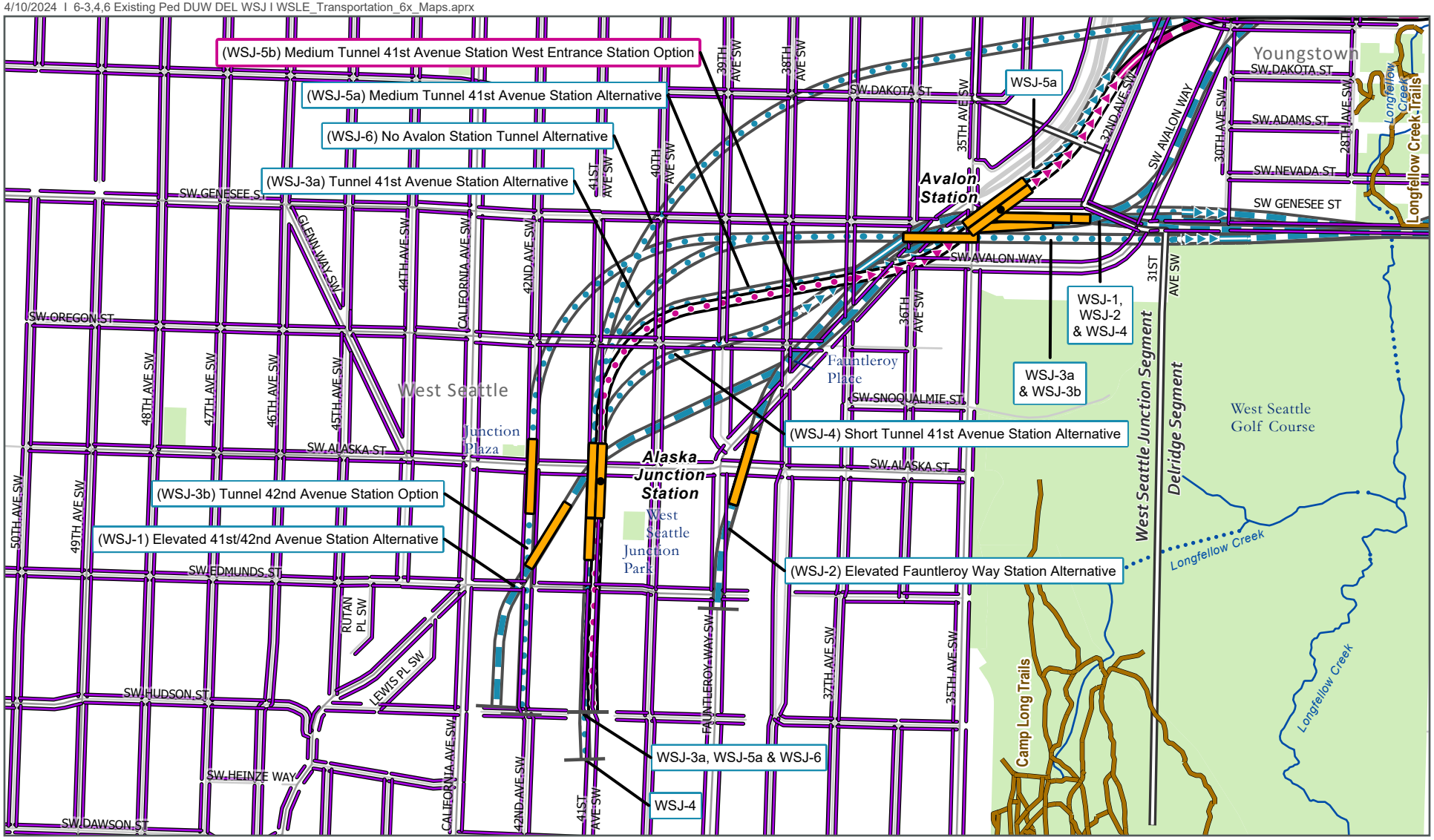
Sidewalk Condition
- Good/Sufficient
- Needs Improvement
- No Sidewalk
- Delridge Station Walkshed (Preferred Alternative)
- Avalon Station Walkshed (Preferred Alternative)

0 500 1,000 Feet

N

FIGURE 6-5
Sidewalk Condition
Delridge Segment

West Seattle Link Extension



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- Tunnel
- At-Grade
- Retained Cut

Other Alternatives
- Elevated
- Tunnel
- At-Grade
- Retained Cut

Station (● *Indicates Preferred Alternative*)
- New

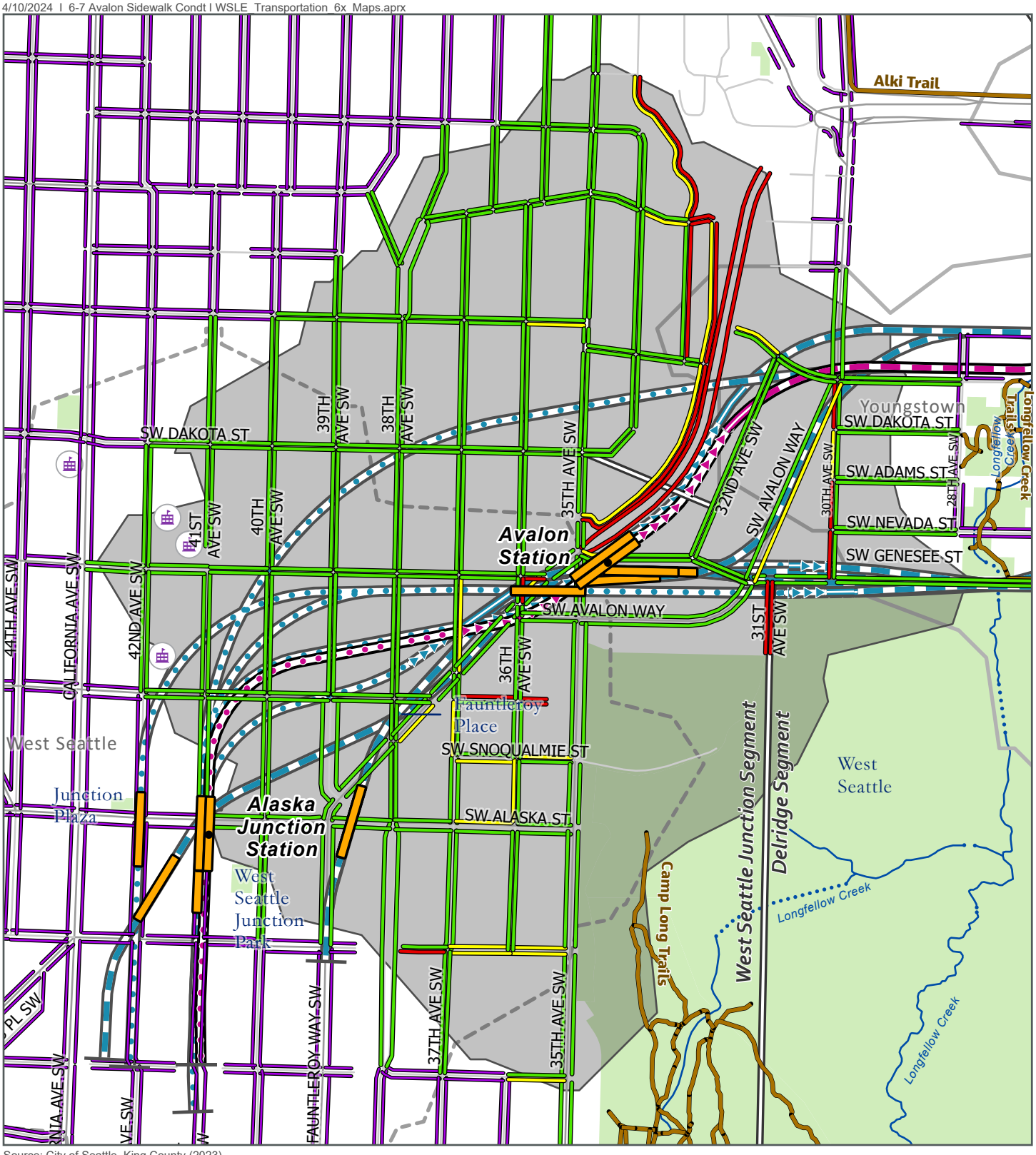
- Segment Line
- Stream
- Piped Stream
- Park
- Sidewalks
- Existing Trail

FIGURE 6-6
Existing Pedestrian Facilities
West Seattle Junction Segment

West Seattle Link Extension

0 500 1,000 Feet

N



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- At-Grade
- Retained Cut

Other Alternatives
- Elevated
- At-Grade
- Retained Cut

Station (● *Indicates Preferred Alternative*)
- New

- Segment Line
- Railroad
- Stream
- Piped Stream
- Park
- Sidewalks
- Existing Trail
- Schools

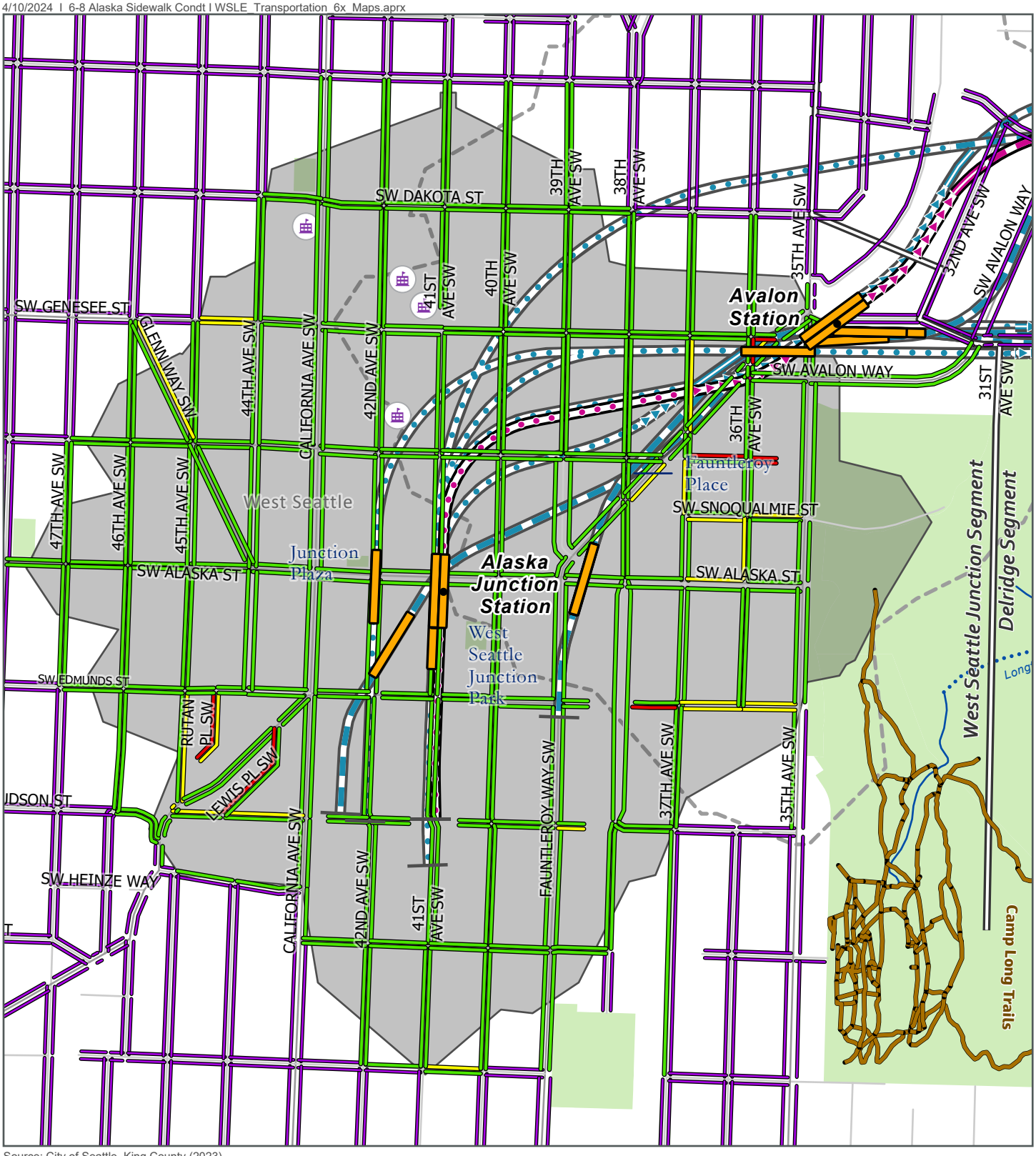
Sidewalk Condition
- Good/Sufficient
- Needs Improvement
- No Sidewalk
- Avalon Station Walkshed (Preferred Alternative)
- Delridge Station Walkshed (Preferred Alternative)
- Alaska Station Walkshed (Preferred Alternative)

0 500 1,000 Feet

N

FIGURE 6-7
Sidewalk Condition
West Seattle Junction Segment
Avalon Station

West Seattle Link Extension



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- At-Grade
- Retained Cut

Other Alternatives
- Elevated
- At-Grade
- Retained Cut

Station (● *Indicates Preferred Alternative*)
- New

- Segment Line
- Railroad
- Stream
- Piped Stream
- Park
- Sidewalks
- Existing Trail
- Schools

Sidewalk Condition
- Good/Sufficient
- Needs Improvement
- No Sidewalk
- Alaska Station Walkshed (Preferred Alternative)
- Avalon Station Walkshed (Preferred Alternative)

FIGURE 6-8
Sidewalk Condition
West Seattle Junction Segment
Alaska Junction Station

West Seattle Link Extension

0 500 1,000 Feet

N

6.2.2 Bicycle Facilities and Multi-use Trails

Most of the study area lacks designated facilities for cyclists, as shown on Figure 6-9. Planned bicycle facilities near stations include bicycle lanes, protected bicycle lanes, neighborhood greenways, and multi-use trails. These types of facilities would increase capacity for bicycles within the station areas; on-road bicycle facilities can accommodate approximately 2,000 bicycles per hour based on guidance in the Highway Capacity Manual (Transportation Research Board 2016).

6.2.2.1 SODO Segment

In the SODO Segment, the SODO Trail runs north-south on the east side of the SODO Busway near SODO Station, between Interstate 90 and South Forest Street (see Figures 6-1 and 6-2). In 2024 the City of Seattle plans to extend the trail to South Spokane Street and connect it to protected bicycle lanes that would extend south to South Lucile Street. No dedicated bicycle facilities currently connect to the SODO Trail or run east-west through the segment. South Lander Street between 1st Avenue South and 4th Avenue South has a shared use path on the north side.

6.2.2.2 Duwamish Segment

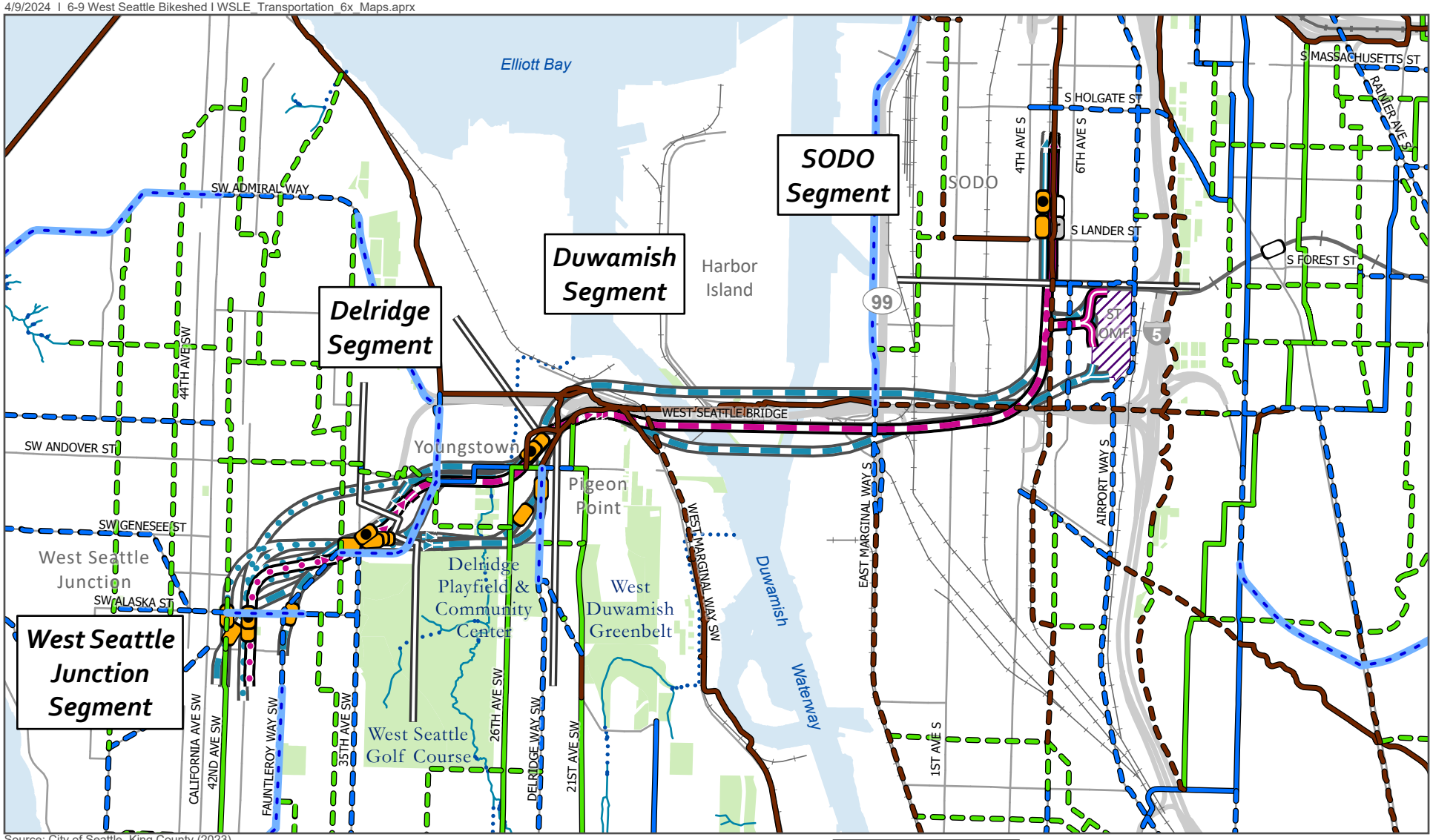
In the Duwamish Segment (see Figure 6-3), the West Seattle Bridge Trail connects across the Duwamish Waterway along South Spokane Street between East Marginal Way South and Delridge Way Southwest. East of the Duwamish Waterway, East Marginal Way South has protected bicycle lanes north of the West Seattle Bridge. West of the Duwamish Waterway, the Duwamish Trail runs north-south parallel to the waterway as a paved path, with the final 0.5 mile to the West Seattle Bridge as a two-way bicycle lane with concrete dividers separating the facility from moving traffic. At the West Seattle Bridge, the Duwamish Trail connects to the Alki Trail, which continues to the north. The Delridge Connector Trail provides access to 23rd Avenue Southwest and the east side of Delridge Way Southwest. Protected bicycle lanes that connect to the West Seattle Bridge bicycle facilities are on East Marginal Way South.

6.2.2.3 Delridge Segment

Roadways in the Delridge Segment have a combination of bicycle lanes (with and without separation), neighborhood greenways, and multi-use trails, but the facilities are discontinuous. The only contiguous east-west connection in the immediate vicinity of the new station area is the West Seattle Bridge Trail. North-south connectivity is provided by three neighborhood greenways (21st Avenue Southwest, 22nd Avenue Southwest, and 26th Avenue Southwest) and Delridge Way Southwest has shared bicycle/bus lanes. Protected east-west bike lanes on Southwest Andover Street, 28th Avenue Southwest, and Southwest Yancy Street to the west of the proposed Delridge Station area connect Delridge Way Southwest with Southwest Avalon Way.

6.2.2.4 West Seattle Junction Segment

There are few existing bicycle facilities in the West Seattle Junction Segment, and they are discontinuous. North-south connectivity is provided by a neighborhood greenway on 42nd Avenue Southwest and on bicycle lanes without separation on Fauntleroy Way Southwest. Southwest Admiral Way and Southwest Alaska Street have bicycle lanes without separation, and Southwest Avalon Way has protected bicycle lanes between 35th Avenue Southwest and Southwest Spokane Street.



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- At-Grade
- Tunnel
- Retained Cut

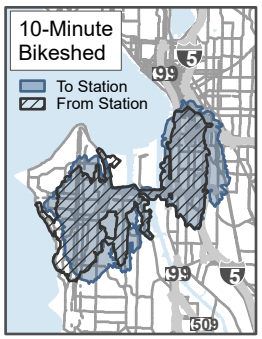
Other Alternatives
- Elevated
- At-Grade
- Tunnel
- Retained Cut

Station (● *Indicates Preferred Alternative*)
- New
- (r) Relocated
- Existing

- Segment Line
- Sound Transit Operations and Maintenance Facility (ST OMF)
- Existing Link Light Rail
- (C) East Link Light Rail (Under Construction)
- Railroad
- Stream
- Piped Stream
- Park

Existing Bicycle Facilities
- Bike Lane (In-Street Separation)
- Multi-Use Trail
- Neighborhood Greenway

Planned Bicycle Facilities
- Bike Lane (In-Street Separation)
- Multi-use Trail
- Neighborhood Greenway
- Planned Improvement of Existing Bike Lane



0 0.5 1 Mile

N

FIGURE 6-9
Existing and Planned Bike Facilities

West Seattle Link Extension

6.3 Environmental Impacts

This section discusses the future non-motorized conditions (year 2042) under the No Build Alternative and the anticipated non-motorized conditions under each Build Alternative. The station locations could affect surrounding non-motorized facilities and pedestrian access and circulation within each station area. This section describes future pedestrian and bicycle facilities, walksheds, bikesheds, school walking routes, Americans with Disabilities Act accessibility, non-motorized trip activity at the stations, and sidewalk, crosswalk, and corner operations. Additional pedestrian and bicycle improvements not included as part of the project could be identified for implementation by others. These improvements could be identified through station planning efforts, included in existing local plans by partner agencies, or potentially funded in partnership with Sound Transit. The Federal Transit Administration considers pedestrian and bicycle improvements within 0.5 mile and 3 miles of station areas for grant funding, which could be sought by partner agencies or in conjunction with Sound Transit. In addition, Sound Transit could consider funding access improvements beyond the station footprint as part of the Non-motorized Access Allowance Fund included in the Sound Transit 3 Plan.

6.3.1 No Build Alternative

Under the No Build Alternative, non-motorized projects in the *Seattle Bicycle Master Plan* (City of Seattle 2014), the *Bicycle Master Plan 2021-2024 Implementation Plan* (City of Seattle 2021), and the *Pedestrian Master Plan* (City of Seattle 2017) are assumed to be built. The Bicycle Master Plan calls for protected bicycle lanes on Airport Way South, Delridge Way Southwest, 35th Avenue Southwest, Fauntleroy Way Southwest, and Southwest Alaska Street and multi-use trails on South Spokane Street and between the SODO Trail and South Spokane Street, among others, as well as a network of greenways as shown on Figure 6-9. A separated pedestrian path is planned for construction in 2024 on the east side of West Marginal Way Southwest from Marginal Place Southwest to Chelan Avenue Southwest. Figure 6-9 shows existing and planned bike facilities that are expected to be present under the No Build or Build Alternatives. A full list of projects is included in Attachment N.1A. Over time, there may be improvements to facilities that are not compliant with the Americans with Disabilities Act. However, it is likely that fewer locations would be upgraded under the No Build Alternative than under the Build Alternatives because Sound Transit would rebuild all facilities within its station footprint to meet Americans with Disabilities Act standards. Under the No Build Alternative assumptions, all sidewalks, crosswalks, and corners studied would meet L.O.S. standards.

6.3.2 Build Alternatives

6.3.2.1 Long-term Impacts

The project proposes pedestrian and bicycle improvements at the stations to serve the projected increases in pedestrian and bicycle travel generated by the project. Specific improvements affecting pedestrian circulation, such as new connections or signals, are described by segment. As the design advances, Sound Transit will continue to work with the City of Seattle to determine appropriate pedestrian and bicycle improvements to support station access. Any new facilities would meet Americans with Disabilities Act requirements. New facilities would also meet local and federal design standards for pedestrian and bicycle facilities, as appropriate.

Impacts Common to All Alternatives

Based on the information available when this analysis was being prepared, no projects listed in the *Seattle Bicycle Master Plan* or *Bicycle Master Plan 2021-2024 Implementation Plan* would be impacted by the Build Alternatives. None of the Build Alternatives would result in long-term impacts to *Pedestrian Master Plan* projects, sidewalks, school access, or safety, because any affected facilities would be rebuilt to meet Americans with Disabilities Act requirements as well as applicable design standards at the time of permitting (such as Seattle Streets Illustrated [City of Seattle 2020], Standard Plans for Municipal Construction [City of Seattle 2023], the Seattle Land Use Code and Light Rail Facility Construction and Construction Impacts sections of the Seattle Municipal Code) or to a standard agreed to by Sound Transit and the City of Seattle. If it is determined that a facility could not be rebuilt in the original location, Sound Transit would work with the City of Seattle to identify an alternate route. Sound Transit will continue to coordinate with the City to ensure bike parking facilities are adequately distributed, sized, and configured to meet present and future bike parking demand at the stations. Therefore, no long-term impacts to bicycle parking are expected under any of the Build Alternatives.

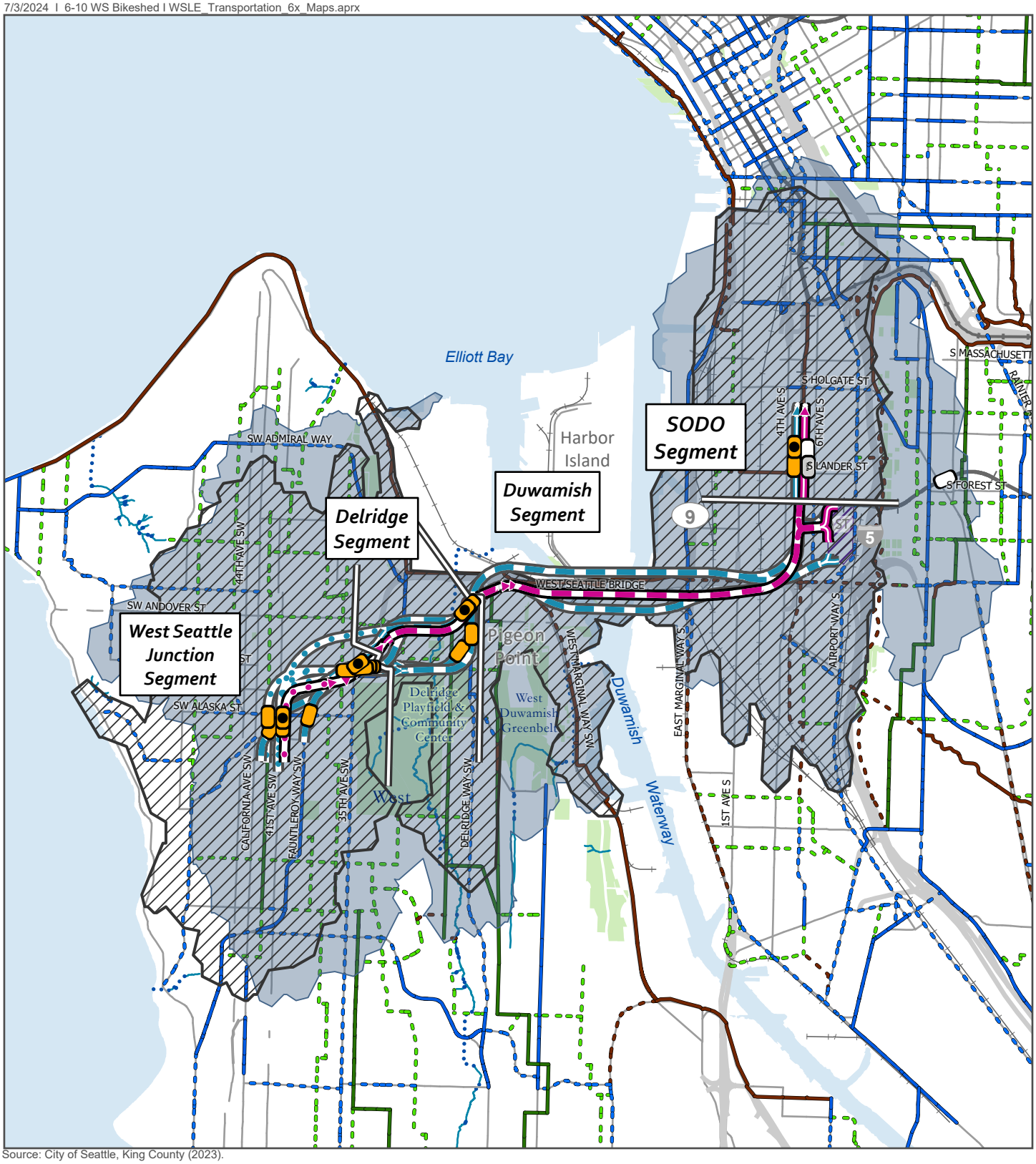
Figure 6-10 shows existing and future bicycle facilities and bikeshed for the 2042 Preferred Alternative. Topography limits how far a cyclist could travel, so both directions to and from a new station are shown together. Due to topography, either the direction of travel to or from a station could be more constrained. The bikeshed displays the theoretical maximum distance a cyclist could travel on the roadway network in a given amount of time, regardless of the specific type of facility provided.

