6 ALTERNATIVES EVALUATION

This chapter evaluates how the West Seattle and Ballard Link Extensions (WSBLE) alternatives would meet the project's purpose and need, and it summarizes the benefits and impacts of each alternative. It also summarizes potential significant impacts that might not be fully mitigated. These extensions are part of several light rail extensions to Sound Transit's Link light rail system that are in the planning, design, or construction phases. Collectively, the system benefits would be greater than those of the individual projects; several system-wide benefits are described in Section 6.1, Meeting the Purpose and Need for WSBLE.

6.1 Meeting the Purpose and Need for WSBLE

The purpose of the WSBLE Project is to expand the Sound Transit Link light rail system from Downtown Seattle to West Seattle and Ballard, to make appropriate community investments to improve mobility, and to increase capacity and connectivity for regional connections (see Chapter 1, Purpose and Need for West Seattle and Ballard Link Extensions, for additional information). All WSBLE Build Alternatives would meet this purpose by improving transit mobility and access to regional activity centers and advancing implementation of local and regional land use and transportation plans. The following sections summarize how the WSBLE would meet the six need statements presented in Section 1.2.2, Need for the WSBLE Project. The No Build Alternative would not meet the purpose and need for the project.

6.1.1 Need #1: Increasing Roadway Congestion will Further Degrade Transit Performance and Reliability

The King County Metro (Metro) RapidRide C Line between Westlake Station and the West Seattle Junction (Fauntleroy Way Southwest and Southwest Alaska Street) currently takes an average of 22 minutes during the peak periods. Increasing congestion on surface streets in the West Seattle Link Extension study area would increase peak transit travel times to 30 minutes on average in 2042 with the No Build Alternative. The Build Alternatives would provide service between these points in 16 minutes. Similarly, the RapidRide D Line route between Ballard and Downtown Seattle (Westlake Station) currently takes an average of 30 minutes during peak periods but would increase to 40 minutes in 2042 with the No Build Alternative. The Build Alternatives would provide service between these points in 11 minutes. In addition, most bus routes in the study area for both extensions would fail to meet Metro's evaluation threshold of 80 percent on-time trips. In comparison, light rail would provide higher reliability because it would operate in exclusive right-of-way.

6.1.2 Need #2: Downtown Seattle Transit Tunnel Capacity Constraints

The WSBLE Project includes a new Downtown Seattle transit tunnel as part of the Ballard Link Extension. This is consistent with the operating assumptions in the Sound Transit 3 Plan, which included routing the Link light rail extensions to Ballard, Federal Way, and Tacoma Dome through a new downtown tunnel. Extensions to West Seattle, Redmond, Lynnwood, and Everett would use the existing Downtown Seattle Transit Tunnel. The new tunnel would provide additional capacity by distributing passengers and trains in two downtown tunnels. This

approach also splits lengthy future trips from Everett and Tacoma in Downtown Seattle, which would improve system reliability.

6.1.3 Need #3: Regional and Local Plans Call for High-Capacity Transit

All of the WSBLE Build Alternatives would help realize plans for high-capacity transit in the WSBLE corridor that regional and local agencies have had for almost 40 years. Puget Sound Regional Council, City of Seattle, and Sound Transit plans all include high-capacity transit in the WSBLE Project corridor, and the Sound Transit 3 plan includes funding for this project.

6.1.4 Need #4: Long-term Regional Mobility and Multi-modal Connectivity for the Region's Citizens and Communities, Including Transit-Dependent Residents, Low-Income People, and Communities of Color

All of the WSBLE Build Alternatives would provide convenient, frequent transit service for 20 hours a day with reliable access to many regional destinations. They would provide greater transit connectivity for transit-dependent populations throughout the Sound Transit system than is available today or would be available under the No Build Alternative.

By improving the overall system capacity (see Need #2) and reach, the WSBLE Build Alternatives would benefit transit-dependent populations and allow regional residents who live in more affordable areas to access employment opportunities in the region's designated growth centers. The project would provide access to more growth centers on the Link system and make that access more frequent and reliable, and would reduce the transportation cost burden on disadvantaged populations that commute to these growth centers for work or school or that need to access public services available in the study area.

6.1.5 Need #5: Increased Density at High-Capacity Transit Stations and Increased Multi-modal Access

All of the WSBLE Build Alternatives would help realize regional and local plans for high-capacity transit in the project corridor as described in Section 1.2.2.3, Regional and Local Plans Call for High-Capacity Transit. Regional and local plans, including the Seattle Comprehensive Plan (City of Seattle 2018), the METRO CONNECTS plan (Metro 2016), and VISION 2050 (Puget Sound Regional Council 2020) also call for increased residential and/or employment density at and around high-capacity-transit stations, and increased options for multi-modal access (see Section 1.2.2.5, Increased Density at High-Capacity-Transit Stations and Increased Multi-modal Access).

All WSBLE Build Alternatives would connect the same regional and city-designated growth centers and would improve multi-modal access with integration with other transit modes and improvements to non-motorized access.

6.1.6 Need #6: State and Regional Environmental and Sustainability Goals

The WSBLE Project would reduce vehicle miles traveled by approximately 115,000 miles per weekday by 2042, which would reduce vehicle emissions generated in the study area. Section 6.2, Comparison of Alternatives, describes how environmental and other impacts vary among the different Build Alternatives and identifies key trade-offs.

6.2 Comparison of Alternatives

All WSBLE Build Alternatives would meet the purpose and need of the project. This section focuses on trade-offs among the WSBLE alternatives in meeting the purpose and need. It describes the key benefits and impacts associated with each alternative and how they compare to other WSBLE alternatives. Tables summarize each Build Alternative's projected ridership and key differentiating impacts. Section 6.2.2.3, Capital Costs, describes the estimated project costs of each Build Alternative.

6.2.1 No Build Alternative

Under the No Build Alternative, the WSBLE Project would not be built and there would be no new high-capacity transit in the project corridor. Congestion on surface streets would continue to affect transit travel time and reliability, and access to regional and city-designated growth centers would not improve.

This increase in vehicle miles traveled would also result in higher greenhouse gas emissions in comparison to the Build Alternatives. However, there would not be the project's temporary disruptions to traffic nor its permanent impacts (such as displacements, visual changes, and to ecosystems and historic resources).

6.2.2 Build Alternatives

6.2.2.1 West Seattle Link Extension

6.2.2.1.1 SODO Segment

Performance and impacts related to this segment are provided here for both the West Seattle Link Extension and Ballard Link Extension. This allows a comparison of this segment's alternatives as a whole and captures the combined impacts in this segment for both Link extensions. As shown in Table 6-1, all of the SODO Segment alternatives would have the same projected ridership.

Key differences in impacts, including construction road closure durations, among the alternatives are shown in Table 6-1. Preferred Alternative SODO-1a and Option SODO-1b would both include a new Lander Street overpass, which would reduce the delays for vehicles in this area but would also have more traffic impacts during construction. Option SODO-1b and Alternative SODO-2 would both require relocating the United States Postal Service Carrier Annex and Distribution Center/Terminal Post Office, while Preferred Alternative SODO-1a would acquire part of this facility (a portion of the surface parking), which the United States Postal Service has indicated would require relocating the facility. Relocating the facility could be

challenging due to its size, functions, and the service area that it would need to be within. Impacts of relocating the United States Postal Service facility are yet undefined, and should an alternative that triggers relocation of the facility move forward, additional environmental review will be conducted to evaluate and disclose impacts of relocating the facility. The staggered station configuration for Preferred Alternative SODO-1a would avoid permanent impacts (i.e., operation and maintenance) to the United States Postal Service facility. Accordingly, this station configuration would not require relocating the facility.

All alternatives include a full closure of the existing Link light rail tracks between the SODO and International District/Chinatown stations for 6 to 7 weeks during construction when connecting to Alternative CID-1a*. When connected with other alternatives in the Chinatown-International District Segment, there would be intermittent periods of single-track operation and closures during nights and weekends.

Table 6-1. Projected Ridership and Key Impact Differences – SODO Segment

Resource Impact Measure	Preferred At-Grade Alternative (SODO-1a) and Stagged Station Configuration [a]	At-Grade South Station Option (SODO-1b) [a]	Mixed Profile Alternative (SODO-2) [a]
Ridership (daily boardings) [b]	14,600	14,600	14,600
Transportation Impacts [b]	• Operational (long-term) benefit from eliminating existing at-grade conflicts at South Lander Street and South Holgate Street, reducing delays for all vehicles. • Permanent closure of SODO Busway, buses relocated to adjacent streets. • Full closures of South Lander Street (for 2 years) and South Holgate Street (for 2 to 3 years) during construction.	• Operational (long-term) benefit from eliminating existing at-grade conflicts at South Lander Street and South Holgate Street, reducing delays for all vehicles. • Permanent closure of SODO Busway, buses relocated to adjacent streets. • Full closures of South Lander Street (for 3 years) and South Holgate Street (for 2 to 3 years) during construction.	• Operational (long-term) benefit from eliminating existing at-grade conflicts at South Holgate Street, reducing delays for all vehicles. • Existing at-grade crossing at South Lander Street would remain. • Maintains SODO Busway but closed for up to 10 years during construction. • Full closure of South Lander Street temporarily on nights and weekends for guideway construction over the roadway. • Full closure of Holgate Street for 3 years during construction.
Potential Displacements	• Business: 19 to 32 [c] • Employees: 150 to 280 [c]	• Business: 17 to 29 • Employees: 150 to 240	• Business: 23 • Employees: 210

Resource Impact Measure	Preferred At-Grade Alternative (SODO-1a) and Stagged Station Configuration [a]	At-Grade South Station Option (SODO-1b) [a]	Mixed Profile Alternative (SODO-2) [a]
Public Service Impacts	• Long-term impacts to United States Postal Service Carrier Annex and Distribution Center/Terminal Post Office surface parking, which the United States Postal Service has indicated would require relocating the facility. Impacts of relocating the United States Postal Service facility are yet undefined, and should a configuration of this alternative trigger relocation of the facility move forward, additional environmental review will be conducted to evaluate and disclose impacts of relocating the facility. • Staggered station configuration has no long-term impacts to United States Postal Service Carrier Annex and Distribution Center/Terminal Post Office and would not require relocating the facility. • Staggered station configuration would provide a new driveway from the southern access point of the United States Postal Service facility under the new South Lander Street Overpass to 4th Avenue South.	• Operational (long-term) relocating United States Postal Service Carrier Annex and Distribution Center/ Terminal Post Office. Impacts of relocating the United States Postal Service facility are yet undefined, and should this alternative trigger relocation of the facility move forward, additional environmental review will be conducted to evaluate and disclose impacts of relocating the facility.	• Operational (long-term) relocating United States Postal Service Carrier Annex and Distribution Center/Terminal Post Office. Impacts of relocating the United States Postal Service facility are yet undefined, and should this alternative trigger relocation of the facility move forward, additional environmental review will be conducted to evaluate and disclose impacts of relocating the facility.

[a] Ranges reflect differences from connecting to different alternatives in adjacent segments.

[b] Ridership numbers are for 2042 after the Ballard Link Extension is operational. The ridership is the total for the new and existing SODO stations.

[c] The range reflects the connection to the Chinatown-International District Segment and that the staggered station configuration would avoid relocation of the United States Postal Service facility.

6.2.2.1.2 Duwamish Segment

There would be no light rail station in the Duwamish Segment; therefore, no ridership is reported.

