West Seattle and Ballard
Link Extensions

Initial Assessment Alternatives Development and Screening

November 2020

Summary

Introduction and Background

Sound Transit completed an alternatives evaluation process for the West Seattle and Ballard Link Extensions project in 2019. Through this process, alternatives suggested during early scoping were refined through a three-level evaluation process with public input and recommendations by a Stakeholder Advisory Group (SAG) and an Elected Leadership Group (ELG). Following completion of the alternatives evaluation and scoping under the National and State Environmental Policy Acts (NEPA and SEPA), the Sound Transit Board considered public and agency input and then identified preferred and other alternatives for study in an Environmental Impact Statement (EIS) in May 2019. At that time, the Sound Transit Board also directed staff to conduct initial assessments of the following potential new alternatives suggested during the scoping period to establish whether further study in the Draft EIS would be appropriate:

- Yancy/Andover Elevated
- Pigeon Point Tunnel
- SODO Elevated
- 20th Avenue Tunnel Ballard

This Initial Assessment Alternatives Development and Screening Report documents the findings of the development, evaluation and screening process for the four potential new alternatives identified by the Sound Transit Board as potentially appropriate for further study in the Draft EIS (along with two options that arose during this study process).

Initial Assessment Alternatives and Findings

Yancy/Andover Elevated

The Yancy/Andover Elevated Alternative would head west from Delridge Way SW in the vicinity of SW Andover Street and follow Avalon Way SW to an Avalon Station in the vicinity of SW Avalon Way and 35th Avenue SW. It would be similar to an alternative that had been studied and dismissed in the Level 1 screening process, but was reintroduced in response to the ongoing concerns about residential effects.

The costs for this alternative would be similar to the ST3 Representative Project. Positives include fewer residential displacements and visual effects in the Delridge/Youngstown neighborhood and fewer acres of parks and recreational resources affected. Negatives include potentially greater effects on businesses and freight, a less accessible Delridge Station, and increased residential effects along Avalon Way.

The Sound Transit Board acted in October 2019 to advance this alternative for study in the Draft EIS.

Pigeon Point Tunnel

The Pigeon Point Tunnel Alternative would cross the Duwamish Waterway on the south side of the West Seattle Bridge, turn toward the southwest and tunnel under the Pigeon Point neighborhood, emerging on the west side of the hill in the vicinity of Delridge Way SW and SW Genesee Street..

This alternative would have fewer business and freight effects, fewer visual effects because of the tunnel, and locate the Delridge station in a more accessible location further south. However, the alternative is estimated to cost approximately $900 million more (+$200 million for Pigeon Point Tunnel and +$700 million for West Seattle Junction Tunnel) than the ST3 Representative Project, and presents greater schedule risks. Tunnel alternatives at this location were not identified or analyzed in the ST3 Plan.

The Sound Transit Board did not advance this alternative for study in the Draft EIS.

SODO Elevated

The SODO Double Elevated Alternative would elevate both the new light rail line and the existing light rail line in SODO. This would achieve full grade separation between light rail and the road network, improving reliability for both, and would facilitate transit integration with the E3 busway maintained and a platform closer to S Lander Street. However, the SODO Double Elevated Alternative would require two shutdowns of Central Link during construction and would cost $300 million more than the ST3 Representative Project (approximately $500 million more than the preferred alternative, SODO At-Grade).

The SODO Partial Elevated Alternative was developed in response to some of the challenges associated with the SODO Double Elevated Alternative. This alternative would elevate only the new light rail line and leave the existing light rail line at grade in SODO. This alternative would remove the at-grade crossing at S Holgate Street, but would maintain the at-grade crossing of S Lander Street with the existing light rail line. This alternative would also facilitate transit integration with the E3 busway maintained and a platform closer to S Lander Street, and it would be less disruptive to existing service during construction. Cost estimates for this alternative are similar to the ST3

Representative Project, and approximately $200 million more than the preferred alternative, SODO At-Grade.

The Sound Transit Board did not advance the SODO Double Elevated Alternative, but did advance the SODO Partial Elevated Alternative for study in the Draft EIS.

20th Avenue Tunnel Ballard

The 20th Avenue Tunnel Ballard - BNSF Portal Alternative was proposed to provide a station at NW Market Street and 20th Avenue NW, which is closer to the core of the Ballard Hub Urban Village than other station alternatives to the east. This alternative would also allow a shorter tunnel under Salmon Bay. This alternative would turn northwest on an elevated structure north of Interbay Station and transition to a tunnel portal on BNSF property in the vicinity of W Emerson Street, then cross under Salmon Bay in a tunnel and follow 20th Avenue NW to a tunnel Ballard Station at 20th Avenue NW and NW Market Street. This alternative encountered engineering constraints, including a conflict with a major sewer pipeline, as well as the requirement for a long-span elevated structure with a large foundation to cross the BNSF tracks. These constraints led to a refinement to the alternative.

The 20th Avenue Tunnel Ballard - Thorndyke Portal Alternative would enter a tunnel portal just north of Interbay Station and cross under Salmon Bay west of the Ballard Bridge and transition west to align with 20th Avenue NW, ending at the same Ballard Station location at 20th Avenue NW and NW Market Street.

Both 20th Avenue Tunnel Ballard alternatives would result in a Ballard Station closer to the core of the Ballard Hub Urban Village. However, both alternatives also present construction challenges and additional residential and business property effects due to the constrained right-of-way along 20th Avenue NW. The 20th Avenue Tunnel Ballard - BNSF Portal Alternative is estimated to cost approximately $750 million more than the ST3 Representative Project and the 20th Avenue Tunnel Ballard - Thorndyke Portal Alternative is estimated to cost approximately $450 million more than the ST3 Representative Project. Tunnel alternatives at this location were not identified or analyzed in the ST3 Plan.

The Sound Transit Board did not advance either of the 20th Avenue Tunnel Ballard alternatives for study in the Draft EIS.

Next Steps

The alternatives chosen by the Sound Transit Board will be added to the set of alternatives that were advanced for further study at the end of the Level 3 screening and incorporated into the Draft EIS.

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Acronyms and Abbreviations

CE	Conceptual Engineering
CID	Chinatown – International District
EIS	Environmental Impact Statement
ELG	Elected Leadership Group
HCT	High Capacity Transit
NEPA	National Environmental Policy Act
ROD	Record of Decision
SAG	Stakeholder Advisory Group
SEPA	State Environmental Policy Act
SODO	South of Downtown
ST3	Sound Transit 3 Plan
WSBLE	West Seattle and Ballard Link Extensions

1 INTRODUCTION

1.1 Overview

Sound Transit is advancing the West Seattle and Ballard Link Extensions (WSBLE) Project through Phase 2, Draft Environmental Impact Statement (EIS) and Conceptual Engineering (CE), of project development. The purpose of the WSBLE Project is to expand the Link light rail system from downtown Seattle to West Seattle and Ballard and to increase capacity and connectivity for regional connections. During Phase 1, Alternatives Development, Sound Transit assessed the "representative project" included in the Sound Transit 3 (ST3) Plan and further refined the specific route, station locations, and other project elements based on additional public engagement and technical analysis. The ST3 Representative Project itself is the result of extensive, years-long planning and public involvement work. This work included carrying out high-capacity transit (HCT) studies, updating the agency's long-range plan, and developing the financing plan for the ST3 Plan approved by voters in 2016. During Phase 1, Sound Transit engaged the public and agencies in an intensive external engagement process that led to the Sound Transit Board identifying a set of preferred alternatives and other alternatives to evaluate in an EIS.

During Phase 1, project alternatives were developed through a three-level Alternatives Development process [See reports: *Level 1 Alternatives Development and Screening – July 2018*; *Level 2 Alternatives Development and Screening – October 2018*; and *Alternative Development Report – February 2019*] and the alternatives refined through this process were presented to the public for comment during the scoping period, between February and March of 2019.

The input received during scoping helped inform the Sound Transit Board action to identify a Preferred Alternative and other alternatives to study in an EIS. On May 23, 2019, the Sound Transit Board adopted **Motion M2019-51**, identifying the preferred alternative(s) and other alternatives for the West Seattle and Ballard Link Extensions Draft EIS.

In this motion, the Board also directed staff to conduct initial assessments of the following potential new alternatives suggested during the EIS scoping period to establish whether further detailed study in the Draft EIS is appropriate. This report summarizes the development of these alternatives and their evaluation results.

- Yancy/Andover Elevated
- Pigeon Point Tunnel
- SODO Elevated
- 20th Avenue Tunnel Ballard

During Phase 2, Sound Transit will complete a Draft EIS in accordance with National Environmental Policy Act (NEPA), State Environmental Policy Act (SEPA), and associated environmental regulations. This work involves developing conceptual engineering to a level sufficient to evaluate the environmental impacts of the project alternatives. The identified project impacts will be documented in the Draft EIS.

This Draft EIS and Conceptual Engineering phase concludes with a public and agency comment period and then advances into Phase 3, Final EIS and Preliminary Engineering, during which public and agency input on the Draft EIS will be incorporated, the design will be advanced, and the Sound Transit Board will make a final determination on which project alternative to construct. The FTA is then anticipated to issue a Record of Decision (ROD) for the project. The WSBLE Project study area is shown on **Figure 1-1** (West Seattle and Ballard Link Extensions Study Area).

Figure 1-1 West Seattle and Ballard Link Extensions Study Area

The WSBLE Project would provide fast, reliable light rail connections to dense residential and job centers throughout the region and add a new downtown Seattle light rail tunnel to provide efficient operating capacity for the entire regional system. The West Seattle Extension would operate on a 4.7-mile guideway from downtown Seattle to West Seattle's Alaska Junction neighborhood and include a new fixed span bridge across the Duwamish Waterway. The Draft EIS includes alternatives on the south and north side of the West Seattle Bridge and elevated and tunnel guideway alternatives in West Seattle Junction. The West Seattle Extension would serve the existing at-grade Stadium Station, an at-grade station at South of Downtown (SODO), an elevated station at Delridge, and either elevated or tunnel stations at Avalon and Alaska Junction.

The Ballard Extension would operate 7.1 miles, starting from downtown Seattle and extending to Ballard's Market Street area. It would include a new 3.3-mile rail-only tunnel from the Chinatown-International District (CID) to South Lake Union and Seattle Center/Uptown. The Draft EIS includes alignment alternatives in Downtown, Interbay, and Ballard; different station depths in Chinatown-International District and Downtown; and fixed bridge and tunnel guideway alternatives across Salmon Bay. The Ballard Extension would serve six tunnel stations (at International District/Chinatown, Midtown, Westlake, Denny, South Lake Union, and Seattle Center); elevated, at-grade, or retained cut stations at Smith Cove and Interbay; and an elevated or tunnel station in Ballard.

1.2 Purpose of Report

This *Initial Assessment Alternatives Development and Screening Report* documents the findings of the alternatives development, evaluation and screening process for these "initial assessment" alternatives contained in the May 23, 2019, Board Motion. This is separate from the previous alternatives narrowing processes and is intended to evaluate these potential alternatives suggested during the EIS scoping period and compare them to the other alternatives already advanced for study in the Draft EIS. This report presents comparisons of these "initial assessment" alternatives to the alternatives from the Level 3 screening and evaluation. This is intended to provide the Sound Transit Board with information on how these new alternatives perform on the same set of criteria used in Level 3.

The preferred and other alternatives identified in **Motion M2019-51** were extensively studied and screened before the scoping comment period, and that work is documented in *Level 1 Alternatives Development and Screening (July 2018)*, *Level 2 Alternatives Development and Screening (October 2018)* and *Alternatives Development Report (February 2019)*.

1.3 Report Organization

The *Initial Assessment Alternatives Development and Screening Report* is organized into the following sections:

- **Section 1 (Introduction)** provides an overview of the project and describes the purpose of this report.
- **Section 2 (Initial Assessment Alternatives)** describes the alternatives and the rationale that led to their development.
- **Section 3 (Evaluation and Findings)** presents the evaluation criteria, process and results.
- **Section 4 (Sound Transit Board Action on the Alternatives)** reports on the Sound Transit Board's decision for each alternative.
- **Section 5 (Next Steps)** concludes with a summary of the next steps in the process for the alternatives to be studied in the Draft EIS.

2 INITIAL ASSESSMENT ALTERNATIVES

2.1 Yancy/Andover Elevated

2.1.1 Description

The Yancy/Andover Elevated Alternative would connect to the South Duwamish Crossing, locate the Delridge Station north of SW Andover Street, be elevated along SW Andover Street and Avalon Way SW and connect to an elevated Avalon Station. The alternative is described in **Table 2-1** (Yancy/Andover Elevated Description) and shown in **Figure 2-1** (Yancy/Andover Elevated Map).

The Yancy/Andover Elevated Alternative was compared to the performance of the Level 3 alternatives only within the area shown in the dashed box in **Figure 2-1**. This area and the Level 3 alternatives are described in **Table 2-2** (Level 3 Alternatives Descriptions (for Yancy/Andover Elevated Comparison)) and shown in **Figure 2-2** (Level 3 Alternatives Map (for Yancy/Andover Elevated Comparison)).

2.1.2 Rationale and History

During the scoping period, comments from the community expressed concerns with effects to the North Delridge/Youngstown and Pigeon Point neighborhoods and requested the study of alternatives to avoid these potential effects, including alignments along SW Yancy Street or SW Andover Street.

Specific requests called for a reconsideration of the Yancy Street/West Seattle Tunnel Alternative from Level 1, which had not been carried forward because it would have required a long tunnel and would have consolidated the Delridge and Avalon Stations, which would not be consistent with the ST3 Plan. The Yancy/Andover Elevated Alternative was developed as a means to follow a similar alignment to the Yancy Street/West Seattle Tunnel Alternative, but also include Delridge and Avalon Stations.

Table 2-1 Yancy/Andover Elevated Description

Yancy/Andover Elevated	
INITIAL ASSESSMENT ALTERNATIVE	
ROUTE DESCRIPTION	**STATIONS**
• Begins at west side of the Duwamish Waterway on a high-level, fixed bridge on south side of existing bridge • Rounds Pigeon Point, crosses to the west side of Delridge Way SW and continues west on an elevated guideway along SW Andover Street • Turns south along SW Avalon Way in the vicinity of SW Yancy Street • Travels south along SW Avalon Way on an elevated guideway and turns west at SW Genesee Street	Delridge — Elevated north of SW Andover Street west of Delridge Way SW oriented northeast-southwest

Table 2-2 Level 3 Alternatives Descriptions (for Yancy/Andover Elevated Comparison)

ST3 Representative Project	
AVALON STATION ELEVATED, DELRIDGE STATION NORTH OF ANDOVER	
ROUTE DESCRIPTION	**STATIONS**
• Begins at west side of the Duwamish Waterway on a high-level, fixed bridge on south side of existing bridge • Rounds Pigeon Point, follows Delridge Way SW heading south on an elevated guideway and runs west along SW Genesee Street north of the West Seattle Golf Course	Delridge — Elevated on Delridge Way SW north of SW Andover Street

West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	
AVALON STATION ELEVATED, DELRIDGE STATION SOUTH OF ANDOVER	
ROUTE DESCRIPTION	**STATIONS**
• Begins at west side of the Duwamish Waterway on a high-level, fixed bridge on south side of existing bridge • Rounds Pigeon Point, follows Delridge Way SW heading south on an elevated guideway and runs west along SW Genesee Street north of the West Seattle Golf Course	Delridge — Elevated on Delridge Way SW south of SW Andover Street

West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel	
AVALON STATION TUNNEL, DELRIDGE STATION NORTH OF GENESEE	
ROUTE DESCRIPTION	**STATIONS**
• Begins at west side of the Duwamish Waterway on a high-level, fixed bridge on north side of existing bridge • Crosses over the West Seattle Bridge ramp and runs south on an elevated guideway on the west side of Delridge Way SW • Turns on a diagonal heading southwest to SW Genesee Street • Continues on an elevated guideway on the northern edge of the West Seattle Golf Course • Descends into a tunnel, with tunnel portal near SW Avalon Way	Delridge — Elevated on a diagonal between Delridge Way SW and 26th Avenue SW north of SW Genesee Street

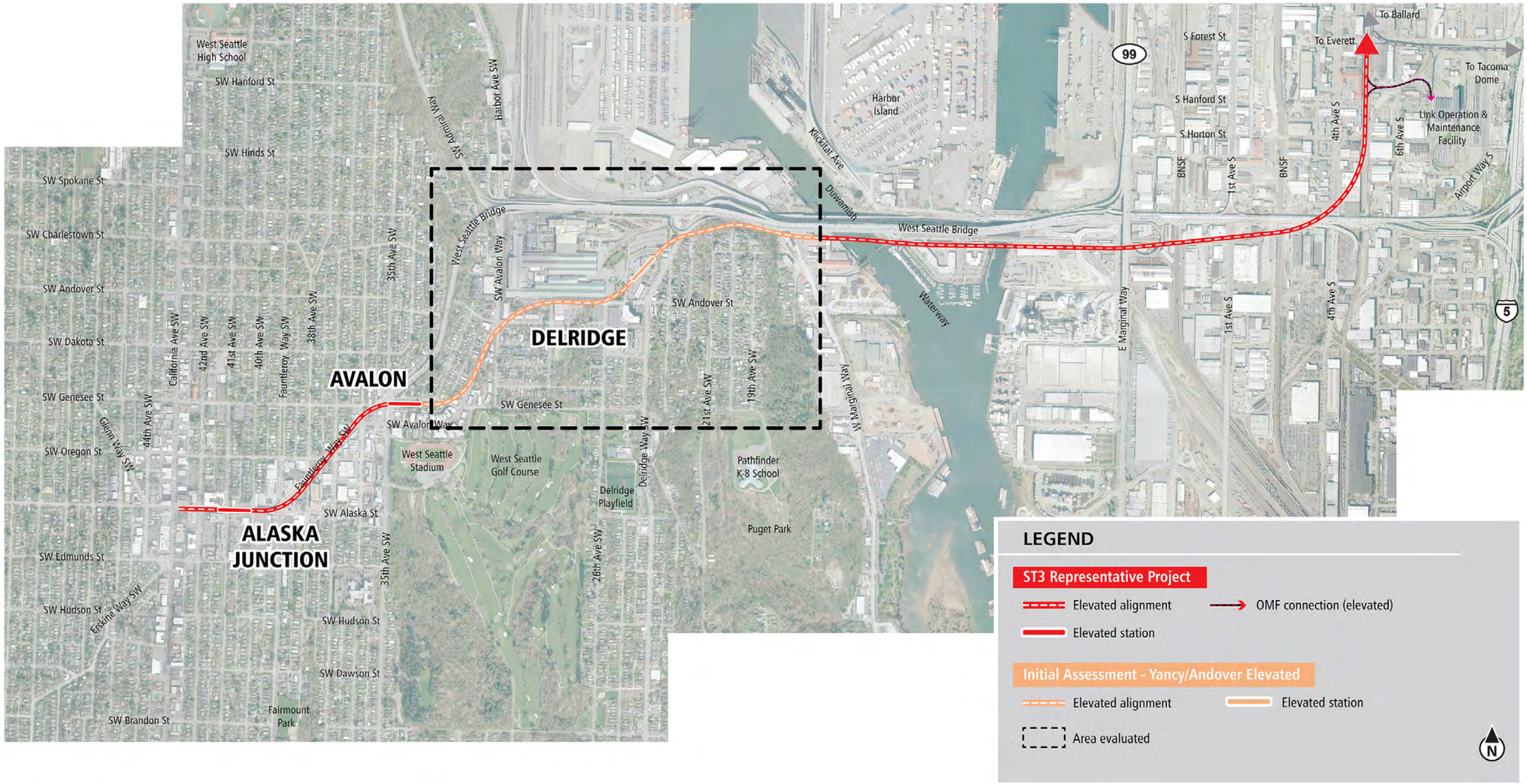


Figure 2-1 Yancy/Andover Elevated Map

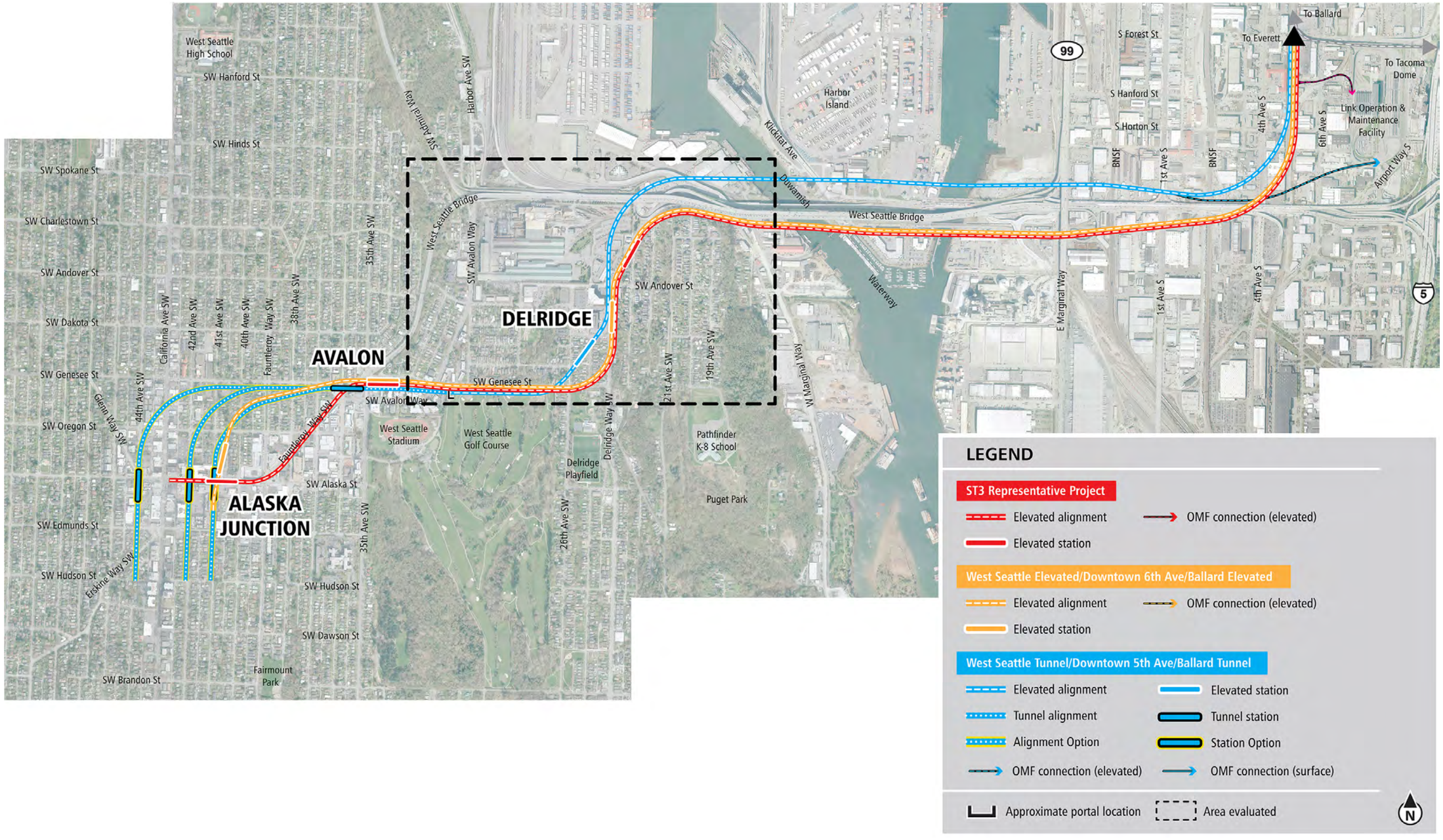


Figure 2-2 Level 3 Alternatives Map (for Yancy/Andover Elevated Comparison)

2.2 Pigeon Point Tunnel

2.2.1 Description

The Pigeon Point Tunnel Alternative would cross the Duwamish Waterway south of the existing West Seattle Bridge, tunnel beneath Pigeon Point and locate the Delridge Station further south than in the Level 3 alternatives. The alternative would connect to the ST3 Representative Project to the east and the Level 3 West Seattle tunnel alternatives to the west. The alternative is described in **Table 2-3** (Pigeon Point Tunnel Description) and shown in **Figure 2-3** (Pigeon Point Tunnel Map).

The Pigeon Point Tunnel Alternative was compared to the performance of the Level 3 alternatives only within the area shown in the dashed box in **Figure 2-3**. This area and the Level 3 alternatives are described in **Table 2-4** (Level 3 Alternatives Descriptions (for Pigeon Point Tunnel Comparison)) and shown in **Figure 2-4** (Level 3 Alternatives Map (for Pigeon Point Tunnel Comparison)).

2.2.2 Rationale and History

During the scoping period, comments expressed concern about neighborhood effects to the North Delridge/Youngstown and Pigeon Point neighborhoods. Specific requests called for a refinement of the Pigeon Ridge Tunnel alignment that was previously evaluated in Level 1 and Level 2 screening. This alignment would include a refined Duwamish crossing location and a tunnel through Pigeon Point with a further south Delridge station location.

Table 2-3 Pigeon Point Tunnel Description

Pigeon Point Tunnel	
INITIAL ASSESSMENT ALTERNATIVE	
ROUTE DESCRIPTION	**STATIONS**
• Spans the east Duwamish Waterway on a high-level, rail-only bridge on south side of existing West Seattle Bridge • Turns toward the southwest crossing the west Duwamish Waterway on a high-level, rail-only bridge and enters a tunnel between 18th Avenue SW and 19th Avenue SW in the vicinity of SW Andover Street • Exits the tunnel east of Delridge Way SW in the vicinity of SW Genesee Street • Continues on an elevated guideway on the northern edge of the West Seattle Golf Course • Descends into a tunnel, with tunnel portal near SW Avalon Way	Delridge Elevated oriented east-west along SW Genesee Street straddling Delridge Way SW

Table 2-4 Level 3 Alternatives Descriptions (for Pigeon Point Tunnel Comparison)

ST3 Representative Project	
DELRIDGE STATION NORTH OF ANDOVER, SOUTH DUWAMISH CROSSING	
ROUTE DESCRIPTION	**STATIONS**
• Spans the Duwamish Waterway on a high-level, fixed bridge on south side of existing bridge • Rounds Pigeon Point, follows Delridge Way SW heading south on an elevated guideway and runs west along SW Genesee Street north of the West Seattle Golf Course	Delridge Elevated on Delridge Way SW north of SW Andover Street
West Seattle Elevated /Downtown 6th Ave/Ballard Elevated	
DELRIDGE STATION SOUTH OF ANDOVER, SOUTH DUWAMISH CROSSING	
ROUTE DESCRIPTION	**STATIONS**
• Spans the Duwamish Waterway on a high-level, fixed bridge on south side of existing bridge • Rounds Pigeon Point, follows Delridge Way SW heading south on an elevated guideway and runs west along SW Genesee Street north of the West Seattle Golf Course	Delridge Elevated on Delridge Way SW south of SW Andover Street
West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel	
DELRIDGE STATION NORTH OF GENESEE, NORTH DUWAMISH CROSSING	
ROUTE DESCRIPTION	**STATIONS**
• Spans the Duwamish Waterway on a high-level, fixed bridge on north side of existing bridge • Crosses over the West Seattle Bridge ramp and runs south on an elevated guideway on the west side of Delridge Way SW • Turns on a diagonal heading southwest to SW Genesee Street • Continues on an elevated guideway on the northern edge of the West Seattle Golf Course • Descends into a tunnel, with tunnel portal near SW Avalon Way	Delridge Elevated on a diagonal between Delridge Way SW and 26th Avenue SW north of SW Genesee Street

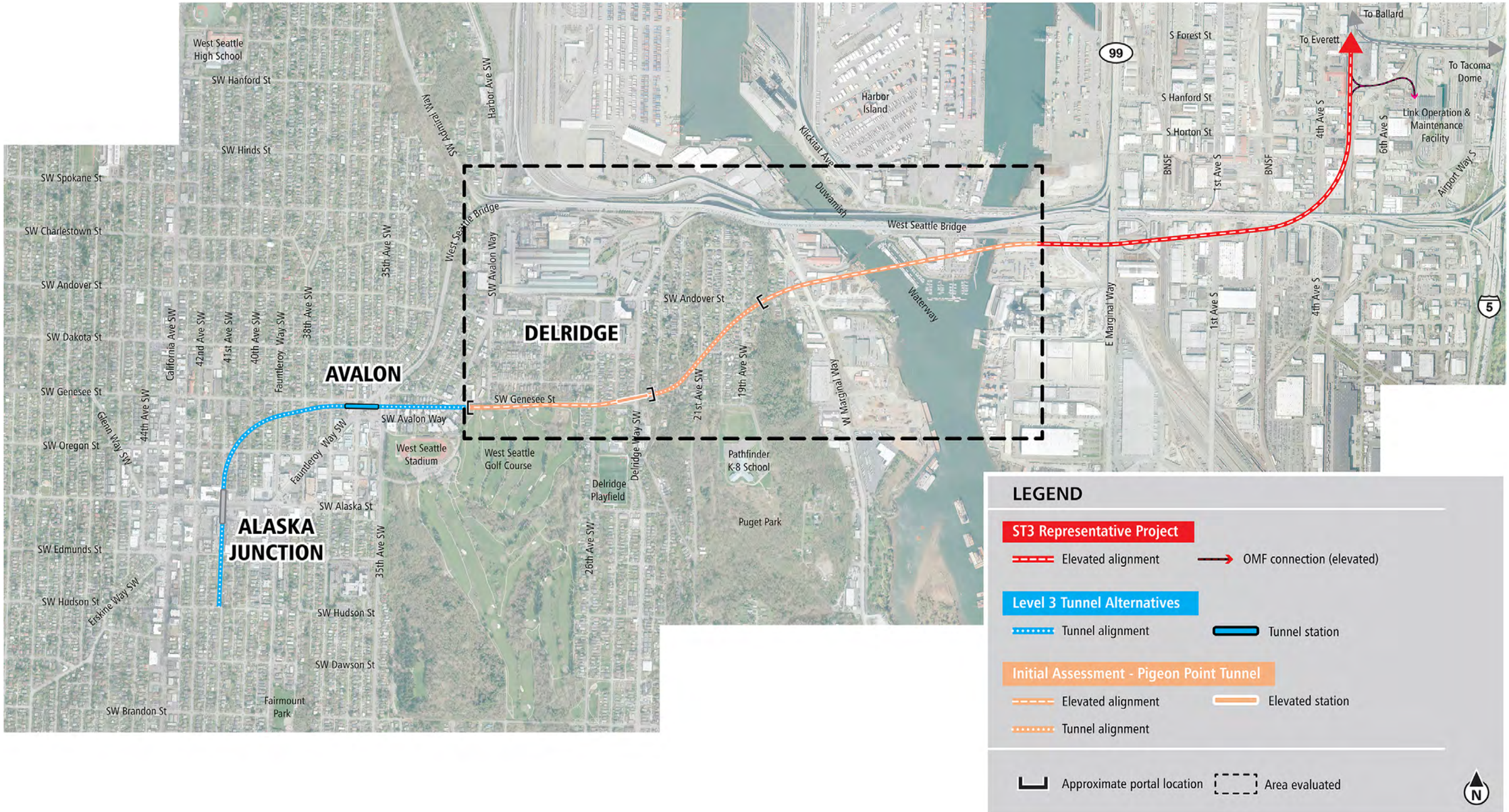


Figure 2-3 Pigeon Point Tunnel Map

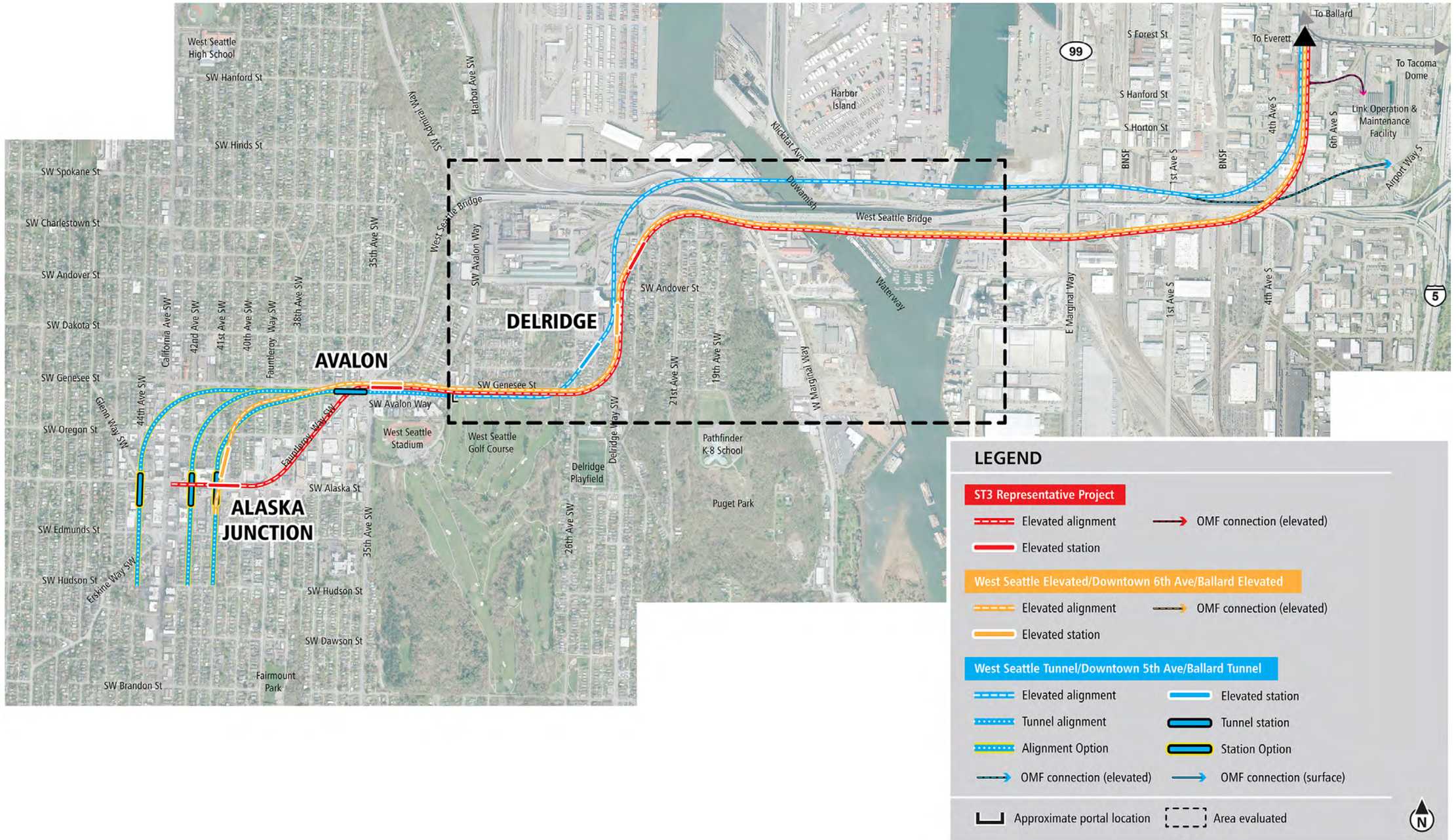


Figure 2-4 Level 3 Alternatives Map (for Pigeon Point Tunnel Comparison)

2.3 SODO Elevated

The Sound Transit Board directed staff to conduct an initial assessment of elevating both the new and existing SODO stations and light rail lines, an alternative suggested during the scoping period. After some early analysis of the SODO Double Elevated alternative, several engineering challenges were identified. A second option, the SODO Partial Elevated Alternative, was then developed to meet the intent of the original alternative introduced during scoping. Both alternatives connect to the CID-5th Avenue Tunnel Alternative studied in Level 3. The following sections describe both the SODO Double Elevated and the SODO Partial Elevated alternatives.

2.3.1 SODO Double Elevated

2.3.1.1 Description

The SODO Double Elevated Alternative would elevate the new and existing SODO Stations and light rail lines. The alternative would maintain S Lander Street and S Holgate Street at-grade, with both light rail lines elevated overhead. S Holgate Street would be lowered to allow for adequate vertical clearance with the elevated guideway. The E3 busway would be maintained and the station platforms would be located closer to S Lander Street. The alternative would connect to the CID-5th Avenue Tunnel Alternative studied in Level 3. The alternative is described in **Table 2-5** (SODO Double Elevated Description) and shown in **Figure 2-5** (SODO Double Elevated Map).

The SODO Double Elevated Alternative would retain the E3 Busway and would locate both the new and existing SODO stations further south closer to S Lander Street.

The SODO Double Elevated Alternative was compared to the performance of the Level 3 alternatives only within the area shown in the dashed box in **Figure 2-5**. This area and the Level 3 alternatives are described in **Table 2-6** (Level 3 Alternatives (for SODO Double and Partial Elevated Comparison)), and the Level 3 alternatives are shown in **Figure 2-6** (Level 3 Alternatives Map (for SODO Double and Partial Elevated Comparison)),

2.3.1.2 Rationale and History

The SODO Double Elevated Alternative was proposed as an alternate means to achieve grade separation by elevating the light rail tracks over S Holgate and S Lander streets, rather than elevating S Holgate and S Lander streets over the tracks. This would result in similar reliability improvements for both light rail and roadway traffic, but leaving the cross streets at-grade could potentially avoid visual, construction and access effects associated with elevating the roadways.

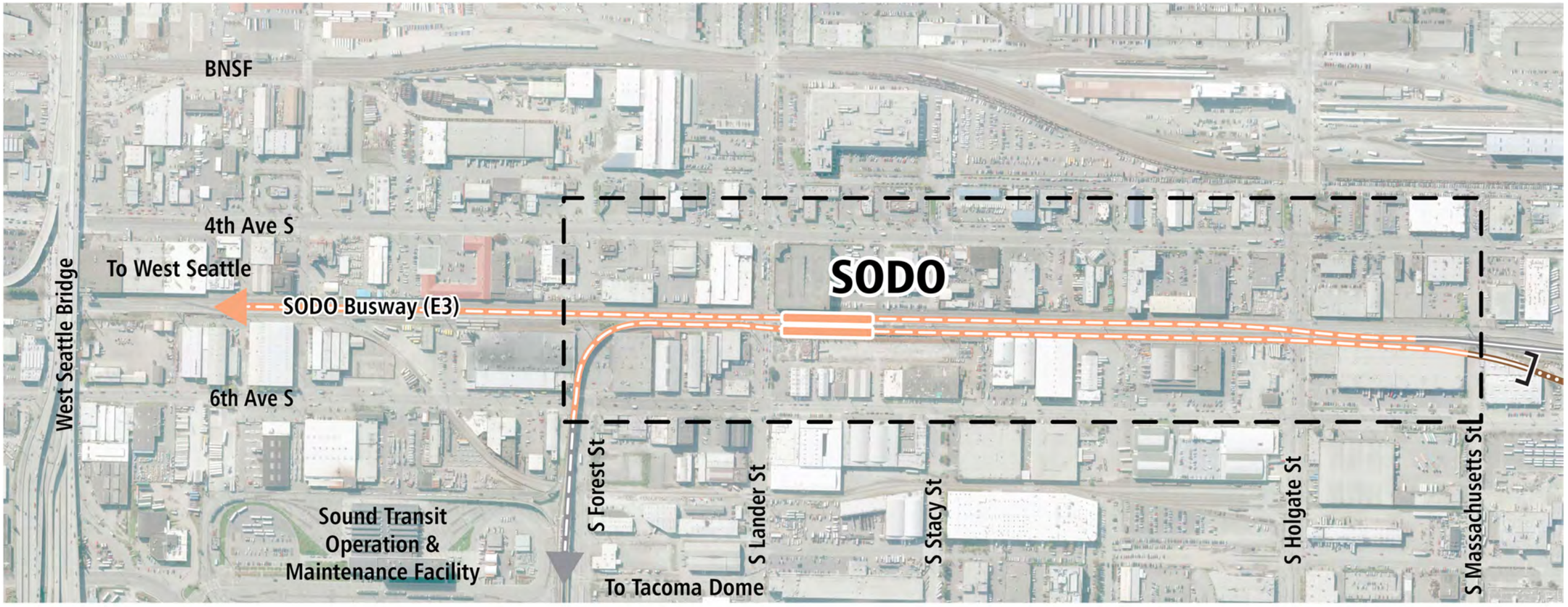
The SODO Double Elevated Alternative was also proposed as a means to retain the E3 Busway. This, in combination with locating both the new and existing SODO stations further south closer to S Lander Street, was proposed to potentially improve bus-to-rail connections.