Most of the Build Alternatives do not include network changes that would affect the existing walksheds and bikesheds; any changes are described under the individual alternatives in the following discussion. Projects included in the *Seattle Bicycle Master Plan, Bicycle Master Plan 2021-2024 Implementation Plan,* and *Pedestrian Master Plan* are assumed to be in place by 2042, though these do not affect the walksheds and bikesheds; rather, these projects influence how comfortable walking and bicycling within the sheds would be. Any effects to *Pedestrian Master Plan* or *Seattle Bicycle Master Plan* projects are described by segment for applicable alternatives in the following sections. All sidewalks, crosswalks, and corners within one block of the station entrances have sufficient capacity, in terms of pedestrian L.O.S., to serve projected demand unless noted. Sound Transit will coordinate with the City of Seattle on sidewalk width standards as the project advances.

SODO Segment

Figure 6-11 shows the walksheds and surrounding pedestrian facilities for the alternatives at the SODO Station. The land uses within the walkshed and bikeshed around the station are generally industrial and commercial. There are sidewalk gaps, limited bicycle facilities, long blocks, and freight vehicles in the station area. Most boardings and alightings at the SODO Station during the p.m. peak hour would be light rail to light rail transfers within the station area. In addition to these transfers, a smaller number of riders would either be transferring from the bus, walking, bicycling, or using pick-up and drop-off to access the SODO Station for all alternatives.

Under all alternatives in the SODO Segment, cyclists could continue to access the station using the SODO Trail, which could be accessed by planned protected bicycle lanes on South Royal Brougham Way and Airport Way South (with connections at South Holgate Street and South Forest Street), a planned trail extension south to South Spokane Street, and planned protected bicycle lanes that would connect at the current trail end on South Forest Street and extend south along 6th Avenue South and Airport Way South to South Lucile Street.



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- Tunnel
- At-Grade
- Retained Cut

Other Alternatives
- Elevated
- Tunnel
- At-Grade
- Retained Cut

Station (● *Indicates Preferred Alternative*)
- New
- Relocated
- Existing

- Segment Line
- Sound Transit Operations and Maintenance Facility (ST OMF)
- Existing Link Light Rail
- East Link Light Rail (Under Construction)
- Railroad
- Stream
- Piped Stream
- Park

10-Minute Bikeshed
- To Station
- From Station

Existing Bicycle Facilities
- Bike Lane (In-Street Separation)
- Multi-Use Trail
- Neighborhood Greenway

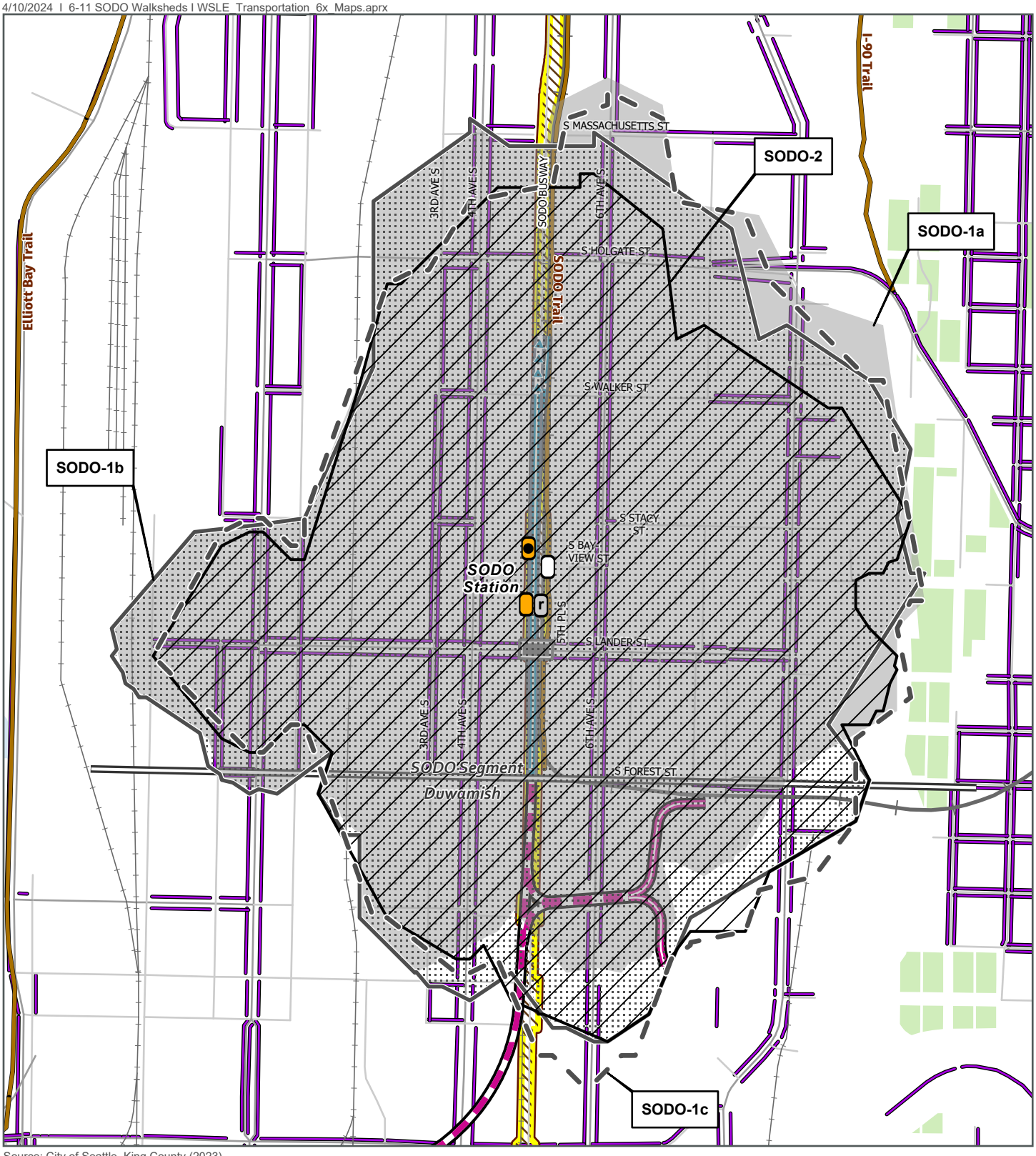
Planned Bicycle Facilities
- Bike Lane (In-Street Separation)
- Multi-use Trail
- Neighborhood Greenway

0 0.5 1 Mile

N

FIGURE 6-10
West Seattle Link Extension Bikeshed

West Seattle Link Extension



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- Retained Cut
- At-Grade

Other Alternatives
- Elevated
- Retained Cut
- At-Grade

Station (● *Indicates Preferred Alternative*)
- New
- Existing
- Relocated

- Segment Line
- Existing Link Light Rail
- Railroad
- SODO Busway
- Proposed Overpass
- Park
- Sidewalks
- Existing Trail
- Sound Transit Operations and Maintenance Facility (ST OMF)

10-Minute Walkshed
- SODO-1a
- SODO-1b
- SODO-1c
- SODO-2

FIGURE 6-11
Pedestrian Facilities and Station Pedestrian Access
SODO Station Walksheds

West Seattle Link Extension

0 500 1,000 Feet

N

Figure 6-12 is a visual simulation that illustrates the South Lander Street overpass from the SODO Trail looking north under Alternative SODO-1c. Figure 6-13 is a visual simulation looking north from the same point and illustrates the elevated guideway assumed under Alternative SODO-2.

Figure 6-12. Visual Simulation of South Lander Street overpass and SODO Trail (Alternative SODO-1c)

Figure 6-13. Visual Simulation of the Elevated Guideway at the SODO Station (Alternative SODO-2)

The bicycle trip generation under all of the SODO Segment alternatives is expected to be about 30 new trips in the p.m. peak hour. Given the number and capacity of bicycle facilities serving the station area (for example, 2,000 bicycle per hour for on-road bicycle facilities), the existing and planned bicycle facilities around the station are expected to have sufficient capacity for these additional bicycle trips.

Preferred Option (SODO-1c)

Preferred Option SODO-1c would create new pedestrian connections to serve station entrances, which increase the pedestrian walksheds for the station compared to the No Build Alternative. Preferred Option SODO-1c proposes station access from a roadway loop constructed along 5th Place South to the east of the station to serve bus and paratransit loading between the concourse and 6th Avenue South and from the South Lander Street overcrossing. These connections would provide riders with better non-motorized access to the SODO Station by shortening the distance that riders approaching from 6th Avenue South north of South Lander Street would have to walk. The new connections provided by this alternative would slightly increase the area reachable by bicycle from the stations, but the effect would be slight.

Preferred Option SODO-1c would include the South Lander Street roadway overpass between 4th Avenue South and 6th Avenue South. The new overpass would include a sidewalk and bicycle lanes or a multi-use path that would separate pedestrians and bicyclists from the current at-grade rail crossing and allow access to the station at the top of the overpass. The pedestrian facilities on the north side of the overpass would meet Americans with Disabilities Act requirements; in addition, Sound Transit is considering options to provide an elevator between the at-grade sidewalk on South Lander Street and the station. Bus stops, pedestrian, and bicycle access would also be provided from the at-grade level via 5th Place South. Preferred Option SODO-1c would incorporate a new traffic signal at South Stacy Street and 6th Avenue South, which would provide a signalized crossing for pedestrians to access the station.

Table 4-9 in Section 4.3.2.3, Arterial and Local Street Operations, summarizes p.m. peak hour non-motorized station trip generation. Pedestrian volumes would be concentrated on the bus loop and the connection to the station platform via the South Lander Street overpass; this connection is being designed to accommodate the expected pedestrian volumes. The pedestrian L.O.S. analysis determined that sidewalks, crosswalks, and intersection corners within one block of the station entrances would have sufficient capacity to serve the pedestrian demand.

Other Build Alternatives (SODO-1a, SODO-1b, and SODO-2)

Alternative SODO-1a proposes station access along the South Stacy Street corridor between 4th Avenue South and 6th Avenue South. This would include new roadway construction along South Stacy Street between 4th Avenue South and the concourse to serve passenger pick-up and drop-off. There would also be station access from a concourse between the east and west sides of the tracks and a roadway loop to serve paratransit loading between the concourse and 6th Avenue South. Alternative SODO-1a would include the South Lander Street roadway overpass between 4th Avenue South and 6th Avenue South but would not include direct access from the overpass to the station; it would also add a new signalized crossing at South Stacy Street and 6th Avenue South.

Alternative SODO-1a and Option SODO-1b would both create new pedestrian connections to serve station entrances, which increases the pedestrian walksheds for the stations compared to the No Build Alternative. Option SODO-1b would improve upon the existing non-motorized access with a new roadway loop serving passenger pick-up and drop-off, paratransit loading,

and bus layover between 4th Avenue South and the light rail stations. The new connections provided by this alternative would slightly increase the area reachable by bicycle from the stations, but at a 10-minute bikeshed scale, the effect would be slight. Option SODO-1b would also include the South Lander Street roadway overpass between 4th Avenue South and 6th Avenue South, as described for Preferred Option SODO-1c. Bus stops would be provided on the bus loop, at the corner of South Lander Street and 6th Avenue South, and on 4th Avenue South near South Stacy Street, so that people transferring to or from the bus would have easy access to the station. Pedestrians and bicyclists could also access the station at-grade.

Alternative SODO-2 would be accessible from the east via the existing South Bayview Street; the existing walkshed would not be substantially affected because the station entrance locations would not be substantially different from the current SODO Station.

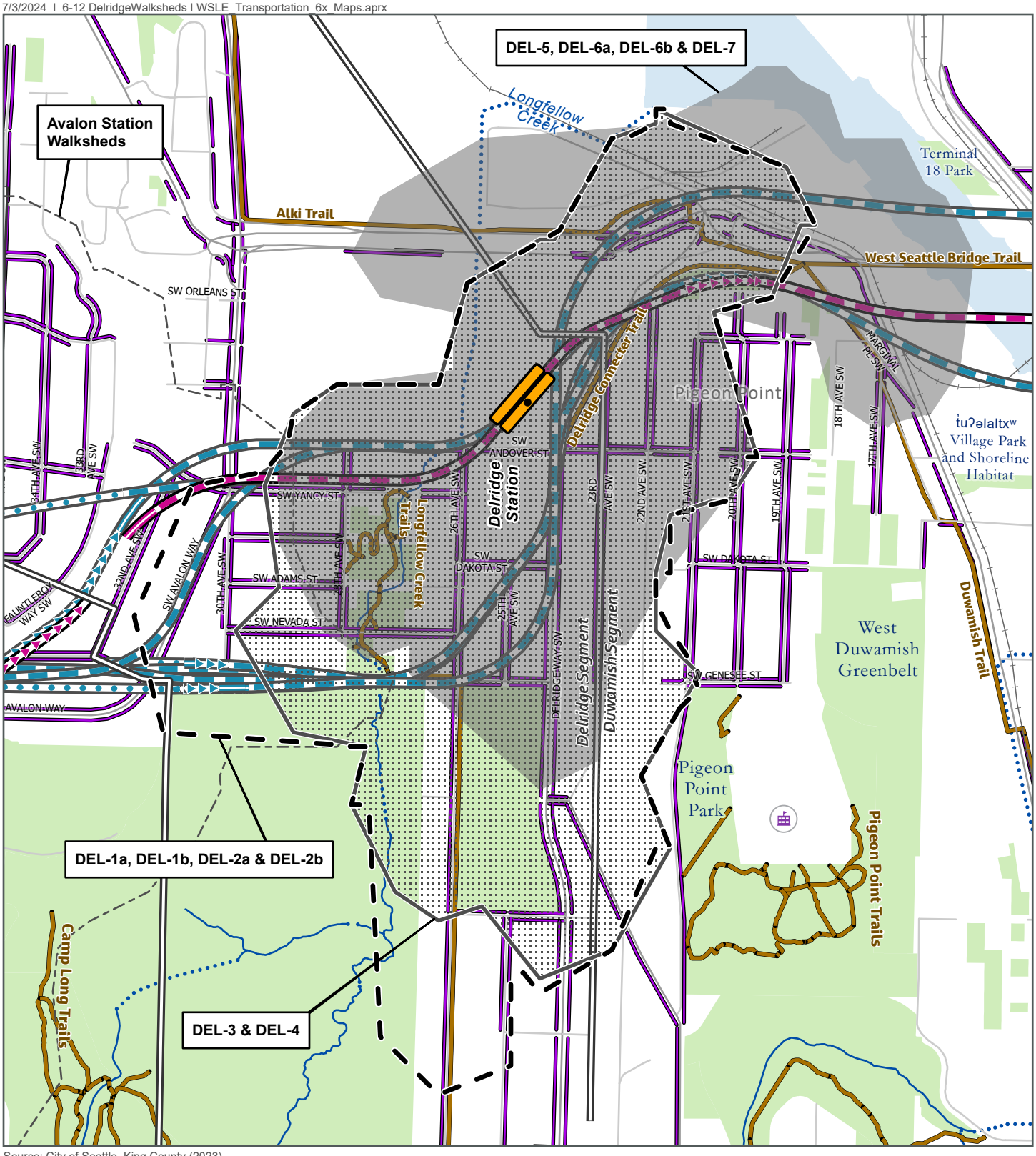
The non-motorized trip generation for Alternative SODO-1a, Option SODO-1b, and Alternative SODO-2 would be the same as Preferred Option SODO-1c.

Duwamish Segment

Because the Duwamish Segment would not include any stations, no walksheds, bikesheds, or pedestrian trip generation analysis was conducted. Columns associated with the elevated guideway for Alternative DUW-2 would encroach on the Alki Trail just west of the Chelan Avenue Southwest/West Marginal Way Southwest/Southwest Spokane Street intersection. The trail would be permanently shifted to maintain connectivity between the trail and the crosswalk at that intersection. Columns associated with the elevated guideway tracks connecting all of the alternatives to the Operations and Maintenance Facility Central could encroach on sidewalks on 6th Avenue South north of South Hanford Street. Under Preferred Alternative DUW-1a and Alternative DUW-2, guideway columns could also encroach on sidewalks along 4th Avenue South north of Spokane Street. In both locations, Sound Transit would rebuild the affected facilities to the extent feasible.

Delridge Segment

Figure 6-14 shows the walksheds and surrounding pedestrian facilities for the alternatives at the Delridge Station. The land uses within the Preferred Option DEL-6b, Alternative DEL-5, Alternative DEL-6a, and Alternative DEL-7 walksheds include commercial, industrial, and residential uses. The land uses within the Alternative DEL-1a, Option DEL-1b, Alternative DEL-2a, and Option DEL-2b walksheds are generally residential, with some commercial uses. The land uses around the Alternative DEL-3 and Alternative DEL-4 walksheds are similar to the other alternatives, with a more equal distribution of residential and commercial land uses. A small area along the 28th Avenue Southwest corridor would fall within the walksheds of both the Avalon and Delridge stations.



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- Retained Cut
- At-Grade

Other Alternatives
- Elevated
- Retained Cut
- At-Grade

Station (● *Indicates Preferred Alternative*)
- New

- Segment Line
- Railroad
- Stream
- Piped Stream
- Park
- Sidewalks
- Existing Trail
- Schools

10-Minute Walkshed
- Delridge-1a, 1b, 2a, & 2b
- Delridge-3 & 4
- Delridge-5, 6a, 6b & 7
- Avalon Station Walksheds

FIGURE 6-14
Pedestrian Facilities and Station Pedestrian Access
Delridge Station Walksheds

West Seattle Link Extension

0 500 1,000 Feet

N

Under all Build Alternatives in the Delridge Segment, bicyclists could access the Delridge Station using the following planned routes:

- Multi-use trails:
  - West Seattle Bridge Trail
  - Delridge Connector Trail
  - 22nd Avenue Southwest Connector Trail
  - 23rd Avenue Southwest Trail
- Neighborhood greenways:
  - 21st Avenue Southwest
  - 22nd Avenue Southwest
  - 26th Avenue Southwest
- Bicycle lanes:
  - Delridge Way Southwest
  - Southwest Andover Street
  - 28th Avenue Southwest
  - Southwest Yancy Street

Figure 6-15 is a visual simulation of Delridge Way Southwest, looking north to the preferred alternative guideway in relation to non-motorized facilities on either side of the roadway.

Figure 6-15. Visual Simulation of Guideway from Delridge Way Southwest

The bicycle trip generation under all of the Delridge Segment alternatives is expected to be about 20 new trips in the p.m. peak hour under the full build and 25 trips in the p.m. peak hour under the M.O.S. Given the number and capacity of bicycle facilities serving the station area (for example, 2,000 bicycle per hour for on-road bicycle facilities), the existing and planned bicycle facilities around the station are expected to have sufficient capacity for these additional bicycle trips.

Pedestrian and bicycle access for all alternatives would be complicated by steep slopes, environmental features, and major infrastructure, particularly to the east and west. Access is hindered by Longfellow Creek Natural Area and large, fenced-off park areas, including the West Seattle Golf Course and Pigeon Point Park, part of the West Duwamish Greenbelt. In addition,

the Delridge Way Southwest on- and off-ramps present a barrier for people walking and biking. There are sidewalks on both sides of most roadways near the new stations, with only a few gaps in coverage on nearby residential streets, including Southwest Andover Street, 28th Avenue Southwest, and 30th Avenue Southwest, and near industrial areas north of the West Seattle Bridge. For all alternatives, cyclists could generally access the Delridge Station area using existing and planned neighborhood greenways on 21st Avenue Southwest, 26th Avenue Southwest, and Southwest Andover Street/Southwest Yancy Street; multi-use trails on Delridge Way Southwest north of 23rd Avenue Southwest; the West Seattle Bridge Trail on the Spokane Street Bridge; the Alki Trail; the Duwamish Trail; the Delridge Connector Trail; and protected bicycle lanes on Delridge Way Southwest and Southwest Avalon Way. Preferred Option DEL-6b and Alternative DEL-7 would add a new signal at Delridge Way Southwest and re-align Southwest Charlestown Street to provide a new crossing location for pedestrians and cyclists accessing the station.

All alternatives would have an elevated guideway with columns that would encroach on existing sidewalks through the Delridge Segment, but Sound Transit would rebuild the affected facilities to the extent feasible. These include:

- The vicinity of 26th Avenue Southwest and Southwest Andover Street (Preferred Option DEL-6b, Alternative DEL-5, Alternative DEL-6a, and Alternative DEL-7)
- 26th Avenue Southwest and Southwest Genesee Street (Alternative DEL-1a, Alternative DEL-2a, Alternative DEL-3, and Alternative DEL-4)
- Southwest Genesee Street from 26th Avenue Southwest to Longfellow Creek (Alternative DEL-1a and Option DEL-2b)

Preferred Option (DEL-6b)

Preferred Option DEL-6b has a station design featuring a one-way bus loop connecting Southwest Andover Street to Delridge Way Southwest via a re-aligned Southwest Charlestown Street. Station access would be provided from the bus loop to the west and Delridge Way Southwest from the east, thus allowing riders to transfer between bus and light rail without any street crossings. Preferred Option DEL-6b would include a new signalized intersection at Delridge Way Southwest and the re-aligned Southwest Charlestown Street/23rd Avenue Southwest to provide a new crossing location for pedestrians and bicyclists accessing the station. Pick-ups/drop-offs would occur on Southwest Andover Street west of Delridge Way Southwest. Most of the riders transferring between light rail and buses come from Delridge, White Center, Burien, and other communities to the south. The RapidRide H Line is expected to have the highest number of light rail transfers. Table 4-9 in Section 4.3.2.3 summarizes p.m. peak hour non-motorized station trip generation. The pedestrian L.O.S. analysis determined that sidewalks, crosswalks, and intersection corners within one block of the station entrances would have sufficient capacity.

Before the Ballard Link Extension opens, which would connect the West Seattle Link Extension directly to the existing light rail system, King County Metro (Metro) would continue to operate some bus routes into Downtown Seattle and would use the existing bus stops on Delridge Way Southwest. Therefore, there would be a multi-year period during which riders transferring between bus and light rail would have to cross two roadways during their transfer. However, the number (approximately 40 peak hour riders) is small relative to the number of expected riders in 2042 when the Sound Transit 3 light rail system expansion is complete.

Preferred Option DEL-6b would also cross 32nd Avenue Southwest at-grade, resulting in a permanent closure of a portion of 32nd Avenue Southwest, which would create a cul-de-sac on

either side of the guideway and reduce the walkshed to the west. Sound Transit is considering options to provide a pedestrian connection from Southwest Andover Street to 32nd Avenue Southwest south of the cul-de-sac; however, it is unknown if a connection is feasible until final design is complete. If a pedestrian connection cannot be maintained, pedestrians would need to detour to Southwest Avalon Way, which is approximately 300 feet east of 32nd Avenue Southwest. Traffic diversion is discussed in more detail in Section 4.3.3.4, Delridge Segment, in the Construction Impacts section of Chapter 4, Arterial and Local Street Operations.

Other Build Alternatives (DEL-1a, DEL-1b, DEL-2a, DEL-2b, DEL-3, DEL-4, DEL-5, DEL-6a, and DEL-7)

Under Alternative DEL-1a, Option DEL-1b, Alternative DEL-2a, and Option DEL-2b, the station entrances would be on the west side of Delridge Way Southwest, one at Southwest Dakota Street near Delridge Way Southwest and one on 26th Avenue Southwest south of Southwest Dakota Street. The nearest signalized crossings are roughly 650 feet to either side of the intersection of Delridge Way Southwest and Southwest Dakota Street (at Southwest Andover Street and at Southwest Genesee Street), so some riders may cross Delridge Way Southwest at Southwest Dakota Street without a signal. If one of these alternatives were selected, Sound Transit, Metro, and the City of Seattle would assess alternative pathways that would enable closer bus stop placement. The walksheds for Alternative DEL-1a, Option DEL-1b, Alternative DEL-2a, and Option DEL-2b overlap with the Avalon Station walksheds to the west. Due to these stations being slightly farther south than Preferred Option DEL-6b, the walksheds extend farther to the south than the other alternative walksheds.

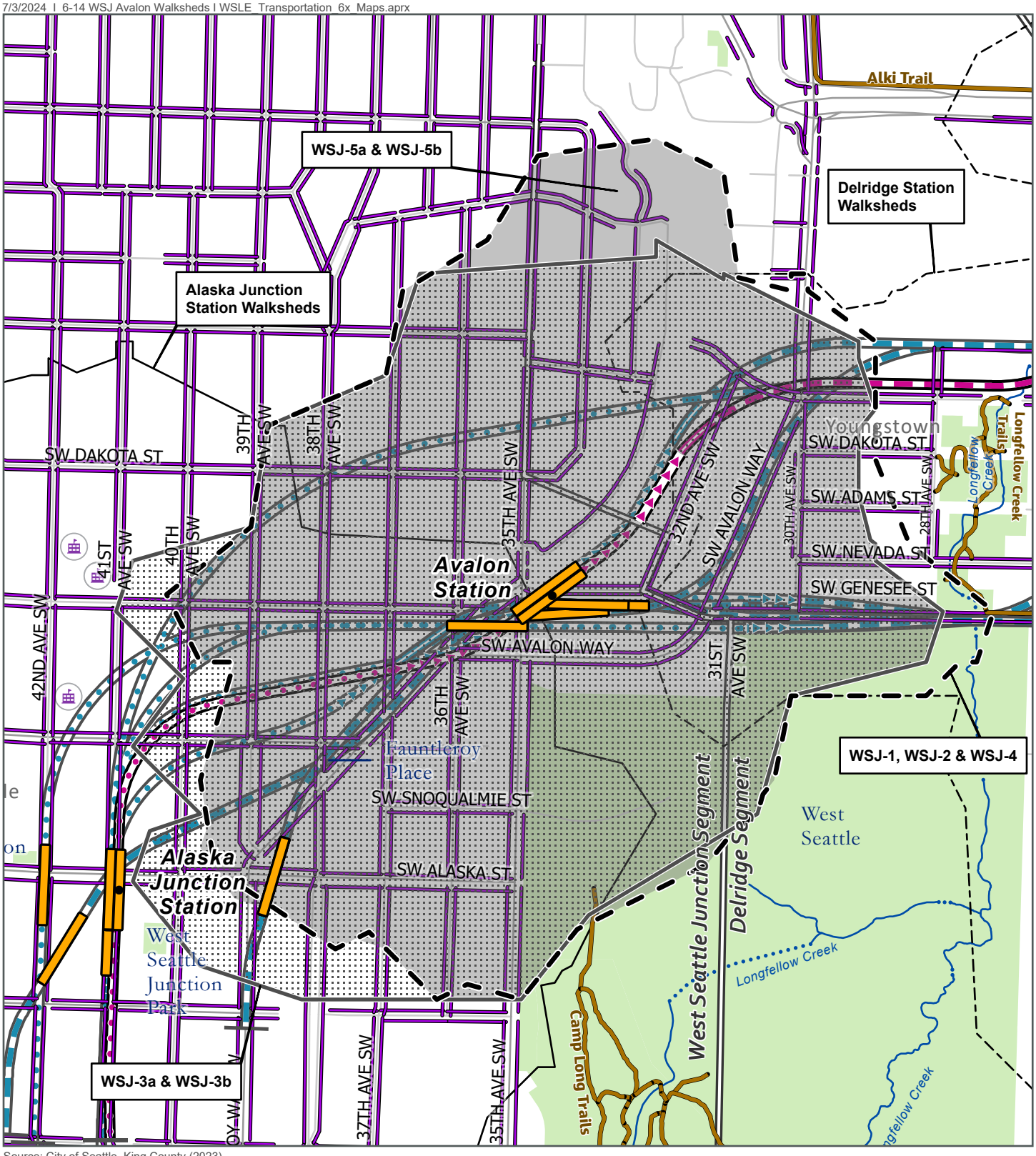
Under Alternative DEL-2a and Option DEL-2b, 25th Avenue Southwest would be closed to through traffic south of Southwest Dakota Street, but pedestrian and bicycle access would be maintained. Option DEL-2b would permanently close 30th Avenue Southwest north of Southwest Genesee Street, thus potentially eliminating pedestrian and bicycle access at that location.