Key differences in impacts, including construction road closure durations, among this segment's alternatives are shown in Table 6-2. Preferred Alternative DUW-1a and Option DUW-1b would

affect the West Duwamish Greenbelt, a park and biodiversity area on Pigeon Point. The guideway along Pigeon Point would also remove trees in a great blue heron management area and result in visual impacts to residences in the Pigeon Point community. Preferred Alternative DUW-1a would also impact habitat enhancements that may occur at the City of Seattle's Bluefield Holdings/Wildlands Site 2. Alternative DUW-2 would avoid these impacts but could permanently impact the Port of Seattle's proposed habitat restoration site at Terminal 25 and would potentially require temporary relocation of parking and training facilities at Fire Station 14 during construction. Alternative DUW-2 and Option DUW-1b would adversely affect a similar number of historic resources, but Option DUW-1b would have adverse effects to two historic districts. Preferred Alternative DUW-1a has fewer adverse effects but would also have adverse effects to the two historic districts. Alternative DUW-2 would have partial road closures of Chelan Avenue Southwest west of the West Marginal Way/Spokane Street/Chelan Avenue intersection. During construction, increased traffic congestion is expected at this intersection, with short-term lane closures on Chelan Avenue Southwest; however, one lane in each direction would be maintained.

Table 6-2. Key Impact Differences – Duwamish Segment

Resource Impact Measure	Preferred South Crossing Alternative (DUW-1a) [a]	South Crossing South Edge Crossing Alignment Option (DUW-1b) [a]	North Crossing Alternative (DUW-2)
Transportation Impacts	• Detour of Delridge Connector Trail from Delridge Way Southwest to the West Seattle Bridge Trail during construction. • Closure of the staircase through the West Duwamish Greenbelt during construction. • Temporary closures of the BNSF railroad tracks east of East Marginal Way South during construction. • BNSF Railway Duwamish Waterway rail bridge could be temporarily affected by construction barges, cranes, and other heavy equipment. • During construction, netting and scaffolding would reduce the planned vertical clearance for 3 months in the East Waterway and 2 months in the West Waterway.	• Detour of Delridge Connector Trail from Delridge Way Southwest to the West Seattle Bridge Trail would be detoured during construction. • Closure of the staircase through the West Duwamish Greenbelt during construction. • Temporary closures of the BNSF railroad tracks east of East Marginal Way South during construction. • During construction, netting and scaffolding would reduce planned vertical clearance for 3 months in the East Waterway and 5 months in the West Waterway.	• Operational (long-term) reduction in the horizontal and vertical clearance of the United States Army Corps of Engineers-maintained navigation channel in the East Duwamish Waterway, just north of the existing restriction from the fixed Spokane Street Bridge. • Partial closure of Chelan Avenue Southwest west of West Marginal Way Southwest/Southwest Spokane Street for 3 months during construction. • Guideway column construction in the Terminal 18 employee parking lot, could encroach into the gate area, but is not expected to affect queue capacity or circulation. • During construction, netting and scaffolding would reduce vertical clearance for 6 months in the East Waterway and 1 month in the West Waterway.
Potential Displacements [b]	• Residential: 22 to 26 • Business: 35 to 36 • Employees: 670 to 680	• Residential: 23 to 26 • Business: 28 to 29 • Employees: 680 to 690	• Residential: 0 • Business: 38 • Employees: 400

Resource Impact Measure	Preferred South Crossing Alternative (DUW-1a) [a]	South Crossing South Edge Crossing Alignment Option (DUW-1b) [a]	North Crossing Alternative (DUW-2)
Length of Potential Operational Visual Impacts (miles)	0.1	• Similar to Preferred Alternative DUW-1a.	0
Historic Properties and Historic District with Adverse Effects [c]	• Spokane Street Manufacturing Historic District. • Pacific Forge Company/Bethlehem Steel Nut and Bolt Factory Historic District. • Four individual resources adversely affected (four removed, including two in Spokane Street Manufacturing Historic District).	• Spokane Street Manufacturing Historic District. • Pacific Forge Company/Bethlehem Steel Nut and Bolt Factory Historic District. • Five individual resources adversely affected (five removed, including three in Spokane Street Manufacturing Historic District).	• Nine resources adversely affected (six removed).
Ecosystem Impacts [d]	• Operational (long-term) impacts of 1.5 to 2.2 acres of biodiversity area. • Construction (temporary) impacts to 0.2 to 0.4 acre of biodiversity area. • Operational (long-term) impacts (tree removal) in great blue heron management area. • Operational (long-term) in-water (benthic surface) impacts of 0 to <0.1 acre. • Construction (temporary) in-water (benthic surface) impacts of 0 to 0.5 acre. • Approximately 600 feet of shoreline permanently impacted. • Approximately 400 feet of shoreline temporarily impacted.	• Operational (long-term) impacts to 1.9 acres of biodiversity area. • Construction (temporary) impacts to 0.6 acre of biodiversity area. • Operational (long-term) impacts (tree removal) in great blue heron management area. • Operational (long-term) in-water (benthic surface) impacts of <0.1 to 0.4 acre. • Construction (temporary) in-water (benthic surface) impacts of 0.6 to 1.0 acre. • Approximately 500 feet of shoreline permanently impacted. • Approximately 1,000 feet of shoreline temporarily impacted.	• No impacts to biodiversity areas. • No impacts to great blue heron management area. • Operational (long-term) potential impact to proposed restoration site. • Operational (long-term) in-water (benthic surface) impacts of 0 to 0.5 acre. • Construction (temporary) in-water (benthic surface) impacts of 0 to 0.9 acre. • Approximately 500 feet of shoreline permanently impacted. • Approximately 700 feet of shoreline temporarily impacted.
Public Service Impacts	• Operational (long-term) noise impact at Fire Station 14, but could be mitigated. • When connected with Alternative DEL-3 or Alternative DEL-4*, relocating Fire Station 36 during construction or potential permanent relocation.	• Operational (long-term) noise impact at Fire Station 14, but could be mitigated. • When connected with Alternative DEL-3 or Alternative DEL-4*, relocating Fire Station 36 during construction or potential permanent relocation.	• Operational (long-term) noise impact at Fire Station 14, but could be mitigated. • Potential relocation of parking and training facilities at Fire Station 14 during construction.

Resource Impact Measure	Preferred South Crossing Alternative (DUW-1a) [a]	South Crossing South Edge Crossing Alignment Option (DUW-1b) [a]	North Crossing Alternative (DUW-2)
Park and Recreational Resources Impacts (acres operational/ acres construction)	• Operational (long-term) and construction (temporary) impacts to Harbor Marina Corporate Center at Terminal 102 permanently; partial loss of access during construction (0.3/0.1). • Operational (long-term) and construction (temporary) impacts to West Duwamish Greenbelt, permanent and temporary loss of habitat and visual buffer (1.1 to 1.2/0.1 to 0.3). • 22nd Avenue Southwest Street-end permanently displaced (<0.1/0).	• Operational (long-term) and construction (temporary) impacts to Harbor Marina Corporate Center at Terminal 102 permanently; partial loss of access during construction (0.6/0.5). • Operational (long-term) and construction (temporary) impacts to West Duwamish Greenbelt, permanent and temporary loss of habitat and visual buffer (1.2 to 1.3/0.1 to 0.3). • 22nd Avenue Southwest Street-end permanently displaced (<0.1/0).	• No park impacts.

[a] Ranges reflect differences from connecting to different alternatives in adjacent segments.

[b] If constructed, the Ballard Link Extension-only Minimum Operable Segment (M.O.S.) would result in some of the impacts identified in this table, as follows: one business displacement with five employees, one noise impact (which can be mitigated), and adverse effects to two historic properties.

[c] Potentially adversely affected under Section 106 (to be confirmed through consultation with State Historic Preservation Officer).

[d] Sound Transit is reviewing the feasibility of bridge types to minimize in-water work. The ranges of impacts shown represent impacts from different bridge types considered. Guideway column locations would vary by bridge type.

The Muckleshoot Indian Tribe has treaty-protected fishing rights and Usual and Accustomed Areas in the Puget Sound region, which includes the Duwamish Waterway. The Muckleshoot Indian Tribe is signatory to both the Treaty of Point Elliott and the Treaty of Medicine Creek. The Suquamish Tribe of the Port Madison Reservation (Suquamish Tribe) is signatory to the Treaty of Point Elliott and has treaty-protected fishing rights and Usual and Accustomed Areas in the Puget Sound region, which also includes the Duwamish Waterway. Some bridge types would require placement of guideway columns in water. Treaty-protected fishing rights and Usual and Accustomed Areas of the Muckleshoot Indian Tribe may be temporarily affected during in-water construction or permanently affected by placement of guideway columns in the water. Some bridge types could also impact Tribal treaty-protected fishing rights and access to the Usual and Accustomed Areas of the Suquamish Tribe.

Preferred Alternative DUW-1a and Alternative DUW-2 could avoid permanent in-water impacts with some bridge types. Option DUW-1b would have permanent in-water impacts for all bridge types. All of the alternatives in this segment would displace businesses that are water-dependent, which could be difficult to relocate. Based on available business information, Alternative DUW-2 would have the most water-dependent business displacements. Option DUW-1b would permanently displace moorage on the Duwamish Waterway (also known as the Duwamish River); replacement moorage is unlikely to be found nearby on the Duwamish Waterway or in Elliott Bay.

6.2.2.1.3 Delridge Segment

As shown in Table 6-3, Alternative DEL-5 and Alternative DEL-6* would have a slightly lower projected ridership due to differences in integration with bus routes. Under the West Seattle and Ballard Link Extensions Minimum Operable Segment (M.O.S.), the Delridge Station would have close to twice as many daily boardings due to the additional bus service connections to this M.O.S. terminus station.

Key differences in impacts, including construction road closure durations, among the Delridge Segment alternatives are shown in Table 6-3. Alternative DEL-6* would have fewer residential displacements than the other alternatives. All alternatives except for Alternatives DEL-5 and DEL-6* would displace Washington State Department of Children, Youth, and Families offices; however, Alternative DEL-5 would displace a duplex owned by Transitional Resources, and Alternative DEL-6* would displace the Transitional Resources main office, onsite supportive housing, and adjacent apartment building. Transitional Resources is a non-profit organization that provides behavioral health services and supportive housing to help people make a transition to stable living in the community. Alternatives DEL-5 and DEL-6* would also have the most business displacements. Alternatives DEL-3 and DEL-4* would result in additional residential property acquisitions under the M.O.S. to accommodate additional bus layover facilities.

Preferred Alternative DEL-1a, Option DEL-1b, Preferred Alternative DEL-2a*, and Option DEL-2b* would have the most adverse effects to historic resources and the greatest change to community character. These alternatives, along with Alternatives DEL-3 and DEL-4*, would impact the most area with sensitive viewers, but impacts would differ among alternatives. Alternative DEL-6* would have the least potential for visual impacts because it would be closer to industrial areas and a lower height west of Avalon Way Southwest.

Preferred Alternative DEL-2a* and Alternative DEL-4* would have the greatest impacts on parks from entering a tunnel on the west end of the West Seattle Golf Course. These alternatives would require modifying the golf course and would permanently reduce the playable area.