Scoping comments related to the SODO area supported moving the SODO Station closer to S Lander Street for easier and safer pedestrian access and expressed the importance of efficient transfers between the two light rail lines at SODO station. Some nearby businesses specifically supported elevating both sets of light rail lines and stations. There was also support for maintaining the E3 busway and avoiding the displacement of the buses currently using the E3 busway onto city streets.

Engineering constraints associated with this alternative, (see below, Section 2.3.2.2), led to the development of a refinement, called the SODO Partial Elevated.

Table 2-5 SODO Double Elevated Description

SODO Double Elevated INITIAL ASSESSMENT ALTERNATIVE	
ROUTE DESCRIPTION	**STATIONS**
West Seattle Extension • Begins at the existing Link light rail line to Everett at S Massachusetts Street heading south at-grade on existing line • Transitions to a new elevated guideway within the E3 busway at approximately S Massachusetts Street • Continues south along the E3 busway in an elevated guideway **Ballard Extension** • Begins at the existing Link light rail line from Tacoma at 6th Avenue S near S Forest Street • Runs west on an elevated structure along S Forest Street and curves north following the existing light rail right-of-way • Continues north on an elevated guideway along the existing light rail right-of-way to north of S Holgate Street • Transitions to grade north of S Holgate Street	SODO - West Seattle: New elevated on West Seattle line shifted south closer to S Lander Street SODO - Ballard: Rebuilt elevated on Ballard line shifted south closer to S Lander Street and adjacent to West Seattle Line



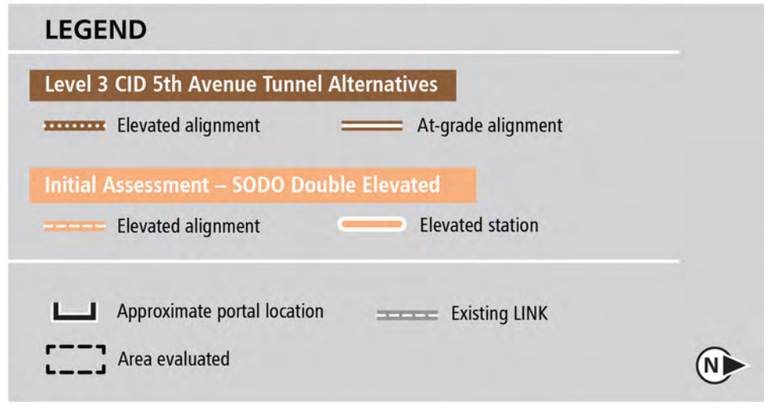


Figure 2-5 SODO Double Elevated Map

Table 2-6 Level 3 Alternatives Description (for SODO Double and Partial Elevated Comparison)

ST3 Representative Project

ELEVATED WEST SEATTLE LINE, AT-GRADE BALLARD LINE

ROUTE DESCRIPTION	STATIONS	
West Seattle Extension • Begins at the existing Link light rail line to Everett and heads south at grade on existing line across S Royal Brougham Way • Transitions to a new elevated guideway within the E3 busway at approximately S Massachusetts Street • Continues south along the E3 busway in an elevated guideway **Ballard Extension** • Begins at the existing Link light rail line from Tacoma at S Lander Street • Runs north at-grade along the existing light rail right-of-way to north of S Holgate Street	SODO - West Seattle	New elevated immediately west of existing station
	SODO - Ballard	Existing at-grade (no change to existing station)

West Seattle Elevated/Downtown 6th Ave/Ballard Elevated

AT-GRADE WEST SEATTLE AND BALLARD LINES

ROUTE DESCRIPTION	STATIONS	
West Seattle Extension • Begins at the existing Link light rail line to Everett and heads south at grade on existing line across S Royal Brougham Way • Continues south at-grade along the E3 busway **Ballard Extension** • Begins at the existing Link light rail line from Tacoma at S Lander Street • Runs north at-grade along the existing light rail right-of-way to north of S Holgate Street Both extensions include elevated roadway overcrossings of S Holgate Street and S Lander Street over the light rail tracks	SODO - West Seattle	New at-grade immediately west of existing station
	SODO - Ballard	Existing at-grade (no change to existing station)

West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel

AT-GRADE WEST SEATTLE AND BALLARD LINES, STATION CLOSER TO S LANDER STREET

ROUTE DESCRIPTION	STATIONS	
West Seattle Extension • Begins at the existing Link light rail line to Everett and heads south at grade on existing line across S Royal Brougham Way • Continues south at-grade along the E3 busway **Ballard Extension** • Begins at the existing Link light rail line from Tacoma at S Lander Street • Runs north at-grade along the existing light rail right-of-way to north of S Holgate Street Both extensions include elevated roadway overcrossings of S Holgate Street and S Lander Street over the light rail tracks	SODO - West Seattle	New at-grade immediately west of Ballard Line station relocated south closer to S Lander Street
	SODO - Ballard	At-grade relocated south closer to S Lander Street

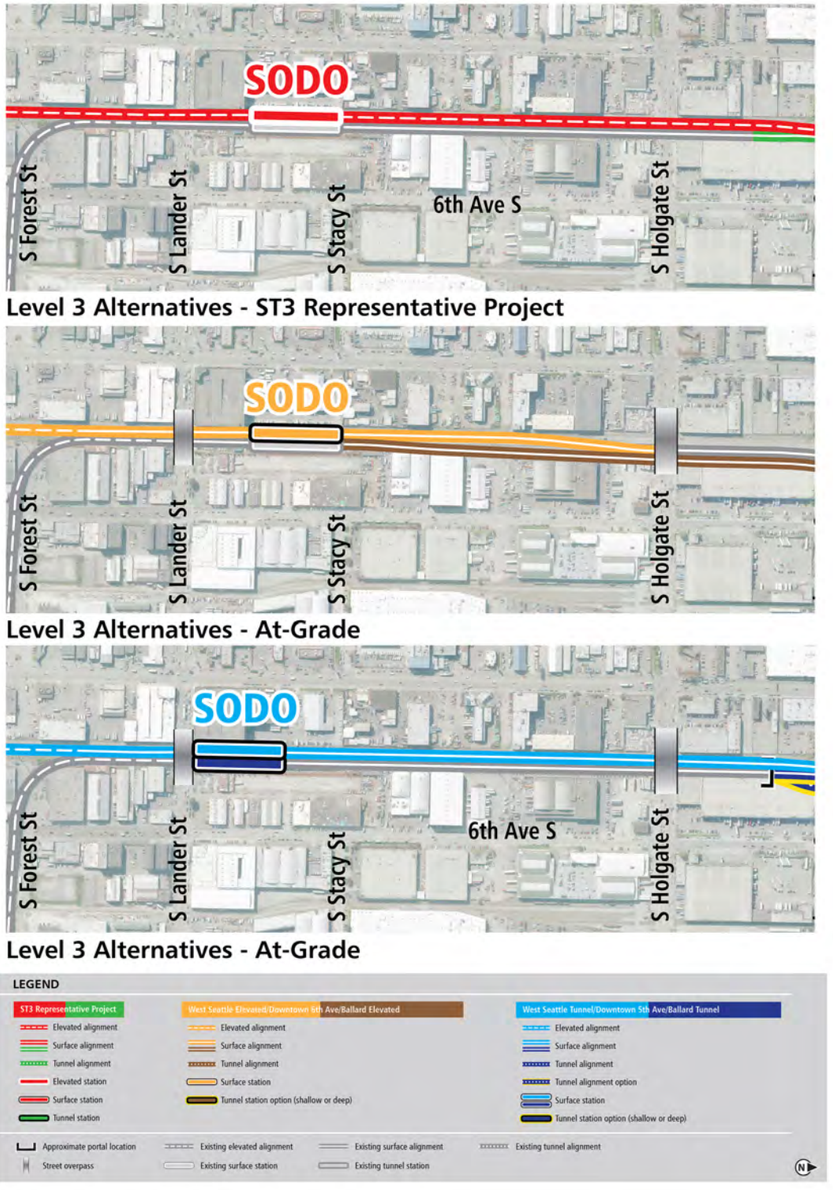


Figure 2-6 Level 3 Alternatives Map (for SODO Double and Partial Elevated Comparison)

2.3.2 SODO Partial Elevated

After some early analysis of the Double Elevated Alternative, several engineering and operational challenges were identified (see below, **Section 2.3.2.2**). A second option, the SODO Partial Elevated Alternative, was then developed to meet the intent of the Board's direction.

2.3.2.1 Description

The SODO Partial Elevated Alternative elevates the new light rail line and the SODO Station it serves, while maintaining the existing light rail line and station at-grade, similar to the ST3 Representative Project. S Lander Street would remain at-grade with an at-grade crossing of the existing light rail line. North of SODO Station, the new light rail line would transition from elevated to at-grade with both lines at-grade at S Holgate Street. S Holgate Street would be rebuilt as an overcrossing. **Figure 2-7** (Street Overcrossing and Undercrossing Options for SODO Elevated and Partial Elevated Alternatives) illustrates the different light rail and roadway configurations of the at-grade, SODO Double Elevated, and SODO Partial Elevated alternatives.

The SODO Partial Elevated Alternative connects to the CID-5th Avenue Tunnel alternatives studied in Level 3. The alternative is described in **Table 2-7** (SODO Partial Elevated Description) and shown in **Figure 2-8** (SODO Partial Elevated Map).

The SODO Partial Elevated Alternative was compared to the performance of the Level 3 alternatives only within the area shown in the dashed box in **Figure 2-8**. This area and the Level 3 alternatives are described in **Section 2.3.1.1** above, in **Table 2-6** (Level 3 Alternatives (for SODO Double and Partial Elevated Comparison)), and shown in **Figure 2-6** (Level 3 Alternatives Map (for SODO Double and Partial Elevated Comparison)).

The SODO Partial Elevated alternative would retain the E3 Busway and would locate both the new and existing SODO stations further south closer to S Lander Street.

2.3.2.2 Rationale and History

During the assessment of the SODO Double Elevated Alternative, engineering constraints were identified which presented challenges. Specifically, elevating the existing light rail line would require reconstruction of the existing elevated light rail guideway on S Forest Street between the E3 busway and 6th Avenue S. This reconstruction would require extended shutdowns of the existing light rail service.

To address these constraints, the SODO Partial Elevated Alternative was developed. This alternative would address some of the community's desires to eliminate an overpass at S Lander Street without requiring lengthy service shutdowns.

Scoping comments supported moving the SODO Station closer to S Lander Street for easier and safer pedestrian access and also expressed the importance of efficient transfers between the light rail lines at SODO station.

Table 2-7 SODO Partial Elevated Description

SODO Partial Elevated INITIAL ASSESSMENT ALTERNATIVE	
ROUTE DESCRIPTION	**STATIONS**
West Seattle Extension • Begins at the existing Link light rail line to Everett at S Massachusetts Street heading south at-grade on existing line • Continues south at-grade along the E3 busway • Transitions to a new elevated guideway within the E3 busway south of S Holgate Street • Continues south along the E3 busway in an elevated guideway **Ballard Extension** • Begins at the existing Link light rail line from Tacoma at S Lander Street • Runs north at-grade along the existing light rail right-of-way to north of S Holgate Street Includes an elevated roadway overcrossing of S Holgate Street over both the West Seattle Extension and Ballard Extension light rail tracks	SODO - West Seattle: New elevated on West Seattle line shifted south closer to S Lander Street SODO - Ballard: Rebuilt at-grade on Ballard line shifted south closer to S Lander Street and adjacent to West Seattle Line

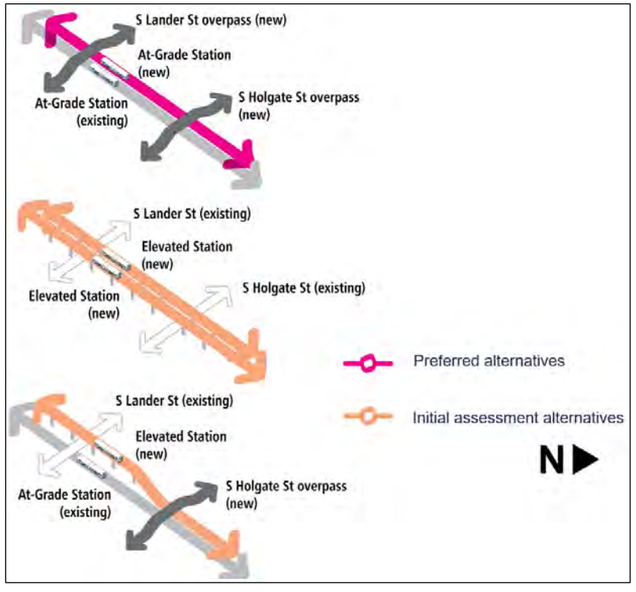
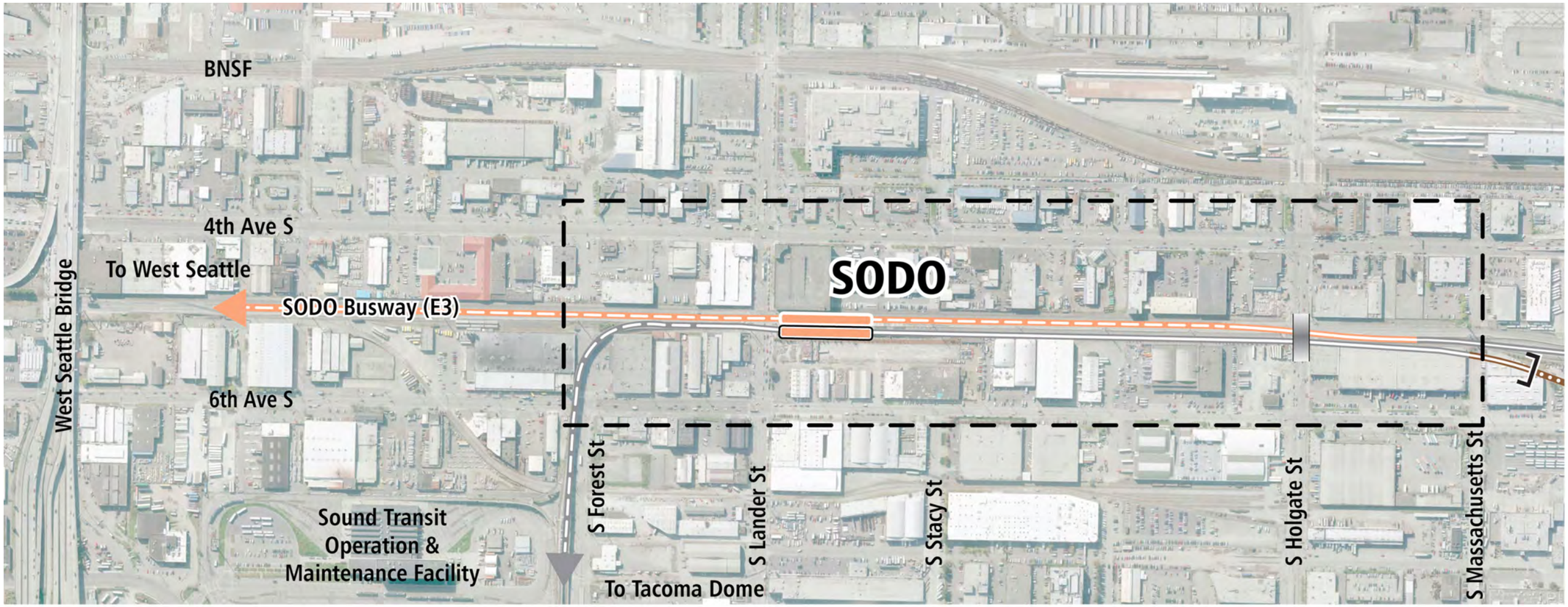


Figure 2-7 Street Overcrossing and Undercrossing Options for SODO Double Elevated and Partial Elevated Alternatives



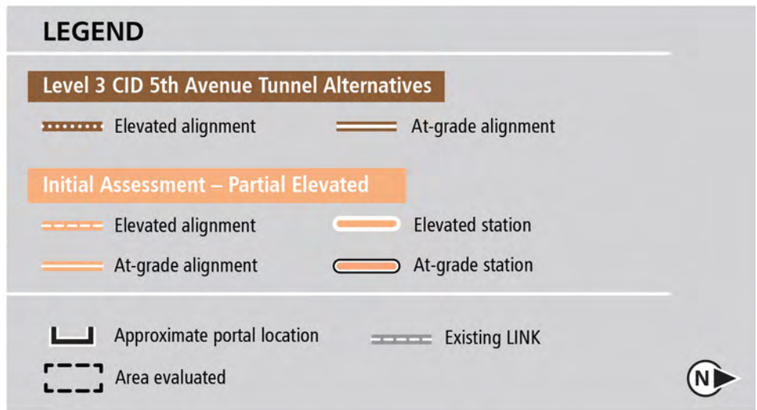


Figure 2-8 SODO Partial Elevated Map

2.4 20th Avenue Tunnel Ballard

The 20th Avenue Tunnel Ballard Alternative would cross Salmon Bay in a tunnel and serve a Ballard Station in a tunnel in the vicinity of 20th Avenue NW and NW Market Street. Two alignment options were developed for the study.

During the scoping period there were comments focused on studying a tunnel alternative along 20th Avenue NW to directly serve the core of the Ballard Hub Urban Village. The alternative introduced was a refinement of a tunnel alignment that was previously evaluated in Level 1, but with a shorter tunnel under Salmon Bay.

The Alternative was developed initially with a tunnel portal located on BNSF property and, in response to engineering challenges with that approach, a refined alternative was developed with a tunnel portal shifted to a location north of Interbay Station and west of Thorndyke Avenue W. These two alternatives are discussed separately below.

2.4.1 20th Avenue Tunnel Ballard – BNSF Portal

2.4.1.1 Description

The 20th Avenue Tunnel Ballard – BNSF Portal Alternative would serve an elevated Interbay station at W Dravus Street; turn northwest and continue elevated over the BNSF tracks; descend into a tunnel portal on BNSF property; tunnel under Salmon Bay; and serve a tunnel station at 20th Avenue NW. The alternative is described in **Table 2-8** (20th Avenue Tunnel Ballard—BNSF Portal Description) and shown in **Figure 2-9** (NW 20th Avenue Tunnel Ballard – BNSF Portal Map).

The 20th Avenue Tunnel Ballard – BNSF Portal Alternative was compared to the performance of the Level 3 alternatives only within the area shown in the dashed box in **Figure 2-9**. This area and the Level 3 alternatives are described in **Table 2-9** (Level 3 Alternatives Descriptions (for 20th Avenue Tunnel Ballard Comparison)), and the Level 3 alternatives are shown in **Figure 2-10** (Level 3 Alternatives Map (for 20th Avenue Tunnel Ballard Comparison)).

2.4.1.2 Rationale and History

The 20th Avenue Tunnel Ballard Alternative was proposed to provide a station at NW Market Street and 20th Avenue NW, which is closer to the core of the Ballard Hub Urban Village than station alternatives to the east. The alternative would also allow a shorter tunnel under Salmon Bay.

The initial assessment of the 20th Avenue Tunnel Ballard – BNSF Portal Alternative encountered engineering constraints which led the development of the Thorndyke Portal refinement. Among these was the need to relocate a 144-inch diameter major King County sewer pipeline, while maintaining operation of the pipeline, which would present engineering complexity, schedule and cost risks to the project. Another engineering challenge encountered was the need for a long span elevated structure with large foundations to cross the BNSF tracks. These challenges led to the development of the Thorndyke Portal refinement, discussed below.

Table 2-8 20th Avenue Tunnel Ballard – BNSF Portal Description

20th Avenue Tunnel Ballard – BNSF Portal INITIAL ASSESSMENT ALTERNATIVE	
ROUTE DESCRIPTION • Begins in elevated guideway heading north on west side of Interbay Golf Course • Crosses over W Dravus Street and turns toward the northwest on elevated guideway over the BNSF yard • Descends into a tunnel headed northwest in the BNSF yard south of W Emerson Street in the vicinity of 21st Avenue W • Turns toward the north in a tunnel adjacent to 21st Avenue W and descends beneath Salmon Bay • Tunnel aligns with 20th Avenue NW in Ballard and terminates along 20th Avenue NW, with tail track in north-south orientation north of NW Market Street	**STATIONS** Interbay – Elevated north of W Dravus Street and east of BNSF Railway tracks Ballard – Tunnel beneath 20th Avenue NW straddling NW Market Street

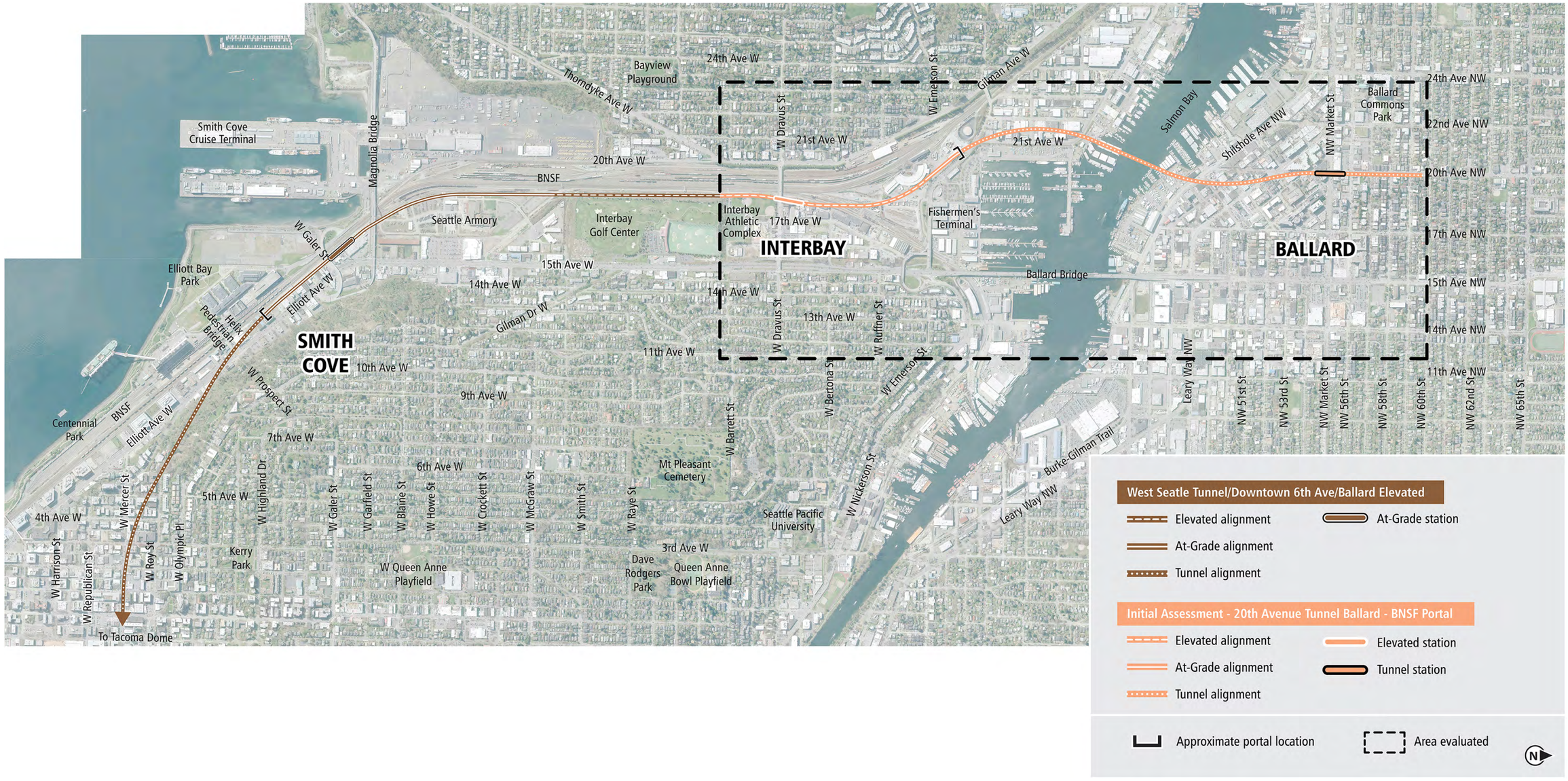


Figure 2-9 20th Avenue Tunnel Ballard – BNSF Portal Map

Table 2-9 Level 3 Alternatives Descriptions (for 20th Avenue Tunnel Ballard Comparison)

ST3 Representative Project

MOVABLE BRIDGE, 15TH AVE BALLARD ELEVATED

ROUTE DESCRIPTION	STATIONS	
• Begins in elevated guideway heading north along 15th Avenue W in center of roadway • Crosses Salmon Bay via movable bridge west of existing Ballard Bridge • Continues in an elevated guideway on west side of 15th Avenue NW and crosses to east side of 15th Avenue NW • Terminates north of NW Market Street, with tail track in north-south orientation on east side of 15th Avenue NW	Interbay	Elevated station on 15th Avenue W straddling W Dravus Street Bridge
	Ballard	Elevated station on 15th Avenue NW south of NW Market Street

West Seattle Elevated/Downtown 6th Ave/Ballard Elevated

FIXED BRIDGE, 14TH AVE BALLARD ELEVATED

ROUTE DESCRIPTION	STATIONS	
• Begins in elevated guideway heading north on west side of Interbay Golf Course • Crosses over W Dravus Street and curves east into the triangle area and then passes over 15th Avenue W through Emerson interchange to align with 14th Avenue NW • Crosses Salmon Bay via fixed bridge east of existing Ballard Bridge and continues in an elevated guideway on 14th Avenue NW • Terminates north of NW Market Street and 14th Avenue NW with tail track in north-south orientation on 14th Avenue NW	Interbay	Elevated station on Thorndyke Avenue W north of W Dravus Street
	Ballard	Elevated station on 14th Avenue NW straddling NW Market Street

West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel

14TH OR 15TH BALLARD TUNNEL

ROUTE DESCRIPTION	STATIONS	
• Begins at grade and in retained cut on the west side of Interbay Golf Course, passes under W Dravus Street and then curves east • Descends into a tunnel beneath Salmon Bay, with tunnel portal between 15th Avenue W and Thorndyke Avenue W • Curves north to align with 14th Avenue NW or 15th Avenue NW and continues in a tunnel under 14th Avenue NW or 15th Avenue NW • Terminates north of NW Market Street with tail track in north-south orientation on 14th Avenue NW or 15th Avenue NW	Interbay	Retained cut (trench) on Thorndyke Avenue W north of W Dravus Street
	Ballard	Tunnel beneath 14th Avenue NW straddling NW Market Street or beneath 15th Avenue NW south of NW Market Street

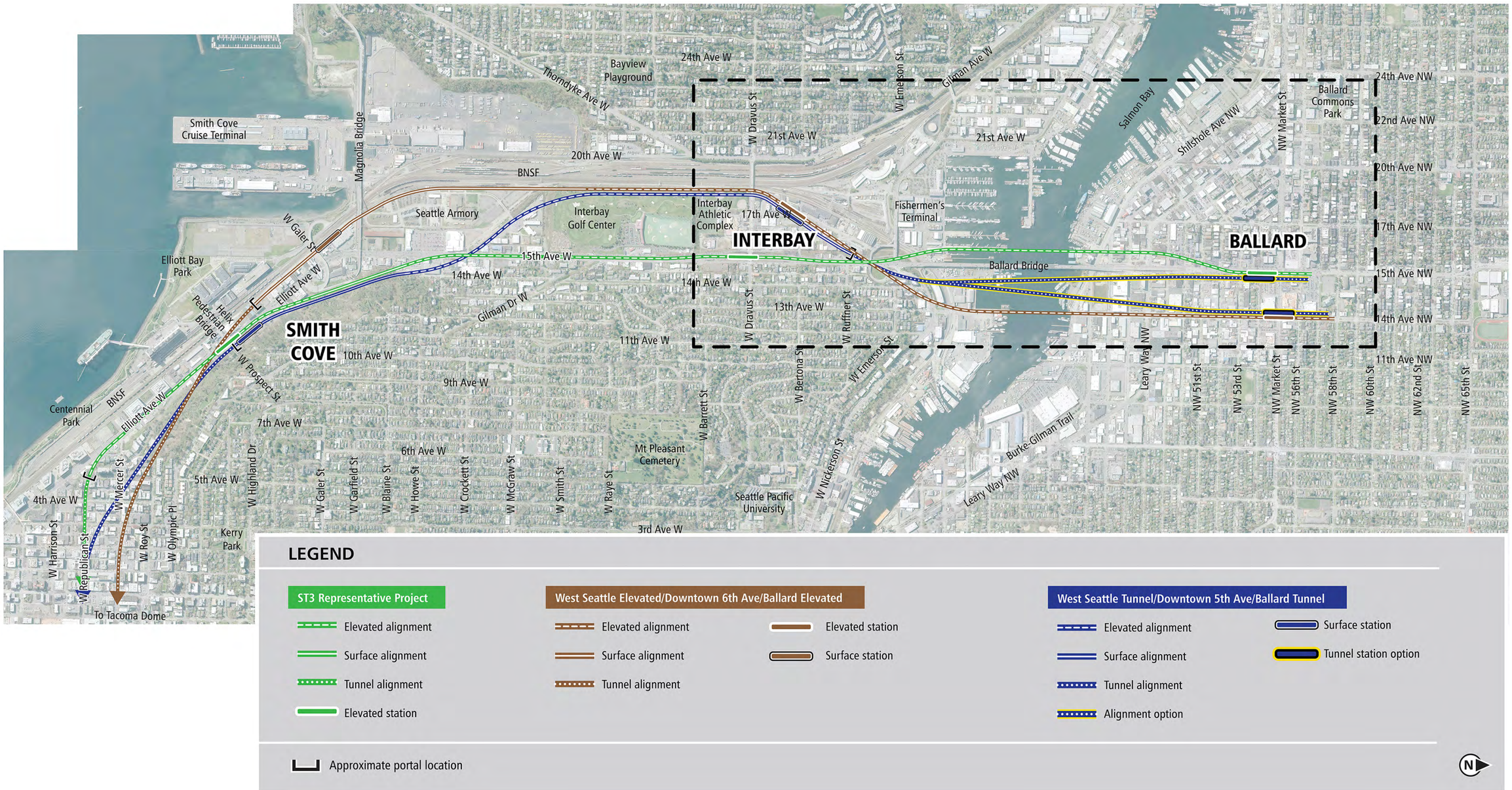


Figure 2-10 Level 3 Alternatives Map (for 20th Avenue Tunnel Ballard Comparison)

2.4.2 20th Avenue Tunnel Ballard – Thorndyke Portal

2.4.2.1 Description

The 20th Avenue Tunnel Ballard – Thorndyke Portal Alternative would serve an Interbay station in a retained cut trench at W Dravus Street; descend into a tunnel portal north of Interbay Station; tunnel under Salmon Bay; and serve a tunnel station at 20th Avenue NW. The alternative is described in **Table 2-10** (20th Avenue Tunnel Ballard – Thorndyke Portal Description) and shown in **Figure 2-11** (20th Avenue Tunnel Ballard – Thorndyke Portal Map).

The 20th Avenue Tunnel Ballard – Thorndyke Portal Alternative was compared to the performance of the Level 3 alternatives only within the area shown in the dashed box in **Figure 2-11**. This area and the Level 3 alternatives are described in **Table 2-9** (Level 3 Alternatives Descriptions (for 20th Avenue Tunnel Ballard Comparison)), and the Level 3 alternatives are shown in **Figure 2-10** (Level 3 Alternatives Map (for 20th Avenue Tunnel Ballard Comparison)).

2.4.2.2 Rationale and History

Engineering challenges associated with the 20th Avenue Tunnel Ballard Alignment – BNSF Portal, discussed earlier, led to the development of the Thorndyke Portal refinement, which avoids some of the engineering challenges of the BNSF Portal. However, it presents other complexities, which are discussed in the Evaluation Chapter below.

Table 2-10 20th Avenue Tunnel Ballard – Thorndyke Portal Description

20th Avenue Tunnel Ballard – Thorndyke Portal	
INITIAL ASSESSMENT ALTERNATIVE	
ROUTE DESCRIPTION	**STATIONS**
• Begins at-grade heading north on west side of Interbay Golf Course • Crosses under W Dravus Street and descends into a tunnel, just north of W Dravus Street, west of Thorndyke Avenue W • Tunnel descends beneath Salmon Bay, west of the Ballard Bridge, curves to the northwest, and then north to align with 20th Avenue NW • Continues north under 20th Avenue NW and terminates along 20th Avenue NW, with tail track in north-south orientation north of NW Market Street	Interbay: Retained cut (trench) north of W Dravus Street and east of BNSF Railway tracks Ballard: Tunnel beneath 20th Avenue NW straddling NW Market Street

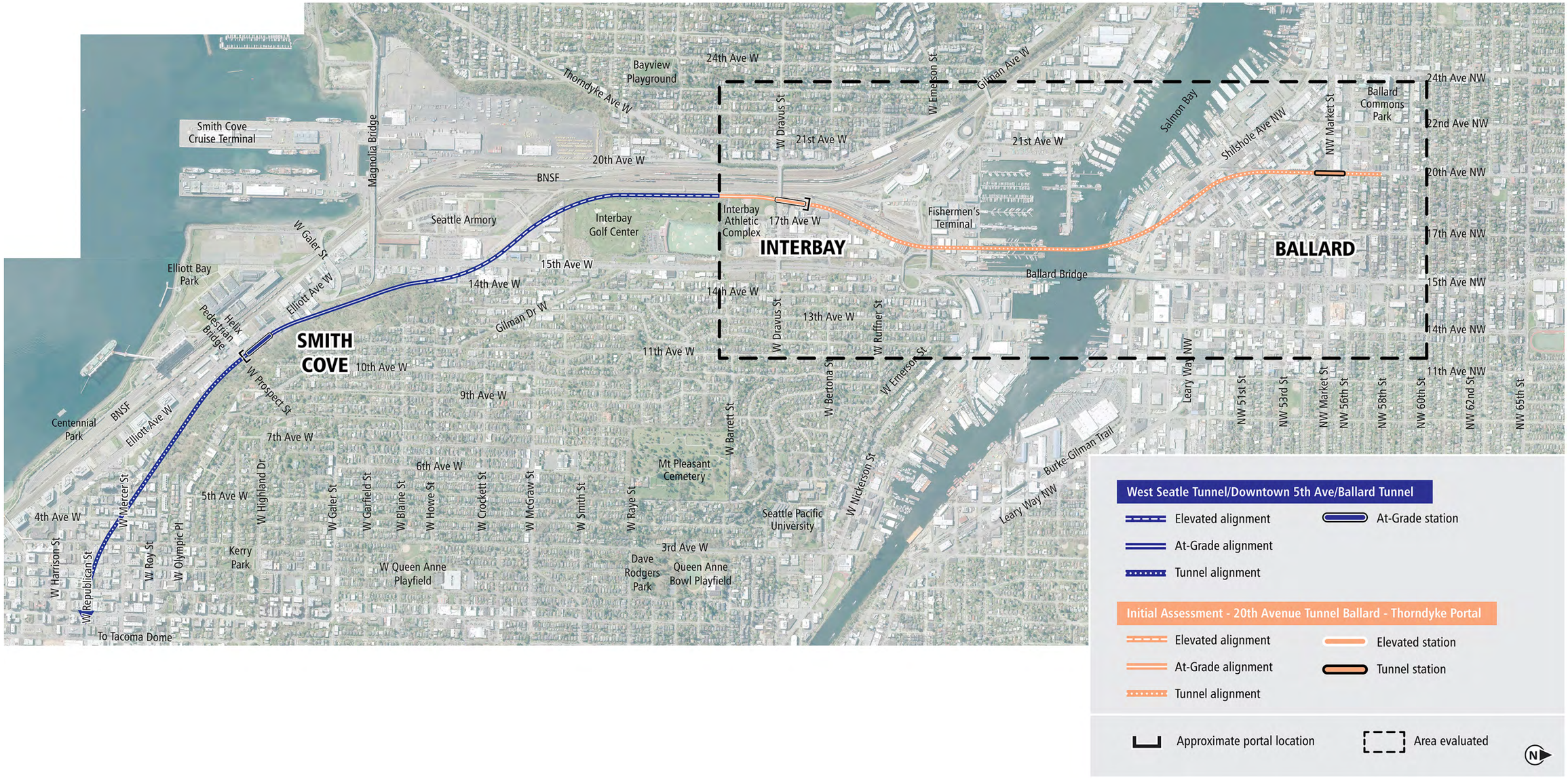


Figure 2-11 20th Ave Tunnel Ballard – Thorndyke Portal Map

3 EVALUATION AND FINDINGS

Purpose and Need

The evaluation of the Initial Assessment Alternatives was based on the Project's Purpose and Need and the specific evaluation measures developed for each Purpose and Need element. The criteria are intended to evaluate how well each alterative achieves the purpose statements described in **Table 3-1** (Purpose Statement, Screening Themes and Symbols).

Evaluation

The full detail of the evaluation criteria, detailed comparisons of all the alternatives, and the specific results for each alternative on each measure can be found in **Appendix A** of this report.

The performance of the Initial Assessment alternatives was evaluated against the performance of the Level 3 alternatives, within the limited areas that would be served by each new alternative. These areas are clearly shown in the dashed boxes in the Level 3 Alternatives maps associated with each Alternative in **Section 2**, above.

The evaluation measures that highlight key differences between the alternatives are reported in this section.

Table 3-1 Purpose Statement, Screening Themes and Symbols

Purpose Statement	Symbol
Provide high quality rapid, reliable, and efficient peak and off-peak LRT service to communities in the project corridors as defined in ST3.	Service performance and reliability in project corridor
Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet the projected transit demand.	Improve Downtown capacity for regional connectivity
Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's RTLP.	Connect regional centers
Implement a system that is consistent with the *ST3 Plan* that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain.	Technically feasible and financially sustainable
Expand mobility for the corridor and region's residents, which include transit dependent, low-income and minority populations.	Expand mobility for all
Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies.	Encourage equitable and sustainable urban growth
Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices.	Promote a healthy built, natural, and social environment

3.1 Yancy/Andover Elevated

The Yancy/Andover Elevated Alternative was compared to Level 3 alternatives in the area from West Marginal Way SW near the West Seattle Bridge to the vicinity of SW Avalon Way and SW Genesee Street. [See: **Figure 2-2 (**Level 3 Alternatives Map (for Yancy/Andover Elevated Comparison)) in **Section 2** above]. **Table 3-2** (Performance of Yancy/Andover Elevated Alternative Relative to Level 3 Alternatives) highlights the key evaluation measures that differentiate the Yancy/Andover Elevated Alternative from the Level 3 Alternatives in this area.

Summary of Findings

This alternative would reduce total potential residential effects in the Delridge area and avoid the West Seattle Golf Course. The tradeoffs to achieve these positives would include a less accessible Delridge station location, a potential increase in effects on businesses and freight, increased potential residential effects along Avalon Way, and a high, elevated guideway with additional curves which would reduce travel speeds.

More details for these and other measures can be found in **Appendix A** to this report.

Public Comment

The initial assessment of the Yancy/Andover Elevated alternative, as described above, was shared with the public between September 14 and October 4, 2019, to mixed feedback. Those who liked this alternative cited positives including:

- Potentially limits residential displacements in the Youngstown neighborhood
- Costs and schedule are comparable to the ST3 Representative Project
- Potentially better fit with the busier/denser corridor along Avalon Way SW, with fewer visual effects in the Youngstown neighborhood
- Avoids West Seattle Golf Course and Longfellow Creek

Members of the public who did not favor this alternative cited concerns including:

- Station located farther north is less accessible and offers less convenient bus-rail transfer opportunities
- Potential effects on businesses, including freight and industrial use
- Potential effects on high-density residential buildings along SW Avalon Way

Table 3-2 Performance of Yancy/Andover Elevated Alternative Relative to Level 3 Alternatives

	YANCY/ANDOVER ELEVATED
Purpose and Need	**Evaluation**
Technically feasible and financially sustainable	• Would require a high guideway and large structure with steeper track grades and additional curves resulting in limitations on train speeds and acceleration and limited flexibility for crossovers • Similar comparative capital cost estimate as ST3 Representative Project
Encourage equitable and sustainable urban growth	• Less convenient access for pedestrians, connecting bus riders and people with limited mobility • Station proximity to bridge and industrial area potentially reduces development opportunities and equitable development opportunities
Promote a healthy built, natural, and social environment	• Fewer acres of parks and recreational resources potentially affected and would avoid West Seattle Golf Course • Fewer potential visual effects and residential displacements in Youngstown neighborhood • More potential effects on freight movement and truck access • Greatest number of potential business displacements, including small businesses that mostly serve the local community

3.2 Pigeon Point Tunnel

The Pigeon Point Tunnel Alternative was compared to Level 3 alternatives in a segment from the east side of the Duwamish Waterway to SW Genesee Street and 31st Avenue SW. [See: **Figure 2-4** (Level 3 Alternatives Map (for Pigeon Point Tunnel Comparison)) in **Section 2** above]. **Table 3-3** (Performance of Pigeon Point Tunnel Alternative Relative to Level 3 Alternatives) highlights the key evaluation measures that differentiate the Pigeon Point Tunnel Alternative from the Level 3 Alternatives in this area.