Alternatives DEL-1a and DEL-3 would remove the sidewalk on the south side of Southwest Genesee Street between Southwest Avalon Way and 26th Avenue Southwest; DEL-4 would remove a portion of that sidewalk segment. This sidewalk runs alongside the West Seattle Golf Course fence; pedestrians would instead travel along the sidewalk on the north side of the street. A bus stop would remain on the south side of Southwest Genesee Street with access maintained from the north sidewalk by a pedestrian crossing and treatments to provide safe access.

The non-motorized trip generation for Alternative DEL-1a, Option DEL-1b, Alternative DEL-2a, Option DEL-2b, Alternative DEL-3, Alternative DEL-4, Alternative DEL-5, and Alternative DEL-6a would be the same as Preferred Option DEL-6b. Preferred Option DEL-6b and Alternative DEL-7 share the same station design, with different volumes of boardings and alightings because Alternative DEL-7 would not include an Avalon Station in the West Seattle Junction Segment. Under Alternative DEL-7, the pedestrian L.O.S. would be acceptable for all pedestrian sidewalks, crossings, and corners studied. More riders would access the Link light rail network at Delridge Station if there were no Avalon Station. Alternative DEL-7 would permanently close 32nd Avenue Southwest, similar to Preferred Option DEL-6b.

Under the West Seattle Link Extension M.O.S., the Delridge Station would be the southern terminus and would therefore have higher ridership than the full-build project. Over 90 percent of the riders would access the light rail station by bus from Alaska Junction, White Center, Burien, and communities to the south. The remaining riders would access the station by walking, biking, or using pick-up and drop-off.

All pedestrian sidewalks, crossings, and corners within one block of Delridge Station are expected to have sufficient capacity under the M.O.S. scenario.



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- Retained Cut
- At-Grade

Other Alternatives
- Elevated
- Retained Cut
- At-Grade

Station (● *Indicates Preferred Alternative*)
- New

- Segment Line
- Railroad
- Stream
- Piped Stream
- Park
- Sidewalks
- Existing Trail
- Schools

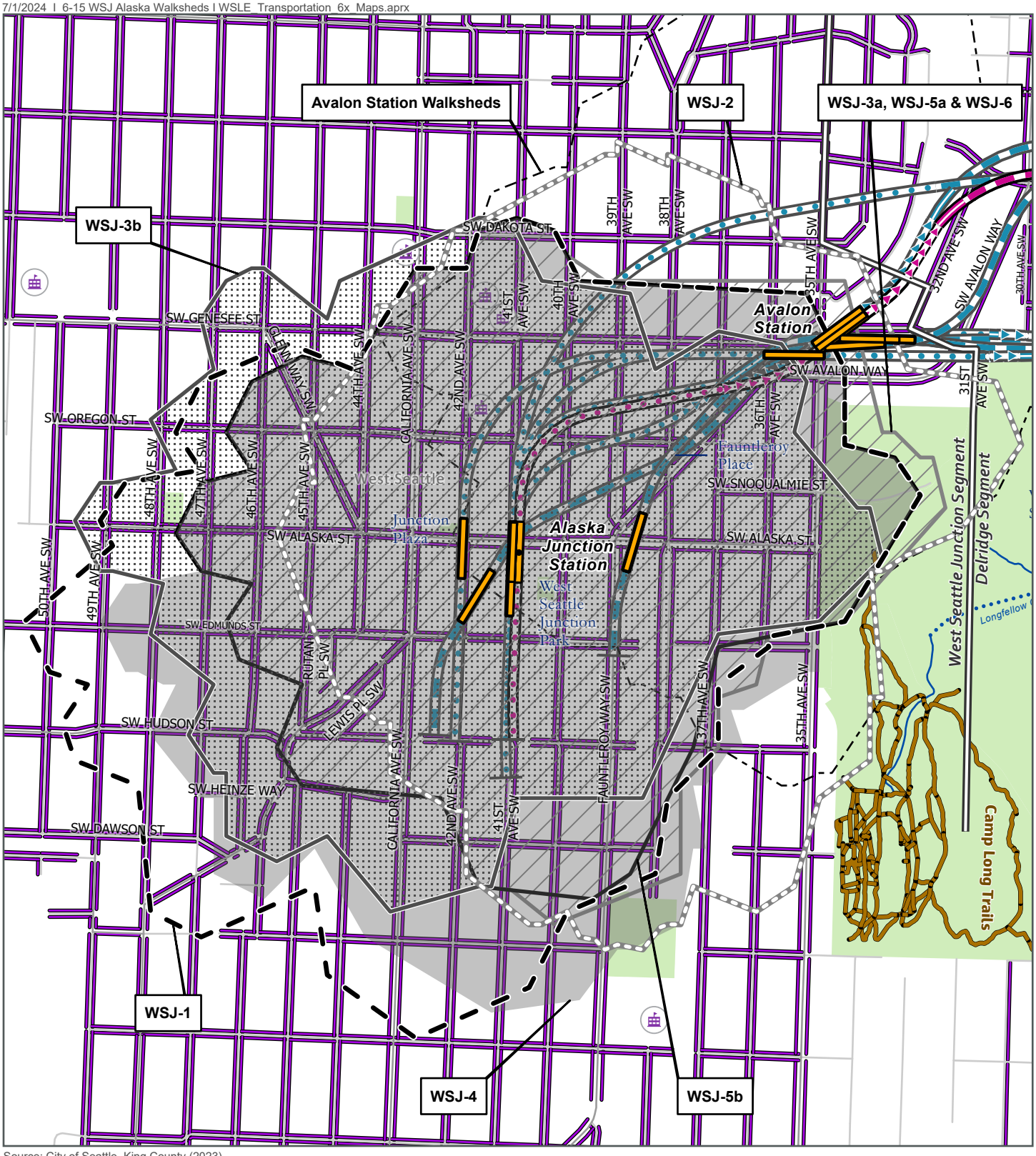
10-Minute Walkshed
- WSJ Avalon-1, 2, & 4
- WSJ Avalon-3a & 3b
- WSJ Avalon-5a & 5b
- Delridge Station Walksheds
- Alaska Junction Station Walksheds

FIGURE 6-16
Pedestrian Facilities and Station Pedestrian Access
Avalon Station Walksheds

West Seattle Link Extension

0 500 1,000 Feet

N



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- At-Grade
- Retained Cut

Other Alternatives
- Elevated
- At-Grade
- Retained Cut

Station (● *Indicates Preferred Alternative*)
- New

- Segment Line
- Railroad
- Park
- Stream
- Piped Stream
- Sidewalks
- Existing Trail
- Schools

10-Minute Walkshed
- WSJ Alaska-1
- WSJ Alaska-2
- WSJ Alaska-3b
- WSJ Alaska-4
- WSJ Alaska-5b
- WSJ Alaska-3a, 5a, & 6
- Avalon Station Walksheds

FIGURE 6-17
Pedestrian Facilities and Station Pedestrian Access
Alaska Junction Station Walksheds

West Seattle Link Extension

0 500 1,000 Feet
N

West Seattle Junction Segment

Figure 6-16 and Figure 6-17 show the walksheds and surrounding pedestrian facilities for the Build Alternatives at the Avalon and Alaska Junction stations, respectively. The Avalon Station walksheds for Preferred Option WSJ-5b and Alternative WSJ-5a are very similar to the other alternatives but do not extend quite as far east or west as some of the other walksheds. These walksheds overlap with portions of the Delridge walksheds to the east and portions of the Alaska Junction walksheds to the southwest. The Avalon Station walksheds for Alternative WSJ-1, Alternative WSJ-2, and Alternative WSJ-4 are similar because the stations would be close together. The walksheds for Alternative WSJ-3a and Option WSJ-3b are shifted slightly to the southwest due to the station location.

The walksheds around Alaska Junction Station vary more, as the station locations are up to 1,200 feet apart. The walksheds for Alternative WSJ-3a, Alternative WSJ-5a, and Alternative WSJ-6 are very similar to the walkshed for Preferred Option WSJ-5b, as they would have similar station entrance locations. The Alaska Junction Station walkshed for Preferred Option WSJ-5b would not extend as far south and west as Alternative WSJ-1, Option WSJ-3b, and Alternative WSJ-4 walksheds due to different station locations. Due to the Avalon and Alaska Junction stations' proximity, their walksheds would overlap.

Under all alternatives, bicyclists could access the station via nearby bicycle facilities, including neighborhood greenways on 42nd Avenue Southwest and 36th Avenue Southwest and bicycle lanes on Fauntleroy Way Southwest, Southwest Avalon Way, and Southwest Alaska Street.

Table 4-9 in Section 4.3.2.3 summarizes p.m. peak hour non-motorized station trip generation. The bicycle trip generation for Preferred Option WSJ-5b at Avalon Station is expected to be approximately 10 new trips in the p.m. peak hour. The bicycle trip generation for Avalon Station under Alternative WSJ-2 would likely be five new trips in the p.m. peak hour and approximately 10 new trips in the p.m. peak hour under the other alternatives. The Alaska Junction Station is expected to have an estimated 35 new bicycle trips in the p.m. peak hour with Preferred Option WSJ-5b. Alternative WSJ-1, Alternative WSJ-3a, Option WSJ-3b, Alternative WSJ-4, and Alternative WSJ-5a would have the same bicycle trip generation as the Preferred Option. Alternative WSJ-2 and Alternative WSJ-6 are expected to have approximately 55 new bicycle trips in the p.m. peak hour. As on-road bicycle facilities can accommodate approximately 2,000 bicycles an hour, the existing and planned bicycle facilities around the station are expected to have sufficient capacity for these additional bicycle trips.

Topography is a limiting factor for both pedestrian and bicycle mobility. For all alternatives, cyclists could access the Alaska Junction and Avalon stations using the following planned routes:

- Neighborhood greenways:
    - 36th Avenue Southwest
    - 42nd Avenue Southwest
    - 45th Avenue Southwest
    - 48th Avenue Southwest
    - Southwest Andover Street
- Bicycle lanes:
    - Glenn Way Southwest
    - Erskine Way Southwest
    - Southwest Charlestown Street
    - Southwest Genesee Street

- Protected bicycle lanes:
    - 35th Avenue Southwest
    - Fauntleroy Way Southwest
    - Southwest Admiral Way
    - Southwest Alaska Street
    - Southwest Avalon Way

There are three schools within the 10-minute walkshed from the new Alaska Junction Station:

- Holy Rosary Elementary, grades Pre-K to 8 (private)
- Hope Lutheran School, grades Pre-K to 8 (private)
- Tilden School, grades K to 5 (private)

There are no designated school crossings, crossing guards, or school patrols near the station, and all roadways adjacent to the station have sidewalks.

Preferred Option (WSJ-5b)

Under Preferred Option WSJ-5b, the station access points would be on the northeast and southwest corners of the 41st Ave Southwest and Southwest Alaska Street intersection.

Under Preferred Option WSJ-5b, Southwest Genesee Street at 35th Avenue Southwest would be permanently closed. Pedestrians would be detoured along Southwest Genesee Street eastbound to Southwest Avalon Way. Table 4-9 in Section 4.3.2.3 summarizes p.m. peak hour non-motorized station trip generation. About half of riders at the Avalon Station and a third of riders at the Alaska Junction Station would be pedestrians or bicyclists. Because Alaska Junction Station would be the terminus, a high share of bus-to-light rail transfers is anticipated. The pedestrian L.O.S. analysis determined that sidewalks, crosswalks, and intersection corners within one block of the station entrances would have sufficient capacity.

Other Build Alternatives (WSJ-1, WSJ-2, WSJ-3a, WSJ-3b, WSJ-4, WSJ-5a, and WSJ-6)

Guideway columns could encroach on sidewalks along the Fauntleroy Way Southwest corridor under Alternative WSJ-1 and Alternative WSJ-2, but Sound Transit would rebuild the affected facilities to the extent feasible.

Non-motorized trip generation for Alternative WSJ-1, Alternative WSJ-3a, Option WSJ-3b, Alternative WSJ-4, and Alternative WSJ-5a would be the same as Preferred Option WSJ-5b. The non-motorized trip generation for Alternative WSJ-2 would be approximately 600 boardings lower at the Avalon Station than under Preferred Option WSJ-5b, and about 850 boardings higher at the Alaska Junction Station than Preferred Option WSJ-5b. This would be because under Alternative WSJ-2, the Alaska Junction Station would be at Fauntleroy Way Southwest, closer to Avalon Station, which would cause some of the Avalon Station riders to shift to the Alaska Junction Station. Non-motorized trips would also slightly increase at Alaska Junction Station under Alternative WSJ-2 due to land use density differences at this location.

Alternative WSJ-6 would differ from Preferred Option WSJ-5b in terms of volume of boardings and alightings because it would not have the Avalon Station. Without the Avalon Station, increased boardings and alightings are expected at the Alaska Junction Station, as well as a higher proportion of bus transfers. The non-motorized trip generation at the Alaska Junction Station for Alternative WSJ-6 would be approximately 750 boardings and 750 alightings higher than for Preferred Option WSJ-5b.

Alternative WSJ-4 would permanently close 37th Avenue Southwest north of Fauntleroy Way Southwest and 38th Avenue Southwest at the guideway north of Southwest Oregon Street, potentially eliminating non-motorized access. Pedestrians and bicycles could reroute to the adjacent parallel roadways, which have short block spacing such that out-of-direction travel would be minimal. Alternative WSJ-5a would permanently close Southwest Genesee Street east of 35th Avenue Southwest. Although the station would still be accessible by cyclists and pedestrians, those passing through the station area may have to cross 35th Avenue Southwest and Fauntleroy Way Southwest at Southwest Avalon Way. Pedestrians and bicycles could reroute to Southwest Avalon Way instead.

6.3.2.2 Construction Impacts

Specific non-motorized facilities that are expected to be affected by construction for at least one year are described in the following segment-specific discussions (consistent with the definition of long-term closures in Attachment N.1A). See Attachment N.1D, Permanent and Temporary Transportation Facility Closures, for a complete list of the roadway construction closures expected for each alternative.

Impacts Common to All Alternatives

Project construction would impact non-motorized travel modes; see Chapter 4 for discussion of specific roadways, including extents and durations of key closures. Construction could temporarily close some sidewalks, reduce sidewalk widths, or close crosswalks, though Americans with Disabilities Act-compliant access would be maintained or detours would be provided to the extent feasible. Construction flaggers may also occasionally halt non-motorized travel adjacent to active construction for very short periods.

Although sidewalks or pedestrian paths that students use to reach schools may be affected during construction, no designated school crossings are expected to be affected. Some Americans with Disabilities Act-accessible curb ramps may be temporarily removed. There could also be bicycle facility closures and reduced bicycle lane widths within or adjacent to construction areas.

Pedestrians, people with disabilities that require the use of Americans with Disabilities Act-accessible curb ramps, and bicyclists might have to use alternate routes and/or navigate closures. In accordance with Seattle Department of Transportation Director's Rule 10-2015, sidewalks and pedestrian paths would be maintained to the maximum extent feasible; adjacent lanes could be repurposed to create non-motorized pathways through or around construction zones. Some roadways may be fully closed; in those cases, pedestrians and bicycles would be rerouted to the next adjacent street, where feasible, to minimize out-of-direction travel. In locations where a dedicated bicycle facility (such as a protected bicycle lane or multi-use path) must be temporarily closed, Sound Transit will work with the City of Seattle to identify and implement an alternate route that achieves, to the extent feasible, a similar level of protection and comfort as the affected facility.

The conditions described above could affect areas throughout the alignment for a range of durations. Trails, bicycle lanes, greenways, signed bicycle routes, and stairways expected to be affected by construction or full roadway closures causing substantial barriers or out-of-direction travel for at least 1 year are described by alternative in the following sections. For long-term roadway closure details, see Section 4.3.3, Construction Impacts.

All project alternatives in the SODO and Duwamish segments would require relocation of 26-kilovolt and 230-kilovolt utilities along the SODO Busway and 6th Avenue South. These closures would be in addition to the closures described for light rail construction.

Construction activity would progress in stages along the corridors such that closures would be localized rather than closing the entire corridor at once. During the utility relocation, the SODO Trail would be fully closed east of the SODO Station for less than 1 month (note additional closures of the SODO Trail are described in the following subsection). South Holgate Street and South Lander Street would each have partial closures at the SODO Busway for up to one month at a time. One to two lanes of 6th Avenue South would be closed at a time, with each closure lasting up to 4 months, thus potentially affecting adjacent pedestrian facilities. Full closures of 6th Avenue South, including sidewalks, would also occur between South Massachusetts Street and South Spokane Street and between Diagonal Avenue South and South Hinds Street. Temporary detours around the localized closures would be put in place to the extent feasible to allow pedestrian access. No designated bicycle facilities are expected to be affected. Intersection closures could also occur during overnight hours.

SODO Segment

For all alternatives, the SODO Trail would be closed for the duration of construction (approximately 4 years) between South Stacy Street and South Forest Street. Pedestrians and bicycles would likely be detoured to 6th Avenue South, approximately 280 feet to the east, with east-west access maintained at adjacent street crossings. Sound Transit will work with the City of Seattle to identify and implement a design on 6th Avenue South (or other location as agreed upon) that achieves, to the extent feasible, a similar level of protection and comfort as the affected facility. There are no additional long-term construction closures under SODO-2; additional closures under the other alternatives are described below.

Preferred Option (SODO-1c) and Other Alternatives (SODO-1a, SODO-1b)

Under Preferred Option SODO-1c, Alternative SODO-1a, and Option SODO-1b, the sidewalks on both sides of South Lander Street between 4th Avenue South and 6th Avenue South would be closed for approximately 3 years during construction of the South Lander Street overpass. During this time, pedestrians would be detoured to a temporary connection south of South Lander Street to connect between 4th Avenue South and 6th Avenue South. The connection would be parallel to South Lander Street along a nearby east-west path where practical. Sound Transit is also considering opportunities to maintain a pedestrian connection with the existing SODO Station, but there may be periods when the SODO Station is not accessible. See Chapter 3, Transit, for more detail.

Duwamish Segment

Preferred Alternative (DUW-1a) and Other Alternative (DUW-1b)

Under Preferred Alternative DUW-1a, 4th Avenue South north of South Spokane Street would have partial closures. There would be periods of time when the sidewalk on one side of 4th Avenue South would be closed between approximately South Spokane Street and South Hinds Street. When the west sidewalk is closed, the east side would remain open and vice versa.

Under Preferred Alternative DUW-1a and Option DUW-1b, the Delridge Connector Trail from Delridge Way Southwest to the West Seattle Bridge Trail would be rerouted during construction. Rather than run along the east side of Delridge Way Southwest, the trail would be detoured along the 23rd Avenue Southwest pathway on the west side of Delridge Way Southwest (starting at roughly Southwest Charlestown Street). The 23rd Avenue Southwest pathway would connect to the trail on the north side of the West Seattle Bridge via a series of improvements Sound Transit is designing in coordination with the City of Seattle.

The 22nd Avenue Southwest connection to the Delridge Connector Trail and the stairway between 22nd Avenue Southwest and Delridge Way Southwest would also be temporarily closed. Bicyclists would be detoured via Southwest Andover Street and 23rd Avenue Southwest, where they could use the new signal at Delridge Way Southwest and 23rd Avenue Southwest to access the detour route.

The staircase through the West Duwamish Greenbelt between Southwest Charlestown Street and Southwest Marginal Place would also be closed during construction of Preferred Alternative DUW-1a and Option DUW-1b, as would the Southwest Marginal Place connector trail to the West Seattle Bridge Trail. Pedestrians who must detour during the staircase closure would have to travel a longer distance and encounter more vehicle conflicts on facilities along the roadway. The Southwest Marginal Place connector trail would be kept open for some periods of construction depending on the construction activity. During some periods, non-motorized users could be detoured to the sidewalk on the west side of West Marginal Way or the planned pedestrian path of the east side of West Marginal Way Southwest (scheduled to be constructed in 2024) to connect to the West Seattle Bridge Trail at the intersection with Chelan Avenue Southwest. However, the west side facility is a relatively narrow sidewalk with no barrier to adjacent traffic. Moreover, there may be periods of construction when the sidewalk on the west side of West Marginal Way and the planned pedestrian path of the east side of West Marginal Way Southwest are closed concurrent with the Southwest Marginal Place closure. Due to the limited street network and topographical constraints, pedestrian and bicycle travel on existing facilities may not be possible during those times. Sound Transit would continue to consider alternative means to transport pedestrians and bicycles through the corridor.

Other Build Alternative (DUW-2)

Under the North Crossing Alternative (Alternative DUW-2), construction of the guideway would close the portion of the Alki Trail west of the Chelan Avenue Southwest/West Marginal Way Southwest/Southwest Spokane Street intersection. Although the current access to the crosswalk would be unavailable, travelers may use existing crosswalks farther to the west to connect to the West Seattle Bridge Trail and the Duwamish Trail. The partial closure of 4th Avenue South as described under Preferred Alternative DUW-1a, would also apply for Alternative DUW-2.

Delridge Segment

During construction of Preferred Option DEL-6b, 26th Avenue Southwest south of Southwest Andover Street would be closed on nights and weekends. This would include closure of the sidewalks on both sides of 26th Avenue Southwest. This roadway is a neighborhood greenway so bicyclists would need to use an alternate route such as 28th Avenue Southwest. No additional non-motorized effects beyond the general roadway impacts described in the Construction Impacts Common to All Alternatives section are expected for Preferred Option DEL-6b.

Other Build Alternatives (DEL-1a, DEL-1b, DEL-2a, DEL-2b, DEL-3, DEL-4, DEL-5, DEL-6a, and DEL-7)

Under Alternative DEL-1a and Option DEL-1b, Southwest Genesee Street would be temporarily closed to all users. Because there are no parallel routes to the south, pedestrians and bicycles would likely reroute approximately 250 feet to the north to Southwest Nevada Street or 650 feet to the north to Southwest Dakota Street. Traffic diversion from this closure would likely cause an increase in vehicular volumes on 26th Avenue Southwest, which is a neighborhood greenway. Traffic diversion is discussed in more detail in Section 4.3.3.4, Delridge Segment, in the Construction Impacts section of Chapter 4.

No non-motorized effects beyond the general roadway impacts described in the Construction Impacts Common to All Alternatives section above are expected for Option DEL-2a or Option DEL-2b. Under Alternatives DEL-3 and DEL-4, the multi-year partial closure of Delridge Way Southwest would close the sidewalk and bicycle lane on one side of the street at a time during construction. Portions of Southwest Genesee Street would be fully closed under Alternative DEL-3 and partially closed under Alternative DEL-4. Because there are no parallel routes to Southwest Genesee Street to the south, pedestrians and bicycles would reroute to the north. Due to the irregular street grid in that area, there would be some out-of-direction travel required. Traffic diversion from the Delridge Way Southwest and Southwest Genesee Street closures would likely cause an increase in vehicular volumes on 26th Avenue Southwest, which is a neighborhood greenway. Traffic diversion is discussed in more detail in Section 4.3.3.4.

Under Alternatives DEL-5 and DEL-6a, Southwest Andover Street—a signed bicycle route—would be temporarily closed to pedestrians and bicyclists. Pedestrians and bicycles could use Southwest Genesee Street approximately 1,300 feet to the south as an alternate route. Alternative DEL-5 would also fully close a portion of Southwest Avalon Way, including the protected bike lanes along that segment. Pedestrians and bicycles could reroute to 32nd Avenue Southwest, approximately 300 feet to the west. Traffic diversion from Southwest Andover Street and Southwest Avalon Way would cause an increase in vehicular volumes on 26th Avenue Southwest, which is a neighborhood greenway. Alternative DEL-7 would have the same closure of 26th Avenue Southwest as Preferred Option DEL-6b. Traffic diversion is discussed in more detail in Section 4.3.3.4.

West Seattle Junction Segment

Preferred Option WSJ-5b

Under Preferred Option WSJ-5b, 35th Avenue Southwest would be closed between Fauntleroy Way Southwest and Southwest Avalon Way for 1 year during construction, during which time pedestrians could detour to Fauntleroy Way Southwest. Construction would be phased such that the 35th Avenue Southwest closure would not coincide with closures at the Fauntleroy Way Southwest and Southwest Avalon Way intersection. Partial closures of the intersection pedestrian crossings would be phased so that pedestrians would only need to detour to one side of the intersection while the other side is closed.

Under Preferred Option WSJ-5b, 41st Avenue Southwest from north of Southwest Alaska Street to Southwest Hudson Street would also be closed during construction. Pedestrians would detour to either 40th Avenue Southwest or 42nd Avenue Southwest, which are approximately 300 feet east and west of 41st Avenue Southwest. The staircases along Southwest Hudson Street on either side of 41st Avenue Southwest would be closed during construction. Pedestrians could detour to Southwest Dawson Street approximately 620 feet to the south.

Other Build Alternatives (WSJ-1, WSJ-2, WSJ-3a, WSJ-3b WSJ-4, WSJ-5a, and WSJ-6)

Under Alternative WSJ-1, Alternative WSJ-2, Alternative WSJ-3a, and Option WSJ-3b, 36th Avenue Southwest from Fauntleroy Way Southwest to Southwest Genesee Street would be closed. Pedestrians would detour approximately 130 feet to the northeast, where Southwest Genesee Street and Fauntleroy Way Southwest meet.

Under Alternative WSJ-2, portions of Southwest Alaska Street and 39th Avenue Southwest would be closed to pedestrians and bicyclists, which includes a westbound bike lane on Southwest Alaska Street. Pedestrians and bicyclists would likely not be allowed on Southwest Alaska Street for several years due to the type of construction activities. For the remaining construction period, the sidewalk could be maintained on at least one side of the street. During the periods when pedestrians are not allowed on Southwest Alaska Street, the nearest alternate route would be 38th Avenue Southwest and Fauntleroy Way Southwest.

Under Alternative WSJ-3a, Option WSJ-3b, and Alternative WSJ-5a, portions of 35th Avenue Southwest would be closed for varying durations. Because there are no parallel routes to the east, pedestrians and bicycles could use 36th Avenue Southwest approximately 260 feet west (under Alternative WSJ-5a) or 37th Avenue Southwest approximately 600 feet west (under Alternative WSJ-3a and Option WSJ-3b) as an alternate route.

Under Alternatives WSJ-3a, WSJ-4, WSJ-5a, and WSJ-6 the staircases along Southwest Hudson Street on either side of 41st Avenue Southwest would be closed during construction. Under Option WSJ-3b, Southwest Hudson Street would be closed to pedestrians and bicycles at 42nd Avenue Southwest.

6.4 Potential Mitigation Measures

6.4.1 Long-term Impacts

The West Seattle Link Extension is not expected to permanently impact existing designated bicycle facilities or routes. If impacts are identified as the project advances, Sound Transit will work with the City of Seattle to rebuild the affected facilities or develop alternate facilities or routes that achieve, to the extent feasible, a similar level of protection and comfort afforded by the facility being impacted. These replacements would be funded by Sound Transit and may include, for example, protected or standard bicycle lanes, trails, and neighborhood greenway treatments, along with associated design elements such as pavement markings and bike signals where needed.

Under the full-build condition, no pedestrian facilities would have an L.O.S. impact with the West Seattle Link Extension. No pedestrian facilities would have an L.O.S. impact under the M.O.S.

The project may also have direct physical impacts to existing sidewalks and trails due to placement of guideway columns in the Duwamish and Delridge segments, and several streets in the Delridge and West Seattle Junction segments would be permanently closed, potentially eliminating pedestrian and bicycle access at those locations. As the project design is refined and potential column locations are identified with greater precision, additional pedestrian and bicycle visibility issues may emerge. These visibility issues could be mitigated with measures such as protected vehicle turns or restricting vehicle movements.

Sound Transit will rebuild affected non-motorized facilities to meet Americans with Disabilities Act requirements as well as applicable local design standards at the time of permitting (such as Seattle Streets Illustrated [City of Seattle 2020] and the Seattle Land Use Code and Light Rail Facility Construction and Construction Impacts sections of the Seattle Municipal Code) or to a standard agreed to by Sound Transit and the City of Seattle.

As the project design advances, if it is determined that a facility could not be rebuilt to applicable design standards and an alternate design cannot be agreed upon in the original location, Sound Transit would work with the City of Seattle to develop mitigation, such as an alternate route.

6.4.2 Construction Impacts

When non-motorized facilities such as sidewalks and bicycle lanes must be temporarily closed for construction, Sound Transit would provide marked detours, such as dedicated walkways and alternate bicycle routes that may include treatments such as pedestrian and bicycle signals, signal optimization including leading pedestrian intervals, crosswalks, curb bulbs, rectangular rapid flashing beacons, pavement markings, and temporary signals. Where possible, temporary facilities will be designed to applicable design standards such as Seattle Streets Illustrated (City of Seattle 2020), Standard Plans for Municipal Construction (City of Seattle 2023), or as agreed to by the City of Seattle; at a minimum they will comply with Americans with Disabilities Act requirements.

