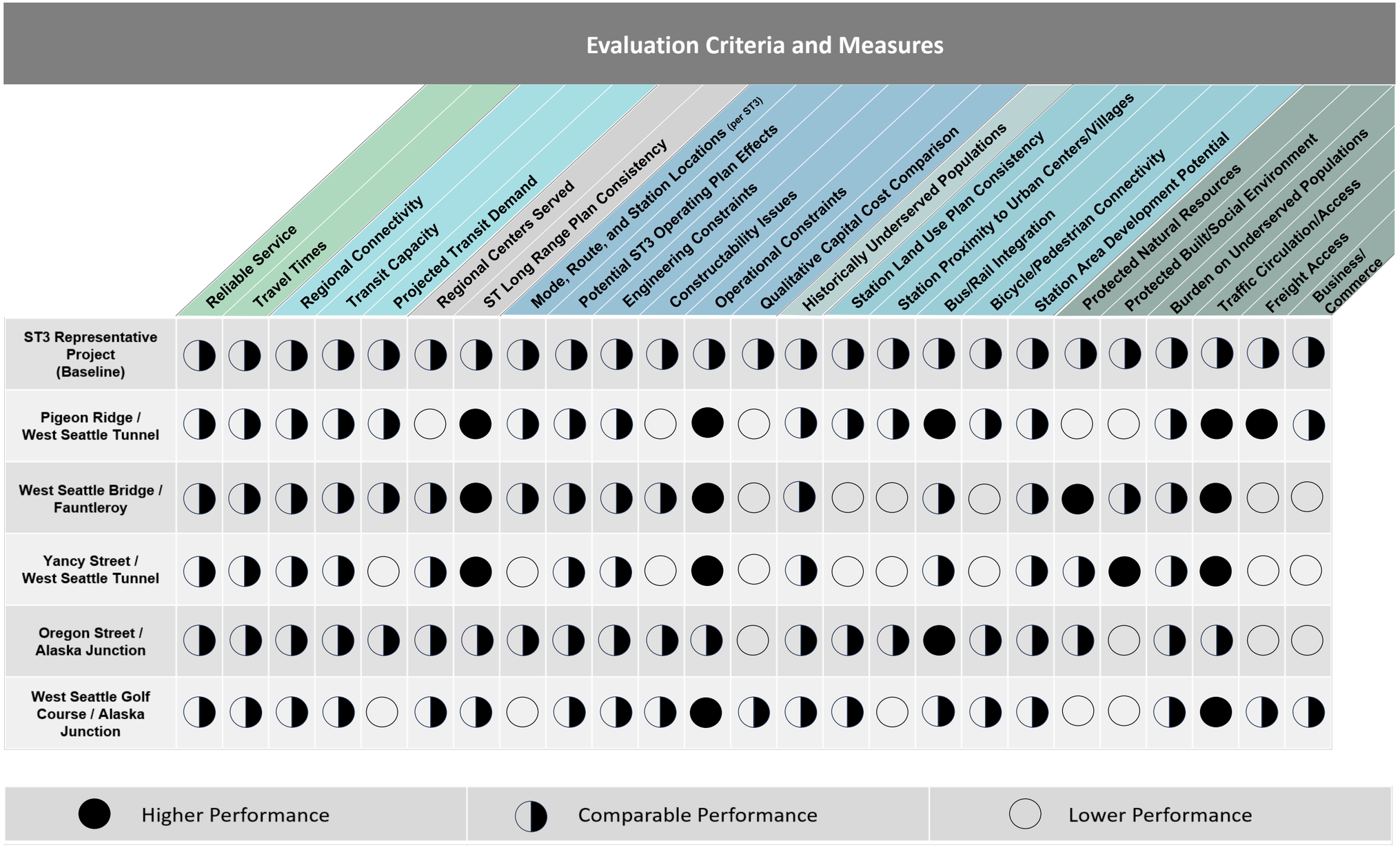
# APPENDIX A

## West Seattle/Duwamish Segment
## Level 1 Evaluation Matrices

# West Seattle/Duwamish Segment – Level 1 Alternatives Evaluation




"Higher Performance" = Higher performance relative to ST3 Representative Project; "Comparable Performance" = Comparable performance relative to ST3 Representative Project; "Lower Performance" = Lower performance relative to ST3 Representative Project

# West Seattle/Duwamish Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | ST3 Representative Project (South of West Seattle Bridge) | | Pigeon Ridge/West Seattle Tunnel | |
| | | | Rating | Evaluation | Rating | Evaluation |
| *Provide high quality rapid, reliable, and efficient peak and off-peak light rail transit service to communities in the project corridors defined in ST3* | | | | | | |
| Reliable Service | Potential service interruptions and recoverability | **Higher Performance** = More grade separation<br>**Comparable Performance** = Grade separation and reliability consistent with ST3 Representative Project<br>**Lower Performance** = Less grade separation | Comparable | • Fully grade separated | Comparable | • Fully grade separated |
| Travel Times | LRT travel times | **Higher Performance** = Travel time approximately 25% faster than ST3 Representative Project<br>**Comparable Performance** = Travel time consistent with ST3 Representative Project<br>**Lower Performance** = Travel time approximately 25% slower than ST3 Representative Project | Comparable | • Travel time approximately 7 minutes for route alignment within West Seattle/Duwamish Segment | Comparable | • Travel time comparable to ST3 Representative Project |
| *Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand* | | | | | | |
| Regional Connectivity | Network integration and operational flexibility to meet future demand | **Higher Performance** = Facilitates additional connectivity and operational flexibility beyond spine segmentation<br>**Comparable Performance** = Facilitates spine segmentation for operational flexibility consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate spine segmentation | Comparable | • Facilitates regional connectivity | Comparable | • Consistent with ST3 Representative Project |
| Transit Capacity | Passenger carrying capacity in downtown | **Higher Performance** = Includes new light rail tunnel through downtown with additional improvements<br>**Comparable Performance** = Includes new light rail tunnel through downtown consistent with ST3 Representative Project<br>**Lower Performance** = Does not include new light rail tunnel through downtown | Comparable | • Baseline for comparison | Comparable | • Consistent with ST3 Representative Project |
| Projected Transit Demand | Ridership potential | **Higher Performance** = More than 10% greater than ST3 Representative Project<br>**Comparable Performance** = Between 10% less and 10% greater than ST3 Representative Project<br>**Lower Performance** = More than 10% less than ST3 Representative Project | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations similar to ST3 Representative Project (approximately 16,000) | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations 5% greater than ST3 Representative Project (approximately 16,800) |
| *Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's Long-Range Plan* | | | | | | |
| Regional Centers Served | Station proximity to PSRC-designated regional centers | **Higher Performance** = Serves more PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project<br>**Comparable Performance** = Serves PSRC-designated regional growth centers and manufacturing/industrial centers consistent with ST3 Representative Project<br>**Lower Performance** = Serves fewer PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project | Comparable | • One regional manufacturing/industrial center served (Duwamish) | Lower | • No regional centers served |
| ST Long-Range Plan Consistency | Accommodates future LRT extension beyond ST3 | **Higher Performance** = A future LRT extension per Sound Transit Long-Range Plan more feasible and more direct than ST3 Representative Project<br>**Comparable Performance** = A future LRT extension per Sound Transit Long-Range Plan feasible, consistent with ST3 Representative Project<br>**Lower Performance** = A future LRT extension per Sound Transit Long-Range Plan would have major challenges | Comparable | • Difficult to turn south onto California Avenue SW and would require elevated structure along California Avenue SW<br>• Further away from 35th Avenue SW to go south | Higher | • Oriented north-south in tunnel |
| *Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain* | | | | | | |
| ST3 Consistency | Mode, route, and general station locations per ST3 | **Higher Performance** = Not applicable<br>**Comparable Performance** = Mode, route and general station locations consistent with ST3 Representative Project and/or System Plan<br>**Lower Performance** = Mode, route and general station locations not consistent with ST3 Representative Project and/or System Plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan |
| | Potential ST3 operating plan effects | **Higher Performance** = Facilitates special trackwork and/or provides reliable system operations<br>**Comparable Performance** = Facilitates special trackwork and/or system operations consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate special trackwork and/or degrades system operations | Comparable | • Facilitates special trackwork that supports operational flexibility | Comparable | • Consistent with ST3 Representative Project |
| Technical Feasibility | Engineering constraints | **Higher Performance** = Minimal engineering constraints, compliance with applicable codes, design guidelines and regulatory requirements<br>**Comparable Performance** = Engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements consistent with ST3 Representative Project<br>**Lower Performance** = Substantial engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements | Comparable | • Long-curved span over S Spokane Street requires a more specialized bridge type, unless a column practical in gore between Spokane Street Viaduct and 4th Avenue S off ramp | Comparable | • No long-curved span<br>• Longer waterway crossing, potential in-water bridge column for Duwamish Waterway crossing depending on bridge type<br>• Tunnel through ridge of Pigeon Point presents additional challenges<br>• Less impact on maintenance of traffic in industrial areas (i.e., Seattle City Light [SCL]) |
| | Constructability issues | **Higher Performance** = Lower construction complexity (e.g., minimal utility conflicts, building impacts, permit requirements, required schedule, geotechnical constraints, tunnel/station constructability, and construction staging/phasing)<br>**Comparable Performance** = Construction complexity consistent with ST3 Representative Project<br>**Lower Performance** = Higher construction complexity | Comparable | • General utility conflicts<br>• Difficult construction at Pigeon Point<br>• Potential in-water work for Duwamish Waterway crossing | Lower | • General utility conflicts<br>• High voltage parallel to guideway at busway between 4th and 6th avenues; powerline ends at Industrial Way S<br>• High voltage crossing 4th Avenue S to 4th Avenue S substation<br>• Potential greater in-water work for Duwamish Waterway crossing<br>• Two tunnels and two cut-and-cover stations |

"Higher Performance" = Higher performance relative to ST3 Representative Project; "Comparable Performance" = Comparable performance relative to ST3 Representative Project; "Lower Performance" = Lower performance relative to ST3 Representative Project

# West Seattle/Duwamish Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | ST3 Representative Project (South of West Seattle Bridge) | | Pigeon Ridge/West Seattle Tunnel | |
| | | | Rating | Evaluation | Rating | Evaluation |
| | Operational constraints | **Higher Performance** = Optimum operational characteristics (e.g., operating efficiency and flexibility)<br>**Comparable Performance** = Operational characteristics consistent with ST3 Representative Project<br>**Lower Performance** = Poor operational characteristics | Comparable | • High rail access from S Forest Street operations and maintenance facility (OMF)<br>• Grade constraints throughout alignment | Higher | • Better OMF access<br>• Fewer curves on alignment<br>• Wider curve for improved design speed prior to crossing Duwamish Waterway from Seattle |
| Financial Sustainability | Qualitative capital cost comparison | **Higher Performance** = Capital cost drivers anticipated to be less than ST3 Representative Project<br>**Comparable Performance** = Capital cost drivers anticipated to be consistent with ST3 Representative Project<br>**Lower Performance** = Capital cost drivers anticipated to be greater than ST3 Representative Project | Comparable | • Total route length approximately 18,500 feet<br>• Approximately 5,000-foot long span bridges<br>• Three elevated stations | Lower | • Total length of alignment approximately 2,000 feet longer than ST3 Representative Project<br>• Approximately 4,500-foot long span bridge, approximately 500 feet less than ST3 Representative Project<br>• Approximately 7,700-foot tunnel<br>• Relocation of major utilities<br>• Less ROW requirement in West Seattle relative to ST3 Representative Project<br>• One elevated and two tunnel stations<br>• Tunnel costs not included ST3 financial plan or methodology |
| *Expand mobility for the corridor and region's residents, which include transit dependent, low income, and minority populations* | | | | | | |
| Historically Underserved Populations | Opportunities for historically underserved populations | **Higher Performance** = Higher access to opportunities for historically underserved populations<br>**Comparable Performance** = Access to opportunities for historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Lower access to opportunities for historically underserved populations | Comparable | • All stations located in areas of moderate access to opportunity | Comparable | • All stations located in areas of moderate access to opportunity |
| *Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies* | | | | | | |
| Station Area Land Use Plan Consistency | General station locations consistent with local land use plans | **Higher Performance** = Station locations have greater consistency with local land use plans<br>**Comparable Performance** = Station locations have consistency with local land use plans consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less consistency with local land use plans | Comparable | • Local land use plans supportive of all three proposed stations<br>• Alaska Junction and Avalon Station locations would serve recently rezoned West Seattle Triangle area<br>• *North Delridge Draft Action Plan* was completed in 2016 and includes Delridge Station area | Comparable | • Similar to ST3 Representative Project; all three proposed stations located in areas with supportive planning |
| | Station proximity to Seattle-designated Urban Centers and Villages | **Higher Performance** = Station locations closer to center of single or combined Seattle-designated Urban Centers and Villages<br>**Comparable Performance** = Station locations at a similar distance to center of single or combined Seattle-designated Urban Centers and Villages consistent with ST3 Representative Project<br>**Lower Performance** = Stations locations further from center of single or combined Seattle-designated Urban Centers and Villages | Comparable | • Alaska Junction and Avalon Stations located within West Seattle Hub Urban Village | Comparable | • Alaska Junction and Avalon Stations located within West Seattle Hub Urban Village |
| Modal Integration | Bus/rail and rail/rail integration | **Higher Performance** = Better opportunities for active bays, layover and/or less route diversion<br>**Comparable Performance** = Opportunities for active bays, layover and/or less route diversion consistent with ST3 Representative Project<br>**Lower Performance** = Fewer opportunities for active bays, layover and/or more route diversion | Comparable | • Active bays may be limited under street-wide stations at Delridge and Alaska Junction<br>• Constrained layover options at Alaska Junction Station | Higher | • More space for active bays at Avalon Station with tunnel station<br>• Better layover opportunity at Alaska Junction Station |
| | Bicycle, pedestrian and persons with limited mobility connectivity | **Higher Performance** = Station locations have better access to existing and planned pedestrian and bicycle networks with few barriers and less grade differences within station areas<br>**Comparable Performance** = Station locations have access to existing and planned pedestrian and bicycle networks within station areas consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less access to existing and planned pedestrian and bicycle networks with more barriers and/or grade differences within station areas | Comparable | • Delridge Station area includes steep grades to east and Avalon Station area includes steep grades in all directions, less grade challenges at Alaska Junction Station<br>• Separated bike path along Delridge Way SW near Delridge Station (heading north from SW Andover Street)<br>• Alki multi-use trail located north of Spokane Street but some challenges to access trail from Delridge Station | Comparable | • Topography at station areas similar to ST3 Representative Project<br>• Delridge Station approximately 0.25 miles further south from Alki multi-use trail and Delridge Way SW bike path |
| Station Area Development Opportunities | Development potential | **Higher Performance** = Half-mile (0.5 mile) station area includes greater amount of land with compatible zoning for future development (over 10% more)<br>**Comparable Performance** = Half-mile (0.5 mile) station area includes amount of land with compatible zoning for future development consistent with ST3 Representative Project<br>**Lower Performance** = Half-mile (0.5 mile) station area includes lesser amount of land with compatible zoning for future development (over 10% less) | Comparable | • Approximately 300 acres with potential for development opportunities | Comparable | • Comparable to ST3 Representative Project |
| *Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices* | | | | | | |
| Environmental Effects | Protected natural resources | **Higher Performance** = Minimal to no potential impacts on natural protected resources (e.g., wetlands, waterbodies, critical areas)<br>**Comparable Performance** = Potential impacts on natural protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to natural protected resources | Comparable | • Potential impacts to wetlands and Longfellow Creek along SW Genesee Street<br>• Steep slopes and habitat on Pigeon Point affected<br>• Potential in-water work in West Duwamish Waterway | Lower | • Potential impacts to wetlands and Longfellow Creek along SW Genesee Street<br>• Steep slopes and habitat on West Duwamish Greenbelt affected<br>• Crosses Duwamish Waterway within boundary of Lower Duwamish Waterway Superfund site<br>• Potential in-water work in Duwamish Waterway |

# West Seattle/Duwamish Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | ST3 Representative Project (South of West Seattle Bridge) | | Pigeon Ridge/West Seattle Tunnel | |
| | | | Rating | Evaluation | Rating | Evaluation |
| | Protected built and social environment | **Higher Performance** = Minimal to no potential impacts on built and social protected resources (e.g., parks, cultural resources, contaminated sites)<br>**Comparable Performance** = Potential impacts on built and social protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to built and social protected resources and/or substantial residential or business displacements | Comparable | • Potential for residential displacements in Delridge, Avalon, and Junction neighborhoods<br>• Potential for neighborhood impacts along elevated alignment (visual, noise and construction)<br>• Potential Impacts to Pigeon Point open space<br>• Potential impacts to historic properties | Lower | • Potential impacts to West Duwamish Greenbelt open space and West Seattle Golf Course<br>• Lower potential for residential and business displacements due to tunnel and avoids turn from Delridge Way SW to SW Genesee Street<br>• Potential for neighborhood impacts along elevated alignment along SW Genesee Street (visual, noise and construction)<br>• Avoids potential permanent visual and noise impacts in Avalon and Junction neighborhoods.<br>• Cut-and-cover Avalon Station could potentially require residential displacements<br>• Cut-and-cover Alaska Junction Station could potentially require business displacements<br>• Potential for archaeological resources on west side of Duwamish Waterway |
| | Burden on historically underserved populations | **Higher Performance** = Would have a lesser burden on historically underserved population than ST3 Representative Project<br>**Comparable Performance** = Would have potential to impact historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Would have a greater burden on historically underserved population than ST3 Representative Project | Comparable | • Alignment and stations located in areas with similar low-income and minority populations as rest of the city<br>• Stations located in areas of low to moderate displacement risk | Comparable | • Alignment and stations located in areas with similar low-income and minority populations as rest of the city<br>• Stations located in areas of low to moderate displacement risk |
| Traffic Operations | Traffic circulation and access | **Higher Performance** = Few to no changes in traffic patterns and/or access<br>**Comparable Performance** = Changes to traffic patterns and/or access consistent with ST3 Representative Project<br>**Lower Performance** = Substantial impacts to traffic circulation and/or access, mitigation likely requires substantial road improvements | Comparable | • Affects traffic lanes and/or circulation on SW Klickitat Way, Delridge Way SW, SW Genesee Street, Fauntleroy Way SW, and SW Alaska Street | Higher | • Affects traffic lanes and/or circulation on SW Genesee Street<br>• Avoids potential roadway impacts on Fauntleroy Way SW and SW Alaska Street |
| Economic Effects | Freight movement and access on land and water | **Higher Performance** = Minimal effects to freight mobility and future freight capacity expansion opportunities<br>**Comparable Performance** = Effects to freight mobility and future freight capacity expansion opportunities consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects to freight mobility and future freight capacity expansion opportunities | Comparable | • Columns might partially block N. parking/access road at Terminal 102 on Harbor Island<br>• Construction could block N. parking area/access at Terminal 102 temporarily; also, could interrupt railroad access to West Seattle during foundation construction<br>• Construction at SCL maintenance facility could partially block S Spokane Street during foundation construction | Higher | • Avoids disruption to freight movement on Harbor Island<br>• Columns could partially block local truck traffic to warehouses on S Nevada Street<br>• Construction could partially block local truck traffic to S Nevada during foundation construction<br>• Construction could partially block truck traffic at about 4th Avenue S and S Industrial Way |
| | Business and commerce effects | **Higher Performance** = Minimal effects on local businesses, as well as commercial and industrial areas<br>**Comparable Performance** = Effects on local businesses, as well as commercial and industrial areas consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects on local businesses, as well as commercial and industrial areas | Comparable | • Potentially require business displacements in Alaska Junction area<br>• Potential impacts to businesses along alignment during construction | Comparable | • Potentially require business displacements in Alaska Junction area; could be lower based on tunnel type<br>• Potential Impacts to businesses along alignment during construction |

# West Seattle/Duwamish Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | West Seattle Bridge/Fauntleroy | | Yancy/West Seattle Tunnel | |
| | | | Rating | Evaluation | Rating | Evaluation |
| *Provide high quality rapid, reliable, and efficient peak and off-peak light rail transit service to communities in the project corridors defined in ST3* | | | | | | |
| Reliable Service | Potential service interruptions and recoverability | **Higher Performance** = More grade separation<br>**Comparable Performance** = Grade separation and reliability consistent with ST3 Representative Project<br>**Lower Performance** = Less grade separation | Comparable | • Fully grade separated | Comparable | • Fully grade separated |
| Travel Times | LRT travel times | **Higher Performance** = Travel time approximately 25% faster than ST3 Representative Project<br>**Comparable Performance** = Travel time consistent with ST3 Representative Project<br>**Lower Performance** = Travel time approximately 25% slower than ST3 Representative Project | Comparable | • Travel time comparable to ST3 Representative Project | Comparable | • Travel time comparable ST3 Representative Project; faster average speed due to one less station |
| *Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand* | | | | | | |
| Regional Connectivity | Network integration and operational flexibility to meet future demand | **Higher Performance** = Facilitates additional connectivity and operational flexibility beyond spine segmentation<br>**Comparable Performance** = Facilitates spine segmentation for operational flexibility consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate spine segmentation | Comparable | • Consistent with ST3 Representative Project | Comparable | • Consistent with ST3 Representative Project |
| Transit Capacity | Passenger carrying capacity in downtown | **Higher Performance** = Includes new light rail tunnel through downtown with additional improvements<br>**Comparable Performance** = Includes new light rail tunnel through downtown consistent with ST3 Representative Project<br>**Lower Performance** = Does not include new light rail tunnel through downtown | Comparable | • Consistent with ST3 Representative Project | Comparable | • Consistent with ST3 Representative Project |
| Projected Transit Demand | Ridership potential | **Higher Performance** = More than 10% greater than ST3 Representative Project<br>**Comparable Performance** = Between 10% less and 10% greater than ST3 Representative Project<br>**Lower Performance** = More than 10% less than ST3 Representative Project | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations 6% less than ST3 Representative Project (approximately 15,000) | Lower | • Total 2040 population and employment within 0.5-mile buffer of stations 12% less than ST3 Representative Project (approximately 14,100) |
| *Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's Long-Range Plan* | | | | | | |
| Regional Centers Served | Station proximity to PSRC-designated regional centers | **Higher Performance** = Serves more PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project<br>**Comparable Performance** = Serves PSRC-designated regional growth centers and manufacturing/industrial centers consistent with ST3 Representative Project<br>**Lower Performance** = Serves fewer PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project | Comparable | • One regional manufacturing/industrial center served (Duwamish) | Comparable | • One regional manufacturing/industrial center served (Duwamish) |
| ST Long-Range Plan Consistency | Accommodates future LRT extension beyond ST3 | **Higher Performance** = A future LRT extension per Sound Transit Long-Range Plan more feasible and more direct than ST3 Representative Project<br>**Comparable Performance** = A future LRT extension per Sound Transit Long-Range Plan feasible, consistent with ST3 Representative Project<br>**Lower Performance** = A future LRT extension per Sound Transit Long-Range Plan would have major challenges | Higher | • Oriented north-south<br>• Closer to 35th Avenue SW to go south | Higher | • Oriented north-south<br>• Closer to 35th Avenue SW to go south |
| *Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain* | | | | | | |
| ST3 Consistency | Mode, route, and general station locations per ST3 | **Higher Performance** = Not applicable<br>**Comparable Performance** = Mode, route and general station locations consistent with ST3 Representative Project and/or System Plan<br>**Lower Performance** = Mode, route and general station locations not consistent with ST3 Representative Project and/or System Plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan | Lower | • Consolidating stations not identified or analyzed in ST3 Plan |
| | Potential ST3 operating plan effects | **Higher Performance** = Facilitates special trackwork and/or provides reliable system operations<br>**Comparable Performance** = Facilitates special trackwork and/or system operations consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate special trackwork and/or degrades system operations | Comparable | • Consistent with ST3 Representative Project | Comparable | • Consistent with ST3 Representative Project |
| Technical Feasibility | Engineering constraints | **Higher Performance** = Minimal engineering constraints, compliance with applicable codes, design guidelines and regulatory requirements<br>**Comparable Performance** = Engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements consistent with ST3 Representative Project<br>**Lower Performance** = Substantial engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements | Comparable | • Avoids Pigeon Point and tall guideway along SW Genesee Street<br>• Requires Port of Seattle/Northwest Seaport Alliance (NWSA) property access east of West Duwamish Waterway<br>• One span over 700 feet and would require a long span bridge; large culvert (80-inch diameter) for Longfellow Creek and large sewer (96-inch) crossing near bridge piers could likely increase span<br>• Delridge Station north of West Seattle Bridge would be tall and need to be integrated with long span bridge | Comparable | • Avoids Pigeon Point and tall guideway along SW Genesee Street<br>• Requires Port of Seattle/NWSA property access east of West Duwamish Waterway<br>• Requires easement from Nucor Steel |