Summary of Findings

The alternative would provide a more direct route, avoiding steep grades. It would have fewer potential business and freight effects and would avoid proximity to the West Seattle Bridge and the BNSF railroad bridge. The tunnel would lessen potential visual effects and the Delridge station would be more accessible because of the location further south and its lower height.

The potential residential effects would be similar to the other alternatives but at different locations. The alternative would potentially affect less area in the Duwamish Greenbelt, but would bisect habitat areas in the Duwamish Greenbelt. The alignment would also be closer to a known archaeological site.

The cost of additional tunnels was not included or evaluated in the ST3 Plan and this alternative would require third-party funding. It is estimated to cost approximately $900 million more than the ST3 Representative Project for the two tunnels (+$200 million for Pigeon Point Tunnel and +$700 million for West Seattle Junction Tunnel).

More detail for these and other measures can be found in **Appendix A** to this report.

Public Comment

The initial assessment of the Pigeon Point Tunnel alternative was shared with the public between September 14 and October 4, 2019, to mixed feedback.

Those who liked this alternative cited potential positives including:

- Limiting potential residential displacements, effects on businesses and visual effects and disruption in the Youngstown neighborhood
- Serving more people with a Delridge Station further south which also provides more potential opportunities for transit-oriented development
- Avoiding construction close to the West Seattle Bridge

Members of the public who did not favor this alternative cited concerns including:

- Increased cost and longer project timeline
- Construction challenges and potential effects of a tunnel and its portals in the Pigeon Point neighborhood
- Potential effects on the West Duwamish Greenbelt
- Potential effects on other residential areas, including the Riverside neighborhood

Some members of the public preferred this alternative only if third-party funding could be secured and there were questions about the feasibility of connecting a Pigeon Point Tunnel to elevated alternatives for the Avalon and Alaska Junction stations. The proximity of Pigeon Point Tunnel portals to the Youngstown Cultural Arts Center was also a concern.

Table 3-3 Performance of Pigeon Point Tunnel Alternative Relative to Level 3 Alternatives

	PIGEON POINT TUNNEL
Purpose and Need	**Evaluation**
Technically feasible and financially sustainable	• Would avoid construction close to West Seattle Bridge and BNSF • Lower elevated guideway along SW Genesee Street • Larger radius curves would enable higher speeds; less steep track grades would result in better acceleration and flexibility for crossovers • Must connect to West Seattle Junction tunnel; higher schedule risk • Comparative capital cost estimate is $900 million higher than ST3 Representative Project over entire West Seattle Extension (includes $700 million for West Seattle Junction Tunnel and $200 million for Pigeon Point Tunnel); requires third-party funding; cost of additional tunnels not included in ST3 Financial Plan or evaluation methodology
Encourage equitable and sustainable urban growth	• Delridge Station further south and straddling S Delridge Way would potentially increase pedestrian accessibility and provide good modal integration with buses on both sides of the street • Station with higher quality equitable development potential
Promote a healthy built, natural, and social environment	• Would potentially bisect habitat areas of the West Duwamish Greenbelt; closer to known archaeological site • Fewest miles of elevated guideway near visually sensitive viewers • Minimal potential effects on truck movements and no direct effects expected to Terminal 5 or Terminal 18 • Potential for visual, noise, and vibration effects on residences from elevated guideway, station and tunnel portal construction near the east side of Pigeon Point for the high-level, rail-only bridge and tunnel portal construction • Greatest potential amount of construction vehicles in Delridge and Pigeon Point neighborhoods for tunnel excavation material hauling • Construction could potentially affect the use of a portion of Youngstown Cultural Arts Center and Delridge Playfield, and could have greater construction effects on the West Seattle Golf Course

3.3 SODO Elevated

The SODO Double Elevated Alternative and the SODO Partial Elevated Alternative were compared to Level 3 alternatives in a segment from S Forest Street to S Massachusetts Street. [See **Figure 2-6** (Level 3 Alternatives Map (for SODO Double and Partial Elevated Comparison)) in **Section 2** above]. **Table 3-4** (SODO Elevated Alternatives Relative to Level 3 Alternatives) highlights the key evaluation measures that differentiate the SODO Double Elevated and SODO Partial Elevated alternatives from the Level 3 Alternatives in this area.

Summary of Findings

SODO Double Elevated

The SODO Double Elevated Alternative would achieve full grade separation between light rail and the road network by elevating the new and existing SODO station and light rail lines. S Lander Street would remain at-grade and S Holgate Street would be lowered for guideway clearance. The SODO Double Elevated Alternative would facilitate transit integration by maintaining the E3 busway and shifting the SODO Station platform south, closer to S Lander Street. However, the SODO Double Elevated Alternative would require the construction of two elevated guideways in poor soils and would increase the potential for business effects. Furthermore, the alternative would require two shutdowns of Central Link during construction, and could disproportionally affect minority and low-income populations.

The SODO Double Elevated Alternative is estimated to cost approximately $300 million more than the ST3 Representative Project (approximately $500 million more than the preferred alternative, SODO At-Grade).

SODO Partial Elevated

Like the SODO Double Elevated Alternative, this alternative would facilitate transit integration, with the E3 busway maintained and a station platform shifted closer to S Lander Street. The SODO Partial Elevated Alternative would include a Holgate Street overcrossing, which would eliminate light rail/traffic conflicts, but would maintain one at-grade crossing at the existing light rail line at S Lander Street. This alternative would also require construction of an elevated guideway in poor soils and would have increased potential for business effects.

Cost estimates for this alternative are similar to the ST3 Representative Project (approximately $200 million more than the preferred alternative, SODO At-Grade).

More detail for these and other measures can be found in **Appendix A** to this report.

Public Comment

The initial assessments of the SODO Double Elevated and the SODO Partial Elevated alternatives were shared with the public between September 14 and October 4, 2019. General public comments included:

- Some support for lack of overpass at S Lander Street
- Preference to maintain the E3 busway
- Interest in preserving freight mobility
- Desire for good pedestrian access and connections
- Preference for improved bus-rail transfer opportunities

Table 3-4 Performance of SODO Elevated Alternatives Relative to Level 3 Alternatives

	SODO DOUBLE ELEVATED	SODO PARTIAL ELEVATED
Purpose and Need	**Evaluation**	
Service performance and reliability in project corridor	• No at-grade crossings; would provide greatest reliability, similar to the SODO at-grade alternatives	• One at-grade crossing but street overcrossing at S Holgate Street would improve reliability over existing
Improve Downtown capacity for regional connectivity	• Similar to at-grade alternatives, would facilitate connection between West Seattle and Ballard lines	• Similar to at-grade alternatives, would facilitate connection between West Seattle and Ballard lines
Technically feasible and financially sustainable	• Longest section of elevated guideway in poor soils and adjacent to active Link tracks • Complex engineering to tie new curved structure at S Forest Street to existing Link light rail line • Would require two shutdowns of existing Link light rail line, totaling several months • Temporary structure during construction would potentially slow existing trains for two years • North Link light rail vehicles could not access Forest Street OMF for at least 4 to 6 weeks during construction • Comparative Estimate $300 million higher than ST3 Representative Project; requires third-party funding	• Elevated guideway in poor soils but less than ST3 Representative Project • Connection of new lines to existing lines could likely be done with short-term single track operations or potential off-peak closures, similar to other Level 3 alternatives • Similar comparative estimate as ST3 Representative Project
Encourage equitable and sustainable urban growth	• All alternatives would require vertical circulation (use of stairs or escalator) to transfer between trains or from trains to buses • Maintaining E3 busway and relocating SODO station closer to S Lander Street would enable improved passenger transfer compared to other alternatives.	• All alternatives would require vertical circulation (use of stairs or escalator) to transfer between trains or from trains to buses • Maintaining E3 busway and relocating SODO station closer to S Lander Street would enable improved passenger transfer compared to other alternatives.
Promote a healthy built, natural, and social environment	• More than approx. 500,000 sq. feet of potential business displacements, more than with the at-grade alternatives • Additional right-of-way potentially required, compared to at-grade alternatives • Travel disruptions due to the potential need to shut down the existing light rail line would disproportionately affect minority and low-income populations	• More than approx. 500,000 sq. feet of potential business displacements, more than with the at-grade alternatives • Additional right-of-way potentially required, compared to at-grade alternatives • Less potential improvement to long-term freight mobility due to maintaining one at-grade light rail crossing at S Lander Street

SODO Double Elevated

The alternative received mixed feedback, with those favoring this alternative citing positives including:

- Not requiring street overpasses would avoid potential associated construction effects and short-term effects on traffic, freight movements, pedestrian safety, and business operations in the area
- Potential to reduce long-term effects on traffic, freight movements, pedestrian safety, and business operations in the area compared with the Partial Elevated alternative
- Potential to limit rail and vehicle conflict points

Concerns cited about the SODO Double Elevated Alternative included:

- Increased cost, noting the at-grade alternatives already provide desired grade separation between vehicles and trains
- Long-term service disruptions of existing light rail service during the construction of the alternative

SODO Partial Elevated

This alternative also received mixed feedback. Positives included:

- It would have fewer potential effects than the SODO Double Elevated Alternative with lower costs

Concerns included:

- Increases costs with limited improvement to transit reliability compared to the preferred SODO At-Grade Alternative, which already provides the desired grade separation between vehicles and trains

3.4 20th Avenue Tunnel Ballard

The 20th Avenue Tunnel Ballard – BNSF Portal and the 20th Avenue Tunnel Ballard – Thorndyke Portal alternatives were compared to Level 3 Alternatives in a segment from north of W Dravus Street in Interbay to the end of the line in Ballard. Table 3-5 (Performance of 20th Avenue Tunnel Ballard Alternatives Relative to Level 3 Alternatives) highlights the key evaluation measures that differentiate the 20th Avenue Tunnel Ballard – BNSF Portal and the 20th Avenue Tunnel Ballard – Thorndyke Portal alternatives from the Level 3 Alternatives in this area.

Summary of Findings

Both the 20th Avenue Tunnel Ballard alternatives would result in a Ballard Station closer to the core of the Ballard Hub Urban Village. Both the 20th Avenue Tunnel Ballard alternatives would also result in greater potential construction effects, property constraints/effects, and constructability challenges in the Ballard core.

20th Avenue Tunnel Ballard – BNSF Portal

The 20th Avenue Tunnel Ballard – BNSF Portal Alternative would require relocation of very large underground utilities in Interbay, adding potential constructability challenges; it would require a long span structure over the BNSF tracks and may require relocation of some BNSF operations; and it has greater potential residential effects due to the location of the tail track in the Ballard core.

The 20th Avenue Tunnel Ballard – BNSF Portal Alternative is estimated to cost approximately $750 million more than the ST3 Representative Project. The cost of additional tunnels was not included or evaluated in the ST3 Plan and this alternative would require third party funding.

20th Avenue Tunnel Ballard – Thorndyke Portal

The 20th Avenue Tunnel Ballard – Thorndyke Portal Alternative would require the relocation of large underground utilities in Interbay, adding potential constructability challenges, though less of a constraint than the 20th Avenue Tunnel – BNSF Portal Alternative; it may require a retrofit or reconstruction of the W Dravus Street and W Emerson Street bridges, which would add engineering complexity and risk, and it would require a longer tunnel under Salmon Bay. It would allow for a shorter tail track in the downtown Ballard core than the 20th Avenue Tunnel Ballard – BNSF Portal Alternative, reducing potential property effects.

The 20th Avenue Tunnel Ballard - Thorndyke Portal Alternative is estimated to cost approximately $450 million more than the ST3 Representative Project. The cost of additional tunnels was not included or evaluated in the ST3 Plan and this alternative would require third party funding.

Details for these and other measures can be found in Appendix A to this report.

Public Comment

The initial assessments of the 20th Avenue Tunnel Ballard – BNSF Portal and the 20th Avenue Tunnel Ballard – Thorndyke Portal alternative were shared with the Public September 14 through October 4, 2019. General public comments in support of the 20th Avenue Tunnel Ballard alternatives included:

- A station on 20th Avenue NW would be closer to the density of businesses and residences in the core of downtown Ballard
- Tunnel stations in Ballard would have better operations, require fewer potential property acquisitions or less disruption, and have fewer environmental effects and generate less noise compared to elevated alternatives

General public comments not in support of the 20th Avenue Tunnel Ballard alternatives included:

- The alternative would have additional cost compared to the other alternatives, increased technical risks, potential disruptions to businesses and residences, and would be less direct for future extensions

20th Avenue Tunnel Ballard – BNSF Portal

- Some support for a shorter tunnel route to Ballard
- Concerns about additional cost

20th Avenue Tunnel Ballard – Thorndyke Portal

- Concerns about additional cost

Table 3-5 Performance of 20th Avenue Tunnel Ballard Alternatives Relative to Level 3 Alternatives

	BNSF PORTAL	THORNDYKE PORTAL
Purpose and Need	**Evaluation**	
Improve Downtown capacity for regional connectivity	• Similar projected ridership for all alternatives	
Connect regional centers	• Would serve greater potential population and employment densities • More challenging for future extension	
Technically feasible and financially sustainable	• Construction of Ballard Station constrained by narrow right-of-way on 20th Avenue NW • Would require relocation of major 144- inch sewer pipeline with schedule/cost risk to maintain operation of pipeline during construction • $750 million higher than ST3 representative project; requires third-party funding; cost of additional tunnels not included in ST3 Financial Plan or evaluation methodology	• Would require relocation of 96-inch major sewer pipeline with schedule/cost risk to maintain operation of pipeline during construction • Would require underpinning W Dravus Street Bridge • Would result in Interbay Station located in a deep trench • $450 million higher than ST3 representative project; requires third-party funding; cost of additional tunnels not included in ST3 Financial Plan or evaluation methodology
Encourage equitable and sustainable urban growth	• Would be closer to core of Ballard Hub Urban Village • Would require greater out-of-direction travel for connecting bus routes to continue north than other alternatives • Greater potential development opportunities as tunnel construction creates surplus land and zoning supports higher-density development	
Promote a healthy built, natural, and social environment	• Construction in core of the Ballard Hub Urban Village would potentially affect residences and businesses • Hauling of tunnel excavation material would potentially affect Interbay and Ballard neighborhoods	
	• More than 100 residential units potentially displaced; more than Thorndyke Portal Alternative due to the additional length of tail track required north of Ballard Station	• 25-100 residential units potentially displaced

3.5 Federal Transit Administration Feedback on Initial Assessment Alternatives

The FTA provided feedback on the Initial Assessment alternatives on October 4, 2019. In general, FTA expressed concern about the large number of alternatives, including the following points:

- Increased cost to conduct technical studies, draft, and finalize the EIS
- Increased schedule to complete the EIS
- Additional alternatives that would require third-party funding

FTA provided the following feedback on specific Initial Assessment alternatives.

Yancy/Andover Elevated or Pigeon Point Tunnel

- Concern: Alternatives that would have higher schedule risk
- Positive: Potential avoidance of Section 4(f) and historic properties

SODO Elevated

- Concern: The SODO Double Elevated alternative would require shut down of the Central Link service during construction
- Concern: Alternatives that would substantially affect the US Postal Service facility
- Positive: Alternatives that maintain the use of the E3 busway

20th Avenue Tunnel Ballard

- Concern: Alternatives that would require substantial BNSF property
- Positive: Alternatives that would avoid permanent in-water structures

4 SOUND TRANSIT BOARD ACTION ON THE ALTERNATIVES

The Sound Transit Board met on Thursday, October 24, 2019, to identify whether or not to study any of the Initial Assessment alternatives in the Draft EIS.

Based on the Board's review of findings from the Initial Assessment, public and agency comments, input from FTA, and other information developed to date, the Sound Transit Board adopted **Motion No. M2019-104**, which identified the following alternatives for further study in the West Seattle and Ballard Link Extensions Draft EIS:

- Yancy/Andover Elevated
- SODO Partial Elevated (refinement)

The Board did not advance for study in the Draft EIS the following Initial Assessment alternatives:

- Pigeon Point Tunnel
- SODO Double Elevated
- 20th Avenue Tunnel Ballard – BNSF Portal
- 20th Avenue Tunnel Ballard – Thorndyke Portal (refinement)

5 NEXT STEPS

The alternatives identified by the Sound Transit Board on October 24, 2019 (**Motion No. M2019-104**) will be studied in the Draft EIS along with the alternatives the Board identified on May 23, 2019 (**Motion No. M2019-51**). All alternatives identified for study will undergo conceptual engineering to support the EIS analyses. During the design and environmental review of the alternatives, Sound Transit will engage affected communities in the project development process and receive feedback on the alignment, profile and station design. Sound Transit will also seek to avoid, minimize or mitigate potential impacts of the project as design progresses.

APPENDIX A

Initial Assessment Maps, Criteria, and Evaluation Matrices

West Seattle and Ballard
Link Extensions

Initial Assessments

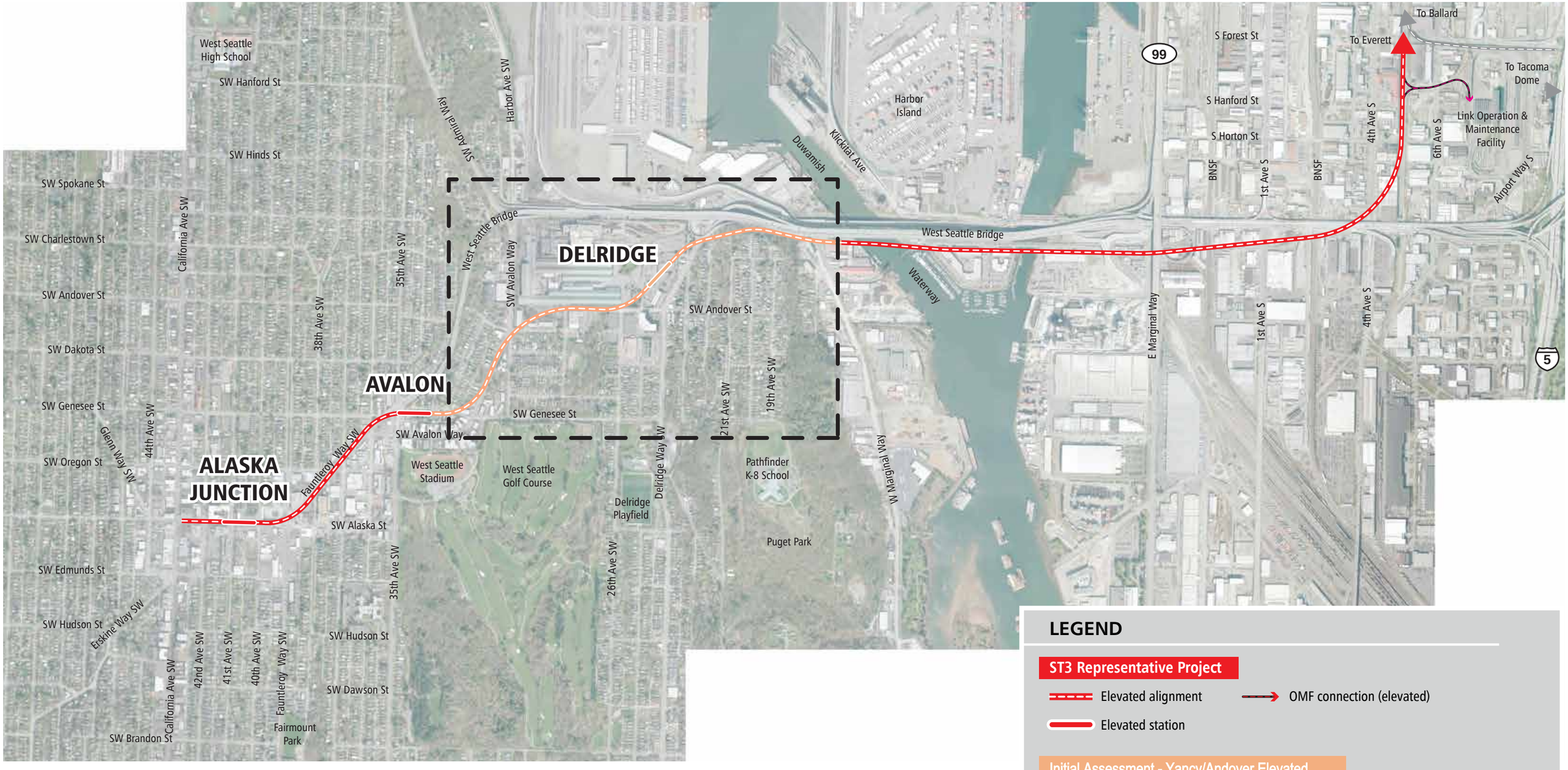
September 2019

Initial Assessment Results

Yancy / Andover Elevated

Pre Draft-EIS Initial Assessment Results

9-12-2019



Yancy/Andover Elevated Alternative

LEGEND

ST3 Representative Project

- Elevated alignment
- OMF connection (elevated)
- Elevated station

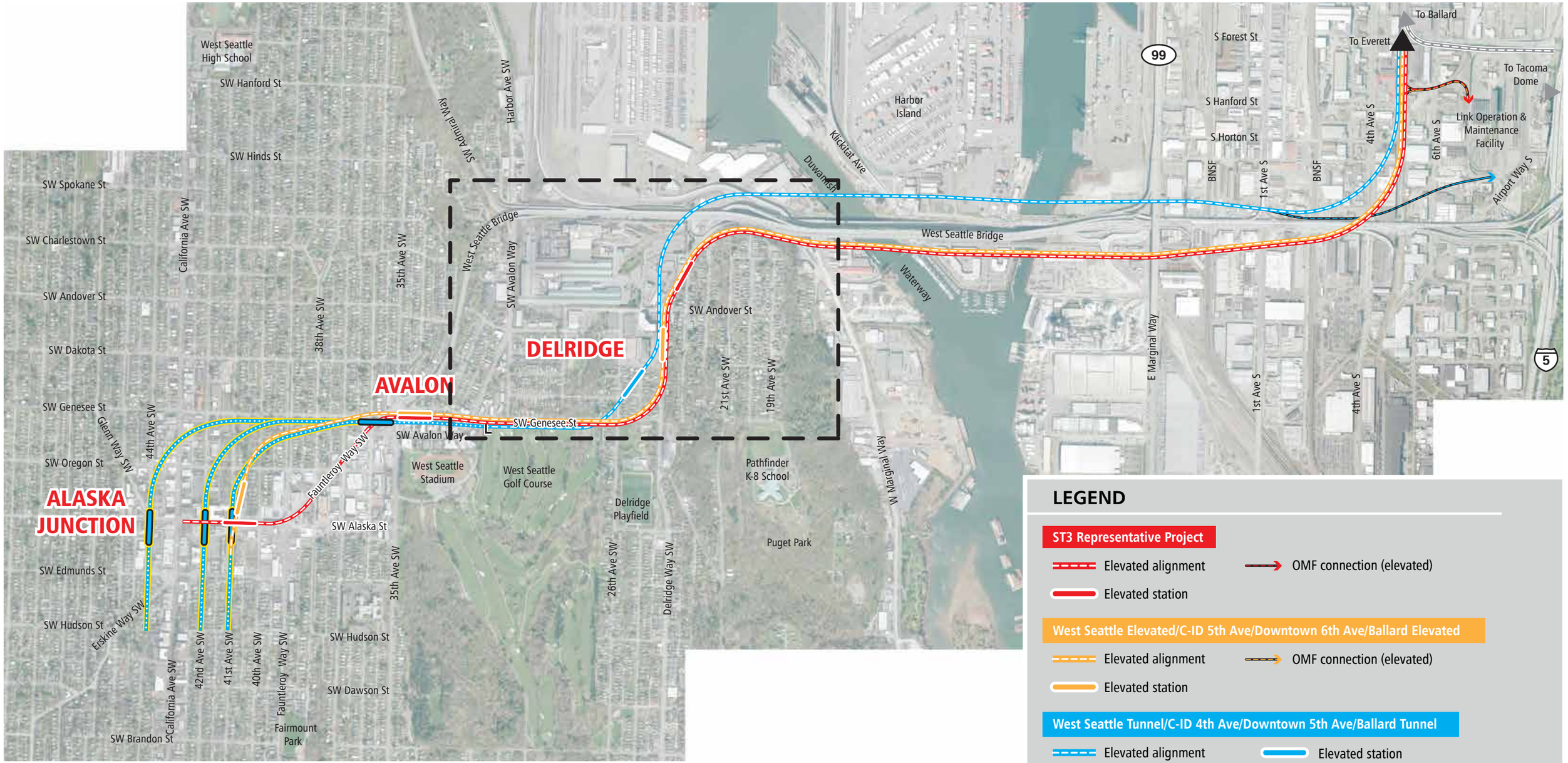
Initial Assessment - Yancy/Andover Elevated

- Elevated alignment
- Elevated station
- Area evaluated

N

Pre Draft-EIS Initial Assessment Results

9-12-2019



Level 3 Alternatives

LEGEND

ST3 Representative Project

- Elevated alignment
- Elevated station
- OMF connection (elevated)

West Seattle Elevated/C-ID 5th Ave/Downtown 6th Ave/Ballard Elevated

- Elevated alignment
- Elevated station
- OMF connection (elevated)

West Seattle Tunnel/C-ID 4th Ave/Downtown 5th Ave/Ballard Tunnel

- Elevated alignment
- Tunnel alignment
- Alignment Option
- OMF connection (elevated)
- Elevated station
- Tunnel station
- Station Option
- OMF connection (surface)

- Approximate portal location
- Area evaluated

N

Pre-DEIS Initial Assessment Criteria, Measures, Methods and Thresholds - Yancy/Andover Elevated 9/12/2019

Purpose and Need / Evaluation Criteria	Measure	Methods	Thresholds
Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain.			
ST3 Consistency	Potential ST3 implementation schedule effects	Constructability, environmental or other issues/challenges that may cause WSBLE Project schedule risks (e.g., right-of-way [ROW] acquisition needs, in-water work restrictions, regulatory compliance process, etc.)	Higher = Similar implementation schedule for WSBLE Project as included in ST3 Plan Medium = Moderate potential effects to implementation schedule for WSBLE Project as included in ST3 Plan Lower = Major potential effects to implementation schedule for WSBLE Project as included in ST3 Plan
Technical Feasibility	Engineering constraints	Compliance with Sound Transit Design Criteria Manual, design criteria from agencies with jurisdiction and federal regulations, and engineering obstacles associated with major infrastructure constraints	Higher = Minimal engineering constraints, design meets full standards, likely acceptance by authority having jurisdiction, minimum ROW issues, and/or no unusual design considerations Medium = Moderate engineering constraints, design meets minimums, likely acceptance by authority having jurisdiction, but with additional mitigation and moderate ROW issues, and/or unusual design considerations that could be mitigated Lower = Substantial engineering constraints, deviations to standards, authority having jurisdiction's acceptance requires substantial mitigation, substantial ROW issues, and/or unique design considerations
	Constructability issues	Constructability issues based on potential conflicts and technical challenges (e.g., utility conflicts, existing infrastructure, geotechnical, tunnel portals, etc.)	Higher = Lower construction complexity and construction risks (e.g., minimal utility conflicts, building impacts, impacts to existing infrastructure, etc.) Medium = Moderate construction complexity and construction risks Lower = Higher construction complexity requiring special mitigation and construction risks
	Operational constraints	Assessment of operational constraints (e.g., access to maintenance facility, vertical grade, horizonal curvature, movable bridge, etc.)	Higher = Optimum operational characteristics (e.g., operating efficiency and flexibility) Medium = Meets minimum operational goals for design speed and operations and maintenance facility (OMF) connection Lower = Poor operational characteristics, with certain operational goals compromised for design speed and OMF connection
Financial Sustainability	Conceptual capital cost comparison	ST3 cost consistency and conceptual capital cost comparison based on conceptual design quantities and Sound Transit unit pricing (2018$)	Higher = Conceptual capital cost estimates less than ST3 Representative Project Medium = Conceptual capital cost estimates 0% to 10% more than ST3 Representative Project Lower = Conceptual capital cost estimates 10% or more than ST3 Representative Project
Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies.			
Modal Integration	Passenger transfers	Assessment of ease of passenger transfer for riders transferring between light rail lines, and between light rail and other motorized modes (i.e., bus, paratransit, drop-off/pick-up, taxis or other ride-hailing services) at stations	Higher = More convenient passenger transfers at stations Medium = Adequate passenger transfers at stations Lower = Less convenient passenger transfers at stations
	Bus/rail and rail/rail integration	Assessment of transportation facility integration between the station and adjacent transit stops that serve other modes	Higher = Above average transportation facility integration at stations Medium = Adequate transportation facility integration at stations Lower = Below average transportation facility integration at stations
	Bicycle infrastructure and accessibility	Assessment of the quality of bicycle infrastructure and percent of bicycle facility miles (i.e., neighborhood greenways, bicycle lanes, protected bicycle lanes, and trails) to total roadway miles within 10-minute bikeshed of stations	Higher = Greatest quality of bicycle facilities and bicycle facility miles greater than 25 percent of total roadway miles within bikeshed area Medium = Moderate quality of bicycle facilities and bicycle facility miles between 15 and 25 percent of total roadway miles within bikeshed area Lower = Lower quality of bicycle facilities and bicycle facility miles lower than 15 percent of total roadway miles within bikeshed area
	Pedestrian and persons with limited mobility accessibility	Assessment of number of intersections, percent of sidewalk/trail miles to total roadway miles, and impediments to pedestrian and American with Disabilities Act (ADA) access (i.e., large intersections with signal delay, adjacency to freight corridors/industrial uses, and substantial topography or grade challenges) within 10-minute walkshed of stations	Higher = Higher number of intersections and sidewalk coverage, good to excellent pedestrian access and few impediments Medium = Moderate number of intersections and sidewalk coverage, average to good pedestrian access and average impediments Lower = Limited number of intersections and sidewalk coverage, poor to fair pedestrian access and greatest impediments

Pre-DEIS Initial Assessment Criteria, Measures, Methods and Thresholds - Yancy/Andover Elevated

9/12/2019

Purpose and Need / Evaluation Criteria	Measure	Methods	Thresholds
Station Area Development Opportunities	Development potential	Percent of properties with development potential based on zoned capacity and market conditions within 10-minute walkshed of stations (5-minute walkshed in downtown)	Higher = Greater than 20 percent of properties with development potential Medium = Between 10 and 20 percent of properties with development potential Lower = Less than 10 percent of properties with development potential
	Equitable development opportunities	Assessment of unique opportunities for equitable development enabled by station location and/or conceptual configuration	Higher = Greatest opportunities for equitable development that would accommodate future residential and employment growth based on station location and configuration Medium = Opportunities for equitable development that would accommodate future residential and employment growth based on station location and configuration Lower = Limited opportunities for equitable development that would accommodate future residential and employment growth based on station location and configuration
Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices.			
Environmental Effects	National Register of Historic Places (NRHP) listed or eligible historic properties and Seattle Landmarks	Number of intersected or adjacent NRHP-listed, NRHP-eligible, and Seattle Landmark properties based on Department of Archaeology and Historic Preservation (DAHP) data and Seattle Landmark data	Higher = 1 or less historic properties potentially affected Medium = Between 2 and 3 historic properties potentially affected Lower = More than 3 historic properties potentially affected
	Parks and recreational resources	Number of and estimated acres of potential permanent impacts to parks and recreational resources	Higher = Less than 1.5 acres of potential permanent impacts to parks Medium = Between 1.5 and 3 acres of potential permanent impacts to parks Lower = 3 acres or more of potential permanent impacts to parks
	Fish and wildlife habitats	Estimated acres of potential permanent impacts to fish and wildlife habitats using city of Seattle environmentally critical areas	Higher = Less than 1 acre of potential permanent fish and wildlife habitat impacts Medium = Between 1 and 2.5 acres of potential permanent fish and wildlife habitat impacts Lower = More than 2.5 acres of potential permanent fish and wildlife habitat impacts
	Hazardous materials	Number of contaminated hazardous materials sites of high concern potentially affected, including Superfund sites	Higher = 5 or less hazardous materials sites potentially affected Medium = Between 6 and 10 hazardous sites potentially affected Lower = More than 10 hazardous materials sites potentially affected
	Visual	Assessment of length of elevated guideway adjacent to residential or other visually sensitive areas, including parks and historic properties and assessment of scale of elevated guideway in visually sensitive areas and potential impacts to State Environmental Policy Act (SEPA) Scenic Routes	Higher = 0.5 miles or less adjacent to visually sensitive viewers, most elevated guideway not more than 75 feet high in visually sensitive areas, and low potential to affect SEPA Scenic Routes Medium = Between 0.6 and 1 miles adjacent to visually sensitive viewers, some elevated guideway more than 75 feet high in visually sensitive areas, and/or moderate potential to affect SEPA Scenic Routes Lower = More than 1 miles potentially adjacent to visually sensitive viewers, extensive elevated guideway more than 75 feet high in visually sensitive areas, and/or high potential to affect SEPA Scenic Routes
	Property acquisitions and displacements	Number of potential residential unit displacements; does not include potential permanent or temporary easements or area for construction staging, TPSS or underground station entrances (except station entrances in downtown)	Higher = Less than approximately 40 potential residential unit displacements Medium = Between approximately 40 and 60 potential residential unit displacements Lower = More than approximately 60 potential residential unit displacements
		Square feet of potential business displacements (including maritime businesses); does not include potential permanent or temporary easements or area for construction staging, TPSS or underground station entrances (except station entrances in downtown)	Higher = Less than approximately 65,000 square feet of potential residential displacements Medium = Between approximately 65,000 and 110,000 square feet of potential residential displacements Lower = More than approximately 110,000 square feet of potential residential displacements

Pre-DEIS Initial Assessment Criteria, Measures, Methods and Thresholds - Yancy/Andover Elevated

9/12/2019

Purpose and Need / Evaluation Criteria	Measure	Methods	Thresholds
Environmental Effects (continued)	Community construction impacts	Assessment of temporary construction impacts to communities, including potential for transportation, access, noise, vibration, and visual effects that could disrupt the community (e.g., existing residents, businesses, social service providers), and relative duration of construction and impacts to high volume traffic areas; potential construction impacts that affect freight and business/commerce are addressed in other criteria below	Higher = Lower potential for impacts to community relative to other alternatives Medium = Moderate potential for impacts to community relative to other alternatives Lower = More substantial potential for impacts to community relative to other alternatives
	Burden on minority and low-income populations	Assessment of how potential acquisitions and displacements (residential and business) and visual, noise and construction impacts would affect minority and low-income populations relative to other communities	Higher = Little to no potential impact to minority or low-income communities relative to other alternatives Medium = Moderate potential for impacts to minority or low-income communities relative to other alternatives Lower = Substantial potential for impacts to minority or low-income communities relative to other alternatives
Traffic Operations	Traffic circulation and access	Effects on traffic and transit (i.e., bus and streetcar) operations, including potential for lane restrictions, lane eliminations, turn restrictions, driveways impacted, and parking taken	Higher = Most of alignment is outside of roadway, with few to no changes in traffic patterns or access Medium = Potential for changes in traffic patterns or access to some properties; could be mitigated with local circulation modifications Lower = Substantial impacts to traffic circulation and/or access to many properties; mitigation likely requires substantial roadway improvements
	Transportation facilities	Effects on existing transportation facilities, including bicycle lanes, sidewalks, traffic interchanges and other transportation infrastructure as warranted, and compatibility with planned facilities	Higher = Minor changes to transportation facilities, and/or moderate changes with opportunities to improve infrastructure Medium = Moderate changes to transportation facilities, with more limited opportunities to improve infrastructure Lower = Substantial changes to transportation facilities, with no or limited opportunities to improve infrastructure
Economic Effects	Freight movement and access on land and water	Effects on existing freight and future capacity expansion opportunities, including truck, rail and water freight; includes potential impacts during construction and operations	Higher = No or less than substantial effects on both land and water freight mobility and capacity expansion Medium = Substantial effects on either land or water freight mobility and capacity expansion Lower = Substantial effects on both land and water freight mobility and capacity expansion
	Business and commerce effects	Effects on existing businesses, commercial areas and designated industrial centers, as well as future expansion opportunities; includes potential impacts during construction and operations	Higher = Minimal effects on local businesses, as well as commercial areas and designated industrial zones Medium = Moderate effects on local businesses, as well as commercial areas and designated industrial zones Lower = Substantial effects on local businesses, as well as commercial areas and designated industrial zones

NOTES:

1. Based on preliminary Purpose and Need Statement.
2. Criteria used are a subset of the criteria used for Level 1, Level 2, and Level 3, based on differentiating factors in the subsegment evaluated.
3. Thresholds were modified from Level 1, Level 2, and Level 3 for the more focused subsegments in order to compare the initial assessment alternatives to the same area of the Level 3 alternatives.
4. Agency and stakeholder input will be considered in the overall alternatives evaluation and screening process.
5. Qualitative measures ranked from high to low based on anticipated ability to achieve evaluation measure; “Higher” = higher ability to achieve measure, “Medium” = moderate ability to achieve measure, “Lower” = lower ability to achieve measure; no weighting will be applied.
6. Minority population is defined in US Department of Transportation Updated Environmental Justice Order 5610.2(a) as persons belonging to any of the following groups: Black, Hispanic, Asian American, and American Indian and Alaska Native.

Pre-DEIS Initial Assessment Summary - Yancy/Andover Elevated

9/12/2019

Purpose and Need / Evaluation Measures	Level 3 Alternatives			Pre-DEIS Initial Assessment Alternatives
	ST3 Representative Project	West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel	Yancy-Andover Elevated
	Avalon Station Elevated Delridge Station North of Andover	Avalon Station Elevated Delridge Station South of of Andover	Avalon Station Tunnel Delridge Station North of Genesee	
Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain.				
Potential ST3 implementation schedule effects	Higher (includes entire West Seattle Extension)	Higher (includes entire West Seattle Extension)	Lower (includes entire West Seattle Extension)	Higher (includes entire West Seattle Extension)
Engineering constraints	Lower	Lower	Medium	Lower
Constructability issues	Lower	Lower	Medium	Lower
Operational constraints	Medium	Medium	Higher	Lower
Conceptual capital cost comparison (2018$ in millions)	--	Similar to ST3 Representative Project (includes entire West Seattle Extension)	$1,000 million increase (includes entire West Seattle Extension)	Similar to ST3 Representative Project (includes entire West Seattle Extension)
Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies.				
Passenger transfers	Medium	Medium	Medium	Lower
Bus/rail and rail/rail integration	Lower	Higher	Medium	Lower
Bicycle infrastructure and accessibility	Higher	Higher	Higher	Higher
Pedestrian and persons with limited mobility accessibility	Lower	Medium	Higher	Lower
Development potential	Lower	Medium	Higher	Lower
Equitable development opportunities	Lower	Medium	Higher	Lower
Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices.				
National Register of Historic Places (NRHP) listed or eligible historic properties and Seattle Landmarks	1	0	1	1
Parks and recreational resources (acres)	3.0	3.1	1.7	2.5
Fish and wildlife habitats (acres)	2.5	2.5	<0.5	2.5
Hazardous materials sites	2	2	2	1
Visual effects (miles of sensitive viewers)	Lower	Lower	Medium	Medium
Potential residential unit displacements	Lower	Lower	Lower	Medium
Potential business displacements	Higher	Higher	Medium	Lower

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

The Pre-DEIS Initial Assessment is based on a limited conceptual design and intended to inform comparison of potential benefits and impacts between alternatives. Sound Transit will evaluate the potential effects of alternatives for environmental review in an Environmental Impact Statement.