Table 6-3. Projected Ridership and Key Impact Differences – Delridge Segment

Resource Impact Measure	Preferred Dakota Street Station Alternative (DEL-1a) [a]	Dakota Street Station North Alignment Option (DEL-1b) [a]	Preferred Dakota Street Station Lower Height Alternative (DEL-2a)* [a]	Dakota Street Station Lower Height North Alignment Option (DEL-2b)* [a]	Delridge Way Station Alternative (DEL-3) [a]	Delridge Way Station Lower Height Alternative (DEL-4)* [a]	Andover Street Station Alternative (DEL-5)	Andover Street Station Lower Height Alternative (DEL-6)*
Ridership (daily boardings)	5,800	5,800	5,800	5,800	5,800	5,800	5,600	5,600
Transportation Impacts	• Full closure on Southwest Genesee Street for 2 years during construction. • Partial closure on Delridge Way Southwest for 9 months during construction. Full closure on nights and weekends during construction.	• Full closure on Southwest Genesee Street for 2 years during construction. • Partial closure on Delridge Way Southwest for 9 months during construction. Full closure on nights and weekends during construction.	• Permanent closure of 25th Avenue Southwest at Delridge Station. • Full closure on Southwest Genesee Street on nights and weekends during construction. • Partial closure on Delridge Way Southwest for 9 months during construction. Full closure on nights and weekends during construction.	• Permanent closure of 25th Avenue Southwest at Delridge Station. • Permanent closure of 30th Avenue Southwest at Southwest Genesee Street. • Partial closure on Southwest Genesee Street for 9 months during construction. Full closure on nights and weekends during construction. • Partial closure on Delridge Way Southwest for 9 months during construction. Full closure on nights and weekends during construction.	• Full closure on Southwest Genesee Street for 2 years during construction. • Partial closure on Delridge Way Southwest for 3 years during construction. Full closure on nights and weekends during construction.	• Partial closure on Southwest Genesee Street for 9 months during construction. Full closure on nights and weekends during construction. • Partial closure on Delridge Way Southwest for 3 years during construction. Full closure on nights and weekends during construction.	• Full closure on Southwest Avalon Way for 1 year during construction.	• Full closure on Southwest Avalon Way on nights and weekends during construction.

Resource Impact Measure	Preferred Dakota Street Station Alternative (DEL-1a) [a]	Dakota Street Station North Alignment Option (DEL-1b) [a]	Preferred Dakota Street Station Lower Height Alternative (DEL-2a)* [a]	Dakota Street Station Lower Height North Alignment Option (DEL-2b)* [a]	Delridge Way Station Alternative (DEL-3) [a]	Delridge Way Station Lower Height Alternative (DEL-4)* [a]	Andover Street Station Alternative (DEL-5)	Andover Street Station Lower Height Alternative (DEL-6)*
Potential Displacements	• Residential: 172. • Business: 13 to 16. • Employees: 140 to 150. • Would displace Washington State Department of Children, Youth, and Families offices.	• Residential: 191. • Business: 13 to 16. • Employees: 140 to 150. • Would displace Washington State Department of Children, Youth, and Families offices.	• Residential: 93. • Business: 13 to 16. • Employees: 140 to 150. • Would displace Washington State Department of Children, Youth, and Families offices.	• Residential: 197. • Business: 13 to 16. • Employees: 140 to 150. • Would displace Washington State Department of Children, Youth, and Families offices.	• Residential: 151 (+4 with M.O.S.). • Business: 13 to 16. • Employees: 140 to 150. • Would displace Washington State Department of Children, Youth, and Families offices.	• Residential: 70 (+4 with M.O.S.). • Business: 13 to 16. • Employees: 140 to 150. • Would displace Washington State Department of Children, Youth, and Families offices.	• Residential: 82. • Business: 21. • Employees: 170. • Would displace a supportive housing associated with a behavioral health facility.	• Residential: 48. • Business: 20. • Employees: 140. • Would displace a behavioral health facility with supportive housing and assisted living, which also provides services to nonresidents who live in the area.
Length of Potential Operational Visual Impacts (miles)	1.0	1.0	1.0	1.0	1.0	1.0	0.2	0.1
Potential Operational Noise and Groundborne Noise or Vibration Impacts before Mitigation (all impacts can be mitigated) [b]	• 212 to 222 noise impacts. • 12 vibration impacts.	• 207 noise impacts. • No vibration impacts.	• 232 noise impacts. • No vibration impacts.	• 178 noise impacts. • No vibration impacts.	• 208 noise impacts. • 12 vibration impacts.	• 237 noise impacts. • No vibration impacts.	• 270 noise impacts. • 9 vibration impacts.	• 102 noise impacts. • 3 vibration impacts.
Historic Properties with Adverse Effects [c]	• Six resources adversely affected (five removed).	• Seven resources adversely affected (six removed).	• Six resources adversely affected (five removed).	• Six resources adversely affected (five removed).	• Four resources adversely affected (three removed).	• Four resources adversely affected (three removed).	• Two resources adversely affected (two removed).	• No adverse effects.

Resource Impact Measure	Preferred Dakota Street Station Alternative (DEL-1a) [a]	Dakota Street Station North Alignment Option (DEL-1b) [a]	Preferred Dakota Street Station Lower Height Alternative (DEL-2a)* [a]	Dakota Street Station Lower Height North Alignment Option (DEL-2b)* [a]	Delridge Way Station Alternative (DEL-3) [a]	Delridge Way Station Lower Height Alternative (DEL-4)* [a]	Andover Street Station Alternative (DEL-5)	Andover Street Station Lower Height Alternative (DEL-6)*
Park and Recreational Resources Impacts (acres operational/ acres construction)	• Operational (long term) and construction (temporary) impacts to West Seattle Golf Course, no operational (long-term) effect on use, temporary modifications during construction (0.5/1.0). • Construction, (temporary) impacts on Longfellow Creek Natural Area, detour of Longfellow Creek Legacy Trail (0/0.1).	• Operational (long term) and construction (temporary) impacts to West Seattle Golf Course, no operational (long-term) effect on use, temporary modifications during construction (<0.1/0.2). • Operational (long-term) and construction (temporary) impacts on Longfellow Creek Natural Area, detour of Longfellow Creek Legacy Trail (0.1/<0.1).	• Operational (long term) and construction (temporary) impacts to West Seattle Golf Course, operational (long-term) effect (modification) of playable area (1.4/1.3).	• Operational (long term) and construction (temporary) impacts to West Seattle Golf Course, no operational (long-term) effect on use, temporary modifications during construction (<0.1/<0.1). • Operational (long-term) and construction (temporary) impacts on Longfellow Creek Natural Area, detour of Longfellow Creek Legacy Trail (<0.1/<0.1).	• Operational (long term) and construction (temporary) impacts to West Seattle Golf Course, no operational (long-term) effect on use, temporary modifications during construction (0.6/1.2). • Operational (long term) and construction (temporary) impacts to Delridge Playfield, no effect on use (<0.1/0.1).	• Operational (long term) and construction (temporary) impacts to West Seattle Golf Course, operational (long-term) effect (modification) of playable area (1.3/1.3). • Construction (temporary) impacts to Delridge Playfield, no effect on use (0/0.1).	• No impact.	• No impact.

* As described in the introduction to Chapter 2, Alternatives Considered, at the time the Sound Transit Board identified alternatives for study in the Draft Environmental Impact Statement some alternatives were anticipated to require third-party funding based on early cost estimates. The asterisk identifies these alternatives and the alternatives that would only connect to these alternatives in adjacent segments.

[a] Ranges reflect differences from connecting to different alternatives in adjacent segments.

[b] The numbers presented are the number of units, counted by individual residences, including individual units of multi-family structures, and number of structures for other uses, like schools, churches, and parks.

[c] Potentially adversely affected under Section 106 (to be confirmed through consultation with State Historic Preservation Officer).

6.2.2.1.4 West Seattle Junction Segment

The projected ridership for West Seattle Junction Segment alternatives is shown in Table 6-4. Preferred Alternative WSJ-2 would have a slightly higher projected ridership due to differences in integration with bus routes at the Alaska Junction Station.

Key differences in impacts, including construction road closure durations, among the West Seattle Junction Segment alternatives are shown in Table 6-4. Preferred Alternative WSJ-1 and Preferred Alternative WSJ-2 would avoid major weekday closures on Fauntleroy Way Southwest that would occur with the other West Seattle Junction Segment alternatives. Fauntleroy Way Southwest at this location is the primary entrance to the West Seattle Bridge and is a freight route. Preferred Alternative WSJ-2 would close a portion of Southwest Alaska Street for up to 3 years. This portion of Southwest Alaska Streets is one of the few connections between Fauntleroy Way Southwest and 35th Avenue Southwest in this area.

Preferred Alternative WSJ-1 would have the greatest business and employee displacements from acquiring multiple mixed-use buildings, including Jefferson Square that has residences and about 40 businesses such as a Safeway grocery store. Preferred Alternative WSJ-1 and Preferred Alternative WSJ-2 would have the most residential displacements since they would displace four or five, respectively, apartment or condominium complexes. Preferred Alternative WSJ-3a,* Alternative WSJ-4*, and Alternative WSJ-5* would avoid impacts to parks. Preferred Alternative WSJ-1 and Preferred Alternative WSJ-2 would remove Fauntleroy Place. Preferred Option WSJ-3b* would remove Junction Plaza Park for a station entrance. Alternative WSJ-4* would have the greatest number of adverse effects to historic resources.

Table 6-4. Projected Ridership and Key Impact Differences – West Seattle Junction Segment

Resource Impact Measure	Preferred Elevated 41st/42nd Avenue Station Alternative (WSJ-1)	Preferred Elevated Fauntleroy Way Station Alternative (WSJ-2) [a]	Preferred Tunnel 41st Avenue Station Alternative (WSJ-3a)* [a]	Preferred Tunnel 42nd Avenue Station Option (WSJ-3b)*	Short Tunnel 41st Avenue Station Alternative (WSJ-4)*	Medium Tunnel 41st Avenue Station Alternative (WSJ-5)*
Ridership (daily boardings)	7,600	7,700	7,600	7,600	7,600	7,600
Transportation Impacts	• Full closure on Fauntleroy Way Southwest on nights and weekends during construction. • Full closure on 35th Avenue Southwest on nights and weekends during construction.	• Full closure on Fauntleroy Way Southwest on nights and weekends during construction. • Full closure on 35th Avenue Southwest on nights and weekends during construction. • Full closure on Southwest Alaska Street for 3 years during construction.	• Partial closure on Fauntleroy Way Southwest for 1.5 years during construction. • Full closure on 35th Avenue Southwest for 3 years during construction.	• Partial closure on Fauntleroy Way Southwest for 1.5 years during construction. • Full closure on 35th Avenue Southwest for 3 years during construction.	• Permanent closure of 37th Avenue Southwest north of Fauntleroy Way Southwest. • Permanent closure of 38th Avenue Southwest north of Southwest Oregon Street. • Partial closure on Fauntleroy Way Southwest for 9 months during construction. Full closure on nights and weekends during construction. • Full closure on 35th Avenue Southwest on nights and weekends during construction.	• Permanent closure of Southwest Genesee Street at 35th Avenue Southwest. • Partial closures on Fauntleroy Way Southwest for 1.5 years during construction. • Full closure on 35th Avenue Southwest for 1 year during construction.

Resource Impact Measure	Preferred Elevated 41st/42nd Avenue Station Alternative (WSJ-1)	Preferred Elevated Fauntleroy Way Station Alternative (WSJ-2) [a]	Preferred Tunnel 41st Avenue Station Alternative (WSJ-3a)* [a]	Preferred Tunnel 42nd Avenue Station Option (WSJ-3b)*	Short Tunnel 41st Avenue Station Alternative (WSJ-4)*	Medium Tunnel 41st Avenue Station Alternative (WSJ-5)*
Potential Displacements	• Residential: 349 to 379 • Business: 61 • Employees: 280	• Residential: 405 to 435 • Business: 13 to 16 • Employees: 80 to 90	• Residential: 167 to 271 • Business: 15 to 18 • Employees: 90 to 100	• Residential: 124 to 228 • Business: 44 to 47 • Employees: 130 to 140	• Residential: 238 • Business: 18 • Employees: 100	• Residential: 153 • Business: 15 • Employees: 90
Length of Potential Operational Visual Impacts (miles)	0.1	0.2	0	0	0	0
Potential Operational Noise and Groundborne Noise or Vibration Impacts before Mitigation (all impacts can be mitigated) [b]	• 400 noise impacts. • 7 vibration impacts.	• 351 to 401 noise impacts. • No vibration or groundborne noise impacts.	• No noise impacts. • 24 to 199 groundborne noise impacts.	• No noise impacts. • 269 to 430 groundborne noise impacts.	• 128 noise impacts. • 153 groundborne noise impacts.	• 6 noise impacts. • 205 groundborne noise impacts.
Historic Properties with Adverse Effects [c]	• Five resources adversely affected (four removed).	• Six resources adversely affected (five removed).	• Four resources adversely affected (three removed).	• Four resources adversely affected (three removed).	• Eight resources adversely affected (seven removed).	• One resource adversely affected (removed).
Park and Recreational Resources Impacts (acres operational/acres construction)	• Permanent displacement of Fauntleroy Place. (0.1/0)	• Permanent displacement of Fauntleroy Place. (0.1/0)	• No impact.	• Permanent displacement of Junction Plaza Park. (0.2/0)	• No impact.	• No impact.

