To:	Jason Hampton, Sound Transit
From:	HNTB
Prepared by:	Seth Gallant, Mariel Kirschen, and Maryam Hakimian
Date:	January 24, 2023
Re:	West Seattle Extension Further Studies

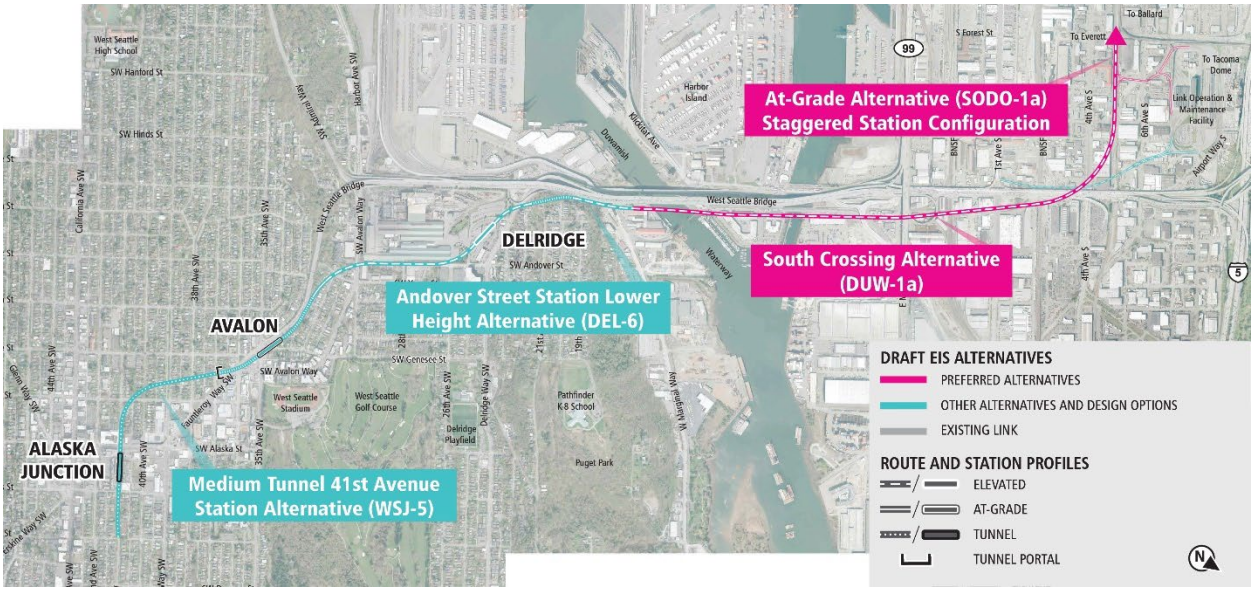
INTRODUCTION

On July 28th, 2022, the Sound Transit Board modified the Preferred Alternative (PA) for the West Seattle Extension (Figure 1) and defined it as:

- *Medium Tunnel 41st Avenue Station Alternative (WSJ-5)* in the West Seattle Junction segment
- *Andover Street Station Lower Height Alternative (DEL-6)* in the Delridge segment
- *South Crossing Alternative (DUW-1a)* in the Duwamish Segment
- *At-Grade Alternative (SODO-1a)* Staggered Station Configuration in the SODO segment

On the same date, in Motion M2022-57 detailed below, the Board requested further studies in some areas to inform potential refinements. This memo focuses on the results of the further studies for the West Seattle Link Extension.

Figure 1 Board Identified Preferred Alternative – West Seattle Extension



Board Direction

Board Motion M2022-57 directed further study of the following in the West Seattle Extension to enhance station access, prioritize an integrated and well-designed transfer experience from buses to light rail, and address concerns over potential displacements of organizations serving low-income and communities of color (Figure 2):

- In the West Seattle Junction segment, explore options to shift a station entrance to 42nd at the Alaska Junction station.
- In the Delridge segment, explore opportunities to provide access north and south of Andover Street at the Delridge station including a pedestrian bridge across Andover Street or shifting the alignment south towards SW Yancy Street west of the station.
- In the SODO segment, explore opportunities to enhance access from the platform to S. Lander Street at the SODO station.

Additionally, the Board directed further study of the following potential cost saving concept:

- In the West Seattle Junction segment, eliminate the Avalon station.

Figure 2 West Seattle Extension Further Studies

Further Study Concepts

To address the Board direction and community input, the project team identified the following four concepts for further study:

1. Alaska Junction Station Access Refinement
2. Delridge Access, Integration, and Alignment Refinement
3. Eliminate Avalon Station
4. SODO Access to S Lander Street

Summary

Figure 3 summarizes the key results of the further studies for the West Seattle Extension. More details about these results can be found in the body of this memo. Costs are shown as a change from the Sound Transit 3 Plan as represented in the realigned financial plan.