"Higher Performance" = Higher performance relative to ST3 Representative Project; "Comparable Performance" = Comparable performance relative to ST3 Representative Project; "Lower Performance" = Lower performance relative to ST3 Representative Project

# West Seattle/Duwamish Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | West Seattle Bridge/Fauntleroy | | Yancy/West Seattle Tunnel | |
| | | | Rating | Evaluation | Rating | Evaluation |
| | Constructability issues | **Higher Performance** = Lower construction complexity (e.g., minimal utility conflicts, building impacts, permit requirements, required schedule, geotechnical constraints, tunnel/station constructability, and construction staging/phasing)<br>**Comparable Performance** = Construction complexity consistent with ST3 Representative Project<br>**Lower Performance** = Higher construction complexity | Comparable | • General utility conflicts<br>• Potential conflicts with existing large culvert (80-inch diameter) for Longfellow Creek near Delridge Station<br>• Construction sequencing to accommodate Port of Seattle/NWSA operations<br>• Potential in-water work for Duwamish Waterway crossing<br>• Construction of tall Delridge Station with a long span bridge (structurally separated)<br>• Three elevated stations | Lower | • General utility conflicts<br>• Construction sequencing to accommodate Port of Seattle/NWSA operations<br>• Construction sequencing to accommodate Nucor Steel operations<br>• Potential in-water work for Duwamish Waterway crossing<br>• Tunnel cut-and-cover station |
| | Operational constraints | **Higher Performance** = Optimum operational characteristics (e.g., operating efficiency and flexibility)<br>**Comparable Performance** = Operational characteristics consistent with ST3 Representative Project<br>**Lower Performance** = Poor operational characteristics | Higher | • More direct access to OMF assuming more property acquisitions<br>• Fewer curves on alignment | Higher | • More direct access to OMF assuming more property acquisitions<br>• Fewer curves on alignment |
| Financial Sustainability | Qualitative capital cost comparison | **Higher Performance** = Capital cost drivers anticipated to be less than ST3 Representative Project<br>**Comparable Performance** = Capital cost drivers anticipated to be consistent with ST3 Representative Project<br>**Lower Performance** = Capital cost drivers anticipated to be greater than ST3 Representative Project | Lower | • Approximately 9,200-foot long span bridge<br>• Long span bridge and tall station at bridge; an approximate 4,100-foot increase from ST3 Representative Project<br>• Potential less ROW impact in West Seattle and greater Port of Seattle/NWSA ROW impact<br>• Three elevated stations | Lower | • Approximately 7,900-foot long span bridge; an approximate 2,800-foot increase from ST3 Representative Project<br>• Approximately 4,800-foot tunnel<br>• Potential less ROW impact in West Seattle and greater Port of Seattle/NWSA ROW impact<br>• One elevated and one tunnel station; consolidating sations not identified or analyzed in *ST3 Plan*<br>• Tunnel costs not included ST3 financial plan or methodology |
| *Expand mobility for the corridor and region's residents, which include transit dependent, low income, and minority populations* | | | | | | |
| Historically Underserved Populations | Opportunities for historically underserved populations | **Higher Performance** = Higher access to opportunities for historically underserved populations<br>**Comparable Performance** = Access to opportunities for historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Lower access to opportunities for historically underserved populations | Comparable | • Delridge Station would provide higher access for historically underserved populations but located in area with low population and not walkable from neighborhoods; other stations would be comparable | Comparable | • All stations located in areas of moderate access to opportunity |
| *Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies* | | | | | | |
| Station Area Land Use Plan Consistency | General station locations consistent with local land use plans | **Higher Performance** = Station locations have greater consistency with local land use plans<br>**Comparable Performance** = Station locations have consistency with local land use plans consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less consistency with local land use plans | Lower | • Local land use plans supportive of station at Alaska Junction and Avalon Station locations and would serve recently rezoned West Seattle Triangle area<br>• Delridge Station less consistent with plans because station area not located within North Delridge neighborhood and within Manufacturing/Industrial uses and encompasses Port of Seattle/NWSA uses | Lower | • Local land use plans supportive of station at Alaska Junction location and would serve recently rezoned West Seattle Triangle area<br>• Delridge Station less consistent with plans as it would not be located in North Delridge neighborhood and located on edge of Manufacturing/Industrial area |
| | Station proximity to Seattle-designated Urban Centers and Villages | **Higher Performance** = Station locations closer to center of single or combined Seattle-designated Urban Centers and Villages<br>**Comparable Performance** = Station locations at a similar distance to center of single or combined Seattle-designated Urban Centers and Villages consistent with ST3 Representative Project<br>**Lower Performance** = Stations locations further from center of single or combined Seattle-designated Urban Centers and Villages | Lower | • Alaska Junction and Avalon stations on edge of West Seattle Hub Urban Village<br>• Delridge Station not within designated Urban Center or Village | Lower | • Alaska Junction would be the only station located within West Seattle Hub Urban Village<br>• Delridge Station not within designated Urban Center or Village |
| Modal Integration | Bus/rail and rail/rail integration | **Higher Performance** = Better opportunities for active bays, layover and/or less route diversion<br>**Comparable Performance** = Opportunities for active bays, layover and/or less route diversion consistent with ST3 Representative Project<br>**Lower Performance** = Fewer opportunities for active bays, layover and/or more route diversion | Comparable | • Less bus route diversion at Avalon Station, but more bus diversion to Delridge Station<br>• Could integrate bus service from Admiral<br>• Better layover opportunity at Alaska Junction Station | Comparable | • SW Yancy Street could be hub for bus service from Delridge and Admiral, although all would need to divert<br>• Better layover and active bay opportunities at Alaska Junction Station (tunnel)<br>• May need more active bays due to removal of Avalon Station |
| | Bicycle, pedestrian and persons with limited mobility connectivity | **Higher Performance** = Station locations have better access to existing and planned pedestrian and bicycle networks with few barriers and less grade differences within station areas<br>**Comparable Performance** = Station locations have access to existing and planned pedestrian and bicycle networks within station areas consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less access to existing and planned pedestrian and bicycle networks with more barriers and/or grade differences within station areas | Lower | • Topography at station areas similar to ST3 Representative Project<br>• Delridge Station directly adjacent to Alki multi-use trail but man-made barriers restrict access to station from Delridge neighborhood (West Seattle Bridge and Nucor Steel) | Lower | • Topography at Alaska Junction Station similar to ST3 Representative Project<br>• Yancy Station located in a valley and adjacent to man-made barrier (Nucor Steel); no strong street grid in this area and many streets do not continue through to arterials |

# West Seattle/Duwamish Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | West Seattle Bridge/Fauntleroy | | Yancy/West Seattle Tunnel | |
| | | | Rating | Evaluation | Rating | Evaluation |
| Station Area Development Opportunities | Development potential | **Higher Performance** = Half-mile (0.5 mile) station area includes greater amount of land with compatible zoning for future development (over 10% more)<br>**Comparable Performance** = Half-mile (0.5 mile) station area includes amount of land with compatible zoning for future development consistent with ST3 Representative Project<br>**Lower Performance** = Half-mile (0.5 mile) station area includes lesser amount of land with compatible zoning for future development (over 10% less) | Comparable | • Comparable to ST3 Representative Project | Comparable | • Comparable to ST3 Representative Project |
| *Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices* | | | | | | |
| Environmental Effects | Protected natural resources | **Higher Performance** = Minimal to no potential impacts on natural protected resources (e.g., wetlands, waterbodies, critical areas)<br>**Comparable Performance** = Potential impacts on natural protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to natural protected resources | Higher | • Avoids potential impacts to wetlands and Longfellow Creek along SW Genesee Street<br>• Avoids steep slopes and habitat on Pigeon Point<br>• Potential impacts to habitat restoration area at Terminal 25<br>• Potential in-water work in West Duwamish Waterway | Comparable | • Comparable potential for impacts to wetlands and Longfellow Creek along SW Genesee Street<br>• Avoids steep slopes and habitat on Pigeon Point<br>• Potential impacts to habitat restoration area at Terminal 25<br>• Potential in-water work in West Duwamish Waterway |
| | Protected built and social environment | **Higher Performance** = Minimal to no potential impacts on built and social protected resources (e.g., parks, cultural resources, contaminated sites)<br>**Comparable Performance** = Potential impacts on built and social protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to built and social protected resources and/or substantial residential or business displacements | Comparable | • Avoids potential residential displacements in Delridge neighborhood and potentially Avalon neighborhood<br>• Potential for neighborhood impacts along elevated alignment for areas along Fauntleroy Way SW (visual, noise and construction), but avoid for areas along SW Genesee Street and Delridge Way SW<br>• Avoids potential impacts to Pigeon Point open space | Higher | • Lower potential for residential displacements in Delridge neighborhood<br>• Avoids potential residential displacements in Avalon neighborhood<br>• Potential for residential and/or business displacements for Junction Station near Fauntleroy Way SW<br>• Lower potential for neighborhood impacts along elevated alignment than alignments on Delridge Way SW and SW Genesee Street (visual, noise and construction)<br>• Potential impacts to Pigeon Point open space |
| | Burden on historically underserved populations | **Higher Performance** = Would have a lesser burden on historically underserved population than ST3 Representative Project<br>**Comparable Performance** = Would have potential to impact historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Would have a greater burden on historically underserved population than ST3 Representative Project | Comparable | • Alignment and stations located in areas with similar low-income and minority populations as rest of the city<br>• Stations located in areas of low to moderate displacement risk | Comparable | • Alignment and stations located in areas with similar low-income and minority populations as rest of the city<br>• Stations located in areas of low to moderate displacement risk |
| Traffic Operations | Traffic circulation and access | **Higher Performance** = Few to no changes in traffic patterns and/or access<br>**Comparable Performance** = Changes to traffic patterns and/or access consistent with ST3 Representative Project<br>**Lower Performance** = Substantial impacts to traffic circulation and/or access, mitigation likely requires substantial road improvements | Higher | • Affects traffic lanes and/or circulation on Fauntleroy Way SW and below West Seattle Bridge at Delridge Station<br>• Avoids potential impacts to SW Klickitat Way, Delridge Way SW, and SW Genesee Street | Higher | • Potential impacts to traffic circulation in vicinity of SW Yancy Street and SW Andover Street<br>• Avoids potential traffic impacts on SW Genesee Street, SW Klickitat Way and SW Alaska Street |
| Economic Effects | Freight movement and access on land and water | **Higher Performance** = Minimal effects to freight mobility and future freight capacity expansion opportunities<br>**Comparable Performance** = Effects to freight mobility and future freight capacity expansion opportunities consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects to freight mobility and future freight capacity expansion opportunities | Lower | • Potential columns in gate area of Terminal 18 and at maritime facility east of Terminal 18<br>• Pier construction at E Marginal Way/Spokane Street could likely disrupt north-south traffic, truck gate operations at Terminal 18 and maritime facility east of Terminal 18<br>• Construction could likely disrupt repackaging operations for maritime/truck shipment on west side of West Duwamish Waterway<br>• Construction could likely disrupt of perimeter road and lead tracks in Terminal 5 during foundation construction | Lower | • Potential columns in gate area of Terminal 18 and at maritime facility east of Terminal 18<br>• Columns in Nucor Steel yard could likely disrupt material supply to facility<br>• Pier construction at E Marginal Way/Spokane Street could likely disrupt north-south traffic, truck gate operations at Terminal 18 and maritime facility east of Terminal 18<br>• Construction could likely disrupt repackaging operations for maritime/truck shipment on west side of West Duwamish Waterway<br>• Foundation construction in Nucor Steel yard could likely disrupt material supply to facility |
| | Business and commerce effects | **Higher Performance** = Minimal effects on local businesses, as well as commercial and industrial areas<br>**Comparable Performance** = Effects on local businesses, as well as commercial and industrial areas consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects on local businesses, as well as commercial and industrial areas | Lower | • Avoids potential business displacements in Alaska Junction area<br>• Potential impacts to industrial businesses north of West Seattle Bridge<br>• Potential impacts to businesses along alignment during construction | Lower | • Avoids potential business displacements in Alaska Junction area<br>• Could affect Nucor Steel operations<br>• Potential impacts to industrial businesses north of West Seattle Bridge<br>• Potential impacts to businesses along alignment during construction<br>• Potentially requires business displacements on Fauntleroy Way SW; could be lower based on tunnel type |

# West Seattle/Duwamish Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | Oregon Street/Alaska Junction | | West Seattle Golf Course/Alaska Junction | |
| | | | Rating | Evaluation | Rating | Evaluation |
| *Provide high quality rapid, reliable, and efficient peak and off-peak light rail transit service to communities in the project corridors defined in ST3* | | | | | | |
| Reliable Service | Potential service interruptions and recoverability | **Higher Performance** = More grade separation<br>**Comparable Performance** = Grade separation and reliability consistent with ST3 Representative Project<br>**Lower Performance** = Less grade separation | Comparable | • Fully grade separated | Comparable | • Fully grade separated |
| Travel Times | LRT travel times | **Higher Performance** = Travel time approximately 25% faster than ST3 Representative Project<br>**Comparable Performance** = Travel time consistent with ST3 Representative Project<br>**Lower Performance** = Travel time approximately 25% slower than ST3 Representative Project | Comparable | • Travel time comparable to ST3 Representative Project | Comparable | • Travel time comparable to ST3 Representative Project; faster average speed due to one less station |
| *Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand* | | | | | | |
| Regional Connectivity | Network integration and operational flexibility to meet future demand | **Higher Performance** = Facilitates additional connectivity and operational flexibility beyond spine segmentation<br>**Comparable Performance** = Facilitates spine segmentation for operational flexibility consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate spine segmentation | Comparable | • Consistent with ST3 Representative Project | Comparable | • Consistent with ST3 Representative Project |
| Transit Capacity | Passenger carrying capacity in downtown | **Higher Performance** = Includes new light rail tunnel through downtown with additional improvements<br>**Comparable Performance** = Includes new light rail tunnel through downtown consistent with ST3 Representative Project<br>**Lower Performance** = Does not include new light rail tunnel through downtown | Comparable | • Consistent with ST3 Representative Project | Comparable | • Consistent with ST3 Representative Project |
| Projected Transit Demand | Ridership potential | **Higher Performance** = More than 10% greater than ST3 Representative Project<br>**Comparable Performance** = Between 10% less and 10% greater than ST3 Representative Project<br>**Lower Performance** = More than 10% less than ST3 Representative Project | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations 8% greater than ST3 Representative Project (approximately 17,200) | Lower | • Total 2040 population and employment within 0.5-mile buffer of stations 12% less than ST3 Representative Project (approximately 14,100) |
| *Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's Long-Range Plan* | | | | | | |
| Regional Centers Served | Station proximity to PSRC-designated regional centers | **Higher Performance** = Serves more PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project<br>**Comparable Performance** = Serves PSRC-designated regional growth centers and manufacturing/industrial centers consistent with ST3 Representative Project<br>**Lower Performance** = Serves fewer PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project | Comparable | • One regional manufacturing/industrial center served (Duwamish) | Comparable | • One regional manufacturing/industrial center served (Duwamish) |
| ST Long-Range Plan Consistency | Accommodates future LRT extension beyond ST3 | **Higher Performance** = A future LRT extension per Sound Transit Long-Range Plan more feasible and more direct than ST3 Representative Project<br>**Comparable Performance** = A future LRT extension per Sound Transit Long-Range Plan feasible, consistent with ST3 Representative Project<br>**Lower Performance** = A future LRT extension per Sound Transit Long-Range Plan would have major challenges | Comparable | • Oriented north-south, but west of California Avenue SW to go south<br>• Requires elevated along California Avenue SW to south | Comparable | • Oriented east-west in a tunnel at Fauntleroy Way SW, but would require a U-turn to orient south towards 35th Avenue SW |
| *Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain* | | | | | | |
| ST3 Consistency | Mode, route, and general station locations per ST3 | **Higher Performance** = Not applicable<br>**Comparable Performance** = Mode, route and general station locations consistent with ST3 Representative Project and/or System Plan<br>**Lower Performance** = Mode, route and general station locations not consistent with ST3 Representative Project and/or System Plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan | Lower | • Consolidating stations not identified or analyzed in ST3 Plan |
| | Potential ST3 operating plan effects | **Higher Performance** = Facilitates special trackwork and/or provides reliable system operations<br>**Comparable Performance** = Facilitates special trackwork and/or system operations consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate spine segmentation and/or degrades system operations | Comparable | • Consistent with ST3 Representative Project | Comparable | • Consistent with ST3 Representative Project |
| Technical Feasibility | Engineering constraints | **Higher Performance** = Minimal engineering constraints, compliance with applicable codes, design guidelines and regulatory requirements<br>**Comparable Performance** = Engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements consistent with ST3 Representative Project<br>**Lower Performance** = Substantial engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements | Comparable | • Avoids Pigeon Point<br>• Requires Port of Seattle/NWSA property access east of West Duwamish Waterway | Comparable | • Long curved span over S Spokane Street requires a more specialized bridge type, unless a column practical in gore between Spokane Street Viaduct and 4th Avenue S off-ramp<br>• Reduced property impacts along SW Genesee Street but potential impacts to West Seattle Golf Course and Delridge Community Center yard/park |
| | Constructability issues | **Higher Performance** = Lower construction complexity (e.g., minimal utility conflicts, building impacts, permit requirements, required schedule, geotechnical constraints, tunnel/station constructability, and construction staging/phasing)<br>**Comparable Performance** = Construction complexity consistent with ST3 Representative Project<br>**Lower Performance** = Higher construction complexity | Comparable | • General utility conflicts<br>• Construction sequencing to accommodate Port of Seattle/NWSA operations<br>• Construction sequencing to accommodate Nucor Steel operations<br>• Potential in-water work for Duwamish Waterway crossing<br>• Three elevated stations | Comparable | • General utility conflicts<br>• Difficult construction at Pigeon Point<br>• Potential in-water work for Duwamish Waterway crossing<br>• Tunnel cut-and-cover station |

# West Seattle/Duwamish Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | Oregon Street/Alaska Junction | | West Seattle Golf Course/Alaska Junction | |
| | | | Rating | Evaluation | Rating | Evaluation |
| | Operational constraints | **Higher Performance** = Optimum operational characteristics (e.g., operating efficiency and flexibility)<br>**Comparable Performance** = Operational characteristics consistent with ST3 Representative Project<br>**Lower Performance** = Poor operational characteristics | Comparable | • More direct access to OMF assuming more property acquisitions<br>• Longer route and curves into Alaska Junction | Higher | • Fewer curves on alignment |
| Financial Sustainability | Qualitative capital cost comparison | **Higher Performance** = Capital cost drivers anticipated to be less than ST3 Representative Project<br>**Comparable Performance** = Capital cost drivers anticipated to be consistent with ST3 Representative Project<br>**Lower Performance** = Capital cost drivers anticipated to be greater than ST3 Representative Project | Lower | • Approximately 6,800-foot long span bridge, an approximate 1,800-foot increase from ST3 Representative Project<br>• More ROW impact in West Seattle relative to ST3 Representative Project<br>• Three elevated stations | Comparable | • Approximately 4,900-foot long span bridges<br>• Approximately 3,000-foot tunnel<br>• Less ROW impact in West Seattle relative to ST3 Representative Project<br>• One elevated and one tunnel station; consolidating stations not identified or analyzed in *ST3 Plan*<br>• Tunnel costs not included in ST3 financial plan or evaluation methodology |
| *Expand mobility for the corridor and region's residents, which include transit dependent, low income, and minority populations* | | | | | | |
| Historically Underserved Populations | Opportunities for historically underserved populations | **Higher Performance** = Higher access to opportunities for historically underserved populations<br>**Comparable Performance** = Access to opportunities for historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Lower access to opportunities for historically underserved populations | Comparable | • All stations located in areas of moderate access to opportunity | Comparable | • All stations located in areas of moderate access to opportunity |
| *Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies* | | | | | | |
| Station Area Land Use Plan Consistency | General station locations consistent with local land use plans | **Higher Performance** = Station locations have greater consistency with local land use plans<br>**Comparable Performance** = Station locations have consistency with local land use plans consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less consistency with local land use plans | Comparable | • Similar to ST3 Representative Project, all three proposed stations located in areas with supportive planning | Comparable | • Local land use plans supportive of stations at Alaska Junction and Delridge |
| | Station proximity to Seattle-designated Urban Centers and Villages | **Higher Performance** = Station locations closer to center of single or combined Seattle-designated Urban Centers and Villages<br>**Comparable Performance** = Station locations at a similar distance to center of single or combined Seattle-designated Urban Centers and Villages consistent with ST3 Representative Project<br>**Lower Performance** = Stations locations further from center of single or combined Seattle-designated Urban Centers and Villages | Comparable | • Alaska Junction and Avalon stations located within West Seattle Hub Urban Village | Lower | • Alaska Junction would be the only station located within West Seattle Hub Urban Village |
| Modal Integration | Bus/rail and rail/rail integration | **Higher Performance** = Better opportunities for active bays, layover and/or less route diversion<br>**Comparable Performance** = Opportunities for active bays, layover and/or less route diversion consistent with ST3 Representative Project<br>**Lower Performance** = Fewer opportunities for active bays, layover and/or more route diversion | Higher | • More available space for active bays and transit access to Alaska Junction and Delridge stations, along with layover at Alaska Junction area<br>• Some bus diversion to Avalon Station | Comparable | • Available space for active bays and transit access to Alaska Junction Station (tunnel station)<br>• Likely bus diversion due to elimination of Avalon Station<br>• Active bays may be limited under or adjacent to Delridge Station spanning roadway |
| | Bicycle, pedestrian and persons with limited mobility connectivity | **Higher Performance** = Station locations have better access to existing and planned pedestrian and bicycle networks with few barriers and less grade differences within station areas<br>**Comparable Performance** = Station locations have access to existing and planned pedestrian and bicycle networks within station areas consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less access to existing and planned pedestrian and bicycle networks with more barriers and/or grade differences within station areas | Comparable | • Topography at station areas similar to ST3 Representative Project | Comparable | • Topography at station areas similar to ST3 Representative Project |
| Station Area Development Opportunities | Development potential | **Higher Performance** = Half-mile (0.5 mile) station area includes greater amount of land with compatible zoning for future development (over 10% more)<br>**Comparable Performance** = Half-mile (0.5 mile) station area includes amount of land with compatible zoning for future development consistent with ST3 Representative Project<br>**Lower Performance** = Half-mile (0.5 mile) station area includes lesser amount of land with compatible zoning for future development (over 10% less) | Comparable | • Comparable to ST3 Representative Project | Comparable | • Comparable to ST3 Representative Project |
| *Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices* | | | | | | |
| Environmental Effects | Protected natural resources | **Higher Performance** = Minimal to no potential impacts on natural protected resources (e.g., wetlands, waterbodies, critical areas)<br>**Comparable Performance** = Potential impacts on natural protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to natural protected resources | Comparable | • Potential impacts to wetlands and Longfellow Creek along SW Genesee Street<br>• Avoids steep slopes and habitat on Pigeon Point affected because on north side of West Seattle Bridge<br>• Potential impacts to habitat restoration area at Terminal 25<br>• Potential in-water work in West Duwamish Waterway | Lower | • Greater potential for impacts to habitat in West Seattle Golf Course<br>• Potential impacts to steep slopes and habitat on Pigeon Point<br>• Potential in-water work in West Duwamish Waterway |