Segment Evaluated: SW Avalon Way and SW Genesee Street to West Marginal Way SW

Pre-DEIS Initial Assessment Summary - Yancy/Andover Elevated

9/12/2019

Purpose and Need / Evaluation Measures	Level 3 Alternatives			Pre-DEIS Initial Assessment Alternatives
	ST3 Representative Project	West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel	Yancy-Andover Elevated
	Avalon Station Elevated Delridge Station North of Andover	Avalon Station Elevated Delridge Station South of of Andover	Avalon Station Tunnel Delridge Station North of Genesee	
Community construction impacts	Medium	Medium	Lower	Medium
Burden on minority and low-income populations	Higher	Higher	Higher	Higher
Traffic circulation and access effects	Medium	Medium	Higher	Medium
Effects on transportation facilities	Medium	Medium	Medium	Medium
Effects on freight movement	Lower	Medium	Medium	Lower
Business and commerce effects	Medium	Medium	Medium	Lower

NOTES:

1. Minority population is defined in US Department of Transportation Updated Environmental Justice Order 5610.2(a) as persons belonging to any of the following groups: Black, Hispanic, Asian American, and American Indian and Alaska Native

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

The Pre-DEIS Initial Assessment is based on a limited conceptual design and intended to inform comparison of potential benefits and impacts between alternatives. Sound Transit will evaluate the potential effects of alternatives for environmental review in an Environmental Impact Statement.

Segment Evaluated: SW Avalon Way and SW Genesee Street to West Marginal Way SW

Pre-DEIS Inital Assessment - Yancy/Andover Elevated

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		Level 3 Alternatives			Pre-DEIS Initial Assessment Alternatives
		ST3 Representative Project	West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel	Yancy-Andover Elevated
		Avalon Station Elevated Delridge Station North of Andover	Avalon Station Elevated Delridge Station South of of Andover	Avalon Station Tunnel Delridge Station North of Genesee	
Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain.					
ST3 Consistency	Potential ST3 implementation schedule effects	Higher (includes entire West Seattle Extension) • Implementation schedule anticipated to be similar to ST3 Plan	Higher (includes entire West Seattle Extension) • Implementation schedule anticipated to be similar to ST3 Plan	Lower (includes entire West Seattle Extension) • Implementation schedule anticipated to be similar to ST3 Plan within the limit of the segment evaluated • However, segment leads to the West Seattle tunnel, which may affect the ST3 schedule	Higher (includes entire West Seattle Extension) • Implementation schedule anticipated to be similar to ST3 Plan
Technical Feasibility	Engineering constraints	Lower • Duwamish Waterway crossing south of West Seattle Bridge potentially requires special design for steep and unstable slope at Pigeon Point in West Seattle • Higher elevated guideway with potentially larger foundation • Delridge Station at approximately 45-60 feet above Delridge Way SW with mezzanine • Substantial straddle bents and support structure at Delridge Way SW and West Seattle bridge ramps	Lower • Duwamish Waterway crossing south of West Seattle Bridge potentially requires special design for steep and unstable slope at Pigeon Point in West Seattle • Higher elevated guideway with potentially larger foundation • Delridge Station at approximately 45-60 feet above Delridge Way SW with mezzanine	Medium • Duwamish Waterway crossing north of West Seattle Bridge likely avoids steep and unstable slope design at Pigeon Point in West Seattle, however may need special design for the long span bridge going above the flyover leading to Terminal 5 and also above the West Seattle Bridge • Lower elevated guideway with potentially smaller foundation • Off-street Delridge Station at approximately 30 feet above ground level with no mezzanine	Lower • Duwamish Waterway crossing south of West Seattle Bridge potentially requires special design for steep and unstable slope at Pigeon Point in West Seattle • Higher elevated guideway with potentially larger foundation to fit within constrained right-of-way along SW Andover Street and SW Avalon Way with adjacent multi-story buildings on both sides • Higher Delridge Station at approximately 90 feet above ground level and 60 feet above Delridge Way SW results in more complex station structure • Substantial straddle bents and support structure at Delridge Way SW and West Seattle bridge ramps
	Constructability issues	Lower • Duwamish Waterway crossing south of West Seattle Bridge potentially requires soil stabilization at Pigeon Point in West Seattle • Construction constraints along SW Genesee Street width with adjacent residences and West Seattle Golf Course • Higher elevated guideway along SW Genesee Street	Lower • Duwamish Waterway crossing south of West Seattle Bridge potentially requires soil stabilization at Pigeon Point in West Seattle • Construction constraints along SW Genesee Street width with adjacent residences and West Seattle Golf Course • Higher elevated guideway along SW Genesee Street	Medium • Duwamish Waterway crossing north of West Seattle Bridge likely avoids challenges of construction at Pigeon Point in West Seattle; however construction near West Marginal Way SW/Chelan Ave SW intersection will be challenging due to limited area for construction and staging • Construction constraints at tunnel portal location on SW Genesee Street with adjacent residences and West Seattle Golf Course • Lower elevated guideway along SW Genesee Street	Lower • Duwamish Waterway crossing south of West Seattle Bridge potentially requires soil stabilization at Pigeon Point in West Seattle • Construction constraints along Avalon Way SW width with adjacent multi-story buildings on both sides • Higher elevated guideway along SW Andover Street and SW Avalon Way • Higher Delridge Station at approximately 90 feet above ground level and 60 feet above Delridge Way SW results in more complex construction • Substantial support structure at Delridge Way SW and West Seattle bridge ramps
	Operational constraints	Medium • Steeper track grades for elevated guideway in West Seattle limit train acceleration and flexibility for crossovers compared to a tunnel in West Seattle	Medium • Steeper track grades for elevated guideway in West Seattle limit train acceleration and flexibility for crossovers compared to a tunnel in West Seattle	Higher • Less steep track grades for tunnel in West Seattle improves train acceleration and flexibility for crossovers compared to an elevated guideway in West Seattle • Larger radius curves crossing West Seattle Bridge and avoiding Pigeon Point with the North Duwamish Waterway crossing would likely result in higher speeds	Lower • Steeper track grades for elevated guideway in West Seattle limit train acceleration and flexibility for crossovers compared to a tunnel in West Seattle '• Potentially lower speeds due to additional curves combined with steep grades.

Key to Rating — **Alternative Performance**: Lower Performing | Medium Performing | Higher Performing

The Pre-DEIS Initial Assessment is based on a limited conceptual design and intended to inform comparison of potential benefits and impacts between alternatives. Sound Transit will evaluate the potential effects of alternatives for environmental review in an Environmental Impact Statement.

Segment Evaluated: SW Avalon Way and SW Genesee Street to West Marginal Way SW

Pre-DEIS Inital Assessment - Yancy/Andover Elevated

Purpose and Need / Evaluation Criteria / Measures		Level 3 Alternatives: ST3 Representative Project — Avalon Station Elevated, Delridge Station North of Andover	Level 3 Alternatives: West Seattle Elevated/Downtown 6th Ave/Ballard Elevated — Avalon Station Elevated, Delridge Station South of of Andover	Level 3 Alternatives: West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel — Avalon Station Tunnel, Delridge Station North of Genesee	Pre-DEIS Initial Assessment Alternatives: Yancy-Andover Elevated
Financial Sustainability	Conceptual capital cost comparison (2018$ in millions)	--	Similar to ST3 Representative Project (includes entire West Seattle Extension)	$1,000 million increase (includes entire West Seattle Extension)	Similar to ST3 Representative Project (includes entire West Seattle Extension)
		• Baseline for capital cost comparison to other alternatives	• Similar cost to ST3 Representative Project in West Seattle	• Approximately $1,000 million more than the ST3 Representative Project in West Seattle • Higher cost for additional tunnel construction in West Seattle Junction ($700 million increase) and for north Duwamish Waterway crossing ($300 million increase) • Cost for additional tunnel in West Seattle Junction not included in ST3 financial plan	• Similar cost to ST3 Representative Project in West Seattle
Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies.					
Modal Integration	Passenger transfers	Medium	Medium	Medium	Lower
		• Station location at north end of Delridge Way SW may constrain passenger drop-off/pick-up areas	• Station location at Delridge provides opportunity for convenient passenger drop-off/pick-up areas but the higher profile at the guideway and higher station mezzanine result in slightly longer access path	• Station location at Delridge off street may constrain passenger drop-off/pick-up areas	• Station location at Delridge off-street may constrain passenger drop-off/pick-up areas immediately adjacent to station and result in the need to cross up to two streets to reach the station
	Bus/rail and rail/rail integration	Lower	Higher	Medium	Lower
		• Delridge Station may have constrained areas for bus zones • Bus routes destined to Alki may need to either be re-routed to serve station or serve a bus zone south of SW Andover Street because of ramp lane configurations	• Delridge Station straddling the street provides good integration with buses on both sides of the street	• Delridge Station is located off-street, requiring either some bus reroutings or a walk to the station from bus stops on Delridge Way SW	• Delridge Station may have constrained areas for bus zones • Bus routes destined to Alki may need to either be re-routed to serve station or serve a bus zone south of SW Andover Street because of ramp lane configurations
	Bicycle infrastructure and accessibility	Higher	Higher	Higher	Higher
		• Existing multi-use bike facilities within a 10-minute ride from stations include West Seattle Bridge Trail, Alki Trail and Duwamish River Trail • There are existing in-street, separated bike facilities within a 10-minute ride from stations	• Existing multi-use bike facilities within a 10-minute ride from stations include West Seattle Bridge Trail, Alki Trail and Duwamish River Trail • There are existing in-street, separated bike facilities within a 10-minute ride from stations	• Existing multi-use bike facilities within a 10-minute ride from stations include West Seattle Bridge Trail, Alki Trail and Duwamish River Trail • There are existing in-street, separated bike facilities within a 10-minute ride from stations	• Existing multi-use bike facilities within a 10-minute ride from stations include West Seattle Bridge Trail, Alki Trail and Duwamish River Trail • There are existing in-street, separated bike facilities within a 10-minute ride from stations

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

The Pre-DEIS Initial Assessment is based on a limited conceptual design and intended to inform comparison of potential benefits and impacts between alternatives. Sound Transit will evaluate the potential effects of alternatives for environmental review in an Environmental Impact Statement.

Segment Evaluated: SW Avalon Way and SW Genesee Street to West Marginal Way SW

Pre-DEIS Inital Assessment - Yancy/Andover Elevated

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		Level 3 Alternatives			Pre-DEIS Initial Assessment Alternatives
		ST3 Representative Project	West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel	Yancy-Andover Elevated
		Avalon Station Elevated Delridge Station North of Andover	Avalon Station Elevated Delridge Station South of of Andover	Avalon Station Tunnel Delridge Station North of Genesee	
Modal Integration (continued)	Pedestrian and persons with limited mobility accessibility	Lower • Delridge Station is sited closer to the West Seattle Bridge and West Seattle industrial areas, which results in fewer intersections, less sidewalk coverage and lower accessibility compared to all other alternatives	Medium • Delridge Station is sited further south, which results in a higher number of intersections and sidewalk coverage for better accessibility than the ST3 Representative Project	Higher • Delridge Station is sited further south, which results in a higher number of intersections and sidewalk coverage for better accessibility than the ST3 Representative Project and Delridge Station South of Andover	Lower • Delridge Station is similar in location to the ST3 Representative Project alternative relative to the West Seattle Bridge and West Seattle industrial areas, resulting in fewer intersections and less sidewalk coverage than alternatives that shift Delridge Station further south • Pedestrian access for persons with limited mobility is lower in quality than the Delridge South of Andover and Delridge North of Genesee alternatives
Station Area Development Opportunities	Development potential	Lower • Fewer development opportunities due to proximity of Delridge Station to West Seattle Bridge	Medium • Development opportunities at Delridge Station are similar in acreage to those associated with other alternatives, but parcels are of higher value due to location	Higher • Development opportunities at Delridge Station are similar in acreage to those associated with other alternatives, but parcels are of higher value due to southern location	Lower • Fewer properties with development opportunities due to proximity of Delridge Station to West Seattle Bridge • Development opportunities similar to ST Representative alternative
	Equitable development opportunities	Lower • Fewer equitable development opportunities due to proximity of Delridge Station to West Seattle Bridge	Medium • Equitable development opportunities at Delridge Station are improved compared to the ST3 Representative Project	Higher • Equitable development opportunities at Delridge Station are similar to other alternatives, but parcels are of higher value due to further south station location	Lower • Fewer equitable development opportunities due to proximity of Delridge Station to West Seattle Bridge and industrial areas
Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices.					
Environmental Effects	National Register of Historic Places (NRHP) listed or eligible historic properties and Seattle Landmarks	1 • 1 NRHP-listed, NRHP-eligible, and/or Seattle Landmark property could be directly affected by the project	0 • No NRHP-listed, NRHP-eligible, and/or Seattle Landmark properties could be directly affected by the project	1 • 1 NRHP-listed, NRHP-eligible, and/or Seattle Landmark property could be directly affected by the project	1 • 1 NRHP-listed, NRHP-eligible, and/or Seattle Landmark property could be directly affected by the project
	Parks and recreational resources (acres)	3.0 • Approximately 3 acres of potential permanent impacts to the following parks: West Duwamish Greenbelt and West Seattle Golf Course • Requires clearing steep slope on Pigeon Point in the West Duwamish Greenbelt; revegetation with low-growing shrubs is expected to be possible	3.1 • Approximately 3.1 acres of potential permanent impacts to the following parks: West Duwamish Greenbelt and West Seattle Golf Course • Requires clearing steep slope on Pigeon Point in the West Duwamish Greenbelt; revegetation with low-growing shrubs is expected to be possible	1.7 • Approximately 1.7 acres of potential permanent impacts to the West Seattle Golf Course • North Duwamish Waterway crossing avoids steep slope on Pigeon Point in the West Duwamish Greenbelt	2.5 • Approximately 2.5 acres of potential permanent impacts to the West Duwamish Greenbelt • Requires clearing steep slope on Pigeon Point in the West Duwamish Greenbelt; revegetation with low-growing shrubs is expected to be possible • Avoids West Seattle Golf Course

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

The Pre-DEIS Initial Assessment is based on a limited conceptual design and intended to inform comparison of potential benefits and impacts between alternatives. Sound Transit will evaluate the potential effects of alternatives for environmental review in an Environmental Impact Statement.

Segment Evaluated: SW Avalon Way and SW Genesee Street to West Marginal Way SW

Pre-DEIS Inital Assessment - Yancy/Andover Elevated

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		Level 3 Alternatives			Pre-DEIS Initial Assessment Alternatives
		ST3 Representative Project	West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel	Yancy-Andover Elevated
		Avalon Station Elevated Delridge Station North of Andover	Avalon Station Elevated Delridge Station South of of Andover	Avalon Station Tunnel Delridge Station North of Genesee	
Environmental Effects (continued)	Fish and wildlife habitats (acres)	2.5 • Approximately 2.5 acres of potential permanent habitat impacts • Requires clearing steep slope on Pigeon Point in the West Duwamish Greenbelt; revegetation with low-growing shrubs is expected to be possible • Heron rookery has been observed in West Duwamish Greenbelt within 250 feet south of the alignment	2.5 • Approximately 2.5 acres of potential permanent habitat impacts • Requires clearing steep slope on Pigeon Point in the West Duwamish Greenbelt; revegetation with low-growing shrubs is expected to be possible • Heron rookery has been observed in West Duwamish Greenbelt within 250 feet south of the alignment	<0.5 • Less than approximately 0.5 acres of potential permanent habitat impacts • North Duwamish Waterway crossing avoids Pigeon Point	2.5 • Approximately 2.5 acres of potential permanent habitat impacts • Requires clearing steep slope on Pigeon Point in the West Duwamish Greenbelt; revegetation with low-growing shrubs is expected to be possible • Heron rookery has been observed in West Duwamish Greenbelt within 250 feet south of the alignment
	Hazardous materials sites	2 • 2 contaminated sites of higher concern within the alternative footprint or within an intersecting parcel	2 • 2 contaminated sites of higher concern within the alternative footprint or within an intersecting parcel	2 • 2 contaminated sites of higher concern within the alternative footprint or within an intersecting parcel	1 • 1 contaminated sites of higher concern within the alternative footprint or within an intersecting parcel
	Visual effects (miles of sensitive viewers)	Lower • Approximately 1 mile of elevated guideway near visually sensitive viewers • Along SW Genesee Street/West Seattle Golf Course, approximately 900 feet of length of elevated guideway would be over 75 feet, with a maximum height of about 160 feet	Lower • Approximately 1 mile of elevated guideway near visually sensitive viewers • Along SW Genesee Street/West Seattle Golf Course, approximately 900 feet of length of elevated guideway would be over 75 feet, with a maximum height of about 160 feet	Medium • Approximately 0.9 miles of elevated guideway near visually sensitive viewers • There would be no elevated guideway over 75 feet above grade	Medium • Approximately 0.5 miles of elevated guideway near visually sensitive viewers • Along SW Avalon Way and SW Yancy Street, approximately 1,650 feet of length of elevated guideway would be over 75 feet, with a maximum height of about 160 feet
	Potential residential unit displacements	Lower • More than 60 potential residential unit displacements	Lower • More than 60 potential residential unit displacements	Lower • More than 60 potential residential unit displacements	Medium • Between 40 and 60 potential residential unit displacements
	Potential business displacements	Higher • Fewer than 65,000 square feet of potential business displacements	Higher • Fewer than 65,000 square feet of potential business displacements	Medium • Between 65,000 and 110,000 square feet of potential business displacements	Lower • More than 110,000 square feet of potential business displacements

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

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Segment Evaluated: SW Avalon Way and SW Genesee Street to West Marginal Way SW

Pre-DEIS Inital Assessment - Yancy/Andover Elevated

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		Level 3 Alternatives			Pre-DEIS Initial Assessment Alternatives
		ST3 Representative Project	West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel	Yancy-Andover Elevated
		Avalon Station Elevated Delridge Station North of Andover	Avalon Station Elevated Delridge Station South of of Andover	Avalon Station Tunnel Delridge Station North of Genesee	
Environmental Effects (continued)	Community construction impacts	Medium • Potential for visual, noise, and vibration impacts on residences near SW Genesee Street and Delridge Way SW • Potential Increased congestion on SW Avalon Way, 35th Avenue SW and the West Seattle Bridge due to construction on Delridge Way SW and SW Genesee Street • Access to businesses would be maintained throughout the corridor, although the community may experience changes in access to some businesses • Construction could affect the West Seattle Golf Course • Delridge Station construction mostly within right-of-way	Medium • Potential for visual, noise, and vibration impacts on residences near SW Genesee Street and Delridge Way SW • Potential increased congestion on SW Avalon Way, 35th Avenue SW and the West Seattle Bridge due to construction on Delridge Way SW and SW Genesee Street • Access to businesses would be maintained throughout the corridor, although the community may experience changes in access to some businesses • Construction could affect the West Seattle Golf Course • Delridge Station construction mostly within right-of-way	Lower • Potential for visual, noise, and vibration impacts on residences near SW Genesee Street and Delridge Way SW • Greater amount of construction vehicles in West Seattle neighborhoods for tunnel excavation material hauling • Access to businesses would be maintained throughout the corridor, although the community may experience changes in access to some businesses • Would have the greatest potential construction effect to the West Seattle Golf Course • Delridge Station construction mostly outside right-of-way	Medium • Potential for visual, noise, and vibration impacts on residences near SW Avalon Way, SW Yancy Street and SW Andover Street, as well as the north end of Pigeon Point for elevated guideway and Delridge station construction • Access to businesses would be maintained throughout the corridor, although the community may experience changes in access to some businesses • Increased potential congestion on Delridge Way SW and Fauntleroy Way SW due to construction on Avalon Way SW • No construction effect to the West Seattle Golf Course
	Burden on minority and low-income populations	Higher • Located in an area where minority or low-income populations are not above the city average	Higher • Located in an area where minority or low-income populations are not above the city average	Higher • Located in an area where minority or low-income populations are not above the city average	Higher • Located in an area where minority or low-income populations are not above the city average
Traffic Operations	Traffic circulation and access effects	Medium • Could affect driveway access and roadway capacity/turn lanes along Delridge Way SW and SW Genesee Street	Medium • Could affect driveway access and roadway capacity/turn lanes along Delridge Way SW and SW Genesee Street	Higher • Limited effect to driveway access and roadway capacity/turn lanes, including minor circulation changes around West Seattle tunnel portal	Medium • Could affect driveway access for major industrial use on SW Andover Street; limited effects elsewhere • Would potentially increase traffic on SW Avalon Way and impede access
	Effects on transportation facilities	Medium • Affected facilities include the Delridge Way SW corridor	Medium • Affected facilities include the Delridge Way SW corridor	Medium • Affected facilities include the Delridge Way SW corridor	Medium • Affected facilities in West Seattle include the Delridge Way SW and Avalon Way corridor
Economic Effects	Effects on freight movement	Lower • Elevated guideway columns could affect truck access to local businesses on Delridge Way SW • Truck and rail access to Nucor Steel could be affected by the elevated guideway columns and Delridge Station • Construction of elevated guideway columns could have limited effects associated with the guideway crossing the W Marginal Way Major Freight Route	Medium • Elevated guideway columns could affect truck access to local businesses on Delridge Way SW • Traffic signal at SW Dakota Street/Delridge Way SW intersection will likely divert some local traffic away from heavy freight movements on SW Andover Street • Construction of elevated guideway columns could have limited effects associated with the guideway crossing the W Marginal Way Major Freight Route	Medium • Elevated guideway columns could affect truck access to local businesses on Delridge Way SW • Truck and rail access to Nucor Steel could be affected by the elevated guideway columns • Traffic signal at SW Dakota Street/Delridge Way SW intersection will likely divert some local traffic away from heavy freight movements on SW Andover Street • Construction of elevated guideway columns could have limited effects associated with the guideway crossing the W Marginal Way Major Freight Route	Lower • Elevated guideway columns could affect truck access to local businesses on SW Yancy Street, SW Andover Street and Avalon Way • Truck and rail access to Nucor Steel could be affected by the elevated guideway columns and Delridge Station • Construction of elevated guideway columns could have limited effects associated with the guideway crossing the W Marginal Way Major Freight Route and SW Avalon Way Minor Freight Route

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

The Pre-DEIS Initial Assessment is based on a limited conceptual design and intended to inform comparison of potential benefits and impacts between alternatives. Sound Transit will evaluate the potential effects of alternatives for environmental review in an Environmental Impact Statement.

Segment Evaluated: SW Avalon Way and SW Genesee Street to West Marginal Way SW

Pre-DEIS Inital Assessment - Yancy/Andover Elevated

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		Level 3 Alternatives			Pre-DEIS Initial Assessment Alternatives
		ST3 Representative Project	West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel	Yancy-Andover Elevated
		Avalon Station Elevated Delridge Station North of Andover	Avalon Station Elevated Delridge Station South of of Andover	Avalon Station Tunnel Delridge Station North of Genesee	
Economic Effects (continued)		Medium	Medium	Medium	Lower
	Business and commerce effects	• Would have the least amount of business displacements, the majority of which would be in the Duwamish Manufacturing/Industrial Center (MIC) and along Delridge Way SW • Could displace small businesses that mostly serve local community • Potential construction period effects such as lane closures and access changes, to local businesses on or near SW Avalon Way and Delridge Way SW	• Would have the least amount of business displacements, the majority of which would be in the Duwamish MIC and along Delridge Way SW • Could displace small businesses that mostly serve local community • Potential construction period impacts, such as lane closures and access changes, to local businesses on or near SW Avalon Way and Delridge Way SW	• Could have a moderate amount of business displacements, the majority of which would be along Delridge Way SW • Could displace small businesses in that mostly serve local community • Potential construction period impacts, such as lane closures and access changes to local businesses on or near SW Avalon Way and Delridge Way SW	• Would have the greatest amount of business displacements, the majority of which would be in the Duwamish MIC and along Delridge Way SW and along SW Andover Street and SW Yancy Street • Could displace small businesses that mostly serve local community • Potential construction period impacts, such as lane closures and access changes, to local businesses on or near SW Yancy Street and SW Andover Street

NOTES:

1. Minority population is defined in US Department of Transportation Updated Environmental Justice Order 5610.2(a) as persons belonging to any of the following groups: Black, Hispanic, Asian American, and American Indian and Alaska Native

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

The Pre-DEIS Initial Assessment is based on a limited conceptual design and intended to inform comparison of potential benefits and impacts between alternatives. Sound Transit will evaluate the potential effects of alternatives for environmental review in an Environmental Impact Statement.

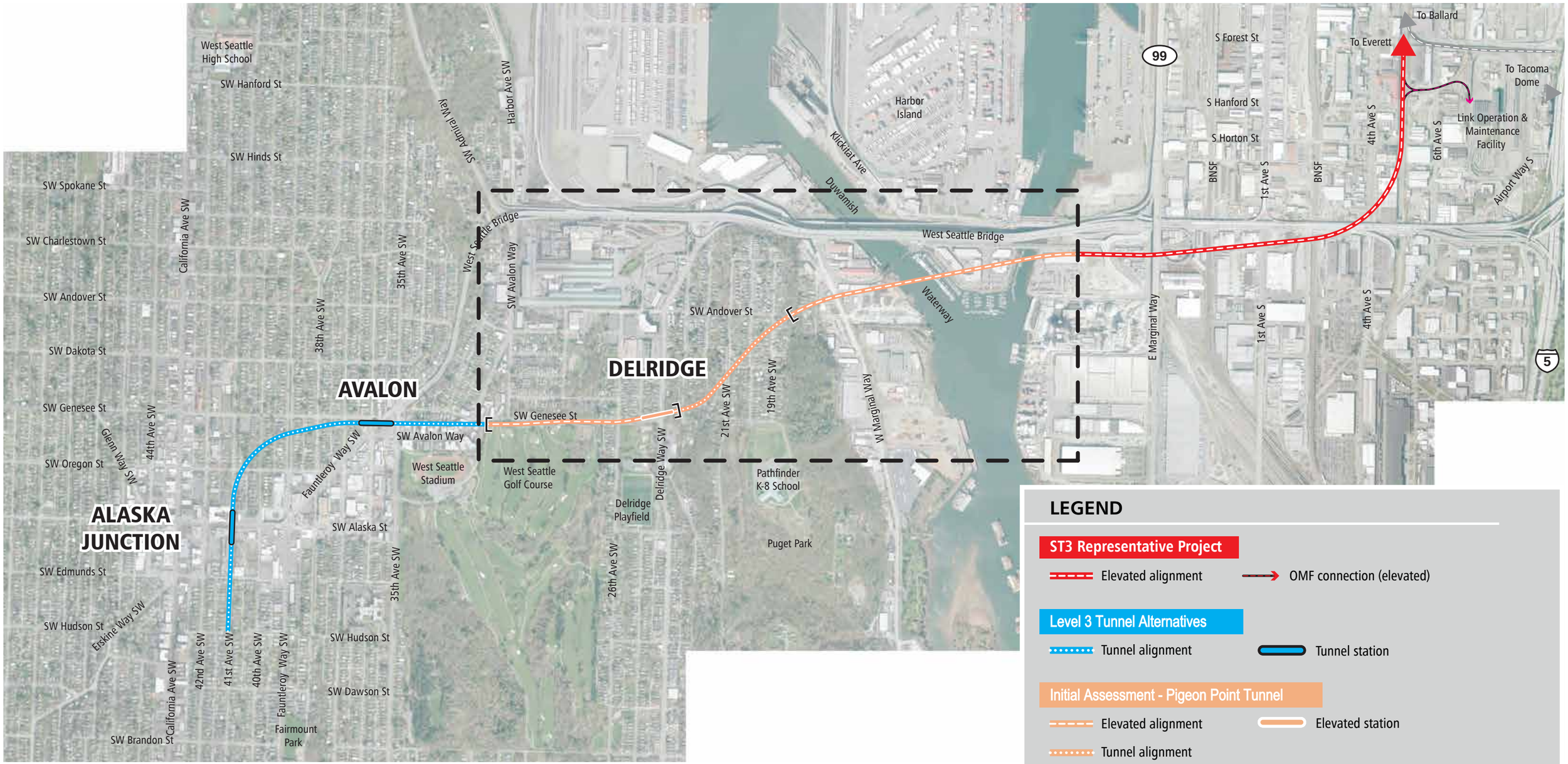
Segment Evaluated: SW Avalon Way and SW Genesee Street to West Marginal Way SW

Initial Assessment Results

Pigeon Point Tunnel

Pre Draft-EIS Initial Assessment Results

9-12-2019



LEGEND

ST3 Representative Project

- Elevated alignment
- OMF connection (elevated)

Level 3 Tunnel Alternatives

- Tunnel alignment
- Tunnel station

Initial Assessment - Pigeon Point Tunnel

- Elevated alignment
- Elevated station
- Tunnel alignment

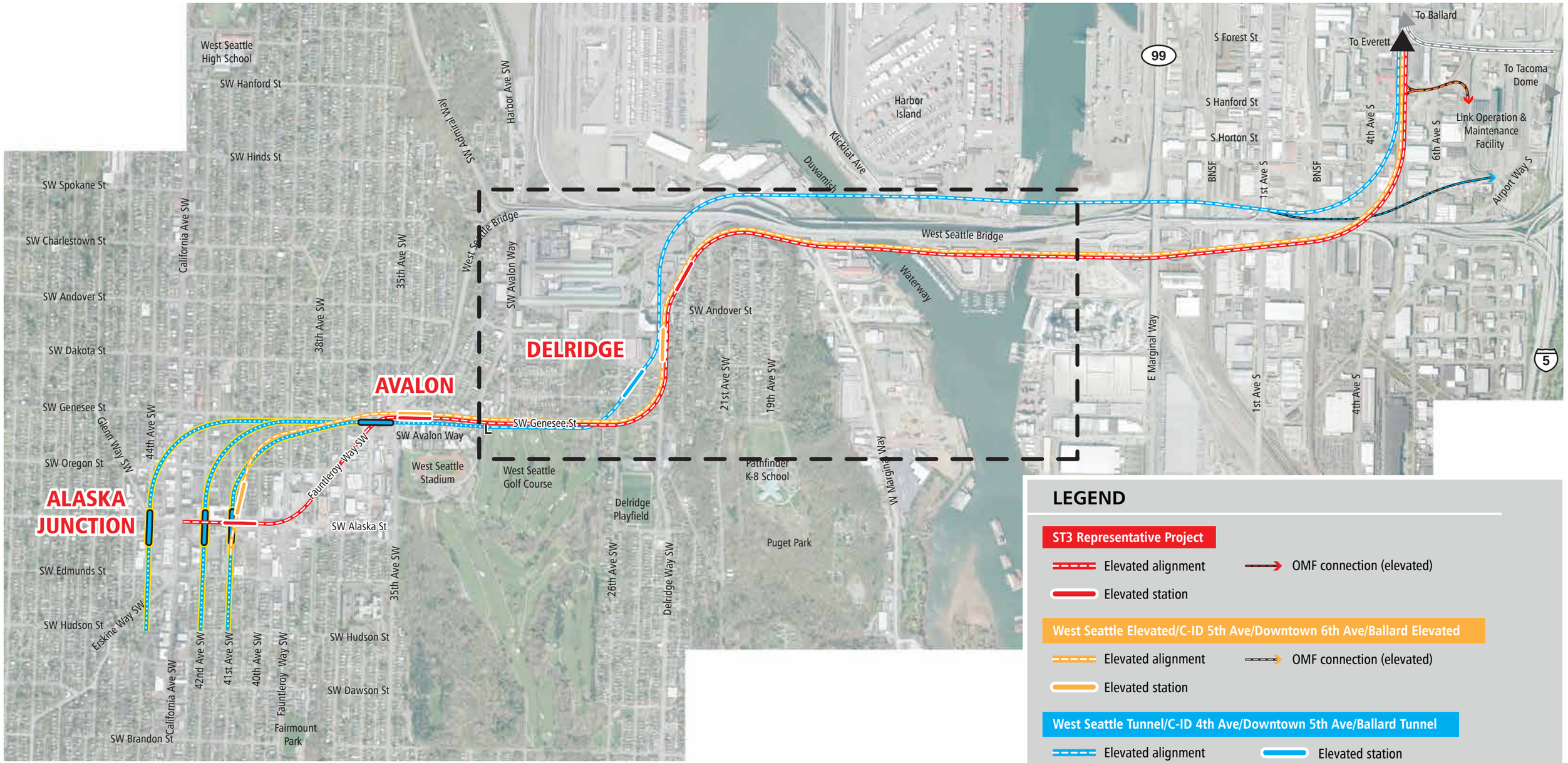
- Approximate portal location
- Area evaluated

N

Pigeon Point Tunnel Alternative

Pre Draft-EIS Initial Assessment Results

9-12-2019



Level 3 Alternatives

LEGEND

ST3 Representative Project

- Elevated alignment
- Elevated station
- OMF connection (elevated)

West Seattle Elevated/C-ID 5th Ave/Downtown 6th Ave/Ballard Elevated

- Elevated alignment
- Elevated station
- OMF connection (elevated)

West Seattle Tunnel/C-ID 4th Ave/Downtown 5th Ave/Ballard Tunnel

- Elevated alignment
- Elevated station
- Tunnel alignment
- Tunnel station
- Alignment Option
- Station Option
- OMF connection (elevated)
- OMF connection (surface)

- Approximate portal location
- Area evaluated

N

Pre-DEIS Initial Assessment Criteria, Measures, Methods and Thresholds - Pigeon Point Tunnel

Purpose and Need / Evaluation Criteria	Measure	Methods	Thresholds
Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain.			
ST3 Consistency	Potential ST3 implementation schedule effects	Constructability, environmental or other issues/challenges that may cause WSBLE Project schedule risks (e.g., right-of-way [ROW] acquisition needs, in-water work restrictions, regulatory compliance process, etc.)	Higher = Similar implementation schedule for WSBLE Project as included in ST3 Plan Medium = Moderate potential effects to implementation schedule for WSBLE Project as included in ST3 Plan Lower = Major potential effects to implementation schedule for WSBLE Project as included in ST3 Plan
Technical Feasibility	Engineering constraints	Compliance with Sound Transit Design Criteria Manual, design criteria from agencies with jurisdiction and federal regulations, and engineering obstacles associated with major infrastructure constraints	Higher = Minimal engineering constraints, design meets full standards, likely acceptance by authority having jurisdiction, minimum ROW issues, and/or no unusual design considerations Medium = Moderate engineering constraints, design meets minimums, likely acceptance by authority having jurisdiction, but with additional mitigation and moderate ROW issues, and/or unusual design considerations that could be mitigated Lower = Substantial engineering constraints, deviations to standards, authority having jurisdiction's acceptance requires substantial mitigation, substantial ROW issues, and/or unique design considerations
	Constructability issues	Constructability issues based on potential conflicts and technical challenges (e.g., utility conflicts, existing infrastructure, geotechnical, tunnel portals, etc.)	Higher = Lower construction complexity and construction risks (e.g., minimal utility conflicts, building impacts, impacts to existing infrastructure, etc.) Medium = Moderate construction complexity and construction risks Lower = Higher construction complexity requiring special mitigation and construction risks
	Operational constraints	Assessment of operational constraints (e.g., access to maintenance facility, vertical grade, horizonal curvature, movable bridge, etc.)	Higher = Optimum operational characteristics (e.g., operating efficiency and flexibility) Medium = Meets minimum operational goals for design speed and operations and maintenance facility (OMF) connection Lower = Poor operational characteristics, with certain operational goals compromised for design speed and OMF connection
Financial Sustainability	Conceptual capital cost comparison	ST3 cost consistency and conceptual capital cost comparison based on conceptual design quantities and Sound Transit unit pricing (2018$)	Higher = Conceptual capital cost estimates less than ST3 Representative Project Medium = Conceptual capital cost estimates 0% to 10% more than ST3 Representative Project Lower = Conceptual capital cost estimates 10% or more than ST3 Representative Project
Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies.			
Modal Integration	Passenger transfers	Assessment of ease of passenger transfer for riders transferring between light rail lines, and between light rail and other motorized modes (i.e., bus, paratransit, drop-off/pick-up, taxis or other ride-hailing services) at stations	Higher = More convenient passenger transfers at stations Medium = Adequate passenger transfers at stations Lower = Less convenient passenger transfers at stations
	Bus/rail and rail/rail integration	Assessment of transportation facility integration between the station and adjacent transit stops that serve other modes	Higher = Above average transportation facility integration at stations Medium = Adequate transportation facility integration at stations Lower = Below average transportation facility integration at stations
	Bicycle infrastructure and accessibility	Assessment of the quality of bicycle infrastructure and percent of bicycle facility miles (i.e., neighborhood greenways, bicycle lanes, protected bicycle lanes, and trails) to total roadway miles within 10-minute bikeshed of stations	Higher = Greatest quality of bicycle facilities and bicycle facility miles greater than 25 percent of total roadway miles within bikeshed area Medium = Moderate quality of bicycle facilities and bicycle facility miles between 15 and 25 percent of total roadway miles within bikeshed area Lower = Lower quality of bicycle facilities and bicycle facility miles lower than 15 percent of total roadway miles within bikeshed area
	Pedestrian and persons with limited mobility accessibility	Assessment of number of intersections, percent of sidewalk/trail miles to total roadway miles, and impediments to pedestrian and American with Disabilities Act (ADA) access (i.e., large intersections with signal delay, adjacency to freight corridors/industrial uses, and substantial topography or grade challenges) within 10-minute walkshed of stations	Higher = Higher number of intersections and sidewalk coverage, good to excellent pedestrian access and few impediments Medium = Moderate number of intersections and sidewalk coverage, average to good pedestrian access and average impediments Lower = Limited number of intersections and sidewalk coverage, poor to fair pedestrian access and greatest impediments

The Pre-DEIS Initial Assessment is based on limited conceptual design and intended to inform comparison of potential benefits between alternatives. Sound Transit will evaluate the potential effects of alternatives carried forward for environmental review in an Environmental Impact Statement.