Figure 3 Summary of West Seattle Extension Further Study Results

Concept	Study Focus	Key Results	Cost Delta from realigned financial plan (in $2019)
Alaska Junction Station Access Refinement compared to WSJ-5	Improve station access from California Avenue SW	It is possible to locate a station entrance at 42nd Avenue SW, with these implications: • Passengers do not need to cross 41st Avenue SW to access California Avenue SW • Net change of 39 fewer residential displacements and 32 additional business displacements • Greater opportunity for agency-led equitable TOD resulting in upwards of 600 units of housing under current zoning across all sites (90 more than WSJ-5)	**+$81 million**
Delridge Access, Integration, and Alignment Refinement compared to DEL-6	Improve station access and transit integration and reduce effects to organizations serving low-income and communities of colors	Shifting the alignment south towards SW Yancy Street would have the following implications: • Direct bus-light rail transfer with stops adjacent to station entrance • Eliminates potential conflicts between Nucor Steel trucks and passengers transferring between buses and light rail • Lowers height of Delridge Station by about 15 feet • New signal at 23rd Avenue SW and Delridge Way SW • Permanent closure of 32nd Avenue SW by creating two cul-de-sacs • Results in 14 fewer residential and 3 additional business displacements • Reduced property effects to Transitional Resources • Columns in the riparian management area and 100-year floodplain of Longfellow Creek	**+$53 million**
Eliminate Avalon Station compared to WSJ-5 connected to DEL-6	Explore eliminating station as potential cost savings opportunity	Eliminating Avalon Station would result in the following: • Longer travel times for light rail passengers from the area around the Avalon Station location. No expected decrease in West Seattle ridership • 48 fewer residential displacements and 3 fewer business displacements • Reduces full and partial roadway closures of 35th Avenue SW south and Fauntleroy Way SW during construction • Avoids permanent closure of SW Genesee Street at 35th Avenue SW	**-$31 million** (with Delridge, Access, Integration, and Alignment Refinement) or **estimated -$80 million** (does not include additional cost of Delridge Access, Integration and Alignment Refinement)

SODO Access to S Lander Street compared to SODO-1a Staggered	Improve station access to S Lander Street overpass and minimize property effects west of the station	It is possible to enhance access to S Lander Street overcrossing with the following implications: • Direct access to S Lander Street from the station • Minimizes property effects west of the station • Increased distance for people walking and biking to the station from the northwest or transferring from buses on 4th Avenue S • No level access from west of the station for people with disabilities	**No increase or decrease**

WEST SEATTLE EXTENSION FURTHER STUDIES RESULTS

This section of the memo defines each of the concepts, outlines the scope of study, and presents the results for each of the West Seattle Extension further studies.

Alaska Junction Station Access Refinement

Objective

The Board directed the project team to improve the passenger experience of accessing Alaska Junction Station in WSJ-5 by shifting a station entrance one block west from 41st Avenue SW to 42nd Avenue SW. Adding an entrance closer to California Avenue SW, a main commercial street in the heart of the Alaska Junction neighborhood and a primary north-south transit corridor, increases visibility and reduces the number of street crossings for passengers approaching the station from the west.

Definition of Concept

The project team defined the *Alaska Junction Station Access Refinement* concept as a refinement to WSJ-5 (Figure 4). In the concept, the entrance south of SW Alaska St is shifted from the east to west of 41st Avenue SW, with a station entrance located between 41st Avenue SW and 42nd Avenue SW (Figure 5).