# West Seattle/Duwamish Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | Oregon Street/Alaska Junction | | West Seattle Golf Course/Alaska Junction | |
| | | | Rating | Evaluation | Rating | Evaluation |
| | Protected built and social environment | **Higher Performance** = Minimal to no potential impacts on built and social protected resources (e.g., parks, cultural resources, contaminated sites)<br>**Comparable Performance** = Potential impacts on built and social protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to built and social protected resources and/or substantial residential or business displacements | Lower | • Potential for residential displacements in Delridge, Avalon and Junction neighborhoods<br>• Potential for neighborhood impacts along elevated alignment (visual, noise and construction)<br>• Could potentially remove buildings in Junction commercial district | Lower | • Traverses West Seattle Golf Course (Section 4(f) resource), likely requiring showing no feasible and prudent alternative<br>• Avoids potential residential displacements in Delridge and Avalon neighborhoods<br>• Lower potential for neighborhood impacts along elevated alignment than alignment along SW Genesee Street (visual, noise and construction) |
| | Burden on historically underserved populations | **Higher Performance** = Would have a lesser burden on historically underserved population than ST3 Representative Project<br>**Comparable Performance** = Would have potential to impact historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Would have a greater burden on historically underserved population than ST3 Representative Project | Comparable | • Alignment and stations located in areas with similar low-income and minority populations as rest of the city<br>• Stations located in areas of low to moderate displacement risk | Comparable | • Alignment and stations located in areas with similar low-income and minority populations as rest of the city<br>• Stations located in areas of low to moderate displacement risk |
| Traffic Operations | Traffic circulation and access | **Higher Performance** = Few to no changes in traffic patterns and/or access<br>**Comparable Performance** = Changes to traffic patterns and/or access consistent with ST3 Representative Project<br>**Lower Performance** = Substantial impacts to traffic circulation and/or access, mitigation likely requires substantial road improvements | Comparable | • Affects traffic lanes and/or circulation on Delridge Way SW, SW Genesee Street, Fauntleroy Way SW, SW Oregon Street, and 44th Street SW<br>• Avoids potential traffic impacts on SW Alaska Street | Higher | • Affects traffic lanes and circulation on Delridge Way SW<br>• Avoids potential permanent traffic impacts on SW Genesee Street, Fauntleroy Way SW and SW Alaska Street |
| Economic Effects | Freight movement and access on land and water | **Higher Performance** = Minimal effects to freight mobility and future freight capacity expansion opportunities<br>**Comparable Performance** = Effects to freight mobility and future freight capacity expansion opportunities consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects to freight mobility and future freight capacity expansion opportunities | Lower | • Potential columns in gate area of Terminal 18 and at maritime facility east of Terminal 18<br>• Pier construction at E Marginal Way/Spokane Street could likely disrupt north-south traffic, truck gate operations at Terminal 18 and maritime facility east of Terminal 18<br>• Construction could likely disrupt repackaging operations for maritime/truck shipment on west side of West Duwamish Waterway | Comparable | • Columns could likely partially block N. parking/access road at Terminal 102 on Harbor Island<br>• Construction could likely block N. Parking area/access at Terminal 102 temporarily; also, could likely interrupt railroad access to West Seattle during foundation construction<br>• Construction of column at SCL maintenance facility could likely partially block S Spokane Street during foundation construction |
| | Business and commerce effects | **Higher Performance** = Minimal effects on local businesses, as well as commercial and industrial areas<br>**Comparable Performance** = Effects on local businesses, as well as commercial and industrial areas consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects on local businesses, as well as commercial and industrial areas | Lower | • Potentially greater business displacements along alignment<br>• Potential impacts to industrial businesses north of West Seattle Bridge<br>• Potential impacts to businesses along alignment during construction | Comparable | • Avoids potential business displacements in Alaska Junction area<br>• Potential business displacements at SW Alaska Street and Fauntleroy Way SW, depending on tunnel type<br>• Potential impacts to businesses along alignment during construction |

# APPENDIX B

## SODO Segment

## Level 1 Evaluation Matrices

# SODO Segment – Additional Level 1 Alternatives Evaluation

## Evaluation Criteria and Measures

| | Reliable Service | Travel Times | Regional Connectivity | Transit Capacity | Projected Transit Demand | Regional Centers Served | ST Long Range Plan Consistency | Mode, Route, and Station Locations (per ST3) | Potential ST3 Operating Plan Effects | Engineering Constraints | Constructability Issues | Operational Constraints | Qualitative Capital Cost Comparison | Historically Underserved Populations | Station Land Use Plan Consistency | Station Proximity to Urban Centers/Villages | Bus/Rail Integration | Bicycle/Pedestrian Connectivity | Station Area Development Potential | Protected Natural Resources | Protected Built/Social Environment | Burden on Underserved Populations | Traffic Circulation/Access | Freight Access | Business/ Commerce |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ST3 Representative Project (Baseline) | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ |
| Massachusetts Tunnel Portal | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ○ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ● | ● | ● | ● | ● |
| Surface E-3 | ● | ◑ | ● | ◑ | ◑ | ◑ | ◑ | ◑ | ● | ◑ | ● | ● | ◑ | ◑ | ◑ | ◑ | ● | ◑ | ◑ | ◑ | ◑ | ◑ | ● | ● | ● |
| Occidental Avenue | ◑ | ◑ | ○ | ◑ | ◑ | ◑ | ◑ | ◑ | ○ | ○ | ○ | ○ | ○ | ● | ◑ | ◑ | ○ | ● | ◑ | ◑ | ◑ | ◑ | ○ | ○ | ○ |
| 6th Avenue | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ○ | ◑ | ○ | ○ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ○ | ○ | ○ |

● Higher Performance ◑ Comparable Performance ○ Lower Performance

"Higher Performance" = Higher performance relative to ST3 Representative Project; "Comparable Performance" = Comparable performance relative to ST3 Representative Project; "Lower Performance" = Lower performance relative to ST3 Representative Project

# SODO Segment – Additional Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | ST3 Representative Project (Elevated E-3) | | Massachusetts Tunnel Portal | |
| | | | Rating | Evaluation | Rating | Evaluation |
| *Provide high quality rapid, reliable, and efficient peak and off-peak light rail transit service to communities in the project corridors defined in ST3* | | | | | | |
| Reliable Service | Potential service interruptions and recoverability | **Higher Performance** = More grade separation<br>**Comparable Performance** = Grade separation and reliability consistent with ST3 Representative Project<br>**Lower Performance** = Less grade separation | Comparable | • Fully grade separated | Comparable | • Fully grade separated |
| Travel Times | LRT travel times | **Higher Performance** = Travel time approximately 25% faster than ST3 Representative Project<br>**Comparable Performance** = Travel time consistent with ST3 Representative Project<br>**Lower Performance** = Travel time approximately 25% slower than ST3 Representative Project | Comparable | • Travel time approximately 3 minutes for route alignment within SODO Segment | Comparable | • Travel time comparable to ST3 Representative Project |
| *Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand* | | | | | | |
| Regional Connectivity | Network integration and operational flexibility to meet future demand | **Higher Performance** = Facilitates additional connectivity and operational flexibility beyond spine segmentation<br>**Comparable Performance** = Facilitates spine segmentation for operational flexibility consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate spine segmentation | Comparable | • Facilitates spine segmentation by providing connections to new tunnel | Comparable | • Consistent with ST3 Representative Project |
| Transit Capacity | Passenger carrying capacity in downtown | **Higher Performance** = Includes new light rail tunnel through downtown with additional improvements<br>**Comparable Performance** = Includes new light rail tunnel through downtown consistent with ST3 Representative Project<br>**Lower Performance** = Does not include new light rail tunnel through downtown | Comparable | • Baseline for comparison | Comparable | • Consistent with ST3 Representative Project |
| Projected Transit Demand | Ridership potential | **Higher Performance** = More than 10% greater than ST3 Representative Project<br>**Comparable Performance** = Between 10% less and 10% greater than ST3 Representative Project<br>**Lower Performance** = More than 10% less than ST3 Representative Project | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations approximately 23,700 | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations similar to ST3 Representative Project (approximately 23,700) |
| *Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's Long-Range Plan* | | | | | | |
| Regional Centers Served | Station proximity to PSRC-designated regional centers | **Higher Performance** = Serves more PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project<br>**Comparable Performance** = Serves PSRC-designated regional growth centers and manufacturing/industrial centers consistent with ST3 Representative Project<br>**Lower Performance** = Serves fewer PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project | Comparable | • One regional manufacturing/industrial center (MIC) served (Duwamish) | Comparable | • One regional manufacturing/industrial center (MIC) served (Duwamish) |
| ST Long-Range Plan Consistency | Accommodates future LRT extension beyond ST3 | **Higher Performance** = A future LRT extension per Sound Transit Long-Range Plan more feasible and more direct than ST3 Representative Project<br>**Comparable Performance** = A future LRT extension per Sound Transit Long-Range Plan feasible, consistent with ST3 Representative Project<br>**Lower Performance** = A future LRT extension per Sound Transit Long-Range Plan would have major challenges | Comparable | • Consistent with Sound Transit Long-Range Plan | Comparable | • Consistent with Sound Transit Long-Range Plan |
| *Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain* | | | | | | |
| ST3 Consistency | Mode, route, and general station locations per ST3 | **Higher Performance** = Not applicable<br>**Comparable Performance** = Mode, route and general station locations consistent with ST3 Representative Project and/or System Plan<br>**Lower Performance** = Mode, route and general station locations not consistent with ST3 Representative Project and/or System Plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan |
| | Potential ST3 operating plan effects | **Higher Performance** = Facilitates special trackwork and/or provides reliable system operations<br>**Comparable Performance** = Facilitates special trackwork and/or system operations consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate special trackwork and/or degrades system operations | Comparable | • Facilitates special trackwork and system reliability | Comparable | • Facilitates special trackwork and system reliability similar to ST3 Representative Project |

"Higher Performance" = Higher performance relative to ST3 Representative Project; "Comparable Performance" = Comparable performance relative to ST3 Representative Project; "Lower Performance" = Lower performance relative to ST3 Representative Project

# SODO Segment – Additional Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | ST3 Representative Project (Elevated E-3) | | Massachusetts Tunnel Portal | |
| | | | Rating | Evaluation | Rating | Evaluation |
| Technical Feasibility | Engineering constraints | **Higher Performance** = Minimal engineering constraints, compliance with applicable codes, design guidelines and regulatory requirements<br>**Comparable Performance** = Engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements consistent with ST3 Representative Project<br>**Lower Performance** = Substantial engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements | Comparable | • Impacts to Ryerson Base during construction<br>• Potential location of guideway columns to minimize impact to Burlington Northern-Santa Fe (BNSF)/Union Pacific (UP)<br>• "S" development encroachment and right-of-way (ROW) needs<br>• Washington State Department of Transportation (WSDOT)/EastLink structure modifications<br>• Elevated guideway has greatest amount of ground improvements<br>• Overhead transmission line greatest impact<br>• Interim terminus (interlining) may result in Royal Brougham closure | Comparable | • Proximity issue to existing foundations of WSDOT/EastLink structures<br>• Moderate amount of ground improvements<br>• Least impact to Ryerson Base<br>• "S" Development minimal encroachment<br>• Potential location of guideway columns to minimize impact to BNSF/UP<br>• Design of bored tunnel and portal in poor soils and high-water table<br>• Greater ROW needs than ST3 Representative Project<br>• Tunnel profile may result in Holgate needing to be grade separated<br>• Overhead transmission line impact<br>• Interim terminus (interlining) may result in Royal Brougham closure |
| | Constructability issues | **Higher Performance** = Lower construction complexity (e.g., minimal utility conflicts, building impacts, permit requirements, required schedule, geotechnical constraints, tunnel/station constructability, and construction staging/phasing)<br>**Comparable Performance** = Construction complexity consistent with ST3 Representative Project<br>**Lower Performance** = Higher construction complexity | Comparable | • Light rail lines at different elevations for most of E-3<br>• Limited area for construction staging may result in increased service disruption<br>• Proximity to Immigration and Naturalization Service (INS) (historic immigration building) property<br>• South tunnel portal requires WSDOT/EastLink structure modifications<br>• Tunnel portal and retained cut and proximity to operating trackway may need temporary track and temporary closure of Stadium Station | Comparable | • South tunnel portal would not require WSDOT/EastLink structure modifications<br>• No construction on existing Line north of Holgate and no impacts to Stadium Station<br>• No impacts to INS (historic immigration building) property<br>• Bored tunnel and portal through poor soils and high-water table<br>• Light rail lines at different elevations for most of E-3<br>• Limited area for construction staging may result in increased service disruption |
| | Operational constraints | **Higher Performance** = Optimum operational characteristics (e.g., operating efficiency and flexibility)<br>**Comparable Performance** = Operational characteristics consistent with ST3 Representative Project<br>**Lower Performance** = Poor operational characteristics | Comparable | • Generally meets operation goals and pocket tracks<br>• Has at-grade roadway crossings on Ballard-Tacoma Line at Holgate and Lander, and on Everett-West Seattle Line at Royal Brougham<br>• May not be able to provide connection between West Seattle and Ballard lines | Comparable | • Generally, meets operation goals and pocket tracks<br>• Has at-grade roadway crossing on Ballard-Tacoma Line at Lander, and on Everett-West Seattle Line at Royal Brougham (existing)<br>• May not be able to provide connection between West Seattle and Ballard lines |
| Financial Sustainability | Qualitative capital cost comparison | **Higher Performance** = Capital cost drivers anticipated to be less than ST3 Representative Project<br>**Comparable Performance** = Capital cost drivers anticipated to be consistent with ST3 Representative Project<br>**Lower Performance** = Capital cost drivers anticipated to be greater than ST3 Representative Project | Comparable | • Total length of West Seattle alignment: approximately 5,900 feet<br>• Total length of Ballard alignment: approximately 3,800 feet<br>• One elevated and one at grade station | Lower | • Avoids "S" Development ROW<br>• Avoids WSDOT ramp structure modifications<br>• Does not require Stadium Station to be reconstructed<br>• Reduced elevated guideway length<br>• No elevated pocket track<br>• ROW required along east side of E-3, north of SODO Station<br>• Longer tunnel length (approximately 800 feet more), but avoids cut-and-cover tunnel construction in constrained area<br>• One elevated and one at grade station |
| *Expand mobility for the corridor and region's residents, which include transit dependent, low income, and minority populations* | | | | | | |
| Historically Underserved Populations | Opportunities for historically underserved populations | **Higher Performance** = Higher access to opportunities for historically underserved populations<br>**Comparable Performance** = Access to opportunities for historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Lower access to opportunities for historically underserved populations | Comparable | • All stations located in areas of high access to opportunity | Comparable | • All stations located in areas of high access to opportunity |
| *Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies* | | | | | | |
| Station Area Land Use Plan Consistency | General station locations consistent with local land use plans | **Higher Performance** = Station locations have greater consistency with local land use plans<br>**Comparable Performance** = Station locations have consistency with local land use plans consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less consistency with local land use plans | Comparable | • Existing station locations | Comparable | • Existing station locations |
| | Station proximity to Seattle-designated Urban Centers and Villages | **Higher Performance** = Station locations closer to center of single or combined Seattle-designated Urban Centers and Villages<br>**Comparable Performance** = Station locations at a similar distance to center of single or combined Seattle-designated Urban Centers and Villages consistent with ST3 Representative Project<br>**Lower Performance** = Stations locations further from center of single or combined Seattle-designated Urban Centers and Villages | Comparable | • Existing station locations outside of designated urban center/village | Comparable | • Comparable to ST3 Representative Project |

# SODO Segment – Additional Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | ST3 Representative Project (Elevated E-3) | | Massachusetts Tunnel Portal | |
| | | | Rating | Evaluation | Rating | Evaluation |
| Modal Integration | Bus/rail and rail/rail integration | **Higher Performance** = Better opportunities for active bays, layover and/or less route diversion<br>**Comparable Performance** = Opportunities for active bays, layover and/or less route diversion consistent with ST3 Representative Project<br>**Lower Performance** = Fewer opportunities for active bays, layover and/or more route diversion | Comparable | • Available space for active bays and transit access; no layovers needed | Comparable | • Available space for active bays and transit access; no layovers needed |
| | Bicycle, pedestrian and persons with limited mobility connectivity | **Higher Performance** = Station locations have better access to existing and planned pedestrian and bicycle networks with few barriers and less grade differences within station areas<br>**Comparable Performance** = Station locations have access to existing and planned pedestrian and bicycle networks within station areas consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less access to existing and planned pedestrian and bicycle networks with more barriers and/or grade differences within station areas | Comparable | • Relatively flat station areas<br>• Adjacent to E-3 trail<br>• Large north/south block sizes limit east and east and west access<br>• Man-made barriers such as rail lines | Comparable | • Comparable to ST3 Representative Project |
| Station Area Development Opportunities | Development potential | **Higher Performance** = Half-mile (0.5 mile) station area includes greater amount of land with compatible zoning for future development (over 10% more)<br>**Comparable Performance** = Half-mile (0.5 mile) station area includes amount of land with compatible zoning for future development consistent with ST3 Representative Project<br>**Lower Performance** = Half-mile (0.5 mile) station area includes lesser amount of land with compatible zoning for future development (over 10% less) | Comparable | • Limited likelihood for redevelopment based on existing zoning | Comparable | • Limited likelihood for redevelopment based on existing zoning |
| *Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices* | | | | | | |
| Environmental Effects | Protected natural resources | **Higher Performance** = Minimal to no potential impacts on natural protected resources (e.g., wetlands, waterbodies, critical areas)<br>**Comparable Performance** = Potential impacts on natural protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to natural protected resources | Comparable | • No identified impacts to protected natural resources<br>• Located in critical area for liquefaction prone soils (Seattle Environmentally Critical Areas [ECA]) | Comparable | • No identified impacts to protected natural resources<br>• Located in critical area for liquefaction prone soils (Seattle ECA) |
| | Protected built and social environment | **Higher Performance** = Minimal to no potential impacts on built and social protected resources (e.g., parks, cultural resources, contaminated sites)<br>**Comparable Performance** = Potential impacts on built and social protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to built and social protected resources and/or substantial residential or business displacements | Comparable | • Potential impacts to National Register of Historic Places (NRHP) listed INS Building | Higher | • Avoids potential impacts to NRHP-listed INS Building |
| | Burden on historically underserved populations | **Higher Performance** = Would have a lesser burden on historically underserved population than ST3 Representative Project<br>**Comparable Performance** = Would have potential to impact historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Would have a greater burden on historically underserved population than ST3 Representative Project | Comparable | • Alignment and stations located in areas with similar low-income and minority populations as rest of the city<br>• Stations located in areas of low to moderate displacement risk | Higher | • Alignment and stations located in areas with similar low-income and minority populations as rest of the city<br>• Stations located in areas of low to moderate displacement risk<br>• Reduces cut-and-cover construction impacts to Chinatown/International District neighborhood |
| Traffic Operations | Traffic circulation and access | **Higher Performance** = Few to no changes in traffic patterns and/or access<br>**Comparable Performance** = Changes to traffic patterns and/or access consistent with ST3 Representative Project<br>**Lower Performance** = Substantial impacts to traffic circulation and/or access, mitigation likely requires substantial road improvements | Comparable | • Potential traffic impacts during construction of cut-and-cover tunnel at Royal Brougham Way, Seattle Boulevard and Jackson Street | Higher | • Avoids potential traffic impacts at Royal Brougham Way, Seattle Boulevard and Jackson Street during construction<br>• Eliminates existing light rail grade crossing at Holgate with roadway overcrossing; roadway overcrossing may impact local property access |
| Economic Effects | Freight movement and access on land and water | **Higher Performance** = Minimal effects to freight mobility and future freight capacity expansion opportunities<br>**Comparable Performance** = Effects to freight mobility and future freight capacity expansion opportunities consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects to freight mobility and future freight capacity expansion opportunities | Comparable | • Freight could be affected by changes in traffic patterns during construction<br>• No permanent access impacts expected | Higher | • Removal of at-grade crossing at Holgate would benefit freight mobility<br>• Freight could be affected by changes in traffic patterns during construction<br>• Removal of at-grade crossing at Holgate could change property access |
| | Business and commerce effects | **Higher Performance** = Minimal effects on local businesses, as well as commercial and industrial areas<br>**Comparable Performance** = Effects on local businesses, as well as commercial and industrial areas consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects on local businesses, as well as commercial and industrial areas | Comparable | • Low potential for business displacements<br>• Businesses could be affected by changes in traffic patterns during construction<br>• No permanent access impacts expected | Higher | • Low potential for business displacements<br>• Businesses could be affected by changes in traffic patterns during construction, but to lesser degree<br>• No permanent access impacts expected |

# SODO Segment – Additional Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | Surface E-3 | | Occidental Avenue | |
| | | | Rating | Evaluation | Rating | Evaluation |
| *Provide high quality rapid, reliable, and efficient peak and off-peak light rail transit service to communities in the project corridors defined in ST3* | | | | | | |
| Reliable Service | Potential service interruptions and recoverability | **Higher Performance** = More grade separation<br>**Comparable Performance** = Grade separation and reliability consistent with ST3 Representative Project<br>**Lower Performance** = Less grade separation | Higher | • Requires full or partial closure of Royal Brougham<br>• Full grade separation of Holgate and Lander; improves reliability of existing light rail line | Comparable | • Fully grade separated |
| Travel Times | LRT travel times | **Higher Performance** = Travel time approximately 25% faster than ST3 Representative Project<br>**Comparable Performance** = Travel time consistent with ST3 Representative Project<br>**Lower Performance** = Travel time approximately 25% slower than ST3 Representative Project | Comparable | • Travel time comparable to ST3 Representative Project | Comparable | • Travel time comparable to ST3 Representative Project |
| *Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand* | | | | | | |
| Regional Connectivity | Network integration and operational flexibility to meet future demand | **Higher Performance** = Facilitates additional connectivity and operational flexibility beyond spine segmentation<br>**Comparable Performance** = Facilitates spine segmentation for operational flexibility consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate spine segmentation | Higher | • Consistent with ST3 Representative Project<br>• Two Stadium Stations allows for greater regional connectivity | Lower | • Reduces network integration and connectivity with location of new SODO Station on Occidental Avenue |
| Transit Capacity | Passenger carrying capacity in downtown | **Higher Performance** = Includes new light rail tunnel through downtown with additional improvements<br>**Comparable Performance** = Includes new light rail tunnel through downtown consistent with ST3 Representative Project<br>**Lower Performance** = Does not include new light rail tunnel through downtown | Comparable | • Consistent with ST3 Representative Project | Comparable | • Consistent with ST3 Representative Project |
| Projected Transit Demand | Ridership potential | **Higher Performance** = More than 10% greater than ST3 Representative Project<br>**Comparable Performance** = Between 10% less and 10% greater than ST3 Representative Project<br>**Lower Performance** = More than 10% less than ST3 Representative Project | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations similar to ST3 Representative Project (approximately 23,700) | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations approximately 3% higher than ST3 Representative Project (approximately 24,400) |
| *Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's Long-Range Plan* | | | | | | |
| Regional Centers Served | Station proximity to PSRC-designated regional centers | **Higher Performance** = Serves more PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project<br>**Comparable Performance** = Serves PSRC-designated regional growth centers and manufacturing/industrial centers consistent with ST3 Representative Project<br>**Lower Performance** = Serves fewer PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project | Comparable | • One regional manufacturing/industrial center (MIC) served (Duwamish) | Comparable | • One regional manufacturing/industrial center (MIC) served (Duwamish) |
| ST Long-Range Plan Consistency | Accommodates future LRT extension beyond ST3 | **Higher Performance** = A future LRT extension per Sound Transit Long-Range Plan more feasible and more direct than ST3 Representative Project<br>**Comparable Performance** = A future LRT extension per Sound Transit Long-Range Plan feasible, consistent with ST3 Representative Project<br>**Lower Performance** = A future LRT extension per Sound Transit Long-Range Plan would have major challenges | Comparable | • Consistent with Sound Transit Long-Range Plan | Comparable | • Consistent with Sound Transit Long-Range Plan |
| *Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain* | | | | | | |
| ST3 Consistency | Mode, route, and general station locations per ST3 | **Higher Performance** = Not applicable<br>**Comparable Performance** = Mode, route and general station locations consistent with ST3 Representative Project and/or System Plan<br>**Lower Performance** = Mode, route and general station locations not consistent with ST3 Representative Project and/or System Plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan |
| | Potential ST3 operating plan effects | **Higher Performance** = Facilitates special trackwork and/or provides reliable system operations<br>**Comparable Performance** = Facilitates special trackwork and/or system operations consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate special trackwork and/or degrades system operations | Higher | • At grade surface alignment with roadway grade separations facilitate special trackwork for connectivity between West Seattle and Ballard lines | Lower | • Does not provide all required special trackwork for connectivity between West Seattle and Ballard lines |