If maintaining a facility is not feasible, Sound Transit would work with the City of Seattle to develop and implement a construction management plan to provide alternate facilities that, to the extent feasible, offer a similar level of protection and comfort. Where already identified, specific mitigation measures are described by segment below. As design progresses, these detours will be refined in coordination with the City of Seattle.

6.4.2.1 SODO Segment

Under the SODO Trail construction closure (approximately 4 years), pedestrians and bicycles would be detoured to 6th Avenue South, approximately 280 feet to the east with east-west access maintained at adjacent street crossings. Sound Transit will work with the City of Seattle to identify and implement a design on 6th Avenue South that achieves, to the extent feasible, a similar level of protection and comfort as the affected facility.

During the South Lander Street closure, Sound Transit would maintain a temporary pedestrian connection south of South Lander Street to allow access between 4th Avenue South and 6th Avenue South.

6.4.2.2 Duwamish Segment

Under Preferred Alternative DUW-1a and Option DUW-1b, the Delridge Connector Trail from Delridge Way Southwest to the West Seattle Bridge Trail would be rerouted during construction. Rather than run along the east side of Delridge Way Southwest, the trail would be detoured along the 23rd Avenue Southwest pathway on the west side of Delridge Way Southwest (starting at roughly Southwest Charlestown Street). The 23rd Avenue Southwest pathway would connect to the trail on the north side of the West Seattle Bridge via a series of improvements Sound Transit is designing in coordination with the City of Seattle. The 22nd Avenue Southwest connection to the Delridge Connector and stairway from 22nd Avenue Southwest to Delridge Way Southwest would also be temporarily closed. Pedestrians and bicyclists would be detoured via Southwest Andover Street and 23rd Avenue Southwest, where they could use the new signal at Delridge Way Southwest and 23rd Avenue Southwest to access the detour route. These replacements will be located and designed in coordination with the City of Seattle and funded by Sound Transit.

Pedestrian and bicycle facilities removed or damaged by construction would be replaced, to the extent feasible, by permanent facilities that meet applicable design standards or as agreed to by the City of Seattle when project construction is complete.

7 SAFETY

7.1 Introduction

This chapter describes the effects of the West Seattle Link Extension Project (the project) on safety for motorists, pedestrians, and cyclists. To assess the current safety conditions within the study area, collision data were collected for the 5-year period between 2017 and 2021. The safety study area is defined as a one-block (approximately 300 feet) radius around the guideway and stations. A total of 1,014 collisions were reported within this study area between 2017 and 2021. The 20 roadway segments and 20 intersections with the highest number of collisions are summarized to highlight existing trends in collisions along the project corridor and around station locations.

To determine the project's effects on safety, qualitative assessments of the operating condition (permanent effects) were performed using a 2042 horizon year. Because ridership is expected to be higher in 2042 than in the year of opening (2032), this provides a conservative assessment of potential impacts. Analysis was also performed for the construction period. These assessments considered factors such as detours, traffic volume changes, conflict points, and project design elements. Finally, potential mitigation was identified for long-term and temporary impacts.

7.1.1 Key Findings

- Under the no build condition, safety performance is expected to remain largely the same as the existing conditions, with slight growth in traffic volumes and no major transportation infrastructure projects that would substantially alter the travel patterns within the study area.
- The project would minimally affect safety because all light rail alternatives would be grade-separated and operate in exclusive right-of-way.
- The project would result in approximately 17,000 fewer vehicle miles traveled per day in the region due to travelers shifting from driving to transit—an inherently safer mode.
- Increased vehicular and/or non-motorized activity around stations may result in increased conflicts. Stations would be designed to include appropriate non-motorized facilities to accommodate this expected level of activity and coordinated with the City of Seattle. Station access would be through signalized or controlled locations, and in some instances grade-separated crossings.
- Although pedestrian and bicyclist activities are expected to increase around stations, the increase in conflicts is small compared to the number of conflicts already present within the existing study area.
- For construction, Sound Transit would develop a Maintenance of Traffic Plan based on the Federal Highway Administration's *Manual on Uniform Traffic Control Devices* and Seattle Department of Transportation's *Traffic Control Manual for In-street Work*. During construction, some roadways would be partially or fully closed. While the number of collisions on the network within any given segment are expected to be similar, streets used as alternative routes would have more vehicles traveling on them potentially creating more collisions on those streets.
- Construction also may temporarily close some sidewalks, crosswalks, and bicycle facilities. Some closures may detour bicyclists away from dedicated facilities to shared facilities,

but Sound Transit would coordinate with the City of Seattle to identify appropriate alternative facilities.

7.2 Affected Environment

The City of Seattle's safety initiative, Vision Zero, aims to eliminate all traffic deaths by 2030, and the City is using several strategies to advance this goal, including efforts to increase transit use. Vision Zero high crash corridors are the 100 arterial segments with the highest number of collisions. This section considers the high crash corridors included in the Vision Zero corridor prioritization in the study area.

Several roadways within the project study area are identified as high injury corridors in the Seattle Department of Transportation's *Vision Zero 2019 Update*.

Southwest Oregon Street was identified as a priority location, along with Southwest Avalon Way, 4th Avenue South, 6th Avenue South, the Spokane Street Viaduct, and South Lander Street. There are currently no planned, committed safety improvement projects at these locations within the project study area. However, recent improvements along Southwest Avalon Way included adding protected bicycle lanes and removing some parking spaces, which may reduce collision severity and frequency.

Intersections between the roadway system and the existing light rail system are potential conflict points. While most of the existing light rail system is grade-separated and does not interact with other modes, portions of the Link light rail system are at-grade and at intersections vehicle and non-motorized traffic have direct conflicts with light rail vehicles. Within the project corridor, the 1 Line operates at-grade in the SODO Segment with at-grade roadway crossings at South Holgate Street and South Lander Street. Dynamic and static warning signs, signals, and zigzag or gated pedestrian crossings are present in these locations to alert drivers and pedestrians of the presence or potential presence of light rail vehicles.

Roadway segments and intersections potentially affected by the Build Alternatives were summarized and sorted based on total collision frequency. Table 7-1 summarizes the 20 intersections with the highest number of collisions, by severity, within the study area. Most of these were property damage only. No fatal collisions occurred at these intersections.[1] Angle collisions were the most common collision type, which is typical for intersections. More information regarding the distribution of collision types at these intersections are included in Attachment N.1G, Historical Collisions by Collision Type.

[1] One fatal crash within the study area occurred in 2019 at the intersection of the Alaskan Way Viaduct and South Spokane Street; that intersection is not a top 20 location, so it does not appear in Table 7-1.

Table 7-1. Top 20 Collision Intersections by Severity (2017 to 2021)

Segment	Location [a]	Fatal Collisions	Serious Injury Collisions	Injury Collisions	Property Damage Only Collisions	Unknown Collisions	Total Collisions
Duwamish	1st Avenue South and South Spokane Street (northbound)	0	2	10	12	0	24
Duwamish	1st Avenue South and South Spokane Street (southbound)	0	1	2	2	0	5
Duwamish	4th Avenue South and South Horton Street	0	1	5	4	0	10
Duwamish	4th Avenue South and South Spokane Street (northbound)	0	0	6	6	0	12
Duwamish	4th Avenue South and South Spokane Street (southbound)	0	0	24	23	0	47
Duwamish	East Marginal Way South and South Spokane Street (southbound)	0	0	2	11	0	13
Duwamish	South Lander Street and SODO Busway	0	1	2	3	0	6
Duwamish	West Marginal Way Southwest and Southwest Spokane Street (northbound)	0	0	1	6	0	7
Delridge	Delridge Way Southwest and Southwest Andover Street	0	0	5	6	0	11
West Seattle Junction	35th Avenue Southwest and Fauntleroy Way Southwest	0	0	6	10	1	17
West Seattle Junction	35th Avenue Southwest and Southwest Avalon Way	0	0	10	12	0	22
West Seattle Junction	37th Avenue Southwest and Fauntleroy Way Southwest	0	0	3	4	0	7

Segment	Location [a]	Fatal Collisions	Serious Injury Collisions	Injury Collisions	Property Damage Only Collisions	Unknown Collisions	Total Collisions
West Seattle Junction	38th Avenue Southwest and Fauntleroy Way Southwest	0	0	4	2	0	6
West Seattle Junction	38th Avenue Southwest and Southwest Oregon Street	0	0	3	3	0	6
West Seattle Junction	42nd Avenue Southwest and Southwest Alaska Street	0	0	8	4	0	12
West Seattle Junction	44th Avenue Southwest and Southwest Oregon Street	0	0	2	7	0	9
West Seattle Junction	California Avenue Southwest and Southwest Oregon Street	0	0	6	3	0	9
West Seattle Junction	Fauntleroy Way Southwest and Southwest Alaska Street	0	0	0	6	0	6
West Seattle Junction	Fauntleroy Way Southwest and Southwest Oregon Street	0	2	2	4	0	8
West Seattle Junction	Klickitat Avenue Southwest and Southwest Spokane Street	0	0	1	7	0	8

[a] Locations included are within one block of the West Seattle Link Extension.

Table 7-2 summarizes the 20 roadway segments with the highest number of collisions within the study area. For the roadway segments analyzed along the project corridor, the highest number of collisions occurred at the West Seattle Bridge eastbound lane between the Alaskan Way Viaduct on-ramp and West Seattle Bridge eastbound on-ramp from Delridge Way South. Nearly half of the 20 highest-collision roadway segments are on or near the West Seattle Bridge.

For these high-collision intersections and roadway segments, over half of the collisions resulted in property damage only. There were 2 fatal collisions, both of which were pedestrian-related, and 10 serious injury collisions, 2 of which were pedestrian-related and 1 of which was bicycle-related.

Table 7-2. Top 20 Collision Roadway Segments by Severity (2017 to 2021)

Segment	Location [a]	Fatal Collision	Serious Injury Collision	Injury Collision	Property Damage Only Collision	Unknown Collisions	Total Collisions
SODO	East Marginal Way South between South Spokane Street (south) and East Marginal Way South (southbound)	0	0	4	4	0	8
Duwamish	Alaskan Way Viaduct (southbound) between Alaskan Way Viaduct northbound on-ramp from South Spokane Street and Alaskan Way Viaduct southbound off-ramp to South Spokane Street	0	0	2	5	1	8
Duwamish	Alaskan Way Viaduct northbound on-ramp between South Spokane Street–Alaskan Ramp and Alaskan Way Viaduct (northbound)	0	0	1	13	1	15
Duwamish	Alaskan Way Viaduct (southbound) West Seattle Bridge westbound off-ramp between Alaskan Way Viaduct southbound and West Seattle Bridge westbound	0	0	3	13	0	16
Duwamish	South Spokane Street between Southwest Manning Street and Duwamish Avenue South	0	0	4	7	1	12
Duwamish	Southwest Spokane Street between West Marginal Way Southwest and 11th Avenue Southwest	0	1	10	11	1	23
Duwamish	West Seattle Bridge (eastbound) between Alaskan Way Viaduct northbound on-ramp and 1st Avenue South	0	0	6	13	0	19

Segment	Location [a]	Fatal Collision	Serious Injury Collision	Injury Collision	Property Damage Only Collision	Unknown Collisions	Total Collisions
Duwamish	West Seattle Bridge (eastbound) between Alaskan Way Viaduct (northbound) on-ramp and West Seattle Bridge eastbound on-ramp from Delridge Way South	0	0	9	46	1	56
Duwamish	West Seattle Bridge (eastbound) between West Seattle Bridge eastbound 4th Avenue South off-ramp and 1st Avenue South off-ramp	0	1	1	16	0	18
Duwamish	West Seattle Bridge (westbound) between 1st Avenue South and Alaskan Way Viaduct	0	0	5	5	0	10
Duwamish	West Seattle Bridge (westbound) between 4th Avenue South and 1st Avenue South	0	0	5	4	0	9
Duwamish	West Seattle Bridge (westbound) between Alaskan Way Viaduct southbound West Seattle Bridge westbound off-ramp and West Seattle Bridge westbound-Chelan off-ramp	0	0	5	29	0	34
Delridge	Delridge Way Southwest between 23rd Avenue Southwest and West Marginal Way Southwest	0	0	3	12	2	17
Delridge	Delridge Way Southwest between Southwest Andover Street and Southwest Dakota Street	0	0	7	1	0	8
Delridge	Delridge Way Southwest between Southwest Dakota Street and Southwest Genesee Street	0	0	1	12	0	13
Delridge	Southwest Avalon Way between Southwest Genesee Street and 35th Avenue Southwest	0	0	1	12	0	13

Segment	Location [a]	Fatal Collision	Serious Injury Collision	Injury Collision	Property Damage Only Collision	Unknown Collisions	Total Collisions
Delridge	West Marginal Way Southwest between Chelan Avenue Southwest and Southwest Marginal Place	0	0	4	7	1	12
West Seattle Junction	42nd Avenue Southwest between Southwest Alaska Street and Southwest Edmunds Street	1	0	2	10	0	13
West Seattle Junction	California Avenue Southwest between Southwest Edmunds Street and Southwest Alaska Street	0	1	2	10	0	13
West Seattle Junction	California Avenue Southwest between Southwest Hudson Street and Southwest Edmunds Street	1	0	3	9	0	13

[a] Locations are included within one block of the West Seattle Link Extension alignment/station areas.

7.3 Environmental Impacts

The transportation safety impacts of the project were assessed qualitatively for each alternative. This assessment takes into consideration the concept designs for the alternatives and how travel patterns, volume, and transportation network changes may affect conflicts and impact overall transportation safety. This also includes consideration of vehicles, pedestrians, and bicyclists, particularly focused on the preferred alternative in each segment and the areas surrounding stations.

In general, while activity in station areas would increase due to users accessing the light rail system, the project is expected to shift people from using non-transit modes to riding transit. Sound Transit is proposing pedestrian and bicyclist circulation improvements adjacent to stations, such as new connections or signals, both of which would potentially reduce conflicts in some locations. In general, these aspects of the project are likely to improve safety at or near the stations, which will be described in the following sections.

Safety is generally described in this section in terms of potential conflicts between modes (e.g., the number of pedestrians that might interact with motor vehicles). However, a variety of other factors that could influence safety could be considered at more advanced stages of design, including speed differential between users, improved visibility between users, and potential applications of shared space designs.

7.3.1 No Build Alternative

While background traffic volumes are expected to grow modestly under the 2042 no build condition, transportation safety is expected to be similar or better than existing conditions, as the City of Seattle completes transportation (including Vision Zero) projects within the corridor. Transportation projects in the study area assumed to be completed include the Fauntleroy Way Southwest Boulevard Project, 35th Avenue Southwest/Southwest Avalon Way Repaving Project (completed in 2020), the RapidRide H Line Project (completed in 2023), Delridge Multimodal Corridor Project (completed in 2022), West Marginal Way Southwest Safety Corridor Project (completed in 2023), East Marginal Way Corridor Improvement Project, Lander Street Bridge Project (completed in 2020), as well as planned bicycle and greenway improvements.

The Fauntleroy Way Southwest Boulevard Project would reconfigure the street cross-section on Fauntleroy Way Southwest, also a high crash corridor, with bicycle lanes and a raised median, which also have the potential to reduce collisions or their severity. The Southwest Avalon Way and 35th Avenue Southwest Project would redesign Southwest Avalon Way by adding protected bicycle lanes, removing the center turn lane while maintaining the transit lane, and improving parking and pedestrian facilities. The RapidRide H Line Project includes improvements to Delridge Way Southwest that have the potential to reduce crashes, crash severity, or both by providing non-motorized facilities (for example, bicycle greenways and signalized crossings) on a high crash corridor. The Delridge Multimodal Corridor Project improved pavement conditions, enhanced safety, and improved traffic operations for all modes along Delridge Way Southwest. The West Marginal Way Southwest Safety Corridor Project installed a two-way protected bicycle lane and updated adjacent driveways with signage and pavement markings. The East Marginal Way Corridor Improvement Project would add a two-way protected bicycle lane to East Marginal Way South from South Atlantic Street to South Spokane Street as well as add a new multi-use path between Duwamish Avenue South and 1st Avenue South. The Lander Street Bridge Project includes a bridge over the BNSF mainline railroad with pedestrian and bicycle facilities, intersection improvements, Intelligent Transportation System elements to improve signal operations, and other infrastructure enhancements.

Beyond these planned improvements, the City routinely conducts Vision Zero progress reports to assess previous projects and identify prioritized locations for future projects. Therefore, it is expected that beyond the projects identified above, the City would deliver additional projects to improve the safety of the transportation system prior to the project being built.

7.3.2 Build Alternatives

7.3.2.1 Long-term Impacts

Impacts Common to All Alternatives

While most of the project alignment would be adjacent to or along City of Seattle-designated high crash corridors, the safety of the transportation system is expected to be minimally affected by the project or improve because of the following:

- Light rail alternatives would all be grade-separated and operate in exclusive rights-of-way, with no new direct conflicts with vehicles, pedestrians, or bicyclists.
- Light rail design would adhere to both light rail and roadway standards to minimize impacts on transportation safety.
- People would shift from driving to riding transit, a safer travel mode.
- Station access improvements (such as proposed signaled crossings) would be implemented.

Overall, the project would eliminate about 17,000 vehicle miles traveled per day by shifting trips to transit from driving and other non-transit modes. According to the American Public Transportation Association (American Public Transportation Association 2018), transit is safer than driving on a per-mile basis, so this shift would have an inherent safety benefit.

A large majority of project riders would walk, bike, or take transit to stations, with pick-up/drop-off representing between 2 percent and 11 percent of total boardings, depending on the station and alternative. Therefore, only small increases in daily vehicle traffic around stations can be expected, suggesting that the project's impact on safety due to additional vehicular volumes would be negligible. The light rail design would adhere to both light rail and roadway standards to minimize impacts on transportation safety. Pedestrian and bicyclist activities are expected to increase between 450 and 2,500 additional pedestrian and bicyclists per day around each station. While this increase in activity would create the potential for more conflicts near stations, Sound Transit is proposing pedestrian and bicycle improvements adjacent to the stations to provide access at signalized or controlled locations and, in some instances, grade-separated crossings. Beyond the station improvements, increased non-motorized activity can also improve driver expectations (i.e., drivers expecting pedestrians and bicyclists to be present) and reduce collision severity because of reduced speeds. All stations would be designed to include appropriate non-motorized facilities to accommodate this expected level of activity and be coordinated with the City of Seattle.

SODO Segment

Preferred Option SODO-1c

With Preferred Option SODO-1c, the guideway would be within the SODO Busway right-of-way and separated from general purpose traffic. Buses would no longer use the SODO Busway, which would become a rail-only facility with this alternative. As part of the project's transit integration plan (see Appendix B, Transit Service Integration Technical Memorandum, in Attachment N.1A, Transportation Technical Analysis Methodology Report), five of the seven bus routes currently using the SODO Busway would be truncated or eliminated, and the other two would shift to 4th Avenue South. Therefore, the additional bus traffic on nearby streets with the SODO Busway transition to a rail-only facility is not expected to be substantial. Some shifts to pedestrians' exposure to traffic may occur because of bus stops shifting to 4th Avenue South, with some riders (i.e., those coming from the east) needing to cross 4th Avenue South for a round trip, while others (those coming from the west) having one fewer crossing of 4th Avenue South. Therefore, the net change to rider safety is expected to be minimal.

A roadway overcrossing at South Lander Street would separate the proposed West Seattle Link Extension and the existing 1 Line light rail tracks from South Lander Street traffic, thus eliminating rail conflicts with crossing vehicles, pedestrians, and bicyclists. Also, no portion of the guideway would be within the roadway in this segment; therefore, the guideway would not impact vehicle safety.

South Bayview Street between 5th Place South and 6th Avenue South, and 5th Place South between South Lander Street and South Bayview Street would be permanently closed under Preferred Option SODO-1c. These closures are not expected to have an impact on safety in the area as these routes operate as secondary access points to businesses and do not provide connectivity for vehicular or non-motorized traffic outside of these access points.

Pedestrian and bicyclist interactions under Preferred Option SODO-1c would be comparable or better than under the no build condition. Non-motorized volumes in the area are expected to increase by about 450 trips per day, and while by themselves higher volumes can create the potential for increased conflict, project design treatments would offset that effect. From the

south, access would be provided via the South Lander Street overpass, which would improve safety by eliminating the need for pedestrians to cross the train tracks at-grade, as is the case today. The conceptual design for the South Lander Street overpass includes a bicycle facility separate from vehicle traffic on South Lander Street, and limits pedestrian exposure by reducing crossing distance across South Lander Street. Therefore, the project is not expected to cause net adverse safety impacts at this location.

According to the Seattle Department of Transportation's *Vision Zero 2019 Update* document (City of Seattle 2019), the SODO Segment contains roadway sections that are high-priority streets, with a high density of collisions and frequency of serious injury and fatal crashes. The high-priority streets in this segment are South Spokane Street from the West Seattle Bridge to 4th Avenue South, Alaskan Way Viaduct from South Spokane Street to South Hinds Street, 1st Avenue South from South Dakota Street to South Horton Street, 4th Avenue South from South Spokane Steet to South Horton Street, and South Lander Street from 4th Avenue South to 6th Avenue South. Of those corridors, the only street that would experience a substantive increase in pedestrian activity due to the project would be South Lander Street, where users could access the station via the new overpass; the safety implications of this are discussed in the previous paragraph. Changes in safety along all other high-priority streets in the SODO Segment are expected to be negligible. Top priority locations from the Seattle Department of Transportation's *Vision Zero 2019 Update* and collision locations from this safety analysis differ due to variations in study period years and study geography area.

Other Build Alternatives (SODO-1a, SODO-1b, and SODO-2)

Alternative SODO-1a would be the same as Preferred Option SODO-1c except for the SODO Station access. The station would include the South Stacy Street cul-de-sac to the west and would not include an access point at South Lander Street. This would lower pedestrian traffic and conflicts at South Lander Street but could potentially increase pedestrian issues at other access points. Access at 6th Avenue South would remain the same as Preferred Option SODO-1c.

Transportation safety issues and impacts with Option SODO-1b are expected to be similar to Alternative SODO-1a because the South Lander Street overcrossing would also be constructed as part of this alternative, the SODO Busway would be eliminated, and no portion of the existing or new guideway would be within the roadway.

With Alternative SODO-2, buses would continue to operate in the SODO Busway. No portion of the guideway would be within the general purpose roadway system in the segment, so the guideway would not impact vehicle safety. This option would be elevated over South Lander Street and would not create any additional at-grade rail crossings. Existing rail and bus traffic would still have an at-grade signalized crossing at South Lander Street.

Duwamish Segment

About half of the top collision locations identified in Section 7.2, Affected Environment, are within the Duwamish Segment, but none of the alternatives would affect vehicular or non-motorized safety in the segment because the guideway would be elevated, grade-separated, and outside of the roadway for the entirety of the segment. The project would ensure adequate lateral clearance from the guideway columns to any travel lanes. The alternatives in this segment do not include a station.

South Hinds Street would be permanently closed between 4th Avenue South and the SODO Busway under Alternative DUW-2. South Hinds Street serves as a secondary business

access/driveway at this location, does not provide a through route for vehicles or non-motorized users, and is not anticipated to affect vehicular or non-motorized user safety.

According to the Seattle Department of Transportation's *Vision Zero 2019 Update,* the Duwamish Segment contains no roadway sections that are high-priority streets with a high density of collisions and frequency of serious injury and fatal crashes. Top priority locations from the *Vision Zero 2019 Update* and collision locations from this safety analysis differ due to variations in study period years and study geography area.

Delridge Segment

Preferred Option DEL-6b

Preferred Option DEL-6b would be on an elevated guideway on the west side of Delridge Way Southwest, south of Southwest Andover Street. The alignment would travel west along the north side of Southwest Yancy Street on an elevated guideway, then cross Southwest Avalon Way in the vicinity of Southwest Yancy Street. Preferred Option DEL-6b would cross 32nd Avenue Southwest at-grade, which would result in the permanent closure of a portion of 32nd Avenue Southwest and the construction of cul-de-sacs on the street to the north and south.
Sound Transit is considering options to provide a pedestrian connection from Southwest Andover Street to 32nd Avenue Southwest south of the cul-de-sac; however, it is unknown if a connection would be feasible until final design. If a pedestrian connection cannot be maintained, then non-motorized users would likely divert to Southwest Avalon Way, where there are higher numbers of vehicle-pedestrian conflicts.

Preferred Option DEL-6b would add a traffic signal at the intersection of Delridge Way Southwest and 23rd Avenue Southwest to facilitate vehicle access and pedestrian crossings into the station area and Nucor Steel. Bus stops would be along the station frontage, which would allow riders to transfer between bus and rail without needing to cross a street.
The addition of the new signal to the current free-flow traffic on Delridge Way Southwest could result in an increase in rear-end crashes. However, it would potentially improve the severity of crashes for all modes at this location, and particularly has the potential to reduce vehicle versus vehicle angle collisions (the collision type most commonly associated with injuries and fatalities [National Safety Council 2023]) and vehicle versus pedestrian crashes. Pedestrian safety would improve because the new signal would provide a protected crossing.

The Delridge Station would generate approximately 500 new daily pedestrian and bicycle trips, thus creating the potential for increased conflicts near the station. However, the station would be designed to accommodate this level of activity, and station access would be at signalized and/or controlled locations.

Before the opening of the Ballard Link Extension, which would connect the West Seattle Link Extension directly to the existing light rail system, King County Metro (Metro) would continue to operate some bus routes into Downtown Seattle and would use the existing bus stops on Delridge Way Southwest. Therefore, there would be a multi-year period during which riders transferring between bus and light rail would have to cross two roadways during their transfer, thus increasing the potential for vehicle-pedestrian conflicts. The number of riders making the transfer would be substantially less (approximately 40 peak hour riders) relative to the 2042 condition when the Sound Transit 3 light rail system expansion would be complete.

According to the Seattle Department of Transportation's *Vision Zero 2019 Update*, Southwest Avalon Way from Southwest Spokane Street to Fauntleroy Way Southwest is a high-priority street, with a high density of collisions and frequency of serious injury and fatal crashes. Traffic volumes along this high-priority street could potentially increase because of diverted

traffic from 32nd Avenue Southwest, which would be dead-ended as part of the project; however, the overall safety impact is expected to be negligible. Note that the Seattle Department of Transportation's Vision Zero priority corridors and the high-collision locations identified by this safety analysis are not identical due to a difference in study period years and geographic area.

Other Build Alternatives (DEL-1a, DEL-1b, DEL-2a, DEL-2b, DEL-3, DEL-4, DEL-5, DEL-6a, and DEL-7)

With Alternative DEL-1a, Option DEL-1b, Alternative DEL-2a, Option DEL-2b, Alternative DEL-3, and Alternative DEL-4, the elevated guideway would be outside of or adjacent to the roadway except for a few locations where it crosses from one side to the other. This would place a guideway column in the median of Southwest Genesee Street. The project would ensure adequate sightlines and lateral clearance to any travel lanes, including to and from the Nucor Steel property, to minimize impacts. Safety impacts due to guideway columns outside of the roadway would be minimal to none.

25th Avenue Southwest south of Southwest Dakota Street would be permanently closed with Alternative DEL-2a and Option DEL-2b, and 30th Avenue Southwest north of Southwest Genesee Street would be permanently closed with Option DEL-2b. Both of these streets serve as residential/local streets with limited through traffic. Motorized and non-motorized traffic has similar facilities on 26th Avenue Southwest, which includes marked and signed bike routes, and on 28th Avenue Southwest, with detours of 300 feet and 600 feet, respectively. There would be little anticipated impact on safety with these closures because of the proximity of alternative routes with similar or better facilities. Otherwise, Alternative DEL-2a, Option DEL-2b, Alternative DEL-3, and Alternative DEL-4 would all have similar transportation safety issues and impacts as Alternative DEL-1a.

Alternatives DEL-5 and DEL-6a are similar to Preferred Option DEL-6b except that rather than being aligned with the north side of Southwest Yancy Street, these alternatives would be in line with Southwest Andover Street. Overall, these two alternatives along with Alternative DEL-7 would have impacts similar to Preferred Option DEL-6b in the Delridge Segment.

West Seattle Junction Segment

Preferred Option WSJ-5b

Preferred Option WSJ-5b would begin in a retained cut along the east side of the West Seattle Bridge connection north of Southwest Genesee Street, then cross under 35th Avenue Southwest south of Fauntleroy Way Southwest and under the intersection of Southwest Avalon Way and Fauntleroy Way Southwest before entering a tunnel at approximately 37th Avenue Southwest. This option would not place any guideway columns in the roadway or cause other physical impacts.