Figure 4 **Draft EIS WSJ-5 Station Plan**

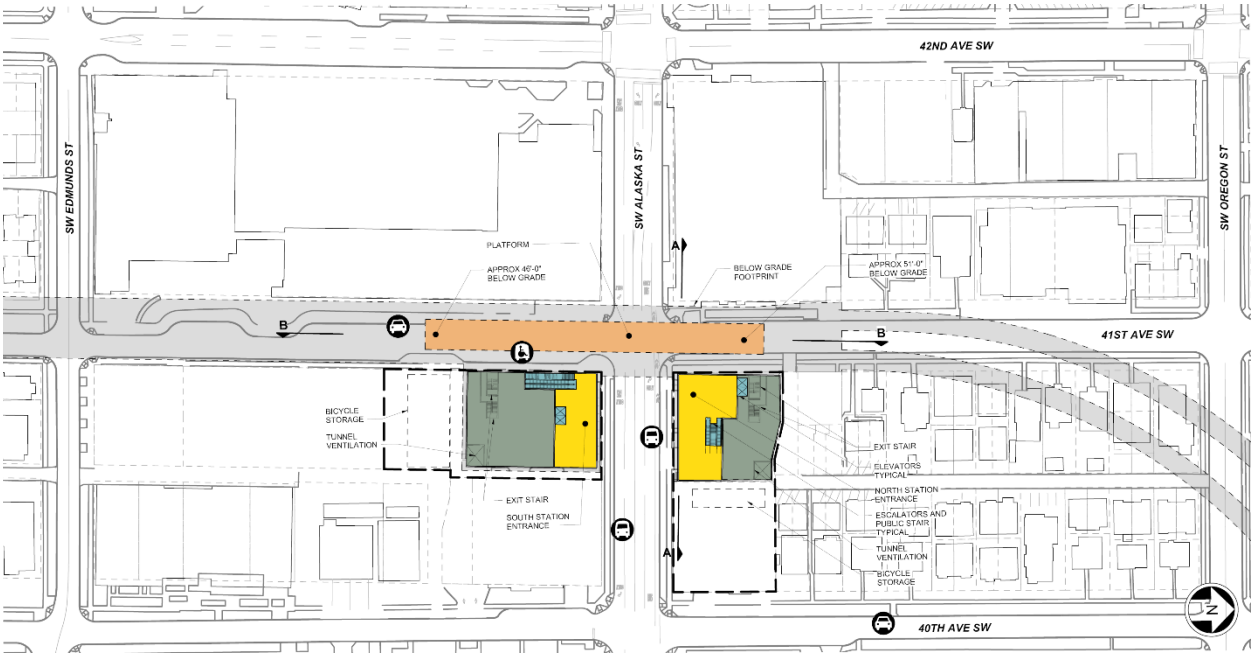
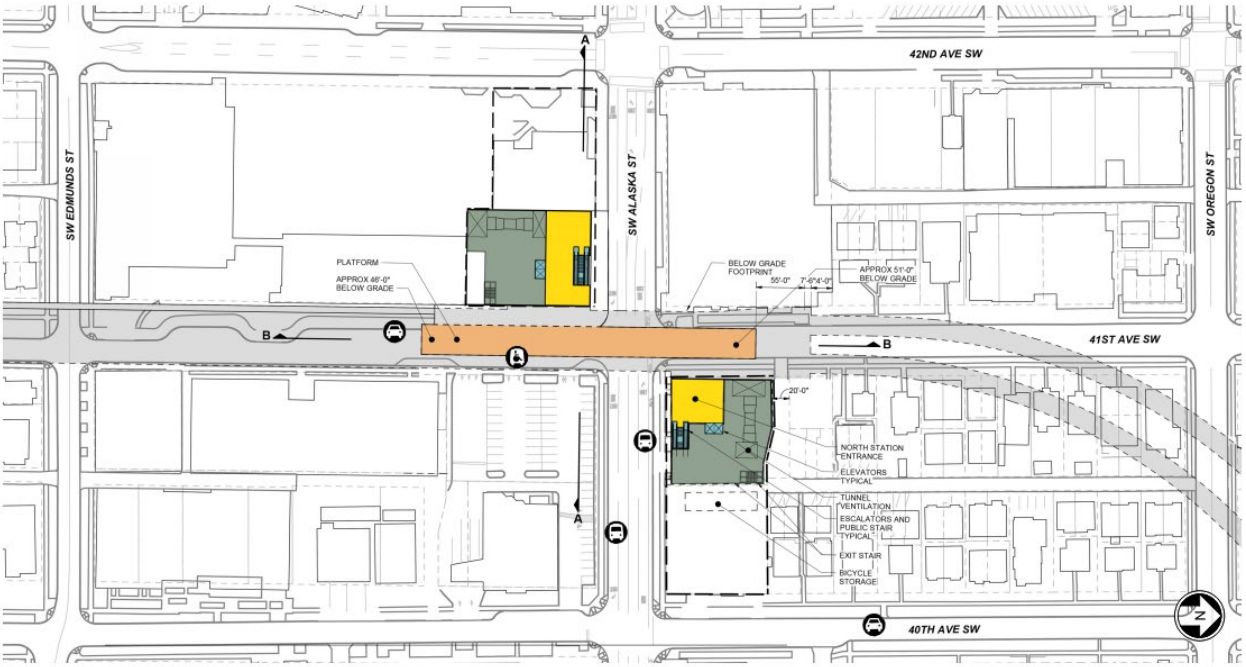


Figure 5 **Alaska Junction Station Access Refinement Station Plan**



Study Results

This section summarizes how the *Alaska Junction Station Access Refinement* concept meets the study focus, as well as other implications such as changes to property acquisition and displacements, development opportunity, and cost. The results in this section are expressed as comparisons to WSJ-5, unless otherwise noted.

Study focus: Improve station access

The *Alaska Junction Station Access Refinement* concept reduces the travel time needed to access the station entrance for passengers approaching from California Avenue SW and transferring from north-south bus routes.

Other Implications

Property acquisition and displacements

The *Alaska Junction Station Access Refinement* concept results in full acquisition of the Jefferson Square property, bounded by SW Alaska Street, 41st Avenue SW, 42nd Avenue SW, and SW Edmunds Street, and reduced property acquisition east of 41st Avenue SW, south of SW Alaska Street. This results in a net change of 39 fewer residential displacements and 32 additional business displacements.

Development opportunity

The full acquisition of the Jefferson Square property increases the opportunity for agency-led equitable transit-oriented development (eTOD) for WSJ-5. This provides the opportunity for development of a large contiguous site with 90 additional potential residential units, compared to WSJ-5.

Cost

The *Alaska Junction Station Access Refinement* concept has the potential to increase the cost from the realigned financial plan (including WSJ-5) by about $81 million. Figure 6 shows a breakdown of the changes in cost for the concept. The primary cost driver is the increase in cost of property acquisitions.

Figure 6 Alaska Junction Station Access Refinement Cost Implications

Cost Category	Alaska Junction Station Access Refinement Cost Implications *(in 2019$ millions)*
Construction	**+0**
Property Acquisitions	**+76**
Professional Services	**+5**
Unallocated Contingency	**0**
Cost delta compared to realigned financial plan	**+81**

Delridge Access, Integration, and Alignment Refinement

Objective

The Board directed the project team to improve the passenger access to station and transit integration of the Delridge Station in DEL-6 by reducing or avoiding conflicts between transit passengers and freight trucks. Delridge Station will be a key connection point for bus riders transferring from communities to the south with higher percentages of people of color and low-income than the areas around the station.[1] Due to the expected high volume of bus-light rail transfers, the station design should facilitate a streamlined transfer experience. Additionally, the project team further refined the alternative to minimize property effects to Transitional Resources, a behavioral health services and supportive housing organization.

Definition of Concept

The *Delridge Access, Integration, and Alignment Refinement* concept shifts the station to the southwest, adds a roadway to accommodate bus and paratransit stops close to a station entrance, and adds a roadway to separate Nucor Steel truck traffic from the transit passenger pathways.