"Higher Performance" = Higher performance relative to ST3 Representative Project; "Comparable Performance" = Comparable performance relative to ST3 Representative Project; "Lower Performance" = Lower performance relative to ST3 Representative Project

# SODO Segment – Additional Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | Surface E-3 | | Occidental Avenue | |
| | | | Rating | Evaluation | Rating | Evaluation |
| Technical Feasibility | Engineering constraints | **Higher Performance** = Minimal engineering constraints, compliance with applicable codes, design guidelines and regulatory requirements<br>**Comparable Performance** = Engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements consistent with ST3 Representative Project<br>**Lower Performance** = Substantial engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements | Comparable | • Minimizes impacts to WSDOT/EastLink structures<br>• Minimizes elevated guideway and associated ground improvements<br>• Overhead transmission line potential option for relocation in E-3<br>• "S" Development encroachment and ROW needs<br>• SDOT approval needed for roadway grade separations (Lander, Holgate, Massachusetts) and Royal Brougham closure<br>• Ryerson Base additional area needed<br>• BNSF/UP freight rail impacted north of Lander due to roadway overcrossing and SODO Station footprint | Lower | • Long-span crossing of BNSF tracks presents engineering challenges associated with special structures<br>• Occidental has a 60-foot ROW with a large amount of utilities (i.e., 30" stormwater drainage, 24" sanitary sewer, 12" water, overhead power, Comm ductbanks); creates design challenges to fit the Project within this constrained ROW, as well as would require relocation of a portion of overhead transmission lines<br>• Guideway widening for SODO Station with center platform may exceed available ROW width<br>• Elevated guideway requires ground improvements<br>• Permanent impacts to Ryerson Base<br>• Property impacts due to crossing from Spokane Street to Occidental and from Occidental to E-3; likely property needs for SODO Station access<br>• Operations and maintenance facility (OMF) connection requires longer segment of elevated guideway with associated ground improvements, and greater ROW needs<br>• Reduces impact to E-3 busway by running along Occidental |
| | Constructability issues | **Higher Performance** = Lower construction complexity (e.g., minimal utility conflicts, building impacts, permit requirements, required schedule, geotechnical constraints, tunnel/station constructability, and construction staging/phasing)<br>**Comparable Performance** = Construction complexity consistent with ST3 Representative Project<br>**Lower Performance** = Higher construction complexity | Higher | • South tunnel portal does not require WSDOT/EastLink structure modifications<br>• No impacts to Stadium Station<br>• Both light rail lines at-grade in E-3 increases area for construction staging, likely least amount of service disruption<br>• Roadway overcrossing structures in poor soils and protection of existing utilities<br>• Proximity to INS (historic immigration building) property | Lower | • Long-span crossing of BNSF tracks presents construction challenges and special structures<br>• Maintenance of traffic and parking impacts during construction in narrow street ROW of Occidental Avenue<br>• Construction phasing in Ryerson Base/Stadium Station area likely to result in longer periods of service disruption and/or property impacts for temporary tracks |
| | Operational constraints | **Higher Performance** = Optimum operational characteristics (e.g., operating efficiency and flexibility)<br>**Comparable Performance** = Operational characteristics consistent with ST3 Representative Project<br>**Lower Performance** = Poor operational characteristics | Higher | • Eliminates light rail grade crossings for both lines<br>• More opportunities for special trackwork and connections between West Seattle and Ballard lines | Lower | • Difficult to include interconnection between lines and pocket tracks<br>• Longer track connection to OMF |
| Financial Sustainability | Qualitative capital cost comparison | **Higher Performance** = Capital cost drivers anticipated to be less than ST3 Representative Project<br>**Comparable Performance** = Capital cost drivers anticipated to be consistent with ST3 Representative Project<br>**Lower Performance** = Capital cost drivers anticipated to be greater than ST3 Representative Project | Comparable | • Reduced length of cut-and-cover tunnel (approximately 1,400 feet less); no Royal Brougham cut-and-cover<br>• Less elevated guideway, including reduction in ground improvements<br>• No elevated pocket track<br>• SODO Station at-grade, not elevated<br>• Two Stadium Stations, one on each line; one new, one existing with additional vertical circulation likely<br>• "S" Development ROW needs similar to ST3 Representative Project<br>• Roadway overcrossing costs | Lower | • Long-span crossing of BNSF requires special structures<br>• Property impacts for crossing from Spokane Street to Occidental and from Occidental to E-3<br>• Longer OMF connection with associated ROW needs |
| *Expand mobility for the corridor and region's residents, which include transit dependent, low income, and minority populations* | | | | | | |
| Historically Underserved Populations | Opportunities for historically underserved populations | **Higher Performance** = Higher access to opportunities for historically underserved populations<br>**Comparable Performance** = Access to opportunities for historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Lower access to opportunities for historically underserved populations | Comparable | • All stations located in areas of high access to opportunity | Higher | • Increases access to SODO employment area for historically underserved populations in other parts of region |
| *Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies* | | | | | | |
| Station Area Land Use Plan Consistency | General station locations consistent with local land use plans | **Higher Performance** = Station locations have greater consistency with local land use plans<br>**Comparable Performance** = Station locations have consistency with local land use plans consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less consistency with local land use plans | Comparable | • Existing station locations | Comparable | • Stations consistent with ST3 plan and local land use plans |

# SODO Segment – Additional Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | Surface E-3 | | Occidental Avenue | |
| | | | Rating | Evaluation | Rating | Evaluation |
| | Station proximity to Seattle-designated Urban Centers and Villages | **Higher Performance** = Station locations closer to center of single or combined Seattle-designated Urban Centers and Villages<br>**Comparable Performance** = Station locations at a similar distance to center of single or combined Seattle-designated Urban Centers and Villages consistent with ST3 Representative Project<br>**Lower Performance** = Stations locations further from center of single or combined Seattle-designated Urban Centers and Villages | Comparable | • Comparable to ST3 Representative Project | Comparable | • Station locations outside of designated urban center/village similar to ST3 Representative Project |
| Modal Integration | Bus/rail and rail/rail integration | **Higher Performance** = Better opportunities for active bays, layover and/or less route diversion<br>**Comparable Performance** = Opportunities for active bays, layover and/or less route diversion consistent with ST3 Representative Project<br>**Lower Performance** = Fewer opportunities for active bays, layover and/or more route diversion | Higher | • Available space for active bays and transit access; no layovers needed<br>• Two Stadium stations allow for increased rail/rail connections | Lower | • Reduced connectivity between existing and new SODO stations |
| | Bicycle, pedestrian and persons with limited mobility connectivity | **Higher Performance** = Station locations have better access to existing and planned pedestrian and bicycle networks with few barriers and less grade differences within station areas<br>**Comparable Performance** = Station locations have access to existing and planned pedestrian and bicycle networks within station areas consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less access to existing and planned pedestrian and bicycle networks with more barriers and/or grade differences within station areas | Comparable | • Comparable to ST3 Representative Project | Higher | • Better access to regional bicycle facilities<br>• Located in more pedestrian-friendly environment compared with ST3 Representative Project |
| Station Area Development Opportunities | Development potential | **Higher Performance** = Half-mile (0.5 mile) station area includes greater amount of land with compatible zoning for future development (over 10% more)<br>**Comparable Performance** = Half-mile (0.5 mile) station area includes amount of land with compatible zoning for future development consistent with ST3 Representative Project<br>**Lower Performance** = Half-mile (0.5 mile) station area includes lesser amount of land with compatible zoning for future development (over 10% less) | Comparable | • Limited likelihood for redevelopment based on existing zoning | Comparable | • Limited likelihood for redevelopment based on existing zoning |
| *Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices* | | | | | | |
| Environmental Effects | Protected natural resources | **Higher Performance** = Minimal to no potential impacts on natural protected resources (e.g., wetlands, waterbodies, critical areas)<br>**Comparable Performance** = Potential impacts on natural protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to natural protected resources | Comparable | • No identified impacts to protected natural resources<br>• Located in critical area for liquefaction prone soils (Seattle Environmentally Critical Areas [ECA]) | Comparable | • No identified impacts to protected natural resources<br>• Located in critical area for liquefaction prone soils (Seattle Environmentally Critical Areas [ECA]) |
| | Protected built and social environment | **Higher Performance** = Minimal to no potential impacts on built and social protected resources (e.g., parks, cultural resources, contaminated sites)<br>**Comparable Performance** = Potential impacts on built and social protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to built and social protected resources and/or substantial residential or business displacements | Comparable | • Potential impacts to National Register of Historic Places (NRHP) listed INS Building | Comparable | • Potential impacts to National Register of Historic Places (NRHP) listed INS Building |
| | Burden on historically underserved populations | **Higher Performance** = Would have a lesser burden on historically underserved population than ST3 Representative Project<br>**Comparable Performance** = Would have potential to impact historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Would have a greater burden on historically underserved population than ST3 Representative Project | Comparable | • Alignment and stations located in areas with similar low-income and minority populations as rest of the city<br>• Stations located in areas of low to moderate displacement risk | Comparable | • Alignment and stations located in areas with similar low-income and minority populations as rest of the city<br>• Stations located in areas of low to moderate displacement risk |
| Traffic Operations | Traffic circulation and access | **Higher Performance** = Few to no changes in traffic patterns and/or access<br>**Comparable Performance** = Changes to traffic patterns and/or access consistent with ST3 Representative Project<br>**Lower Performance** = Substantial impacts to traffic circulation and/or access, mitigation likely requires substantial road improvements | Higher | • Potential traffic impacts from potential permanent closure of Royal Brougham Way<br>• Eliminates existing light rail grade crossings with roadway grade separations at Lander and Holgate; roadway grade separations may impact local property access | Lower | • Potential temporary and permanent impacts to traffic circulation due to elevated guideway in street ROW |
| Economic Effects | Freight movement and access on land and water | **Higher Performance** = Minimal effects to freight mobility and future freight capacity expansion opportunities<br>**Comparable Performance** = Effects to freight mobility and future freight capacity expansion opportunities consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects to freight mobility and future freight capacity expansion opportunities | Higher | • Removal of at-grade crossings at Lander and Holgate would benefit freight mobility<br>• Removal of at-grade crossing at Lander and Holgate could change property access<br>• Freight could be affected by changes in traffic patterns during construction and potential closure of Royal Brougham | Lower | • Potential temporary and permanent impacts to truck freight mobility due to elevated guideway in street ROW |
| | Business and commerce effects | **Higher Performance** = Minimal effects on local businesses, as well as commercial and industrial areas<br>**Comparable Performance** = Effects on local businesses, as well as commercial and industrial areas consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects on local businesses, as well as commercial and industrial areas | Higher | • Low potential for business displacements<br>• Businesses could be affected by changes in traffic patterns during construction and potential closure of Royal Brougham, but to lesser degree<br>• No permanent access impacts expected | Lower | • Potential temporary and permanent impacts to business access due to elevated guideway in street ROW |

# SODO Segment – Additional Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | |
|---|---|---|---|---|
| | | | 6th Avenue | |
| | | | Rating | Evaluation |
| *Provide high quality rapid, reliable, and efficient peak and off-peak light rail transit service to communities in the project corridors defined in ST3* | | | | |
| Reliable Service | Potential service interruptions and recoverability | **Higher Performance** = More grade separation<br>**Comparable Performance** = Grade separation and reliability consistent with ST3 Representative Project<br>**Lower Performance** = Less grade separation | Comparable | • Fully grade separated |
| Travel Times | LRT travel times | **Higher Performance** = Travel time approximately 25% faster than ST3 Representative Project<br>**Comparable Performance** = Travel time consistent with ST3 Representative Project<br>**Lower Performance** = Travel time approximately 25% slower than ST3 Representative Project | Comparable | • Travel time comparable to ST3 Representative Project |
| *Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand* | | | | |
| Regional Connectivity | Network integration and operational flexibility to meet future demand | **Higher Performance** = Facilitates additional connectivity and operational flexibility beyond spine segmentation<br>**Comparable Performance** = Facilitates spine segmentation for operational flexibility consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate spine segmentation | Comparable | • Consistent with ST3 Representative Project |
| Transit Capacity | Passenger carrying capacity in downtown | **Higher Performance** = Includes new light rail tunnel through downtown with additional improvements<br>**Comparable Performance** = Includes new light rail tunnel through downtown consistent with ST3 Representative Project<br>**Lower Performance** = Does not include new light rail tunnel through downtown | Comparable | • Consistent with ST3 Representative Project |
| Projected Transit Demand | Ridership potential | **Higher Performance** = More than 10% greater than ST3 Representative Project<br>**Comparable Performance** = Between 10% less and 10% greater than ST3 Representative Project<br>**Lower Performance** = More than 10% less than ST3 Representative Project | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations similar to ST3 Representative Project (approximately 23,700) |
| *Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's Long-Range Plan* | | | | |
| Regional Centers Served | Station proximity to PSRC-designated regional centers | **Higher Performance** = Serves more PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project<br>**Comparable Performance** = Serves PSRC-designated regional growth centers and manufacturing/industrial centers consistent with ST3 Representative Project<br>**Lower Performance** = Serves fewer PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project | Comparable | • One regional manufacturing/industrial center (MIC) served (Duwamish) |
| ST Long-Range Plan Consistency | Accommodates future LRT extension beyond ST3 | **Higher Performance** = A future LRT extension per Sound Transit Long-Range Plan more feasible and more direct than ST3 Representative Project<br>**Comparable Performance** = A future LRT extension per Sound Transit Long-Range Plan feasible, consistent with ST3 Representative Project<br>**Lower Performance** = A future LRT extension per Sound Transit Long-Range Plan would have major challenges | Comparable | • Consistent with Sound Transit Long-Range Plan |
| *Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain* | | | | |
| ST3 Consistency | Mode, route, and general station locations per ST3 | **Higher Performance** = Not applicable<br>**Comparable Performance** = Mode, route and general station locations consistent with ST3 Representative Project and/or System Plan<br>**Lower Performance** = Mode, route and general station locations not consistent with ST3 Representative Project and/or System Plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan |
| | Potential ST3 operating plan effects | **Higher Performance** = Facilitates special trackwork and/or provides reliable system operations<br>**Comparable Performance** = Facilitates special trackwork and/or system operations consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate special trackwork and/or degrades system operations | Lower | • Does not provide all required special trackwork for connectivity between West Seattle and Ballard lines |
| Technical Feasibility | Engineering constraints | **Higher Performance** = Minimal engineering constraints, compliance with applicable codes, design guidelines and regulatory requirements<br>**Comparable Performance** = Engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements consistent with ST3 Representative Project<br>**Lower Performance** = Substantial engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements | Comparable | • Greater engineering constraints related to difficult connection to OMF and braiding of lines near Stadium Station<br>• No need to relocate overhead transmission lines for majority of corridor (transmission lines may need to be relocated at Spokane Street where alignment crosses over to 6th Avenue)<br>• Reduces impact to E-3 busway and avoids impacts to E-3 busway paired with Massachusetts tunnel portal option<br>• High elevated guideway over existing elevated guideway at Forest Street and associated ground improvements presents greater engineering challenges<br>• More traffic and property impacts with alignment on 6th versus E-3 busway<br>• Property impacts with transitions to SODO Station |

# SODO Segment – Additional Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | |
|---|---|---|---|---|
| | | | 6th Avenue | |
| | | | Rating | Evaluation |
| Financial Sustainability | Constructability issues | **Higher Performance** = Lower construction complexity (e.g., minimal utility conflicts, building impacts, permit requirements, required schedule, geotechnical constraints, tunnel/station constructability, and construction staging/phasing)<br>**Comparable Performance** = Construction complexity consistent with ST3 Representative Project<br>**Lower Performance** = Higher construction complexity | Lower | • Greater constructability challenges associated with maintenance of traffic and parking impacts during construction in 6th Avenue due to likely displacement of travel lanes and/or parking during construction<br>• Challenging construction phasing in Ryerson Base/Stadium Station area due to braiding of West Seattle and Ballard lines<br>• Challenging construction of high elevated guideway and associated ground improvements over existing Forest Street structure; could require disruption to existing LRT service |
| | Operational constraints | **Higher Performance** = Optimum operational characteristics (e.g., operating efficiency and flexibility)<br>**Comparable Performance** = Operational characteristics consistent with ST3 Representative Project<br>**Lower Performance** = Poor operational characteristics | Lower | • Difficult to include interconnection between lines and pocket tracks<br>• Difficult connection to OMF |
| | Qualitative capital cost comparison | **Higher Performance** = Capital cost drivers anticipated to be less than ST3 Representative Project<br>**Comparable Performance** = Capital cost drivers anticipated to be consistent with ST3 Representative Project<br>**Lower Performance** = Capital cost drivers anticipated to be greater than ST3 Representative Project | Comparable | • Similar to ST3 Representative Project |
| *Expand mobility for the corridor and region's residents, which include transit dependent, low income, and minority populations* | | | | |
| Historically Underserved Populations | Opportunities for historically underserved populations | **Higher Performance** = Higher access to opportunities for historically underserved populations<br>**Comparable Performance** = Access to opportunities for historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Lower access to opportunities for historically underserved populations | Comparable | • All stations located in areas of high access to opportunity |
| *Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies* | | | | |
| Station Area Land Use Plan Consistency | General station locations consistent with local land use plans | **Higher Performance** = Station locations have greater consistency with local land use plans<br>**Comparable Performance** = Station locations have consistency with local land use plans consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less consistency with local land use plans | Comparable | • Existing station locations |
| | Station proximity to Seattle-designated Urban Centers and Villages | **Higher Performance** = Station locations closer to center of single or combined Seattle-designated Urban Centers and Villages<br>**Comparable Performance** = Station locations at a similar distance to center of single or combined Seattle-designated Urban Centers and Villages consistent with ST3 Representative Project<br>**Lower Performance** = Stations locations further from center of single or combined Seattle-designated Urban Centers and Villages | Comparable | • Existing station locations outside of designated urban center/village comparable to ST3 Representative Project |
| Modal Integration | Bus/rail and rail/rail integration | **Higher Performance** = Better opportunities for active bays, layover and/or less route diversion<br>**Comparable Performance** = Opportunities for active bays, layover and/or less route diversion consistent with ST3 Representative Project<br>**Lower Performance** = Fewer opportunities for active bays, layover and/or more route diversion | Comparable | • Available space for active bays and transit access; no layovers needed |
| | Bicycle, pedestrian and persons with limited mobility connectivity | **Higher Performance** = Station locations have better access to existing and planned pedestrian and bicycle networks with few barriers and less grade differences within station areas<br>**Comparable Performance** = Station locations have access to existing and planned pedestrian and bicycle networks within station areas consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less access to existing and planned pedestrian and bicycle networks with more barriers and/or grade differences within station areas | Comparable | • Comparable to ST3 Representative Project |
| Station Area Development Opportunities | Development potential | **Higher Performance** = Half-mile (0.5 mile) station area includes greater amount of land with compatible zoning for future development (over 10% more)<br>**Comparable Performance** = Half-mile (0.5 mile) station area includes amount of land with compatible zoning for future development consistent with ST3 Representative Project<br>**Lower Performance** = Half-mile (0.5 mile) station area includes lesser amount of land with compatible zoning for future development (over 10% less) | Comparable | • Limited likelihood for redevelopment based on existing zoning |
| *Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices* | | | | |
| Environmental Effects | Protected natural resources | **Higher Performance** = Minimal to no potential impacts on natural protected resources (e.g., wetlands, waterbodies, critical areas)<br>**Comparable Performance** = Potential impacts on natural protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to natural protected resources | Comparable | • No identified impacts to protected natural resources<br>• Located in critical area for liquefaction prone soils (Seattle Environmentally Critical Areas [ECA]) |
| | Protected built and social environment | **Higher Performance** = Minimal to no potential impacts on built and social protected resources (e.g., parks, cultural resources, contaminated sites)<br>**Comparable Performance** = Potential impacts on built and social protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to built and social protected resources and/or substantial residential or business displacements | Comparable | • Potential impacts to National Register of Historic Places (NRHP) listed INS Building |

# SODO Segment – Additional Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | |
|---|---|---|---|---|
| | | | 6th Avenue | |
| | | | Rating | Evaluation |
| | Burden on historically underserved populations | **Higher Performance** = Would have a lesser burden on historically underserved population than ST3 Representative Project<br>**Comparable Performance** = Would have potential to impact historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Would have a greater burden on historically underserved population than ST3 Representative Project | Comparable | • Alignment and stations located in areas with similar low-income and minority populations as rest of the city<br>• Stations located in areas of low to moderate displacement risk |
| Traffic Operations | Traffic circulation and access | **Higher Performance** = Few to no changes in traffic patterns and/or access<br>**Comparable Performance** = Changes to traffic patterns and/or access consistent with ST3 Representative Project<br>**Lower Performance** = Substantial impacts to traffic circulation and/or access, mitigation likely requires substantial road improvements | Lower | • Potential temporary and permanent impacts to traffic circulation due to elevated guideway in street ROW |
| Economic Effects | Freight movement and access on land and water | **Higher Performance** = Minimal effects to freight mobility and future freight capacity expansion opportunities<br>**Comparable Performance** = Effects to freight mobility and future freight capacity expansion opportunities consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects to freight mobility and future freight capacity expansion opportunities | Lower | • Potential temporary and permanent impacts to freight mobility due to elevated guideway in street ROW |
| | Business and commerce effects | **Higher Performance** = Minimal effects on local businesses, as well as commercial and industrial areas<br>**Comparable Performance** = Effects on local businesses, as well as commercial and industrial areas consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects on local businesses, as well as commercial and industrial areas | Lower | • Potential temporary and permanent impacts to business access due to elevated guideway in street ROW |

# APPENDIX C

## Downtown Segment and International District/Chinatown Station
## Level 1 Evaluation Matrices

# Downtown Segment – Level 1 Alternatives Evaluation

| | Evaluation Criteria and Measures | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Reliable Service | Travel Times | Regional Connectivity | Transit Capacity | Projected Transit Demand | Regional Centers Served | ST Long Range Plan Consistency | Mode, Route, and Station Locations (per ST3) | Potential ST3 Operating Plan Effects | Engineering Constraints | Constructability Issues | Operational Constraints | Qualitative Capital Cost Comparison | Historically Underserved Populations | Station Land Use Plan Consistency | Station Proximity to Urban Centers/Villages | Bus/Rail Integration | Bicycle/Pedestrian Connectivity | Station Area Development Potential | Protected Natural Resources | Protected Built/Social Environment | Burden on Underserved Populations | Traffic Circulation/Access | Freight Access | Business/ Commerce |
| ST3 Representative Project (Baseline) | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ |
| 5th/Harrison | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ○ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ |
| 5th/Mercer | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ○ | ○ | ◑ | ○ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ○ | ◑ | ◑ | ○ | ○ | ◑ |
| 6th/Boren/Roy | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ● | ◑ | ○ | ◑ | ◑ | ○ | ◑ | ○ | ◑ | ○ | ◑ | ◑ | ◑ | ◑ | ◑ |
| 8th/6th/Republican | ◑ | ◑ | ○ | ○ | ◑ | ◑ | ◑ | ○ | ◑ | ○ | ○ | ◑ | ○ | ◑ | ◑ | ○ | ◑ | ○ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ |
| 5th/Roy/Consolidated SLU Station | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ○ | ◑ | ● | ● | ◑ | ● | ◑ | ◑ | ○ | ◑ | ○ | ◑ | ○ | ◑ | ◑ | ● | ◑ | ◑ |

● Higher Performance ◑ Comparable Performance ○ Lower Performance

"Higher Performance" = Higher performance relative to ST3 Representative Project; "Comparable Performance" = Comparable performance relative to ST3 Representative Project; "Lower Performance" = Lower performance relative to ST3 Representative Project