The Preferred Option WSJ-5b Avalon Station is expected to generate a small increase in daily vehicle traffic around the station location; the impact to vehicle safety is expected to be negligible. Pedestrian and bicyclist daily volumes are expected to increase from approximately 900 daily trips in the no build condition to approximately 1,800 daily trips. This doubling of trips is expected to have a negligible impact on safety around the station area because there is not a history of pedestrian and bicycle crashes in this location, the project components would be built to local and federal design standards, and the predicted pedestrian level of service would be at acceptable levels (see Chapter 6, Non-motorized Facilities). Southwest Genesee Street would be permanently closed to through vehicle movements from 35th Avenue Southwest, but

pedestrians would still be able to follow that route via the station area, so it is not anticipated that the closure would encourage jaywalking or other unsafe pedestrian movements.

At the underground Alaska Junction Station, there would be an increase in pedestrian and bicycle volumes on the surrounding transportation system from approximately 1,300 daily trips in the no build condition to approximately 3,800 daily trips. This is in addition to the already active West Seattle Junction area, which would increase the potential for conflicts around the station area. However, the Alaska Junction Station area would be designed to accommodate this level of activity, and station access would be at signalized or controlled locations, including a new signal at Southwest Alaska Street and 41st Avenue Southwest. There would also be entrances on both sides of Southwest Alaska Street to avoid the need for riders to cross this street. Although pedestrian and bicyclist volumes are expected to increase at this station location, the increase in conflicts would be relatively small compared to the number of conflicts already experienced in this urban environment.

According to the Seattle Department of Transportation's *Vision Zero 2019 Update,* Southwest Oregon Street from Fauntleroy Way Southwest to Glenn Way Southwest is a high-priority street with a high density of collisions and frequency of serious injury and fatal crashes. Safety impacts for this high-priority roadway are expected to be negligible due to no major changes to the expected volume or facility in this segment. Note that the Seattle Department of Transportation's Vision Zero priority corridors and the high-collision locations identified by this safety analysis are not identical due to a difference in study period years and geographic area. Seven of the highest-collision locations identified in Section 7.2 are adjacent to the Alaska Junction Station area for Preferred Option WSJ-5b. However, as with the Avalon Station, the small increase in daily vehicle traffic around the station would be likely to have a negligible impact on vehicle safety.

Other Build Alternatives (WSJ-1, WSJ-2, WSJ-3a, WSJ-3b, WSJ-4, WSJ-5a, and WSJ-6)

Alternatives WSJ-1 and WSJ-2 would have similar transportation safety issues and impacts as Preferred Option WSJ-5b in terms of station activity levels and lack of conflicts with motorized vehicles. However, unlike Preferred Option WSJ-5b, Alternatives WSJ-1 and WSJ-2 would require the placement of guideway columns to support portions of the elevated guideway. These columns would adhere to design standards and be outside of the vehicle travel lanes, and thus would not be expected to introduce a safety hazard.

The transportation safety impacts of Alternative WSJ-2 would also be similar to Preferred Option WSJ-5b, except that the Alaska Junction Station along Fauntleroy Way Southwest would be in an area with lower background pedestrian volumes. However, about a dozen of the top collision locations identified in Section 7.2 are near the Alaska Junction Station with Alternative WSJ-2. Design of the station and alignment through this area would adhere to City of Seattle roadway standards, consider the collision history, and include potential applicable roadway treatments to minimize the conflicts.

The daily increase in non-motorized trips for Alternative WSJ-2 would be about the same as for Preferred Option WSJ-5b; however, the station would be closer to the major arterials (Fauntleroy Way Southwest and Southwest Alaska Street) and may have greater potential for intermodal conflicts. The station would be designed to include appropriate non-motorized facilities to accommodate this expected level of activity and coordinated with the City.

Alternative WSJ-3a, Option WSJ-3b, Alternative WSJ-4, Alternative WSJ-5a, and Alternative WSJ-6 would have transportation safety issues and impacts similar to Preferred Option WSJ-5b because all would be underground or mostly underground, have similar station locations and similar vehicular and non-motorized volumes around the stations. Unlike the preferred option,

Alternative WSJ-4 would permanently close 37th Avenue Southwest between Southwest Genesee Street and Fauntleroy Way Southwest, and 38th Avenue Southwest north of Southwest Oregon Street. This would result in pedestrian and vehicular volumes being displaced to 39th Avenue Southwest, but it is not expected to negatively impact safety due to the short reroute distance traveled.

7.3.2.2 Construction Impacts

With each of the Build Alternatives, traffic diversion caused by light rail construction would be required. These diversions would be focused on arterials, where feasible.

Refer to Section 4.3.3, Construction Impacts, for details on the location and duration of each closure for the Build Alternatives. The following sections highlight roadways that are expected to have long-term closures, with access or travel pattern changes that could affect the safety of the transportation system.

Impacts Common to All Alternatives

The potential roadway closures and traffic diversions during construction could increase traffic volumes and the potential for conflicts and collisions on adjacent streets and alternative routes, as drivers would be required to navigate unfamiliar routes and roadway configurations. Consistent with City of Seattle regulations, construction and construction traffic management plans would be prepared in consultation with the City during the project final design and construction phases. These traffic plans would include appropriate detours, signage, flagger control, and driver education and would actively manage traffic during this period, limiting the potential for increased conflict. Also, overall volumes in the area would be similar. Site-specific conditions may have impacts, as noted for each segment in the following sections.

In locations where there would be no physical change to the roadway (i.e., volume changes only), the types of collisions would likely remain similar to existing conditions. Currently, most collisions in the study area are property damage only. Signing and advanced communication of any changes to travel patterns and detours would minimize the potential safety impacts and be addressed in the Construction Access and Traffic Management Plan. This plan would be developed based on the Federal Highway Administration *Manual on Uniform Traffic Control Devices* (Federal Highway Administration 2009) and Seattle Department of Transportation *Traffic Control Manual* (City of Seattle 2018). Items that would be included are described in Section 4.4.2, Construction Mitigation.

Access modifications (such as right-in, right-out) and left-turn restrictions at intersections could be imposed in construction areas where necessary to reduce conflicts.

Some sidewalks, crosswalks, and bicycle facilities could be closed temporarily during construction. Detours would be provided where feasible and appropriately designed and marked to encourage compliance. This could temporarily modify trips to these other routes. Some closures may divert bicyclists away from dedicated facilities to shared facilities, and Sound Transit would coordinate with the City of Seattle to identify appropriate alternative facilities.

SODO Segment

Preferred Option SODO-1c

The long-term full closure of South Lander Street between 4th Avenue South and 6th Avenue South under Preferred Option SODO-1c would redistribute traffic to parallel routes such as South Holgate Street and South Spokane Street. This would likely have a mixed impact on

safety because collisions are related to traffic volumes. While specific streets may see a change in safety impacts (increase or decrease), it is likely that there would be negligible overall safety impact within the SODO Segment because the total traffic volumes in the area are not expected to change.

During construction, pedestrians would be detoured to a temporary connection south of South Lander Street to connect between 4th Avenue South and 6th Avenue South. The connection would be parallel to South Lander Street along a nearby east-west path where practical. If this connection is temporarily closed for short periods during construction, non-motorized users would need to find alternate east-west routes, which may require additional crossings and more exposure to potential conflicts. The SODO Trail would be temporarily closed, which would require pedestrians and bicyclists to divert to a new non-motorized facility on 6th Avenue South to be developed in partnership with the City of Seattle prior to the trail closure. Depending on the selected design, this detour could increase users' exposure to, and potentially conflicts with, vehicles.

Other Build Alternatives (SODO-1a, SODO-1b, and SODO-2)

Alternative SODO-1a and Option SODO-1b would have construction impacts comparable to Preferred Option SODO-1c. The closure of South Lander Street for Alternative SODO-2 would be limited to nights and weekends, thus reducing disruption to vehicular and non-motorized conflicts. Also, the SODO Busway would be closed for multiple years under Alternative SODO-2, as opposed to permanently under the other Build Alternatives. Some shifts to pedestrians' exposure to traffic could occur as a result of bus stops shifting to 4th Avenue South: some walk-access riders (i.e., those coming from the east) would need to cross 4th Avenue South for a round trip, while others (those coming from the west) would make one fewer crossing of 4th Avenue South. Therefore, the net change to rider safety is expected to be minimal.

Duwamish Segment

Preferred Alternative DUW-1a

At the Spokane Street Viaduct, 4th Avenue South would be partially closed for multiple years, which would result in a combined estimated 200 to 300 vehicles being diverted during the peak hour to 6th Avenue South and 1st Avenue South. These vehicular diversions are not anticipated to substantially affect safety conditions due to multiple potential diversion routes and similar roadway attributes among 1st, 4th, and 6th Avenues South. Pedestrians would be required to navigate sidewalk closures (one side of the street at a time), necessitating additional roadway crossings. Depending on their destination, pedestrians may have to cross 4th Avenue South twice to detour. These additional crossings would add two potential conflict locations with vehicles during construction. Vehicles would be detoured to one side of the roadway to allow a partial closure of the other side using temporary barriers, signage, and signals as appropriate for construction zones.

All lanes of Southwest Marginal Place, a low-volume local access street, would be closed for multiple years for construction of the guideway, where the new light rail bridge would cross the roadway. No detours are assumed because this is a dead-end street. Southwest Charlestown Street and 18th Avenue Southwest would not be affected, with the closure of Southwest Marginal Place beginning just north of Southwest Charlestown Street. The street closure is not expected to substantially affect safety, as this is a dead-end street that provides local access only, and no additional conflicts would be introduced.

Also closed for this time would be the staircase through the West Duwamish Greenbelt between Southwest Charlestown Street and Southwest Marginal Place and the Southwest Marginal Place connector trail to the West Seattle Bridge Trail. Pedestrians who must detour during the staircase closure would have to travel a longer distance and encounter more vehicle conflicts on facilities along the roadway. During some periods, non-motorized users could be detoured to the sidewalk on the west side of West Marginal Way Southwest or the planned pedestrian path of the east side of West Marginal Way Southwest (scheduled to be constructed in 2024) to connect to the West Seattle Bridge Trail at the intersection with Chelan Avenue Southwest. However, the west side facility is a relatively narrow sidewalk with no barrier to adjacent traffic. Moreover, there may be periods of construction when the sidewalk on the west side of West Marginal Way Southwest and the planned pedestrian path of the east side of West Marginal Way Southwest are closed concurrent with the Southwest Marginal Place closure. Due to the limited street network and topographical constraints, pedestrian and bicycle travel on existing facilities may not be possible during those times. Sound Transit would continue to consider alternative means to transport pedestrians and bicycles through the corridor.

Under Preferred Alternative DUW-1a, the Delridge Connector Trail from Delridge Way Southwest to the West Seattle Bridge Trail would be rerouted during construction. Rather than run along the east side of Delridge Way Southwest, the trail would be detoured along the 23rd Avenue Southwest pathway on the west side of Delridge Way Southwest (starting at roughly Southwest Charlestown Street). The 23rd Avenue Southwest pathway would connect to the trail on the north side of the West Seattle Bridge via a series of improvements Sound Transit is designing in coordination with the City of Seattle. This detour route would require non-motorized users to cross multiple roadways during construction, which would introduce new conflict locations with vehicles.

The 22nd Avenue Southwest connection to the Delridge Connector would also be temporarily closed. Bicyclists would be detoured via Southwest Andover Street and 23rd Avenue Southwest, where they could use the new signal at Delridge Way Southwest and 23rd Avenue Southwest to access the detour route. This detour route would require non-motorized users to cross multiple roadways during construction, which would introduce new conflict locations with vehicles. The detour route and associated treatments to provide safe crossings for users are being designed in coordination with City of Seattle.

Navigation-related safety concerns are discussed in Chapter 8, Navigation.

Other Build Alternatives (DUW-1b and DUW-2)

There would be no major (greater than 1 year) roadway construction closures under Option DUW-1b and Alternative DUW-2. All closures would be limited to nights and weekends or less than 1 year in duration. However, South Hinds Street (a dead-end street) would be permanently closed between 4th Avenue South and the SODO Busway under Alternative DUW-2 (see Section 7.3.2.1, Long-term Impacts). Option DUW-1b would have the same effects on the Delridge Connector Trail and staircase through the West Duwamish Greenbelt as Preferred Alternative DUW-1a.

Navigation-related safety concerns are discussed in Chapter 8.

Delridge Segment

Preferred Option DEL-6b

Roadway closures under Preferred Option DEL-6b would be short in duration and/or limited to nights and weekends. Therefore, safety impacts are expected to be negligible. Preferred Option

DEL-6b would require permanent closure of 32nd Avenue Southwest, as described in Section 7.3.2.1.

Other Build Alternatives (DEL-1a, DEL-1b, DEL-2a, DEL-2b, DEL-3, DEL-4, DEL-5, DEL-6a, and DEL-7)

Several local streets and arterials would experience multi-year construction closures under the other Delridge Segment alternatives, including the following (for a full list of construction-related closures, see Attachment N.1D, Permanent and Temporary Transportation Facility Closures):

- Under Alternative DEL-1a and Option DEL-1b, 25th Avenue Southwest south of Southwest Dakota Street would be closed for multiple years (and permanently closed under Alternative DEL-2a and Option DEL-2b). Alternative routes would be available less than 250 feet to the east and west of the closure and is expected to have a minimal impact on safety.
- Southwest Genesee Street between 26th Avenue Southwest and 32nd Avenue Southwest would be closed for multiple years under Alternative DEL-1a, Option DEL-1b, and Alternative DEL-3. This would reroute vehicular traffic along Southwest Andover Street, Southwest Avalon Way, and Southwest Yancy Street. Vehicular traffic making a through or left movement at the Southwest Genesee Street/Southwest Avalon Way intersection, which currently has a traffic signal to protect movements against north-south traffic, would have to navigate a stop-controlled intersection at Southwest Yancy Street. Pedestrian and bicyclists would be exposed to more traffic on Southwest Yancy Street as a result of this diversion, but existing infrastructure, including protected bicycle lanes and pedestrian crossings with rectangular rapid flash beacons, would limit potential conflicts. There are no parallel routes to the south, and this closure would result in some out-of-direction travel for pedestrians.
- Delridge Way Southwest between 23rd Avenue Southwest and south of Southwest Dakota Street would be partially closed for multiple years under Alternatives DEL-3 and DEL-4; this would include closing the sidewalk on one side of the road at a time during construction. Pedestrians would need to cross during this time, and this would introduce new conflict points. Also under Alternative DEL-3 and DEL-4, there would be a full closure of Southwest Dakota Street between Delridge Way Southwest and 25th Avenue Southwest. This closure could improve intersection-related crashes at that location because it would temporarily eliminate a conflict point at Delridge Way Southwest and Southwest Dakota Street.
- Southwest Andover Street between 26th Avenue Southwest and 28th Avenue Southwest would be closed for multiple years under Alternatives DEL-5 and DEL-6a, resulting in the closure of a marked/unprotected bicycle facility and sidewalks. Pedestrians and bicycles would need to reroute approximately 1,300 feet to the south to Southwest Genesee Street along 26th Avenue Southwest and 28th Avenue Southwest; 26th Avenue Southwest is a neighborhood greenway with marked bicycle lanes and sidewalks. Traffic diversions along 26th Avenue Southwest would increase the exposure of bicycles to vehicles along the route.
- Southwest Avalon Way between Southwest Yancy Street/Southwest Andover Street and Southwest Genesee Street would fully close under Alternative DEL-5, including the protected bicycle lanes along that segment of road. Pedestrians and bicyclists could reroute to 32nd Avenue Southwest, which is approximately 300 feet to the west and is a low-volume, local street.

In general, these closures could increase traffic volumes on detour routes and potentially increase conflicts on those routes. For a list of potential detour routes refer to Section 4.3.3.

South of Southwest Dakota Street, 25th Avenue Southwest would be permanently closed under Alternative DEL-2a and Option DEL-2b, and 30th Avenue Southwest north of Southwest Genesee Street would be permanently closed under Option DEL-2b (see Section 7.3.2.1).

West Seattle Junction Segment

Preferred Option WSJ-5b

Preferred Option WSJ-5b would require the full closure of 35th Avenue Southwest between Southwest Avalon Way and Fauntleroy Way Southwest during construction. Northbound traffic on 35th Avenue Southwest would divert at Southwest Alaska Street and Southwest Avalon Way, which would substantially increase the number of left turns. The signal at Southwest Alaska Street already operates with a protected left-turn phase, which eliminates the conflict point between the northbound left and southbound through movements. With the closure of 35th Avenue Southwest, the 35th Avenue South/Southwest Avalon Way intersection would become a three-leg intersection during construction, with the northbound left turn becoming, in effect, a protected movement with no oncoming southbound traffic with which to conflict. Southbound traffic would be accommodated along Fauntleroy Way Southwest. The southbound through/right movement on 35th Avenue Southwest could be converted to a left/right lane, which would improve flow during the closure and reduce the need for upstream lane positioning. Northbound pedestrians and bicyclists would be diverted approximately 300 feet along Southwest Avalon Way to Fauntleroy Way Southwest, while southbound pedestrians and cyclists would be diverted directly along Fauntleroy Way Southwest. Fauntleroy Way Southwest has equivalent pedestrian facilities to 35th Avenue Southwest, with buffered sidewalks, although there are no bicycle lanes. Southwest Avalon Way has sufficient sidewalks and buffered bicycle lanes. Therefore, the closure is expected to have a minimal impact on safety.

The intersection of Fauntleroy Way Southwest and Southwest Avalon Way would experience partial closures for 9 months to 18 months and would be phased to avoid coinciding with the closure of 35th Avenue Southwest. Multiple potential detours could be implemented, such as either keeping one lane open in either direction on Fauntleroy Way Southwest or making traffic one-way southbound on Fauntleroy Way Southwest, with a one-way couplet on Southwest Avalon Way and 35th Avenue Southwest to accommodate northbound traffic. With appropriate signing, destination guidance, and detour communications, neither partial closure strategy is estimated to substantially impact safety.

Westbound vehicular traffic diversions on Southwest Avalon Way would use existing protected left turns at 35th Avenue Southwest/Southwest Avalon Way and Southwest Alaska Street/Fauntleroy Way Southwest with similar facility types as diversions, which is expected to have minimal impact on safety conditions. Northbound vehicular traffic diversions on Fauntleroy Way Southwest would use Southwest Alaska Street and 35th Avenue Southwest, including the three-leg intersection with protected left (westbound to northbound) movements at Southwest Alaska Street and similar facility types at 35th Avenue Southwest; this is expected to have minimal impacts on safety conditions. Depending on their destination, pedestrians might have to make additional crossings on Fauntleroy Way Southwest or Southwest Avalon Way to reroute past closed sidewalks. These additional crossings would add potential conflict locations with vehicles during construction.

There would be a multi-year full closure along 41st Avenue Southwest from north of Southwest Alaska Street to Southwest Hudson Street. The staircases along Southwest Hudson Street on either side of 41st Avenue Southwest would be closed during project construction. Pedestrians would detour approximately 300 feet to either 40th Avenue Southwest or 42nd Avenue Southwest, which are both residential streets (like 41st Avenue Southwest) with similar sidewalk facilities. As 40th, 41st, and 42nd avenues all have similar intersection configurations with crossroads and similar roadway designs, these detours would be likely to have minimal impacts on vehicular and non-motorized safety.

Other Build Alternatives (WSJ-1, WSJ-2, WSJ-3a, WSJ-3b, WSJ-4, WSJ-5a, and WSJ-6)

The multi-year full closure of 36th Avenue Southwest between Southwest Genesee Street and Fauntleroy Way Southwest would occur with Alternatives WSJ-1, WSJ-2, and WSJ-3a and Option WSJ-3b. This 100-foot section of street only provides a connection for vehicles turning right onto southbound Fauntleroy Way Southwest, which could be served at several parallel routes. Similarly, non-motorized traffic has multiple alternative routes that provide similar facilities to 36th Avenue Southwest. This closure is not anticipated to impact traffic safety due to the limited use and easily accessible alternative routes.

The multi-year full closure of Southwest Alaska Street between 38th Avenue Southwest and Fauntleroy Way Southwest with Alternative WSJ-2 would divert vehicles to adjacent arterial streets where feasible. This would result in similar impacts as under Preferred Option WSJ-5b because the diversions would be similar to those accommodating closures on Fauntleroy Way Southwest and 35th Avenue Southwest under the preferred option. During the periods when pedestrians would not be allowed on Southwest Alaska Street, the nearest alternative route would be 38th Avenue Southwest and Fauntleroy Way Southwest. Pedestrians would have access to sidewalks for alternative routes, but bicycles would be shifted from the buffered bicycle lane on Southwest Alaska Street to Fauntleroy Way Southwest, which has no dedicated or shared bicycle lanes (north of Alaska), or 39th Avenue Southwest.

The full closure of 35th Avenue Southwest and the partial closure of Fauntleroy Way Southwest with Alternative WSJ-3a and Option WSJ-3b would also divert vehicles and non-motorized users to adjacent arterial streets where feasible and have similar impacts as Preferred Option WSJ-5b. The additional multi-year full closure of Southwest Genesee Street between Fauntleroy Way Southwest and 37th Avenue Southwest with Alternative WSJ-3a (only when connecting to Option DEL-2b) would divert vehicles and non-motorized users to similar facilities and is not expected to impact safety.

From north of Southwest Alaska Street to Southwest Hudson Street, 41st Avenue Southwest would be closed under Alternatives WSJ-3a, WSJ-4, WSJ-5a, and WSJ-6, with the same effects as those discussed for Preferred Option WSJ-5b.

Option WSJ-3b would include a multi-year full closure of 42nd Avenue Southwest between north of Southwest Alaska Street and Southwest Hudson Street and associated intersections of 42nd Avenue Southwest with Southwest Edmunds Street and Southwest Hudson Street. This closure would be instead of the closure of 41st Avenue Southwest with Preferred Option WSJ-5b. The impacts of the 42nd Avenue Southwest closure would be similar to the impacts to the 41st Avenue Southwest closure for vehicles and non-motorized users.

Both Alternatives WSJ-4 and WSJ-5a would partially close Fauntleroy Way Southwest, similar to Alternative WSJ-3a and Option WSJ-3b. Alternative WSJ-5a would also require the full closure of 35th Avenue Southwest. Closures with Alternative WSJ-4 and Alternative WSJ-5a would have construction impacts similar to Preferred Option WSJ-5b.

Under Alternatives WSJ-3a, WSJ-4, WSJ-5a, and WSJ-6, the staircases along Southwest Hudson Street on either side of 41st Avenue Southwest would be closed during construction. Under Option WSJ-3b, Southwest Hudson Street would be closed to pedestrians and bicycles at 42nd Avenue Southwest. The closures are not anticipated to impact safety other than needing to reroute pedestrians along similar nearby facilities.

7.4 Potential Mitigation Measures

7.4.1 Long-term Impacts

The project includes roadway, transit, and pedestrian and bicyclist improvements and associated potential mitigation around the stations, including some grade-separated facilities to eliminate conflicts between modes, increase visibility, and reduce delay. These project elements and potential mitigation are described in the sections for transit (Chapter 3, Transit), arterials and local streets (Chapter 4, Arterial and Local Street Operations), and non-motorized facilities (Chapter 6).

Mitigation for impacts to traffic operations would be implemented as described in Chapter 4; however, there may be instances where congestion increases. This could have the effect of increasing the crash rate but lowering severity.

Potential mitigation measures for non-motorized facilities would be determined as the project design proceeds because the project is not currently expected to permanently affect existing designated pedestrian or bicycle facilities or routes. The project may have direct physical impacts on existing sidewalks and trails due to placement of guideway columns in the Duwamish and Delridge segments, and several streets in the Delridge and West Seattle Junction segments would be permanently closed potentially eliminating pedestrian and bicycle access at those locations. Depending on placement, columns could introduce visibility concerns between bicyclists and pedestrians and generally between non-motorized users and vehicles. Any impeded visibility reduces time to recognize potential conflicts and react, either in braking or otherwise maneuvering to avoid a conflict. As the project design is refined and potential column locations are identified with greater precision, additional pedestrian and bicycle visibility issues may emerge. These visibility issues could be addressed in the design with measures such as protected vehicle turns, restricting vehicle movements, signage, curb bulbs, crossing enhancements, and enhanced pavement markings.

Permanent street closures that would affect existing bicycle and pedestrian facilities are noted in Section 6.3.2.1, Long-Term Impacts. Alternative routes with similar or better facilities would be provided, where feasible, and as the project progresses pedestrian enhancements would be designed to avoid unintended driver and non-motorist behaviors. In the SODO Segment, the space underneath the South Lander Street overpass would be designed in accordance with Crime Prevention Through Environmental Design principles, including adequate lighting and open sightlines to adjacent spaces, to ensure pedestrian visibility and security. See Chapter 6 for more details about impacts and potential mitigation.

Beyond these improvements, the project would operate in exclusive right-of-way, separated from other modes of travel, and would be built to applicable design standards, such as those that determine the placement of guideway columns; therefore, no further mitigation specific to safety-related impacts is proposed beyond those improvements identified in other chapters of this Transportation Technical Report.

7.4.2 Construction Impacts

During construction, Sound Transit would develop a Maintenance of Traffic Plan to adhere to federal and local agency guidelines as described in Section 7.3.2.2, Construction Impacts, as well as to the measures described in Section 4.4.2. The Maintenance of Traffic Plan would be created to minimize safety concerns on the transportation system during construction.
The mitigation proposed in Section 3.4.2, Construction Impacts, for transit and Section 6.4.2, Construction Impacts, for non-motorized facilities would also be implemented to maximize safety. Therefore, no additional safety-related mitigation measures for the construction period are anticipated to be necessary.

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8 NAVIGATION

8.1 Introduction to Resource and Regulatory Requirements

This chapter discusses how the West Seattle Link Extension Project (the project) would affect navigation on navigable waterways. Navigable waterways are defined by the United States Coast Guard (Coast Guard) as waters subject to tidal influence, waterways with a history of substantial commercial navigation, waterways that presently have commercial navigation, or waterways susceptible to commercial development (Coast Guard 2011).

The Coast Guard has primary permitting authority related to navigation. The Coast Guard approves the locations and clearances of bridges through the issuance of bridge permits under the authority of Section 9 of the Rivers and Harbors Act, the General Bridge Act of 1946, and other statutes. A bridge permit is required for new construction, reconstruction, or modification of a bridge or causeway over navigable waters of the United States. The Coast Guard issues bridge permits after confirming that the other federal approvals as described below have been issued.

The United States Army Corps of Engineers (Corps) also has regulatory authority under Section 10 and Section 14 of the Rivers and Harbors Act of 1899. Section 10, codified in 33 United States Code Section 403, allows the Corps to require a permit for any construction, not just bridges, that would affect navigable waters. Section 14, codified in 33 United States Code Section 408 and referred to herein as Section 408, requires the Corps to review and approve proposed modifications to federally authorized Public Works to ensure that such proposed activities would not be injurious to the public interest or impair the usefulness of a federally authorized project. Federally authorized Public Works can include navigation Projects to improve the nation's waterways. Together, both agencies provide safe, reliable, and efficient waterborne transportation systems (e.g., channels, harbors, and waterways) for movement of commerce, national security needs, and recreation.

In addition to this Final EIS, Sound Transit prepared a navigation impact report for the Duwamish Waterway to support the Coast Guard bridge permitting process. Sound Transit submitted the navigation impact report to the Coast Guard in May 2021. On January 4, 2022, based on the findings in the navigation impact report, the Coast Guard issued a preliminary navigation clearance determination for any bridge Sound Transit would construct over the West Waterway as part of the project. The preliminary navigation clearance determination concluded that the vertical clearance must be a minimum of 140 feet and the horizontal clearance must be a minimum of 250 feet. The preliminary navigation clearance determination also requires that, for any bridge that needs in-water piers, those piers must line up with the current West Seattle Bridge piers to maintain the existing horizontal clearance of 250 feet through both the West Seattle Bridge and the project's bridge over the West Waterway (Coast Guard 2022).

8.2 Affected Environment

The study area for navigation analysis in the West Seattle Link Extension corridor extends 3 miles from the project. It includes across Elliott Bay (from the mouth of the Duwamish Waterway [also known as the Duwamish River] north to the Olympic Sculpture Park and around Duwamish Head to Alki Point), in Puget Sound (from Alki Point to Lincoln Park), and south along the Duwamish Waterway from Elliott Bay to the Corps Turning Basin 3 at Rivermile 6.2. Turning Basin 3 is the upstream extent of the Corps-maintained navigation channel in the waterway. A turning basin is a wider area of the waterway for vessels to turn around.