This concept adds a new intersection and signal at Delridge Way SW and 23rd Avenue SW. Trucks and other traffic accessing Nucor would utilize this new intersection. Buses would enter the site at the existing SW Charlestown Street access from SW Andover Street, which would no longer be used by trucks. Buses would serve the station at stops located adjacent to the station entrance on a roadway separated from trucks accessing Nucor. Buses would then exit the site using the same new roadway that would be used by trucks accessing Nucor.

Figure 7 shows the draft circulation plan for this concept. The project team is coordinating closely with the City of Seattle and King County Metro to evaluate multiple scenarios and develop an agreed-upon preferred concept. It should be noted that the concept does not include a pedestrian overpass, as suggested by the Board motion. The bus stops on SW Andover Street are shifted onto the station site and trucks are served by a separate roadway. This eliminates the need for pedestrians to cross at SW Andover Street when transferring between bus and light rail which reduces pedestrian and cyclist conflicts with freight movement.

To facilitate these station refinements, the project team shifted the light rail alignment to the south between SW Andover Street and SW Yancy Street. Where the alignment crosses 32nd Avenue SW, the guideway transitions to an at-grade section and requires the closure of 32nd Avenue SW. Figure 8 shows a map of the alignment for the *Delridge Access, Integration, and Alignment Refinement* concept.

In summary, the concept includes the following elements:

- Delridge Station shifted to the southwest from the DEL-6 station location.
- New internal access roadway for bus access that separates passenger loading from truck traffic.
- New intersection and signal at Delridge Way SW and 23rd Avenue SW.

[1] Racial Equity Toolkit Report: Environmental Review Phase, Section 1.6, July 2022

- Track guideway shifted south between 26th Avenue SW and SW Avalon Way.
- Permanent closure of a portion of 32nd Avenue SW with two cul-de-sacs built on either end. The north cul-de-sac is accessible from SW Andover Street. The south cul-de-sac is accessible from SW Genesee Street.
- The guideway crosses Longfellow Creek at the daylighted portion rather than the piped portion with columns within the riparian corridor. The project team is coordinating closely with the Seattle Public Utilities (SPU) and Seattle Department of Construction and Inspections (SDCI) to evaluate multiple scenarios to minimize effects to the riparian corridor and floodplain.