# Downtown Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | ST3 Representative Project (5th/6th/Republican) | | 5th/Harrison | |
| | | | Rating | Evaluation | Rating | Evaluation |
| *Provide high quality rapid, reliable, and efficient peak and off-peak light rail transit service to communities in the project corridors defined in ST3* | | | | | | |
| Reliable Service | Potential service interruptions and recoverability | **Higher Performance** = More grade separation<br>**Comparable Performance** = Grade separation and reliability consistent with ST3 Representative Project<br>**Lower Performance** = Less grade separation | Comparable | • Fully grade separated | Comparable | • Fully grade separated |
| Travel Times | LRT travel times | **Higher Performance** = Travel time approximately 25% faster than ST3 Representative Project<br>**Comparable Performance** = Travel time consistent with ST3 Representative Project<br>**Lower Performance** = Travel time approximately 25% slower than ST3 Representative Project | Comparable | • Travel time approximately 7 to 8 minutes for route alignment within Downtown Segment | Comparable | • Travel time comparable to ST3 Representative Project |
| *Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand* | | | | | | |
| Regional Connectivity | Network integration and operational flexibility to meet future demand | **Higher Performance** = Facilitates additional connectivity and operational flexibility beyond spine segmentation<br>**Comparable Performance** = Facilitates spine segmentation for operational flexibility consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate spine segmentation | Comparable | • Facilitates spine segmentation | Comparable | • Consistent with ST3 Representative Project |
| Transit Capacity | Passenger carrying capacity in downtown | **Higher Performance** = Includes new light rail tunnel through downtown with additional improvements<br>**Comparable Performance** = Includes new light rail tunnel through downtown consistent with ST3 Representative Project<br>**Lower Performance** = Does not include new light rail tunnel through downtown | Comparable | • Includes new light rail tunnel through downtown | Comparable | • Includes new light rail tunnel through downtown |
| Projected Transit Demand | Ridership potential | **Higher Performance** = More than 10% greater than ST3 Representative Project<br>**Comparable Performance** = Between 10% less and 10% greater than ST3 Representative Project<br>**Lower Performance** = More than 10% less than ST3 Representative Project | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations similar to ST3 Representative Project (approximately 258,600) | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations 1% less than ST3 Representative Project (approximately 256,600) |
| *Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's Long-Range Plan* | | | | | | |
| Regional Centers Served | Station proximity to PSRC-designated regional centers | **Higher Performance** = Serves more PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project<br>**Comparable Performance** = Serves PSRC-designated regional growth centers and manufacturing/industrial centers consistent with ST3 Representative Project<br>**Lower Performance** = Serves fewer PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project | Comparable | • 3 regional growth centers served (Seattle Central Business District [CBD], South Lake Union, Uptown) | Comparable | • 3 regional growth centers served (Seattle CBD, South Lake Union, Uptown) |
| ST Long-Range Plan Consistency | Accommodates future LRT extension beyond ST3 | **Higher Performance** = A future LRT extension per Sound Transit Long-Range Plan more feasible and more direct than ST3 Representative Project<br>**Comparable Performance** = A future LRT extension per Sound Transit Long-Range Plan feasible, consistent with ST3 Representative Project<br>**Lower Performance** = A future LRT extension per Sound Transit Long-Range Plan would have major challenges | Comparable | • Consistent with Sound Transit Long-Range Plan | Comparable | • Consistent with Sound Transit Long-Range Plan |
| *Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain* | | | | | | |
| ST3 Consistency | Mode, route, and general station locations per ST3 | **Higher Performance** = Not applicable<br>**Comparable Performance** = Mode, route and general station locations consistent with ST3 Representative Project and/or System Plan<br>**Lower Performance** = Mode, route and general station locations not consistent with ST3 Representative Project and/or System Plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan |
| | Potential ST3 operating plan effects | **Higher Performance** = Facilitates special trackwork and/or provides reliable system operations<br>**Comparable Performance** = Facilitates special trackwork and/or system operations consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate special trackwork and/or degrades system operations | Comparable | • Baseline for comparison | Comparable | • Consistent with ST3 Representative Project |
| Technical Feasibility | Engineering constraints | **Higher Performance** = Minimal engineering constraints, compliance with applicable codes, design guidelines and regulatory requirements<br>**Comparable Performance** = Engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements consistent with ST3 Representative Project<br>**Lower Performance** = Substantial engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements | Comparable | • Constraints include right-of-way (ROW), major utilities and traffic operations<br>• Requires relocation of a major stretch of 72-inch sewer<br>• South Lake Union Station located under SR 99 off ramp<br>• North tunnel portal has property constraints | Comparable | • Constraints include ROW and traffic operations<br>• Conflicts with 72-inch sewer crossing<br>• Alignment goes under Key Arena<br>• North tunnel portal has similar property constraints<br>• South Lake Union Station avoids SR 99 off-ramp<br>• Protection of 60-inch sewer crossing located above tunnel |

"Higher Performance" = Higher performance relative to ST3 Representative Project; "Comparable Performance" = Comparable performance relative to ST3 Representative Project; "Lower Performance" = Lower performance relative to ST3 Representative Project

# Downtown Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | ST3 Representative Project (5th/6th/Republican) | | 5th/Harrison | |
| | | | Rating | Evaluation | Rating | Evaluation |
| | Constructability issues | **Higher Performance** = Lower construction complexity (e.g., minimal utility conflicts, building impacts, permit requirements, required schedule, geotechnical constraints, tunnel/station constructability, and construction staging/phasing)<br>**Comparable Performance** = Construction complexity consistent with ST3 Representative Project<br>**Lower Performance** = Higher construction complexity | Comparable | • Tunnel portal near International District/Chinatown Station and mining through tie-backs create constructability issues<br>• Approximately 700 linear feet of 72-inch sewer line above South Lake Union Station needs to be relocated<br>• Westlake Station on 6th Avenue abutting existing Westlake Station at 90 degrees | Lower | • Tunnel portal near International District/Chinatown Station and mining through tie-backs create constructability issues<br>• Less sewer line conflicts along Harrison<br>• Potential conflict with the 72-inch sewer crossing<br>• Proximity to new Key Arena expansion<br>• New Westlake Station on 5th Avenue directly under existing Westlake Station, making it more challenging to construct |
| | Operational constraints | **Higher Performance** = Optimum operational characteristics (e.g., operating efficiency and flexibility)<br>**Comparable Performance** = Operational characteristics consistent with ST3 Representative Project<br>**Lower Performance** = Poor operational characteristics | Comparable | • Baseline operational performance | Comparable | • Similar to ST3 Representative Project |
| Financial Sustainability | Qualitative capital cost comparison | **Higher Performance** = Capital cost drivers anticipated to be less than ST3 Representative Project<br>**Comparable Performance** = Capital cost drivers anticipated to be consistent with ST3 Representative Project<br>**Lower Performance** = Capital cost drivers anticipated to be greater than ST3 Representative Project | Comparable | • Tunnel alignment approximately 16,000 feet long<br>• Six underground tunnel stations<br>• ROW needed at the north portal<br>• Requires relocation of approximately 700 linear feet of 72-inch sewer | Comparable | • Shorter tunnel alignment (approximately 700 linear feet shorter)<br>• ROW needs at the north portal similar to ST3 Representative Project<br>• Potential complex relocation of 72-inch sewer |
| *Expand mobility for the corridor and region's residents, which include transit dependent, low income, and minority populations* | | | | | | |
| Historically Underserved Populations | Opportunities for historically underserved populations | **Higher Performance** = Higher access to opportunities for historically underserved populations<br>**Comparable Performance** = Access to opportunities for historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Lower access to opportunities for historically underserved populations | Comparable | • All stations located in areas of high access to opportunity | Comparable | • All stations located in areas of high access to opportunity |
| *Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies* | | | | | | |
| Station Area Land Use Plan Consistency | General station locations consistent with local land use plans | **Higher Performance** = Station locations have greater consistency with local land use plans<br>**Comparable Performance** = Station locations have consistency with local land use plans consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less consistency with local land use plans | Comparable | • All six stations located in areas with supportive local land use plans | Comparable | • All six stations located in areas with supportive local land use plans |
| | Station proximity to Seattle-designated Urban Centers and Villages | **Higher Performance** = Station locations closer to center of single or combined Seattle-designated Urban Centers and Villages<br>**Comparable Performance** = Station locations at a similar distance to center of single or combined Seattle-designated Urban Centers and Villages consistent with ST3 Representative Project<br>**Lower Performance** = Stations locations further from center of single or combined Seattle-designated Urban Centers and Villages | Comparable | • All six stations located within Urban Centers and/or Villages | Comparable | • All six stations located within Urban Centers and/or Villages |
| Modal Integration | Bus/rail and rail/rail integration | **Higher Performance** = Better opportunities for active bays, layover and/or less route diversion<br>**Comparable Performance** = Opportunities for active bays, layover and/or less route diversion consistent with ST3 Representative Project<br>**Lower Performance** = Fewer opportunities for active bays, layover and/or more route diversion | Comparable | • Minimal bus interaction at International District/Chinatown, Midtown, and Westlake stations<br>• Available active bays at Denny, South Lake Union, and Seattle Center stations<br>• Limited South Lake Union Station bus access to SR 99 | Comparable | • Minimal bus interaction at International District/Chinatown, Midtown, and Westlake stations<br>• Available active bays and transit access at Denny, South Lake Union, and Seattle Center stations<br>• Better access to SR 99 buses at South Lake Union Station |
| | Bicycle, pedestrian and persons with limited mobility connectivity | **Higher Performance** = Station locations have better access to existing and planned pedestrian and bicycle networks with few barriers and less grade differences within station areas<br>**Comparable Performance** = Station locations have access to existing and planned pedestrian and bicycle networks within station areas consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less access to existing and planned pedestrian and bicycle networks with more barriers and/or grade differences within station areas | Comparable | • All stations have access to multiple existing and planned in-street bicycle facilities, including Westlake Trail and 2nd Avenue cycletrack<br>• Steep grades east and west of Midtown and Westlake stations; grade increases to north towards Queen Anne<br>• Man-made barriers include I-5 to east | Comparable | • Similar to ST3 Representative Project |
| Station Area Development Opportunities | Development potential | **Higher Performance** = Half-mile (0.5 mile) station area includes greater amount of land with compatible zoning for future development (over 10% more)<br>**Comparable Performance** = Half-mile (0.5 mile) station area includes amount of land with compatible zoning for future development consistent with ST3 Representative Project<br>**Lower Performance** = Half-mile (0.5 mile) station area includes lesser amount of land with compatible zoning for future development (over 10% less) | Comparable | • Approximately 1,650 acres have potential for development opportunities | Comparable | • Similar to ST3 Representative Project |

"Higher Performance" = Higher performance relative to ST3 Representative Project; "Comparable Performance" = Comparable performance relative to ST3 Representative Project; "Lower Performance" = Lower performance relative to ST3 Representative Project

# Downtown Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | ST3 Representative Project (5th/6th/Republican) | | 5th/Harrison | |
| | | | Rating | Evaluation | Rating | Evaluation |
| *Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices* | | | | | | |
| Environmental Effects | Protected natural resources | **Higher Performance** = Minimal to no potential impacts on natural protected resources (e.g., wetlands, waterbodies, critical areas)<br>**Comparable Performance** = Potential impacts on natural protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to natural protected resources | Comparable | • No identified impacts to protected natural resources | Comparable | • No identified impacts to protected natural resources |
| | Protected built and social environment | **Higher Performance** = Minimal to no potential impacts on built and social protected resources (e.g., parks, cultural resources, contaminated sites)<br>**Comparable Performance** = Potential impacts on built and social protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to built and social protected resources and/or substantial residential or business displacements | Comparable | • Potential residential displacements from station and tunnel portals<br>• Potential neighborhood impacts from station and tunnel portal construction<br>• Potential impacts to multiple historic properties, historic district and parks | Comparable | • Potential residential displacements from station and tunnel portals<br>• Potential neighborhood impacts from station and tunnel portal construction<br>• Potential impacts to multiple historic properties, historic district and parks |
| | Burden on historically underserved populations | **Higher Performance** = Would have a lesser burden on historically underserved population than ST3 Representative Project<br>**Comparable Performance** = Would have potential to impact historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Would have a greater burden on historically underserved population than ST3 Representative Project | Comparable | • Alignment and stations located in areas with similar low-income and minority populations as rest of the city<br>• Stations located in areas of low to moderate displacement risk<br>• Potential impacts to Chinatown/International District neighborhood during construction | Comparable | • Alignment and stations located in areas with similar low-income and minority populations as rest of the city<br>• Stations located in areas of low to moderate displacement risk<br>• Potential impacts to Chinatown/International District neighborhood during construction |
| Traffic Operations | Traffic circulation and access | **Higher Performance** = Few to no changes in traffic patterns and/or access<br>**Comparable Performance** = Changes to traffic patterns and/or access consistent with ST3 Representative Project<br>**Lower Performance** = Substantial impacts to traffic circulation and/or access, mitigation likely requires substantial road improvements | Comparable | • Potential impacts during station and tunnel portal construction | Comparable | • Potential impacts during station and tunnel portal construction |
| Economic Effects | Freight movement and access on land and water | **Higher Performance** = Minimal effects to freight mobility and future freight capacity expansion opportunities<br>**Comparable Performance** = Effects to freight mobility and future freight capacity expansion opportunities consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects to freight mobility and future freight capacity expansion opportunities | Comparable | • Freight could be affected by changes in traffic patterns during construction | Comparable | • Freight could be affected by changes in traffic patterns during construction |
| | Business and commerce effects | **Higher Performance** = Minimal effects on local businesses, as well as commercial and industrial areas<br>**Comparable Performance** = Effects on local businesses, as well as commercial and industrial areas consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects on local businesses, as well as commercial and industrial areas | Comparable | • Potential for some business displacements<br>• Potential for disruption to businesses during construction around station areas and tunnel portals | Comparable | • Potential for some business displacements<br>• Potential for disruption to businesses during construction around station areas and tunnel portals |

# Downtown Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | 5th/Mercer | | 6th/Boren/Roy | |
| | | | Rating | Evaluation | Rating | Evaluation |
| *Provide high quality rapid, reliable, and efficient peak and off-peak light rail transit service to communities in the project corridors defined in ST3* | | | | | | |
| Reliable Service | Potential service interruptions and recoverability | **Higher Performance** = More grade separation<br>**Comparable Performance** = Grade separation and reliability consistent with ST3 Representative Project<br>**Lower Performance** = Less grade separation | Comparable | • Fully grade separated | Comparable | • Fully grade separated |
| Travel Times | LRT travel times | **Higher Performance** = Travel time approximately 25% faster than ST3 Representative Project<br>**Comparable Performance** = Travel time consistent with ST3 Representative Project<br>**Lower Performance** = Travel time approximately 25% slower than ST3 Representative Project | Comparable | • Travel time comparable to ST3 Representative Project | Comparable | • Travel time comparable to ST3 Representative Project |
| *Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand* | | | | | | |
| Regional Connectivity | Network integration and operational flexibility to meet future demand | **Higher Performance** = Facilitates additional connectivity and operational flexibility beyond spine segmentation<br>**Comparable Performance** = Facilitates spine segmentation for operational flexibility consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate spine segmentation | Comparable | • Consistent with ST3 Representative Project | Comparable | • Consistent with ST3 Representative Project |
| Transit Capacity | Passenger carrying capacity in downtown | **Higher Performance** = Includes new light rail tunnel through downtown with additional improvements<br>**Comparable Performance** = Includes new light rail tunnel through downtown consistent with ST3 Representative Project<br>**Lower Performance** = Does not include new light rail tunnel through downtown | Comparable | • Includes new light rail tunnel through downtown | Comparable | • Includes new light rail tunnel through downtown |
| Projected Transit Demand | Ridership potential | **Higher Performance** = 10% greater than ST3 Representative Project<br>**Comparable Performance** = Between 10% less and 10% greater than ST3 Representative Project<br>**Lower Performance** = 10% less than ST3 Representative Project | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations 1% greater than ST3 Representative Project (approximately 260,800) | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations 4% greater than ST3 Representative Project (approximately 267,800) |
| *Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's Long-Range Plan* | | | | | | |
| Regional Centers Served | Station proximity to PSRC-designated regional centers | **Higher Performance** = Serves more PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project<br>**Comparable Performance** = Serves PSRC-designated regional growth centers and manufacturing/industrial centers consistent with ST3 Representative Project<br>**Lower Performance** = Serves fewer PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project | Comparable | • 3 regional growth centers served (Seattle CBD, South Lake Union, Uptown) | Comparable | • 3 regional growth centers served (Seattle CBD, South Lake Union, Uptown) |
| ST Long-Range Plan Consistency | Accommodates future LRT extension beyond ST3 | **Higher Performance** = A future LRT extension per Sound Transit Long-Range Plan more feasible and more direct than ST3 Representative Project<br>**Comparable Performance** = A future LRT extension per Sound Transit Long-Range Plan feasible, consistent with ST3 Representative Project<br>**Lower Performance** = A future LRT extension per Sound Transit Long-Range Plan would have major challenges | Comparable | • Consistent with Sound Transit Long-Range Plan | Comparable | • Consistent with Sound Transit Long-Range Plan |
| *Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain* | | | | | | |
| ST3 Consistency | Mode, route, and general station locations per ST3 | **Higher Performance** = Not applicable<br>**Comparable Performance** = Mode, route and general station locations consistent with ST3 Representative Project and/or System Plan<br>**Lower Performance** = Mode, route and general station locations not consistent with ST3 Representative Project and/or System Plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan |
| | Potential ST3 operating plan effects | **Higher Performance** = Facilitates special trackwork and/or provides reliable system operations<br>**Comparable Performance** = Facilitates special trackwork and/or system operations consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate special trackwork and/or degrades system operations | Comparable | • Consistent with ST3 Representative Project | Comparable | • Consistent with ST3 Representative Project |
| Technical Feasibility | Engineering constraints | **Higher Performance** = Minimal engineering constraints, compliance with applicable codes, design guidelines and regulatory requirements<br>**Comparable Performance** = Engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements consistent with ST3 Representative Project<br>**Lower Performance** = Substantial engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements | Lower | • ROW and utility constraints<br>• Mercer Street is high volume traffic arterial connecting to I-5<br>• Major utility constraints: potential impacts to 176-inch sewer crossing; 48-inch sewer below South Lake Union Station; and impacts 72-inch sewer crossing<br>• North tunnel portal has less ROW constraints<br>• North tunnel portal is located near steep slopes | Comparable | • South Lake Union Station constraints would be less–Roy is a less travelled roadway and further away from SR 99 off ramp<br>• Potential relocation of 72-inch sewer crossing and requires protection of 84-inch, 48-inch and 176-inch sewers<br>• North tunnel portal has less ROW constraints<br>• North tunnel portal is located near steep slopes |

"Higher Performance" = Higher performance relative to ST3 Representative Project; "Comparable Performance" = Comparable performance relative to ST3 Representative Project; "Lower Performance" = Lower performance relative to ST3 Representative Project

# Downtown Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | 5th/Mercer | | 6th/Boren/Roy | |
| | | | Rating | Evaluation | Rating | Evaluation |
| | Constructability issues | **Higher Performance** = Lower construction complexity (e.g., minimal utility conflicts, building impacts, permit requirements, required schedule, geotechnical constraints, tunnel/station constructability, and construction staging/phasing)<br>**Comparable Performance** = Construction complexity consistent with ST3 Representative Project<br>**Lower Performance** = Higher construction complexity | Lower | • Tunnel portal near International District/Chinatown Station and mining through tie-backs at Columbia Tower create constructability issues<br>• New Westlake Station on 5th Avenue directly under existing Westlake Station, making it more challenging to construct<br>• Maintenance of traffic would be more difficult due to higher traffic volumes connecting to I-5<br>• Sewer line conflicts are greater: requires relocation of 72-inch sewer and potential relocation of 176-inch sewer at crossing; relocation of 48-inch sewer; and challenging to protect 176-inch sewer during construction, especially at station location<br>• Geotechnical concerns building next to steep slope | Higher | • No need to mine through tie-backs at Columbia Tower but need to construct under Washington State Department of Transportation (WSDOT) walls along I-5<br>• Sewer line conflicts along Roy would be less<br>• Westlake Station on 6th Avenue; similar to ST3 Representative Project<br>• South Lake Union Station avoids SR 99 off-ramp<br>• North tunnel portal construction has fewer impacts on ROW<br>• Geotechnical concerns building next to steep slope |
| | Operational constraints | **Higher Performance** = Optimum operational characteristics (e.g., operating efficiency and flexibility)<br>**Comparable Performance** = Operational characteristics consistent with ST3 Representative Project<br>**Lower Performance** = Poor operational characteristics | Comparable | • Similar to ST3 Representative Project | Comparable | • Longer curve lengths increase operational speed; but operationally similar to ST3 Representative Project |
| Financial Sustainability | Qualitative capital cost comparison | **Higher Performance** = Capital cost drivers anticipated to be less than ST3 Representative Project<br>**Comparable Performance** = Capital cost drivers anticipated to be consistent with ST3 Representative Project<br>**Lower Performance** = Capital cost drivers anticipated to be greater than ST3 Representative Project | Lower | • Greater utility impacts: protection and potential relocation of 176-inch sewer at crossing; relocation of 72-inch sewer; and potential relocation of 48-inch sewer<br>• Potential impacts to major infrastructure on Mercer (recently constructed arterial)<br>• More extensive construction staging and maintenance of traffic on Mercer<br>• Longer tunnel alignment (approximately 1,800 linear feet longer)<br>• Less ROW impacts at north tunnel portal | Lower | • Longer tunnel alignment (approximately 2,000 linear feet longer)<br>• Less ROW impacts at north tunnel portal<br>• Less utility impacts |
| *Expand mobility for the corridor and region's residents, which include transit dependent, low income, and minority populations* | | | | | | |
| Historically Underserved Populations | Opportunities for historically underserved populations | **Higher Performance** = Higher access to opportunities for historically underserved populations<br>**Comparable Performance** = Access to opportunities for historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Lower access to opportunities for historically underserved populations | Comparable | • All stations located in areas of high access to opportunity | Comparable | • All stations located in areas of high access to opportunity |
| *Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies* | | | | | | |
| Station Area Land Use Plan Consistency | General station locations consistent with local land use plans | **Higher Performance** = Station locations have greater consistency with local land use plans<br>**Comparable Performance** = Station locations have consistency with local land use plans consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less consistency with local land use plans | Comparable | • All six stations located in areas with supportive local land use plans | Comparable | • All six stations located in areas with supportive local land use plans |
| | Station proximity to Seattle-designated Urban Centers and Villages | **Higher Performance** = Station locations closer to center of single or combined Seattle-designated Urban Centers and Villages<br>**Comparable Performance** = Station locations at a similar distance to center of single or combined Seattle-designated Urban Centers and Villages consistent with ST3 Representative Project<br>**Lower Performance** = Stations locations further from center of single or combined Seattle-designated Urban Centers and Villages | Comparable | • All six stations located within Urban Centers and/or Villages | Lower | • Five stations located within Urban Centers and/or Villages; one located on border (Seattle Center Station at Roy Street) |
| Modal Integration | Bus/rail and rail/rail integration | **Higher Performance** = Better opportunities for active bays, layover and/or less route diversion<br>**Comparable Performance** = Opportunities for active bays, layover and/or less route diversion consistent with ST3 Representative Project<br>**Lower Performance** = Fewer opportunities for active bays, layover and/or more route diversion | Comparable | • Minimal bus interaction at International District/Chinatown, Midtown, and Westlake stations<br>• Available active bays and transit access at Denny, South Lake Union, and Seattle Center stations<br>• Limited South Lake Union Station bus access to SR 99 | Comparable | • Minimal bus interaction at International District/Chinatown, Midtown, and Westlake stations<br>• Reduced access to buses/streetcar on Westlake<br>• Better access to buses on SR 99 at South Lake Union Station<br>• Further away from Seattle Center bus routes |
| | Bicycle, pedestrian and persons with limited mobility connectivity | **Higher Performance** = Station locations have better access to existing and planned pedestrian and bicycle networks with few barriers and less grade differences within station areas<br>**Comparable Performance** = Station locations have access to existing and planned pedestrian and bicycle networks within station areas consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less access to existing and planned pedestrian and bicycle networks with more barriers and/or grade differences within station areas | Comparable | • Similar to ST3 Representative Project | Lower | • Similar to ST3 Representative Project, except greater grade difference to north (Queen Anne) affects two station locations (South Lake Union and Seattle Center) |