The Duwamish River is the only navigable waterway that would be crossed by the West Seattle Link Extension Project. It extends 12 miles from the Green River in Tukwila to Elliott Bay in Seattle. The portion of the Duwamish River in the study area is known as the Duwamish Waterway. In the study area, the Duwamish Waterway includes the Lower Duwamish, West, and East waterways. The Lower Duwamish Waterway extends 6 miles downstream or north from the Corps turning basin through the South Park, Highland Park, and Georgetown neighborhoods of Seattle to the south end of Harbor Island. The Duwamish Waterway then splits into the West Waterway and the East Waterway. The West Waterway includes the Harbor Island Reach that extends northwest from where the Lower Duwamish Waterway splits to where the West Waterway has been widened and flows north into Elliott Bay.

8.2.1 Waterway Users

Because the Duwamish Waterway has a primarily industrial and commercial shoreline, tugboats, barges, and cargo boats make up a large portion of the vessels that use it. Between 2015 and 2019, vessels that requested an opening of the Spokane Street (swing) Bridge on the West Waterway consisted of approximately 90 percent tugboats, 7 percent sailboats, 2 percent fishing or motor vessels, and 1 percent yachts, derricks, and commercial, government, research, or passenger vessels.

In addition, the Muckleshoot Indian Tribe is signatory to both the Treaty of Point Elliott and the Treaty of Medicine Creek. The Muckleshoot Indian Tribe has treaty-protected fishing rights and Usual and Accustomed Areas in the Puget Sound region, which includes the Duwamish Waterway. The Suquamish Tribe of the Port Madison Reservation (Suquamish Tribe) is signatory to the Treaty of Point Elliott and has treaty-protected fishing rights and Usual and Accustomed Areas in the Puget Sound region, which includes the Duwamish Waterway. Tribal fishing boats operate on the waterway, and the Tribal fishermen place fishing gear in traditional fishing locations. Tribal treaty-protected fishing peaks in mid- to late summer through late fall during annually established salmon and steelhead fishing seasons. The Muckleshoot Indian Tribe Fisheries Division enforcement vessels dock in the study area at Harbor Island Marina.

The Corps uses vessels such as a workboat with a crane or a standard clamshell dredge to maintain navigation channels by clearing debris and dredging. Barges may also be used to remove dredged material from the waterway, and other Corps vessels are used for hydrographic surveys to map the navigation channels.

The Seattle Police Harbor Patrol (Harbor Patrol) is on the north shore of Lake Union. While the headquarters and boat docks are outside the study area, Harbor Patrol operates on waterways within the study area, including Elliott Bay and the Duwamish Waterway. They provide marine law enforcement, rescue, fire response, and assistance.

Recreational pleasure boat traffic on the Duwamish Waterway occurs year-round but typically peaks in the summer months between Memorial Day and Labor Day. While recreational fishing boats stored outside the waterway may fish the waterway during salmon and steelhead seasons, most recreational vessel traffic occurs as recreational vessels make their way to and from their berths on the Duwamish Waterway. Based on the number of berths available at the four marinas on the waterway, approximately 430 recreational vessels are kept on the Duwamish Waterway.

8.2.2 Existing Vertical Clearances, Horizontal Clearances, and Hazards

A navigation channel is a deeper channel cut into a river bed to enable larger vessels to pass through to a port. Areas outside of the navigation channels are also used by vessels to access local facilities and maneuver, hold, or avoid other vessels. The Duwamish Waterway includes two navigation channels maintained by the Corps: one that includes the West Waterway and Lower Duwamish Waterway between Elliott Bay and the Corps turning basin, and another that comprises the East Waterway between Elliott Bay and the Spokane Street (fixed) Bridge. Because these navigation channels are maintained by the Corps, they are considered federal navigation Projects subject to Section 408 requirements.

Existing structures create horizontal or vertical restrictions to navigation. Ten existing bridges and five existing overhead cables cross the Duwamish Waterway in the study area, as listed in Tables 8-1 through 8-3. The Coast Guard has established guide clearances for the West Waterway of a 140-foot vertical clearance for fixed bridges and a 250-foot horizontal clearance for all types of bridges (Coast Guard 2017), which were matched in the preliminary navigation clearance determination, but the Coast Guard has not established guide clearances for the East Waterway.

When traveling from Elliott Bay, vessels can enter either the East or West waterways. In the East Waterway in the vicinity of the Spokane Street (fixed) Bridge, obstructions limit navigation under the bridge to vessels that can pass beneath a vertical clearance of 5 feet (National Oceanic and Atmospheric Administration [NOAA] 2019). In the West Waterway, vessels are restricted by the 140-foot vertical and 150-foot horizontal clearances of the West Seattle Bridge.

The Duwamish Waterway is tidally influenced. Some vessels must wait for certain tides to travel under the West Seattle Bridge, either sailing on a lower tide to meet the vertical clearance or sailing on a higher tide to have enough draft within the navigation channel. Other existing hazards to navigation include shoaling (sediment accumulation that creates shallow areas) at the edge of the navigation channels, submerged obstructions, and minimal room outside of the navigation channels to maneuver, hold, or avoid other vessels. Along the Harbor Island Reach, the areas available outside of the navigation channel are narrow and much shallower than the maintained depth of the channel.

Climate change projections suggest that sea level rise is very likely to affect the water level of the Duwamish Waterway. Under a high emissions scenario (Representative Concentration Pathway 8.5, the highest emissions scenario adopted by the Intergovernmental Panel on Climate Change), there is a 17 percent probability that sea level rise will exceed 3 feet and a 1 percent probability that it will exceed 5 feet by the year 2100 (Miller et al. 2018). If the sea level rises as projected, the vertical clearance of the existing and future aerial structures over the Duwamish Waterway would be reduced. It is reasonable to assume that the vertical clearance of the bridges and overhead cables across the Harbor Island Reach and East Waterway near the southern part of Harbor Island would be affected equally by future sea level rise.

Table 8-1. Existing Restrictions to Navigation in the Study Area – West Waterway

Structure	Approximate Rivermile	Type/Use	Vertical Clearance Closed/Open (feet) [a]	Horizontal Clearance Closed/Open (feet) [b]	Channel Depth (feet)	Waterway Width (feet) [c]
Overhead cable	1.28	Power	175	Unrestricted	40	450
Spokane Street (swing) Bridge	1.33	Moveable (swing)/road	44/Unrestricted	250	42	450
West Seattle Bridge	1.36	Fixed/road	140	150	42	450
BNSF Railway Duwamish Waterway Rail Bridge	1.45	Moveable (single-leaf bascule)/rail	7/Unrestricted	150	43	400

Sources: NOAA 2019; Corps 2020a, 2020b, 2020c.

[a] Vertical clearance in feet above mean high water; refers to the lowest clearance of the cable or bridge.

[b] Horizontal clearance refers to the width between bridge fenders or bridge protection on either side of a bridge opening.

[c] Width based on approximate measurements using aerial imagery.

Table 8-2. Existing Restrictions to Navigation in the Study Area – East Waterway

Structure	Approximate Rivermile	Type/Use	Vertical Clearance Closed/Open (feet) [a]	Horizontal Clearance Closed/Open (feet) [b]	Channel Depth (feet)	Waterway Width (feet) [c]
Pedestrian/ bicycle pier	1.30	Fixed/ multi-modal	5	16	8	390
Spokane Street (fixed) Bridge	1.31	Fixed/road	5	90	Unknown	390
West Seattle Bridge	1.34	Fixed/road	60	163	Unknown	390
Southwest Klickitat Way Bridge [d]	1.38	Fixed/road and rail	7	48	11	390
Overhead cable	1.38	Power	27	Unrestricted	11	230

Sources: NOAA 2019; Corps 2020a, 2020b, 2020c.

[a] Vertical clearance in feet above mean high water; refers to the lowest clearance of the cable or bridge.

[b] Horizontal clearance refers to the width between bridge fenders or bridge protection on either side of a bridge opening.

[c] Width based on approximate measurements using aerial imagery.

[d] The Southwest Klickitat Way Bridge across the East Waterway includes two structures for the railroad tracks and one for the two-lane roadway. However, this report considers the structures to be one bridge because they are intricately connected by metal grating and have the same vertical and horizontal clearances.

Table 8-3. Existing Restrictions to Navigation in the Study Area – Lower Duwamish Waterway

Structure	Approximate Rivermile	Type/Use	Vertical Clearance Closed/Open (feet) [a]	Horizontal Clearance Closed/Open (feet) [b]	Channel Depth (feet)	Waterway Width (feet) [c]
Overhead cable	1.95	Power	174	Unrestricted	35	760
Overhead cable	3.48	Power	160	Unrestricted	26	460
1st Avenue South Bridge (west)	3.56	Moveable (double-leaf bascule)/road	22 (39 at center)/ Unrestricted	145/120	30	890
1st Avenue South Bridge (east)	3.58	Moveable (double-leaf bascule)/road	22 (39 at center)/ Unrestricted	145/120	30	825
South Park Bridge	4.85	Moveable (double-leaf bascule)/road	29	125	22	490
Overhead cable	5.93	Power	134	Unrestricted	15	365

Sources: NOAA 2019; Corps 2020b, 2020c, 2020d.

[a] Vertical clearance in feet above mean high water; refers to the lowest clearance of the cable or bridge.

[b] Horizontal clearance refers to the width between bridge fenders or bridge protection on either side of a bridge opening.

[c] Width based on approximate measurements using aerial imagery.

8.3 Environmental Impacts

8.3.1 No Build Alternative

Under the No Build Alternative, light rail would not be extended to West Seattle and the potential impacts on navigation identified for the Build Alternatives would be avoided. Navigation on the Duwamish Waterway would continue as it does today.

8.3.2 Build Alternatives

Sound Transit evaluated the following three alternatives that would have bridge crossings of the Duwamish Waterway in the Duwamish Segment:

- Preferred Alternative DUW-1a
- Option DUW-1b
- Alternative DUW-2

Table 8-4 lists the proposed vertical and horizontal clearances of the bridges over the East and West waterways for each of the three Duwamish Segment alternatives. The listed clearances are proposed, and the horizontal and vertical clearances of bridges would be coordinated through the Coast Guard through the bridge permitting process under the General Bridge Act of 1946, not through the National Environmental Policy Act process.

Table 8-4. Proposed Bridge Clearances over the Duwamish Waterway

Bridge Alternative	Proposed Vertical Clearance (feet)	Proposed Horizontal Clearance (feet)
East Waterway		
Preferred Alternative DUW-1a	**104**	**155**
Option DUW-1b	125	150
Alternative DUW-2	100	315
West Waterway		
Preferred Alternative DUW-1a	**140**	**250**
Option DUW-1b	140	290
Alternative DUW-2	140	275

8.3.2.1 Long-term Impacts

Impacts Common to All Alternatives

The West Seattle Link Extension would cross both the East and West waterways. Sound Transit evaluated impacts to navigation in the Corps-maintained navigation channels and to vessel movements outside of the navigation channels to access local docks. Impacts to moorage were also identified. Displacement of water-dependent businesses by the West Seattle Link Extension and the related economic impacts and mitigation are described in Section 4.1, Acquisitions, Displacements, and Relocations, and Section 4.3, Economics, of the West Seattle Link Extension Final EIS.

Sound Transit is evaluating the feasibility of several high-level fixed bridge types to cross the Duwamish Waterway, as described in Chapter 2, Alternatives Considered, of the Final EIS. All alternatives would have a balanced cantilever segmental box girder bridge over the East Waterway. Preferred Alternative DUW-1a would be either cable-stayed or truss over the West Waterway and would avoid placing guideway columns in the water. All bridge types for Option DUW-1b would require a guideway column in the West Waterway. Depending on the bridge type selected for Alternative DUW-2, the waterway crossing could require guideway columns in the West Waterway. All bridge types would have the same or greater vertical clearance than the West Seattle Bridge. Therefore, all vessels that currently travel under the West Seattle Bridge and through the area could continue to do so. Bridge types that avoid guideway columns in the water would have fewer impacts to navigation.

All alternatives would cross the East and West waterways near existing restrictions. For the West Waterway, all alternatives would meet or exceed the 140-foot vertical clearance and 250-foot horizontal clearance required by the Coast Guard preliminary navigation clearance determination. The projected 3- to 5-foot increase in the Duwamish Waterway water levels related to climate change would correspondingly reduce vertical clearances under the existing structures and the structures of proposed alternatives over the East and West waterways.

Bridge types with guideway columns and associated pier protection in the water, and to a lesser degree bridge types with guideway columns on shore, could affect the Muckleshoot Indian Tribe treaty-protected fishing rights and access to the Tribe's Usual and Accustomed Areas. Bridge types with guideway columns and associated pier protection in the water could also affect the Suquamish Tribe treaty-protected fishing rights and access to the Tribe's Usual and Accustomed Areas.

Depending on bridge type, occasional maintenance about every 2 years would also temporarily reduce portions of the planned vertical clearance over the waterway up to about 15 feet. The maintenance durations would range from 2 weeks to 3 weeks for a structural inspection to 2 years to repaint a truss bridge. Truss bridge repainting would occur approximately every 20 years. Based on vessel heights reported during surveys and coordination Sound Transit conducted with Duwamish Waterway users, these temporary vertical clearance reductions could affect some of the boats that currently access maritime facilities on the Lower Duwamish Waterway, such as shipping terminals and facilities for marine construction and building boats.

East Waterway

All alternatives would create a new over-water structure that could affect vessel movement outside of the navigation channel. These impacts and impacts to the navigation channel are described in more detail by alternative in the following sections.

West Waterway

None of the alternatives would encroach upon the West Waterway navigation channel. All alternatives would meet or exceed the West Seattle Bridge horizontal and vertical clearances. Therefore, they would not affect the ability of vessels to sail between the West Waterway and the Lower Duwamish Waterway.

In addition to the existing Spokane Street (swing), West Seattle, and BNSF bridges, a new light rail bridge would be a fourth bridge in a relatively short stretch of water. A bridge type with in-water guideway columns and pier protection in the West Waterway would require vessels to set up to travel through the bridges earlier and to hold their course longer in a relatively narrow channel.

Along the Harbor Island Reach, in the West Waterway, the areas available for holding or maneuvering outside of the navigation channel are already relatively narrow. Additional in-water guideway columns and pier protection would further constrain these areas. Anecdotal evidence indicates that tugs frequently tow or push barges “on the hip” or in a nearly side-by-side configuration on the Duwamish Waterway. Wider vessels, like a tug and barge configured on the hip, could have less room to navigate outside of the navigation channel and maneuver during heavy traffic. Therefore, during times with heavier vessel traffic (typically Wednesdays and Fridays and daily around 7 a.m. and 5 p.m.), increased interaction with Puget Sound Vessel Traffic Services may be needed.

Preferred South Crossing Alternative (DUW-1a)

East Waterway

Preferred Alternative DUW-1a would be about 40 feet south of the existing Southwest Klickitat Way (fixed) Bridge, and about 300 feet south of the Spokane Street (fixed) bridge. These bridges have vertical clearances of 7 feet and 5 feet, respectively, which block the majority of vessels from navigating under these bridges. Preferred Alternative DUW-1a would be over a portion of the East Waterway that does not include a Corps-maintained navigation channel. Therefore, the new structure would not impact navigation channels.

The portion of the East Waterway where Preferred Alternative DUW-1a would cross is primarily used by vessels to access the Harbor Island Marina commercial dock. The horizontal clearance under the guideway would not change. The vertical clearance under the guideway would be approximately 104 feet. This is not anticipated to negatively affect the vessels that use the Harbor Island Marina commercial dock because they are primarily tugs and work boats that require less than 104 feet of vertical clearance.

West Waterway

Preferred Alternative DUW-1a would introduce a new over-water structure about 120 feet south of the West Seattle Bridge. As described in Impacts Common to All Alternatives, this alternative would have the same or greater vertical clearance than the West Seattle Bridge. The horizontal clearance would be about 250 feet. All vessels that currently travel under the West Seattle Bridge and through the area could continue to do so. Outside of the navigation channel, in the areas used by vessels to access maritime businesses and associated docks, vertical clearance immediately under the guideway would be limited to about 140 feet.

South Crossing South Edge Crossing Alignment Option (DUW-1b)

Option DUW-1b would permanently reduce moorage in the Duwamish Waterway by removing recreational marinas and docks. The amount of recreational moorage that would be removed from the Duwamish Waterway represents about 20 percent of what is currently available. Due to the percentage of moorage being displaced, many recreational boaters are unlikely to find replacement moorage nearby on the Duwamish Waterway or in Elliott Bay.

East Waterway

Option DUW-1b would have similar impacts to the East Waterway as Preferred Alternative DUW-1a. However, the vertical clearance under the guideway would be higher at approximately 125 feet.

West Waterway

Option DUW-1b would introduce a new over-water structure approximately 600 feet south of the West Seattle Bridge and would have similar impacts to the West Waterway as Preferred Alternative DUW-1a.

North Crossing Alternative (DUW-2)

East Waterway

Alternative DUW-2 would introduce a new over-water structure approximately 150 feet north of the Spokane Street (fixed) Bridge, which has a vertical clearance of 5 feet and blocks the majority of vessels from navigating under the bridge. Alternative DUW-2 is over an Corps-maintained navigation channel (a Public Work subject to the Section 408 review and approval process) that spans the width of the East Waterway. This area is primarily used by vessels to access maritime businesses and includes a dock. The vertical clearance under the guideway would be about 100 feet over the navigation channel. The horizontal clearance under the guideway would be about 315 feet wide, approximately 85 feet less than the current horizontal clearance. Sound Transit would coordinate with the Corps regarding the East Waterway federal navigation project as part of the permission process pursuant to Section 408 of the Rivers and Harbors Act.

Because vessels that use this area typically require about 75 feet of vertical clearance or less, the vertical clearance of the bridge is not anticipated to prevent current uses. However, the change in horizontal clearance could affect vessel movements by reducing the area available for navigation and maneuvering in this section of the waterway.

West Waterway

Alternative DUW-2 would introduce a new over-water structure approximately 310 feet north of the West Seattle Bridge. As described under Impacts Common to All Alternatives, this alternative would have the same or greater vertical clearance than the West Seattle Bridge. All vessels that currently travel under the West Seattle Bridge and through the area could continue to do so. However, the Harbor Island Reach is currently constrained by moored barges and other vessels that encroach on the navigation channel. Alternative DUW-2 would add another constraint to this section of the waterway if it includes in-water guideway columns. Outside of the navigation channel, in the areas used by vessels to access maritime businesses and associated docks, vertical clearance immediately under the guideway would be limited to about 140 feet.

8.3.2.2 Construction Impacts

Impacts Common to All Alternatives

Barges would be required for material supply and would be moored outside of the navigation channels when possible. However, given the size of the barges, they are likely to encroach on the navigation channels, which are Section 408 resources.

All alternatives would result in the short-term closure of the East and West waterways for approximately 4 hours about twice a week during bridge construction. The waterways would be closed because larger vessels and those constrained to the deep-draft channel may not have adequate horizontal clearance or water depth to pass the construction barges. In addition, all alternatives could result in two 12-hour closures of the East and West waterways to complete the center of each over-water bridge span, but the truss bridge type would result in a full 3-day closure when the center span is placed. Closures of the West and East waterways could affect access to the navigation channels in those waterways. Sound Transit would coordinate with the Corps regarding potential impacts to the Duwamish Waterway and East Waterway federal navigation Projects as part of the permission process pursuant to Section 408 of the Rivers and Harbors Act. All waterway closures would be coordinated through and approved by the Coast Guard. Economic impacts related to temporary restrictions on the Duwamish Waterway during construction and mitigation are described in Section 4.3 of the Final EIS.

Harbor Patrol response times to the Duwamish Waterway could be affected by temporary closures of the navigation channel and by increased waterway congestion during construction. Sound Transit would coordinate with Harbor Patrol prior to and throughout construction at key milestones or phases where navigation conditions could change.

Construction activities on the shoreline or in the water for all alternatives including placement of temporary cofferdams, work barges, and work trestles (for Option DUW-1b and Alternative DUW-2 only), may affect Muckleshoot Indian Tribe treaty-protected fishing rights and access to the Usual and Accustomed Areas for the duration of construction when Tribal treaty-protected fishing is occurring. These construction activities may also affect Suquamish Tribe treaty-protected fishing rights and access to the Usual and Accustomed Areas for the duration of construction when Tribal treaty-protected fishing is occurring. Construction activities may also change vessel traffic patterns, which could interfere with upstream and downstream Tribal treaty-protected fishing rights and access.

Preferred South Crossing Alternative (DUW-1a)

East Waterway

The northern gangway from Harbor Island to the Harbor Island Marina commercial dock on the East Waterway would be temporarily closed during construction. Mariners could use the existing southern access point; however, the northern gangway is the only vehicle access point for loading and unloading heavy gear. In addition, the northern 125 feet of the dock would be closed during construction. Closure of the northern portion of the dock would reduce commercial moorage and may temporarily displace some commercial vessels. If Muckleshoot Indian Tribe Fisheries Division vessels moor at the commercial dock, these vessels may also be temporarily displaced. Temporarily displaced commercial vessels and Tribal patrol boats could have difficulty finding replacement moorage on the Duwamish Waterway. Sound Transit would coordinate with the Port of Seattle to minimize disruptions to land and water access from the closure of the northern gangway and northern portion of the Harbor Island Marina commercial dock, and use would be restored following construction. Sound Transit would coordinate with the Port of Seattle to ensure access is maintained throughout construction to the Harbor Island Marina.

Neither of the bridge types for Preferred Alternative DUW-1a would require temporary work trestles to be installed in the East Waterway. For all bridge types, scaffolding and netting under the bridge would temporarily reduce portions of the planned vertical clearance over the waterway by up to 15 feet (from approximately 104 feet to approximately 89 feet) for about 3 months. Because vessels that use this area are primarily tugs and work boats that typically require less than 89 feet of vertical clearance, the vertical clearance is not anticipated to prevent current uses. Sound Transit's *Duwamish Waterway Navigation Impact Report* has more information on the vertical clearance requirements of the vessels that use the Harbor Island Marina commercial dock (Sound Transit 2021).

West Waterway

The gangway from Harbor Island to the Jim Clark Marina on the West Waterway would be temporarily relocated. Sound Transit would coordinate with the Port of Seattle and tenants to provide alternate access to the marina from the western edge of the Port-owned Harbor Marina Corporate Center parking lot. Sound Transit would coordinate with the Port of Seattle to ensure access is maintained throughout construction to the Jim Clark Marina.

Neither of the bridge types for Preferred Alternative DUW-1a would require a permanent bridge protection system or temporary work trestles to be installed in the West Waterway. For all bridge types, scaffolding and netting under the bridge would temporarily reduce portions of the vertical clearance over the waterway by up to 15 feet (from approximately 140 feet to approximately 125 feet) for about 2 months. Based on vessel heights reported during surveys and coordination Sound Transit conducted with Duwamish Waterway users, these temporary vertical clearance reductions could affect some of the boats that currently access maritime facilities on the Lower Duwamish Waterway such as shipping terminals and facilities for marine construction and building boats.

South Crossing South Edge Crossing Alignment Option (DUW-1b)

East Waterway

The southern gangway from Harbor Island to the Harbor Island Marina commercial dock on the East Waterway would be closed intermittently during construction, but mariners could use the existing northern access point. In addition, the southern 300 feet of the dock would be restricted during overhead bridge construction, which would temporarily displace commercial vessels. Temporarily displaced commercial vessels could have difficulty finding replacement moorage on the Duwamish Waterway. Sound Transit would coordinate with the Port of Seattle to minimize disruptions to land and water access from the intermittent closures of the southern gangway and southern portion of the Harbor Island Marina commercial dock. Use of the southern access point and southern portion of the dock would be restored following construction.

Temporary work trestles may be installed in the East Waterway to support the operation of heavy equipment. The trestles would be placed outside of the navigation channel. For all bridge types, scaffolding and netting under the bridge would temporarily reduce portions of the planned vertical clearance over the waterway by up to 15 feet (from approximately 125 feet to approximately 110 feet) for about 3 months. Because vessels that use this area are primarily tugs and work boats that typically require less than 100 feet of vertical clearance (Sound Transit 2021), the vertical clearance of the bridge during construction is not anticipated to prevent current uses.

West Waterway

The Harbor Island Marina recreational docks would be closed for approximately 3 to 4 years during construction, which would temporarily remove about 18 percent of recreational moorage and 100 percent of linear dockage for recreational boats on the Duwamish Waterway. If Muckleshoot Indian Tribe Fisheries Division patrol boats moor at a recreational dock, these vessels may also be temporarily displaced. Temporarily displaced recreational vessels and Tribal patrol boats could have difficulty finding replacement moorage nearby. Sound Transit would coordinate with Port of Seattle to retain the Harbor Island Marina recreational docks and associated marina infrastructure so that marina operations could resume after construction.

Temporary work trestles may be installed in the West Waterway to support the operation of heavy equipment. The trestles would be placed outside of the navigation channel. For all bridge types, scaffolding and netting under the bridge would temporarily reduce portions of the vertical clearance over the waterway by up to 15 feet (from approximately 140 feet to approximately 125 feet) for about 5 months. Based on vessel heights reported during surveys and coordination Sound Transit conducted with Duwamish Waterway users, these temporary vertical clearance reductions could affect some of the boats that currently access maritime facilities on the Lower Duwamish Waterway such as shipping terminals and facilities for marine construction and building boats.

West Waterway navigation channel closures would occur during installation of the bridge protection system for all bridge types, when part of the navigation channel would be closed intermittently for up to approximately 4 weeks.

North Crossing Alternative (DUW-2)

East Waterway

Temporary work trestles may be installed in the East Waterway to support the operation of heavy equipment. The trestles would be placed outside of the navigation channel. For all bridge types, scaffolding and netting under the bridge would temporarily reduce portions of the planned vertical clearance over the waterway by up to 15 feet (from approximately 100 feet to approximately 85 feet) for about 6 months. Because vessels that use this area typically require about 75 feet of vertical clearance or less, the vertical clearance of the bridge during construction is not anticipated to prevent current uses.

East Waterway navigation channel closures would occur during installation of the bridge protection system for all bridge types, when part of the navigation channel would be closed intermittently for up to approximately 4 weeks.

West Waterway

Temporary work trestles may be installed in the West Waterway to support the operation of heavy equipment. The trestles would be placed outside of the navigation channel. For all bridge types, scaffolding and netting under the bridge would temporarily reduce portions of the vertical clearance over the waterway by up to 15 feet (from approximately 140 feet to approximately 125 feet) for about 1 month. Based on vessel heights reported during surveys and coordination Sound Transit conducted with Duwamish Waterway users, these temporary vertical clearance reductions could affect some of the boats that currently access maritime facilities on the Lower Duwamish Waterway such as shipping terminals and facilities for marine construction and building boats.

West Waterway navigation channel closures would occur during installation of the bridge protection system for all bridge types, when part of the navigation channel would be closed intermittently for up to approximately 4 weeks.

8.4 Potential Mitigation Measures

Sound Transit would determine mitigation actions in coordination with the Muckleshoot Indian Tribe, the Suquamish Tribe, the Coast Guard, and the Corps during final design and the bridge permitting process. This would include identifying specific aids to navigation, such as signage and lighting. Proposed aids to navigation would be approved by the Coast Guard prior to installation.

The Federal Transit Administration, in coordination with Sound Transit, will continue government-to-government consultation with the Muckleshoot Indian Tribe and the Suquamish Tribe to avoid or minimize impacts to Tribal treaty-protected fishing rights and access to Usual and Accustomed Areas during construction.

Sound Transit would develop a construction navigation management plan in consultation with the Coast Guard, Corps, and Port of Seattle to mitigate impacts to navigation during construction. Measures in the plan could include the following:

- Create a marine safety zone (to be approved by the Coast Guard and Corps) to help motorized and non-motorized waterway users pass through the Harbor Island Reach and East Waterway construction zones.

- Provide a safe and easily recognizable path for non-motorized waterway users through the marine safety zone.
- Set up the marine safety zone so all construction features or potential obstacles can be seen during inclement weather.
- Coordinate with maritime stakeholders and emergency service providers, and conduct construction outreach prior to and throughout construction at key milestones or phases where navigation conditions could change.
- Schedule navigation channel restrictions during a time of day or a day of the week with less vessel traffic.
- Coordinate all maritime operations with the Coast Guard, Corps, Puget Sound Vessel Traffic Services, Puget Sound Harbor Safety Committee, and local mariners and advertise all changes to maritime operations in the Local Notice to Mariners publication.

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9 FREIGHT MOBILITY AND ACCESS

This chapter describes the freight transportation system within 0.5 mile of the West Seattle Link Extension Project (the project) Build Alternatives, including the facilities and operations for truck and rail transportation. It also describes how the Build Alternatives could affect the freight system during project operation and construction. The marine freight system and potential project impacts to the marine system are presented in Chapter 8, Navigation. The assessment of freight mobility and access in this section addresses direct impacts from the project.