* As described in the introduction to Chapter 2, Alternatives Considered, at the time the Sound Transit Board identified alternatives for study in the Draft Environmental Impact Statement some alternatives were anticipated to require third-party funding based on early cost estimates. The asterisk identifies these alternatives and the alternatives that would only connect to these alternatives in adjacent segments.

[a] Ranges reflect differences from connecting to different alternatives in adjacent segments.

[b] The numbers presented are the number of units, counted by individual residences, including individual units of multi-family structures, and number of structures for other uses, like schools, churches, and parks.

[c] Potentially adversely affected under Section 106 (to be confirmed through consultation with State Historic Preservation Officer).

6.2.2.2 Ballard Link Extension

Discussion of the SODO Segment is provided under Section 6.2.2.1, West Seattle Link Extension.

6.2.2.2.1 Chinatown-International District Segment

As shown in Table 6-5, the projected ridership for the Chinatown-International District Segment alternatives would be the same. A range in ridership is presented because of the possibility that some rail-to-rail transfers could occur at the International District/Chinatown Station or other transfer points in the light rail system.

Key differences in impacts, including construction road closure durations, among the Chinatown-International District Segment alternatives are shown in Table 6-5. Construction of alternatives on 4th Avenue South would have the greatest amount of traffic diverted to other streets in the area because of the high traffic volumes on that roadway and the need to rebuild a portion of the existing 4th Avenue South Viaduct. This rebuild would require full and partial closures of portions of 4th Avenue South for several years for both Alternative CID-1a* and Option CID-1b*, with Option CID-1b* having the longest duration of full closure. Alternative CID-2a would have a partial closure of a portion of 5th Avenue South for a couple of years and a full closure for less than a year, whereas Option CID-2b would have partial closure for a year. Full closure of the 4th Avenue South and South Jackson Street intersection for construction of Alternative CID-1a* and Option CID-1b* would temporarily impact this segment of the Seattle Streetcar. The other segments of the streetcar system would still be able to operate, but not as a connected system, which could impact the frequency of service. Alternative CID-2a would also impact this segment of the streetcar at 5th Avenue South and South Jackson Street and require relocating during construction trolley buses that run on 5th Avenue South. Option CID-2b and the diagonal station configuration for Alternative CID-2a would avoid these streetcar impacts.

Only Alternative CID-1a* would have residential displacements. Option CID-1b* would have the most employee displacements, primarily resulting from displacing the Metro Ryerson Bus Base. Alternative CID-2a and Option CID-2b would have the most business displacements within the Chinatown-International District (13 of the 18 to 27 in the segment), which is a unique hub of cultural importance for the city and its Asian-American communities. Only Alternative CID-2a and the diagonal station configuration would have groundborne noise or vibration impacts, which can be mitigated.

All Chinatown-International District Segment alternatives would have an adverse effect to a historic district during construction. Only Alternative CID-2a and Option CID-2b would permanently remove historic buildings.

Based on assessments to date, the construction duration in this segment could take longer for Alternative CID-1a* and Option CID-1b* (primarily due to reconstruction of the 4th Avenue South Viaduct) compared to Alternative CID-2a and Option CID-2b. Construction in the area of the station (generally between Seattle Boulevard South and James Street) for Alternative CID-1a* would take approximately 9 to 11 years and Option CID-1b* would take approximately 8 to 10 years. Construction in the station area for Alternative CID-2a would take approximately 8 to 9 years and Option CID-2b would take approximately 6.5 to 7.5 years. It is anticipated that construction in the station area for the CID-2a diagonal station configuration would take approximately 5 to 6 years.

Table 6-5. Projected Ridership and Key Impact Differences – Chinatown-International District Segment

Resource Impact Measure	4th Avenue Shallow Alternative (CID-1a)*	4th Avenue Deep Station Option (CID-1b)*	5th AvenueShallow Alternative (CID-2a) and Diagonal Station Configuration	5th Avenue Deep Station Option (CID-2b)
Ridership (daily boardings) [a]	30,000 to 34,000	30,000 to 34,000	30,000 to 34,000	30,000 to 34,000
Transportation Impacts	• Operational (long-term) impacts from removal of northbound bus lane between Seattle Boulevard and South Jackson Street. • Operational (long-term) impacts from removal of 4th Avenue South southbound left-turn access to the Union Station parking garage. • Permanent loss of 10 to 20 on-street and about 200 off-street parking spaces in Union Station parking garage. • Partial closure of 4th Avenue South during construction for about 6 years between the Interstate 90 off-ramp and South Jackson Street and full closure of 4th Avenue South from north side of South Jackson Street to South Main Street for 4 years. Closures of 4th Avenue South would result in traffic diversion, including multiple bus routes, into Pioneer Square and the Chinatown-International District. The 4th Avenue South and South Jackson Street intersection would	• Operational (long-term) impacts from removal of northbound bus lane between Seattle Boulevard and South Jackson Street. • Operational (long-term) impacts from removal of 4th Avenue South southbound left-turn access to the Union Station parking garage. • Operational (long-term) impacts from relocating Ryerson Bus Base. • Permanent loss of 45 to 60 on-street and about 200 off-street parking spaces in Union Station parking garage. • Full closure of 4th Avenue South during construction for about 6.5 years between Seattle Boulevard South and South Jackson Street would result in traffic diversion, including multiple bus routes, into Pioneer Square and the Chinatown-International District. Partial closure of 4th Avenue South would be required for an additional 2 years. The 4th Avenue South and South Jackson Street intersection would be closed for 2 years.	• Full closure of 5th Avenue South during construction for 9 months between South Weller Street and South Jackson Street would result in traffic diversion, including buses, into Pioneer Square and Chinatown-International District. Additional partial closures on this street for 2.5 years. • Metro trolley buses on 5th Avenue South would be relocated to 7th Avenue South or 8th Avenue South during construction. • Closure of the 5th Avenue South and South Jackson Street intersection for less than a year during construction would impact this segment of the Seattle Streetcar. The other segments of the streetcar would still operate, but not as a connected system. • The diagonal station configuration would avoid full closure of 5th Avenue South and would not affect the intersection of this road and South Jackson Street. It would avoid the trolley bus relocation and impacts to Seattle Streetcar operations during construction. • Permanent loss of 50 to 65 on-street and about 80 off-street	• Partial closure of 5th Avenue South between South Weller Street and South Jackson Street during construction for 1 year but would avoid impacts to the Seattle Streetcar and trolley bus diversion on 5th Avenue South. • Permanent loss of 35 to 45 on-street and about 80 off-street parking spaces and additional parking spaces during construction.

Resource Impact Measure	4th Avenue Shallow Alternative (CID-1a)*	4th Avenue Deep Station Option (CID-1b)*	5th AvenueShallow Alternative (CID-2a) and Diagonal Station Configuration	5th Avenue Deep Station Option (CID-2b)
	also be fully closed for 2 years. • Full closure of the 4th Avenue South and Seattle Boulevard South intersection for 2 years during construction. • Closure of the 4th Avenue South and South Jackson Street intersection for 2 years during construction would impact this segment of the Seattle Streetcar. The other segments of the Streetcar would still operate, but not as a connected system. • Stadium Station closure for up to 2 years during construction would require station users to use the International District/Chinatown or SODO stations or another travel mode. • Likely closure of 4th Avenue South access to the Weller Street bridge during construction. Temporary pedestrian crossing may be possible.	• Closure of the 4th Avenue South and South Jackson Street intersection for 2 years during construction would impact this segment of the Seattle Streetcar. The other segments of the Streetcar would still operate, but not as a connected system. • Likely closure of 4th Avenue South access to the Weller Street bridge during construction. Temporary pedestrian crossing may be possible.	parking spaces and additional parking spaces during construction. The diagonal station configuration would remove fewer on-street parking spaces during construction.	
Potential Displacements	• Residential: 120 • Business: 5 to 8 [b] • Employees: 120	• Residential: 0 • Business: 5 • Employees: 200	• Residential: 0 • Business: 19 to 27 [c] • Employees: 170 to 230 [c]	• Residential: 0 • Business: 18 • Employees: 170

Resource Impact Measure	4th Avenue Shallow Alternative (CID-1a)*	4th Avenue Deep Station Option (CID-1b)*	5th AvenueShallow Alternative (CID-2a) and Diagonal Station Configuration	5th Avenue Deep Station Option (CID-2b)
Potential Operational Groundborne Noise or Vibration Impacts before Mitigation (all impacts can be mitigated)	• No impacts.	• No impacts.	• 24 to 74 groundborne noise impacts. [b, c]	• No impacts.
Historic Properties and Historic District with Adverse Effects [d]	• One individual resource adversely affected. Would alter Union Station to incorporate a station entrance into the building, and a vent shaft structure on the northwest corner of the entrance plaza that would block views of Union Station. • Seattle Chinatown Historic District (from construction disruption). • Pioneer Square-Skid Road National Historic District (from construction disruption and partial property acquisition).	• One individual resource adversely affected. Would alter Union Station to incorporate a station entrance into the building, and a vent shaft structure on the northwest corner of the entrance plaza that would block views of Union Station. • Seattle Chinatown Historic District (from construction disruption). • Pioneer Square-Skid Road National Historic District (from construction disruption and partial property acquisition).	• Seattle Chinatown Historic District (property demolition and construction disruption). • Two individual resources adversely affected (two removed).	• Seattle Chinatown Historic District (property demolition and construction disruption). • Two individual resources adversely affected (two removed).
Other Construction Impacts	• No additional key construction impacts.	• No additional key construction impacts.	• Would require relocating utilities in Pigeon Alley utility corridor. • Diagonal station configuration would avoid closure of 5th Avenue South and associated utility relocations but could require temporary relocating up to eight businesses. • Proximity impacts to Hing Hay Park. • Noise, [e] vibration, [e] and visual disruption during construction to residences and businesses in the Chinatown-International District.	• Proximity impacts to Hing Hay Park. • Noise [e] and vibration [e] disruption during construction to residences and businesses in Chinatown-International District. • Chinatown Gate would be wrapped for protection

Resource Impact Measure	4th Avenue Shallow Alternative (CID-1a)*	4th Avenue Deep Station Option (CID-1b)*	5th AvenueShallow Alternative (CID-2a) and Diagonal Station Configuration	5th Avenue Deep Station Option (CID-2b)
			• Chinatown Gate would be wrapped for protection during civil construction.	during civil construction.

* As described in the introduction to Chapter 2, Alternatives Considered, at the time the Sound Transit Board identified alternatives for study in the Draft Environmental Impact Statement some alternatives were anticipated to require third-party funding based on early cost estimates. The asterisk identifies these alternatives and the alternatives that would only connect to these alternatives in adjacent segments.

[a] The ridership is the total for the new and existing International District/Chinatown Station.

[b] Ranges reflect differences from connecting to different alternatives in adjacent segments.

[c] Range is based on station configuration and construction methods. These include potential temporary displacements of less than a year during construction.

[d] Potentially adversely affected under Section 106 (to be confirmed through consultation with State Historic Preservation Officer).

[e] All impacts could be mitigated.