Purpose and Need / Evaluation Criteria	Measure	Methods	Thresholds
Station Area Development Opportunities	Development potential	Percent of properties with development potential based on zoned capacity and market conditions within 10-minute walkshed of stations (5-minute walkshed in downtown)	Higher = Greater than 20 percent of properties with development potential Medium = Between 10 and 20 percent of properties with development potential Lower = Less than 10 percent of properties with development potential
	Equitable development opportunities	Assessment of unique opportunities for equitable development enabled by station location and/or conceptual configuration	Higher = Greatest opportunities for equitable development that would accommodate future residential and employment growth based on station location and configuration Medium = Opportunities for equitable development that would accommodate future residential and employment growth based on station location and configuration Lower = Limited opportunities for equitable development that would accommodate future residential and employment growth based on station location and configuration
Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices.			
Environmental Effects	National Register of Historic Places (NRHP) listed or eligible historic properties and Seattle Landmarks	Number of intersected or adjacent NRHP-listed, NRHP-eligible, and Seattle Landmark properties based on Department of Archaeology and Historic Preservation (DAHP) data and Seattle Landmark data	Higher = 1 or less historic properties potentially affected Medium = Between 2 and 3 historic properties potentially affected Lower = More than 3 historic properties potentially affected
	Potential archaeological resources	Percent of alternative length within previously identified archaeologically sensitive areas that are 500 feet (or 0.5 miles at water crossings) from alignment	Higher = Less than 25 percent of alternative length within Very High Risk or High Risk probability areas Medium = Between 25 and 75 percent of alternative length within Very High Risk or High Risk probability areas Lower = More than 75 percent of alternative length within Very High Risk or High Risk probability areas
	Parks and recreational resources	Number of and estimated acres of potential permanent impacts to parks and recreational resources	Higher = Less than 1.5 acres of potential permanent impacts to parks Medium = Between 1.5 and 3 acres of potential permanent impacts to parks Lower = 3 acres or more of potential permanent impacts to parks
	Water resources	Estimated acres of potential permanent in-water impacts	Higher = Less than 0.1 acre of potential permanent in-water impacts for both water bodies Medium = Up to 0.5 acre of potential permanent in-water impacts in each water body Lower = More than 0.5 acre of potential permanent in-water impacts in one or more water bodies
	Fish and wildlife habitats	Estimated acres of potential permanent impacts to fish and wildlife habitats using city of Seattle environmentally critical areas	Higher = Less than 1.5 acres of potential permanent fish and wildlife habitat impacts Medium = Between 1.5 and 2.5 acres of potential permanent fish and wildlife habitat impacts Lower = More than 2.5 acres of potential permanent fish and wildlife habitat impacts
	Hazardous materials	Number of contaminated hazardous materials sites of high concern potentially affected, including Superfund sites	Higher = 5 or less hazardous materials sites potentially affected Medium = Between 6 and 10 hazardous sites potentially affected Lower = More than 10 hazardous materials sites potentially affected
	Visual	Assessment of length of elevated guideway adjacent to residential or other visually sensitive areas, including parks and historic properties and assessment of scale of elevated guideway in visually sensitive areas and potential impacts to State Environmental Policy Act (SEPA) Scenic Routes	Higher = 0.5 miles or less adjacent to visually sensitive viewers, most elevated guideway not more than 75 feet high in visually sensitive areas, and low potential to affect SEPA Scenic Routes Medium = Between 0.6 and 1 miles adjacent to visually sensitive viewers, some elevated guideway more than 75 feet high in visually sensitive areas, and/or moderate potential to affect SEPA Scenic Routes Lower = More than 1 miles potentially adjacent to visually sensitive viewers, extensive elevated guideway more than 75 feet high in visually sensitive areas, and/or high potential to affect SEPA Scenic Routes
	Property acquisitions and displacements	Number of potential residential unit displacements; does not include potential permanent or temporary easements or area for construction staging, TPSS or underground station entrances (except station entrances in downtown)	Higher = Less than approximately 20 potential residential unit displacements Medium = Between approximately 20 and 40 potential residential unit displacements Lower = More than approximately 40 potential residential unit displacements
		Square feet of potential business displacements (including maritime businesses); does not include potential permanent or temporary easements or area for construction staging, TPSS or underground station entrances (except station entrances in downtown)	Higher = Less than approximately 200,000 square feet of potential business displacements Medium = Between approximately 200,000 and 300,000 square feet of potential business displacements Lower = More than approximately 300,000 square feet of potential business displacements

Pre-DEIS Initial Assessment Criteria, Measures, Methods and Thresholds - Pigeon Point Tunnel

Purpose and Need / Evaluation Criteria	Measure	Methods	Thresholds
Environmental Effects (continued)	Community construction impacts	Assessment of temporary construction impacts to communities, including potential for transportation, access, noise, vibration, and visual effects that could disrupt the community (e.g., existing residents, businesses, social service providers), and relative duration of construction and impacts to high volume traffic areas; potential construction impacts that affect freight and business/commerce are addressed in other criteria below	Higher = Lower potential for impacts to community relative to other alternatives Medium = Moderate potential for impacts to community relative to other alternatives Lower = More substantial potential for impacts to community relative to other alternatives
	Burden on minority and low-income populations	Assessment of how potential acquisitions and displacements (residential and business) and visual, noise and construction impacts would affect minority and low-income populations relative to other communities	Higher = Little to no potential impact to minority or low-income communities relative to other alternatives Medium = Moderate potential for impacts to minority or low-income communities relative to other alternatives Lower = Substantial potential for impacts to minority or low-income communities relative to other alternatives
Traffic Operations	Traffic circulation and access	Effects on traffic and transit (i.e., bus and streetcar) operations, including potential for lane restrictions, lane eliminations, turn restrictions, driveways impacted, and parking taken	Higher = Most of alignment is outside of roadway, with few to no changes in traffic patterns or access Medium = Potential for changes in traffic patterns or access to some properties; could be mitigated with local circulation modifications Lower = Substantial impacts to traffic circulation and/or access to many properties; mitigation likely requires substantial roadway improvements
	Transportation facilities	Effects on existing transportation facilities, including bicycle lanes, sidewalks, traffic interchanges and other transportation infrastructure as warranted, and compatibility with planned facilities	Higher = Minor changes to transportation facilities, and/or moderate changes with opportunities to improve infrastructure Medium = Moderate changes to transportation facilities, with more limited opportunities to improve infrastructure Lower = Substantial changes to transportation facilities, with no or limited opportunities to improve infrastructure
Economic Effects	Freight movement and access on land and water	Effects on existing freight and future capacity expansion opportunities, including truck, rail and water freight; includes potential impacts during construction and operations	Higher = No or less than substantial effects on both land and water freight mobility and capacity expansion Medium = Substantial effects on either land or water freight mobility and capacity expansion Lower = Substantial effects on both land and water freight mobility and capacity expansion
	Business and commerce effects	Effects on existing businesses, commercial areas and designated industrial centers, as well as future expansion opportunities; includes potential impacts during construction and operations	Higher = Minimal effects on local businesses, as well as commercial areas and designated industrial zones Medium = Moderate effects on local businesses, as well as commercial areas and designated industrial zones Lower = Substantial effects on local businesses, as well as commercial areas and designated industrial zones

NOTES:

1. Based on preliminary Purpose and Need Statement.
2. Criteria used are a subset of the criteria used for Level 1, Level 2, and Level 3, based on differentiating factors in the subsegment evaluated.
3. Thresholds were modified from Level 1, Level 2, and Level 3 for the more focused subsegments in order to compare the initial assessment alternatives to the same area of the Level 3 alternatives.
4. Agency and stakeholder input will be considered in the overall alternatives evaluation and screening process.
5. Qualitative measures ranked from high to low based on anticipated ability to achieve evaluation measure; “Higher” = higher ability to achieve measure, “Medium” = moderate ability to achieve measure, “Lower” = lower ability to achieve measure; no weighting will be applied.
6. Minority population is defined in US Department of Transportation Updated Environmental Justice Order 5610.2(a) as persons belonging to any of the following groups: Black, Hispanic, Asian American, and American Indian and Alaska Native.

Pre-DEIS Initial Assessment Summary - Pigeon Point Tunnel

9/12/2019

Purpose and Need / Evaluation Measures	Level 3 Alternatives			Pre-DEIS Initial Assessment Alternatives
	ST3 Representative Project	West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel	Pigeon Point Tunnel
	Delridge Station North of Andover South Duwamish Crossing	Delridge Station South of of Andover South Duwamish Crossing	Delridge Station North of Genesee North Duwamish Crossing	
Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain.				
Potential ST3 implementation schedule effects	Higher (includes entire West Seattle Extension)	Higher (includes entire West Seattle Extension)	Lower (includes entire West Seattle Extension)	Lower (includes entire West Seattle Extension)
Engineering constraints	Lower	Lower	Higher	Medium
Constructability issues	Lower	Lower	Medium	Higher
Operational constraints	Medium	Medium	Higher	Higher
Conceptual capital cost comparison (2018$ in millions)	--	Similar to ST3 Representative Project (includes entire West Seattle Extension)	$1,000 million increase (includes entire West Seattle Extension)	$900 million increase (includes entire West Seattle Extension)
Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies.				
Passenger transfers	Medium	Medium	Medium	Higher
Bus/rail and rail/rail integration	Lower	Higher	Medium	Higher
Bicycle infrastructure and accessibility	Higher	Higher	Higher	Higher
Pedestrian and persons with limited mobility accessibility	Lower	Medium	Higher	Higher
Development potential	Lower	Medium	Higher	Higher
Equitable development opportunities	Lower	Medium	Higher	Higher
Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices.				
National Register of Historic Places (NRHP) listed or eligible historic properties and Seattle Landmarks	2	1	2	1
Potential archaeological resources	Lower	Lower	Lower	Lower
Parks and recreational resources (acres)	3.3	3.4	1.7	2.4
Water resources (acres)	>0.1	>0.1	<0.1	>0.1
Fish and wildlife habitats (acres)	3.5	3.5	1.2	2.0
Hazardous materials sites	4	4	6	3
Visual effects (miles of sensitive viewers)	Lower	Lower	Medium	Higher
Potential residential unit displacements	Medium	Medium	Medium	Medium

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

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Segment Evaluated: SW Genesee Street and 31st Avenue SW to east side of Duwamish Waterway

Pre-DEIS Initial Assessment Summary - Pigeon Point Tunnel

9/12/2019

Purpose and Need / Evaluation Measures	Level 3 Alternatives			Pre-DEIS Initial Assessment Alternatives
	ST3 Representative Project	West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel	Pigeon Point Tunnel
	Delridge Station North of Andover South Duwamish Crossing	Delridge Station South of of Andover South Duwamish Crossing	Delridge Station North of Genesee North Duwamish Crossing	
Potential business displacements	Medium	Medium	Lower	Medium
Community construction impacts	Medium	Medium	Medium	Lower
Burden on minority and low-income populations	Higher	Higher	Higher	Higher
Traffic circulation and access effects	Medium	Medium	Higher	Higher
Effects on transportation facilities	Medium	Medium	Medium	Higher
Effects on freight movement	Medium	Medium	Medium	Higher
Business and commerce effects	Medium	Medium	Lower	Medium

NOTES:

1. Minority population is defined in US Department of Transportation Updated Environmental Justice Order 5610.2(a) as persons belonging to any of the following groups: Black, Hispanic, Asian American, and American Indian and Alaska Native

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

The Pre-DEIS Initial Assessment is based on a limited conceptual design and intended to inform comparison of potential benefits and impacts between alternatives. Sound Transit will evaluate the potential effects of alternatives for environmental review in an Environmental Impact Statement.

Segment Evaluated: SW Genesee Street and 31st Avenue SW to east side of Duwamish Waterway

Pre-DEIS Initial Assessment - Pigeon Point Tunnel

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		Level 3 Alternatives			Pre-DEIS Initial Assessment Alternatives
		ST3 Representative Project	West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel	Pigeon Point Tunnel
		Delridge Station North of Andover South Duwamish Crossing	Delridge Station South of of Andover South Duwamish Crossing	Delridge Station North of Genesee North Duwamish Crossing	
Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain.					
ST3 Consistency	Potential ST3 implementation schedule effects	Higher (includes entire West Seattle Extension) • Implementation schedule anticipated to be similar to ST3 Plan	Higher (includes entire West Seattle Extension) • Implementation schedule anticipated to be similar to ST3 Plan	Lower (includes entire West Seattle Extension) • Implementation schedule anticipated to be similar to ST3 Plan within the limit of the segment evaluated • However, segment leads to the West Seattle tunnel, which may affect the ST3 schedule	Lower (includes entire West Seattle Extension) • Implementation schedule anticipated to be similar to ST3 Plan within the limit of the segment evaluated • However, segment leads to the West Seattle tunnel, which may affect the ST3 schedule
Technical Feasibility	Engineering constraints	Lower • Duwamish Waterway crossing south of West Seattle Bridge potentially requires special design for steep and unstable slope at Pigeon Point in West Seattle • Duwamish Waterway crossing south of West Seattle Bridge could require potential column placements in Duwamish Waterway and coordination with Port of Seattle and Northwest Seaport Alliance • Potentially requires additional design measures for the potential in-water pier for being in close proximity to BNSF railroad bridge and West Seattle Bridge • Higher elevated guideway with potentially larger foundation	Lower • Duwamish Waterway crossing south of West Seattle Bridge potentially requires special design for steep and unstable slope at Pigeon Point in West Seattle • Duwamish Waterway crossing south of West Seattle Bridge could require potential column placements in Duwamish Waterway and coordination with Port of Seattle and Northwest Seaport Alliance • Potentially requires additional design measures for potential in-water pier for being in close proximity to BNSF railroad bridge and West Seattle Bridge • Higher elevated guideway with potentially larger foundation	Higher • Duwamish Waterway crossing north of West Seattle Bridge avoids steep and unstable slope design at Pigeon Point in West Seattle, however may need special design for the long span bridge going above the flyover leading to Terminal 5 and also above the West Seattle Bridge • Duwamish Waterway crossing north of West Seattle Bridge could require potential column placement in Duwamish Waterway and coordination with Port of Seattle and Northwest Seaport Alliance; north crossing could have less area of in-water effects than other crossings • Avoids having a potential in-water pier in close proximity to BNSF railroad bridge and West Seattle Bridge • Lower elevated guideway with potentially smaller foundation	Medium • Duwamish Waterway crossing further south of West Seattle Bridge leading to the tunnel potentially requires special design for steep and unstable slope and landslide evaluation at east and west tunnel portal at Pigeon Point in West Seattle • Duwamish Waterway crossing further south of West Seattle Bridge leading to the tunnel could require potential column placement in Duwamish Waterway and coordination with Port of Seattle and Northwest Seaport Alliance • Avoids having a potential in-water pier in close proximity to BNSF railroad bridge and West Seattle Bridge • Lower elevated guideway with potentially smaller foundation

Key to Rating

Alternative Performance

Lower Performing | Medium Performing | Higher Performing

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Segment Evaluated: SW Genesee Street and 31st Avenue SW to east side of Duwamish Waterway

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Technical Feasibility (continued)	Constructability issues	Lower	Lower	Medium	Higher
		• Duwamish Waterway crossing south of West Seattle Bridge potentially requires soil stabilization and multiple construction access roads along steep slope at Pigeon Point in West Seattle which will be challenging • Requires coordination with Port of Seattle and Northwest Seaport Alliance for construction access, staging and ground improvements at Harbor Marina Corporate Center (Terminal 102) and Terminal 104 but avoids affecting Port of Seattle and Northwest Seaport Alliance's major operation directly • Requires coordination with BNSF Railroad for any construction activity close to BNSF railroad bridge • Requires coordination with City of Seattle for any construction activity close to the West Seattle bridge • Requires potential in-water construction activities for piers in Duwamish Waterway with consideration for vessel traffic in the navigation channel, where the waterway is the narrowest at this location • Requires potential in-water construction activities for piers in Duwamish Waterway with consideration for work windows and tribal treaty fishing windows • Construction constraints along SW Genesee Street width with adjacent properties and West Seattle Golf Course • Higher elevated guideway along SW Genesee Street	• Duwamish Waterway crossing south of West Seattle Bridge potentially requires soil stabilization and multiple construction access roads along steep slope at Pigeon Point in West Seattle which will be challenging • Requires coordination with Port of Seattle and Northwest Seaport Alliance for construction access, staging and ground improvements at Harbor Marina Corporate Center (Terminal 102) and Terminal 104 but avoids affecting Port of Seattle and Northwest Seaport Alliance's major operation directly • Requires coordination with BNSF Railroad for any construction activity close to BNSF railroad bridge • Requires coordination with City of Seattle for any construction activity close to the West Seattle bridge • Requires potential in-water construction activities for piers in Duwamish Waterway with consideration for vessel traffic in the navigation channel, where the waterway is the narrowest at this location • Requires potential in-water construction activities for piers in Duwamish Waterway with consideration for work windows and tribal treaty fishing windows • Construction constraints along SW Genesee Street width with adjacent properties and West Seattle Golf Course • Higher elevated guideway along SW Genesee Street	• Duwamish Waterway crossing north of West Seattle Bridge likely avoids challenges of construction at Pigeon Point in West Seattle; however construction near West Marginal Way SW/Chelan Ave SW intersection will be challenging due to limited area for construction and staging • Requires coordination with Port of Seattle and Northwest Seaport Alliance for construction access, staging and ground improvements at Terminal 18 on Harbor Island and near access road and tracks leading to Terminal 5 • Avoids construction activity close to BNSF railroad bridge and the West Seattle bridge • Requires potential in-water construction activities for piers in Duwamish Waterway with consideration for vessel traffic in the navigation channel, however avoids the narrow channel at BNSF railroad bridge • Requires potential in-water construction activities for piers in Duwamish Waterway with consideration for work windows and tribal treaty fishing windows • Construction constraints at tunnel portal location on SW Genesee Street with adjacent properties and West Seattle Golf Course • Lower elevated guideway along SW Genesee Street	• Duwamish Waterway crossing further south of West Seattle Bridge on Harbor Island leading to the tunnel requires soil stabilization at east and west tunnel portals at Pigeon Point in West Seattle • Requires coordination with Port of Seattle and Northwest Seaport Alliance for construction access, staging and ground improvements at Harbor Marina Corporate Center (Terminal 102), Terminal 104 and Terminal 103 but avoids affecting Port of Seattle and Northwest Seaport Alliance's major operation directly • Avoids construction activity close to BNSF railroad bridge and the West Seattle bridge • Minimizes coordination with BNSF Railroad and potentially minimizes risks to construction schedule • Requires potential in-water construction activities for piers in Duwamish Waterway with consideration for vessel traffic in the navigation channel, however avoids the narrow channel at BNSF railroad bridge • Requires potential in-water construction activities for piers in Duwamish Waterway with consideration for work windows and tribal treaty fishing windows • Construction constraints at tunnel portal location on SW Genesee Street with adjacent properties and West Seattle Golf Course • Lower elevated guideway along SW Genesee Street • Guideway approaching the east portal at Pigeon Point would likely require modification to existing overhead power lines
	Operational constraints	Medium	Medium	Higher	Higher
		• Steeper track grades for elevated guideway in West Seattle limit train acceleration and flexibility for crossovers compared to a tunnel in West Seattle • Tighter radius curves rounding Pigeon Point would likely result in lower speeds	• Steeper track grades for elevated guideway in West Seattle limit train acceleration and flexibility for crossovers compared to a tunnel in West Seattle. • Tighter radius curves rounding Pigeon Point would likely result in lower speeds	• Larger radius curves crossing West Seattle Bridge and avoiding Pigeon Point would likely result in higher speeds • Less steep track grades result in better acceleration and flexibility for crossovers	• Larger radius curves through Pigeon Point tunnel would enable higher speeds • Less steep track grades result in better acceleration and flexibility for crossovers
Financial Sustainability	Conceptual capital cost comparison (2018$ in millions)	--	Similar to ST3 Representative Project (includes entire West Seattle Extension)	$1,000 million increase (includes entire West Seattle Extension)	$900 million increase (includes entire West Seattle Extension)
		• Baseline for capital cost comparison to other alternatives	• Similar cost to ST3 Representative Project in West Seattle	• Approximately $1,000 million more than the ST3 Representative Project • Higher cost for additional tunnel construction in West Seattle Junction ($700 million increase) and for north Duwamish Waterway Crossing ($300 million increase) • Cost for additional tunnel in West Seattle Junction not included in ST3 financial plan	• Approximately $900 million more than the ST3 Representative Project • Alignment can only tie to tunnel in West Seattle Junction; higher cost includes additional tunnel construction in Pigeon Point ($200 million increase) and in West Seattle Junction ($700 million increase) • Cost for additional tunnels in Pigeon Point and West Seattle Junction not included in ST3 financial plan

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

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Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies.					
Modal Integration	Passenger transfers	Medium • Station location at Delridge may constrain passenger drop-off/pick-up areas	Medium • Station location at Delridge provides opportunity for convenient passenger drop-off/pick-up areas but the higher profile at the guideway and higher station mezzanine result in slightly longer access path	Medium • Station location at Delridge off street may constrain passenger drop-off/pick-up areas	Higher • Station location straddling Delridge provides opportunity for convenient passenger drop-off/pick-up areas and the lower profile at the guideway and lower station mezzanine result in slightly shorter access path
Modal Integration	Bus/rail and rail/rail integration	Lower • Delridge Station may have constrained areas for bus zones • Bus routes destined to Alki may need to either be re-routed to serve station or serve a station platform south of SW Andover Street because of ramp lane configurations	Higher • Delridge Station straddling the street provides good integration with buses on both sides of the street	Medium • Delridge Station is located off-street, requiring either some bus reroutings or a walk to the station from bus stops on Delridge Way SW	Higher • Delridge Station straddling the street provides good integration with buses on both sides of the street
Modal Integration	Bicycle infrastructure and accessibility	Higher • Existing multi-use bike facilities within a 10-minute ride from stations include West Seattle Bridge Trail, Alki Trail and Duwamish River Trail • There are existing in-street, separated bike facilities within a 10-minute ride from stations	Higher • Existing multi-use bike facilities within a 10-minute ride from stations include West Seattle Bridge Trail, Alki Trail and Duwamish River Trail • There are existing in-street, separated bike facilities within a 10-minute ride from stations	Higher • Existing multi-use bike facilities within a 10-minute ride from stations include West Seattle Bridge Trail, Alki Trail and Duwamish River Trail • There are existing in-street, separated bike facilities within a 10-minute ride from stations	Higher • Existing multi-use bike facilities within a 10-minute ride from stations include West Seattle Bridge Trail, Alki Trail and Duwamish River Trail • There are existing in-street, separated bike facilities within a 10-minute ride from stations
Modal Integration	Pedestrian and persons with limited mobility accessibility	Lower • Delridge Station is sited closer to the West Seattle Bridge industrial areas north of SW Andover Street, which results in fewer intersections, less sidewalk coverage and lower accessibility compared to all other alternatives	Medium • Delridge Station is sited further south, which results in a higher number of intersections and sidewalk coverage for better accessibility than the ST3 Representative Project	Higher • Delridge Station is sited further south, which results in a higher number of intersections and sidewalk coverage for better accessibility than the ST3 Representative Project and Delridge Station South of Andover	Higher • Delridge Station is sited further south, which results in a higher number of intersections and sidewalk coverage for better accessibility than the ST3 Representative Project and Delridge Station South of Andover
Station Area Development Opportunities	Development potential	Lower • Fewer development opportunities due to proximity of Delridge Station to West Seattle Bridge	Medium • Development opportunities at Delridge Station are similar in acreage to those associated with other alternatives, but parcels are of higher value due to location	Higher • Development opportunities at Delridge Station are similar in acreage to those associated with other alternatives, but parcels are of higher value due to southern location	Higher • Development opportunities at Delridge Station are similar in acreage to those associated with other alternatives, but parcels are of higher value due to southern location
Station Area Development Opportunities	Equitable development opportunities	Lower • Fewer equitable development opportunities due to proximity of Delridge Station to West Seattle Bridge	Medium • Equitable development opportunities at Delridge Station are improved compared to the ST3 Representative Project	Higher • Equitable development opportunities at Delridge Station are similar to other alternatives, but parcels are of higher value due to further south station location	Higher • Equitable development opportunities similar to opportunities for Delridge North of Genesee

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Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices.					
Environmental Effects	National Register of Historic Places (NRHP) listed or eligible historic properties and Seattle Landmarks	2 • 2 NRHP-listed, NRHP-eligible, and/or Seattle Landmark property could be directly affected by the project	1 • 1 NRHP-listed, NRHP-eligible, and/or Seattle Landmark property could be directly affected by the project	2 • 2 NRHP-listed, NRHP-eligible, and/or Seattle Landmark property could be directly affected by the project	1 • 1 NRHP-listed, NRHP-eligible, and/or Seattle Landmark property could be directly affected by the project
Environmental Effects	Potential archaeological resources	Lower • 100% of alternative is within Very High Risk or High Risk probability areas due to proximity to shorelines and historic development, and therefore, there is a high probability of encountering buried precontact and historic-era archaeological sites • Fill deposits known to be present in the region may have buried/preserved archaeological sites	Lower • 100% of alternative is within Very High Risk or High Risk probability areas due to proximity to shorelines and historic development, and therefore, there is a high probability of encountering buried precontact and historic-era archaeological sites • Fill deposits known to be present in the region may have buried/preserved archaeological sites	Lower • 100% of alternative is within Very High Risk or High Risk probability areas due to proximity to shorelines and historic development, and therefore, there is a high probability of encountering buried precontact and historic-era archaeological sites • Fill deposits known to be present in the region may have buried/preserved archaeological sites	Lower • 100% of alternative is within Very High Risk or High Risk probability areas due to proximity to shorelines and historic development, and therefore, there is a high probability of encountering buried precontact and historic-era archaeological sites • Fill deposits known to be present in the region may have buried/preserved archaeological sites • Precontact archaeological sites may have been less disturbed and may retain a higher degree of integrity compared to those archaeological sites immediately adjacent to existing infrastructure along/over the Duwamish Waterway • Closest to National Register-listed archaeology site
Environmental Effects	Parks and recreational resources (acres)	3.3 • Approximately 3.3 acres of potential permanent impacts to the following parks: West Duwamish Greenbelt, West Seattle Golf Course, and Harbor Marina Corporate Center (Terminal 102) • Requires clearing steep slope on Pigeon Point in the West Duwamish Greenbelt; revegetation with low-growing shrubs is expected to be possible	3.4 • Approximately 3.4 acres of potential permanent impacts to the following parks: West Duwamish Greenbelt, West Seattle Golf Course, and Harbor Marina Corporate Center (Terminal 102) • Requires clearing steep slope on Pigeon Point in the West Duwamish Greenbelt; revegetation with low-growing shrubs is expected to be possible	1.7 • Approximately 1.7 acres of potential permanent impacts to the West Seattle Golf Course • Avoids steep slope on Pigeon Point in the West Duwamish Greenbelt	2.4 • Approximately 2.4 acres of potential permanent impacts to the following parks: Delridge Playfield, West Duwamish Greenbelt, West Seattle Golf Course, and Harbor Marina Corporate Center (Terminal 102) • Requires clearing steep slope in the West Duwamish Greenbelt at the tunnel portal; revegetation with low-growing shrubs is expected to be possible
Environmental Effects	Water resources (acres)	>0.1 • More than 0.1 acres of potential permanent in-water impact would occur in the Duwamish Waterway from bridge columns • Duwamish Waterway crossing south of West Seattle Bridge could have more potential in-water impacts than the north crossing	>0.1 • More than 0.1 acres of potential permanent in-water impact would occur in the Duwamish Waterway from bridge columns • Duwamish Waterway crossing south of West Seattle Bridge could have more potential in-water impacts than the north crossing	<0.1 • Less than 0.1 acres of potential permanent in-water impact would occur in the Duwamish Waterway from bridge columns • Duwamish Waterway crossing north of West Seattle Bridge could have less potential in-water impacts than the south crossing	>0.1 • More than 0.1 acres of potential permanent in-water impact would occur in the Duwamish Waterway from bridge columns • Duwamish Waterway crossing south of West Seattle Bridge could have more potential in-water impacts than the north crossing

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Environmental Effects (continued)	Fish and wildlife habitats (acres)	3.5 • Approximately 3.5 acres of potential permanent habitat impacts • Crosses the Duwamish Waterway and requires clearing steep slope on Pigeon Point in West Duwamish Greenbelt; revegetation with low-growing shrubs is expected to be possible • Heron rookery has been observed in West Duwamish Greenbelt within 250 feet south of the alignment	3.5 • Approximately 3.5 acres of potential permanent habitat impacts • Crosses the Duwamish Waterway and requires clearing steep slope on Pigeon Point in West Duwamish Greenbelt; revegetation with low-growing shrubs is expected to be possible • Heron rookery has been observed in West Duwamish Greenbelt within 250 feet south of the alignment	1.2 • Approximately 1.2 acres of potential permanent habitat impacts • North bridge crossing of Duwamish Waterway avoids steep slope on Pigeon Point in West Duwamish Greenbelt	2.0 • Approximately 2.0 acres of potential permanent habitat impacts • Crosses the Duwamish Waterway and requires clearing steep slope in West Duwamish Greenbelt near the tunnel portal; revegetation with low-growing shrubs is expected to be possible • The alignment and vegetation clearing would bisect the West Duwamish Greenbelt • Heron rookery has been observed in West Duwamish Greenbelt within 500 feet north of the elevated guideway and within 550 feet south of the elevated guideway • Historical presence of bald eagle nests in the West Duwamish Greenbelt. Bald Eagle and Heron Management Areas are approximately 320 feet south of the elevated guideway
	Hazardous materials sites	4 • 4 contaminated sites of higher concern within the alternative footprint or within an intersecting parcel • Crosses the Harbor Island Superfund Site (includes West and East Duwamish Waterways)	4 • 4 contaminated sites of higher concern within the alternative footprint or within an intersecting parcel • Crosses the Harbor Island Superfund Site (includes West and East Duwamish Waterways)	6 • 6 contaminated sites of higher concern within the alternative footprint or within an intersecting parcel • Crosses the Harbor Island Superfund Site (includes West and East Duwamish Waterways)	3 • 3 contaminated sites of higher concern within the alternative footprint or within an intersecting parcel • Crosses the Harbor Island Superfund Site (includes West and East Duwamish Waterways) • A small portion of the alignment crosses the northern extent of the Lower Duwamish Superfund Site
	Visual effects (miles of sensitive viewers)	Lower • Approximately 1 mile of elevated guideway near visually sensitive viewers • Along SW Genesee Street/West Seattle Golf Course, approximately 900 feet of length of elevated guideway would be over 75 feet, with a maximum height of about 160 feet • Would be about 100 feet south of the West Seattle Bridge, a SEPA Scenic Route	Lower • Approximately 1 mile of elevated guideway near visually sensitive viewers • Along SW Genesee Street/West Seattle Golf Course, approximately 900 feet of length of elevated guideway would be over 75 feet, with a maximum height of about 160 feet • Would be about 100 feet south of the West Seattle Bridge, a SEPA Scenic Route	Medium • Approximately 0.9 miles of elevated guideway near visually sensitive viewers • There would be no elevated guideway over 75 feet above grade • Would be about 100 feet north of the West Seattle Bridge, a SEPA Scenic Route	Higher • Approximately 0.3 miles of elevated guideway near visually sensitive viewers • Along 18th Avenue SW and 17th Avenue SW, approximately 500 feet of length of elevated guideway would be over 75 feet, with a maximum height of about 135 feet • Would be between approximately 220 feet (at the eastern extent) to 960 feet (at the western extent) south of the West Seattle Bridge, a SEPA Scenic Route
	Potential residential unit displacements	Medium • Between approximately 20 and 40 potential residential unit displacements • Residential displacements primarily located west of Delridge Way SW	Medium • Between approximately 20 and 40 potential residential unit displacements • Residential displacements primarily located west of Delridge Way SW	Medium • Between approximately 20 and 40 potential residential unit displacements • Residential displacements primarily located west of Delridge Way SW	Medium • Between approximately 20 and 40 potential residential unit displacements • Residential displacements primarily located east of Delridge Way SW

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Environmental Effects (continued)	Potential business displacements	Medium • Between approximately 200,000 and 300,000 square feet of potential business displacements • Business displacements are primarily located in the Duwamish MIC and along Delridge Way SW	Medium • Between approximately 200,000 and 300,000 square feet of potential business displacements • Business displacements are primarily located in the Duwamish MIC and along Delridge Way SW	Lower • More than approximately 300,000 square feet of potential business displacements • Business displacements are primarily located in the Duwamish MIC and along Delridge Way SW	Medium • Between approximately 200,000 and 300,000 square feet of potential business displacements • Business displacements are primarily located in the Duwamish MIC and along Delridge Way SW
	Community construction impacts	Medium • Potential for visual, noise, and vibration impacts on residences near SW Genesee Street and Delridge Way SW • Potential increased congestion on SW Avalon Way, 35th Avenue SW and the West Seattle Bridge due to construction on Delridge Way SW and SW Genesee Street • Access to businesses would be maintained throughout the corridor, although the community may experience changes in access to some businesses • Construction could affect the West Seattle Golf Course • Delridge Station construction mostly within right-of-way	Medium • Potential for visual, noise, and vibration impacts on residences near SW Genesee Street and Delridge Way SW • Potential increased congestion on SW Avalon Way, 35th Avenue SW and the West Seattle Bridge due to construction on Delridge Way SW and SW Genesee Street • Access to businesses would be maintained throughout the corridor, although the community may experience changes in access to some businesses • Construction could affect the West Seattle Golf Course • Delridge Station construction mostly within right-of-way	Medium • Potential for visual, noise, and vibration impacts on residences near SW Genesee Street and Delridge Way SW • Greater amount of construction vehicles in West Seattle neighborhoods for tunnel excavation material hauling • Access to businesses would be maintained throughout the corridor, although the community may experience changes in access to some businesses • Greater construction effect to the West Seattle Golf Course • Delridge Station construction outside right-of-way	Lower • Potential for visual, noise, and vibration impacts on residences near SW Genesee Street and Delridge Way SW (near the intersection of SW Genesee Street) for elevated guideway, station and tunnel portal construction and near the east side of Pigeon Point for the high-level, rail-only bridge and tunnel portal construction • Reduces construction disruption on Delridge Way SW and on the northern end of Pigeon Point • Greatest amount of construction vehicles in Delridge and Pigeon Point neighborhoods for tunnel excavation material hauling • Construction could affect use of a portion of Youngstown Cultural Arts Center, Delridge Playfield (which includes Delridge Community Center and Skate Park), and could have greater construction effect to the West Seattle Golf Course
	Burden on minority and low-income populations	Higher • Located in an area where minority or low-income populations are not above the city average	Higher • Located in an area where minority or low-income populations are not above the city average	Higher • Located in an area where minority or low-income populations are not above the city average	Higher • Located in an area where minority or low-income populations are not above the city average
Traffic Operations	Traffic circulation and access effects	Medium • Could affect driveway access and roadway capacity/turn lanes along Delridge Way SW and SW Genesee Street	Medium • Could affect driveway and roadway capacity/turn lanes along Delridge Way SW and SW Genesee Street	Higher • Limited effects to driveway access and roadway capacity/turn lanes because the alignment is outside of Delridge Way SW right-of-way	Higher • Limited effects to driveway access and roadway capacity/turn lanes because the alignment is outside of major arterial rights-of way
	Effects on transportation facilities	Medium • Could affect Delridge Way SW corridor and West Seattle Bridge	Medium • Could affect the Delridge Way SW corridor and West Seattle Bridge	Medium • Could affect the Delridge Way SW corridor and West Seattle Bridge	Higher • Fewer effects to the Delridge Way SW corridor

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		Delridge Station North of Andover South Duwamish Crossing	Delridge Station South of of Andover South Duwamish Crossing	Delridge Station North of Genesee North Duwamish Crossing	
Economic Effects	Effects on freight movement	Medium • Elevated guideway columns could affect truck access to local businesses on Delridge Way SW • Construction of elevated guideway columns would potentially have limited effects associated with the guideway crossing the West Marginal Way Major Freight Route • Truck and rail access to Nucor Steel could be affected by the elevated guideway columns and Delridge Station • South bridge crossing would span the Duwamish Waterway navigation channel, but could have temporary construction impacts to waterway operations and BNSF railroad bridge • No direct effects expected to Terminal 5 or Terminal 18 access or operations	Medium • Elevated guideway columns could potentially affect truck access to local businesses on Delridge Way SW • Potential to add a traffic signal at SW Dakota Street/Delridge Way SW intersection would likely divert some local traffic away from heavy freight movements on SW Andover Street • Construction of elevated guideway columns would potentially have limited affected associated with the guideway crossing the W Marginal Way SW Major Freight Route • South bridge crossing would span the Duwamish Waterway navigation channel, but could have temporary construction impacts to waterway operations and BNSF railroad bridge • No direct effects expected to Terminal 5 or Terminal 18 access or operations	Medium • Elevated guideway columns could affect truck access to local businesses on Delridge Way SW • Potential to add a traffic signal at SW Dakota Street/Delridge Way SW intersection would likely divert some local traffic away from heavy freight movements on SW Andover Street • Truck and rail access to Nucor Steel could be affected by the elevated guideway columns and Delridge Station • Construction of elevated guideway columns could potentially have effects associated with the guideway crossing the West Marginal Way SW Major Freight Route • North bridge crossing would span Duwamish Waterway navigation channel, but could have temporary construction impacts to waterway operations • Possible temporary construction parking and gate queue storage impacts at Terminal 18 on Harbor Island; rail access to businesses would be maintained	Higher • Delridge Station would straddle Delridge Way SW and have minimal truck effects on access to local businesses on Delridge Way SW • Construction of elevated guideway columns could potentially have effects associated with the guideway crossing the West Marginal Way SW Major Freight Route • South bridge crossing would span Duwamish Waterway navigation channel, but could have temporary construction effects to waterway operations and marina • No direct effects expected to Terminal 5 or Terminal 18 access or operations
	Business and commerce effects	Medium • Could have moderate amount of business displacements, the majority of which would be industrial or light-industrial businesses in Duwamish Manufacturing/Industrial Center (MIC) • Could displace small businesses that mostly serve local community • Could displace businesses that support international and domestic trade through Port of Seattle and Northwest Seaport Alliance terminals on Duwamish Waterway • Potential construction period effects such as lane closures and access changes, to local businesses on or near Delridge Way SW and south side of West Seattle Bridge	Medium • Could have moderate amount of business displacements, the majority of which would be industrial or light-industrial businesses in Duwamish MIC • Could displace small businesses that mostly serve local community • Could displace businesses that support international and domestic trade through Port of Seattle and Northwest Seaport Alliance terminals on Duwamish Waterway • Potential construction period effects such as lane closures and access changes, to local businesses on or near Delridge Way SW and south side of West Seattle Bridge	Lower • Would have the greatest amount of business displacements, the majority of which would be industrial or light-industrial businesses in Duwamish MIC • Could displace small businesses that mostly serve local community • Duwamish Waterway crossing north of West Seattle Bridge may displace some water-dependent businesses • Duwamish Waterway crossing north of West Seattle Bridge could displace businesses that support international and domestic trade through Port of Seattle and Northwest Seaport Alliance terminals; could displace some buildings at Terminal 7 (private) • Potential construction period effects such as lane closures and access changes to local businesses on or near Delridge Way SW and north side of West Seattle Bridge	Medium • Could have moderate amount of business displacements, the majority of which would be industrial or light-industrial businesses in Duwamish MIC • Could displace small businesses that mostly serve local community • Could displace businesses that support international and domestic trade through Port of Seattle and Northwest Seaport Alliance terminals on Duwamish Waterway • Potential construction period effects, such as lane closures and access changes, to local businesses on or near Delridge Way SW and south side of West Seattle Bridge

NOTES:

1. Minority population is defined in US Department of Transportation Updated Environmental Justice Order 5610.2(a) as persons belonging to any of the following groups: Black, Hispanic, Asian American, and American Indian and Alaska Native

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

The Pre-DEIS Initial Assessment is based on a limited conceptual design and intended to inform comparison of potential benefits and impacts between alternatives. Sound Transit will evaluate the potential effects of alternatives for environmental review in an Environmental Impact Statement.