9.1 Introduction

9.1.1 Overview of Truck Street Network

The City of Seattle has designated many streets and arterials with various functions as part of its truck network. The designations include Limited Access Facility, Major Truck Street, Minor Truck Street, First/Last Mile Connector, Heavy Haul Network, Over-Legal Network, Seaport Highway Connectors, and Seaport Intermodal Connectors. The Washington State Freight and Goods Transportation System designates freight facilities with numbers, T-1 through T-5, with T-1 indicating the highest volume or tonnage of freight carried.
Both designations are provided in Section 9.2, Affected Environment. The various truck networks are mostly concentrated in the Duwamish Manufacturing/Industrial Center, which includes the SODO and Duwamish segments.

9.1.1.1 Summary of Long-term Impacts to Truck Network

All alternatives would be designed to retain clearance envelopes for truck streets, including those designated for over-legal loads. All of the alternatives could affect 4th Avenue South, which is designated by the City of Seattle as a Major Truck Street, a street classification for arterials that accommodate substantial amounts of freight movement. On 4th Avenue South, between South Massachusetts Street and South Spokane Street, transit improvements would be constructed to accommodate buses diverted from the SODO Busway. The 4th Avenue transit improvements could be permanent for Preferred Option SODO-1c, Alternative SODO-1a, and Option SODO1b because the rail alignment would eliminate the SODO Busway.
For Alternative SODO-2, the transit accommodations on 4th Avenue South would be a long-term construction-related change for the duration of construction on the SODO Busway. The closure period would be 5 years for construction of the West Seattle Link Extension. Sound Transit is also planning the Ballard Link Extension, which is a light rail extension from SODO Station to Ballard that would require a closure of the SODO Busway during construction. See Chapter 11, Cumulative Impacts, for a discussion of the combined effect on the SODO Busway. Improvement options being considered include bus queue jumps at key intersections, business access and transit lanes, and/or a freight and bus lane that could be shared by buses and trucks. The first two transit improvement options could increase delays to truck traffic on 4th Avenue South and the third could reduce delays for truck traffic. Chapter 3, Transit, provides further information about the transit improvements on 4th Avenue South.

In the SODO Segment, the planned grade separation on South Lander Street for Preferred Option SODO-1c, Alternative SODO-1a, and Option SODO-1b would eliminate roadway delays at the existing light rail crossing. The grade of the new structure is expected to be about 7 percent, which is similar to the grade of the South Lander Street grade-separated structure to the west.

In the Delridge Segment, Preferred Option DEL-6b and Alternative DEL-7 would create a new signalized intersection at Delridge Way Southwest and Southwest Charlestown Street/23rd Avenue Southwest that would provide truck and passenger vehicle access to Nucor Steel.

No other alternatives would permanently affect the truck network.

9.1.1.2 Summary of Construction Impact to Truck Network

Section 4.3.3, Construction Impacts, of this technical report details key construction-related facility closures. Construction activities would affect the truck network with full and partial closures of truck streets. Many streets could be fully closed for a short duration (less than 48 hours) when structures are constructed overhead. Longer-term full and partial closures that affect truck streets are described in this section.

In the SODO Segment, the planned grade separation on South Lander Street for Preferred Option SODO-1c would require fully closing South Lander Street between 4th Avenue South and 6th Avenue South for several years. Alternative SODO-1a and Option SODO-1b would also close South Lander Street for several years; Alternative SODO-2 would only require night and weekend closures. When South Lander Street is closed, South Holgate Street and South Spokane Street would remain open and could serve as detour routes for trucks. Local access to the United States Postal Service Carrier Annex and Distribution Center/Terminal Post Office (Carrier Annex/Terminal Post Office), would be retained during construction, although some short-term closures could be needed when placing overhead structures. Partial short-term closures (of a few months) of 6th Avenue South and 4th Avenue South near the intersections with South Lander Street would also occur under Preferred Option SODO-1c, Alternative SODO-1a, and Option SODO-1b.

In the Duwamish Segment, Preferred Alternative DUW-1a would construct guideway columns on each side of 4th Avenue South, north of South Spokane Street, that would require multi-pier foundations that could close up to three lanes of 4th Avenue South at a time for over a year. Option DUW-1b would also partially close this section of South Spokane Street but for a shorter period of time (about 6 months). Another guideway column on the south side of South Spokane Street west of 4th Avenue South would also have a multi-pier foundation that would require closing three lanes on eastbound South Spokane Street for 3 to 6 months for both Preferred Alternative DUW-1a and Option DUW-1b. These closures are expected to increase travel times for trucks on these corridors. Additional detail is presented in Section 4.3.3 in Chapter 4, Arterial and Local Street Operations.

Southwest Avalon Way, which is a Minor Truck Street and part of the City's Over-Legal Network for large trucks, could be fully closed on nights and weekends with Preferred Option DEL-6b, Alternative DEL-1a, Option DEL-1b, Alternative DEL-3, Alternative DEL-6a, and Alternative DEL-7, partially closed for nine months with Option DEL-1b, and fully closed for approximately 1 year with Alternative DEL-5. Partial closures of streets in the truck network could occur for various alternatives. This includes partial closures of Delridge Way Southwest for multiple years with Alternative DEL-3 and Alternative DEL-4.

Fauntleroy Way Southwest would have a partial closure with Preferred Option WSJ-5b, Alternative WSJ-3a, Option WSJ-3b, and Alternative WSJ-5a. Alternative WSJ-1, Alternative WSJ-2, and Alternative WSJ-4 would have full closures on Fauntleroy Way Southwest on nights and weekends. Sound Transit would coordinate with the City of Seattle to identify alternative routes for over-dimension freight during the construction period.

9.1.2 Overview of Truck Parking and Loading

On-street truck-only load zones, commercial vehicle load zones, and general load zones serve local business deliveries. Truck-only load zones are the most restrictive and allow only vehicles that are licensed as trucks. Commercial vehicle load zones allow a broader range of vehicles but still require specific licensing or commercial permits. They are most commonly in Seattle's business districts. In some areas, general load zones, which allow any type of vehicle, also exist. Most of these zones are longer than a standard vehicle parking space.

The project would permanently affect load zones that serve trucks or business deliveries, either through elimination of a street or conversion to a different curb-use function such as a transit stop or passenger load zone. The project's largest permanent effect to load zones would be near the SODO Station, where Preferred Option SODO-1c and Alternative SODO-1a would permanently eliminate ten general load zones and four truck-only load zones. Other alternatives in SODO and all other segments would permanently eliminate two or fewer general load zones.

Construction activities could temporarily disrupt load zones for all alternatives. The highest number affected would be for Option SODO-1b and Alternative SODO-2, which would each affect four general load zones and three truck-only load zones on 5th Place South. Other alternatives in SODO and all other segments would temporarily affect fewer than five load zones.

The SODO and Duwamish segments are within the Duwamish Manufacturing/Industrial Center, where trucks are allowed to park on-street. Alternative DUW-2 would have the highest impact to truck parking because construction staging areas could affect 95 to 120 on-street parking spaces, including the area under State Route 99, which is often used for truck parking. Alternative DUW-2 would also temporarily displace Terminal 25 South, which is the Port of Seattle's designated off-street truck parking lot with capacity for about 140 truck tractors. Preferred Alternative DUW-1a could temporarily remove 40 to 55 on-street parking spaces during construction and would not affect Terminal 25 South. Additional information about truck parking and loading impacts is presented in Chapter 5, Parking.

Sound Transit would coordinate with the City of Seattle to replace truck load zones and truck parking where feasible.

9.1.3 Overview of Rail Network

Seattle is served by two Class I railroads: BNSF Railway and Union Pacific Railroad. The BNSF Railway's mainline passes through SODO, under Downtown Seattle, and through Interbay. The Union Pacific Railroad mainline is south of South Spokane Street. There are local rail spurs throughout the Duwamish area, including lead tracks located just south of South Spokane Street that serve Harbor Island and West Seattle (referred to as the West Seattle Lead tracks) as well as spur tracks along the SODO Busway that serve local businesses.

Spur tracks along the SODO Busway north of South Lander Street would be removed with all alternatives. The BNSF storage tracks on the west side of the SODO Busway between about the vicinity of South Hinds Street and South Lander Street would also be eliminated. Loading and lead tracks on the east side of the SODO Busway south of South Lander Street, including those that serve Franz Bakery and the 7th Avenue South lead tracks, would be retained. No other long-term effects to rail operations are expected. In the Duwamish Segment, ground improvements near guideway columns close to the West Seattle Lead railroad tracks could affect the track envelope during construction. Sound Transit would coordinate with the railroads prior to construction.

9.1.4 Overview of Marine Network

All Duwamish Segment alternatives would cross the navigation channels of the East and West waterways of the Duwamish Waterway (also known as the Duwamish River). Potential impacts on navigation and marine access on these waterways, including to marine freight, are described in Chapter 8.

9.2 Affected Environment

Almost all of the arterials and streets that comprise the study area's truck network are owned and operated by the City of Seattle. Regional highways that connect to the local network, including Interstate 5, Interstate 90, and State Route 99, are owned and operated by the Washington State Department of Transportation (WSDOT).

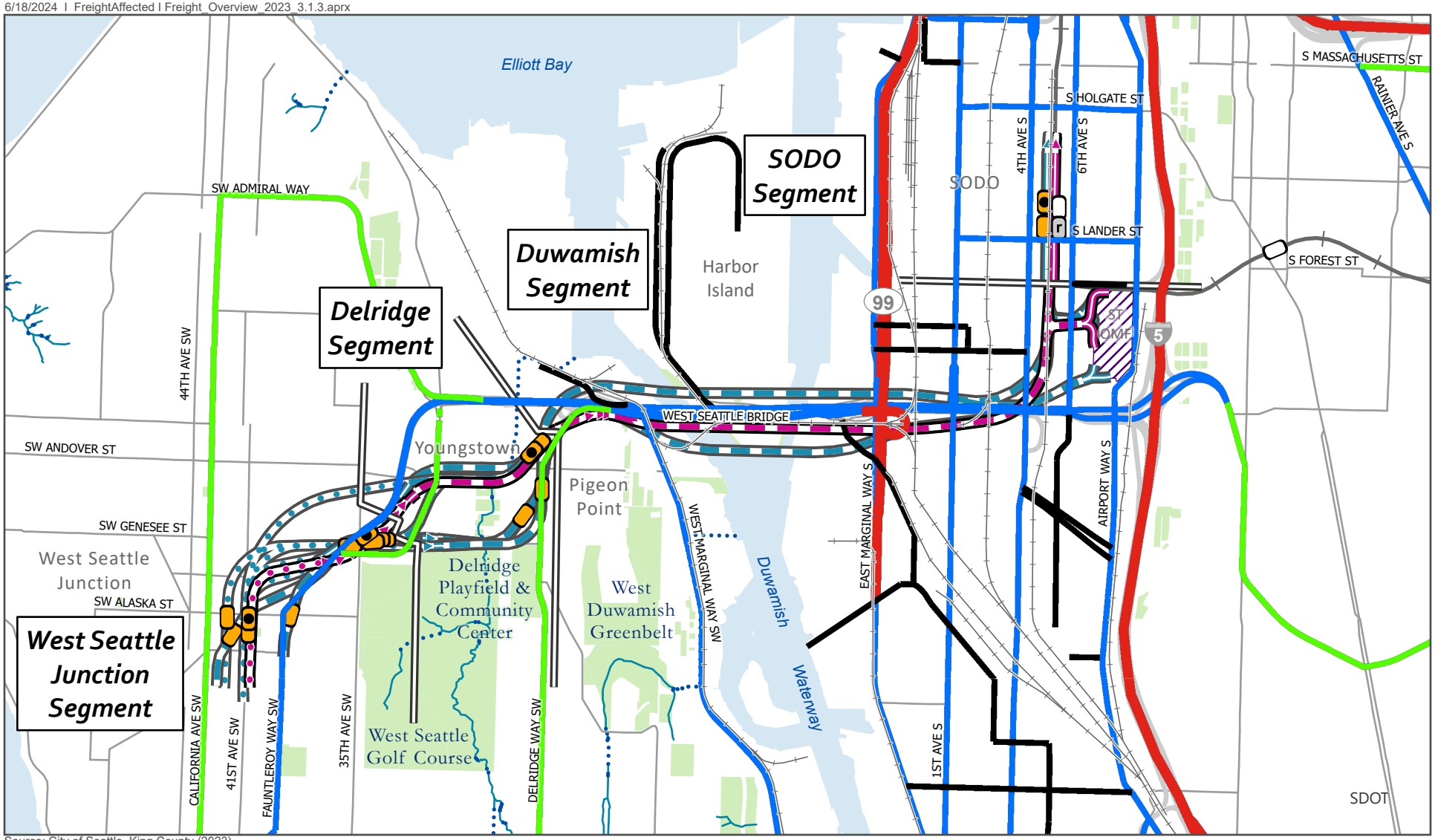
The *City of Seattle Freight Master Plan* (City of Seattle 2016) defines the following freight network designations:

- Limited Access Facility – Supports through-movements and/or long-distance trips. These facilities include interstate and state highways, such as Interstate 5 and State Route 99.
- Major Truck Street – An arterial street serving connections to the regional network, between and through the City's designated Manufacturing/Industrial Centers, commercial districts, and urban centers.
- Minor Truck Street – Supports goods delivery to urban villages and neighborhood commercial districts. These streets also provide secondary connections to the Major Truck Street network, thereby creating freight system redundancy and resiliency.
- First/Last Mile Connector – Supports short truck movements to/from key freight activity centers, such as marine and intermodal terminals. These connections are all within the designated Manufacturing/Industrial Centers.

The City also has two regulatory networks related to freight: the Heavy Haul Network and the Over-Legal Network (City of Seattle 2016). These routes play an important role in moving freight loads, with appropriate permits, throughout Seattle. The City established the Heavy Haul Network to allow heavier cargo containers to be transported between the Port of Seattle, industrial businesses, and rail yards. The Over-Legal Network can accommodate trucks with larger loads, with most segments able to accommodate loads that require up to a 20-foot-wide by 20-foot-high envelope.

Seaport Highway Connectors and Seaport Intermodal Connectors are also highlighted in the Freight Master Plan. Although not officially designated, these routes are identified on arterial streets that accommodate two-way travel and direct access between the regional highway system and port or railroad intermodal facilities.

Figure 9-1 and Figure 9-2 show Seattle's truck street designations for the West Seattle Link Extension. Some transportation facilities within the study area are also included in the Washington State Freight and Goods Transportation System, which is a classification system for roadways, railways, and waterways based on the freight tonnage that they carry. Freight facilities are designated with numbers, T-1 through T-5, with T-1 indicating the highest volume of freight carried. (WSDOT 2020). T-1 corridors carry more than 10 million tons per year; T-2 corridors carry between 4 and 10 million tons per year; and T-3 corridors carry between 300,000 and 4 million tons per year.



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- Tunnel
- At-Grade
- Retained Cut

Other Alternatives
- Elevated
- Tunnel
- At-Grade
- Retained Cut

Station (● *Indicates Preferred Alternative*)
- New
- Relocated
- Existing

- Segment Line
- Sound Transit Operations and Maintenance Facility (ST OMF)
- Existing Link Light Rail
- Railroad
- Stream
- Piped Stream
- Park

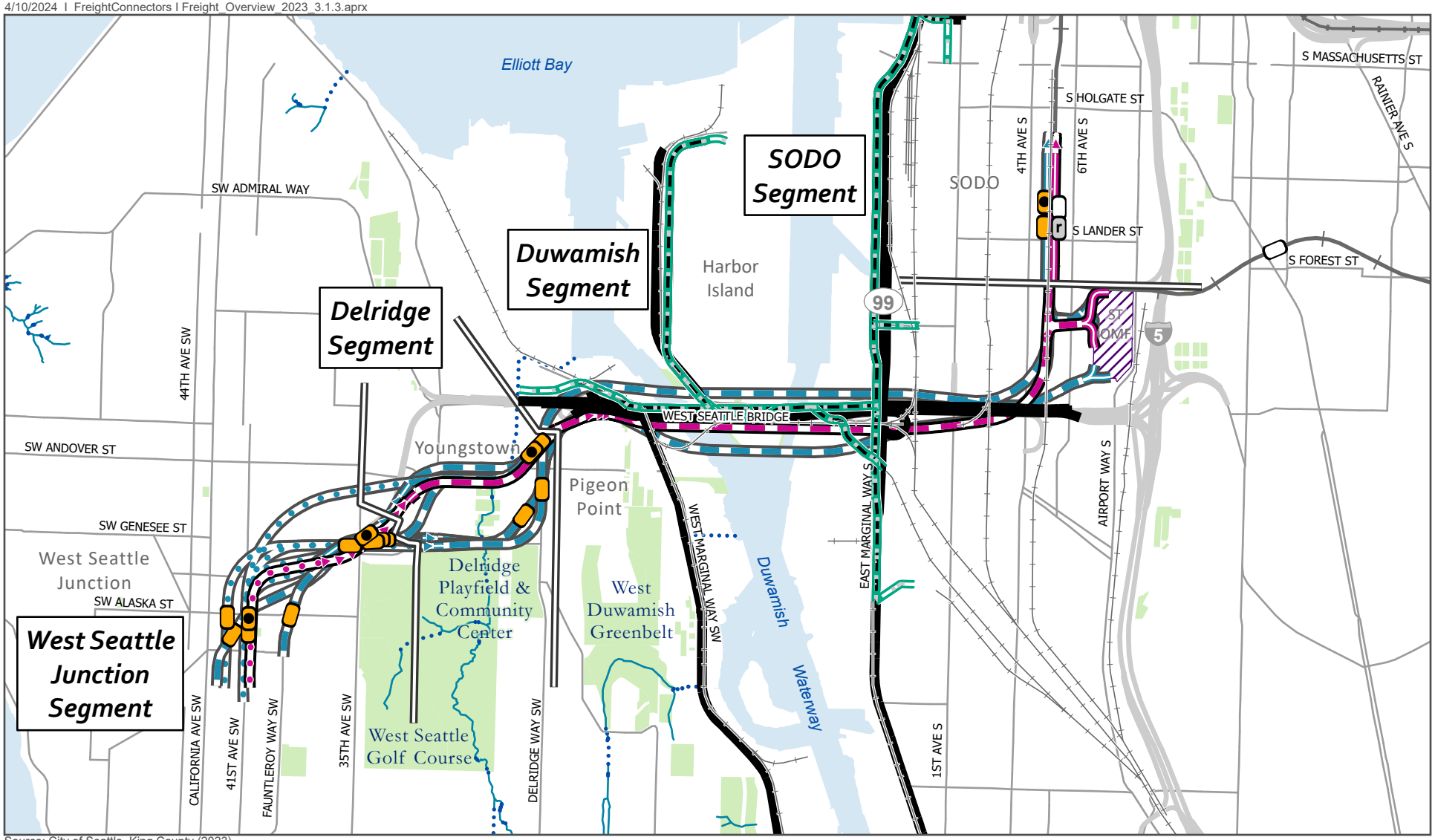
Freight Network
- Limited Access
- Major
- Minor
- First/Last Mile Connector

0 0.5 1 Mile

N

FIGURE 9-1
Freight Affected Environment

West Seattle Link Extension



Source: City of Seattle, King County (2023).

Preferred Alternative
- Elevated
- At-Grade
- Tunnel
- Retained Cut

Other Alternatives
- Elevated
- At-Grade
- Tunnel
- Retained Cut

Station (● *Indicates Preferred Alternative*)
- New
- Relocated
- Existing

- Segment Line
- Sound Transit Operations and Maintenance Facility (ST OMF)
- Existing Link Light Rail
- Railroad
- Stream
- Piped Stream
- Park
- Seaport Intermodal Rail Connector
- Seaport Highway Connector

FIGURE 9-2
Freight Affected Environment Connectors

West Seattle Link Extension

0 0.5 1 Mile

N

Rail facilities are also described in the SODO, Duwamish, and Delridge segments. There are no rail facilities in the West Seattle Junction Segment.

Marine facilities are only described for the Duwamish Segment as there are no marine facilities in the SODO, Delridge, or West Seattle Junction segments.

This section also summarizes potential impacts to on-street load zones that were evaluated in Chapter 5. It evaluates general load zones, commercial vehicle load zones, and truck-only load zones within one block of the light rail alignment or stations. Definitions for various types of load zones are provided in Chapter 5.

9.2.1 SODO Segment

9.2.1.1 Truck System

The SODO Segment passes through the Duwamish Manufacturing/Industrial Center, which is a designated employment area with intensive, concentrated manufacturing and industrial land uses that cannot be easily mixed with other activities. It is characterized by large contiguous blocks served by the region's major transportation infrastructure, including roads, rail, and port facilities. The Duwamish Manufacturing/Industrial Center is one of the largest and most intensely developed industrial and manufacturing areas in the Pacific Northwest.

Table 9-1 summarizes the existing truck transportation route characteristics of the SODO Segment study area.

Major Truck Streets in this segment include 4th Avenue South, 6th Avenue South, South Holgate Street, and South Lander Street. All of these are also designated truck freight corridors in the statewide Freight and Goods Transportation System network.

Table 9-1. Truck Route Characteristics – SODO Segment

Street Corridor	Freight Classification(s)	Over-Legal or Heavy Haul Designation	Freight Constraints
4th Avenue South	Major Truck Street State T-2 corridor	None	None
6th Avenue South	Major Truck Street State T-3 corridor	Heavy Haul Network (short segment north of South Holgate Street)	None
South Holgate Street between 1st Avenue South and 6th Avenue South	Major Truck Street State T-3 corridor	Heavy Haul Network	At-grade rail crossings west of 4th Avenue South include BNSF Railway mainline and Amtrak yards. At-grade rail crossing east of 4th Avenue South (Sound Transit light rail line)
South Lander Street between 1st Avenue South and Airport Way South	Major Truck Street State T-1 corridor	None	At-grade rail crossing east of 4th Avenue South (Sound Transit line)

Sources: City of Seattle 2016, WSDOT 2020.

Depending on the station and alignment locations, there are up to ten general load zones and four truck-only load zones that serve businesses within one block of the station/alignment. Most of these are along 5th Place South and South Bayview Street near the SODO Station.

9.2.1.2 Rail System

The BNSF Railway mainline passes through SODO about midway between 1st Avenue South and 4th Avenue South. It crosses South Holgate Street at-grade. There are many other spur tracks that cross South Holgate Street, including those to the Amtrak/Sound Transit maintenance facility. There are also rail spurs and rail storage tracks along the SODO Busway. The spurs, which serve local business rail needs, extend north to South Massachusetts Street and connect to the 7th Avenue South lead tracks.

9.2.2 Duwamish Segment

9.2.2.1 Truck System

Table 9-2 summarizes the existing truck transportation route characteristics of the Duwamish Segment study area, which is also within the Duwamish Manufacturing/Industrial Center. In addition to the City of Seattle's truck street designations, key arterials in this segment—4th Avenue South, South/Southwest Spokane Street, West Marginal Way Southwest, East Marginal Way South, and the West Seattle Bridge/Spokane Street Viaduct—are designated as T-1 or T-2 truck freight corridors in the statewide Freight and Goods Transportation System network. East Marginal Way South and Southwest Spokane Street are also part of the City's Over-Legal Network, and several streets within the study area are in the City's Heavy Haul network. Streets designated as both a Seaport Highway Connector and Seaport Intermodal Rail Connector include the West Seattle Bridge/Spokane Street Viaduct, South Spokane Street, East Marginal Way South, and West Marginal Way Southwest.

Table 9-2. Truck Route Characteristics – Duwamish Segment

Street Corridor	Freight Classification(s)	Over-Legal or Heavy Haul Designation	Freight Constraints
4th Avenue South, north of Argo Yard	Major Truck Street State T-2 corridor	None	None
6th Avenue South, north of South Spokane Street	Major Truck Street State T-3 corridor	None	One at-grade rail crossing
Delridge Way Southwest between West Seattle Bridge and 23rd Avenue Southwest	Minor Truck Street Seaport Highway Connector State T-2 corridor	None	None
East Marginal Way South	Major Truck Street Seaport Intermodal Rail Connector Seaport Highway Connector State T-1 corridor	Over-Legal Network Heavy Haul Network	Five at-grade rail crossings
South Spokane Street between 23rd Avenue Southwest and Interstate 5	Major Truck Street Seaport Highway Connector Seaport Intermodal Rail Connector State T-2 corridor	Over-Legal Network Heavy Haul Network	Seven at-grade rail crossings Bridge openings at Duwamish Waterway
West Marginal Way Southwest between South Spokane Street and Terminal 5	Last/First Mile Connector Seaport Intermodal Rail Connector Seaport Highway Connector State T-2 corridor	Heavy Haul Network	One at-grade rail crossing

Street Corridor	Freight Classification(s)	Over-Legal or Heavy Haul Designation	Freight Constraints
West Seattle Bridge/ Spokane Street Viaduct between 23rd Avenue Southwest and Interstate 5	Major Truck Street Seaport Highway Connector Seaport Intermodal Rail Connector State T-1 corridor	Heavy Haul Network	None

Sources: City of Seattle 2016, WSDOT 2020.

Depending on the alignment, there are two general load zones and three truck-only load zones within one block of the alignment. The general load zones are on 6th Avenue South near South Hanford Street, and the truck-only load zones are on 6th Avenue South near South Hinds Street. As described in Chapter 5, trucks and trailers are allowed to park on-street in the Duwamish Manufacturing/Industrial Center, and the Port of Seattle operates the Terminal 25 off-street parking facility for port-related trucks.

9.2.2.2 Rail System

The BNSF Railway mainline passes through the Duwamish Segment about midway between 1st Avenue South and 4th Avenue South. It crosses South Spokane Street and South Horton Street at-grade.

Both railroads have major intermodal transfer hubs in the Duwamish Segment. The BNSF Railway's Seattle International Gateway Yard is just east of State Route 99 between South Hanford Street and South Massachusetts Street. The Union Pacific Railroad Argo Yard is south of South Spokane Street and east of East Marginal Way South. Both terminals receive and discharge cargo by truck, a large proportion of which passes through the Port of Seattle's marine terminals.

The Port of Seattle's Terminal 5 and Terminal 18 have on-dock intermodal rail yards, which allow the direct transfer of containers between rail and ship within the terminals. During both the arrival and departure maneuvers, trains to the Terminal 5 on-dock intermodal yard block the at-grade crossing of West Marginal Way Southwest (just north of Southwest Spokane Street) and require lowering of the rail bridge across the Duwamish Waterway. Terminals 5 and 18 trains use the lead tracks across Harbor Island along the south side of Klickitat Avenue Southwest (referred to as the West Seattle Lead tracks). There are other rail storage yards and local rail spurs throughout the Duwamish Segment, including the Whatcom Yard west of State Route 99, the West Marginal Branch line on the west side of the Duwamish Waterway, and storage yards on Harbor Island. Train movements across Harbor Island can block both main driveways to Terminal 102, which is an industrial park on the south end of Harbor Island. When this occurs, vehicles can access that terminal through a Port-owned bridge that connects the south tip of Harbor Island to the east side of the Duwamish Waterway. There are also local spur tracks along the SODO Busway south of South Forest Street.

9.2.3 Delridge Segment

9.2.3.1 Truck System

The Delridge Segment is in an area with a mix of residential, commercial, and industrial/ manufacturing land uses. Its largest industrial business is the Nucor Steel plant. Table 9-3 summarizes the existing truck transportation route characteristics of the Delridge Segment.

Table 9-3. Truck Route Characteristics – Delridge Segment

Street Corridor	Freight Classification(s)	Over-Legal or Heavy Haul Designation	Freight Constraints
Delridge Way Southwest	Minor Truck Street Seaport Highway Connector State T-2 corridor	None	Low-clearance under pedestrian bridge for northbound trucks north of Southwest Oregon Street
Fauntleroy Way Southwest	Major Truck Street State T-3 corridor	Over-Legal Network south of Southwest Avalon Way	Low-clearance location under pedestrian bridge at Southwest Andover Street
Southwest Avalon Way	Minor Truck Street State T-3 corridor	Over-Legal Network	None

Sources: City of Seattle 2016, WSDOT 2020.

There is one general load zone and one truck-only load zone within one block of the alternative alignments in this segment. The truck-only load zone is on Southwest Andover Street west of Delridge Way Southwest, and the general load zone is on Southwest Yancy Street.

9.2.3.2 Rail System

There is one rail facility partially in this segment, the rail tracks at Nucor Steel Seattle. The Nucor Steel plant is connected to the rail tracks of BNSF Railway's West Seattle Yard just west of the Port of Seattle's Terminal 5. The railroad tracks access the site through the northwest corner of the plant lot under the West Seattle Bridge and across South Spokane Street at-grade. These spurs and yard connect to the BNSF Railway mainline by shared tracks that cross the south tip of Harbor Island (West Seattle Lead).