6.2.2.2.2 Downtown Segment

As shown in Table 6-6, the Downtown Segment alternatives would have similar projected ridership. Preferred Alternative DT-1 would have greater total ridership compared to Alternative DT-2 because there are more bus connections and better accessibility to land uses at some stations.

Key differences in impacts, including construction road closure durations, among the Downtown Segment alternatives are shown in Table 6-6. Preferred Alternative DT-1 would have more closures of high-traffic streets downtown. Road closures for both alternatives would impact the segment of Seattle Streetcar operations near Denny Station. For Preferred Alternative DT-1, other segments of the streetcar may continue to operate, but not as a connected system, which could impact the frequency of service. Alternative construction approaches that could allow for single-track operations of the streetcar and maintain access to the maintenance facility during construction are being considered for this location that could substantially reduce the impact to streetcar service through the Westlake Avenue/Denny Way portion of the route. Alternative DT-2 would affect northbound streetcar travel, which could impact frequency of service. Alternative DT-2 would have greater residential and business displacements, while Preferred Alternative DT-1 would have greater employee displacements. Preferred Alternative DT-1 would have the greatest impacts to parks during construction. Alternative DT-2 would potentially have adverse effects on a greater number of historic resources compared with Preferred Alternative DT-1.

Table 6-6. Projected Ridership and Key Impact Differences – Downtown Segment

Resource Impact Measure	Preferred 5th Avenue/Harrison Street Alternative (DT-1) [a]	6th Avenue/Mercer Street Alternative (DT-2)
Ridership (daily boardings) [b]	163,700	158,700
Transportation Impacts	• Full closure of Madison Street between 4th Avenue and 5th Avenue for up to 1 to 3 years during construction. The intersection of Madison Street and 4th Avenue would be partially closed for 4 years during construction. • Full closure of 5th Avenue between Madison Street and Columbia Street for 1.5 years during construction. During this time, there would be 9-month full closures of the Madison, Marion and Columbia streets intersections. • Partial closure of 5th Avenue between Union Street and Pike Street for 6 years during construction. • Full closure of 4th Avenue between Pine Street and Olive Way for 2 years during construction. 4th Avenue would also be partially closed from Marion Street to Madison Street and from James Street to Columbia Street for 6 years. • Full closure of Interstate 5 high-occupancy-vehicle express lanes reversible ramp at Columbia Street for 9 months during construction.	• Partial closure of 6th Avenue between University Street and Madison Street for 1 year during construction. 6th Avenue between Olive Way and Stewart Street would be fully closed for 6 years. • Partial closure of the southbound Interstate 5 off-ramp to James Street for up to 6 years during construction, as well as nighttime lane closures on the Interstate 5 mainline near Madison Street. • Full closure of Pine Street between 5th Avenue and 6th Avenue for 4 years during construction. • Full closure of Terry Avenue North from Denny Way to Thomas Street for 4 years during construction. During this time, this segment of the Seattle Streetcar would be impacted. Northbound travel of the streetcar would be impacted.

Resource Impact Measure	Preferred 5th Avenue/Harrison Street Alternative (DT-1) [a]	6th Avenue/Mercer Street Alternative (DT-2)
	• Full closure of Pine Street between 4th Avenue and 5th Avenue for 6 years during construction. • Full closure of Westlake Avenue between 7th Avenue and Denny Way for 4 years during construction. During this time, this segment of the Seattle Streetcar would be impacted. Other segments of the streetcar (through South Lake Union, Downtown, and Capitol Hill/First Hill) may continue to operate, but not as a connected system. • Full closure of Harrison Street between 6th Avenue North and Dexter Avenue North for 4 years during construction. Access to and from State Route 99 would remain open. Harrison Street would also be partially closed from Dexter Avenue North to 8th Avenue North for 1.5 years. • Full closure of Republican Street from Queen Anne Avenue North to Warren Avenue North for 5 years during construction.	• Partial closure of Mercer Street between Warren Avenue North and 1st Avenue West for 3.5 years during construction. • Full closure of Taylor Avenue North between Mercer Street and Roy Street for 4 years during construction.
Potential Displacements	• Residential: 26 • Business: 44 to 46 • Employees: 480 to 490	• Residential: 167 • Business: 47 • Employees: 440
Potential Operational Groundborne Noise or Vibration Impacts before Mitigation (all impacts can be mitigated)	• Potential operational (long-term) vibration impacts. Impacts to K.E.X.P. radio station, the Vera Project, Seattle International Film Festival Film Center, and Seattle Repertory Theatre.	• Potential operational (long-term) vibration impacts to UW Medicine South Lake Union campus. • 34 potential operational (long-term) groundborne noise impacts on a multi-family building west of the Seattle Center Station.
Potential Construction Noise and/or Groundborne Noise or Vibration Impacts before Mitigation	• Impacts to K.E.X.P. radio station, The Vera Project, Seattle International Film Festival Film Center, Seattle Repertory Theatre, The Cornish Playhouse, Seattle Children's Research Institute, A/NT Art Gallery, and Juno Therapeutics.	• Impacts to Seattle Repertory Theatre, Cascade Public Media (K.C.T.S. television station), Seattle Opera and KING FM, McCaw Hall, Allen Institute for Brain Science, UW Medicine South Lake Union campus, and five other research facilities.
Historic Properties with Adverse Effects [c]	• Three resources adversely affected (one removed).	• Nine resources adversely affected (four removed).
Park and Recreational Resources Impacts (acres operational/acres construction)	• Construction (temporary) impacts to Westlake Park (0/0.1). • Operational (long-term) and construction (temporary) impacts to Seattle Center (0.4/1.1). • Closure of Urban Triangle Park during construction (0/0.2).	• Construction (temporary) impacts to Seattle Center (0/<0.1). • Operational (long-term) impacts to Naramore Fountain Park (0.1/0).

Resource Impact Measure	Preferred 5th Avenue/Harrison Street Alternative (DT-1) [a]	6th Avenue/Mercer Street Alternative (DT-2)
		• Operational (long-term) impacts to Freeway Park south of Seneca Street (Box Garden area) (0.5/0).

[a] Ranges reflect differences between construction methods and differences from connecting to different alternatives in adjacent segments.

[b] The ridership is the total for the new downtown stations and the existing Pioneer Square, University Street, and Westlake stations.

[c] Potentially adversely affected under Section 106 (to be confirmed through consultation with State Historic Preservation Officer).

6.2.2.2.3 South Interbay Segment

As shown in Table 6-7, all of the South Interbay Segment alternatives would have the same projected ridership.

Key differences in impacts, including construction road closure durations, among the South Interbay Segment alternatives are also shown in Table 6-7. Preferred Alternative SIB-1 and Alternative SIB-2 would have the most impacts on traffic on Elliott Avenue West during construction, while Alternative SIB-2 would have the most impacts on 15th Avenue West of all the alternatives. Preferred Alternative SIB-1 would have the most residential displacements, while Alternative SIB-2 would have the most business displacements. Alternative SIB-3 would have the most employee displacements. Alternative SIB-3 would have the most impacts to the Southwest Queen Anne Greenbelt biodiversity corridor and parks but the least number of adverse effects to historic properties. Alternative SIB-2 would have the most visual impacts.

Table 6-7. Projected Ridership and Key Impact Differences – South Interbay Segment

Resource Impact Measure	Preferred Galer Street Station/Central Interbay Alternative (SIB-1) [a]	Prospect Street Station/15th Avenue Alternative (SIB-2) [a]	Prospect Street Station/Central Interbay Alternative (SIB-3)
Ridership (daily boardings)	2,600	2,600	2,600
Transportation Impacts	• Operational (long-term) impacts from medians along Elliott Avenue West south of Smith Cove Station. Medians would restrict left-turn access from Elliott Avenue West to a number of properties. • Partial closure of Elliott Avenue West between West Republican Street and West Galer Street for 1.5 years during construction. • Full closure of the West Galer Street Flyover on some nights and weekends during construction.	• Operational (long-term) impacts from the guideway in the middle of 15th Avenue West, which would remove left-turn access to mid-block properties on 15th Avenue West between West Newton Street and West Barrett Street. This would change access to properties in this area. It would also remove left-turn access to a number properties on Elliott Avenue West. • Partial closure of Elliott Avenue West south of West Mercer Place for 9 months during construction.	• Partial closure of Elliott Avenue West on nights and weekends periodically during construction. 15th Avenue West would be partially closed in the vicinity of the West Armory Way intersection for 9 months.

Resource Impact Measure	Preferred Galer Street Station/Central Interbay Alternative (SIB-1) [a]	Prospect Street Station/15th Avenue Alternative (SIB-2) [a]	Prospect Street Station/Central Interbay Alternative (SIB-3)
		• Partial closures on 15th Avenue West between West Howe Street and West Barrett Street for 1 year during construction.	
Number of Potential Displacements	• Residential: 174 • Business: 33 (+3 with either M.O.S.) [b] • Employees: 280 (+50 with M.O.S.) [b]	• Residential: 123 • Business: 35 (+3 with M.O.S.) • Employees: 290 to 300 (+50 with M.O.S.)	• Residential: 5 • Business: 25 (+3 with M.O.S.) • Employees: 320 (+50 with M.O.S.)
Length of Potential Operational Visual Impacts (miles)	0.1	0.4	1.0
Potential Operational Noise and Groundborne Noise or Vibration Impacts before Mitigation (all impacts can be mitigated) [c]	• 456 noise impacts. • 351 vibration or groundborne noise impacts.	• 745 noise impacts. • 352 vibration or groundborne noise impacts.	• 532 noise impacts. • No vibration or groundborne noise impacts.
Biodiversity Area Impacts (acres operational/acres construction)	<0.1/<0.1	3.7 to 3.8/0.3 to 0.5	5.5/0.7
Public Services Impacts	• No impacts.	• Operational (long-term) impact (displacement) to some parking spaces at the United States Postal Service Interbay Post Office and Carrier Annex and the Seattle Parks and Recreation Department West Central Maintenance Warehouse. Replacement parking would be provided and there would not be an impact to operations or access to the facilities. • Construction (temporary) impacts to United States Postal Service Interbay Post Office and Carrier Annex (temporary loss of several parking spaces which would be replaced) and Fire Station 20. • Operational (long-term) noise impacts to Fire Station 20, but could be mitigated.	• Operational (long-term) relocating United States Postal Service Interbay Post Office and Carrier Annex. • Operational (long-term) relocating Seattle Parks and Recreation West Central Grounds Maintenance Facility.

Resource Impact Measure	Preferred Galer Street Station/Central Interbay Alternative (SIB-1) [a]	Prospect Street Station/15th Avenue Alternative (SIB-2) [a]	Prospect Street Station/Central Interbay Alternative (SIB-3)
Historic Properties with Adverse Effects [d]	• Seven resources adversely affected (seven removed).	• Eight resources adversely affected (eight removed).	• Two resources adversely affected (two removed).
Park and Recreational Resources Impacts (acres operational/acres construction)	• Operational (long-term) and construction (temporary) impacts to Kinnear Park, no effect on use (0.1/<0.1). • Operational (long-term) and construction (temporary) impacts to Interbay Golf Center, no effect on use (2.2/1.0 to 1.5). • Operational (long-term) impacts to Interbay Athletic Center, would require relocating grass fields (0.7 to 0.8/0).	• Operational (long-term) and construction (temporary) impacts to Kinnear Park, no effect on use (0.1 to 0.2/0.1). • Operational (long-term) and construction (temporary) impacts to Southwest Queen Anne Greenbelt, trail connection to 15th Avenue West would be cut off (0.4/<0.1). • Operational (long-term) and construction (temporary) impacts to Interbay Golf Center (0.1/0.3), which includes Interbay P-Patch Community Garden, no effect on use.	• Operational (long-term) and construction (temporary) impacts to Kinnear Park, no effect on use (<0.1/0.3). • Operational (long-term) and construction (temporary) impacts to Southwest Queen Anne Greenbelt, trail connection to 15th Avenue West would be cut off (0.9/0.4). • Operational (long-term) and construction (temporary) impacts to Interbay Golf Center, would impact the playable area and require modification to golf center (2.4/0.9). • Operational (long-term) impacts to Interbay Athletic Center, would require relocating grass fields (0.7/0).