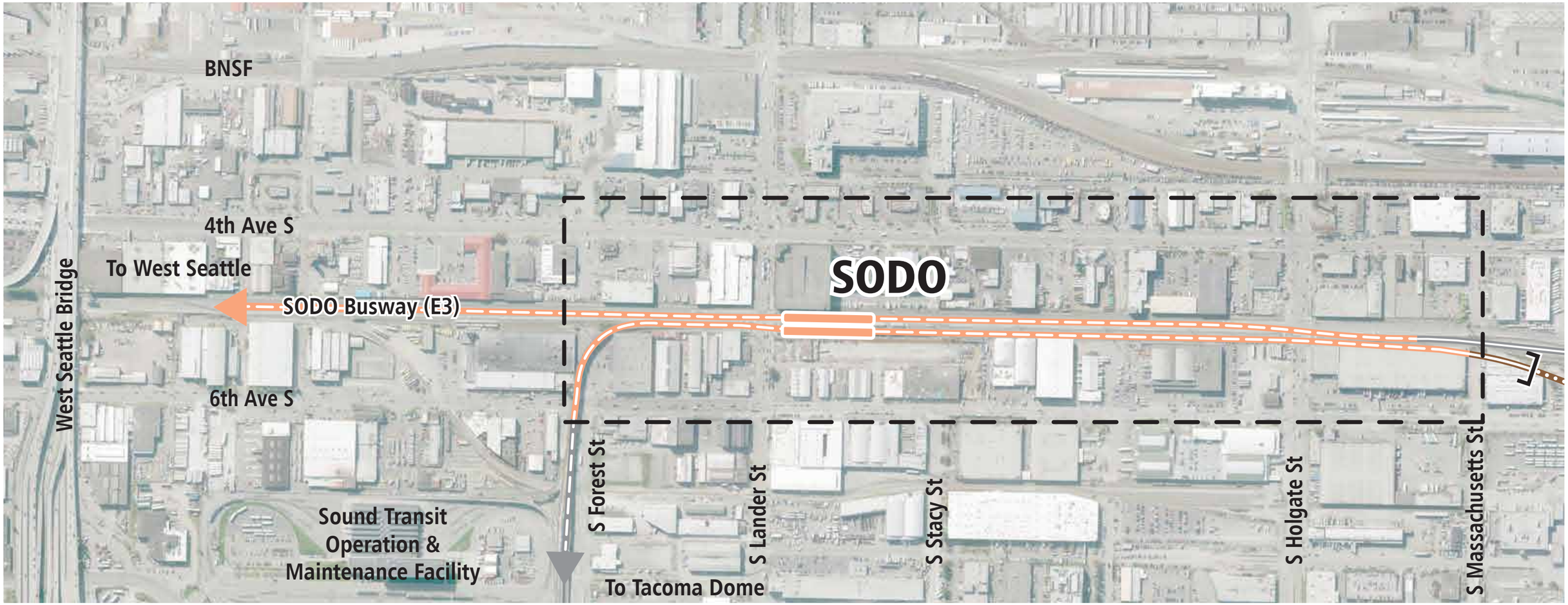
Segment Evaluated: SW Genesee Street and 31st Avenue SW to east side of Duwamish Waterway

Initial Assessment Results

SODO Elevated

Pre Draft-EIS Initial Assessment Results

9-12-2019



SODO Double Elevated

LEGEND

Level 3 CID 5th Avenue Tunnel Alternatives

- Elevated alignment
- At-grade alignment

Initial Assessment - SODO Double Elevated

- Elevated alignment
- Elevated station

- Approximate portal location
- Existing LINK
- Area evaluated

N

Pre Draft-EIS Initial Assessment Results

9-12-2019

SODO Partial Elevated

LEGEND

Level 3 CID 5th Avenue Tunnel Alternatives

- Elevated alignment
- At-grade alignment

Initial Assessment - SODO Partial Elevated

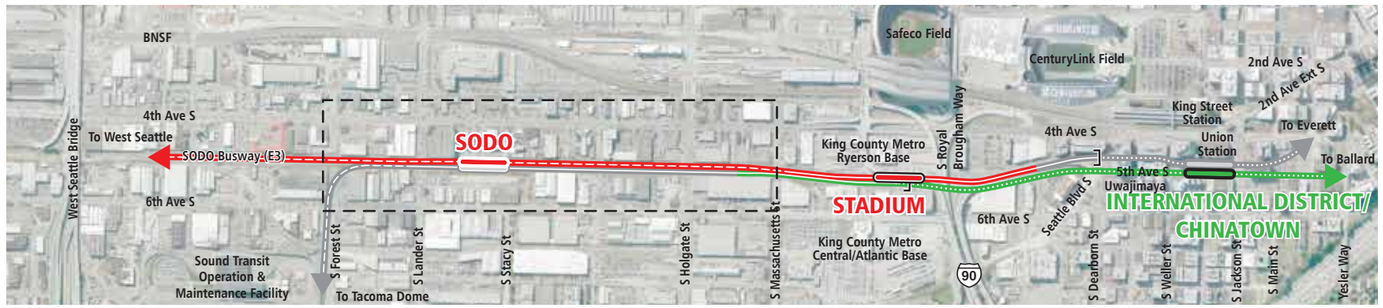
- Elevated alignment
- At-grade alignment
- Elevated station
- At-grade station

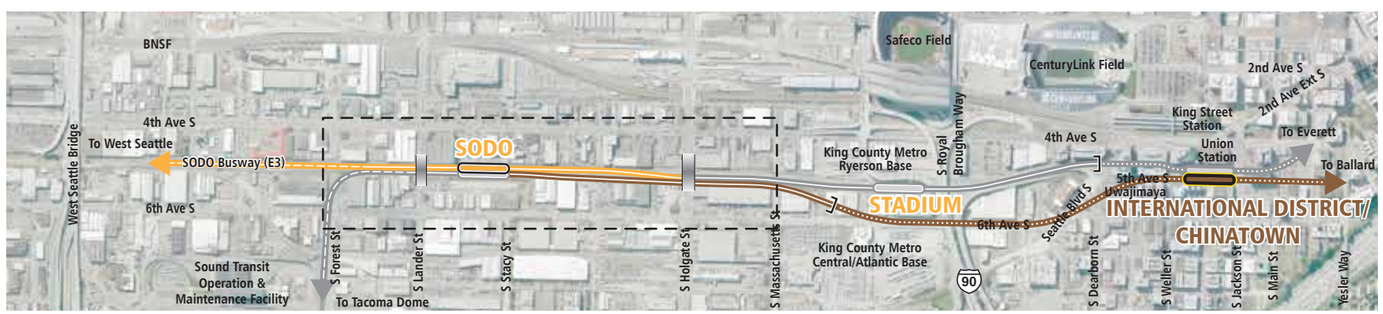
- Approximate portal location
- Area evaluated
- Existing LINK

N

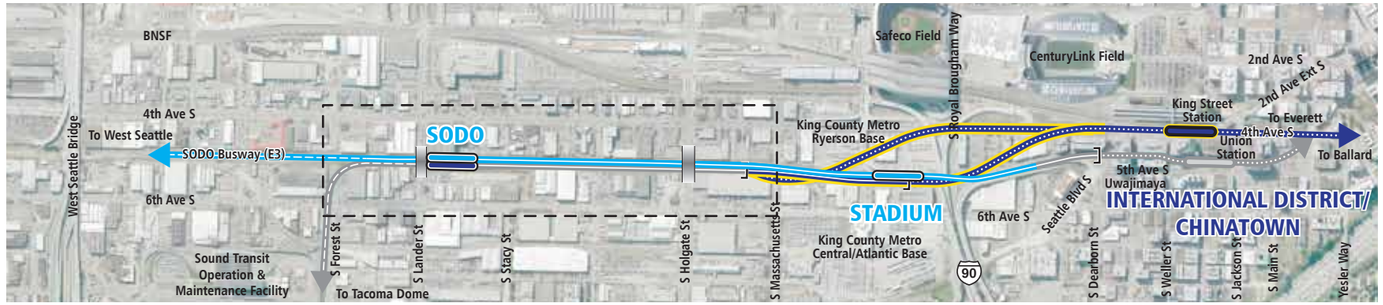
Pre Draft-EIS Initial Assessment Results

9-12-2019





Level 3 Alternatives



LEGEND

ST3 Representative Project
- Elevated alignment
- Surface alignment
- Tunnel alignment
- Elevated station
- Surface station
- Tunnel station

West Seattle Elevated/C-ID 5th Ave/Downtown 6th Ave/Ballard Elevated
- Elevated alignment
- Surface alignment
- Tunnel alignment
- Surface station
- Tunnel station option (shallow or deep)

West Seattle Tunnel/C-ID 4th Ave/Downtown 5th Ave/Ballard Tunnel
- Elevated alignment
- Surface alignment
- Tunnel alignment
- Tunnel alignment option
- Surface station
- Tunnel station option (shallow or deep)

- Approximate portal location
- Street overpass
- Existing elevated alignment
- Existing surface station
- Existing surface alignment
- Existing tunnel station
- Existing tunnel alignment
- Area evaluated

N

Pre-DEIS Initial Assessment Criteria, Measures, Methods and Thresholds - SODO Elevated

9/12/2019

Purpose and Need / Evaluation Criteria	Measure	Methods	Thresholds
Provide high quality rapid, reliable, and efficient peak and off-peak light rail transit service to communities in the project corridors defined in ST3.			
Reliable Service	At-grade crossings	Number of at-grade signalized intersections traversed	Higher = No at-grade signalized intersections traversed Medium = Between 1 and 2 at-grade signalized intersections traversed Lower = More than 2 at-grade signalized intersections traversed
	Potential service interruptions and recoverability	Likelihood of service interruptions during peak and off-peak travel periods (e.g., frequency and duration of movable bridge openings, etc.) and ability to reroute service	Higher = Low likelihood of service interruptions and good ability to reroute service Medium = Limited likelihood of service interruptions and adequate ability to reroute service Lower = High likelihood of service interruptions and/or limited ability to reroute service
Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand.			
Regional Connectivity	LRT network integration	Ability to connect and integrate West Seattle and Ballard extensions with existing regional Link light rail transit (LRT) system network and operational flexibility to meet future demand through regional spine (i.e., spine segmentation)	Higher = Facilitates additional connectivity and operational flexibility beyond spine segmentation Medium = Facilitates spine segmentation for operational flexibility consistent with ST3 Plan Lower = Does not facilitate connection and integration with existing Link system network through regional spine (i.e., spine segmentation) or has limited operational flexibility on overall Link system network
Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain.			
ST3 Consistency	Potential ST3 operating plan effects	Integration of WSBLE Project into existing LRT spine and overall system (i.e., special trackwork, movable bridge implications, etc.)	Higher = Facilitates special trackwork and/or provides reliable system operations Medium = Facilitates some special trackwork and/or provides moderately reliable system operations Lower = Does not facilitate special trackwork and/or degrades system operations
Technical Feasibility	Engineering constraints	Compliance with Sound Transit Design Criteria Manual, design criteria from agencies with jurisdiction and federal regulations, and engineering obstacles associated with major infrastructure constraints	Higher = Minimal engineering constraints, design meets full standards, likely acceptance by authority having jurisdiction, minimum ROW issues, and/or no unusual design considerations Medium = Moderate engineering constraints, design meets minimums, likely acceptance by authority having jurisdiction, but with additional mitigation and moderate ROW issues, and/or unusual design considerations that could be mitigated Lower = Substantial engineering constraints, deviations to standards, authority having jurisdiction's acceptance requires substantial mitigation, substantial ROW issues, and/or unique design considerations
	Constructability issues	Constructability issues based on potential conflicts and technical challenges (e.g., utility conflicts, existing infrastructure, geotechnical, tunnel portals, etc.)	Higher = Lower construction complexity and construction risks (e.g., minimal utility conflicts, building impacts, impacts to existing infrastructure, etc.) Medium = Moderate construction complexity and construction risks Lower = Higher construction complexity requiring special mitigation and construction risks
	Operational constraints	Assessment of operational constraints (e.g., access to maintenance facility, vertical grade, horizontal curvature, movable bridge, etc.)	Higher = Optimum operational characteristics (e.g., operating efficiency and flexibility) Medium = Meets minimum operational goals for design speed and operations and maintenance facility (OMF) connection Lower = Poor operational characteristics, with certain operational goals compromised for design speed and OMF connection
Financial Sustainability	Conceptual capital cost comparison	ST3 cost consistency and conceptual capital cost comparison based on conceptual design quantities and Sound Transit unit pricing (2018$)	Higher = Conceptual capital cost estimates less than ST3 Representative Project Medium = Conceptual capital cost estimates 0% to 10% more than ST3 Representative Project Lower = Conceptual capital cost estimates 10% or more than ST3 Representative Project
Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies.			
Modal Integration	Passenger transfers	Assessment of ease of passenger transfer for riders transferring between light rail lines, and between light rail and other motorized modes (i.e., bus, paratransit, drop-off/pick-up, taxis or other ride-hailing services) at stations	Higher = More convenient passenger transfers at stations Medium = Adequate passenger transfers at stations Lower = Less convenient passenger transfers at stations

The Pre-DEIS Initial Assessment is based on limited conceptual design and intended to inform comparison of potential benefits between alternatives.
Sound Transit will evaluate the potential effects of alternatives carried forward for environmental review in an Environmental Impact Statement.

Purpose and Need / Evaluation Criteria	Measure	Methods	Thresholds
Modal Integration (continued)	Bus/rail and rail/rail integration	Assessment of transportation facility integration between the station and adjacent transit stops that serve other modes	Higher = Above average transportation facility integration at stations Medium = Adequate transportation facility integration at stations Lower = Below average transportation facility integration at stations
	Bicycle infrastructure and accessibility	Assessment of the quality of bicycle infrastructure and percent of bicycle facility miles (i.e., neighborhood greenways, bicycle lanes, protected bicycle lanes, and trails) to total roadway miles within 10-minute bikeshed of stations	Higher = Greatest quality of bicycle facilities and bicycle facility miles greater than 25 percent of total roadway miles within bikeshed area Medium = Moderate quality of bicycle facilities and bicycle facility miles between 15 and 25 percent of total roadway miles within bikeshed area Lower = Lower quality of bicycle facilities and bicycle facility miles lower than 15 percent of total roadway miles within bikeshed area
	Pedestrian and persons with limited mobility accessibility	Assessment of number of intersections, percent of sidewalk/trail miles to total roadway miles, and impediments to pedestrian and American with Disabilities Act (ADA) access (i.e., large intersections with signal delay, adjacency to freight corridors/industrial uses, and substantial topography or grade challenges) within 10-minute walkshed of stations	Higher = Higher number of intersections and sidewalk coverage, good to excellent pedestrian access and few impediments Medium = Moderate number of intersections and sidewalk coverage, average to good pedestrian access and average impediments Lower = Limited number of intersections and sidewalk coverage, poor to fair pedestrian access and greatest impediments
Station Area Development Opportunities	Development potential	Percent of properties with development potential based on zoned capacity and market conditions within 10-minute walkshed of stations (5-minute walkshed in downtown)	Higher = Greater than 20 percent of properties with development potential Medium = Between 10 and 20 percent of properties with development potential Lower = Less than 10 percent of properties with development potential
	Equitable development opportunities	Assessment of unique opportunities for equitable development enabled by station location and/or conceptual configuration	Higher = Greatest opportunities for equitable development that would accommodate future residential and employment growth based on station location and configuration Medium = Opportunities for equitable development that would accommodate future residential and employment growth based on station location and configuration Lower = Limited opportunities for equitable development that would accommodate future residential and employment growth based on station location and configuration
Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices.			
Environmental Effects	National Register of Historic Places (NRHP) listed or eligible historic properties and Seattle Landmarks	Number of intersected or adjacent NRHP-listed, NRHP-eligible, and Seattle Landmark properties based on Department of Archaeology and Historic Preservation (DAHP) data and Seattle Landmark data	Higher = 1 or less historic properties potentially affected Medium = Between 2 and 3 historic properties potentially affected Lower = More than 3 historic properties potentially affected
	Hazardous materials	Number of contaminated hazardous materials sites of high concern potentially affected, including Superfund sites	Higher = 5 or less hazardous materials sites potentially affected Medium = Between 6 and 10 hazardous sites potentially affected Lower = More than 1 hazardous materials sites potentially affected
	Visual	Assessment of length of elevated guideway adjacent to residential or other visually sensitive areas, including parks and historic properties and assessment of scale of elevated guideway in visually sensitive areas and potential impacts to State Environmental Policy Act (SEPA) Scenic Routes	Higher = 0.5 miles or less adjacent to visually sensitive viewers, most elevated guideway not more than 75 feet high in visually sensitive areas, and low potential to affect SEPA Scenic Routes Medium = Between 0.6 and 1 miles adjacent to visually sensitive viewers, some elevated guideway more than 75 feet high in visually sensitive areas, and/or moderate potential to affect SEPA Scenic Routes Lower = More than 1 miles potentially adjacent to visually sensitive viewers, extensive elevated guideway more than 75 feet high in visually sensitive areas, and/or high potential to affect SEPA Scenic Routes
	Property acquisitions and displacements	Number of potential residential unit displacements; does not include potential permanent or temporary easements or area for construction staging, TPSS or underground station entrances (except station entrances in downtown)	Higher = Less than approximately 20 potential residential unit displacements Medium = Between approximately 20 and 40 potential residential unit displacements Lower = More than approximately 40 potential residential unit displacements
		Square feet of potential business displacements (including maritime businesses); does not include potential permanent or temporary easements or area for construction staging, TPSS or underground station entrances (except station entrances in downtown)	Higher =Less than approximately 250,000 square feet of potential business displacements Medium = Between approximately 250,000 and 500,000 square feet of potential business displacements Lower = More than approximately 500,000 square feet of potential business displacements

Pre-DEIS Initial Assessment Criteria, Measures, Methods and Thresholds - SODO Elevated

9/12/2019

Purpose and Need / Evaluation Criteria	Measure	Methods	Thresholds
Environmental Effects (continued)	Community construction impacts	Assessment of temporary construction impacts to communities, including potential for transportation, access, noise, vibration, and visual effects that could disrupt the community (e.g., existing residents, businesses, social service providers), and relative duration of construction and impacts to high volume traffic areas; potential construction impacts that affect freight and business/commerce are addressed in other criteria below	Higher = Lower potential for impacts to community relative to other alternatives Medium = Moderate potential for impacts to community relative to other alternatives Lower = More substantial potential for impacts to community relative to other alternatives
	Burden on minority and low-income populations	Assessment of how potential acquisitions and displacements (residential and business) and visual, noise and construction impacts would affect minority and low-income populations relative to other communities	Higher = Little to no potential impact to minority or low-income communities relative to other alternatives Medium = Moderate potential for impacts to minority or low-income communities relative to other alternatives Lower = Substantial potential for impacts to minority or low-income communities relative to other alternatives
Traffic Operations	Traffic circulation and access	Effects on traffic and transit (i.e., bus and streetcar) operations, including potential for lane restrictions, lane eliminations, turn restrictions, driveways impacted, and parking taken	Higher = Most of alignment is outside of roadway, with few to no changes in traffic patterns or access Medium = Potential for changes in traffic patterns or access to some properties; could be mitigated with local circulation modifications Lower = Substantial impacts to traffic circulation and/or access to many properties; mitigation likely requires substantial roadway improvements
	Transportation facilities	Effects on existing transportation facilities, including bicycle lanes, sidewalks, traffic interchanges and other transportation infrastructure as warranted, and compatibility with planned facilities	Higher = Minor changes to transportation facilities, and/or moderate changes with opportunities to improve infrastructure Medium = Moderate changes to transportation facilities, with more limited opportunities to improve infrastructure Lower = Substantial changes to transportation facilities, with no or limited opportunities to improve infrastructure
Economic Effects	Freight movement and access on land and water	Effects on existing freight and future capacity expansion opportunities, including truck, rail and water freight; includes potential impacts during construction and operations	Higher = No or less than substantial effects on both land and water freight mobility and capacity expansion Medium = Substantial effects on either land or water freight mobility and capacity expansion Lower = Substantial effects on both land and water freight mobility and capacity expansion
	Business and commerce effects	Effects on existing businesses, commercial areas and designated industrial centers, as well as future expansion opportunities; includes potential impacts during construction and operations	Higher = Minimal effects on local businesses, as well as commercial areas and designated industrial zones Medium = Moderate effects on local businesses, as well as commercial areas and designated industrial zones Lower = Substantial effects on local businesses, as well as commercial areas and designated industrial zones

NOTES:
1. Based on preliminary Purpose and Need Statement.
2. Criteria used are a subset of the criteria used for Level 1, Level 2, and Level 3, based on differentiating factors in the subsegment evaluated.
3. Thresholds were modified from Level 1, Level 2, and Level 3 for the more focused subsegments in order to compare the initial assessment alternatives to the same area of the Level 3 alternatives.
4. Agency and stakeholder input will be considered in the overall alternatives evaluation and screening process.
5. Qualitative measures ranked from high to low based on anticipated ability to achieve evaluation measure; “Higher” = higher ability to achieve measure, “Medium” = moderate ability to achieve measure, “Lower” = lower ability to achieve measure; no weighting will be applied.
6. Minority population is defined in US Department of Transportation Updated Environmental Justice Order 5610.2(a) as persons belonging to any of the following groups: Black, Hispanic, Asian American, and American Indian and Alaska Native.

Pre-DEIS Initial Assessment Summary - SODO Elevated

9/12/2019

Purpose and Need / Evaluation Measures	Level 3 Alternatives			Pre-DEIS Initial Assessment Alternatives	
	ST3 Representative Project	West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel	SODO Double Elevated	SODO Partial Elevated
	Elevated West Seattle at Lander and Holgate	SODO At-Grade	SODO At-Grade with SODO Station Closer to Lander		
Provide high quality rapid, reliable, and efficient peak and off-peak light rail transit service to communities in the project corridors defined in ST3.					
At-grade crossings	2	0	0	0	1
Potential service interruptions and recoverability	Lower	Higher	Higher	Higher	Higher
Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand.					
LRT network integration	Medium	Higher	Higher	Higher	Higher
Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain.					
Potential ST3 operating plan effects	Lower	Higher	Higher	Higher	Higher
Engineering constraints	Medium	Medium	Medium	Lower	Medium
Constructability issues	Medium	Higher	Higher	Lower	Medium
Operational constraints	Lower	Higher	Higher	Lower	Medium
Conceptual capital cost comparison (2018$ in millions)	--	$200 million decrease	$200 million decrease	$300 million increase	Similar to ST3 Representative
Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies.					
Passenger transfers	Medium	Medium	Higher	Higher	Higher
Bus/rail and rail/rail integration	Medium	Medium	Higher	Higher	Higher
Bicycle infrastructure and accessibility	Medium	Medium	Medium	Medium	Medium
Pedestrian and persons with limited mobility accessibility	Medium	Medium	Medium	Medium	Medium
Development potential	Medium	Medium	Medium	Medium	Medium
Equitable development opportunities	Lower	Lower	Lower	Lower	Lower
Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices.					
National Register of Historic Places (NRHP) listed or eligible historic properties and Seattle Landmarks	0	0	0	0	0
Hazardous materials sites	1	4	1	6	3
Visual effects (miles of sensitive viewers)	Higher	Higher	Higher	Higher	Higher

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

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Pre-DEIS Initial Assessment Summary - SODO Elevated

9/12/2019

Purpose and Need / Evaluation Measures	Level 3 Alternatives			Pre-DEIS Initial Assessment Alternatives	
	ST3 Representative Project	West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel	SODO Double Elevated	SODO Partial Elevated
	Elevated West Seattle at Lander and Holgate	SODO At-Grade	SODO At-Grade with SODO Station Closer to Lander		
Potential residential unit displacements	Higher	Higher	Higher	Higher	Higher
Potential business displacements	Higher	Medium	Higher	Lower	Lower
Community construction impacts	Higher	Medium	Medium	Lower	Medium
Burden on minority and low-income populations	Medium	Medium	Medium	Lower	Medium
Traffic circulation and access effects	Medium	Higher	Higher	Higher	Medium
Effects on transportation facilities	Medium	Medium	Medium	Lower	Medium
Effects on freight movement	Medium	Higher	Higher	Lower	Medium
Business and commerce effects	Higher	Medium	Higher	Lower	Lower

NOTES:

1. Minority population is defined in US Department of Transportation Updated Environmental Justice Order 5610.2(a) as persons belonging to any of the following groups: Black, Hispanic, Asian American, and American Indian and Alaska Native

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

The Pre-DEIS Initial Assessment is based on a limited conceptual design and intended to inform comparison of potential benefits and impacts between alternatives. Sound Transit will evaluate the potential effects of alternatives for environmental review in an Environmental Impact Statement.

Segment Evaluated: S Forest Street to S Massachusetts Street

Pre-DEIS Initial Assessment - SODO Elevated

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		Level 3 Alternatives		
		ST3 Representative Project	West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel
		Elevated West Seattle at Lander and Holgate	SODO At-Grade	SODO At-Grade with SODO Station Closer to Lander
Provide high quality rapid, reliable, and efficient peak and off-peak light rail transit service to communities in the project corridors defined in ST3.				
Reliable Service	At-grade crossings	2 • Approximately 2 at-grade crossings; the existing Link light rail line would continue to have at-grade crossings at S Holgate Street and S Lander Street in SODO	0 • No at-grade crossings; proposed new roadway overpasses at S Lander and S Holgate streets in SODO would improve Link light rail reliability by removing at-grade intersections on both the new and existing light rail line	0 • No at-grade crossings; proposed new Roadway overpasses at S Lander and S Holgate streets in SODO would improve Link light rail reliability by removing at-grade intersections on both the new and existing light rail line
	Potential service interruptions and recoverability	Lower • No connection between West Seattle and Ballard lines in SODO limits operational flexibility and recoverability	Higher • Accommodates connection between West Seattle and Ballard lines in SODO • Shared pocket tracks on the West Seattle and Ballard lines in SODO accommodate operational flexibility and recoverability	Higher • Accommodates connection between West Seattle and Ballard lines in SODO • Shared pocket tracks on the West Seattle and Ballard lines in SODO accommodate operational flexibility and recoverability
Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand.				
Regional Connectivity	LRT network integration	Medium • Facilitates connectivity and integration of West Seattle and Ballard extensions with regional spine of existing Link system network; extensions would operate on two separate lines through the regional spine (i.e., spine segmentation) • Limited operational flexibility on overall Link system due to lack of connection between West Seattle and Ballard lines	Higher • Facilitates connectivity and integration of West Seattle and Ballard extensions with regional spine of existing Link system network; extensions would operate on two separate lines through the regional spine (i.e., spine segmentation) • Accommodates connections between West Seattle and Ballard lines in SODO, but some train movements require out-of-direction travel	Higher • Facilitates connectivity and integration of West Seattle and Ballard extensions with regional spine of existing Link system network; extensions would operate on two separate lines through the regional spine (i.e., spine segmentation) • Accommodates connections between West Seattle and Ballard lines in SODO, with train movements in all directions possible
Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain.				
ST3 Consistency	Potential ST3 operating plan effects	Lower • Does not facilitate track interconnections in SODO	Higher • Facilitates all pocket tracks and crossovers needed to provide reliable system operations	Higher • Facilitates all pocket tracks and crossovers needed to provide reliable system operations

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

The Pre-DEIS Initial Assessment is based on a limited conceptual design and intended to inform comparison of potential benefits and impacts between alternatives. Sound Transit will evaluate the potential effects of alternatives for environmental review in an Environmental Impact Statement.

Segment Evaluated: S Forest Street to S Massachusetts Street

Pre-DEIS Initial Assessment - SODO Elevated

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		Pre-DEIS Initial Assessment Alternatives	
		SODO Double Elevated	SODO Partial Elevated
Provide high quality rapid, reliable, and efficient peak and off-peak light rail transit service to communities in the project corridors defined in ST3.			
Reliable Service	At-grade crossings	0 • No at-grade crossings; proposed elevated light rail guideway at S Lander and S Holgate streets in SODO would improve Link light rail reliability by removing at-grade intersections on both the new and existing light rail line	1 • Approximately 1 at-grade crossing; proposed elevated light rail guideway at S Lander Street and proposed roadway overcrossing at S Holgate Street in SODO would improve Link light rail reliability by removing at-grade intersections; would maintain at-grade intersection of existing light rail line at S Lander Street
	Potential service interruptions and recoverability	Higher • Accommodates connection between West Seattle and Ballard lines in SODO • Shared pocket tracks on the West Seattle and Ballard lines in SODO accommodate operational flexibility and recoverability	Higher • Accommodates connection between West Seattle and Ballard lines in SODO • Shared pocket tracks on the West Seattle and Ballard lines in SODO accommodate operational flexibility and recoverability
Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand.			
Regional Connectivity	LRT network integration	Higher • Facilitates connectivity and integration of West Seattle and Ballard extensions with regional spine of existing Link system network; extensions would operate on two separate lines through the regional spine (i.e., spine segmentation) • Accommodates connections between West Seattle and Ballard lines in SODO, but some train movements require out-of-direction travel	Higher • Facilitates connectivity and integration of West Seattle and Ballard extensions with regional spine of existing Link system network; extensions would operate on two separate lines through the regional spine (i.e., spine segmentation) • Accommodates connections between West Seattle and Ballard lines in SODO, but some train movements require out-of-direction travel
plement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintai			
ST3 Consistency	Potential ST3 operating plan effects	Higher • Facilitates all pocket tracks and crossovers needed to provide reliable system operations	Higher • Facilitates all pocket tracks and crossovers needed to provide reliable system operations

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

The Pre-DEIS Initial Assessment is based on a limited conceptual design and intended to inform comparison of potential benefits and impacts between alternatives. Sound Transit will evaluate the potential effects of alternatives for environmental review in an Environmental Impact Statement.

Segment Evaluated: S Forest Street to S Massachusetts Street

Pre-DEIS Initial Assessment - SODO Elevated

9/12/2019

	Purpose and Need / Evaluation Criteria / Measures	Level 3 Alternatives		
		ST3 Representative Project	**West Seattle Elevated/Downtown 6th Ave/Ballard Elevated**	**West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel**
		Elevated West Seattle at Lander and Holgate	**SODO At-Grade**	**SODO At-Grade with SODO Station Closer to Lander**
Technical Feasibility	Engineering constraints	Medium • Minimizes roadway modifications, no major cross street work • Elevated guideway in poor soils and adjacent to active Link tracks	Medium • Substantial roadway modifications on S Lander and S Holgate streets to construct roadway overcrossings • No elevated light rail guideway • Enables connection to all four alternatives in Chinatown/International District	Medium • Substantial roadway modifications on S Lander and S Holgate streets to construct roadway overcrossings • No elevated light rail guideway • Enables connection to all four alternatives in Chinatown/International District
	Constructability issues	Medium • Limited interruptions of existing Central Link light rail to connect new lines to existing, likely can be done with single-track operations or potential off-peak closures • Would likely require additional ground improvements for the elevated guideway	Higher • Limited interruptions of existing Central Link light rail to connect new lines to existing, likely can be done with single-track operations or potential off-peak closures • Construction of S Lander Street and S Holgate Street overcrossings above active light rail tracks • Potential partial closure on 4th Avenue S and 6th Avenue S likely required for construction of S Lander Street and S Holgate Street overcrossings at the intersections	Higher • Limited interruptions of existing Central Link light rail to connect new lines to existing and reconstruct existing SODO Station, likely can be done with single-track operations or potential off-peak closures • Construction of S Lander Street and S Holgate Street overcrossings above active light rail tracks • Potential partial closure on 4th Avenue S and 6th Avenue S likely required for construction of S Lander Street and S Holgate Street overcrossings at the intersections
	Operational constraints	Lower • No connection between West Seattle and Ballard extension lines in SODO creates operational constraints	Higher • Provides all needed track connections and pocket tracks with reasonable spacing for switching between northbound and southbound tracks for both lines	Higher • Provides all needed track connections and pocket tracks with reasonable spacing for switching between northbound and southbound tracks for both lines

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

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Segment Evaluated: S Forest Street to S Massachusetts Street

Pre-DEIS Initial Assessment - SODO Elevated

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		Pre-DEIS Initial Assessment Alternatives	
		SODO Double Elevated	SODO Partial Elevated
Technical Feasibility	Engineering constraints	Lower • Longest section of elevated guideway in poor soils and adjacent to active Link tracks • Would require complex engineering to tie new curved elevated structure into existing Central Link light rail line in constrained right-of-way along S Forest Street with adjacent buildings • Substantial roadway modification on S Holgate Street to lower roadway approximately eight feet with retaining walls and grading resulting in access changes; would likely require a stormwater pump station • Enables connection to the 5th Avenue Cut-and-Cover, 5th Avenue Deep Mined, and 4th Avenue Cut-and-Cover International District/Chinatown Station • May connect to the 4th Avenue Deep Mined International District/Chinatown Station with additional challenges: would likely require operation at maximum grade or elimination of a pocket track; additional challenges to construct cut-and-cover tunnel below light rail track	Medium • Substantial roadway modifications on S Holgate Street to construct roadway overcrossing • Elevated guideway in poor soils and adjacent to active Link tracks, but less than with ST3 Representative Project • Enables connection to the 5th Avenue Cut-and-Cover, 5th Avenue Deep Mined, and 4th Avenue Cut-and-Cover International District/Chinatown Station • May connect to the 4th Avenue Deep Mined International District/Chinatown Station with additional challenges: would likely require operation at maximum grade or elimination of a pocket track; additional challenges to construct cut-and-cover tunnel below light rail track
	Constructability issues	Lower • To elevate the existing Central Link light rail it would likely require two extensive shutdowns to construct; one period of at least approximately two to three months and one period of at least approximately four to six months, assuming accelerated construction schedule • Would require temporary structure/shoofly to connect existing Central Link light rail tracks to West Seattle line • Would likely require additional ground improvements for the elevated guideway; longest section of elevated guideway compared to other alternatives	Medium • Limited interruptions of existing Central Link light rail to connect new lines to existing and reconstruct existing SODO Station, likely can be done with single-track operations or potential off-peak closures • Construction of S Holgate Street overcrossing above active light rail tracks • Potential partial closure on 4th Avenue S and 6th Avenue S likely required for construction of S Holgate Street overcrossing at the intersections • Would likely require additional ground improvements for the elevated guideway
	Operational constraints	Lower • Provides all needed track connections and pocket tracks with reasonable spacing for switching between northbound and southbound tracks for both lines • Transitioning for pocket tracks and special trackwork introduces additional curves with less desirable operating speeds • Two extensive shutdowns of existing Central Link light rail to construct would likely require extensive temporary additional bus service to replace Central Link service • Temporary structure/shoofly during construction with tight curve would result in slower train speeds for a duration of approximately two years • Light rail transit vehicles from the north would be unable to access the Forest Street Operations and Maintenance Facility for a period of at least approximately four to six weeks during construction • Central Link light rail shutdown during construction would result in less frequent light rail service throughout the system	Medium • Provides all needed track connections and pocket tracks with reasonable spacing for switching between northbound and southbound tracks for both lines • Transitioning for pocket tracks and special trackwork introduces additional curves with less desirable operating speeds

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

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Segment Evaluated: S Forest Street to S Massachusetts Street

Pre-DEIS Initial Assessment - SODO Elevated

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		Level 3 Alternatives		
		ST3 Representative Project	West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel
		Elevated West Seattle at Lander and Holgate	SODO At-Grade	SODO At-Grade with SODO Station Closer to Lander
Financial Sustainability	Conceptual capital cost comparison (2018$ in millions)	--	$200 million decrease	$200 million decrease
		• Baseline for capital cost comparison to other alternatives	• Approximately $200 million less than the ST3 Representative Project if connected with 5th Avenue shallow tunnel in Chinatown/International District • Lower cost in SODO due to at-grade guideway and station • Lower cost in Chinatown/International District due to reduced cut-and-cover construction on 5th Avenue S	• Approximately $200 million less than the ST3 Representative Project if connected with 5th Avenue shallow tunnel in Chinatown/International District • Approximately $250 million more than the ST3 Representative Project if connected with 4th Avenue shallow tunnel in Chinatown/International District • Lower cost in SODO due to at-grade guideway and station • Higher cost in Chinatown/International District due to 4th Avenue S viaduct reconstruction
Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies.				
Modal Integration	Passenger transfers	Medium	Medium	Higher
		• Elevated West Seattle line and at-grade Ballard line would require vertical circulation to transfer between the light rail lines • At-grade S Lander Street would result in less vertical circulation required to transfer between bus stops on S Lander Street and the at-grade Ballard line	• At-grade West Seattle and Ballard lines would require vertical circulation to transfer between the light rail lines • S Lander Street overcrossing would require vertical circulation to transfer between bus stops on S Lander Street and the light rail lines	• At-grade West Seattle and Ballard lines would require vertical circulation to transfer between the light rail lines • S Lander Street overcrossing would require vertical circulation to transfer between bus stops on S Lander Street and the light rail lines • SODO Station located closer to S Lander Street would improve passenger transfers to/from buses on S Lander Street
	Bus/rail and rail/rail integration	Medium	Medium	Higher
		• Would require vertical circulation to transfer between the light rail lines • Less vertical circulation required to transfer between bus stops on S Lander Street and the at-grade Ballard line	• Would require vertical circulation to transfer between light rail lines and between light rail and buses	• Would require vertical circulation to transfer between light rail lines and between light rail and buses • Platform closer to S Lander Street to reduce distance to bus/rail transfer
	Bicycle infrastructure and accessibility	Medium	Medium	Medium
		• Existing multi-use bike facilities within a 10-minute ride from stations include, SODO Trail, I-90 Trail and West Seattle Trail	• Existing multi-use bike facilities within a 10-minute ride from stations include, SODO Trail, I-90 Trail and West Seattle Trail	• Existing multi-use bike facilities within a 10-minute ride from stations include, SODO Trail, I-90 Trail and West Seattle Trail
	Pedestrian and persons with limited mobility accessibility	Medium	Medium	Medium
		• Number of intersections and sidewalk coverage similar for all alternatives	• Number of intersections and sidewalk coverage similar for all alternatives	• Number of intersections and sidewalk coverage similar for all alternatives

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

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Segment Evaluated: S Forest Street to S Massachusetts Street

Pre-DEIS Initial Assessment - SODO Elevated

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		Pre-DEIS Initial Assessment Alternatives	
		SODO Double Elevated	SODO Partial Elevated
Financial Sustainability	Conceptual capital cost comparison (2018$ in millions)	$300 million increase • Approximately $300 million more than the ST3 Representative Project if connected with 5th Avenue shallow tunnel in Chinatown/International District • Additional cost not included in ST3 financial plan or evaluation methodology	Similar to ST3 Representative • Similar cost to the ST3 Representative Project if connected with 5th Avenue shallow tunnel in Chinatown/International District
equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans ar			
Modal Integration	Passenger transfers	Higher • Elevated West Seattle and Ballard lines would require vertical circulation to transfer between the light rail lines • Elevated West Seattle and Ballard lines above S Lander Street would require vertical circulation to transfer between bus stops on S Lander Street and the light rail lines • SODO Station located closer to S Lander Street would improve passenger transfers to/from buses on S Lander Street • Opportunity for more direct transfers to/from buses with maintained E3 busway	Higher • Elevated West Seattle line and at-grade Ballard line would require vertical circulation to transfer between the light rail lines • At-grade S Lander Street would result in less vertical circulation required to transfer between bus stops on S Lander Street and the at-grade Ballard line • SODO Station located closer to S Lander Street would improve passenger transfers to/from buses on S Lander Street • Opportunity for more direct transfers to/from buses with maintained E3 busway
	Bus/rail and rail/rail integration	Higher • Would require vertical circulation to transfer between light rail lines and between light rail and buses • Platform closer to S Lander Street to reduce distance to bus/rail transfer • Opportunity for more integrated bus transfers with maintained E3 busway	Higher • Would require vertical circulation to transfer between the light rail lines • Less vertical circulation required to transfer between bus stops on S Lander Street and the at-grade Ballard line • Platform closer to S Lander Street to reduce distance to bus/rail transfer • Opportunity for more integrated bus transfers with maintained E3 busway
	Bicycle infrastructure and accessibility	Medium • Existing multi-use bike facilities within a 10-minute ride from stations include, SODO Trail, I-90 Trail and West Seattle Trail	Medium • Existing multi-use bike facilities within a 10-minute ride from stations include, SODO Trail, I-90 Trail and West Seattle Trail
	Pedestrian and persons with limited mobility accessibility	Medium • Number of intersections and sidewalk coverage similar for all alternatives	Medium • Number of intersections and sidewalk coverage similar for all alternatives

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

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Segment Evaluated: S Forest Street to S Massachusetts Street

Pre-DEIS Initial Assessment - SODO Elevated

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		Level 3 Alternatives		
		ST3 Representative Project	West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel
		Elevated West Seattle at Lander and Holgate	SODO At-Grade	SODO At-Grade with SODO Station Closer to Lander
Station Area Development Opportunities	Development potential	Medium • Development potential would be similar for all alternatives	Medium • Development potential would be similar for all alternatives	Medium • Development potential would be similar for all alternatives
	Equitable development opportunities	Lower • Limited equitable development opportunities in SODO due to lack of residential zoning	Lower • Limited equitable development opportunities in SODO due to lack of residential zoning	Lower • Limited equitable development opportunities in SODO due to lack of residential zoning
Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices.				
Environmental Effects	National Register of Historic Places (NRHP) listed or eligible historic properties and Seattle Landmarks	0 • No known NRHP-listed, NRHP-eligible, and/or Seattle Landmark properties could be directly affected by the project	0 • No known NRHP-listed, NRHP-eligible, and/or Seattle Landmark properties could be directly affected by the project	0 • No known NRHP-listed, NRHP-eligible, and/or Seattle Landmark properties could be directly affected by the project
	Hazardous materials sites	1 • 1 contaminated site of higher concern within the alternative footprint or within an intersecting parcel	4 • 4 contaminated sites of higher concern within the alternative footprint or within an intersecting parcel	1 • 1 contaminated site of higher concern within the alternative footprint or within an intersecting parcel
	Visual effects (miles of sensitive viewers)	Higher • Elevated guideway and SODO Station would not be near visually sensitive viewers • Would include approximately 0.5 miles of new elevated guideway which would bring visual change along the alignment	Higher • At-grade alignment and SODO station would not be near sensitive viewers • New S Holgate Street and S Lander Street overpasses would bring visual change along the alignment	Higher • At-grade alignment and SODO station would not be near sensitive viewers • New S Holgate Street and S Lander Street overpasses would bring visual change to the alignment
	Potential residential unit displacements	Higher • No potential residential unit displacements	Higher • No potential residential unit displacements	Higher • No potential residential unit displacements
	Potential business displacements	Higher • Fewer than approximately 250,000 square feet of potential business displacements	Medium • Between approximately 250,000 and 500,000 square feet of potential business displacements	Higher • Fewer than approximately 250,000 square feet of potential business displacements