9.2.4 West Seattle Junction Segment

The West Seattle Junction Segment is in an area with a high level of commercial development, mixed with residential uses. Most of the freight activity is related to local business deliveries. Table 9-4 summarizes the existing truck transportation route characteristics of the West Seattle Junction Segment.

Table 9-4. Truck Route Characteristics – West Seattle Junction Segment

Street Corridor	Freight Classification(s)	Over-Legal or Heavy Haul Designation	Freight Constraints
California Avenue Southwest	Minor Truck Street State T-3 corridor	None	None
Fauntleroy Way Southwest	Major Truck Street State T-3 corridor	Over-Legal Network south of Southwest Avalon Way	Low-clearance location under pedestrian bridge at Southwest Andover Street
Southwest Avalon Way	Minor Truck Street State T-3 corridor	Over-Legal Network	None

Sources: City of Seattle 2016, WSDOT 2020.

Depending on the station and alignment locations, there are up to 20 general load zones and three truck-only load zones within one block of the stations or alignment. The truck-only load zones are concentrated on Fauntleroy Way Southwest north of 39th Avenue Southwest, and the general load zones are concentrated on 36th Avenue Southwest south of Southwest Avalon Way and California Avenue Southwest north of Southwest Hudson Street.

9.3 Environmental Impacts

This section discusses the future freight conditions for the No Build Alternative and Build Alternatives, including effects to the truck network and rail network. Marine network impacts are presented in Chapter 8. In general, long-term or short-term impacts to traffic operations, as described in Chapter 4, would affect both general and truck traffic. This section summarizes the potential effects unique to freight traffic or facilities.

9.3.1 No Build Alternative

With the No Build Alternative, there are no planned changes to the freight network, although slight growth in traffic volumes is expected in the future, which would increase congestion on designated freight routes. As part of the transportation analysis, future planned industrial and port developments are assumed, including the recently completed improvements at Terminal 5 and potential future increases in freight throughput at Terminal 18.

9.3.2 Build Alternatives

9.3.2.1 Long-term Impacts

Impacts Common to All Build Alternatives

The Build Alternatives would be designed to retain clearance envelopes for truck streets, including those designated for over-legal loads. They would also retain horizontal and vertical clearance requirements for railroad tracks.

At new stations, there would be functional changes to the surrounding curb uses. In some locations, existing truck-only/commercial vehicle load zones would be modified to support the station as a transit stop or passenger load zone area. Most stations would eliminate fewer than five load zones.

All of the alternatives could affect 4th Avenue South, a Major Truck Street, between South Massachusetts Street and South Spokane Street, where transit improvements would be constructed to accommodate buses diverted from the SODO Busway. The 4th Avenue South transit improvements could be permanent for Preferred Option SODO-1c, Alternative SODO-1a, and Option SODO-1b, because the rail alignment would eliminate the SODO Busway. For Alternative SODO-2, the transit accommodations on 4th Avenue South would be a long-term construction-related change for the duration of construction on the SODO Busway. The closure period would be 5 years for construction of the West Seattle Link Extension. Sound Transit is also planning the Ballard Link Extension, which is a light rail extension from SODO Station to Ballard that would require a closure of the SODO Busway during construction. See Chapter 11 for a discussion of the combined effect on the SODO Busway. Improvement options being considered include bus queue jumps at key intersections, business access and transit lanes, and/or a freight and bus lane that could be shared by buses and trucks. The first two transit improvement options could increase delays to truck traffic on 4th Avenue South, and the third could reduce delays for truck traffic. Chapter 3 provides further information about the transit improvements on 4th Avenue South.

SODO Segment

Preferred Option (SODO-1c)

Preferred Option SODO-1c would build a new vehicle overpass over the guideways on South Lander Street, which is a Major Truck Street. The vehicle overpass would be designed to accommodate trucks with a maximum slope of 7 percent, and would eliminate roadway delay at the existing light rail crossing. Alternative access to the existing Carrier Annex/Terminal Post Office garage would be provided by connecting the southern access driveway to 4th Avenue South via a new access road under the new South Lander Street overpass. Sound Transit is working with the United States Postal Service and the City of Seattle to ensure trucks and other vehicles are able to access the parking garage facility. The clearance above the new roadway would accommodate truck access to the Post Office facility.

Spur tracks along the SODO Busway north of South Lander Street would be removed with all alternatives. The BNSF storage tracks on the west side of the SODO Busway between the vicinity of South Hinds Street and South Lander Street would also be eliminated. Loading and lead tracks on the east side of the SODO Busway south of South Lander Street, including those that serve Franz Bakery and the 7th Avenue South lead tracks, would be retained.

Preferred Option SODO-1c would permanently eliminate 14 load zones. This includes three truck-only load zones on 5th Place South, four general load zones on 5th Place South, and four general load zones on South Bayview Street. The new vehicle overpass on South Lander Street would eliminate two general load zones and one truck-only load zone. Adjacent businesses would be acquired for the station, which could reduce or eliminate demand for the affected load zones.

Other Build Alternatives (SODO-1a, SODO-1b, and SODO-2)

Alternative SODO-1a and Option SODO-1b would also build a new overpass on South Lander Street. In the West Seattle and Ballard Link Extensions (WSBLE) Draft Environmental Impact Statement (EIS), Option SODO-1b was planned to have a pedestrian crossing at the top of the overpass that could add delay for trucks, but that feature has been eliminated. Alternative SODO-2 would not have an overpass at South Lander Street, and the new guideway would be elevated above South Lander Street; the existing Link light rail track would remain at-grade, and trucks would continue to experience short-duration closures when trains cross South Lander Street.

The other alternatives would have similar effects on spur tracks along the SODO Busway as Preferred Option SODO-1c.

Alternative SODO-1a would have similar loading space losses as Preferred Option SODO-1c. Option SODO-1b would remove fewer loading spaces than the preferred option, with two general load zone spaces and one truck-only load zone on South Lander Street. Alternative SODO-2 would have no loss of load zone spaces.

Duwamish Segment

Preferred Alternative (DUW-1a)

No stations are proposed in the Duwamish Segment, and Preferred Alternative DUW-1a would have no structures within the public street system or Port of Seattle terminals that would permanently affect traffic or truck operations, including over-legal trucks. No on-street load zones or truck parking would be permanently affected.

Preferred Alternative DUW-1a would cross several major rail facilities, including the BNSF Railway mainline and the Seattle International Gateway Yard lead tracks, but it would have no long-term effects on rail operations. It would retain the existing local rail spurs along both sides of the SODO Busway south of South Hinds Street.

Other Build Alternatives (DUW-1b and DUW-2)

Option DUW-1b and Alternative DUW-2 would not affect truck or rail operations. Alternative DUW-2 includes a guideway column near Terminal 18, but this column would be outside of the gate queuing area. No load zones would be affected.

Delridge Segment

Preferred Option (DEL-6b)

Preferred Option DEL-6b would create a new signalized intersection at Delridge Way Southwest and Southwest Charlestown Street/23rd Avenue Southwest that would provide truck and passenger vehicle access to Nucor Steel. No load zones would be affected.

Other Build Alternatives (DEL-1a, DEL-1b, DEL-2a, DEL-2b, DEL-3, DEL-4, DEL-5, DEL-6a, and DEL-7)

Alternative DEL-7 would be similar to Preferred Option DEL-6b. None of the other alternatives would permanently affect the truck or rail networks in this segment. No load zones would be affected.

West Seattle Junction Segment

Preferred Option (WSJ-5b)

Preferred Option WSJ-5b would not permanently affect the truck or rail networks in this segment. No load zones would be affected.

Other Build Alternatives (WSJ-1, WSJ-2, WSJ-3a, WSJ-3b, WSJ-4, WSJ-5a, and WSJ-6)

None of the other alternatives or options would permanently affect the truck or rail networks in this segment. No load zones would be affected.

9.3.2.2 Construction Impacts

Impacts Common to All Build Alternatives

Construction activities for all Build Alternatives are expected to eliminate on-street load zones that trucks can use within the construction areas, particularly near stations. For many of those locations, adjacent businesses would also be acquired, which could limit the demand for the affected load zone. Temporary removal of parking during construction could affect trucks, which are allowed to legally park long-term and overnight on streets in industrial areas.

Many streets could be fully closed for a short duration (less than 48 hours) when structures are constructed overhead. Freight facilities expected to be affected by construction or full roadway closures causing substantial barriers or out-of-direction travel are described by alternative in the following sections. Specific information about each closure is provided in Section 4.3.3, in Chapter 4. Construction flaggers may also occasionally halt vehicle traffic on roadways adjacent to active construction for very short periods; this would affect key freight routes that pass through the construction area.

All alternatives would temporarily close sections of 6th Avenue South between South Massachusetts Street and South Spokane Street during relocation of the 230-kilovolt power lines from the SODO Busway. This Major Truck Street is in the SODO and Duwamish segments of the project. Sections of 6th Avenue South could be fully closed temporarily while a crane is used to erect power poles. Access to truck parking or loading zones along each segment would also be eliminated during these closures. Major Truck Streets that cross 6th Avenue South could also require temporary closures during these construction activities.

SODO Segment

Preferred Option (SODO-1c)

Preferred Option SODO-1c would build a new vehicle overpass over the guideways on South Lander Street, which is a Major Truck Street. Construction is expected to require a full closure of South Lander Street between 4th Avenue South and 6th Avenue South. When South Lander Street is closed, South Holgate Street and South Spokane Street would remain open and would likely be the primary diversion routes for trucks. Partial closures of 6th Avenue South and 4th Avenue South near the intersections with South Lander Street for a few months would also occur. Local access to the Carrier Annex/Terminal Post Office would be retained during construction, although some short-term closures could be needed when placing overhead structures. No additional load zones beyond those described as long-term impacts would be removed for construction.

Other Build Alternatives (SODO-1a, SODO-1b, and SODO-2)

Alternative SODO-1a and Option SODO-1b would also build a vehicle overpass on South Lander Street with similar closures as Preferred Option SODO-1c. Local access to the Carrier Annex/ Terminal Post Office would be retained during construction, with potential short-term closures.

Alternative SODO-2 would not have an overpass at South Lander Street and would not require long-term closure of South Lander Street. Construction of Option SODO-1b and Alternative SODO-2 would affect seven load zones, which includes four general load zones and three truck-only load zones on 5th Place South. Alternative SODO-1a would not have additional load zones removed for construction beyond those described as long-term impacts.

Duwamish Segment

Preferred Alternative (DUW-1a)

Preferred Alternative DUW-1a would construct guideway columns on each side of 4th Avenue South north of South Spokane Street; construction of multi-pier foundations for the guideway columns could close up to three lanes of 4th Avenue South at a time for 12 to 18 months. Another guideway column on the south side of South Spokane Street west of 4th Avenue South would also have a multi-pier foundation that would require closing three lanes on eastbound South Spokane Street for 3 to 6 months. Preferred Alternative DUW-1a could require short-term closures of key streets in the truck network (e.g., South Spokane Street, State Route 99, East Marginal Way South, and West Marginal Way Southwest) when the guideway is built over those streets.

Preferred Alternative DUW-1a would have a guideway column close to the BNSF Railway tracks east of East Marginal Way South, for which ground improvements could extend into the track envelope and require temporary closures of the tracks. It would also have a bridge pier and foundation just east of the West Waterway that is close to the BNSF West Seattle lead tracks. Construction of the guideway and columns could also temporarily affect the local business rail spurs on each side of the SODO Busway.

Preferred Alternative DUW-1a would affect two general load zones on 6th Avenue South between South Forest Street and South Horton Street. Construction staging areas could also affect between 40 and 55 on-street parking spaces, which can be used for general truck parking (see Chapter 5 for further detail).

Other Build Alternatives (DUW-1b and DUW-2)

Option DUW-1b would have similar street network impacts as Preferred Alternative DUW-1a, except that the partial closure of 4th Avenue South would be shorter, lasting about 6 months.

Alternative DUW-2 would have a guideway column requiring lane closures on Chelan Avenue Southwest west of the West Marginal Way Southwest/Southwest Spokane Street intersection. Ground improvements for this column would extend into the west leg of the intersection on Chelan Avenue Southwest. There would be a guideway column in the Terminal 18 employee parking lot just west of the Terminal 18 truck gate queue area, but it would not affect truck operations at the terminal. Construction access to the column and construction of the guideway could encroach into the gate area but is not expected to affect queue capacity or circulation within the terminal.

Option DUW-1b would have similar rail impacts as Preferred Alternative DUW-1a except that the pier for the Duwamish River Bridge crossing would not be near the West Seattle lead track. Alternative DUW-2 would span several tracks, including the lead rail track serving Harbor Island and Terminal 5, but is not expected to disrupt rail operations. Construction of the guideway and columns could also temporarily affect the local business rail spurs on each side of the SODO Busway.

Alternative DUW-2 would temporarily displace the truck parking lot at Terminal 25 described in Chapter 5. Both Option DUW-1b and Alternative DUW-2 would affect two general load zones on 6th Avenue South between South Forest Street and South Horton Street. Construction staging for Alternative DUW-2 would temporarily remove 95 to 120 on-street parking spaces including many under State Route 99, which would reduce general truck parking. Option DUW-1b would have parking losses due to staging similar to Preferred Alternative DUW-1a.

Delridge Segment

Preferred Option (DEL-6b)

Preferred Option DEL-6b would require the full closure of Southwest Avalon Way during nights and weekends. This is part of the City of Seattle's designated Over-Legal Network and a Minor Truck Street. It would affect one general load zone on Southwest Yancy Street. Preferred Option DEL-6b would not affect the rail network.

Other Build Alternatives (DEL-1a, DEL-1b, DEL-2a, DEL-2b, DEL-3, DEL-4, DEL-5, DEL-6a, and DEL-7)

Nucor Steel is adjacent to two alternatives that would be constructed along Southwest Andover Street. Alternative DEL-5 and Alternative DEL-6a would require a full closure of Southwest Andover Street during construction of the tall bridge footings and structure, but access to the Nucor facility by vehicle and rail would be maintained. Nucor access could also be affected by Alternative DEL-3 and Alternative DEL-4, which would require a partial closure of Delridge Way Southwest for multiple years.

Alternative DEL-5 would require the full closure of Southwest Avalon Way for about 1 year. Option DEL-1b would partially close Southwest Avalon Way for nine months. Alternative DEL-1a, Option DEL-1b, Alternative DEL-3, Alternative DEL-6a and Alternative DEL-7 would close this street on nights and weekends. This is part of the City of Seattle's designated Over-Legal Network and a Minor Truck Street. Other truck streets could be closed on nights and weekends during construction.

Alternative DEL-5, Alternative DEL-6a, and Alternative DEL-7 would affect one general load zone on Southwest Yancy Street; the other Build Alternatives would not have additional load zone impacts during construction beyond those described as long-term impacts.

None of the alignments would affect the rail network in this segment.

West Seattle Junction Segment

Preferred Option (WSJ-5b)

Preferred Option WSJ-5b would require a partial closure of the intersection at Fauntleroy Way Southwest and Southwest Avalon Way. Both of these streets are part of the City's Over-Legal Network; Fauntleroy Way Southwest is a Major Truck Street and Southwest Avalon Way is a Minor Truck Street. It would affect one general load zone on 41st Avenue Southwest.

There is no rail network in this segment.

Other Build Alternatives (WSJ-1, WSJ-2, WSJ-3a, WSJ-3b, WSJ-4, WSJ-5a, and WSJ-6)

Alternative WSJ-1 and Alternative WSJ-2 would require a full closure on Fauntleroy Way Southwest on nights and weekends. Alternative WSJ-1 would affect four general load zones along Fauntleroy Way Southwest, 38th Avenue Southwest, and 39th Avenue Southwest. Alternative WSJ-2 would affect three truck-only load zones on Fauntleroy Way Southwest, and three general load zones on 38th Avenue Southwest, Fauntleroy Way Southwest, and Southwest Genesee Street.

Alternative WSJ-3a and Option WSJ-3b would require a partial closure of Fauntleroy Way Southwest. Alternative WSJ-3a and Option WSJ-3b would affect two general load zones.

Alternative WSJ-4 would require a full closure on Fauntleroy Way Southwest on nights and weekends. Alternative WSJ-5a would require partial closure of Fauntleroy Way Southwest. Alternative WSJ-4 would not remove any load zones, and Alternative WSJ-5a would affect one general load zone on 41st Avenue Southwest. WSJ-6 would not affect any truck streets but would affect one general load zone on 41st Avenue Southwest.

9.4 Potential Mitigation Measures

9.4.1 Long-term Impacts

Freight traffic could be affected by the mitigation options being considered on 4th Avenue South to address the impact to transit of the SODO Busway closure. Potential improvement options for the busway closure include modifying 4th Avenue South with bus queue jumps at key intersections, business access and transit lanes, and/or a freight and bus lane that could be shared by buses and trucks. The first two transit improvement options could increase delays to truck traffic on 4th Avenue South, and the third option could reduce delays for truck traffic on 4th Avenue South. Therefore, Sound Transit and the City of Seattle may choose to mitigate the effect to freight travel times by selecting freight and bus lanes as the improvement on 4th Avenue South.

As part of the parking mitigation, Sound Transit would coordinate with the Seattle Department of Transportation to manage curb use in the station vicinities. This would include locating commercial vehicle and truck-only load zones to serve business needs. For more information, see Section 5.4, Potential Mitigation Measures, in Chapter 5.

9.4.2 Construction Impacts

Prior to construction activities that fully or partially close a Major or Minor Truck Street, Sound Transit would work with the City of Seattle to accommodate truck turning maneuvers or to identify detour routes suitable for trucks. Construction activities that affect the City of Seattle's Over-Legal Network, including Southwest Avalon Way and Fauntleroy Way Southwest, would be coordinated with the City of Seattle to identify construction management measures to maintain an envelope to accommodate oversized trucks during construction or to identify suitable alternative routes that would be defined prior to freight movements as part of the City's over-legal permit process.

Sound Transit would coordinate with the BNSF Railway and Union Pacific Railroad prior to construction over rail tracks or ground improvements for guideway columns close to the rail tracks. To the extent feasible, construction activity would adhere to schedule and minimum clearance requirements as agreed to by Sound Transit and BNSF Railway.

Sound Transit would work with the Port of Seattle and Northwest Seaport Alliance to identify construction management measures to maintain adequate port terminal access and operations along its primary drayage routes between the marine and rail terminals. This could include identifying alternative routes for trucks if construction closures affect access or drayage routes along South Spokane Street and other streets that connect the Port terminals to local railyards. In addition, for Alternative DUW-2, measures could include ensuring adequate terminal driveway widths and restricting some construction activities to times of day when the terminals have low or no gate activity. At a broader level, Sound Transit would coordinate with the Port of Seattle and Northwest Seaport Alliance on the construction schedule and sequencing to minimize major construction work on key freight corridors at the same time.

For locations where truck-only load zones, commercial load zones, or general load zones would be eliminated but the businesses that rely on them remain, Sound Transit would coordinate with the City of Seattle to relocate these commercial load zones. For Alternative DUW-2, Sound Transit would work with the Port of Seattle to provide temporary truck parking to replace parking affected by construction activities on Terminal 25.

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10 INDIRECT AND SECONDARY IMPACTS

This chapter presents the indirect and secondary transportation impacts from the West Seattle Link Extension Project (the project), which are those that occur later in time or are farther removed in distance during project operation and construction. Any additional mitigation measures beyond those described in previous chapters are also discussed.

10.1 Regional Travel

The completion of the West Seattle Link Extension would provide reliable light rail service between West Seattle and the region's major urban centers, including Downtown Seattle. Light rail service could help facilitate further increases in residential and employment uses around the stations beyond what is assumed for the Final EIS. This could lead to changes in regional and local travel patterns as trips to and from these areas increase for all travel modes, affecting transit, local and regional traffic volumes, parking demand, and non-motorized users.

10.2 Transit Service and Operations

Beyond the future conceptual bus service plan assumed for each Build Alternative, other changes in transit service within the West Seattle Link Extension corridor that are not yet planned or anticipated in response to the project could also result in shifts in ridership. For instance, Metro could redeploy or reinvest in bus service that would be replaced by light rail service above what has been assumed in the West Seattle Link Extension Final EIS.

Investments in high-capacity transit service can attract higher-density residential and commercial land uses around stations; this is known as transit-oriented development. The population and employment projections used in Sound Transit's ridership forecasting model (Puget Sound Regional Council's 2014 Land Use Targets) forecast substantial population and employment growth around project stations. Because the ridership model already accounts for this potential transit-oriented development, ridership is not expected to exceed the forecasts presented in the Final EIS. Passenger load forecasts (see Section 3.3.2.1, Long-term Impacts, in Chapter 3, Transit) indicate sufficient capacity on the project and other routes in the corridor, so overcrowding is unlikely.

10.3 Arterial and Local Street Operations

Increased automobile and bus trips to and from the station areas could result from potential increases in land use development around the light rail stations along the corridor. The increase in traffic could cause additional impacts on the arterials and local streets. Shifts among the automobile, transit, bicycle, and pedestrian modes could also result from increased development along the project corridor. For example, depending on how development is planned and permitted, there could be additional bicycle and pedestrian activity near the station areas.

10.4 Parking

Increase in parking demand around station areas along the project corridor might result from the potential increase in land use development surrounding these areas. The demand for parking more than 0.25 mile from the stations could increase because riders could park along feeder bus routes and travel to the station by bus. Hide-and-ride impacts are not anticipated in station areas, as Sound Transit would work with the City of Seattle to implement curb use management where it does not already exist.

10.5 Non-motorized Facilities

Additional pedestrian and bicycle trips to the station could result from potential increases in higher-density residential and commercial developments. Likewise, light rail ridership at the affected station could potentially increase. These trips may travel along streets that lack sufficient facilities or Americans with Disabilities Act accessibility. However, that could encourage local jurisdictions to implement improvements to these facilities as increased usage becomes evident. The non-motorized analysis (see Chapter 6, Non-motorized Facilities) indicates that the surrounding sidewalks, crosswalks, and corners have ample capacity under future conditions.

10.6 Safety

The potential for increases in residential and employment uses around the light rail stations could lead to an increase in non-motorized activity and further conflicts between all travel modes (i.e., automobile, transit, and non-motorized).

10.7 Freight Mobility and Access

Increased automobile and bus trips to and from the station areas could result from potential increases in land use development around the light rail stations along the project corridor. The increase in traffic could cause additional impacts on the arterials and local street operations near stations, which could affect freight mobility and access on local roadways. Any impacts on freight would be similar to those for automobiles.

10.8 Navigation

No indirect effects to navigation are anticipated. See Section 4.3, Economics, of the Final EIS for discussion of potential indirect effects to maritime businesses.

11 CUMULATIVE IMPACTS

This chapter describes how the cumulative long-term incremental transportation effects of the West Seattle Link Extension Project (the project), in conjunction with past, present, and reasonably foreseeable future actions, are accounted for in the transportation analysis. Cumulative impacts include both direct and indirect impacts resulting from governmental and private actions. Assumed background projects have been reflected in the analyses discussed in previous chapters. Cumulative short-term construction transportation impacts are also presented.

11.1 Impacts during Operation

The analysis of future traffic and transit impacts in this technical report is a cumulative analysis based on the results of traffic modeling and ridership modeling that incorporate past, funded, and approved future actions, as well as projected growth that would result from development in the region. Other reasonably foreseeable transit and development projects could affect transit ridership and travel patterns within the study area, including traffic operations near new stations. This could include possible transit-oriented development in station areas, which would likely increase the numbers of people walking or biking to stations.

As the West Seattle Link Extension becomes operational, its contribution to cumulative impacts on transportation would be beneficial in several ways. The project would contribute travel efficiencies in addition to those provided by the other reasonably foreseeable future transportation improvement projects listed in Appendix A, Future Transportation Project List, of Attachment N.1A, Transportation Technical Analysis Methodology Report. It would shift trips from personal auto to transit, reducing the number of vehicle miles traveled and vehicle hours of delay along the corridor compared to the No Build Alternative. Fewer vehicle miles and hours could improve general traffic conditions, including freight mobility, within the study area. In the SODO Segment, the South Lander Street Overpass that would be constructed as part of the project would eliminate a railroad crossing on South Lander Street between 6th Avenue South and 4th Avenue South, reducing delay.

The project, in combination with other reasonably foreseeable future transit projects, is not expected to have a cumulative impact on parking throughout the study area. The project would either remove or convert some street parking to bus (or other transit) loading zones in the immediate vicinity of the stations. Sound Transit would work with the Seattle Department of Transportation to consider appropriate on-street parking measures within a 0.25-mile radius of each station to discourage hide-and-ride activity and encourage parking availability for residents and businesses in the area.

While other transportation projects could also remove street parking to implement their improvements (for example, a City of Seattle project that changes allocation of the right-of-way), these changes would be consistent with City goals and policies related to curb space management. With the project creating a more connected and accessible regional transit system, especially in the commercial and residential areas along the project corridor, transit ridership would increase and potentially reduce the need for parking within the study area. The City of Seattle could adjust curb space use in the project corridor for reasons unrelated to the project, such as policy, adjacent land uses, transportation improvement project needs, transit service availability, and non-motorized network improvements (for example, the Georgetown to Downtown Safety Project).

This Final EIS assumes completion of the Sound Transit 3 program of regional transit improvements by 2042; Sound Transit's Long-Range Vision (Sound Transit 2014) contains additional rail projects beyond the Sound Transit 3 program that may eventually be implemented. Similarly, the Final EIS assumes that a modified version of King County Metro Transit (Metro) Metro Connects (2021) long-range vision is in place by 2042. These improvements are accounted for in the impacts analysis for this project. If regional transit service is expanded beyond these assumptions, it could attract additional ridership to project stations in the project corridor, thereby increasing vehicle and pedestrian activity around stations. Future unfunded projects or local growth could add more pedestrian and bicycle trips to the street network surrounding the light rail stations and improve non-motorized facilities within the study area.

The City of Seattle is in the process of delivering several safety projects as part of Vision Zero, which is Seattle's plan to eliminate traffic deaths and serious injuries on city streets by 2030, and additional projects may be implemented in the future. These include the Highland Park Way Safety Project and Georgetown to Downtown Safety Project, which will be completed in 2024. In addition, protected bike lanes are planned for several areas near the project corridor. Other development would not likely affect safety in the study area. These projects, together with the West Seattle Link Extension, would lead to an overall improvement in safety.

11.2 Impacts during Construction

Other transportation projects in the study area could have construction periods that overlap with civil construction of the project and, if they include road closures, could extend or intensify the disruption to regular travel patterns in the affected areas. Cumulative traffic-related construction impacts could include longer durations of detours for all modes, increased travel delay and congestion, and increased traffic on detour routes.

In bored-tunnel areas, the project would not affect traffic flow outside of station, station shaft, and portal locations. WSDOT, the City of Seattle, Metro, the Port of Seattle, Northwest Seaport Alliance, and Sound Transit have been coordinating and would continue to coordinate on the construction schedules for transportation projects to avoid major construction work on overlapping corridors at the same time. The proposed project, in combination with the proposed Ballard Link Extension, could include building roadway overpasses at South Lander Street and South Holgate Street, two of the few major east-west streets in SODO that cross the light rail and BNSF Railway tracks. Preferred Option SODO-1c, Alternative SODO-1a, and Option SODO-1b would include construction of one roadway overpass at South Lander Street as part of the West Seattle Link Extension. The proposed Ballard Link Extension would include construction of one roadway overpass at South Holgate Street and, depending on the alternative selected for the south end of the Ballard Link Extension, partial or full closures of Major Truck Streets in the area, including 4th Avenue South, Seattle Boulevard South, and 6th Avenue South. Overlapping traffic-related construction impacts in the SODO Segment would be minimized due to the construction schedules of the West Seattle Link Extension and the Ballard Link Extension. However, the construction schedules may be consecutive or separated by a short period of time, resulting in a cumulative impact by extending the duration of construction closures in the area. Access for all types of vehicles and non-motorized access would be maintained on one roadway while the other is under construction. South Lander Street and South Holgate Street would not be closed for construction at the same time.

Although Alternative SODO-2 would not permanently close the SODO Busway as would occur under the other project alternatives, it would close the SODO Busway for 5 years, followed by a similar closure of 5 years to construct the Ballard Link Extension. This would result in a cumulative 10-year closure of that facility and extending the duration of bus route detours to 4th Avenue South.

The proposed project, in combination with the proposed Ballard Link Extension, could include disruptions to the Link light rail system while the light rail extensions are being integrated into the existing system. The schedules of construction activities that could affect Link light rail service are unknown at this time, but they may occur in similar timeframes, leading to longer periods of service disruptions for light rail riders.

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