[a] Ranges reflect differences from connecting to different alternatives in adjacent segments.

[b] With either the West Seattle and Ballard Link Extensions M.O.S. (SODO to Smith Cove and SODO to Delridge) or Ballard Link Extension-only M.O.S. (SODO to Smith Cove).

[c] The numbers presented are the number of units, counted by individual residences, including individual units of multi-family structures, and number of structures for other uses, like schools, churches, and parks.

[d] Potentially adversely affected under Section 106 (to be confirmed through consultation with State Historic Preservation Officer).

6.2.2.2.4 Interbay/Ballard Segment

As shown in Table 6-8, all of the Interbay/Ballard Segment alternatives would have the same ridership.

Key differences in impacts, including construction road closure durations, among the Interbay/Ballard Segment alternatives are shown in Table 6-8. Notable differences are associated with light rail operation as well as navigation, construction traffic, displacements, ecosystems, historic resources, and park impacts. Only Alternative IBB-3 would experience interruptions in light rail service and service delays from the moveable bridge opening periodically to allow passage of certain marine vessels. All of the bridge alternatives would meet or exceed the governing limitations on the United States Army Corps of Engineers-maintained Lake Washington Ship Canal navigation channel. However, with the exception of the double-leaf bascule bridge for Alternative IBB-3, they would become the first vertical restriction on the Ship Canal upstream of Shilshole Bay. All bridge alternatives would require temporary closures

of the navigation channel and also the area outside the navigation channel during construction, impacting vessel movement and access. Only Alternative IBB-3 would introduce new permanent constraints on access between the navigation channel and Fishermen's Terminal due to guideway columns in Salmon Bay. It would also have the greatest impact on moorage, reducing moorage in Fishermen's Terminal and Salmon Bay. Preferred Alternative IBB-1a and Option IBB-1b would reduce moorage in Salmon Bay. Option IBB-1b would have the most construction traffic impacts due to periodic full closure of the West Dravus Street on- and off-ramps to 15th Avenue West and full closure of 14th Avenue Northwest. Preferred Alternative IBB-1a and Option IBB-1b would have similar impacts to most resources, although Option IBB-1b would have more residential displacements, and Preferred Alternative IBB-1a would have more business displacements. Alternative IBB-3 would displace the most employees.

All bridge alternatives would displace water-dependent businesses (and their employees) that could be difficult to relocate and would have permanent in-water impacts. The Muckleshoot Indian Tribe, signatory to the Treaty of Point Elliott and the Treaty of Medicine Creek, has treaty-protected fishing rights and Usual and Accustomed Areas in the Puget Sound region, including Salmon Bay. The Suquamish Tribe of the Port Madison Reservation (Suquamish Tribe) is signatory to the Treaty of Point Elliott and uses Salmon Bay to access its Usual and Accustomed Areas. Tribal treaty-protected fishing rights of the Muckleshoot Indian Tribe may be temporarily affected by construction of all bridge alternatives over Salmon Bay and could be permanently affected by guideway columns in the water. Tribal treaty-protected access to the Usual and Accustomed Areas of the Suquamish Tribe may be similarly affected. The tunnel alternatives would not impact Tribal treaty-protected fishing rights or access.

Only Preferred Alternative IBB-1a and Option IBB-1b would affect parks. All of the alternatives would adversely affect historic properties but Alternative IBB-3 would affect the most properties and would also adversely affect the recommended National Register-eligible Fishermen's Terminal Historic District. All of the bridge alternatives would have a visual impact to water recreationists using Salmon Bay, but Alternative IBB-3 would have the greatest visual impact. Depending on the type of fixed-span bridge. Preferred Alternative IBB-1a and Option IBB-1b could have a visual impact on residences on the north side of Queen Anne Hill. The tunnel alternatives would have no visual impacts.

Table 6-8. Projected Ridership and Key Impact Differences – Interbay/Ballard Segment

Resource Impact Measure	Preferred Elevated 14th Avenue Alternative (IBB-1a) [a]	Elevated 14th Avenue Alignment Option (from Prospect Street Station/15th Avenue) (IBB-1b)	Preferred Tunnel 14th Avenue Alternative (IBB-2a)*	Preferred Tunnel 15th Avenue Station Option (IBB-2b)*	Elevated 15th Avenue Alternative (IBB-3) [a]
Ridership (daily boardings)	17,300	17,300	17,300	17,300	17,300
Transportation Impacts	• Operational (long-term) impacts from guideway columns on land on the south side of Salmon Bay. The columns could affect the circulation and operations of businesses in this area and affect freight. • Operational (long-term) impacts to the United States Army Corps of Engineers-maintained navigation channel. Would become the first vertical restriction on the Lake Washington Ship Canal upstream of Shilshole Bay. Would limit the vertical clearance over the navigation channel to 136 feet. • Full closure of 15th Avenue West near the West Emerson Street interchange on nights and weekends during construction.	• Same operational (long-term) impacts as Preferred Alternative IBB-1a. • Full closures of the West Dravus Street on- and off-ramps to 15th Avenue West during construction. Periodic 1-month closures would be phased over 3 years. • Partial closure of 15th Avenue West near the West Dravus Street/15th Avenue West interchange for 6 months during construction. There would also be full closures on nights and weekends. • Full closure of 14th Avenue Northwest from Northwest 45th Street to Northwest 51st Street for 3 years during construction. • Full closure of 14th Avenue Northwest between Northwest 52nd Street and	• Partial closure of 15th Avenue West near the West Emerson Street interchange for 6 months during construction. • Full closure of 14th Avenue Northwest between Northwest 52nd Street and Northwest 58th Street for 3 years during construction. • Full closure of Northwest 54th Street and Northwest 56th Street east of 15th Avenue Northwest for 3 years during construction.	• Partial closure of 15th Avenue West near the West Emerson Street interchange for 6 months during construction. • Full closure of Northwest 52nd Street and Northwest 54th Street east of 15th Avenue Northwest for 4 years during construction. • Partial closure of Northwest Market Street at 15th Avenue Northwest for 3 years during construction.	• Operational (long-term) impacts from guideway columns on land on the south side of Salmon Bay. The columns could affect the circulation and operations of businesses in this area and affect freight. • Operational (long-term) impacts to the United States Army Corps of Engineers-maintained navigation channel. The vertical-lift moveable bridge would become the first vertical restriction on the Lake Washington Ship Canal upstream of Shilshole Bay, limiting the vertical clearance over the navigation channel to 136 feet in the open position. A double-leaf bascule moveable bridge would not restrict the vertical clearance over the navigation channel. Interruptions to service

Resource Impact Measure	Preferred Elevated 14th Avenue Alternative (IBB-1a) [a]	Elevated 14th Avenue Alignment Option (from Prospect Street Station/15th Avenue) (IBB-1b)	Preferred Tunnel 14th Avenue Alternative (IBB-2a)*	Preferred Tunnel 15th Avenue Station Option (IBB-2b)*	Elevated 15th Avenue Alternative (IBB-3) [a]
	• Full closure of 14th Avenue Northwest from Northwest 45th Street to Northwest 51st Street for up to 3 years during construction. • Full closure of 14th Avenue Northwest between Northwest 52nd Street and Northwest 58th Street would also be required on nights and weekends during construction. • Full closure of Northwest 54th Street east of 15th Avenue Northwest for 3 years during construction. • Construction in the vicinity the BNSF Railway lead tracks adjacent to the Lake Washington Ship Canal Trail as well as the Ballard Terminal Railroad. Rail operations could be sporadically affected during construction. • Construction activities and street closures would limit pedestrian and bicycle access to the future Burke-Gilman Trail Missing	Northwest 58th Street would also be required on nights and weekends during construction. • Full closure of Northwest 54th Street east of 15th Avenue Northwest for 3 years during construction. • Construction in the vicinity the BNSF Railway lead tracks adjacent to the Ship Canal Trail as well as the Ballard Terminal Railroad. Rail operations could be sporadically affected during construction. • Construction activities and street closures would limit pedestrian and bicycle access to the future Burke-Gilman Trail Missing Link on Northwest 46th Street. • Full closure of Ship Canal Trail multiple times for short durations during construction. • Approximately two 12-hour closures or one 48-hour closure of the navigation channel			from moveable bridge openings to allow certain marine vessels to pass through. Limited peak hour delays because of bridge lift restrictions for vessels navigating through Salmon Bay. • Guideway columns in Salmon Bay would introduce new operational (long-term) constraints on access between the navigation channel and Fishermen's Terminal. Moorage in Salmon Bay and Fishermen's Terminal would also be reduced. • Full closures of the West Dravus Street on- and off-ramps to 15th Avenue West. Periodic 1-month closures phased over 3 years during construction. • Partial closure of 15th Avenue West near the West Dravus Street/15th Avenue West interchange for 6 months during construction. There would also be full

Resource Impact Measure	Preferred Elevated 14th Avenue Alternative (IBB-1a) [a]	Elevated 14th Avenue Alignment Option (from Prospect Street Station/15th Avenue) (IBB-1b)	Preferred Tunnel 14th Avenue Alternative (IBB-2a)*	Preferred Tunnel 15th Avenue Station Option (IBB-2b)*	Elevated 15th Avenue Alternative (IBB-3) [a]
	Link on Northwest 46th Street. • Full closure of Ship Canal Trail multiple times for short durations during construction. • Approximately two 12-hour or one 48-hour closure of the navigation channel during construction. Additional intermittent closures of part of the navigation channel during construction for up to 4 weeks. • Scaffolding and netting under the bridge would temporarily reduce portions of the planned vertical clearance under the bridge for about 5 months during construction.	during construction. Additional intermittent closures of part of the navigation channel during construction for up to 4 weeks. • Scaffolding and netting under the bridge would temporarily reduce portions of the planned vertical clearance under the bridge for about 5 months during construction.			closures on nights and weekends. • Full closure of Northwest 54th Street east of 15th Avenue Northwest. • Full closure of 15th Avenue Northwest on nights and weekends. There would also be partial closures for 3 months. • Full closure of Northwest Market Street at 15th Avenue Northwest on nights and weekends during construction. • Construction activities and street closures would limit pedestrian and bicycle access to the future Burke-Gilman Trail Missing Link on Northwest 46th Street. • Full closure of the Ship Canal Trail multiple times for short durations during construction. • Approximately one 24-hour closure or two 48-hour closures of the navigation channel during construction. Additional intermittent

Resource Impact Measure	Preferred Elevated 14th Avenue Alternative (IBB-1a) [a]	Elevated 14th Avenue Alignment Option (from Prospect Street Station/15th Avenue) (IBB-1b)	Preferred Tunnel 14th Avenue Alternative (IBB-2a)*	Preferred Tunnel 15th Avenue Station Option (IBB-2b)*	Elevated 15th Avenue Alternative (IBB-3) [a]
					closures of portions of the navigation channel during construction for up to 4 weeks. • Netting would reduce vertical clearance under the bridge for 48 hours during construction.
Potential Displacements	• Residential: 94 to 105 • Business: 64 to 71 • Employees: 540 to 610	• Residential: 151 • Business: 57 • Employees: 400	• Residential: 14 • Business: 41 • Employees: 380	• Residential: 21 • Business: 43 • Employees: 370	• Residential: 25 • Business: 51 • Employees: 620
Length of Potential Operational Visual Impacts (miles)	0.1	0.1	0	0	0.2
Potential Operational Noise and Groundborne Noise or Vibration Impacts before Mitigation (all impacts can be mitigated) [b]	• 369 to 378 noise impacts. • 35 to 39 vibration impacts.	• 705 noise impacts. • 43 vibration impacts.	• No noise impacts. • 2 vibration or groundborne noise impacts.	• No noise impacts. • 1 vibration or groundborne noise impact.	• 356 noise impacts. • No vibration impacts.