Figure 7 Delridge Access, Integration, and Alignment Refinement Circulation Plan

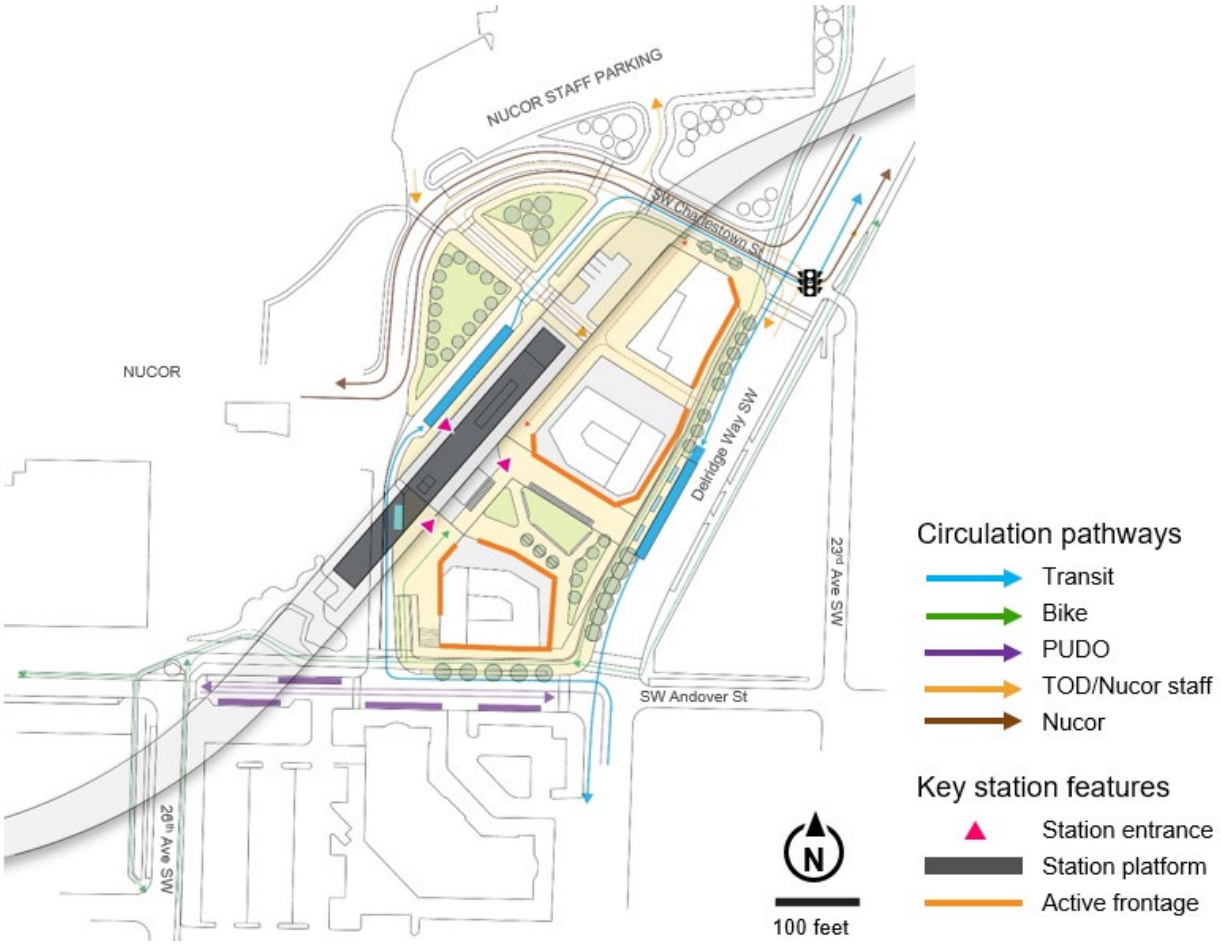
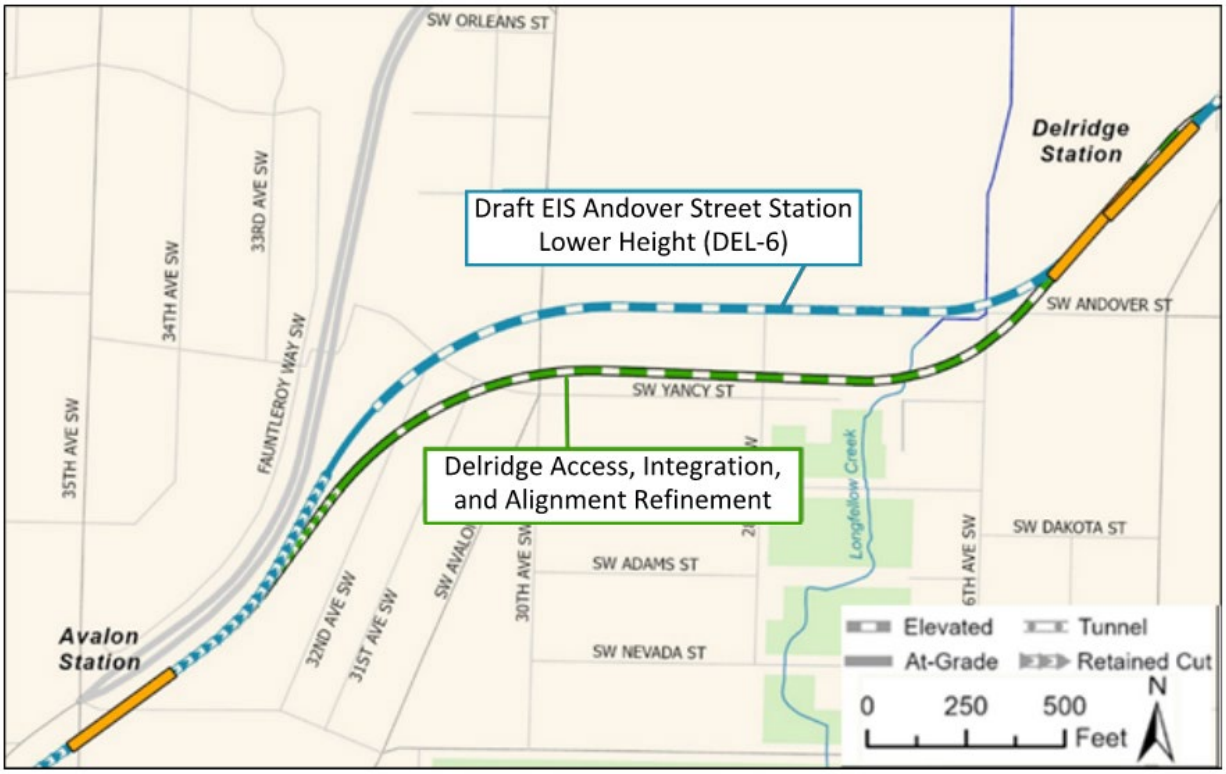


Figure 8 Delridge Access, Integration, and Alignment Refinement Map



Study Results

This section summarizes how the *Delridge Access, Integration, and Alignment Refinement* concept meets the study focus, as well as other implications such as traffic and transit effects, property acquisitions and displacements, effects to Longfellow Creek, and cost. The results in this section are expressed as comparisons to DEL-6, unless otherwise noted.

Study focus: Improve station access and transit integration

The concept achieves the study objective of facilitating streamlined bus-light rail transfers by positioning bus stops adjacent to the light rail station entrance. DEL-6 assumed bus loading zones on both sides of SW Andover Street, requiring people transferring between buses and light rail to cross SW Andover Street at street level in the vicinity of the main access point for trucks serving Nucor Steel. This refinement eliminates the need for light rail passengers transferring from buses to cross SW Andover Street and removes conflicts between people walking and biking to the station and freight movement. Additionally, the refinement lowers the station height by about 15 feet, reducing the time needed for passengers to access the station from ground level. These changes improve the transfer experience for passengers traveling to and from communities to the south of the station, with higher percentages of people of color and low-income people.

Study focus: Reduce effects to organizations serving low-income and communities of colors

The concept avoids two Transitional Resources buildings on the west side of SW Avalon Way at SW Andover Street, which include multiple residential units and outpatient behavioral health offices. The concept avoids 31 units of housing but does affect a different Transitional Resources property that provides housing for five people. These units could be more easily relocated than those affected by DEL-6.