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

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Segment Evaluated: S Forest Street to S Massachusetts Street

Pre-DEIS Initial Assessment - SODO Elevated

9/12/2019

	Purpose and Need / Evaluation Criteria / Measures	Pre-DEIS Initial Assessment Alternatives	
		SODO Double Elevated	SODO Partial Elevated
Station Area Development Opportunities	Development potential	Medium • Development potential would be similar for all alternatives	Medium • Development potential would be similar for all alternatives
	Equitable development opportunities	Lower • Limited equitable development opportunities in SODO due to lack of residential zoning	Lower • Limited equitable development opportunities in SODO due to lack of residential zoning
Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices.			
Environmental Effects	National Register of Historic Places (NRHP) listed or eligible historic properties and Seattle Landmarks	0 • No known NRHP-listed, NRHP-eligible, and/or Seattle Landmark properties could be directly affected by the project	0 • No known NRHP-listed, NRHP-eligible, and/or Seattle Landmark properties could be directly affected by the project
	Hazardous materials sites	6 • 6 contaminated sites of higher concern within the alternative footprint or within an intersecting parcel	3 • 3 contaminated sites of higher concern within the alternative footprint or within an intersecting parcel
	Visual effects (miles of sensitive viewers)	Higher • Elevated guideway and SODO Station would not be near visually sensitive viewers • Would include approximately 0.5 miles of new dual elevated guideway; the elevated guideway structure would be wider than the guideway for the other alternatives, bringing greater visual change along the alignment	Higher • Elevated guideway and SODO Station would not be near visually sensitive viewers • Would include approximately 0.5 miles of new elevated guideway and a new S Holgate Street overcrossing which would bring visual change along the alignment
	Potential residential unit displacements	Higher • No potential residential unit displacements	Higher • No potential residential unit displacements
	Potential business displacements	Lower • More than approximately 500,000 square feet of potential business displacements • Guideway and station footprint would require additional right-of-way in vicinity of S Lander Street intersection	Lower • More than approximately 500,000 square feet of potential business displacements • Elevated West Seattle SODO station shifted closer to Lander would require additional right-of-way in vicinity of S Lander Street intersection

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

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Segment Evaluated: S Forest Street to S Massachusetts Street

Pre-DEIS Initial Assessment - SODO Elevated

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		Level 3 Alternatives		
		ST3 Representative Project	West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel
		Elevated West Seattle at Lander and Holgate	SODO At-Grade	SODO At-Grade with SODO Station Closer to Lander
Environmental Effects (continued)	Community construction impacts	Higher • Construction of elevated guideway and SODO station in E3 busway would have short, off-peak travel disruptions on existing light rail • Access to businesses would be maintained throughout the corridor, although the community may experience changes in access to some businesses	Medium • Construction of at-grade guideway and SODO Station in E3 busway would short, off-peak travel disruptions on existing light rail • Closure of S Lander Street and S Holgate Street during construction would potentially contribute to congestion on 1st Avenue S, 4th Avenue S, Edgar Martinez Drive S, and Airport Way S • Access to businesses would be maintained throughout the corridor, although the community may experience changes in access to some businesses	Medium • Construction of at-grade guideway and SODO Station in E3 busway would short, off-peak travel disruptions on existing light rail • Closure of S Lander Street and S Holgate Street during construction would potentially contribute to congestion on 1st Avenue S, 4th Avenue S, Edgar Martinez Drive S, and Airport Way S • Access to businesses would be maintained throughout the corridor, although the community may experience changes in access to some businesses
	Burden on minority and low-income populations	Medium • SODO station would be located in an area of moderate displacement risk • Construction would result in short, off-peak travel disruptions to passengers traveling from areas where minority or low-income populations are above the city average	Medium • SODO station would be located in an area of moderate displacement risk • Construction would result in short, off-peak travel disruptions to passengers traveling from areas where minority or low-income populations are above the city average	Medium • SODO station would be located in an area of moderate displacement risk • Construction would result in short, off-peak travel disruptions to passengers traveling from areas where minority or low-income populations are above the city average
Traffic Operations	Traffic circulation and access effects	Medium • No change to circulation in SODO due to maintenance of at-grade crossings of the existing Link light rail line with S Lander and S Holgate streets	Higher • Improvements to circulation in SODO due to removal of at-grade Link light rail crossings at S Lander and S Holgate streets	Higher • Improvements to circulation in SODO due to removal of at-grade Link light rail crossings at S Lander and S Holgate streets
	Effects on transportation facilities	Medium • Affected facilities in SODO include Ryerson Base, Central/Atlantic Base and E3 busway • Would result in displacement of the E3 Busway	Medium • Affected facilities in SODO include S Lander Street, S Holgate Street, Ryerson Base, Central/Atlantic Base and E3 busway • Would result in displacement of the E3 Busway • Potential partial closure on 4th Avenue S and 6th Avenue S likely required for construction of S Lander Street and S Holgate Street overcrossings at the intersections	Medium • Affected facilities in SODO include S Lander Street, S Holgate Street, Ryerson Base, Central/Atlantic Base and E3 busway • Would result in displacement of the E3 Busway • Potential partial closure on 4th Avenue S and 6th Avenue S likely required for construction of S Lander Street and S Holgate Street overcrossings at the intersections

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

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Segment Evaluated: S Forest Street to S Massachusetts Street

Pre-DEIS Initial Assessment - SODO Elevated

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		Pre-DEIS Initial Assessment Alternatives	
		SODO Double Elevated	SODO Partial Elevated
Environmental Effects (continued)	Community construction impacts	Lower • Construction of double elevated guideway and SODO station in E3 busway would require two extensive shutdowns of existing Central Link light rail to construct; one period of at least approximately two to three months and one period of at least approximately four to six months, requiring extensive temporary additional bus service to replace Central Link service • Partial or full closure of S Holgate Street to lower the roadway would potentially contribute to congestion on 1st Avenue S, 4th Avenue S, Edgar Martinez Drive S, and Airport Way S • Access to businesses would be maintained throughout the corridor, although the community may experience changes in access to some businesses	Medium • Construction of elevated guideway and SODO station in E3 busway would have short, off-peak travel disruptions on existing light rail • Closure of S Holgate Street to construct the overcrossing would potentially contribute to congestion on 1st Avenue S, 4th Avenue S, Edgar Martinez Drive S, and Airport Way S • Access to businesses would be maintained throughout the corridor, although the community may experience changes in access to some businesses
	Burden on minority and low-income populations	Lower • SODO station would be located in an area of moderate displacement risk • Construction would result in extensive light rail travel disruptions to passengers traveling from areas where minority or low-income populations are above the City of Seattle average, such as Rainier Valley, Tukwila, SeaTac, Kent, Des Moines, and other communities to the south	Medium • SODO station would be located in areas of moderate displacement risk • Construction would result in short, off-peak travel disruptions to passengers traveling from areas where minority or low-income populations are above the city average
Traffic Operations	Traffic circulation and access effects	Higher • Improvements to circulation in SODO due to removal of at-grade Link light rail crossings at S Lander and S Holgate streets	Medium • Improvements to circulation in SODO due to removal of the at-grade Link light rail crossing at S Holgate Street; maintains the at-grade crossing of the existing Link light rail at S Lander Street
	Effects on transportation facilities	Lower • Affected facilities in SODO include Central Link light rail line, S Holgate Street, Ryerson Base, Central/Atlantic Base and E3 busway • Would likely require two extensive shutdowns of existing Central Link light rail to construct, requiring extensive temporary additional bus service to replace Central Link service • Connection to the 5th Avenue International District/Chinatown Station alternatives would result in new downtown tunnel portal shifting slightly further north, reducing space available for KC Metro bases • Would maintain the E3 Busway	Medium • Affected facilities in SODO include S Holgate Street, Ryerson Base, Central/Atlantic Base and E3 busway • Connection to the 5th Avenue International District/Chinatown Station alternatives would result in new downtown tunnel portal shifting further north, reducing space available for KC Metro bases • Potential traffic disruptions on 6th Avenue S related to construction of cut-and-cover tunnel below • Would maintain the E3 Busway • Potential partial closure on 4th Avenue S and 6th Avenue S likely required for construction of S Holgate Street overcrossing at the intersections

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

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Segment Evaluated: S Forest Street to S Massachusetts Street

Pre-DEIS Initial Assessment - SODO Elevated

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		Level 3 Alternatives		
		ST3 Representative Project	West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel
		Elevated West Seattle at Lander and Holgate	SODO At-Grade	SODO At-Grade with SODO Station Closer to Lander
Economic Effects	Effects on freight movement	Medium • Use of BNSF spur track south of S Lander Street in SODO could potentially affect rail freight operations • Bus relocation from E3 busway could potentially affect freight routes in SODO • Reduced potential construction effects to freight delivery associated with not building the S Lander Street and S Holgate Street overpass • There would continue to be minor delays to freight delivery associated with retaining the S Lander Street and S Holgate Street at-grade crossings	Higher • Use of BNSF spur track south of S Lander Street in SODO could potentially affect rail freight operations • Bus relocation from E3 busway could potentially affect freight routes in SODO • Construction of overpasses at S Lander Street and S Holgate Street would require temporary closure and could potentially affect local freight delivery • Full grade separation at S Lander Street and S Holgate Street would improve long-term freight mobility	Higher • Use of BNSF spur track south of S Lander Street in SODO could potentially affect rail freight operations • Bus relocation from E3 busway in SODO could potentially affect freight routes • Construction of overpasses at S Lander Street and S Holgate Street would require temporary closure and could potentially affect local freight delivery • Full grade separation at S Lander Street and S Holgate Street would improve long-term freight mobility
	Business and commerce effects	Higher • Would have the least amount of business displacements, the majority of which would be industrial or light-industrial businesses • Could displace small businesses that mostly serve local community • Potential construction period effects, such as lane closures and access changes, to local businesses on or near S Forest Street, S Lander Street, S Holgate Street, S Massachusetts Street, and the E3 busway	Medium • Would have moderate amount of business displacements, the majority of which would be industrial or light-industrial businesses • Could displace small businesses that mostly serve local community • Potential construction period effects, such as lane closures and access changes, to local businesses on or near S Forest Street, S Lander Street, S Holgate Street, S Massachusetts Street, and the E3 busway	Higher • Would have the least amount of business displacements, the majority of which would be industrial or light-industrial businesses • Could displace small businesses that mostly serve local community • Potential construction period effects, such as lane closures and access changes, to local businesses on or near S Forest Street, S Lander Street, S Holgate Street, S Massachusetts Street, and the E3 busway

NOTES:
1. Minority population is defined in US Department of Transportation Updated Environmental Justice Order 5610.2(a) as persons belonging to any of the following groups: Black, Hispanic, Asian American, and American Indian and Alaska Native

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

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Segment Evaluated: S Forest Street to S Massachusetts Street

Pre-DEIS Initial Assessment - SODO Elevated

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		Pre-DEIS Initial Assessment Alternatives	
		SODO Double Elevated	SODO Partial Elevated
Economic Effects	Effects on freight movement	Lower • Use of BNSF spur track south of S Lander Street in SODO could potentially affect rail freight operations • Reduced construction impacts to freight associated with not building the S Lander Street overpass • Construction associated with lowering S Holgate Street could potentially require temporary full or partial closure and affect freight delivery • Construction of the new elevated guideway and reconstruction of the existing Central Link light rail line on elevated guideway could affect local freight delivery due to additional road closure • Two extensive shutdowns of existing Central Link light rail for construction could substantially increase bus traffic in the area and could affect freight movement	Medium • Use of BNSF spur track south of S Lander Street in SODO could potentially affect rail freight operations • Construction of the overpass at S Holgate Street could potentially require temporary closure and could affect freight delivery • Full grade separation at S Holgate Street would improve truck freight mobility by reducing at-grade crossings • Reduced potential construction impacts to freight delivery associated with not building the S Lander Street overpass • There would continue to be minor delays to freight delivery associated with retaining the S Lander Street at-grade crossing
	Business and commerce effects	Lower • Would have the greatest amount of business displacements, the majority of which would be industrial or light-industrial businesses • Could displace small businesses that mostly serve local community • Potential construction period effects, such as lane closures and access changes, to local businesses on or near S Forest Street, S Lander Street, S Holgate Street, S Massachusetts Street, and the E3 busway	Lower • Would have the greatest amount of business displacements, the majority of which would be industrial or light-industrial businesses • Could displace small businesses that mostly serve local community • Potential construction period effects, such as lane closures and access changes, to local businesses on or near S Forest Street, S Lander Street, S Holgate Street, S Massachusetts Street, and the E3 busway

NOTES:
1. Minority population is defined in US Department of Transportation Updated Environmental Justice Order 5610.2(a) as persons belonging to any of the following groups: Black, Hispanic, Asian American, and American Indian and Alaska Native

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

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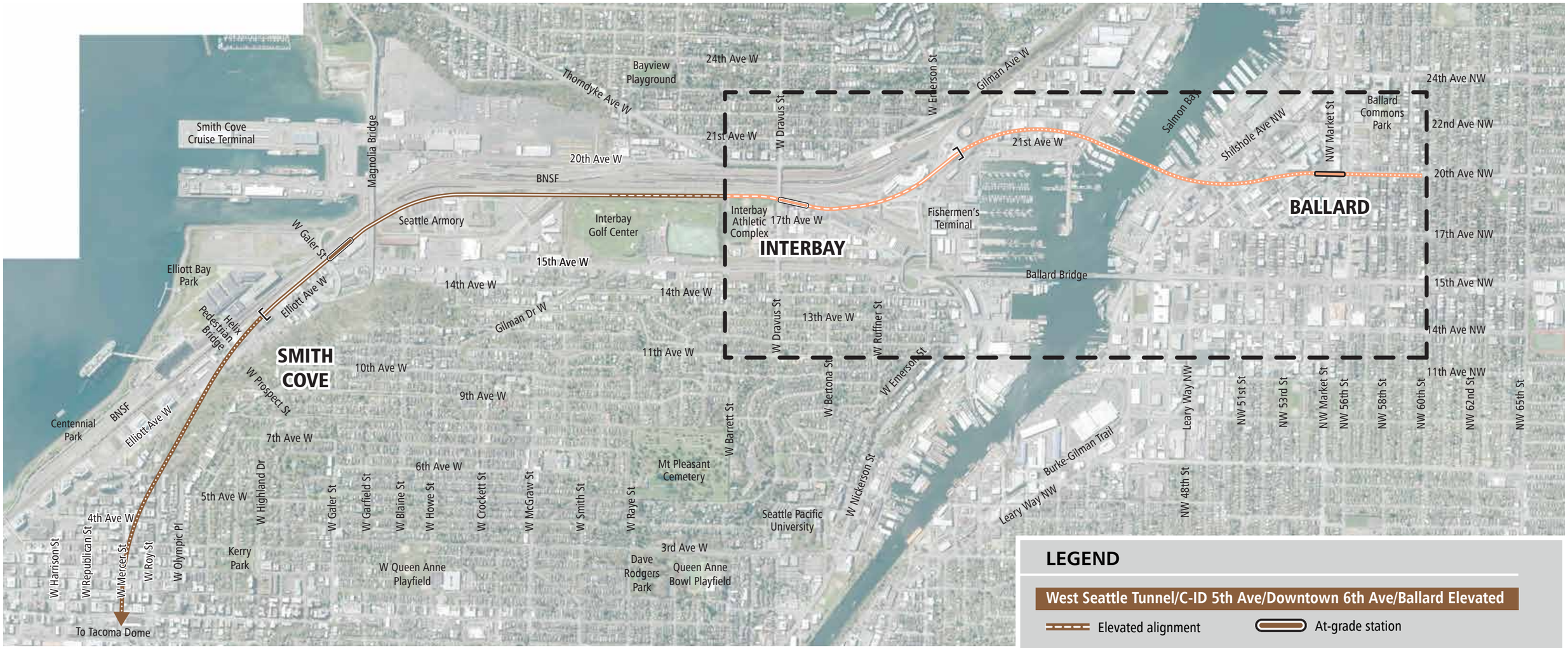
Segment Evaluated: S Forest Street to S Massachusetts Street

Initial Assessment Results

20th Ave Ballard Tunnel

Pre Draft-EIS Initial Assessment Results

9-12-2019



20th Ave Tunnel Ballard - BNSF Portal Alternative

LEGEND

West Seattle Tunnel/C-ID 5th Ave/Downtown 6th Ave/Ballard Elevated

- Elevated alignment
- At-grade alignment
- Tunnel alignment
- At-grade station

Initial Assessment - 20th Ave Tunnel Ballard - BNSF Portal

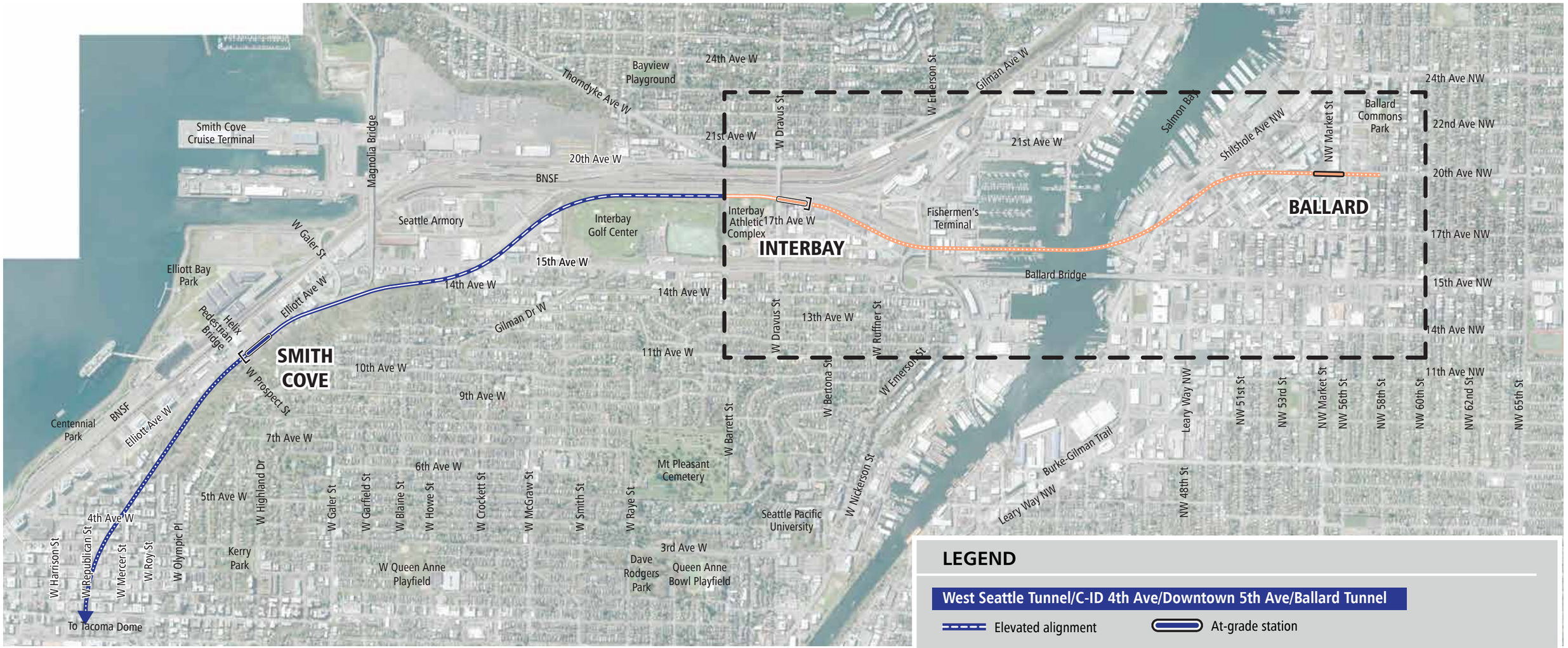
- Elevated alignment
- At-grade alignment
- Tunnel alignment
- Elevated station
- Tunnel station

- Approximate portal location
- Area evaluated

N

Pre Draft-EIS Initial Assessment Results

9-12-2019



20th Ave Tunnel Ballard - Thorndyke Portal Alternative

LEGEND

West Seattle Tunnel/C-ID 4th Ave/Downtown 5th Ave/Ballard Tunnel

- Elevated alignment
- At-grade alignment
- Tunnel alignment
- At-grade station

Initial Assessment - 20th Ave Tunnel Ballard - Thorndyke Portal

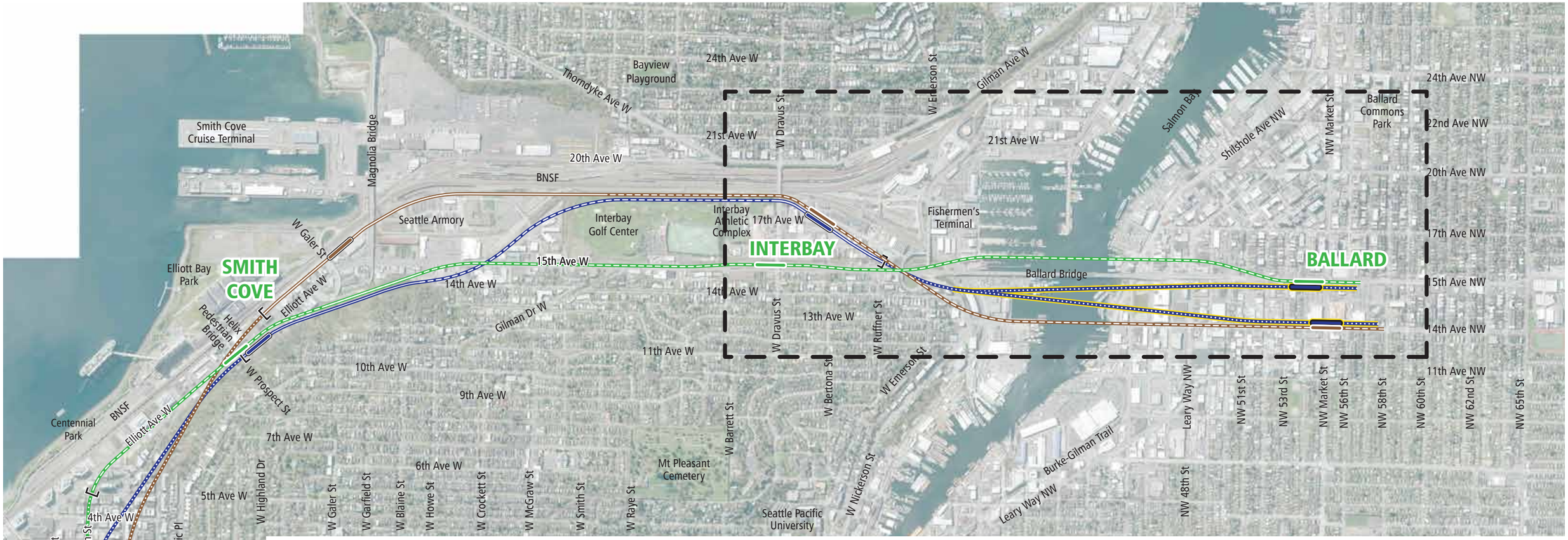
- Elevated alignment
- At-grade alignment
- Tunnel alignment
- Elevated station
- Tunnel station

- Approximate portal location
- Area evaluated

N

Pre Draft-EIS Initial Assessment Results

9-12-2019



LEGEND

ST3 Representative Project

- Elevated alignment
- Surface alignment
- Tunnel alignment
- Elevated station

West Seattle Elevated/C-ID 5th Ave/Downtown 6th Ave/Ballard Elevated

- Elevated alignment
- Surface alignment
- Tunnel alignment
- Elevated station
- Surface station

West Seattle Tunnel/C-ID 4th Ave/Downtown 5th Ave/Ballard Tunnel

- Elevated alignment
- Surface alignment
- Tunnel alignment
- Alignment option
- Surface station
- Tunnel station option

- Approximate portal location
- Area evaluated

N

Level 3 Alternatives

Pre-DEIS Initial Assessment Criteria, Measures, Methods and Thresholds - 20th Ave Ballard Tunnel

9/12/2019

Purpose and Need / Evaluation Criteria	Measure	Methods	Thresholds
Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand.			
Projected Transit Demand	Ridership forecasts	Future forecasted 2042 average weekday trips for West Seattle and Ballard extensions	Higher = Average weekday trips at least 5% more than average of all alternatives Medium = Average weekday trips within 5% of average of all alternatives Lower = Average weekday trips at least 5% less than average of all alternatives
Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's Regional Transit Long-Range Plan.			
Regional Centers Served	Population and job densities	Future PSRC-forecasted 2040 population and job densities within 10-minute walkshed of stations	Higher = Population and job densities at least 5% more than average of all alternatives Medium = Population and job densities within 5% of average of all alternatives Lower = Population and job densities at least 5% less than average of all alternatives
Sound Transit Long-Range Plan Consistency	Accommodates future LRT extension beyond ST3	Ability to accommodate expansion potential of future LRT extensions identified in Sound Transit Regional Transit Long-Range Plan	Higher = A future LRT extension per Sound Transit Long-Range Plan more feasible and more direct Medium = A future LRT extension per Sound Transit Long-Range Plan feasible Lower = A future LRT extension per Sound Transit Long-Range Plan would be less feasible and less direct
Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain.			
Technical Feasibility	Engineering constraints	Compliance with Sound Transit Design Criteria Manual, design criteria from agencies with jurisdiction and federal regulations, and engineering obstacles associated with major infrastructure constraints	Higher = Minimal engineering constraints, design meets full standards, likely acceptance by authority having jurisdiction, minimum ROW issues, and/or no unusual design considerations Medium = Moderate engineering constraints, design meets minimums, likely acceptance by authority having jurisdiction, but with additional mitigation and moderate ROW issues, and/or unusual design considerations that could be mitigated Lower = Substantial engineering constraints, deviations to standards, authority having jurisdiction's acceptance requires substantial mitigation, substantial ROW issues, and/or unique design considerations
	Constructability issues	Constructability issues based on potential conflicts and technical challenges (e.g., utility conflicts, existing infrastructure, geotechnical, tunnel portals, etc.)	Higher = Lower construction complexity and construction risks (e.g., minimal utility conflicts, building impacts, impacts to existing infrastructure, etc.) Medium = Moderate construction complexity and construction risks Lower = Higher construction complexity requiring special mitigation and construction risks
	Operational constraints	Assessment of operational constraints (e.g., access to maintenance facility, vertical grade, horizonal curvature, movable bridge, etc.)	Higher = Optimum operational characteristics (e.g., operating efficiency and flexibility) Medium = Meets minimum operational goals for design speed and operations and maintenance facility (OMF) connection Lower = Poor operational characteristics, with certain operational goals compromised for design speed and OMF connection
Financial Sustainability	Conceptual capital cost comparison	ST3 cost consistency and conceptual capital cost comparison based on conceptual design quantities and Sound Transit unit pricing (2018$)	Higher = Conceptual capital cost estimates less than ST3 Representative Project Medium = Conceptual capital cost estimates 0% to 10% more than ST3 Representative Project Lower = Conceptual capital cost estimates 10% or more than ST3 Representative Project
Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies.			
Station Area Land Use Plan Consistency	Proximity to Seattle-designated Urban Centers and Villages	Percent of 10-minute station walkshed land area located within Seattle-designated Urban Centers and/or Villages	Higher = More than 50% of station walkshed within Urban Centers and Villages Medium = Between 30% and 50% of station walkshed within Urban Centers and Villages Lower = Less than 30% of station walkshed within Urban Centers and Villages
Modal Integration	Passenger transfers	Assessment of ease of passenger transfer for riders transferring between light rail lines, and between light rail and other motorized modes (i.e., bus, paratransit, drop-off/pick-up, taxis or other ride-hailing services) at stations	Higher = More convenient passenger transfers at stations Medium = Adequate passenger transfers at stations Lower = Less convenient passenger transfers at stations
	Bus/rail and rail/rail integration	Assessment of transportation facility integration between the station and adjacent transit stops that serve other modes	Higher = Above average transportation facility integration at stations Medium = Adequate transportation facility integration at stations Lower = Below average transportation facility integration at stations

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Purpose and Need / Evaluation Criteria	Measure	Methods	Thresholds
Modal Integration (continued)	Bicycle infrastructure and accessibility	Assessment of the quality of bicycle infrastructure and percent of bicycle facility miles (i.e., neighborhood greenways, bicycle lanes, protected bicycle lanes, and trails) to total roadway miles within 10-minute bikeshed of stations	Higher = Greatest quality of bicycle facilities within bikeshed area Medium = Moderate quality of bicycle facilities within bikeshed area Lower = Lower quality of bicycle facilities within bikeshed area
	Pedestrian and persons with limited mobility accessibility	Assessment of number of intersections, percent of sidewalk/trail miles to total roadway miles, and impediments to pedestrian and American with Disabilities Act (ADA) access (i.e., large intersections with signal delay, adjacency to freight corridors/industrial uses, and substantial topography or grade challenges) within 10-minute walkshed of stations	Higher = Higher number of intersections and sidewalk coverage, good to excellent pedestrian access and few impediments Medium = Moderate number of intersections and sidewalk coverage, average to good pedestrian access and average impediments Lower = Limited number of intersections and sidewalk coverage, poor to fair pedestrian access and greatest impediments
Station Area Development Opportunities	Development potential	Percent of properties with development potential based on zoned capacity and market conditions within 10-minute walkshed of stations (5-minute walkshed in downtown)	Higher = Greater than 20 percent of properties with development potential Medium = Between 10 and 20 percent of properties with development potential Lower = Less than 10 percent of properties with development potential
	Equitable development opportunities	Assessment of unique opportunities for equitable development enabled by station location and/or conceptual configuration	Higher = Greatest opportunities for equitable development that would accommodate future residential and employment growth based on station location and configuration Medium = Opportunities for equitable development that would accommodate future residential and employment growth based on station location and configuration Lower = Limited opportunities for equitable development that would accommodate future residential and employment growth based on station location and configuration
Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices.			
Environmental Effects	National Register of Historic Places (NRHP) listed or eligible historic properties and Seattle Landmarks	Number of intersected or adjacent NRHP-listed, NRHP-eligible, and Seattle Landmark properties based on Department of Archaeology and Historic Preservation (DAHP) data and Seattle Landmark data	Higher = 1 or less historic properties potentially affected Medium = Between 2 and 3 historic properties potentially affected Lower = More than 3 historic properties potentially affected
	Parks and recreational resources	Number of and estimated acres of potential permanent impacts to parks and recreational resources	Higher = Less than 1 acre of potential permanent impacts to parks Medium = Between 1 and 2 acres of potential permanent impacts to parks Lower = 2 acres or more of potential permanent impacts to parks
	Water resources	Estimated acres of potential permanent in-water impacts	Higher = Less than 0.1 acre of potential permanent in-water impacts for both water bodies Medium = Up to 0.5 acre of potential permanent in-water impacts in each water body Lower = More than 0.5 acre of potential permanent in-water impacts in one or more water bodies
	Hazardous materials	Number of contaminated hazardous materials sites of high concern potentially affected, including Superfund sites	Higher = 5 or less hazardous materials sites potentially affected Medium = Between 6 and 10 hazardous sites potentially affected Lower = More than 10 hazardous materials sites potentially affected
	Property acquisitions and displacements	Number of potential residential unit displacements; does not include potential permanent or temporary easements or area for construction staging, TPSS or underground station entrances (except station entrances in downtown)	Higher = Less than approximately 25 residential unit displacements Medium = Between approximately 25 and 100 residential unit displacements Lower = More than approximately 100 residential unit displacements
		Square feet of potential business displacements (including maritime businesses); does not include potential permanent or temporary easements or area for construction staging, TPSS or underground station entrances (except station entrances in downtown)	Higher = Less than approximately 150,000 square feet of potential business displacements Medium = Between approximately 150,000 and 300,000 square feet of potential business displacements Lower = More than approximately 300,000 square feet of potential business displacementss

Pre-DEIS Initial Assessment Criteria, Measures, Methods and Thresholds - 20th Ave Ballard Tunnel 9/12/2019

Purpose and Need / Evaluation Criteria	Measure	Methods	Thresholds
Environmental Effects (continued)	Community construction impacts	Assessment of temporary construction impacts to communities, including potential for transportation, access, noise, vibration, and visual effects that could disrupt the community (e.g., existing residents, businesses, social service providers), and relative duration of construction and impacts to high volume traffic areas; potential construction impacts that affect freight and business/commerce are addressed in other criteria below	Higher = Lower potential for impacts to community relative to other alternatives Medium = Moderate potential for impacts to community relative to other alternatives Lower = More substantial potential for impacts to community relative to other alternatives
	Burden on minority and low-income populations	Assessment of how potential acquisitions and displacements (residential and business) and visual, noise and construction impacts would affect minority and low-income populations relative to other communities	Higher = Little to no potential impact to minority or low-income communities relative to other alternatives Medium = Moderate potential for impacts to minority or low-income communities relative to other alternatives Lower = Substantial potential for impacts to minority or low-income communities relative to other alternatives
Traffic Operations	Traffic circulation and access	Effects on traffic and transit (i.e., bus and streetcar) operations, including potential for lane restrictions, lane eliminations, turn restrictions, driveways impacted, and parking taken	Higher = Most of alignment is outside of roadway, with few to no changes in traffic patterns or access Medium = Potential for changes in traffic patterns or access to some properties; could be mitigated with local circulation modifications Lower = Substantial impacts to traffic circulation and/or access to many properties; mitigation likely requires substantial roadway improvements
	Transportation facilities	Effects on existing transportation facilities, including bicycle lanes, sidewalks, traffic interchanges and other transportation infrastructure as warranted, and compatibility with planned facilities	Higher = Minor changes to transportation facilities, and/or moderate changes with opportunities to improve infrastructure Medium = Moderate changes to transportation facilities, with more limited opportunities to improve infrastructure Lower = Substantial changes to transportation facilities, with no or limited opportunities to improve infrastructure
Economic Effects	Freight movement and access on land and water	Effects on existing freight and future capacity expansion opportunities, including truck, rail and water freight; includes potential impacts during construction and operations	Higher = No or less than substantial effects on both land and water freight mobility and capacity expansion Medium = Substantial effects on either land or water freight mobility and capacity expansion Lower = Substantial effects on both land and water freight mobility and capacity expansion
	Business and commerce effects	Effects on existing businesses, commercial areas and designated industrial centers, as well as future expansion opportunities; includes potential impacts during construction and operations	Higher = Minimal effects on local businesses, as well as commercial areas and designated industrial zones Medium = Moderate effects on local businesses, as well as commercial areas and designated industrial zones Lower = Substantial effects on local businesses, as well as commercial areas and designated industrial zones

NOTES:
1. Based on preliminary Purpose and Need Statement.
2. Criteria used are a subset of the criteria used for Level 1, Level 2, and Level 3, based on differentiating factors in the subsegment evaluated.
3. Thresholds were modified from Level 1, Level 2, and Level 3 for the more focused subsegments in order to compare the initial assessment alternatives to the same area of the Level 3 alternatives.
4. Agency and stakeholder input will be considered in the overall alternatives evaluation and screening process.
5. Qualitative measures ranked from high to low based on anticipated ability to achieve evaluation measure; “Higher” = higher ability to achieve measure, “Medium” = moderate ability to achieve measure, “Lower” = lower ability to achieve measure; no weighting will be applied.
6. Minority population is defined in US Department of Transportation Updated Environmental Justice Order 5610.2(a) as persons belonging to any of the following groups: Black, Hispanic, Asian American, and American Indian and Alaska Native.

Pre-DEIS Initial Assessment Summary - 20th Ave Ballard Tunnel

9/12/2019

Purpose and Need / Evaluation Measures	Level 3 Alternatives				Pre-DEIS Initial Assessment Alternatives	
	ST3 Representative Project	West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel		20th Ave Ballard Tunnel - BNSF Tunnel Portal	20th Ave Ballard Tunnel - Thorndyke Tunnel Portal
	Movable Bridge 15th Ave Ballard Elevated	Fixed Bridge 14th Ave Ballard Elevated	14th Ave Ballard Tunnel	15th Ave Ballard Tunnel		
Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand.						
Average weekday trips on Ballard extensions (year 2042)	Medium	Medium	Medium	Medium	Medium	Medium
Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's Regional Transit Long-Range Plan.						
Population / job densities served (persons per acre, year 2040)	Medium	Medium	Medium	Medium	Higher	Higher
Accommodates future LRT extension beyond ST3	Medium	Medium	Medium	Medium	Medium	Medium
Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain.						
Engineering constraints	Lower	Medium	Medium	Medium	Lower	Lower
Constructability issues	Lower	Medium	Medium	Medium	Lower	Lower
Operational constraints	Lower	Higher	Higher	Higher	Medium	Medium
Conceptual capital cost comparison (2018$ in millions)	--	$100 million increase (north of Dravus only)	$350 million increase (north of Dravus only)	$350 million increase (north of Dravus only)	$750 million increase (north of Dravus only)	$450 million increase (north of Dravus only)
Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies.						
Proximity to Seattle-designated Urban Centers and Villages	Medium	Medium	Medium	Medium	Higher	Higher
Passenger transfers	Medium	Higher	Higher	Medium	Higher	Higher
Bus/rail and rail/rail integration	Medium	Higher	Higher	Medium	Medium	Medium
Bicycle infrastructure and accessibility	Medium	Medium	Medium	Medium	Medium	Medium
Pedestrian and persons with limited mobility accessibility	Higher	Medium	Medium	Higher	Higher	Higher
Development potential	Medium	Lower	Medium	Medium	Higher	Higher
Equitable development opportunities	Lower	Lower	Medium	Medium	Higher	Higher
Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices.						
National Register of Historic Places (NRHP) listed or eligible historic properties and Seattle Landmarks	2	3	3	3	7	8
Parks and recreational resources (acres)	0.0	1.1	0.8	0.8	1.0	0.9
Water resources (acres)	0.5	0.5	0.0	0.0	0.0	0.0

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

The Pre-DEIS Initial Assessment is based on a limited conceptual design and intended to inform comparison of potential benefits and impacts between alternatives. Sound Transit will evaluate the potential effects of alternatives for environmental review in an Environmental Impact Statement.