Resource Impact Measure	Preferred Elevated 14th Avenue Alternative (IBB-1a) [a]	Elevated 14th Avenue Alignment Option (from Prospect Street Station/15th Avenue) (IBB-1b)	Preferred Tunnel 14th Avenue Alternative (IBB-2a)*	Preferred Tunnel 15th Avenue Station Option (IBB-2b)*	Elevated 15th Avenue Alternative (IBB-3) [a]
Ecosystems Impacts	• Operational (long-term) in-water (benthic surface) impacts of 0.8 to 1.2 acres. • Construction (temporary) in-water (benthic surface) impacts of 0.5 to 1.5 acres. Impacts are from bridge construction and relocating the 14th Avenue Northwest outfall. • Approximately 400 feet of shoreline permanently impacted. • Approximately 1,100 feet of shoreline temporarily impacted.	• Operational (long-term) in-water (benthic surface) impacts of 0.8 to 1.2 acres. • Construction (temporary) in-water (benthic surface) impacts of 0.5 to 1.5 acres. Impacts are from bridge construction and relocating the 14th Avenue Northwest outfall. • Approximately 400 feet of shoreline permanently impacted. • Approximately 1,100 feet of shoreline temporarily impacted.	• No operational (long-term) or construction (temporary) in-water (benthic surface) impacts. • No shoreline impacts.	• No operational (long-term) or construction (temporary) in-water (benthic surface) impacts. • No shoreline impacts.	• Operational (long-term) in-water (benthic surface) impacts of 0.2 to 0.8 acre. • Construction (temporary) in-water (benthic surface) impacts of 0.7 to 1.7 acres for the bridge. • Approximately 500 feet of shoreline permanently impacted. • Approximately 900 feet of shoreline temporarily impacted.
Historic Properties and Historic District with Adverse Effects [c]	• Seven resources adversely affected (seven removed).	• Seven resources adversely affected (seven removed).	• Four resources adversely affected (four removed).	• Three resources adversely affected (three removed).	• Fishermen's Terminal Historic District. • Nine individual historic resources adversely affected (five removed), including two in Fishermen's Terminal Historic District.

Resource Impact Measure	Preferred Elevated 14th Avenue Alternative (IBB-1a) [a]	Elevated 14th Avenue Alignment Option (from Prospect Street Station/15th Avenue) (IBB-1b)	Preferred Tunnel 14th Avenue Alternative (IBB-2a)*	Preferred Tunnel 15th Avenue Station Option (IBB-2b)*	Elevated 15th Avenue Alternative (IBB-3) [a]
Park and Recreational Resources Impacts	• Operational (long-term) impacts to 14th Avenue Northwest Boat Ramp. The boat ramp would be relocated. • Construction (temporary) proximity impacts to 11th Avenue Northwest Street-end and Gemenskap Park.	• Operational (long-term) impacts to 14th Avenue Northwest Boat Ramp. The boat ramp would be relocated. • Construction (temporary) proximity impacts to 11th Avenue Northwest Street-end and Gemenskap Park.	• No impact.	• No impact.	• No impact.

* As described in the introduction to Chapter 2, Alternatives Considered, at the time the Sound Transit Board identified alternatives for study in the Draft Environmental Impact Statement some alternatives were anticipated to require third-party funding based on early cost estimates. The asterisk identifies these alternatives and the alternatives that would only connect to these alternatives in adjacent segments.

[a] Ranges reflect differences from connecting to different alternatives in adjacent segments and differences in impacts from different bridge types.

[b] The numbers presented are the number of units, counted by individual residences, including individual units of multi-family structures, and number of structures for other uses, like schools, churches, and parks.

[c] Potentially adversely affected under Section 106 (to be confirmed through consultation with State Historic Preservation Officer).

6.2.2.3 Capital Costs

The WSBLE Project cost estimates support the Sound Transit Board's evaluation of the relative cost of the alternatives defined and evaluated in this Draft Environmental Impact Statement. The current level of project design includes uncertainties regarding the project scope, engineering data, mitigation requirements, schedule, and project delivery methods. Therefore, the cost estimates at this stage are conceptual and rounded to the nearest $100 million. These estimates focus on the project elements that are defined consistently across alternatives, capture the essential physical features of alternatives, and help distinguish alternatives from one another. The project costs include estimates for construction and right-of-way costs.

In addition, Sound Transit included estimated costs for design, permitting, agency administration, program management, construction change orders, and unallocated contingency as a percentage of the above estimates. The estimated project costs do not include the cost of the additional light rail vehicles or operation and maintenance facility needed to operate the West Seattle and Ballard Link Extensions.

6.2.2.3.1 Cost Summary – West Seattle Link Extension

Table 6-9 shows the costs by Build Alternative in each West Seattle Link Extension segment. Costs for the SODO Segment are the total for both the West Seattle and Ballard Link Extensions.

SODO Segment (West Seattle and Ballard Link Extensions)

The estimated costs of the alternatives in the SODO Segment are shown in Table 6-9. The lowest-cost alternative in the SODO Segment would be Preferred Alternative SODO-1a. Option SODO-1b would have a higher cost due to additional property acquisition and moving the existing station closer to South Lander Street. Alternative SODO-2 would have the highest cost due to the elevated guideway and station, additional property acquisition, and moving the existing station closer to South Lander Street.

Duwamish Segment

The estimated costs of the alternatives in the Duwamish Segment are shown in Table 6-9. The lowest-cost alternative in the Duwamish Segment would be Preferred Alternative DUW-1a. When connecting to Alternatives DEL-3 and DEL-4*, additional elevated guideway and retaining walls would result in a higher overall cost for Preferred Alternative DUW-1a. Option DUW-1b would require additional elevated guideway, retaining walls, and property acquisition, thus resulting in a higher overall cost. Alternative DUW-2 would require additional long-span elevated guideway, more utility relocations, and additional property acquisition, resulting in the highest overall cost among Duwamish Segment alternatives.

Delridge Segment

The estimated costs of the alternatives in the Delridge Segment are shown in Table 6-9. Preferred Alternative DEL-2a* and Alternative DEL-6* would have the lowest costs in the Delridge Segment. They both would have lower guideways, which would reduce costs. However, Preferred Alternative DEL-2a* would only connect with the two more expensive tunnel alternatives in the West Seattle Junction Segment.

Compared with Preferred Alternative DEL-2a*, Option DEL-2b would require additional property acquisition on the north side of Southwest Genesee Street to avoid the West Seattle Golf

Course and would have additional straddle bents across the roadway, which would increase the cost.

Preferred Alternative DEL-1a and Option DEL-1b would have the greatest cost due to the height of the elevated guideway and property acquisition. Alternatives DEL-3 and DEL-5 would cost less because they would have a lower guideway and stations.

Table 6-9. West Seattle Link Extension Estimated Capital Costs

Segment	Alternative	Cost (Millions, $2019)
SODO [a]	SODO-1a	500 to 700 [b]
	SODO-1b	600 to 700 [c]
	SODO-2	800
Duwamish	DUW-1a	1,200 to 1,300 [d]
	DUW-1b	1,300
	DUW-2	1,500
Delridge	DEL-1a	600 to 700
	DEL-1b	700
	DEL-2a*	400
	DEL-2b*	500
	DEL-3	600
	DEL-4*	400
	DEL-5	500
	DEL-6*	400
West Seattle Junction	WSJ-1	1,300
	WSJ-2	900
	WSJ-3a*	1,700
	WSJ-3b*	1,700
	WSJ-4*	1,300
	WSJ-5*	1,100

* As described in the introduction to Chapter 2, Alternatives Considered, at the time the Sound Transit Board identified alternatives for study in the Draft Environmental Impact Statement some alternatives were anticipated to require third-party funding based on early cost estimates. The asterisk identifies these alternatives and the alternatives that would only connect to these alternatives in adjacent segments.

[a] SODO Segment costs are the combined costs for both the West Seattle and Ballard Link Extensions.

[b] Low end of the range reflects cost of the Preferred Alternative SODO-1a (staggered station configuration) connecting to Alternative CID-1a*. High end of the range reflects Preferred Alternative SODO-1a (without the staggered station configuration which includes the relocation of the United States Postal Service facility) connecting to Alternative CID-2a and Option CID-2b.

[c] Low end of the range reflects connecting to Alternative CID-1a*.

[d] High end of the range reflects higher cost of Preferred Alternative DUW-1a when connecting to Alternatives DEL-3 or DEL-4*.

West Seattle Junction Segment

The estimated costs of the alternatives in the West Seattle Junction Segment are shown in Table 6-9. Preferred Alternative WSJ-2 would be the lowest-cost alternative in the West Seattle Junction Segment because it would be elevated and the shortest length. Preferred Alternative

WSJ-1 would cost more because it would be longer, taller, and require more property acquisition.

Among the tunnel alternatives, Alternative WSJ-5* would be the lowest cost because the Avalon Station would be in a retained cut and be one of the shorter tunnels. Preferred Alternative WSJ-3a* and Preferred Option WSJ-3b* would be the most expensive tunnels based on the longest tunnel length and because both stations (Avalon Station and Alaska Junction Station) would be in a tunnel.

6.2.2.3.2 Cost Summary – Ballard Link Extension

Table 6-10 shows the costs by Build Alternative in each Ballard Link Extension segment.

Table 6-10. Ballard Link Extension Estimated Capital Costs

Segment	Alternative	Cost (Millions, $2019)
Chinatown-International District	CID-1a*	1,800 [a]
	CID-1b*	1,700 [a]
	CID-2a	1,200 to 1,300 [b]
	CID-2b	1,300
Downtown	DT-1	4,700 to 4,900 [c]
	DT-2	4,900 to 5,000 [d]
South Interbay	SIB-1	1,300
	SIB-2	1,400 to 1,500 [e]
	SIB-3	1,500 to 1,600 [f]
Interbay/Ballard	IBB-1a	1,500 to 1,600 [g]
	IBB-1b	1,600
	IBB-2a*	1,500
	IBB-2b*	1,700
	IBB-3	1,500

* As described in the introduction to Chapter 2, Alternatives Considered, at the time the Sound Transit Board identified alternatives for study in the Draft Environmental Impact Statement some alternatives were anticipated to require third-party funding based on early cost estimates. The asterisk identifies these alternatives and the alternatives that would only connect to these alternatives in adjacent segments.

[a] The cost of Alternative CID-1a* and Option CID-1b* includes the cost of reconstructing the 4th Avenue South Viaduct.

[b] Cost range for Alternative CID-2a is due to connection to alternatives in the Downtown Segment.

[c] High end of the range reflects higher cost of Preferred Alternative DT-1 when connecting to Alternative CID-1a*, Option CID-1b*, and Option CID-2b.

[d] High end of the range reflects higher cost of Alternative DT-2 when connecting to Alternative CID-2a.

[e] High end of the range reflects higher cost of Alternative SIB-2 when connecting to Option IBB-1b.

[f] High end of the range reflects higher cost of Alternative SIB-3 when connecting to Preferred Alternative IBB-2a* and Preferred Option IBB-2b*.

[g] High end of the range reflects higher cost of Preferred Alternative IBB-1a when connecting to Alternative SIB-3.

Chinatown-International District Segment

The estimated costs of the alternatives in the Chinatown-International District Segment are shown in Table 6-10. The lowest-cost alternative in the Chinatown-International District Segment would be Alternative CID-2a, depending on the connection to alternatives in the Downtown Segment. Option CID-2b would include a deeper station, which would result in a higher overall cost compared to Alternative CID-2a.