Other Implications

Traffic and transit effects

The project team evaluated the traffic implications of adding a new signal at 23rd Avenue SW and Delridge Way SW. A new signal at this location is not expected to affect roadway safety for southbound traffic exiting from the West Seattle Bridge onto Delridge Way SW. Additionally, in the afternoon peak period when southbound volumes are highest, the new traffic signal is not expected to result in a queue beyond what would occur without the new signal. This result is in part due to the existing signal at SW Andover Street and Delridge Way SW. The project team is currently evaluating circulation options to minimize bus travel times on Delridge Way SW, while still providing a direct connection to the station entrance. This work will be completed in the preliminary engineering (PE) and final design phases of the project.

The creation of a cul-de-sac at 32nd Avenue SW is not expected to have implications to traffic. The block of 32nd Avenue SW that would be affected is a low volume local residential street. Some properties on the east side of the street may also be able to continue to access their properties from the alley. Additionally, emergency vehicles may have a longer route to access some properties. Design treatments for the cul-de-sacs and parking restrictions may need to be considered to accommodate adequate emergency access.

Property acquisitions and displacements

Overall, the concept results in 14 fewer residential displacements and 3 more business displacements.

Effects to Longfellow Creek

The changes to the orientation of Delridge Station result in a new elevated track alignment that crosses a daylighted portion of the creek, rather than the piped portion crossed by DEL-6, with columns within the riparian management corridor and 100-year FEMA floodplain. This new alignment will therefore require additional regulatory approvals from federal and state agencies as well as the City. The project team is coordinating closely with the City of Seattle SPU and SDCI to evaluate multiple scenarios to minimize effects to riparian corridor and floodplain.

Cost

The *Delridge Access, Integration, and Alignment Refinement* concept has the potential to increase the cost from the realigned financial plan (including DEL-6) by about $53 million. Figure 9 shows a breakdown of the changes in cost for the concept. The primary cost drivers for the increase include:

- Lower height of the guideway
- Changes to property acquisition
- Additional civil and roadway engineering on the station site and refined station access
- Additional transit priority treatments

Figure 9 Delridge Access, Integration, and Alignment Refinement Cost Implications

Cost Category	Delridge Access, Integration and Alignment Refinement Cost Implications *(in 2019$ millions)*
Construction	**-23**
Property Acquisitions	**+82**
Professional Services	**-3**
Unallocated Contingency	**-2**
Cost delta compared to realigned financial plan	**+53**

Eliminate Avalon Station

Objective

The Sound Transit Board motion directed the project team to study the potential cost savings of eliminating Avalon Station.

Definition of Concept

The *Eliminate Avalon Station* concept was defined as a refinement to WSJ-5 and DEL-6. The concept includes the following elements:

- Connection to *Delridge Access, Integration, and Alignment Refinement* concept
- Elimination of Avalon Station
- Relocated tunnel portal from south of SW Genesee Street and east of 37th Ave SW to the vicinity of SW Andover Street, east of the West Seattle Bridge
- Realigned tunnel that continues west from the tunnel portal and turns south to align with 41st Avenue SW

Figure 10 shows the refined alignment for the Eliminate Avalon Station concept.

Figure 10 Eliminate Avalon Station Alignment Map

Study Results

This section summarizes the potential cost savings from the *Eliminate Avalon Station* concept, as well as other implications such as passenger experience and station access, property acquisitions and displacements, construction, and street right-of-way (ROW). The results in this section are expressed as comparisons to WSJ-5 and DEL-6, unless otherwise noted.

Study focus: Cost savings

The *Eliminate Avalon Station* concept, including the *Delridge Access, Integration, and Alignment Refinement*, has the potential to lower the cost from the realigned financial plan (including WSJ-5 and DEL-6) by about $31 million. Figure 11shows a breakdown of the changes in cost for the concept. The primary cost drivers for the reduction include:

- Elimination of Avalon Station
- Reduction in properties affected

Figure 11 Eliminate Avalon Station Cost Implications

Cost Category	Eliminate Avalon Station Cost Implications *(in 2019$ millions)*
Construction	**-19**
Property Acquisitions	**-3**
Professional Services	**-7**
Unallocated Contingency	**-2**
Cost delta compared to realigned financial plan (including Delridge Access, Integration and Alignment Refinement)	**-31**
Estimated cost delta compared to realigned financial plan (does not include additional cost of Delridge Access, Integration and Alignment Refinement)	**-80**

Other Implications

Passenger experience and station access

The *Eliminate Avalon Station* concept results in longer travel times for passengers taking light rail from the area around the WSJ-5 Avalon Station location. These passengers could walk, bike, or take transit to the Alaska Junction or Delridge Stations. Alaska Junction Station is located uphill from the Avalon Station location, while Delridge Station is located downhill. Bus routes that would have connected to Avalon Station would be reconfigured to connect to Alaska Junction or Delridge stations, so bus access to Link stations may take longer for some riders.

The analysis shows that the elimination of Avalon Station would not result in a reduction in ridership on the West Seattle Extension. In 2042, the Extension would serve a similar number of trips as WSJ-5 due to an anticipated ridership increase at Alaska Junction Station. Any ridership

increase is not expected to result in additional substantive traffic effects as most of the additional trips would come from people walking, biking, or transferring from buses.

Property acquisition and displacements

Overall, this concept results in approximately 48 fewer residential displacements, and 3 fewer business displacements.

Construction effects

The concept eliminates the need for a one-year full closure of 35th Avenue SW south of SW Genesee Street and a one-and-a-half-year partial closure of Fauntleroy Way SW at SW Avalon Way during construction.