Segment Evaluated: North of W Dravus Street

Pre-DEIS Initial Assessment Summary - 20th Ave Ballard Tunnel

9/12/2019

Purpose and Need / Evaluation Measures	Level 3 Alternatives				Pre-DEIS Initial Assessment Alternatives	
	ST3 Representative Project	West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel		20th Ave Ballard Tunnel - BNSF Tunnel Portal	20th Ave Ballard Tunnel - Thorndyke Tunnel Portal
	Movable Bridge 15th Ave Ballard Elevated	Fixed Bridge 14th Ave Ballard Elevated	14th Ave Ballard Tunnel	15th Ave Ballard Tunnel		
Hazardous materials sites	5	10	11	10	8	8
Potential residential unit displacements	Higher	Lower	Higher	Higher	Lower	Medium
Potential business displacements	Medium	Lower	Medium	Medium	Medium	Higher
Community construction impacts	Lower	Medium	Medium	Medium	Lower	Lower
Burden on minority and low-income populations	Higher	Higher	Higher	Higher	Higher	Higher
Traffic circulation and access effects	Lower	Medium	Higher	Higher	Higher	Higher
Effects on transportation facilities	Lower	Medium	Higher	Higher	Medium	Medium
Effects on freight movement	Lower	Medium	Higher	Higher	Medium	Higher
Business and commerce effects	Medium	Lower	Medium	Medium	Medium	Medium

NOTES:

1. Minority population is defined in US Department of Transportation Updated Environmental Justice Order 5610.2(a) as persons belonging to any of the following groups: Black, Hispanic, Asian American, and American Indian and Alaska Native

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

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Pre-DEIS Initial Assessment - 20th Ave Ballard Tunnel

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		Level 3 Alternatives		
		ST3 Representative Project	West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel
		Movable Bridge 15th Ave Ballard Elevated	Fixed Bridge 14th Ave Ballard Elevated	14th Ave Ballard Tunnel
Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand.				
Projected Transit Demand	Average weekday trips on Ballard extensions (year 2042)	Medium • Average weekday trips on the Ballard extension would be similar for all alternatives	Medium • Average weekday trips on the Ballard extension would be similar for all alternatives	Medium • Average weekday trips on the Ballard extension would be similar for all alternatives
Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's Regional Transit Long-Range Plan.				
Regional Centers Served	Population / job densities served (persons per acre, year 2040)	Medium • Population and employment densities would be less than average for the ST3 Representative Project in this 15th Avenue NW Ballard Station location due to its distance from the center of the Ballard Urban Village	Medium • Population and employment densities would be less than average for the 14th Avenue Elevated Ballard Station due to its distance from the center of the Ballard Urban Village	Medium • Population and employment densities would be less than average for the 14th Avenue Tunnel Ballard Station due to its distance from the center of the Ballard Urban Village.
Sound Transit Long-Range Plan Consistency	Accommodates future LRT extension beyond ST3	Medium • Elevated Ballard Station oriented north-south along 15th Avenue NW would accommodate a future extension to the north or east, similar to all alternatives	Medium • Elevated Ballard Station oriented north-south along 14th Avenue NW would accommodate a future extension to the north or east, similar to all alternatives	Medium • Tunnel Ballard Station oriented north-south along 14th Avenue NW would accommodate a future extension to the north or east, similar to all alternatives
Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain.				
Technical Feasibility	Engineering constraints	Lower • Straddle bents likely required to minimize roadway impacts along 15th Avenue W in Interbay, as well as NW Market Street in Ballard • Movable bridge could require column placements in Salmon Bay and coordination with maritime properties and vessel movements • Complex movable bridge over Salmon Bay in a high seismic zone	Medium • Potential need for ground improvements along guideway between W Dravus Street and 15th Avenue W in Interbay • Fixed bridge would require column placements in Salmon Bay and coordination with maritime properties and vessel movements	Medium • Potential need for ground improvements along guideway between W Dravus Street and 15th Avenue W in Interbay, and for tunnel boring under Nickerson Street bridge in Interbay

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

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Segment Evaluated: North of W Dravus Street

Pre-DEIS Initial Assessment - 20th Ave Ballard Tunnel

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel 15th Ave Ballard Tunnel	Pre-DEIS Initial Assessment Alternatives 20th Ave Ballard Tunnel - BNSF Tunnel Portal	Pre-DEIS Initial Assessment Alternatives 20th Ave Ballard Tunnel - Thorndyke Tunnel Portal
Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand.				
Projected Transit Demand	Average weekday trips on Ballard extensions (year 2042)	Medium • Average weekday trips on the Ballard extension would be similar for all alternatives	Medium • Average weekday trips on the Ballard extension would be similar for all alternatives	Medium • Average weekday trips on the Ballard extension would be similar for all alternatives
Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's Regional Transit Long-Range Plan.				
Regional Centers Served	Population / job densities served (persons per acre, year 2040)	Medium • Population and employment densities would be less than average for the 15th Avenue Tunnel Ballard Station for this station location due to its distance from the center of the Ballard Urban Village	Higher • Population and employment densities would be greater than average for the 20th Avenue Tunnel Ballard Station due to its proximity to the center of the Ballard Urban Village	Higher • Population and employment densities would be greater than average for the 20th Avenue NW Tunnel Ballard Station due to its proximity to the center of the Ballard Urban Village
Sound Transit Long-Range Plan Consistency	Accommodates future LRT extension beyond ST3	Medium • Tunnel Ballard Station oriented north-south along 15th Avenue NW would accommodate a future extension to the north or east, similar to all alternatives	Medium • Tunnel Ballard Station oriented north-south along 20th Avenue NW would accommodate a future extension to the north or east, similar to all alternatives • Less direct for a future extension to the north or east than alternatives with a terminus along 14th Avenue NW or 15th Avenue NW	Medium • Tunnel Ballard Station oriented north-south along 20th Avenue NW would accommodate a future extension to the north or east, similar to all alternatives • Less direct for a future extension to the north or east than alternatives with a terminus along 14th Avenue NW or 15th Avenue NW
Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain.				
Technical Feasibility	Engineering constraints	Medium • Potential need for ground improvements along guideway between W Dravus Street and 15th Avenue W in Interbay, and for tunnel boring under Nickerson Street bridge in Interbay • Tunnel Ballard Station at 15th Avenue NW would require a deeper tunnel under Salmon Bay than alternatives with a Ballard Station at 14th Avenue NW to avoid a large diameter planned Seattle Public Utilities (SPU) storage tunnel under Shilshole Avenue	Lower • Would require relocation of 144-inch diameter major King County combined sewer pipeline, resulting in increased engineering complexity and schedule/cost risk to construct while maintaining operation of pipeline • Would require a long span elevated structure with large foundations to cross BNSF railroad tracks	Lower • Would require underpinning of foundations of a portion of W Dravus Street bridge • Would require relocation of 96-inch diameter major King County combined sewer pipeline, resulting in increased engineering complexity and schedule/cost risk to construct while maintaining operation of pipeline • Would require tunnel to be deeper compared to 14th Avenue NW tunnel and 15th Avenue NW tunnel alternatives In order to avoid the Nickerson Bridge retrofit structure • Lowered alignment approaching tunnel portal would result in Interbay Station in deep trench approximately 40 feet below BNSF yard and 60 feet below W Dravus Street in constrained space below the W Dravus Street bridge

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

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Segment Evaluated: North of W Dravus Street

Pre-DEIS Initial Assessment - 20th Ave Ballard Tunnel

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		Level 3 Alternatives		
		ST3 Representative Project	West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel
		Movable Bridge 15th Ave Ballard Elevated	Fixed Bridge 14th Ave Ballard Elevated	14th Ave Ballard Tunnel
Technical Feasibility (continued)	Constructability issues	Lower	Medium	Medium
		• Potential challenges maintaining traffic during construction along 15th Avenue W in Interbay and 15th Avenue NW in Ballard • Movable bridge would require in-water construction activities for multiple piers in Salmon Bay and need to take into account vessel traffic in the navigation channel, fish windows and tribal treaty fishing	• Coordination likely required with BNSF Railway in Interbay • Fixed bridge would require in-water construction activities for piers in Salmon Bay and need to take into account vessel traffic in the navigation channel, fish windows, and tribal treaty fishing	• Coordination likely required with BNSF Railway in Interbay • Construction under the Nickerson Street bridge in Interbay creates potential challenges for maintenance of traffic • Potential challenges identifying muck hauling routes for tunnel construction and constructing cross passages
	Operational constraints	Lower	Higher	Higher
		• Movable bridge openings over Salmon Bay would result in periodic service interruptions, which would impact systemwide operations	• Fixed bridge over Salmon Bay would not require openings for vessel traffic associated with a movable bridge	• Tunnel under Salmon Bay would not require openings for vessel traffic associated with a movable bridge
Financial Sustainability	Conceptual capital cost comparison (2018$ in millions)	--	$100 million increase (north of Dravus only)	$350 million increase (north of Dravus only)
		• Baseline for capital cost comparison to other alternatives	• Approximately $100 million more than the ST3 Representative Project • Additional cost for elevated guideway outside of public right-or-way compared to ST3 Representative Project	• Approximately $350 million more than the ST3 Representative Project • Higher cost for additional tunnel construction • Cost of additional tunnels not included in ST3 financial plan or evaluation methodology
Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies.				
Station Area Land Use Plan Consistency	Proximity to Seattle-designated Urban Centers and Villages	Medium	Medium	Medium
		• Ballard Station located on 15th Avenue NW is one block closer to the center of the Ballard Hub Urban Village than the station alternatives on 14th Avenue NW	• Ballard Station located on 14th Avenue NW is one block further from the center of the Ballard Hub Urban Village than the ST3 Representative Project	• Ballard Station located on 14th Avenue NW is one block further from the center of the Ballard Hub Urban Village than the ST3 Representative Project

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

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Segment Evaluated: North of W Dravus Street

Pre-DEIS Initial Assessment - 20th Ave Ballard Tunnel

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel 15th Ave Ballard Tunnel	Pre-DEIS Initial Assessment Alternatives 20th Ave Ballard Tunnel - BNSF Tunnel Portal	Pre-DEIS Initial Assessment Alternatives 20th Ave Ballard Tunnel - Thorndyke Tunnel Portal
Technical Feasibility (continued)	Constructability issues	Medium • Coordination likely required with BNSF Railway in Interbay • Construction under the Nickerson Street bridge in Interbay creates potential challenges for maintenance of traffic • Potential challenges identifying muck hauling routes for tunnel construction and constructing cross passages	Lower • Maintaining operation of 144-inch diameter major King County combined sewer pipeline during construction would increase construction challenges and schedule/cost risk • Construction of Ballard Station would be more constrained than with other alternatives due to narrower right-of-way along 20th Avenue NW • Potential closure of the Intersection of 21st Avenue W and W Emerson Street for the cut-and-cover tunnel • Potential traffic disruptions on W Dravus Street for construction of elevated Interbay Station • Coordination required with BNSF Railroad in Interbay for construction of tunnel portal in BNSF property with approximately 1,000-foot long transition from retained fill/cut • Requires long span of elevated structure over BNSF tracks to avoid disruption to freight service and need for rail reconstruction • Potential challenges identifying muck hauling routes for tunnel construction and constructing cross passages	Lower • Maintaining operation of 96-inch diameter major King County combined sewer pipeline during construction would increase construction challenges and schedule/cost risk • Construction of Ballard Station would be more constrained than with other alternatives due to narrower right-of-way along 20th Avenue NW • Coordination likely required with BNSF Railway in Interbay • Construction under the W Emerson Street bridge in Interbay creates potential challenges for maintenance of traffic • Potential challenges identifying muck hauling routes for tunnel construction and constructing cross passages • Includes reconstruction of portion of W Dravus Street bridge and potential retrofit or reconstruction of W Emerson Street bridge
	Operational constraints	Higher • Tunnel under Salmon Bay would not require openings for vessel traffic associated with a movable bridge	Medium • Tunnel under Salmon Bay would not require openings for vessel traffic associated with a movable bridge • Would include additional curves, resulting in lower operating speeds than other alternatives • Tunnel would be approximately 200 to 500 feet shorter than tunnel to 14th Avenue NW or 15th Avenue NW	Medium • Tunnel under Salmon Bay would not require openings for vessel traffic associated with a movable bridge • Would include additional curves and steeper grades, resulting in lower operating speeds than other alternatives • Tunnel would be approximately 1,400 to 1,700 feet longer than tunnel to 14th Avenue NW or 15th Avenue NW, requiring additional ventilation and emergency egress
Financial Sustainability	Conceptual capital cost comparison (2018$ in millions)	$350 million increase (north of Dravus only) • Approximately $350 million more than the ST3 Representative Project • Higher cost for additional tunnel construction • Cost of additional tunnels not included in ST3 financial plan or evaluation methodology	$750 million increase (north of Dravus only) • Approximately $750 million more than the ST3 Representative Project • Higher cost for additional tunnel construction • Additional right-of-way costs in downtown Ballard • Cost of additional tunnels not included in ST3 financial plan or evaluation methodology	$450 million increase (north of Dravus only) • Approximately $450 million more than the ST3 Representative Project • Higher cost for additional tunnel construction • Additional right-of-way costs in downtown Ballard • Cost of additional tunnels not included in ST3 financial plan or evaluation methodology
Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies.				
Station Area Land Use Plan Consistency	Proximity to Seattle-designated Urban Centers and Villages	Medium • Ballard Station located on 15th Avenue NW is one block closer to the center of the Ballard Hub Urban Village than the station alternatives on 14th Avenue NW	Higher • Ballard Station located on 20th Avenue NW is closer to the center of the Ballard Hub Urban Village than the station alternatives on 14th Avenue NW and 15th Avenue NW	Higher • Ballard Station located on 20th Avenue NW is closer to the center of the Ballard Hub Urban Village than the station alternatives on 14th Avenue NW and 15th Avenue NW

Key to Rating	Alternative Performance		
	Lower Performing	Medium Performing	Higher Performing

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Segment Evaluated: North of W Dravus Street

Pre-DEIS Initial Assessment - 20th Ave Ballard Tunnel

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		Level 3 Alternatives		
		ST3 Representative Project	West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel
		Movable Bridge 15th Ave Ballard Elevated	Fixed Bridge 14th Ave Ballard Elevated	14th Ave Ballard Tunnel
Modal Integration	Passenger transfers	Medium	Higher	Higher
		• Transfers from southbound buses on 15th Avenue NW would require crossing 15th Avenue NW	• Opportunity for buses in all directions to serve station entrances without requiring passengers to cross a street • Pick-up and drop-off activity can be distributed over several blocks	• Opportunity for buses in all directions to serve station entrances without requiring passengers to cross a street • Pick-up and drop-off activity can be distributed over several blocks
	Bus/rail and rail/rail integration	Medium	Higher	Higher
		• Ballard station is adjacent to north/south bus routes on 15th Avenue NW • Ballard Station on east side of 15th Avenue NW south of NW Market Street provides less opportunity for integration with buses on both sides of 15th Avenue NW	• Ballard Station straddling NW Market Street provides good integration with buses on both sides of the street	• Ballard Station straddling NW Market Street provides good integration with buses on both sides of the street
	Bicycle infrastructure and accessibility	Medium	Medium	Medium
		• Existing multi-use bike facilities within a 10-minute ride from stations include: Burke-Gilman Trail, Elliot Bay Trail, and Ship Canal Trail • There are existing in-street, separated bike facilities within a 10-minute ride from stations, particularly: 8th Avenue NW, Thorndyke Avenue W/20th Avenue W/Gilman Avenue W, NW 45th Street/Shilshole Ave NW, and Nickerson Street	• Existing multi-use bike facilities within a 10-minute ride from stations include : Burke-Gilman Trail, Elliot Bay Trail, and Ship Canal Trail • There are existing in-street, separated bike facilities within a 10-minute ride from stations, particularly: 8th Avenue NW, Thorndyke Avenue W/20th Avenue W/Gilman Avenue W, NW 45th Street/Shilshole Avenue NW, and Nickerson Street	• Existing multi-use bike facilities within a 10-minute ride from stations include: Burke-Gilman Trail, Elliot Bay Trail, and Ship Canal Trail • There are existing in-street, separated bike facilities within a 10-minute ride from stations, particularly: 8th Avenue NW, Thorndyke Avenue W/20th Avenue W/Gilman Avenue W, NW 45th Street/Shilshole Avenue NW, and Nickerson Street
	Pedestrian and persons with limited mobility accessibility	Higher	Medium	Medium
		• Interbay Station on 15th Avenue W straddling W Dravus Street Bridge has a lower percentage of sidewalks and trails, but more intersections than other alternatives; walkshed for this station does not extend as far west towards Magnolia neighborhood, but extends further east into Queen Anne neighborhood • Alternative with 15th Avenue NW Ballard Station includes slightly more intersections within combined walkshed than alternatives with 14th Avenue NW Ballard Station	• Interbay Station on 17th Avenue W has a lower percentage of sidewalks and trails than other alternatives; walkshed for this station extends farther west towards Magnolia neighborhood than the ST3 Representative Project, but less far into Queen Anne neighborhood • Ballard Station on 14th Avenue NW has a lower percentage of sidewalks and trails than other alternatives	• Interbay Station on 17th Avenue W has a lower percentage of sidewalks and trails than other alternatives; walkshed for this station extends farther west towards Magnolia neighborhood than the ST3 Representative Project, but less far into Queen Anne neighborhood • Ballard Station on 14th Avenue NW has a lower percentage of sidewalks and trails than other alternatives

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Segment Evaluated: North of W Dravus Street

Pre-DEIS Initial Assessment - 20th Ave Ballard Tunnel

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel 15th Ave Ballard Tunnel	Pre-DEIS Initial Assessment Alternatives 20th Ave Ballard Tunnel - BNSF Tunnel Portal	Pre-DEIS Initial Assessment Alternatives 20th Ave Ballard Tunnel - Thorndyke Tunnel Portal
Modal Integration	Passenger transfers	Medium • Transfers from southbound buses on 15th Avenue NW would require crossing 15th Avenue NW • Drop-offs more challenging compared to station options on lower-volume streets	Higher • Opportunity for buses in all directions to serve station entrances without requiring passengers to cross a street • Good passenger access to downtown Ballard area; Pick-up and drop-off activity can be distributed over several blocks	Higher • Opportunity for buses in all directions to serve station entrances without requiring passengers to cross a street • Good passenger access to downtown Ballard area; Pick-up and drop-off activity can be distributed over several blocks
	Bus/rail and rail/rail integration	Medium • Ballard station is adjacent to north/south bus routes on 15th Avenue NW • Ballard Station is on the east side of 15th Avenue NW and does not straddle NW Market Street, reducing integration with buses on both sides of NW Market Street	Medium • Ballard Station straddling NW Market Street provides good integration with buses on both sides of the street • Ballard station on 20th Avenue NW would require greater out-of-direction travel for connecting bus routes to continue north on 15th Avenue NW than other alternatives, adding delay • Ballard Station on 20th Avenue NW may have constrained areas for bus zones	Medium • Ballard Station straddling NW Market Street provides good integration with buses on both sides of the street • Ballard station on 20th Avenue NW would require greater out-of-direction travel for connecting bus routes to continue north on 15th Avenue NW than other alternatives, adding delay • Ballard Station on 20th Avenue NW may have constrained areas for bus zones
	Bicycle infrastructure and accessibility	Medium • Existing multi-use bike facilities within a 10-minute ride from stations include: Burke-Gilman Trail, Elliot Bay Trail, and Ship Canal Trail • There are existing in-street, separated bike facilities within a 10-minute ride from stations, particularly: 8th Avenue NW, Thorndyke Avenue W/20th Avenue W/Gilman Avenue W, NW 45th Street/Shilshole Avenue NW, and Nickerson Street	Medium • Existing multi-use bike facilities within a 10-minute ride from stations include: Burke-Gilman Trail, Elliot Bay Trail, and Ship Canal Trail • There are existing in-street, separated bike facilities within a 10-minute ride from stations, particularly: Thorndyke Ave W/20th Ave W/Gilman Avenue W, NW 45th Street/Shilshole Avenue NW, and Nickerson Street • The 20th Avenue NW station location is closer to the Burke-Gilman Trail and NW 58th Greenway than other alternatives	Medium • Existing multi-use bike facilities within a 10-minute ride from stations include: Burke-Gilman Trail, Elliot Bay Trail, and Ship Canal Trail • There are existing in-street, separated bike facilities within a 10-minute ride from stations, particularly: Thorndyke Avenue W/20th Avenue W/Gilman Avenue W, NW 45th Street/Shilshole Avenue NW, and Nickerson Street • The 20th Avenue NW station location is closer to the Burke-Gilman Trail and NW 58th Greenway than other alternatives
	Pedestrian and persons with limited mobility accessibility	Higher • Interbay Station on 17th Avenue W has a lower percentage of sidewalks and trails than other alternatives; walkshed for this station extends farther west towards Magnolia neighborhood than the ST3 Representative Project, but less far into Queen Anne neighborhood • Alternative with 15th Avenue NW Ballard Station includes slightly more intersections within combined walkshed than alternatives with 14th Avenue NW Ballard Station	Higher • Interbay Station on 17th Avenue W has a lower percentage of sidewalks and trails than other alternatives; walkshed for this station extends farther west towards Magnolia neighborhood than the ST3 Representative Project, but less far into Queen Anne neighborhood • Alternative with 20th Avenue NW Ballard Station includes more intersections within combined walkshed than alternatives with the Ballard Station at 14th Avenue NW or 15th Avenue NW	Higher • Interbay Station on 17th Avenue W has a lower percentage of sidewalks and trails than other alternatives; walkshed for this station extends farther west towards Magnolia neighborhood than the ST3 Representative Project, but less far into Queen Anne neighborhood • Alternative with 20th Avenue NW Ballard Station includes more intersections within combined walkshed than alternatives with the Ballard Station at 14th Avenue NW or 15th Avenue NW

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Segment Evaluated: North of W Dravus Street

Pre-DEIS Initial Assessment - 20th Ave Ballard Tunnel

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		Level 3 Alternatives		
		ST3 Representative Project	West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel
		Movable Bridge 15th Ave Ballard Elevated	Fixed Bridge 14th Ave Ballard Elevated	14th Ave Ballard Tunnel
Station Area Development Opportunities	Development potential	Medium • Moderate development opportunities with elevated station at 15th Ave NW due to smaller surplus lots than tunnel alternatives	Lower • Fewer development opportunities with elevated Ballard Station at 14th Avenue NW due to project footprint almost entirely within street right-of-way and majority industrial zoning south of Ballard station	Medium • Greater development opportunities due to tunnel construction resulting in increased surplus land available; however, proximity to industrial zoning allows for less density than 20th Ave Ballard Tunnel alternative
	Equitable development opportunities	Lower • Lower equitable development opportunities with elevated station at 15th Avenue NW due to smaller surplus lots than tunnel alternatives and industrial zoning southeast of station	Lower • Lower equitable development opportunities with elevated station at 14th Avenue NW due to project footprint almost entirely within street right-of-way and majority industrial zoning south of Ballard station	Medium • Greater equitable development opportunities due to tunnel construction resulting in increased surplus land available; however, proximity to industrial zoning allows for fewer equitable development opportunities than 20th Ave Ballard Tunnel alternative
Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices.				
Environmental Effects	National Register of Historic Places (NRHP) listed or eligible historic properties and Seattle Landmarks	2 • 2 NRHP-listed, NRHP-eligible, and/or Seattle Landmark Properties could be affected by the project	3 • 3 NRHP-listed, NRHP-eligible, and/or Seattle Landmark Properties could be affected by the project	3 • 3 NRHP-listed, NRHP-eligible, and/or Seattle Landmark Properties could be affected by the project
	Parks and recreational resources (acres)	0.0 • No permanent impacts to parks	1.1 • Approximately 1.1 acres of potential permanent impacts to Interbay Athletic Field and 14th Avenue NW Boat Ramp	0.8 • Approximately 0.8 acres of potential permanent impacts to Interbay Athletic Field
	Water resources (acres)	0.5 • More than 0.5 acres of potential permanent in-water impacts	0.5 • More than 0.5 acres of potential permanent in-water impacts	0.0 • No potential permanent in-water impacts
	Hazardous materials sites	5 • 5 contaminated sites of higher concern within the alternative footprint or within an intersecting parcel	10 • 10 contaminated sites of higher concern within the alternative footprint or within an intersecting parcel	11 • 11 contaminated sites of higher concern within the alternative footprint or within an intersecting parcel
	Potential residential unit displacements	Higher • Fewer than approximately 25 potential residential unit displacements	Lower • More than approximately 100 potential residential unit displacements	Higher • Fewer than approximately 25 potential residential unit displacements

Key to Rating	Alternative Performance		
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Segment Evaluated: North of W Dravus Street

Pre-DEIS Initial Assessment - 20th Ave Ballard Tunnel

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel 15th Ave Ballard Tunnel	Pre-DEIS Initial Assessment Alternatives 20th Ave Ballard Tunnel - BNSF Tunnel Portal	Pre-DEIS Initial Assessment Alternatives 20th Ave Ballard Tunnel - Thorndyke Tunnel Portal
Station Area Development Opportunities	Development potential	Medium • Greater development opportunities due to tunnel construction resulting in increased surplus land available; however, proximity to industrial zoning allows for less density than 20th Ave Ballard Tunnel alternative	Higher • Greater development opportunities due to tunnel construction resulting in increased surplus land available • Greater development opportunities due to increased density allowed with Mixed-Use and Multi-Family Residential zoning within station walkshed	Higher • Greater development opportunities due to tunnel construction resulting in increased surplus land available • Greater development opportunities due to increased density allowed with Mixed-Use and Multi-Family Residential zoning within station walkshed
	Equitable development opportunities	Medium • Greater equitable development opportunities due to tunnel construction resulting in increased surplus land available; however, proximity to industrial zoning allows for fewer equitable development opportunities than 20th Ave Ballard Tunnel alternative	Higher • Greater equitable development opportunities due to tunnel construction resulting in increased surplus land available • Greater equitable development opportunities due to Mixed-Use and Multi-Family Residential zoning within station walkshed	Higher • Greater equitable development opportunities due to tunnel construction resulting in increased surplus land available • Greater equitable development opportunities due to Mixed-Use and Multi-Family Residential zoning within station walkshed
Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices.				
Environmental Effects	National Register of Historic Places (NRHP) listed or eligible historic properties and Seattle Landmarks	3 • 3 NRHP-listed, NRHP-eligible, and/or Seattle Landmark Properties could be affected by the project	7 • 7 NRHP-listed, NRHP-eligible, and/or Seattle Landmark Properties could be affected by the project • Includes tunnel beneath Ballard Historic District	8 • 8 NRHP-listed, NRHP-eligible, and/or Seattle Landmark Properties could be affected by the project • Includes tunnel beneath Ballard Historic District
	Parks and recreational resources (acres)	0.8 • Approximately 0.8 acres of potential permanent impacts to Interbay Athletic Field	1.0 • Approximately 1.0 acres of potential permanent impacts to Interbay Athletic Field	0.9 • Approximately 0.9 acres of potential permanent impacts to Interbay Athletic Field
	Water resources (acres)	0.0 • No potential permanent in-water impacts	0.0 • No potential permanent in-water impacts	0.0 • No potential permanent in-water impacts
	Hazardous materials sites	10 • 10 contaminated sites of higher concern within the alternative footprint or within an intersecting parcel	8 • 8 contaminated sites of higher concern within the alternative footprint or within an intersecting parcel	8 • 8 contaminated sites of higher concern within the alternative footprint or within an intersecting parcel
	Potential residential unit displacements	Higher • Fewer than approximately 25 potential residential unit displacements	Lower • More than approximately 100 potential residential unit displacements	Medium • Between approximately 25 and 100 potential residential unit displacements

Key to Rating	Alternative Performance		
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Pre-DEIS Initial Assessment - 20th Ave Ballard Tunnel

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		Level 3 Alternatives		
		ST3 Representative Project	**West Seattle Elevated/Downtown 6th Ave/Ballard Elevated**	**West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel**
		Movable Bridge 15th Ave Ballard Elevated	**Fixed Bridge 14th Ave Ballard Elevated**	**14th Ave Ballard Tunnel**
Environmental Effects (continued)	Potential business displacements	Medium • Between approximately 150,000 and 300,000 square feet of potential business displacements	Lower • More than approximately 300,000 square feet of potential business displacements	Medium • Between approximately 150,000 and 300,000 square feet of potential business displacements
	Community construction impacts	Lower • Potential for visual, noise, and vibration impacts on residences near 15th Avenue W, 15th Avenue NW and NW Market Street • Access to businesses would be maintained throughout the corridor, although the community may experience changes in access to some businesses • Lane closures during construction on 15th Avenue W in Interbay and 15th Avenue NW in Ballard contribute to widespread diversion and increased congestion in Lower Queen Anne and the Westlake and SR 99 corridors	Medium • Potential for visual, noise, and vibration impacts on residences near 15th Avenue W and 14th Avenue W (north of W Emerson Street), and NW Market Street • Access to businesses would be maintained throughout the corridor, although the community may experience changes in access to some businesses	Medium • Potential for visual, noise, and vibration impacts on residences near NW Market Street • Greater amount of construction vehicles in the Interbay/Ballard neighborhoods for tunnel excavation material hauling • Access to businesses would be maintained throughout the corridor, although the community may experience changes in access to some businesses
	Burden on minority and low-income populations	Higher • Interbay and Ballard stations would be located in areas where minority or low-income populations are not above the city average and located in areas of lower displacement risk	Higher • Interbay and Ballard stations would be located in areas where minority or low-income populations are not above the city average and located in areas of lower displacement risk	Higher • Interbay and Ballard stations would be located in areas where minority or low-income populations are not above the city average and located in areas of lower displacement risk
Traffic Operations	Traffic circulation and access effects	Lower • Lengthy segments of elevated guideway along principal arterial 15th Ave W/NW could eliminate or truncate left turn lanes, reduce capacity, and restrict turning movements	Medium • Includes elevated guideway along 14th Avenue NW, a lower-volume street • Columns could affect access by restricting certain turning movements.	Higher • Alignment in tunnel limits permanent effects to traffic circulation and access
	Effects on transportation facilities	Lower • Fully elevated guideway along 15th Avenue W in Interbay and 15th Avenue NW in Ballard • Highest number of potential conflicts with existing and planned transportation infrastructure • Affected facilities include W Dravus Street, the Emerson interchange, 15th Avenue W, 15th Avenue NW, and the 15th Avenue NW/NW Market Street intersection	Medium • Fully elevated guideway primarily outside of roadway right-of-way and along 14th Avenue NW in Ballard; avoids 15th Avenue W and 15th Avenue NW • Reduced number of potential conflicts with existing and planned transportation infrastructure compared to ST3 Representative Project • Affected facilities include W Dravus Street, the Emerson interchange and 14th Avenue NW/NW Market Street intersection	Higher • Tunnels in Ballard and routing in Interbay reduce the number of potential conflicts with other transportation facilities • Affected facilities include the Emerson interchange

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Segment Evaluated: North of W Dravus Street

Pre-DEIS Initial Assessment - 20th Ave Ballard Tunnel

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel 15th Ave Ballard Tunnel	Pre-DEIS Initial Assessment Alternatives 20th Ave Ballard Tunnel - BNSF Tunnel Portal	20th Ave Ballard Tunnel - Thorndyke Tunnel Portal
Environmental Effects (continued)	Potential business displacements	Medium • Between approximately 150,000 and 300,000 square feet of potential business displacements	Medium • Between approximately 150,000 and 300,000 square feet of potential business displacements	Higher • Fewer than approximately 150,000 square feet of potential business displacements
	Community construction impacts	Medium • Potential for visual, noise, and vibration impacts on residences near NW Market Street • Greater amount of construction vehicles in the Interbay/Ballard neighborhoods for tunnel excavation material hauling • Access to businesses would be maintained throughout the corridor, although the community may experience changes in access to some businesses	Lower • Potential for visual, noise, and vibration impacts on residences near 20th Avenue NW and NW Market Street • Construction for cut-and-cover tunnel Ballard Station would occur in the core of the Ballard Hub Urban Village • Greater amount of construction vehicles in the Interbay/Ballard neighborhoods for tunnel excavation material hauling • Access to businesses would be maintained throughout the corridor, although the community may experience changes in access to some businesses	Lower • Potential for visual, noise, and vibration impacts on residences near 20th Avenue NW and NW Market Street • Construction for cut-and-cover tunnel Ballard Station would occur in the core of the Ballard Hub Urban Village • Includes reconstruction of portion of W Dravus Street bridge and potential retrofit or reconstruction of W Emerson Street bridge • Greater amount of construction vehicles in the Interbay/Ballard neighborhoods for tunnel excavation material hauling • Access to businesses would be maintained throughout the corridor, although the community may experience changes in access to some businesses
	Burden on minority and low-income populations	Higher • Interbay and Ballard stations would be located in areas where minority or low-income populations are not above the city average and located in areas of lower displacement risk	Higher • Interbay and Ballard stations would be located in areas where minority or low-income populations are not above the city average and located in areas of lower displacement risk	Higher • Interbay and Ballard stations would be located in areas where minority or low-income populations are not above the city average and located in areas of lower displacement risk
Traffic Operations	Traffic circulation and access effects	Higher • Alignment in tunnel limits permanent effects to traffic circulation and access	Higher • Alignment in tunnel limits permanent effects to traffic circulation and access	Higher • Alignment in tunnel limits permanent effects to traffic circulation and access
	Effects on transportation facilities	Higher • Tunnels in Ballard and routing in Interbay reduce the number of potential conflicts with other transportation facilities • Affected facilities include the Emerson interchange	Medium • Tunnels in Ballard and routing in Interbay reduce the number of potential conflicts with other transportation facilities • Affected facilities include construction over live BNSF rail tracks and temporary construction-related impacts to W Emerson Place	Medium • Tunnels in Ballard and routing in Interbay reduce the number of potential conflicts with other transportation facilities • Affected facilities in Interbay/Ballard include reconstruction of portion of W Dravus Street bridge, potential retrofit or reconstruction of W Emerson Street bridge

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Segment Evaluated: North of W Dravus Street

Pre-DEIS Initial Assessment - 20th Ave Ballard Tunnel

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		Level 3 Alternatives		
		ST3 Representative Project	West Seattle Elevated/Downtown 6th Ave/Ballard Elevated	West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel
		Movable Bridge 15th Ave Ballard Elevated	Fixed Bridge 14th Ave Ballard Elevated	14th Ave Ballard Tunnel
Economic Effects	Effects on freight movement	Lower	Medium	Higher
		• Elevated guideway columns could affect truck access to local businesses on 15th Avenue W and 15th Avenue NW; this alternative would have greatest potential direct impact to truck freight routes of all alternatives • Construction activities would be conducted along and affect the 15th Avenue W and 15th Avenue NW Major Freight Routes • Construction of elevated guideway columns would likely have limited impacts associated with the guideway crossing the following Major Freight Routes: Shilshole Avenue NW, NW Leary Way and NW Market Street • Potential temporary and permanent impacts to water-dependent businesses and Dock 3 at Fishermen's Terminal are expected, and as fresh-water dependent businesses, these uses could be very difficult to relocate • Movable bridge columns in Salmon Bay would maintain Ship Canal navigation channel, but could affect large vessel turning movement to Fishing Vessel Owners (FVO)/Fisherman's Terminal • Construction of the elevated Ballard Station would occur on 15th Avenue NW and close to NW Market Street, both of which are a Major Freight Route. Construction of the station could have limited impact to freight movement on 15th Avenue NW and NW Market Street	• Construction of elevated guideway columns could have limited potential impacts associated with the guideway crossing the following Major Freight Routes: 15th Avenue W, Shilshole Avenue NW, NW Leary Way and NW Market Street • Construction on the east side of BNSF yard in Interbay • Avoids impacts to Fishermen's Terminal, but could affect operations of an intermodal freight facility that provides unique shipping services to/from Alaska and is dependent on a freshwater location and proximity to rail lines and freight truck routes, which could be difficult to relocate • Columns for the Salmon Bay fixed bridge crossing would maintain navigation channel but could affect large vessel navigation to/from water dependent businesses on Salmon Bay, as well as the Maritime Academy/14th Avenue NW Boat Ramp area, and as freshwater dependent businesses, these uses could be difficult to relocate • Columns in 14th Avenue NW would restrict turning movements for businesses in the Ballard MIC • Construction of the elevated Ballard Station would occur on 14th Avenue NW straddling NW Market Street which is a Major Freight Route; construction of the station could have limited impact to freight movement on NW Market Street	• Construction on the east side of Interbay BNSF yard in Interbay • Construction associated with the tunnel portal could affect local freight access • Tunnel avoids in-water columns in Salmon Bay and impacts on Fishermen's Terminal • Construction of the tunnel Ballard Station would occur beneath 14th Avenue NW straddling NW Market Street which is a Major Freight Route; construction of the station could have temporary impact to freight movement on NW Market Street
	Business and commerce effects	Medium	Lower	Medium
		• Could have moderate amount of business displacements, the majority of which would be industrial or light-industrial businesses in Interbay Manufacturing/Industrial Center (MIC) • Could displace small businesses in Ballard that mostly serve local community • Could displace businesses that support international and domestic trade through terminals on Salmon Bay • Potential construction period impacts, such as lane closures and access changes, to local businesses on or near 15th Avenue W in Interbay; 15th Avenue NW and NW Market Street in Ballard • Could displace water-dependent businesses at Fishermen's Terminal, which could have secondary effects to other marine industries that maintain the Alaskan Fishing Fleet, and would reduce available moorage for fishing vessels • Other water dependent businesses could be displaced on north side of Salmon Bay (i.e., marina for recreational vessels)	• Could have the greatest amount of business displacements, the majority of which would be industrial or light-industrial businesses in Interbay MIC • Could displace small businesses in Interbay that are service-or light-industrial-oriented • Could displace businesses that support international and domestic trade through terminals on Salmon Bay • Potential construction period effects such as lane closures and access changes, to local businesses on or near 14th Avenue W, 17th Avenue W, 16th Avenue W and 13th Avenue W in Interbay, 14th Avenue NW and NW Market Street in Ballard • Would avoid impacts to Fishermen's Terminal, but could affect operations of an intermodal freight facility that provides unique shipping services to/from Alaska and is dependent on a freshwater location and proximity to rail lines and freight routes • Other water dependent businesses could be displaced	• Could have a moderate amount of business displacements, the majority of which would be industrial or light-industrial businesses in Interbay MIC • Potential construction period effects such as lane closures and access changes, to local businesses on or near 15th Avenue W, 17th Avenue W, 16th Avenue W and 13th Avenue W in Interbay; 14th Avenue NW and NW Market Street in Ballard • Could displace small businesses in Interbay that are service-or light-industrial-oriented • Tunnel under Salmon Bay would avoid permanent maritime business impacts, including those at Fishermen's Terminal

NOTES:

1. Minority population is defined in US Department of Transportation Updated Environmental Justice Order 5610.2(a) as persons belonging to any of the following groups: Black, Hispanic, Asian American, and American Indian and Alaska Native

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Pre-DEIS Initial Assessment - 20th Ave Ballard Tunnel

9/12/2019

Purpose and Need / Evaluation Criteria / Measures		West Seattle Tunnel/Downtown 5th Ave/Ballard Tunnel 15th Ave Ballard Tunnel	Pre-DEIS Initial Assessment Alternatives 20th Ave Ballard Tunnel - BNSF Tunnel Portal	Pre-DEIS Initial Assessment Alternatives 20th Ave Ballard Tunnel - Thorndyke Tunnel Portal
Economic Effects	Effects on freight movement	Higher • Construction on the east side of Interbay BNSF yard in Interbay • Construction associated with the tunnel portal could affect local freight access • Tunnel avoids in-water columns in Salmon Bay and impacts on Fishermen's Terminal • Construction of the tunnel Ballard Station would occur beneath 15th Avenue NW and close to NW Market Street, both of which are Major Freight Routes; construction of the station could have temporary impact to freight movement on 15th Avenue NW and NW Market Street, but less impact compared to the alternative with the elevated station	Medium • Construction on the east side of Interbay BNSF yard in Interbay could require relocation of some BNSF operations due to the proximity of guideway construction and tunnel excavation • Construction associated with the tunnel could affect local freight access • Tunnel avoids in-water columns in Salmon Bay and impacts on Fishermen's Terminal • Construction of the tunnel Ballard Station would occur beneath 20th Avenue NW straddling NW Market Street which is a Major Freight Route; construction of the station could have temporary impact to freight movement on NW Market Street	Higher • Construction on the east side of Interbay BNSF yard in Interbay • Construction associated with the tunnel could affect local freight access • Tunnel avoids in-water columns in Salmon Bay and impacts on Fishermen's Terminal • Construction of the tunnel Ballard Station would occur beneath 20th Avenue NW straddling NW Market Street which is a Major Freight Route; construction of the station could have temporary impact to freight movement on NW Market Street
	Business and commerce effects	Medium • Could have a moderate amount of business displacements, the majority of which would be industrial or light-industrial businesses in Interbay MIC • Potential construction period impacts, such as lane closures and access changes, to local businesses on or near 15th Avenue W, 16th Avenue W in Interbay; 17th Avenue W, 15th Avenue NW and NW Market Street in Ballard • Could displace small businesses in Interbay that are service-or light-industrial-oriented • Tunnel under Salmon Bay would avoid permanent maritime business impacts, including those at Fishermen's Terminal	Medium • Could have a moderate amount of business displacements, the majority of which would be industrial or light-industrial businesses in Interbay MIC • Potential construction period impacts, such as lane closures and access changes, to local businesses on or near 17th Avenue W in Interbay, 20th Avenue NW and NW Market Street in Ballard • Could displace small businesses in Interbay that are service-or light-industrial-oriented • Tunnel under Salmon Bay would avoid permanent maritime business impacts, including those at Fishermen's Terminal	Medium • Could have the least amount of business displacements, the majority of which would be industrial or light-industrial businesses in Interbay MIC • Potential construction period impacts, such as lane closures and access changes, to local businesses on or near 17th Avenue W in Interbay, 20th Avenue NW and NW Market Street in Ballard • Could displace small businesses in Interbay that are service-or light-industrial-oriented • Tunnel under Salmon Bay would avoid permanent maritime business impacts, including those at Fishermen's Terminal

NOTES:
1. Minority population is defined in US Department of Transportation Updated Environmental Justice Order 5610.2(a) as persons belonging to any of the following groups: Black, Hispanic, Asian American, and American Indian and Alaska Native

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