# Downtown Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | 5th/Mercer | | 6th/Boren/Roy | |
| | | | Rating | Evaluation | Rating | Evaluation |
| Station Area Development Opportunities | Development potential | **Higher Performance** = Half-mile (0.5 mile) station area includes greater amount of land with compatible zoning for future development (over 10% more)<br>**Comparable Performance** = Half-mile (0.5 mile) station area includes amount of land with compatible zoning for future development consistent with ST3 Representative Project<br>**Lower Performance** = Half-mile (0.5 mile) station area includes lesser amount of land with compatible zoning for future development (over 10% less) | Comparable | • Similar to ST3 Representative Project | Comparable | • Similar to ST3 Representative Project |
| *Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices* | | | | | | |
| Environmental Effects | Protected natural resources | **Higher Performance** = Minimal to no potential impacts on natural protected resources (e.g., wetlands, waterbodies, critical areas)<br>**Comparable Performance** = Potential impacts on natural protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to natural protected resources | Lower | • Potential impact to steep slopes and wildlife habitat in Kinnear Park (Section 4(f) resource) | Lower | • Potential impact to steep slopes and wildlife habitat in Kinnear Park (Section 4(f) resource) |
| | Protected built and social environment | **Higher Performance** = Minimal to no potential impacts on built and social protected resources (e.g., parks, cultural resources, contaminated sites)<br>**Comparable Performance** = Potential impacts on built and social protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to built and social protected resources and/or substantial residential or business displacements | Comparable | • Potential residential displacements from station and tunnel portals<br>• Potential neighborhood impacts from station and tunnel portal construction<br>• Potential impacts to multiple historic properties, historic district, and parks | Comparable | • Potential residential displacements from station and tunnel portals<br>• Potential neighborhood impacts from station and tunnel portal construction<br>• Potential impacts to multiple historic properties, historic district, and parks |
| | Burden on historically underserved populations | **Higher Performance** = Would have a lesser burden on historically underserved population than ST3 Representative Project<br>**Comparable Performance** = Would have potential to impact historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Would have a greater burden on historically underserved population than ST3 Representative Project | Comparable | • Alignment and stations located in areas with similar low-income and minority populations as rest of the city<br>• Stations located in areas of low to moderate displacement risk<br>• Potential impacts to Chinatown/International District neighborhood during construction | Comparable | • Alignment and stations located in areas with similar low-income and minority populations as rest of the city<br>• Stations located in areas of low to moderate displacement risk<br>• Potential impacts to Chinatown/International District neighborhood during construction |
| Traffic Operations | Traffic circulation and access | **Higher Performance** = Few to no changes in traffic patterns and/or access<br>**Comparable Performance** = Changes to traffic patterns and/or access consistent with ST3 Representative Project<br>**Lower Performance** = Substantial impacts to traffic circulation and/or access, mitigation likely requires substantial road improvements | Lower | • Station and tunnel portal construction on Mercer Street more disruptive than ST3 Representative Project due to heavy traffic volumes | Comparable | • Potential impacts during station and tunnel portal construction<br>• Midtown Station location avoids construction impacts to 5th Avenue, but increases impacts to 6th Avenue |
| Economic Effects | Freight movement and access on land and water | **Higher Performance** = Minimal effects to freight mobility and future freight capacity expansion opportunities<br>**Comparable Performance** = Effects to freight mobility and future freight capacity expansion opportunities consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects to freight mobility and future freight capacity expansion opportunities | Lower | • Freight could be affected by changes in traffic patterns during construction; more disruptive than ST3 Representative Project due to station construction on Mercer Street | Comparable | • Freight could be affected by changes in traffic patterns during construction |
| | Business and commerce effects | **Higher Performance** = Minimal effects on local businesses, as well as commercial and industrial areas<br>**Comparable Performance** = Effects on local businesses, as well as commercial and industrial areas consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects on local businesses, as well as commercial and industrial areas | Comparable | • Potential for some business displacements<br>• Potential disruption to businesses during construction around station areas and tunnel portals | Comparable | • Potential for some business displacements<br>• Potential disruption to businesses during construction around station areas and tunnel portals |

# Downtown Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | 8th/6th/Republican | | 5th/Roy/Consolidated South Lake Union Station | |
| | | | Rating | Evaluation | Rating | Evaluation |
| *Provide high quality rapid, reliable, and efficient peak and off-peak light rail transit service to communities in the project corridors defined in ST3* | | | | | | |
| Reliable Service | Potential service interruptions and recoverability | **Higher Performance** = More grade separation<br>**Comparable Performance** = Grade separation and reliability consistent with ST3 Representative Project<br>**Lower Performance** = Less grade separation | Comparable | • Fully grade separated | Comparable | • Fully grade separated |
| Travel Times | LRT travel times | **Higher Performance** = Travel time approximately 25% faster than ST3 Representative Project<br>**Comparable Performance** = Travel time consistent with ST3 Representative Project<br>**Lower Performance** = Travel time approximately 25% slower than ST3 Representative Project | Comparable | • Travel time comparable to ST3 Representative Project | Comparable | • Travel time comparable to ST3 Representative Project; faster average speed due to one less station |
| *Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand* | | | | | | |
| Regional Connectivity | Network integration and operational flexibility to meet future demand | **Higher Performance** = Facilitates additional connectivity and operational flexibility beyond spine segmentation<br>**Comparable Performance** = Facilitates spine segmentation for operational flexibility consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate spine segmentation | Lower | • Creates additional passenger loads at International District/Chinatown and Westlake stations, which affects distribution of passengers between two downtown tunnels and spine segmentation | Comparable | • Consistent with ST3 Representative Project |
| Transit Capacity | Passenger carrying capacity in downtown | **Higher Performance** = Includes new light rail tunnel through downtown with additional improvements<br>**Comparable Performance** = Includes new light rail tunnel through downtown consistent with ST3 Representative Project<br>**Lower Performance** = Does not include new light rail tunnel through downtown | Lower | • Includes new light rail tunnel through downtown, but creates additional passenger loads at International District/Chinatown and Westlake stations | Comparable | • Includes new light rail tunnel through downtown |
| Projected Transit Demand | Ridership potential | **Higher Performance** = More than 10% greater than ST3 Representative Project<br>**Comparable Performance** = Between 10% less and 10% greater than ST3 Representative Project<br>**Lower Performance** = More than 10% less than ST3 Representative Project | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations 4% greater than ST3 Representative Project (approximately 267,700) | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations 3% less than ST3 Representative Project (approximately 249,900) |
| *Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's Long-Range Plan* | | | | | | |
| Regional Centers Served | Station proximity to PSRC-designated regional centers | **Higher Performance** = Serves more PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project<br>**Comparable Performance** = Serves PSRC-designated regional growth centers and manufacturing/industrial centers consistent with ST3 Representative Project<br>**Lower Performance** = Serves fewer PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project | Comparable | • 3 regional growth centers served (Seattle CBD, South Lake Union, Uptown)<br>• Midtown Station serves First Hill/Capitol Hill regional growth center, but not identified or analyzed in ST3 Plan | Comparable | • 3 regional growth centers served (Seattle CBD, South Lake Union, Uptown) |
| ST Long-Range Plan Consistency | Accommodates future LRT extension beyond ST3 | **Higher Performance** = A future LRT extension per Sound Transit Long-Range Plan more feasible and more direct than ST3 Representative Project<br>**Comparable Performance** = A future LRT extension per Sound Transit Long-Range Plan feasible, consistent with ST3 Representative Project<br>**Lower Performance** = A future LRT extension per Sound Transit Long-Range Plan would have major challenges | Comparable | • Consistent with Sound Transit Long-Range Plan | Comparable | • Consistent with Sound Transit Long-Range Plan |
| *Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain* | | | | | | |
| ST3 Consistency | Mode, route, and general station locations per ST3 | **Higher Performance** = Not applicable<br>**Comparable Performance** = Mode, route and general station locations consistent with ST3 Representative Project and/or System Plan<br>**Lower Performance** = Mode, route and general station locations not consistent with ST3 Representative Project and/or System Plan | Lower | • First Hill Station not identified or analyzed in *ST3 Plan* | Lower | • Consolidating stations not identified or analyzed in *ST3 Plan* |
| | Potential ST3 operating plan effects | **Higher Performance** = Facilitates special trackwork and/or provides reliable system operations<br>**Comparable Performance** = Facilitates special trackwork and/or system operations consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate special trackwork and/or degrades system operations | Comparable | • Consistent with ST3 Representative Project | Comparable | • Consistent with ST3 Representative Project |
| Technical Feasibility | Engineering constraints | **Higher Performance** = Minimal engineering constraints, compliance with applicable codes, design guidelines and regulatory requirements<br>**Comparable Performance** = Engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements consistent with ST3 Representative Project<br>**Lower Performance** = Substantial engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements | Lower | • Two under crossings of I-5<br>• Sewer conflicts and tunnel portal issues similar to ST3 Representative Project | Higher | • Potential relocation of 72-inch sewer crossing and requires protection of 84-inch, 48-inch and 176-inch sewers<br>• North tunnel portal has less ROW constraints<br>• North tunnel portal is located near steep slope<br>• Constraints would be less–Roy is further away from SR 99 off ramp and fewer utility impacts |

"Higher Performance" = Higher performance relative to ST3 Representative Project; "Comparable Performance" = Comparable performance relative to ST3 Representative Project; "Lower Performance" = Lower performance relative to ST3 Representative Project

# Downtown Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | 8th/6th/Republican | | 5th/Roy/Consolidated South Lake Union Station | |
| | | | Rating | Evaluation | Rating | Evaluation |
| | Constructability issues | **Higher Performance** = Lower construction complexity (e.g., minimal utility conflicts, building impacts, permit requirements, required schedule, geotechnical constraints, tunnel/station constructability, and construction staging/phasing)<br>**Comparable Performance** = Construction complexity consistent with ST3 Representative Project<br>**Lower Performance** = Higher construction complexity | Lower | • Westlake Station on 6th Avenue abutting existing Westlake Station at 90 degrees; similar to ST3 Representative Project<br>• Deep tunnel station (approximately 160 feet deep)<br>• Two crossings of I-5 present high-risk and construction considerations<br>• Unknown soil conditions | Higher | • New Westlake Station on 5th Avenue directly under existing Westlake Station, making it more challenging to construct; however, removing a station results in less construction issues<br>• Sewer line conflicts along Roy would be less<br>• South Lake Union Station avoids SR 99 off-ramp<br>• North tunnel portal construction has fewer impacts on ROW<br>• Geotechnical concerns building next to steep slope |
| | Operational constraints | **Higher Performance** = Optimum operational characteristics (e.g., operating efficiency and flexibility)<br>**Comparable Performance** = Operational characteristics consistent with ST3 Representative Project<br>**Lower Performance** = Poor operational characteristics | Comparable | • Tighter curves reduce design speed but operationally comparable to ST3 Representative Project | Comparable | • Removes one station but operationally comparable to ST3 Representative Project |
| Financial Sustainability | Qualitative capital cost comparison | **Higher Performance** = Capital cost drivers anticipated to be less than ST3 Representative Project<br>**Comparable Performance** = Capital cost drivers anticipated to be consistent with ST3 Representative Project<br>**Lower Performance** = Capital cost drivers anticipated to be greater than ST3 Representative Project | Lower | • Longer tunnel alignment (approximately 600 linear feet longer)<br>• North tunnel portal location has less ROW impacts and utility impacts<br>• Requires two crossings under I-5<br>• Unknown soil conditions under I-5 and east of I-5<br>• Deep station location (approximately 40 feet deeper) requires more vertical circulation | Higher | • Longer tunnel alignment (approximately 1,800 linear feet longer), but one less station; consolidating stations not identified or analyzed in *ST3 Plan*<br>• North tunnel portal location has less ROW impacts<br>• Potentially less utility impacts |
| *Expand mobility for the corridor and region's residents, which include transit dependent, low income, and minority populations* | | | | | | |
| Historically Underserved Populations | Opportunities for historically underserved populations | **Higher Performance** = Higher access to opportunities for historically underserved populations<br>**Comparable Performance** = Access to opportunities for historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Lower access to opportunities for historically underserved populations | Comparable | • All stations located in areas of high access to opportunity | Comparable | • All stations located in areas of high access to opportunity |
| *Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies* | | | | | | |
| Station Area Land Use Plan Consistency | General station locations consistent with local land use plans | **Higher Performance** = Station locations have greater consistency with local land use plans<br>**Comparable Performance** = Station locations have consistency with local land use plans consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less consistency with local land use plans | Comparable | • All six stations located in areas with supportive local land use plans | Comparable | • All five stations located in areas with supportive local land use plans |
| | Station proximity to Seattle-designated Urban Centers and Villages | **Higher Performance** = Station locations closer to center of single or combined Seattle-designated Urban Centers and Villages<br>**Comparable Performance** = Station locations at a similar distance to center of single or combined Seattle-designated Urban Centers and Villages consistent with ST3 Representative Project<br>**Lower Performance** = Stations locations further from center of single or combined Seattle-designated Urban Centers and Villages | Lower | • Five stations within Urban Centers and/or Villages<br>• Midtown Station located in different Urban Center/Village than designated in ST3 plan | Lower | • Four stations within Urban Center and/or Villages; one on border (Seattle Center Station at Roy Street) |
| Modal Integration | Bus/rail and rail/rail integration | **Higher Performance** = Better opportunities for active bays, layover and/or less route diversion<br>**Comparable Performance** = Opportunities for active bays, layover and/or less route diversion consistent with ST3 Representative Project<br>**Lower Performance** = Fewer opportunities for active bays, layover and/or more route diversion | Comparable | • Minimal bus interaction at International District/Chinatown, First Hill, and Westlake stations<br>• First Hill poor connections to north/south bus routes but good connections with Madison Bus Rapid Transit (BRT)<br>• Available active bays and transit access at Denny, South Lake Union, and Seattle Center stations<br>• Limited South Lake Union Station bus access to SR 99 | Comparable | • Minimal bus interaction at International District/Chinatown, Midtown, and Westlake stations<br>• Consolidated station not as convenient to buses on Denny, Dexter, or SR 99, but bus service can be re-routed<br>• Further away from Seattle Center bus routes |
| | Bicycle, pedestrian and persons with limited mobility connectivity | **Higher Performance** = Station locations have more access to existing and planned pedestrian and bicycle networks and limited grade differences within station areas<br>**Comparable Performance** = Station locations have access to existing and planned pedestrian and bicycle networks and limited grade differences within station areas consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less access to existing and planned pedestrian and bicycle networks and limited grade differences within station areas | Lower | • Similar to ST3 Representative Project, except greater grade difference at east and west of Midtown Station (east of I-5) that connects to heart of commercial core and First Hill | Lower | • Similar to ST3 Representative Stations, except greater grade difference to north (Queen Anne) |
| Station Area Development Opportunities | Development potential | **Higher Performance** = Half-mile (0.5 mile) station area includes greater amount of land with compatible zoning for future development (over 10% more)<br>**Comparable Performance** = Half-mile (0.5 mile) station area includes amount of land with compatible zoning for future development consistent with ST3 Representative Project<br>**Lower Performance** = Half-mile (0.5 mile) station area includes lesser amount of land with compatible zoning for future development (over 10% less) | Comparable | • Similar to ST3 Representative Project | Comparable | • Similar to ST3 Representative Project |

# Downtown Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | 8th/6th/Republican | | 5th/Roy/Consolidated South Lake Union Station | |
| | | | Rating | Evaluation | Rating | Evaluation |
| *Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices* | | | | | | |
| Environmental Effects | Protected natural resources | **Higher Performance** = Minimal to no potential impacts on natural protected resources (e.g., wetlands, waterbodies, critical areas)<br>**Comparable Performance** = Potential impacts on natural protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to natural protected resources | Comparable | • No identified impacts to protected natural resources | Lower | • Potential impact to steep slopes and wildlife habitat in Kinnear Park (Section 4(f) resource) |
| | Protected built and social environment | **Higher Performance** = Minimal to no potential impacts on built and social protected resources (e.g., parks, cultural resources, contaminated sites)<br>**Comparable Performance** = Potential impacts on built and social protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to built and social protected resources and/or substantial residential or business displacements | Comparable | • Potential residential displacements from station and tunnel portals<br>• Potential neighborhood impacts from station and tunnel portal construction<br>• Potential impacts to multiple historic properties, historic district, and parks | Comparable | • Potential residential displacements from station and tunnel portals<br>• Potential neighborhood impacts from station and tunnel portal construction<br>• Potential impacts to multiple historic properties, historic district, and parks |
| | Burden on historically underserved populations | **Higher Performance** = Would have a lesser burden on historically underserved population than ST3 Representative Project<br>**Comparable Performance** = Would have potential to impact historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Would have a greater burden on historically underserved population than ST3 Representative Project | Comparable | • Alignment and stations located in areas with similar low-income and minority populations as rest of the city<br>• Stations located in areas of low to moderate displacement risk<br>• Potential impacts to Chinatown/International District neighborhood during construction | Comparable | • Alignment and stations located in areas with similar low-income and minority populations as rest of the city<br>• Stations located in areas of low to moderate displacement risk<br>• Potential impacts to Chinatown/International District neighborhood during construction |
| Traffic Operations | Traffic circulation and access | **Higher Performance** = Few to no changes in traffic patterns and/or access<br>**Comparable Performance** = Changes to traffic patterns and/or access consistent with ST3 Representative Project<br>**Lower Performance** = Substantial impacts to traffic circulation and/or access, mitigation likely requires substantial road improvements | Comparable | • Potential impacts during station and tunnel portal construction<br>• Midtown Station location avoids construction impacts to 5th Avenue, but increases impacts to 8th Avenue | Higher | • Potential impacts during station and tunnel portal construction<br>• Less disruptive than ST3 Representative Project due to one fewer station |
| Economic Effects | Freight movement and access on land and water | **Higher Performance** = Minimal effects to freight mobility and future freight capacity expansion opportunities<br>**Comparable Performance** = Effects to freight mobility and future freight capacity expansion opportunities consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects to freight mobility and future freight capacity expansion opportunities | Comparable | • Freight could be affected by changes in traffic patterns during construction | Comparable | • Freight could be affected by changes in traffic patterns during construction |
| | Business and commerce effects | **Higher Performance** = Minimal effects on local businesses, as well as commercial and industrial areas<br>**Comparable Performance** = Effects on local businesses, as well as commercial and industrial areas consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects on local businesses, as well as commercial and industrial areas | Comparable | • Potential for some business displacements<br>• Potential for disruption to businesses during construction around station areas and tunnel portals | Comparable | • Potential for some business displacements<br>• Potential for disruption to businesses during construction around station areas and tunnel portals |

# C-ID Station – Additional Level 1 Alternatives Evaluation

## Evaluation Criteria and Measures

| | Reliable Service | Travel Times | Regional Connectivity | Transit Capacity | Projected Transit Demand | Regional Centers Served | ST Long Range Plan Consistency | Mode, Route, and Station Locations (per ST3) | Potential ST3 Operating Plan Effects | Engineering Constraints | Constructability Issues | Operational Constraints | Qualitative Capital Cost Comparison | Historically Underserved Populations | Station Land Use Plan Consistency | Station Proximity to Urban Centers/Villages | Bus/Rail Integration | Bicycle/Pedestrian Connectivity | Station Area Development Potential | Protected Natural Resources | Protected Built/Social Environment | Burden on Underserved Populations | Traffic Circulation/Access | Freight Access | Business/ Commerce |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5th Ave Cut-and-Cover Tunnel and Station (ST3 Baseline) | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ |
| 5th Ave Bored Tunnel / Cut-and-Cover Station | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ● | ◑ | ◑ | ◑ |
| 5th Ave Bored Tunnel / Mined Station | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ○ | ○ | ◑ | ○ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ● | ◑ | ◑ | ◑ |
| 4th Ave Cut-and-Cover Tunnel and Station | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ○ | ○ | ◑ | ○ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ○ | ○ | ○ |
| 4th Ave Bored Tunnel / Mined Station | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ○ | ○ | ◑ | ○ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ○ | ○ | ○ |
| Union Station Bored Tunnel / Mined Station | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ○ | ○ | ◑ | ○ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ● | ◑ | ◑ | ◑ |

● Higher Performance ◑ Comparable Performance ○ Lower Performance

"Higher Performance" = Higher performance relative to ST3 Representative Project; "Comparable Performance" = Comparable performance relative to ST3 Representative Project; "Lower Performance" = Lower performance relative to ST3 Representative Project

# C-ID Station – Additional Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | 5th Avenue Cut-and-Cover Tunnel and Station (ST3 Baseline) | | 5th Avenue Bored Tunnel/Cut-and-Cover Station | |
| | | | Rating | Evaluation | Rating | Evaluation |
| *Provide high quality rapid, reliable, and efficient peak and off-peak light rail transit service to communities in the project corridors defined in ST3* | | | | | | |
| Reliable Service | Potential service interruptions and recoverability | **Higher Performance** = More grade separation<br>**Comparable Performance** = Grade separation and reliability consistent with ST3 Representative Project<br>**Lower Performance** = Less grade separation | Comparable | • Fully grade separated | Comparable | • Fully grade separated |
| Travel Times | LRT travel times | **Higher Performance** = Travel time approximately 25% faster than ST3 Representative Project<br>**Comparable Performance** = Travel time consistent with ST3 Representative Project<br>**Lower Performance** = Travel time approximately 25% slower than ST3 Representative Project | Comparable | • Baseline for comparison | Comparable | • Travel time comparable to ST3 Representative Project |
| *Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand* | | | | | | |
| Regional Connectivity | Network integration and operational flexibility to meet future demand | **Higher Performance** = Facilitates additional connectivity and operational flexibility beyond spine segmentation<br>**Comparable Performance** = Facilitates spine segmentation for operational flexibility consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate spine segmentation | Comparable | • Facilitates spine segmentation | Comparable | • Consistent with ST3 Representative Project |
| Transit Capacity | Passenger carrying capacity in downtown | **Higher Performance** = Includes new light rail tunnel through downtown with additional improvements<br>**Comparable Performance** = Includes new light rail tunnel through downtown consistent with ST3 Representative Project<br>**Lower Performance** = Does not include new light rail tunnel through downtown | Comparable | • Includes new light rail tunnel through downtown | Comparable | • Consistent with ST3 Representative Project |
| Projected Transit Demand | Ridership potential | **Higher Performance** = More than 10% greater than ST3 Representative Project<br>**Comparable Performance** = Between 10% less and 10% greater than ST3 Representative Project<br>**Lower Performance** = More than 10% less than ST3 Representative Project | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations approximately 51,300 | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations similar to ST3 Representative Project (approximately 51,300) |
| *Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's Long-Range Plan* | | | | | | |
| Regional Centers Served | Station proximity to PSRC-designated regional centers | **Higher Performance** = Serves more PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project<br>**Comparable Performance** = Serves PSRC-designated regional growth centers and manufacturing/industrial centers consistent with ST3 Representative Project<br>**Lower Performance** = Serves fewer PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project | Comparable | • One regional growth center served (Seattle Central Business District [CBD]) | Comparable | • One regional growth center served (Seattle CBD) |
| ST Long-Range Plan Consistency | Accommodates future LRT extension beyond ST3 | **Higher Performance** = A future LRT extension per Sound Transit Long-Range Plan more feasible and more direct than ST3 Representative Project<br>**Comparable Performance** = A future LRT extension per Sound Transit Long-Range Plan feasible, consistent with ST3 Representative Project<br>**Lower Performance** = A future LRT extension per Sound Transit Long-Range Plan would have major challenges | Comparable | • Consistent with Sound Transit Long-Range Plan | Comparable | • Consistent with Sound Transit Long-Range Plan |
| *Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain* | | | | | | |
| ST3 Consistency | Mode, route, and general station locations per ST3 | **Higher Performance** = Not applicable<br>**Comparable Performance** = Mode, route and general station locations consistent with ST3 Representative Project and/or System Plan<br>**Lower Performance** = Mode, route and general station locations not consistent with ST3 Representative Project and/or System Plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan |
| Technical Feasibility | Potential ST3 operating plan effects | **Higher Performance** = Facilitates special trackwork and/or provides reliable system operations<br>**Comparable Performance** = Facilitates special trackwork and/or system operations consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate special trackwork and/or degrades system operations | Comparable | • Baseline for comparison | Comparable | • Similar to ST3 Representative Project |
| | Engineering constraints | **Higher Performance** = Minimal engineering constraints, compliance with applicable codes, design guidelines and regulatory requirements<br>**Comparable Performance** = Engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements consistent with ST3 Representative Project<br>**Lower Performance** = Substantial engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements | Comparable | • Cut-and-cover tunnel and station design in limited street right-of-way (ROW)<br>• Cut-and-cover tunnel in street from Seattle Boulevard to Main Street; tunnel boring machine (TBM) portal at Main Street<br>• Design of connections to existing International District/Chinatown Station with existing pile foundations | Comparable | • Bored and cut-and-cover tunnels and station design in limited street ROW<br>• Design of connections to existing International District/Chinatown Station with existing pile foundations<br>• Pile supported 5th Avenue retaining wall extends to Main Street; may require cut-and-cover extended to Main Street or advance removal of structure |