Alternative CID-1a* and Option CID-1b* would require reconstructing the 4th Avenue South Viaduct and therefore result in the highest cost of all this segment's alternatives. Alternative CID-1a* would cost more than Option CID-1b* due to the longer length of cut-and-cover tunnel construction and longer length of reconstruction of the 4th Avenue South Viaduct.

The alternative selected in the Chinatown-International District Segment could affect the cost of the alternatives in the SODO Segment. Preferred Alternative SODO-1a and Option SODO-1b would be less expensive when connecting to Alternative CID-1a* because fewer properties would be acquired for the tunnel portal. Alternative SODO-2 would have a similar cost when connecting to Alternative CID-1a* or Alternative CID-2a and would not connect to Options CID-1b* or CID-2b.

The alternative selected in the Chinatown-International District Segment could also affect the cost of the Downtown Segment alternatives. Alternative CID-1a*, Option CID-1b*, and Option CID-2b would result in a deeper Midtown Station for Preferred Alternative DT-1, which would result in higher costs associated with this Downtown Segment alternative (see Section 6.2.2.2.2, Downtown Segment).

Downtown Segment

The estimated costs of the alternatives in the Downtown Segment are shown in Table 6-10. Preferred Alternative DT-1 in the Downtown Segment could cost less than Alternative DT-2, depending on the connection to alternatives in the Chinatown-International District Segment. Preferred Alternative DT-1 would be least expensive when connecting to Alternative CID-2a. Providing a connection to Alternative CID-1a*, Option CID-1b*, and Option CID-2b would require a deeper Midtown Station. This would result in a higher estimated cost for Preferred Alternative DT-1 that would be the same as the low end of the cost range for Alternative DT-2. Alternative DT-2, which could only connect to Alternatives CID-1a* and CID-2a, would be least expensive when connecting to Alternative CID-1a*. With a connection to Alternative CID-2a, the location of the special trackwork such as crossovers would be required at Midtown Station and result in a higher estimated cost for Alternative DT-2.

South Interbay Segment

The estimated costs of the alternatives in the South Interbay Segment are shown in Table 6-10. The lowest-cost alternative in the South Interbay Segment would be Preferred Alternative SIB-1. Alternatives SIB-2 and SIB-3 would have a higher cost because they require stabilization on the southwest side of Queen Anne Hill. Alternative SIB-2 would have a higher cost when connecting to Preferred Option IBB-1b in the Interbay/Ballard Segment because special trackwork would be required. Alternative SIB-3 would also have a higher cost when connecting to Preferred Alternative IBB-2a* and Preferred Option IBB-2b* in the Interbay/Ballard Segment because of special trackwork.

Interbay/Ballard Segment

The estimated costs of the alternatives in the Interbay/Ballard Segment are shown in Table 6-10. The lowest-cost alternatives in the Interbay/Ballard Segment would be Preferred Alternative IBB-1a (connecting to Preferred Alternative SIB-1), Preferred Alternative IBB-2a*, and Alternative IBB-3. When connecting to Alternative SIB-3 in the South Interbay Segment, Preferred Alternative IBB-1a would require changes in special trackwork (such as pocket tracks) that would result in a higher overall cost compared to Preferred Alternative IBB-2a* and Alternative IBB-3. Preferred Option IBB-2b* would have the higher property acquisition costs as well as a mined cavern for special trackwork, which would result in the highest cost of all the alternatives in the Interbay/Ballard Segment.

6.3 Benefits and Disadvantages of Delaying Implementation

As required by the State Environmental Policy Act (SEPA), this section discusses the benefits and disadvantages of delaying the proposed project instead of approving it now.

Delaying the project would postpone impacts associated with project construction but would also postpone realizing a major component of the region's long-range plans for managing growth and transportation and the opportunity to link neighborhoods with Puget Sound regional employment centers. Delay would limit economic development from the movement of people and goods and allow projects to develop that might preclude or increase the cost of the WSBLE Project

A substantial delay in implementing the WSBLE Project would inhibit the region's ability to accommodate growth, as articulated in local and regional plans. This would lead to a number of other consequences, including changed development patterns, steadily increasing corridor roadway congestion, and deteriorating transit performance and reliability, with related air quality issues and higher energy usage.

6.4 Commitment of Resources

If built, the WSBLE Project would have irreversible and irretrievable commitments of property and natural resources. Private properties with residential and commercial uses would be converted to transportation use. The conversion of lands would change the character of some areas along the WSBLE corridor. The project would affect wetlands, wildlife habitat, and aquatic habitat to varying degrees, depending on the alternative selected. Mitigation measures would be implemented, but some of those resources would be irretrievably altered. Construction of the proposed project would also require the commitment of resources such as fuel and construction materials (such as aggregate for concrete, wood for forms and frames, and steel for rebar and rails).

6.5 Significant and Unavoidable Adverse Impacts

With the avoidance, minimization, and potential mitigation measures described in Chapter 3, Transportation Environment and Consequences, and Chapter 4, Affected Environment and Environmental Consequences, significant adverse impacts would be avoided or minimized for

most alternatives. Long-term permanent impacts that could be significant and unavoidable for the WSBLE Project are described in the following sections.

6.5.1 West Seattle Link Extension

Permanent impacts that could be significant and unavoidable for particular West Seattle Link Extension alternatives include the following:

- Displacement of water-dependent businesses on the Duwamish Waterway and ripple effects on other maritime-related businesses (Preferred Alternative DUW-1a, Option DUW-1b, and Alternative DUW-2). Water-dependent uses have unique characteristics or uses that could be difficult to relocate and may require constructing new facilities. Some water-dependent facilities may not be able to be relocated.
- Visual impacts from elevated guideway in the Delridge Segment (Preferred Alternative DEL-1a, Option DEL-1b, Preferred Alternative DEL-2a*, Option DEL-2b*, Alternative DEL-3, and Alternative DEL-4*).

Some temporary impacts during construction would not be avoidable and could be significant and adverse in some locations. These impacts would include temporary but long-term lane or roadway closures, and noise and vibration. Detour routes could reduce the impact of roadway closures, although delays, congestion, and inconvenience would still occur. Road closures would also require temporary Metro bus diversions. Connection of the SODO Segment alternatives to alternatives in the Chinatown-International District Segment would also temporarily impact operation of existing light rail service. There could be adverse impacts on businesses in the West Seattle Link Extension corridor, especially for businesses adjacent to the alternatives that depend on drive-by traffic. All Duwamish Segment alternatives would require short-term closures of the navigation channel and netting and scaffolding would temporarily reduce vertical clearance over both waterways.

6.5.2 Ballard Link Extension

Permanent impacts that could be significant and unavoidable for particular Ballard Link Extension alternatives include the following:

- Navigation channel impacts of a new bridge over Salmon Bay (Preferred Alternative IBB-1a, Option IBB-1b, and Alternative IBB-3). Bridge alternatives would meet or exceed the governing limitations on the United States Army Corps of Engineers-maintained Ship Canal navigation channel; however, a bridge would become the first vertical restriction upstream of Shilshole Bay preventing vessels that require a vertical clearance of more than 136 feet from traveling further east to the next vertical restriction of the Aurora Bridge.
- Displacement of water-dependent businesses on Salmon Bay and ripple effects on other maritime-related businesses (Preferred Alternative IBB-1a, Option IBB-1b, and Alternative IBB-3). Water-dependent uses have unique characteristics or uses that could be difficult to relocate and may require constructing new facilities. Some water-dependent facilities may not be able to be relocated.

Some temporary impacts during construction would not be avoidable and could be significant and adverse in some locations. These impacts would include temporary but long-term roadway closures (particularly in the Chinatown-International District and Downtown Segments). Detour routes could reduce the impact of roadway closures, although delays, congestion, and

inconvenience would still occur. Road closures would also temporarily affect a segment of the Seattle Streetcar in the Chinatown-International District and Downtown Segments. There would also be temporary noise and vibration impacts. There could be adverse impacts on businesses in the Ballard Link Extension corridor, especially for businesses adjacent to the alternatives that depend on drive-by traffic. Alternative IBB-1a, Option IBB-1b, and Alternative IBB-3 would require one or two short-term closures of the navigation channel during construction of the bridge. Scaffolding and/or netting under the bridge during construction of all alternatives would temporarily reduce the vertical clearance, and some vessels would not be able to pass under portions of the bridge.

6.6 Areas of Controversy and Issues to be Resolved

Areas of controversy and issues to resolve include the following:

- **Funding**: Based on information to date, some alternatives could require third-party funding. These alternatives incorporate enhancements to the scope of the Sound Transit 3 Representative Project identified in the Sound Transit 3 Plan (such as tunnels in West Seattle and Alternative CID-1a* and Option CID-1b* that require replacement of the 4th Avenue South Viaduct). Cost estimates prepared for the Draft Environmental Impact Statement reflect increased costs above those anticipated during the Alternatives Development phase. To ensure that funding remains available to complete all voter-approved projects, the Board conducted a “realignment” process that established a program schedule that is affordable, utilizing current financial projections and cost estimates to set the general order in which projects will advance. This “affordable” schedule established an approach to prioritize, fund, and manage program work over time (Resolution 2021-05). In addition, the Board adopted a “target” schedule for priority projects, reliant upon reductions in the affordability gap. To reduce the affordability gap, Sound Transit will pursue expanded financial capacity (Motion M2020-37); develop and implement a cost savings plan; identify cost savings for the Sound Transit budget outside of the capital program; identify opportunities to reduce cost and planning delays; and engage project stakeholders in discussions to address the trade-offs between project scope, schedule, and new financial resources to inform Board decision-making on project schedule.
- **West Seattle High-Rise Bridge**: The Seattle Department of Transportation closed the West Seattle High-Rise Bridge in March 2020 due to structural issues. In November 2020, the Seattle Department of Transportation announced its intention to repair the current bridge and reopen it, and also to study a long-term replacement bridge. The closure to repair the existing bridge is expected to last until mid-2022. This closure has raised questions about the relationship of a long-term replacement bridge to the WSBLE Project. The repaired existing bridge is expected to have a service life of approximately 40 years; therefore, a long-term replacement bridge is anticipated to be built after the WSBLE Project is constructed. Sound Transit and the Seattle Department of Transportation are coordinating on the relationship between the two projects, and the next steps will be considered as the West Seattle Link Extension project advances.
- **Displacement of Public Facilities:** In the SODO Segment, Option SODO-1b and Alternative SODO-2 would displace the SODO United States Postal Service Carrier Annex and Distribution Center/Terminal Post Office. Preferred Alternative SODO-1a would affect surface parking at the post office, which the United States Postal Service has indicated would require relocating the facility. The staggered station configuration of Preferred

Alternative SODO-1a would avoid permanent impacts (i.e., operation and maintenance) to the United States Postal Service facility. In the South Interbay Segment, Alternative SIB-3 would displace the United States Postal Service Interbay Post Office and Carrier Annex. If a United States Postal Service facility is displaced, Sound Transit would be responsible for environmental review, design, and construction of a replacement facility. The replacement facility would be designed to meet the United States Postal Service's siting criteria and facility requirements. Impacts of relocating either United States Postal Service facility are yet undefined, and should an alternative that triggers relocation of a United States Postal Service facility move forward, additional environmental review will be conducted to evaluate and disclose the impacts of relocating the facility. Postal operations would be relocated to the replacement facility prior to the project impacting the existing facility. In the Chinatown-International District Segment, Option CID-1b* would displace the Ryerson Bus Base, resulting in changes to Metro's routings tied to a relocated base. If this design option were selected, Sound Transit would coordinate with Metro to identify appropriate capital, routing, alternative base locations, and access management strategies and implement those prior to displacement of the base.