Street ROW effects

The concept results in the following street ROW effects:

- Avoids permanent closure of SW Genesee Street at 35th Avenue SW
- Additional permanent roadway closures for a tunnel portal in the vicinity of SW Andover Street and 32nd Avenue SW

SODO Access to S Lander Street

Objective

The Board directed the project team to improve the passenger experience of accessing SODO Station in *SODO-1a Staggered Station Configuration* by adding a direct pedestrian connection between the station and the Lander Street overpass. Additionally, in response to stakeholder comments, the project team further refined the concept to minimize property effects to properties on the west side of the station.

Definition of Concept

The *SODO Station Access to S Lander Street* concept was defined as a refinement to *SODO-1a Staggered Station Configuration*. The concept includes:

- Extending the passenger concourse towards S Lander Street, with a pedestrian bridge connection to the to-be-constructed Lander Street overpass from the station entrance.
- A multi-use path on the north side of the bridge that meets Americans with Disabilities Act (ADA) requirements. The project team is coordinating closely with the City of Seattle to evaluate different scenarios and to develop an agreed-upon preferred concept.
- Removal of the station entrance from 4th Avenue S in SODO-1a Staggered Configuration to reduce property effects on the west side of the station. The only access to the station from 4th Avenue S would be via the Lander Street overpass and the new access connection.
- Shifting the northbound and southbound bus stops from S Stacy Street to S Lander Street on 4th Avenue S

Figure 12 shows the SODO-1a Station Plan, as included in the Draft EIS. Figure 13 shows the station plan for the SODO Access to S Lander Street concept while Figure 14 shows the cross section of the station

Figure 12 Draft EIS SODO-1a Staggered Station Configuration Plan (Platform Plan)

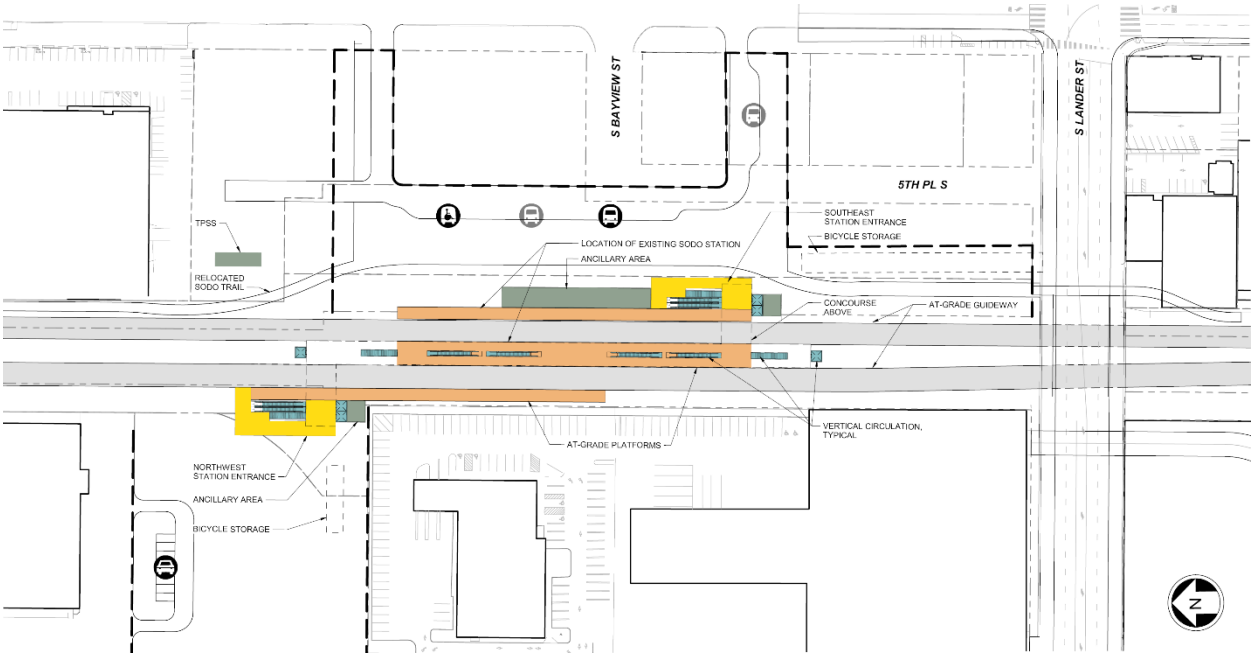


Figure 13 SODO Access to S Lander Street Station Plan (Platform Plan)