"Higher Performance" = Higher performance relative to ST3 Representative Project; "Comparable Performance" = Comparable performance relative to ST3 Representative Project; "Lower Performance" = Lower performance relative to ST3 Representative Project

# C-ID Station – Additional Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | 5th Avenue Cut-and-Cover Tunnel and Station (ST3 Baseline) | | 5th Avenue Bored Tunnel/Cut-and-Cover Station | |
| | | | Rating | Evaluation | Rating | Evaluation |
| Financial Sustainability | Constructability issues | **Higher Performance** = Lower construction complexity (e.g., minimal utility conflicts, building impacts, permit requirements, required schedule, geotechnical constraints, tunnel/station constructability, and construction staging/phasing)<br>**Comparable Performance** = Construction complexity consistent with ST3 Representative Project<br>**Lower Performance** = Higher construction complexity | Comparable | • Cut-and-cover tunnel and station construction in limited street ROW<br>• Cut-and-cover tunnel in-street from Seattle Boulevard to Main Street; TBM portal at Main Street | Comparable | • Bored and cut-and-cover tunnels and station construction in limited street ROW<br>• Pile supported 5th Avenue retaining wall extends to Main Street; may require cut-and-cover extended to Main Street or advance removal of structure |
| | Operational constraints | **Higher Performance** = Optimum operational characteristics (e.g., operating efficiency and flexibility)<br>**Comparable Performance** = Operational characteristics consistent with ST3 Representative Project<br>**Lower Performance** = Poor operational characteristics | Comparable | • Baseline operational performance | Comparable | • Similar to ST3 Representative Project |
| | Qualitative capital cost comparison | **Higher Performance** = Capital cost drivers anticipated to be less than ST3 Representative Project<br>**Comparable Performance** = Capital cost drivers anticipated to be consistent with ST3 Representative Project<br>**Lower Performance** = Capital cost drivers anticipated to be greater than ST3 Representative Project | Comparable | • Baseline for comparison | Comparable | • Similar to ST3 Representative Project |
| *Expand mobility for the corridor and region's residents, which include transit dependent, low income, and minority populations* | | | | | | |
| Historically Underserved Populations | Opportunities for historically underserved populations | **Higher Performance** = Higher access to opportunities for historically underserved populations<br>**Comparable Performance** = Access to opportunities for historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Lower access to opportunities for historically underserved populations | Comparable | • Station located in area of high access to opportunity | Comparable | • Station located in area of high access to opportunity |
| *Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies* | | | | | | |
| Station Area Land Use Plan Consistency | General station locations consistent with local land use plans | **Higher Performance** = Station locations have greater consistency with local land use plans<br>**Comparable Performance** = Station locations have consistency with local land use plans consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less consistency with local land use plans | Comparable | • Station located in area with supportive local land use plans | Comparable | • Station located in area with supportive local land use plans |
| | Station proximity to Seattle-designated Urban Centers and Villages | **Higher Performance** = Station locations closer to center of single or combined Seattle-designated Urban Centers and Villages<br>**Comparable Performance** = Station locations at a similar distance to center of single or combined Seattle-designated Urban Centers and Villages consistent with ST3 Representative Project<br>**Lower Performance** = Stations locations further from center of single or combined Seattle-designated Urban Centers and Villages | Comparable | • Station located within Urban Center | Comparable | • Station located within Urban Center |
| Modal Integration | Bus/rail and rail/rail integration | **Higher Performance** = Better opportunities for active bays, layover and/or less route diversion<br>**Comparable Performance** = Opportunities for active bays, layover and/or less route diversion consistent with ST3 Representative Project<br>**Lower Performance** = Fewer opportunities for active bays, layover and/or more route diversion | Comparable | • Minimal bus interaction<br>• Good rail-to-rail integration with existing International District/Chinatown Station | Comparable | • Minimal bus interaction<br>• Good rail-to-rail integration with existing International District/Chinatown Station |
| | Bicycle, pedestrian and persons with limited mobility connectivity | **Higher Performance** = Station locations have better access to existing and planned pedestrian and bicycle networks with few barriers and less grade differences within station areas<br>**Comparable Performance** = Station locations have access to existing and planned pedestrian and bicycle networks within station areas consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less access to existing and planned pedestrian and bicycle networks with more barriers and/or grade differences within station areas | Comparable | • Access to multiple existing and planned in-street bicycle facilities<br>• Man-made barriers include Burlington Northern-Santa Fe (BNSF) Railway tracks and busy arterials | Comparable | • Access to multiple existing and planned in-street bicycle facilities<br>• Man-made barriers include BNSF tracks and busy arterials |
| Station Area Development Opportunities | Development potential | **Higher Performance** = Half-mile (0.5 mile) station area includes greater amount of land with compatible zoning for future development (over 10% more)<br>**Comparable Performance** = Half-mile (0.5 mile) station area includes amount of land with compatible zoning for future development consistent with ST3 Representative Project<br>**Lower Performance** = Half-mile (0.5 mile) station area includes lesser amount of land with compatible zoning for future development (over 10% less) | Comparable | • Baseline for comparison | Comparable | • Similar to ST3 Representative Project |
| *Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices* | | | | | | |
| Environmental Effects | Protected natural resources | **Higher Performance** = Minimal to no potential impacts on natural protected resources (e.g., wetlands, waterbodies, critical areas)<br>**Comparable Performance** = Potential impacts on natural protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to natural protected resources | Comparable | • No identified impacts to protected natural resources | Comparable | • No identified impacts to protected natural resources |

# C-ID Station – Additional Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | 5th Avenue Cut-and-Cover Tunnel and Station (ST3 Baseline) | | 5th Avenue Bored Tunnel/Cut-and-Cover Station | |
| | | | Rating | Evaluation | Rating | Evaluation |
| | Protected built and social environment | **Higher Performance** = Minimal to no potential impacts on built and social protected resources (e.g., parks, cultural resources, contaminated sites)<br>**Comparable Performance** = Potential impacts on built and social protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to built and social protected resources and/or substantial residential or business displacements | Comparable | • Potential residential displacements from station construction<br>• Potential neighborhood impacts from station construction<br>• Potential impacts to multiple historic properties, historic district and parks | Comparable | • Potential residential displacements from station construction<br>• Potential neighborhood impacts from station construction<br>• Potential impacts to multiple historic properties, historic district and parks |
| | Burden on historically underserved populations | **Higher Performance** = Would have a lesser burden on historically underserved population than ST3 Representative Project<br>**Comparable Performance** = Would have potential to impact historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Would have a greater burden on historically underserved population than ST3 Representative Project | Comparable | • Alignment and station located in areas with similar low-income and minority populations as rest of the city<br>• Station located in areas of low to moderate displacement risk<br>• Potential impacts to Chinatown/International District neighborhood during construction | Higher | • Alignment and station located in areas with similar low-income and minority populations as rest of the city<br>• Station located in areas of low to moderate displacement risk<br>• Reduced impacts to Chinatown/International District neighborhood during construction due to bored tunnel |
| Traffic Operations | Traffic circulation and access | **Higher Performance** = Few to no changes in traffic patterns and/or access<br>**Comparable Performance** = Changes to traffic patterns and/or access consistent with ST3 Representative Project<br>**Lower Performance** = Substantial impacts to traffic circulation and/or access, mitigation likely requires substantial road improvements | Comparable | • Potential impacts during station construction | Comparable | • Potential impacts during station construction |
| Economic Effects | Freight movement and access on land and water | **Higher Performance** = Minimal effects to freight mobility and future freight capacity expansion opportunities<br>**Comparable Performance** = Effects to freight mobility and future freight capacity expansion opportunities consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects to freight mobility and future freight capacity expansion opportunities | Comparable | • Truck freight could be affected by changes in traffic patterns during construction | Comparable | • Truck freight could be affected by changes in traffic patterns during construction |
| | Business and commerce effects | **Higher Performance** = Minimal effects on local businesses, as well as commercial and industrial areas<br>**Comparable Performance** = Effects on local businesses, as well as commercial and industrial areas consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects on local businesses, as well as commercial and industrial areas | Comparable | • Potential for some business displacements<br>• Potential for disruption to businesses during construction around station area | Comparable | • Potential for some business displacements<br>• Potential for disruption to businesses during construction around station area |

# C-ID Station – Additional Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | 5th Avenue Bored Tunnel/Mined Station | | 4th Avenue Cut-and-Cover Tunnel and Station | |
| | | | Rating | Evaluation | Rating | Evaluation |
| *Provide high quality rapid, reliable, and efficient peak and off-peak light rail transit service to communities in the project corridors defined in ST3* | | | | | | |
| Reliable Service | Potential service interruptions and recoverability | **Higher Performance** = More grade separation<br>**Comparable Performance** = Grade separation and reliability consistent with ST3 Representative Project<br>**Lower Performance** = Less grade separation | Comparable | • Fully grade separated | Comparable | • Fully grade separated |
| Travel Times | LRT travel times | **Higher Performance** = Travel time approximately 25% faster than ST3 Representative Project<br>**Comparable Performance** = Travel time consistent with ST3 Representative Project<br>**Lower Performance** = Travel time approximately 25% slower than ST3 Representative Project | Comparable | • Travel time comparable to ST3 Representative Project | Comparable | • Travel time comparable to ST3 Representative Project |
| *Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand* | | | | | | |
| Regional Connectivity | Network integration and operational flexibility to meet future demand | **Higher Performance** = Facilitates additional connectivity and operational flexibility beyond spine segmentation<br>**Comparable Performance** = Facilitates spine segmentation for operational flexibility consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate spine segmentation | Comparable | • Consistent with ST3 Representative Project | Comparable | • Consistent with ST3 Representative Project |
| Transit Capacity | Passenger carrying capacity in downtown | **Higher Performance** = Includes new light rail tunnel through downtown with additional improvements<br>**Comparable Performance** = Includes new light rail tunnel through downtown consistent with ST3 Representative Project<br>**Lower Performance** = Does not include new light rail tunnel through downtown | Comparable | • Consistent with ST3 Representative Project | Comparable | • Consistent with ST3 Representative Project |
| Projected Transit Demand | Ridership potential | **Higher Performance** = 10% greater than ST3 Representative Project<br>**Comparable Performance** = Between 10% less and 10% greater than ST3 Representative Project<br>**Lower Performance** = 10% less than ST3 Representative Project | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations similar to ST3 Representative Project (approximately 51,300) | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations 4% lower than ST3 Representative Project (approximately 49,000) |
| *Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's Long-Range Plan* | | | | | | |
| Regional Centers Served | Station proximity to PSRC-designated regional centers | **Higher Performance** = Serves more PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project<br>**Comparable Performance** = Serves PSRC-designated regional growth centers and manufacturing/industrial centers consistent with ST3 Representative Project<br>**Lower Performance** = Serves fewer PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project | Comparable | • One regional growth center served (Seattle CBD) | Comparable | • One regional growth center served (Seattle CBD) |
| ST Long-Range Plan Consistency | Accommodates future LRT extension beyond ST3 | **Higher Performance** = A future LRT extension per Sound Transit Long-Range Plan more feasible and more direct than ST3 Representative Project<br>**Comparable Performance** = A future LRT extension per Sound Transit Long-Range Plan feasible, consistent with ST3 Representative Project<br>**Lower Performance** = A future LRT extension per Sound Transit Long-Range Plan would have major challenges | Comparable | • Consistent with Sound Transit Long-Range Plan | Comparable | • Consistent with Sound Transit Long-Range Plan |
| *Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain* | | | | | | |
| ST3 Consistency | Mode, route, and general station locations per ST3 | **Higher Performance** = Not applicable<br>**Comparable Performance** = Mode, route and general station locations consistent with ST3 Representative Project and/or System Plan<br>**Lower Performance** = Mode, route and general station locations not consistent with ST3 Representative Project and/or System Plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan |
| | Potential ST3 operating plan effects | **Higher Performance** = Facilitates special trackwork and/or provides reliable system operations<br>**Comparable Performance** = Facilitates special trackwork and/or system operations consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate special trackwork and/or degrades system operations | Comparable | • Similar to ST3 Representative Project | Comparable | • Similar to ST3 Representative Project |

# C-ID Station – Additional Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | 5th Avenue Bored Tunnel/Mined Station | | 4th Avenue Cut-and-Cover Tunnel and Station | |
| | | | Rating | Evaluation | Rating | Evaluation |
| Technical Feasibility | Engineering constraints | **Higher Performance** = Minimal engineering constraints, compliance with applicable codes, design guidelines and regulatory requirements<br>**Comparable Performance** = Engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements consistent with ST3 Representative Project<br>**Lower Performance** = Substantial engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements | Lower | • More challenging engineering issues for deep bored tunnel and mined station<br>• Challenging to design connections from deep mined station to existing International District/Chinatown Station with existing pile foundations | Lower | • 4th Avenue viaduct rebuild would require complex design and close coordination with City of Seattle<br>• Longer stretch of in-street cut-and-cover tunnel on more heavily traveled arterial as compared to 5th Avenue<br>• More challenging engineering for cut-and-cover tunnel under existing at-grade guideway at Royal Brougham<br>• Engineering challenge for modifications to Yesler Way bridge and coordination with City of Seattle<br>• More challenging issues due to proximity to existing Downtown Seattle Transit Tunnel (DSTT); must design to minimize impacts to DSTT<br>• More challenging engineering associated with modifications to I-90 ramps and coordination with Washington State Department of Transportation (WSDOT)<br>• Challenging to design connections from new station to King Street Station under BNSF tracks and International District/Chinatown Station with existing pile foundations under Union Station |
| | Constructability issues | **Higher Performance** = Lower construction complexity (e.g., minimal utility conflicts, building impacts, permit requirements, required schedule, geotechnical constraints, tunnel/station constructability, and construction staging/phasing)<br>**Comparable Performance** = Construction complexity consistent with ST3 Representative Project<br>**Lower Performance** = Higher construction complexity | Lower | • More challenging construction of deep bored tunnel and mined station, as well as connections to existing International District/Chinatown Station | Lower | • Challenging construction of new 4th Avenue viaduct for multiple blocks north and south of Jackson Street, followed by new station underneath rebuilt viaduct<br>• Limited construction staging area around 4th Avenue Station area would contribute to challenging construction<br>• Maintenance of traffic/traffic re-routing from 4th Avenue during construction would be challenging due to high volumes of general purpose traffic and bus transit on 4th Avenue<br>• Challenging construction of WSDOT I-90 ramps and City of Seattle Yesler Way structure modifications<br>• Construction of new tunnel above existing DSTT would be challenging due to limited clearance between tunnels<br>• Potential temporary service disruption on existing Link light rail lines during construction above DSTT |
| | Operational constraints | **Higher Performance** = Optimum operational characteristics (e.g., operating efficiency and flexibility)<br>**Comparable Performance** = Operational characteristics consistent with ST3 Representative Project<br>**Lower Performance** = Poor operational characteristics | Comparable | • Similar to ST3 Representative Project | Comparable | • Similar to ST3 Representative Project |
| Financial Sustainability | Qualitative capital cost comparison | **Higher Performance** = Capital cost drivers anticipated to be less than ST3 Representative Project<br>**Comparable Performance** = Capital cost drivers anticipated to be consistent with ST3 Representative Project<br>**Lower Performance** = Capital cost drivers anticipated to be greater than ST3 Representative Project | Lower | • Deep mined station and long vertical access elements | Lower | • Addition of 4th Avenue viaduct rebuild |
| *Expand mobility for the corridor and region's residents, which include transit dependent, low income, and minority populations* | | | | | | |
| Historically Underserved Populations | Opportunities for historically underserved populations | **Higher Performance** = Higher access to opportunities for historically underserved populations<br>**Comparable Performance** = Access to opportunities for historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Lower access to opportunities for historically underserved populations | Comparable | • Station located in area of high access to opportunity | Comparable | • Station located in area of high access to opportunity |
| *Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies* | | | | | | |
| Station Area Land Use Plan Consistency | General station locations consistent with local land use plans | **Higher Performance** = Station locations have greater consistency with local land use plans<br>**Comparable Performance** = Station locations have consistency with local land use plans consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less consistency with local land use plans | Comparable | • Station located in area with supportive local land use plans | Comparable | • Station located in area with supportive local land use plans |

# C-ID Station – Additional Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | 5th Avenue Bored Tunnel/Mined Station | | 4th Avenue Cut-and-Cover Tunnel and Station | |
| | | | Rating | Evaluation | Rating | Evaluation |
| | Station proximity to Seattle-designated Urban Centers and Villages | **Higher Performance** = Station locations closer to center of single or combined Seattle-designated Urban Centers and Villages<br>**Comparable Performance** = Station locations at a similar distance to center of single or combined Seattle-designated Urban Centers and Villages consistent with ST3 Representative Project<br>**Lower Performance** = Stations locations further from center of single or combined Seattle-designated Urban Centers and Villages | Comparable | • Station located within Urban Center | Comparable | • Station located within Urban Center |
| Modal Integration | Bus/rail and rail/rail integration | **Higher Performance** = Better opportunities for active bays, layover and/or less route diversion<br>**Comparable Performance** = Opportunities for active bays, layover and/or less route diversion consistent with ST3 Representative Project<br>**Lower Performance** = Fewer opportunities for active bays, layover and/or more route diversion | Comparable | • Minimal bus interaction<br>• Good rail-to-rail integration with existing International District/Chinatown Station | Comparable | • Minimal bus interaction<br>• Potential improvement in rail-to-rail integration with commuter rail; integration with International District/Chinatown Station potentially degraded |
| | Bicycle, pedestrian and persons with limited mobility connectivity | **Higher Performance** = Station locations have better access to existing and planned pedestrian and bicycle networks with few barriers and less grade differences within station areas<br>**Comparable Performance** = Station locations have access to existing and planned pedestrian and bicycle networks within station areas consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less access to existing and planned pedestrian and bicycle networks with more barriers and/or grade differences within station areas | Comparable | • Access to multiple existing and planned in-street bicycle facilities<br>• Man-made barriers include BNSF tracks and busy arterials | Comparable | • Access to multiple existing and planned in-street bicycle facilities<br>• Man-made barriers include BNSF tracks and busy arterials |
| Station Area Development Opportunities | Development potential | **Higher Performance** = Half-mile (0.5 mile) station area includes greater amount of land with compatible zoning for future development (over 10% more)<br>**Comparable Performance** = Half-mile (0.5 mile) station area includes amount of land with compatible zoning for future development consistent with ST3 Representative Project<br>**Lower Performance** = Half-mile (0.5 mile) station area includes lesser amount of land with compatible zoning for future development (over 10% less) | Comparable | • Similar to ST3 Representative Project | Comparable | • Similar to ST3 Representative Project |
| *Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices* | | | | | | |
| Environmental Effects | Protected natural resources | **Higher Performance** = Minimal to no potential impacts on natural protected resources (e.g., wetlands, waterbodies, critical areas)<br>**Comparable Performance** = Potential impacts on natural protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to natural protected resources | Comparable | • No identified impacts to protected natural resources | Comparable | • No identified impacts to protected natural resources |
| | Protected built and social environment | **Higher Performance** = Minimal to no potential impacts on built and social protected resources (e.g., parks, cultural resources, contaminated sites)<br>**Comparable Performance** = Potential impacts on built and social protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to built and social protected resources and/or substantial residential or business displacements | Comparable | • Potential residential displacements from station construction<br>• Potential neighborhood impacts from station construction<br>• Potential impacts to multiple historic properties, historic district and parks | Comparable | • Potential residential displacements from station construction<br>• Potential neighborhood impacts from station construction<br>• Potential impacts to multiple historic properties, historic district and parks |
| | Burden on historically underserved populations | **Higher Performance** = Would have a lesser burden on historically underserved population than ST3 Representative Project<br>**Comparable Performance** = Would have potential to impact historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Would have a greater burden on historically underserved population than ST3 Representative Project | Higher | • Alignment and station located in areas with similar low-income and minority populations as rest of the city<br>• Station located in areas of low to moderate displacement risk<br>• Reduced impacts to Chinatown/International District neighborhood during construction due to bored tunnel and mined station | Comparable | • Alignment and station located in areas with similar low-income and minority populations as rest of the city<br>• Station located in areas of low to moderate displacement risk<br>• Reduced impacts to Chinatown/International District neighborhood during construction offset by increased traffic due to re-routed 4th Avenue traffic |
| Traffic Operations | Traffic circulation and access | **Higher Performance** = Few to no changes in traffic patterns and/or access<br>**Comparable Performance** = Changes to traffic patterns and/or access consistent with ST3 Representative Project<br>**Lower Performance** = Substantial impacts to traffic circulation and/or access, mitigation likely requires substantial road improvements | Comparable | • Potential impacts during station construction | Lower | • Increased traffic impacts during construction due to re-routed 4th Avenue |
| Economic Effects | Freight movement and access on land and water | **Higher Performance** = Minimal effects to freight mobility and future freight capacity expansion opportunities<br>**Comparable Performance** = Effects to freight mobility and future freight capacity expansion opportunities consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects to freight mobility and future freight capacity expansion opportunities | Comparable | • Truck freight could be affected by changes in traffic patterns during construction | Lower | • Increased truck freight mobility impacts during construction due to re-routed 4th Avenue |
| | Business and commerce effects | **Higher Performance** = Minimal effects on local businesses, as well as commercial and industrial areas<br>**Comparable Performance** = Effects on local businesses, as well as commercial and industrial areas consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects on local businesses, as well as commercial and industrial areas | Comparable | • Potential for some business displacements<br>• Potential for disruption to businesses during construction around station area | Lower | • Degraded access to businesses during construction due to re-routed 4th Avenue |