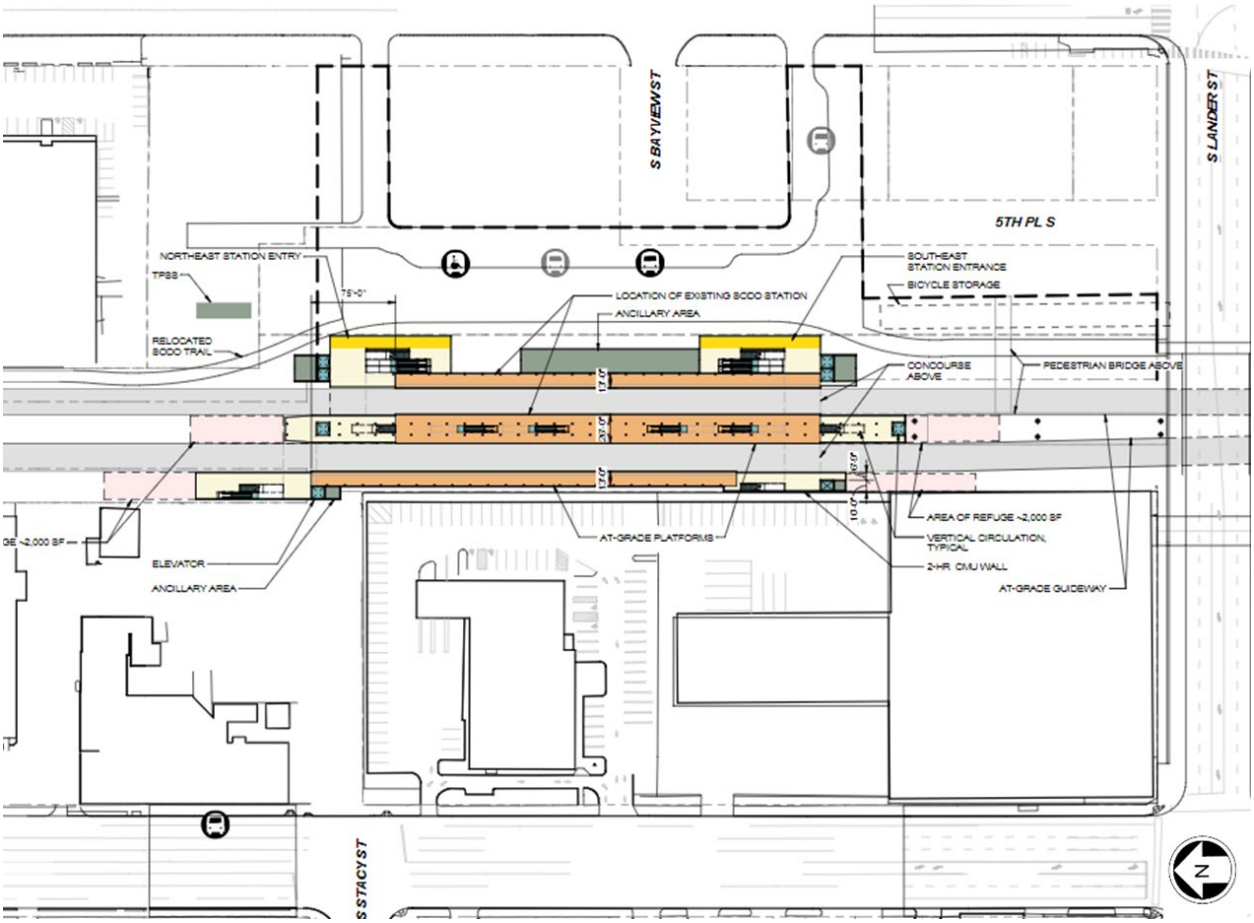
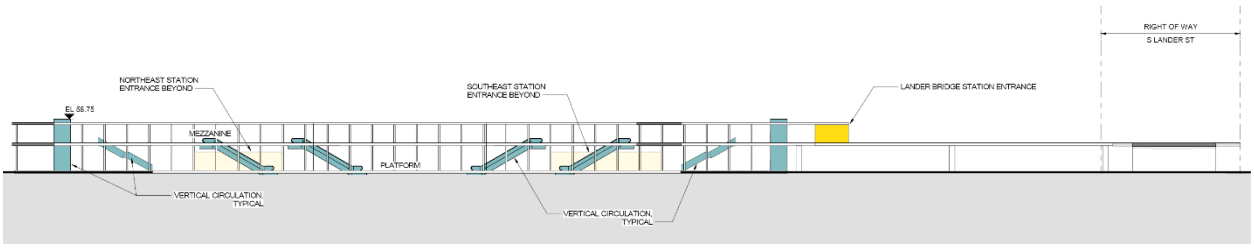


Figure 14 SODO Access to S Lander Street Station Section



Study Results

This section summarizes how the *SODO Station Access to S Lander Street* concept meets the study focus, as well as other implications such as station access, passenger experience, and cost. The results in this section are expressed as comparisons to SODO-1a Staggered Configuration, unless otherwise noted.

Study focus: Improve station access

The *SODO Station Access to S Lander Street* concept meets the study objective of providing direct station access to the Lander Street Overpass. This connection provides access to the station for passengers approaching Lander Street from either the east or west. Bus zones, pick-up/drop-off zones, and pedestrian and bike connections are also located on the east side of the station connecting to 6th Avenue S.

Study focus: Minimize property effects

This concept minimizes effects to the properties on the west side by eliminating station access from the west side of the station at S Stacy Street.

Other Implications

Passenger experience

This concept results in the following effects to the experience of passengers accessing SODO Station:

- Less direct pathways for passengers traveling from the north. The elimination of the entrance from 4th Avenue S at S Stacy Street requires passengers from 4th Avenue S, north of S Lander Street to walk out-of-direction to get to the S Lander Street station entrance.
- Less direct pathways for passengers traveling from the west and transferring from bus routes on 4th Avenue S to light rail. Without the western entrance at S Stacy Street, passengers accessing the station from destinations to the west of the station or from the bus stops at 4th Avenue S and S Lander Street must climb the slope of the multi-use path on the north side of the Lander Street overpass and enter the station using elevators, escalators, or stairs.

To ensure accessibility of the Lander Street overpass, the project team is coordinating closely with the City of Seattle to evaluate multiple scenarios for the design.

Cost

The concept would not result in a substantial change to the cost of SODO-1a Staggered Configuration.