# C-ID Station – Additional Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | 4th Avenue Bored Tunnel/Mined Station | | Union Station Bored Tunnel/Mined Station | |
| | | | Rating | Evaluation | Rating | Evaluation |
| *Provide high quality rapid, reliable, and efficient peak and off-peak light rail transit service to communities in the project corridors defined in ST3* | | | | | | |
| Reliable Service | Potential service interruptions and recoverability | **Higher Performance** = More grade separation<br>**Comparable Performance** = Grade separation and reliability consistent with ST3 Representative Project<br>**Lower Performance** = Less grade separation | Comparable | • Fully grade separated | Comparable | • Fully grade separated |
| Travel Times | LRT travel times | **Higher Performance** = Travel time approximately 25% faster than ST3 Representative Project<br>**Comparable Performance** = Travel time consistent with ST3 Representative Project<br>**Lower Performance** = Travel time approximately 25% slower than ST3 Representative Project | Comparable | • Travel time comparable to ST3 Representative Project | Comparable | • Travel time comparable to ST3 Representative Project |
| *Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand* | | | | | | |
| Regional Connectivity | Network integration and operational flexibility to meet future demand | **Higher Performance** = Facilitates additional connectivity and operational flexibility beyond spine segmentation<br>**Comparable Performance** = Facilitates spine segmentation for operational flexibility consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate spine segmentation | Comparable | • Consistent with ST3 Representative Project | Comparable | • Consistent with ST3 Representative Project |
| Transit Capacity | Passenger carrying capacity in downtown | **Higher Performance** = Includes new light rail tunnel through downtown with additional improvements<br>**Comparable Performance** = Includes new light rail tunnel through downtown consistent with ST3 Representative Project<br>**Lower Performance** = Does not include new light rail tunnel through downtown | Comparable | • Consistent with ST3 Representative Project | Comparable | • Consistent with ST3 Representative Project |
| Projected Transit Demand | Ridership potential | **Higher Performance** = More than 10% greater than ST3 Representative Project<br>**Comparable Performance** = Between 10% less and 10% greater than ST3 Representative Project<br>**Lower Performance** = More than 10% less than ST3 Representative Project | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations 4% lower than ST3 Representative Project (approximately 49,000) | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations 3% lower than ST3 Representative Project (approximately 49,900) |
| *Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's Long-Range Plan* | | | | | | |
| Regional Centers Served | Station proximity to PSRC-designated regional centers | **Higher Performance** = Serves more PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project<br>**Comparable Performance** = Serves PSRC-designated regional growth centers and manufacturing/industrial centers consistent with ST3 Representative Project<br>**Lower Performance** = Serves fewer PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project | Comparable | • One regional growth center served (Seattle CBD) | Comparable | • One regional growth center served (Seattle CBD) |
| ST Long-Range Plan Consistency | Accommodates future LRT extension beyond ST3 | **Higher Performance** = A future LRT extension per Sound Transit Long-Range Plan more feasible and more direct than ST3 Representative Project<br>**Comparable Performance** = A future LRT extension per Sound Transit Long-Range Plan feasible, consistent with ST3 Representative Project<br>**Lower Performance** = A future LRT extension per Sound Transit Long-Range Plan would have major challenges | Comparable | • Consistent with Sound Transit Long-Range Plan | Comparable | • Consistent with Sound Transit Long-Range Plan |
| *Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain* | | | | | | |
| ST3 Consistency | Mode, route, and general station locations per ST3 | **Higher Performance** = Not applicable<br>**Comparable Performance** = Mode, route and general station locations consistent with ST3 Representative Project and/or System Plan<br>**Lower Performance** = Mode, route and general station locations not consistent with ST3 Representative Project and/or System Plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan |
| | Potential ST3 operating plan effects | **Higher Performance** = Facilitates special trackwork and/or provides reliable system operations<br>**Comparable Performance** = Facilitates special trackwork and/or system operations consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate special trackwork and/or degrades system operations | Comparable | • Similar to ST3 Representative Project | Comparable | • Similar to ST3 Representative Project |

# C-ID Station – Additional Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | 4th Avenue Bored Tunnel/Mined Station | | Union Station Bored Tunnel/Mined Station | |
| | | | Rating | Evaluation | Rating | Evaluation |
| Technical Feasibility | Engineering constraints | **Higher Performance** = Minimal engineering constraints, compliance with applicable codes, design guidelines and regulatory requirements<br>**Comparable Performance** = Engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements consistent with ST3 Representative Project<br>**Lower Performance** = Substantial engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements | Lower | • 4th Avenue viaduct rebuild would require complex design and close coordination with City of Seattle<br>• Challenging bored tunnel design under existing at-grade guideway at Royal Brougham to avoid disruption of existing line<br>• Challenging design of modifications to I-90 ramps and coordination with WSDOT<br>• Challenging design of modifications to Yesler Way bridge and coordination with City of Seattle<br>• Challenging to design connections from new station to King Street Station under BNSF tracks and International District/Chinatown Station with existing pile foundations under Union Station | Lower | • Challenging design of deep bored tunnel below pile foundation roadways (Seattle Boulevard) and buildings<br>• Feasibility issues with design of deep mined station under Union Station<br>• Challenging bored tunnel design under existing at-grade guideway at Royal Brougham to avoid disruption of existing line<br>• Challenging design of modifications to I-90 ramps and coordination with WSDOT<br>• Feasibility issues with design connections from new deep mined station to King Street Station under 4th Avenue viaduct piles and BNSF tracks and to International District/Chinatown Station with existing pile foundations under Union Station |
| | Constructability issues | **Higher Performance** = Lower construction complexity (e.g., minimal utility conflicts, building impacts, permit requirements, required schedule, geotechnical constraints, tunnel/station constructability, and construction staging/phasing)<br>**Comparable Performance** = Construction complexity consistent with ST3 Representative Project<br>**Lower Performance** = Higher construction complexity | Lower | • Challenging construction of new 4th Avenue viaduct<br>• Limited construction staging area around 4th Avenue station area would contribute to challenging construction<br>• Maintenance of traffic/traffic re-routing from 4th Avenue during construction would be challenging due to high volumes of general purpose traffic and bus transit on 4th Avenue<br>• Challenging construction of Washington State Department of Transportation I-90 ramps | Lower | • Feasibility issues with construction of deep mined station under Union Station and adjacent buildings to south<br>• Feasibility issues with protection of landmark historic structure of Union Station during construction<br>• Limited construction staging area around Union Station increases construction challenge/feasibility |
| | Operational constraints | **Higher Performance** = Optimum operational characteristics (e.g., operating efficiency and flexibility)<br>**Comparable Performance** = Operational characteristics consistent with ST3 Representative Project<br>**Lower Performance** = Poor operational characteristics | Comparable | • Similar to ST3 Representative Project | Comparable | • Similar to ST3 Representative Project |
| Financial Sustainability | Qualitative capital cost comparison | **Higher Performance** = Capital cost drivers anticipated to be less than ST3 Representative Project<br>**Comparable Performance** = Capital cost drivers anticipated to be consistent with ST3 Representative Project<br>**Lower Performance** = Capital cost drivers anticipated to be greater than ST3 Representative Project | Lower | • Addition of 4th Avenue viaduct rebuild<br>• Longer bored tunnel | Lower | • Deep mined station construction under Union Station<br>• Longer bored tunnel |
| *Expand mobility for the corridor and region's residents, which include transit dependent, low income, and minority populations* | | | | | | |
| Historically Underserved Populations | Opportunities for historically underserved populations | **Higher Performance** = Higher access to opportunities for historically underserved populations<br>**Comparable Performance** = Access to opportunities for historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Lower access to opportunities for historically underserved populations | Comparable | • Station located in area of high access to opportunity | Comparable | • Station located in area of high access to opportunity |
| *Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies* | | | | | | |
| Station Area Land Use Plan Consistency | General station locations consistent with local land use plans | **Higher Performance** = Station locations have greater consistency with local land use plans<br>**Comparable Performance** = Station locations have consistency with local land use plans consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less consistency with local land use plans | Comparable | • Station located in area with supportive local land use plans | Comparable | • Station located in area with supportive local land use plans |
| | Station proximity to Seattle-designated Urban Centers and Villages | **Higher Performance** = Station locations closer to center of single or combined Seattle-designated Urban Centers and Villages<br>**Comparable Performance** = Station locations at a similar distance to center of single or combined Seattle-designated Urban Centers and Villages consistent with ST3 Representative Project<br>**Lower Performance** = Stations locations further from center of single or combined Seattle-designated Urban Centers and Villages | Comparable | • Station located within Urban Center | Comparable | • Station located within Urban Center |
| Modal Integration | Bus/rail and rail/rail integration | **Higher Performance** = Better opportunities for active bays, layover and/or less route diversion<br>**Comparable Performance** = Opportunities for active bays, layover and/or less route diversion consistent with ST3 Representative Project<br>**Lower Performance** = Fewer opportunities for active bays, layover and/or more route diversion | Comparable | • Minimal bus interaction<br>• Potential improvement in rail-to-rail integration with commuter rail; integration with International District/Chinatown Station potentially degraded | Comparable | • Minimal bus interaction<br>• Potential improvement in rail-to-rail integration with commuter rail; integration with International District/Chinatown Station potentially degraded |

# C-ID Station – Additional Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | 4th Avenue Bored Tunnel/Mined Station | | Union Station Bored Tunnel/Mined Station | |
| | | | Rating | Evaluation | Rating | Evaluation |
| | Bicycle, pedestrian and persons with limited mobility connectivity | **Higher Performance** = Station locations have more access to existing and planned pedestrian and bicycle networks and limited grade differences within station areas<br>**Comparable Performance** = Station locations have access to existing and planned pedestrian and bicycle networks and limited grade differences within station areas consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less access to existing and planned pedestrian and bicycle networks and limited grade differences within station areas | Comparable | • Access to multiple existing and planned in-street bicycle facilities<br>• Man-made barriers include BNSF tracks and busy arterials | Comparable | • Access to multiple existing and planned in-street bicycle facilities<br>• Man-made barriers include BNSF tracks and busy arterials |
| Station Area Development Opportunities | Development potential | **Higher Performance** = Half-mile (0.5 mile) station area includes greater amount of land with compatible zoning for future development (over 10% more)<br>**Comparable Performance** = Half-mile (0.5 mile) station area includes amount of land with compatible zoning for future development consistent with ST3 Representative Project<br>**Lower Performance** = Half-mile (0.5 mile) station area includes lesser amount of land with compatible zoning for future development (over 10% less) | Comparable | • Similar to ST3 Representative Project | Comparable | • Similar to ST3 Representative Project |
| *Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices* | | | | | | |
| Environmental Effects | Protected natural resources | **Higher Performance** = Minimal to no potential impacts on natural protected resources (e.g., wetlands, waterbodies, critical areas)<br>**Comparable Performance** = Potential impacts on natural protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to natural protected resources | Comparable | • No identified impacts to protected natural resources | Comparable | • No identified impacts to protected natural resources |
| | Protected built and social environment | **Higher Performance** = Minimal to no potential impacts on built and social protected resources (e.g., parks, cultural resources, contaminated sites)<br>**Comparable Performance** = Potential impacts on built and social protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to built and social protected resources and/or substantial residential or business displacements | Comparable | • Potential residential displacements from station construction<br>• Potential neighborhood impacts from station construction<br>• Potential impacts to multiple historic properties, historic district and parks | Comparable | • Potential residential displacements from station construction<br>• Potential neighborhood impacts from station construction<br>• Potential impacts to multiple historic properties, historic district and parks |
| | Burden on historically underserved populations | **Higher Performance** = Would have a lesser burden on historically underserved population than ST3 Representative Project<br>**Comparable Performance** = Would have potential to impact historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Would have a greater burden on historically underserved population than ST3 Representative Project | Comparable | • Alignment and station located in areas with similar low-income and minority populations as rest of the city<br>• Station located in areas of low to moderate displacement risk<br>• Reduced impacts to Chinatown/International District neighborhood during construction offset by increased traffic due to re-routed 4th Avenue traffic | Higher | • Alignment and station located in areas with similar low-income and minority populations as rest of the city<br>• Station located in areas of low to moderate displacement risk<br>• Reduced impacts to Chinatown/International District neighborhood during construction |
| Traffic Operations | Traffic circulation and access | **Higher Performance** = Few to no changes in traffic patterns and/or access<br>**Comparable Performance** = Changes to traffic patterns and/or access consistent with ST3 Representative Project<br>**Lower Performance** = Substantial impacts to traffic circulation and/or access, mitigation likely requires substantial road improvements | Lower | • Increased traffic impacts during construction due to re-routed 4th Avenue | Comparable | • Potential impacts during station construction |
| Economic Effects | Freight movement and access on land and water | **Higher Performance** = Minimal effects to freight mobility and future freight capacity expansion opportunities<br>**Comparable Performance** = Effects to freight mobility and future freight capacity expansion opportunities consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects to freight mobility and future freight capacity expansion opportunities | Lower | • Increased truck freight mobility impacts during construction due to re-routed 4th Avenue | Comparable | • Truck freight could be affected by changes in traffic patterns during construction |
| | Business and commerce effects | **Higher Performance** = Minimal effects on local businesses, as well as commercial and industrial areas<br>**Comparable Performance** = Effects on local businesses, as well as commercial and industrial areas consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects on local businesses, as well as commercial and industrial areas | Lower | • Degraded access to businesses during construction due to re-routed 4th Avenue | Comparable | • Potential for some business displacements<br>• Potential for disruption to businesses during construction around station area |

# APPENDIX D

## Interbay/Ballard Segment
## Level 1 Evaluation Matrices

# Interbay/Ballard Segment – Level 1 Alternatives Evaluation

| | Reliable Service | Travel Times | Regional Connectivity | Transit Capacity | Projected Transit Demand | Regional Centers Served | ST Long Range Plan Consistency | Mode, Route, and Station Locations (per ST3) | Potential ST3 Operating Plan Effects | Engineering Constraints | Constructability Issues | Operational Constraints | Qualitative Capital Cost Comparison | Historically Underserved Populations | Station Land Use Plan Consistency | Station Proximity to Urban Centers/Villages | Bus/Rail Integration | Bicycle/Pedestrian Connectivity | Station Area Development Potential | Protected Natural Resources | Protected Built/Social Environment | Burden on Underserved Populations | Traffic Circulation/Access | Freight Access | Business/ Commerce |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Evaluation Criteria and Measures** | | | | | | | | | | | | | | | | | | | | | | | | | |
| **ST3 Representative Project (Baseline)** | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ |
| **Elliott/15th / 16th / Fixed Bridge** | ● | ◑ | ◑ | ● | ◑ | ◑ | ◑ | ◑ | ● | ◑ | ● | ● | ○ | ◑ | ◑ | ◑ | ● | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ |
| **West of BNSF / 20th / 17th / Fixed Bridge** | ● | ◑ | ◑ | ● | ◑ | ◑ | ◑ | ◑ | ● | ◑ | ◑ | ● | ○ | ◑ | ◑ | ● | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ● | ● | ● |
| **West of BNSF / 20th / 17th / Tunnel** | ● | ◑ | ◑ | ● | ◑ | ◑ | ● | ◑ | ● | ○ | ◑ | ● | ○ | ◑ | ◑ | ● | ◑ | ◑ | ◑ | ● | ● | ◑ | ● | ● | ● |
| **East of BNSF/14th/Movable Bridge** | ◑ | ◑ | ◑ | ◑ | ○ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ○ | ○ | ◑ | ○ | ○ | ◑ | ◑ | ◑ | ● | ◑ | ● |
| **Elliott/Armory Way/14th/Tunnel** | ● | ◑ | ◑ | ● | ◑ | ◑ | ● | ◑ | ● | ◑ | ◑ | ● | ○ | ◑ | ○ | ○ | ◑ | ◑ | ○ | ● | ● | ◑ | ● | ● | ● |
| **West of BNSF / 20th / Tunnel** | ● | ◑ | ◑ | ● | ◑ | ◑ | ○ | ◑ | ● | ○ | ◑ | ● | ○ | ◑ | ◑ | ● | ◑ | ◑ | ◑ | ● | ● | ◑ | ● | ● | ● |

● Higher Performance ◑ Comparable Performance ○ Lower Performance

"Higher Performance" = Higher performance relative to ST3 Representative Project; "Comparable Performance" = Comparable performance relative to ST3 Representative Project; "Lower Performance" = Lower performance relative to ST3 Representative Project

# Interbay/Ballard Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | ST3 Representative Project (Elliott/15th/Movable Bridge) | | Elliott/15th/16th/Fixed Bridge | |
| | | | Rating | Evaluation | Rating | Evaluation |
| *Provide high quality rapid, reliable, and efficient peak and off-peak light rail transit service to communities in the project corridors defined in ST3* | | | | | | |
| Reliable Service | Potential service interruptions and recoverability | **Higher Performance** = More grade separation<br>**Comparable Performance** = Grade separation and reliability consistent with ST3 Representative Project<br>**Lower Performance** = Less grade separation | Comparable | • Fully grade separated with movable bridge | Higher | • Fully grade separated with no movable bridge |
| Travel Times | LRT travel times | **Higher Performance** = Travel time approximately 25% faster than ST3 Representative Project<br>**Comparable Performance** = Travel time consistent with ST3 Representative Project<br>**Lower Performance** = Travel time approximately 25% slower than ST3 Representative Project | Comparable | • Travel time approximately 5 minutes for route alignment within Interbay/Ballard Segment | Comparable | • Travel time comparable to ST3 Representative Project |
| *Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand* | | | | | | |
| Regional Connectivity | Network integration and operational flexibility to meet future demand | **Higher Performance** = Facilitates additional connectivity and operational flexibility beyond spine segmentation<br>**Comparable Performance** = Facilitates spine segmentation for operational flexibility consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate spine segmentation | Comparable | • Facilitates regional connectivity | Comparable | • Consistent with ST3 Representative Project |
| Transit Capacity | Passenger carrying capacity in downtown | **Higher Performance** = Includes new light rail tunnel through downtown with additional improvements<br>**Comparable Performance** = Includes new light rail tunnel through downtown consistent with ST3 Representative Project<br>**Lower Performance** = Does not include new light rail tunnel through downtown | Comparable | • Baseline for comparison | Higher | • Reliability of fixed bridge supports carrying capacity in downtown |
| Projected Transit Demand | Ridership potential | **Higher Performance** = More than 10% greater than ST3 Representative Project<br>**Comparable Performance** = Between 10% less and 10% greater than ST3 Representative Project<br>**Lower Performance** = More than 10% less than ST3 Representative Project | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations similar to ST3 Representative Project (approximately 40,500) | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations similar to ST3 Representative Project (approximately 40,300) |
| *Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's Long-Range Plan* | | | | | | |
| Regional Centers Served | Station proximity to PSRC-designated regional centers | **Higher Performance** = Serves more PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project<br>**Comparable Performance** = Serves PSRC-designated regional growth centers and manufacturing/industrial centers consistent with ST3 Representative Project<br>**Lower Performance** = Serves fewer PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project | Comparable | • One regional manufacturing/industrial center served (Ballard-Interbay) | Comparable | • One regional manufacturing/industrial center served (Ballard-Interbay) |
| ST Long-Range Plan Consistency | Accommodates future LRT extension beyond ST3 | **Higher Performance** = A future LRT extension per Sound Transit Long-Range Plan more feasible and more direct than ST3 Representative Project<br>**Comparable Performance** = A future LRT extension per Sound Transit Long-Range Plan feasible, consistent with ST3 Representative Project<br>**Lower Performance** = A future LRT extension per Sound Transit Long-Range Plan would have major challenges | Comparable | • Elevated station on a north-south alignment at NW Market Street; a connected eastward extension per Long-Range Plan could involve surface disruption, while an independent extension could cause more modest disruption | Comparable | • Similar profile, location and orientation as ST3 Representative Project |
| *Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain* | | | | | | |
| ST3 Consistency | Mode, route, and general station locations per ST3 | **Higher Performance** = Not applicable<br>**Comparable Performance** = Mode, route and general station locations consistent with ST3 Representative Project and/or System Plan<br>**Lower Performance** = Mode, route and general station locations not consistent with ST3 Representative Project and/or System Plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan |
| | Potential ST3 operating plan effects | **Higher Performance** = Facilitates special trackwork and/or provides reliable system operations<br>**Comparable Performance** = Facilitates special trackwork and/or system operations consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate special trackwork and/or degrades system operations | Comparable | • Movable bridge would affect system operations; requires additional special trackwork for movable bridge | Higher | • Fixed bridge facilitates reliable system operations; requires less special trackwork |
| Technical Feasibility | Engineering constraints | **Higher Performance** = Minimal engineering constraints, compliance with applicable codes, design guidelines and regulatory requirements<br>**Comparable Performance** = Engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements consistent with ST3 Representative Project<br>**Lower Performance** = Substantial engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements | Comparable | • Engineering constraints include overhead distribution power poles, column construction in roadway median, construction of elevated stations over roadway and at W Dravus Street interchange, and multiple pier construction in waterway | Comparable | • Engineering constraints similar to ST3 Representative Project |

# Interbay/Ballard Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | ST3 Representative Project (Elliott/15th/Movable Bridge) | | Elliott/15th/16th/Fixed Bridge | |
| | | | Rating | Evaluation | Rating | Evaluation |
| | Constructability issues | **Higher Performance** = Lower construction complexity (e.g., minimal utility conflicts, building impacts, permit requirements, required schedule, geotechnical constraints, tunnel/station constructability, and construction staging/phasing)<br>**Comparable Performance** = Construction complexity consistent with ST3 Representative Project<br>**Lower Performance** = Higher construction complexity | Comparable | • Guideway pier construction along Elliott and 15th Avenues adjacent to live traffic on roadway<br>• At-grade segment requires walls with tie-backs along hillside to reduce risk of landslide hazards<br>• Station location at W Dravus Street interchange impacts interchange operations and may require reconstruction of roadways<br>• Constrained column locations through Nickerson Interchange<br>• Constrained construction of movable bridge close to existing Ballard Bridge<br>• Impacts to maritime vessel traffic, and fishing window restrictions for bridge pier construction in Salmon Bay<br>• Elevated guideway piers would impact several properties in Ballard west of 15th Avenue<br>• Deep drilled shaft foundations at south bank of Salmon Bay in liquefiable soils<br>• Elevated station and tail track located in busy corner of NW 15th and NW Market with several property acquisitions<br>• Construction mitigation to maintain freight access west of 15th Avenue | Higher | • Same as ST3 Representative Project for majority of alignment, but has lesser complexity of constructing Interbay Station away from Dravus Street interchange<br>• Location of elevated waterway crossing farther away from existing Ballard Bridge<br>• Less construction complexity of guideway north of Salmon Bay outside of 15th Avenue NW |
| | Operational constraints | **Higher Performance** = Optimum operational characteristics (e.g., operating efficiency and flexibility)<br>**Comparable Performance** = Operational characteristics consistent with ST3 Representative Project<br>**Lower Performance** = Poor operational characteristics | Comparable | • Movable bridge clearance assumed at 70 feet with majority of vessels passing without bridge opening; however, it would have an impact on system-wide operations | Higher | • Fixed bridge does not require openings for vessel traffic |
| Financial Sustainability | Qualitative capital cost comparison | **Higher Performance** = Capital cost drivers anticipated to be less than ST3 Representative Project<br>**Comparable Performance** = Capital cost drivers anticipated to be consistent with ST3 Representative Project<br>**Lower Performance** = Capital cost drivers anticipated to be greater than ST3 Representative Project | Comparable | • Total length of alignment approximately 18,000 feet<br>• Elevated guideway with approximately 2,000-foot movable bridge crossing of Salmon Bay<br>• At grade with walls and tiebacks along hillside near Magnolia Bridge<br>• W Dravus Street bridge may require improvements for pedestrian access<br>• All elevated stations with mezzanine levels | Lower | • Total length of alignment approximately 800 feet longer than ST3 Representative Project<br>• Elevated guideway with approximately 2,600-foot fixed bridge crossing of Salmon Bay<br>• Potentially greater property acquisitions |
| *Expand mobility for the corridor and region's residents, which include transit dependent, low income, and minority populations* | | | | | | |
| Historically Underserved Populations | Opportunities for historically underserved populations | **Higher Performance** = Higher access to opportunities for historically underserved populations<br>**Comparable Performance** = Access to opportunities for historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Lower access to opportunities for historically underserved populations | Comparable | • All stations located in areas of moderate access to opportunity<br>• Interbay Station located near Census block groups with slightly above average low-income populations (possibly because of proximity to Seattle Pacific University) | Comparable | • All stations located in areas of moderate access to opportunity<br>• Interbay Station located slightly farther from Census block groups with slightly above average low-income populations (possibly because of proximity to Seattle Pacific University) |
| *Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies* | | | | | | |
| Station Area Land Use Plan Consistency | General station locations consistent with local land use plans | **Higher Performance** = Station locations have greater consistency with local land use plans<br>**Comparable Performance** = Station locations have consistency with local land use plans consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less consistency with local land use plans | Comparable | • Limited planning conducted at Smith Cove Station and some recent planning efforts at Interbay<br>• Recent planning efforts at Ballard Station include the *Urban Design and Transportation Framework* and a multimodal transportation plan (*Move Ballard*), both developed in anticipation of light rail | Comparable | • Limited planning conducted at Smith Cove Station and some recent planning efforts at Interbay<br>• Similar to ST3 Representative Project, supportive planning conducted at Ballard Station |
| | Station proximity to Seattle-designated Urban Centers and Villages | **Higher Performance** = Station locations closer to center of single or combined Seattle-designated Urban Centers and Villages<br>**Comparable Performance** = Station locations at a similar distance to center of single or combined Seattle-designated Urban Centers and Villages consistent with ST3 Representative Project<br>**Lower Performance** = Stations locations further from center of single or combined Seattle-designated Urban Centers and Villages | Comparable | • Ballard Station within but on edge of Ballard Hub Urban Village<br>• Smith Cove Station on border of Uptown Urban Center<br>• Interbay Station not within a designated Urban Center/Village | Comparable | • Ballard Station within but on edge of Ballard Hub Urban Village |
| Modal Integration | Bus/rail and rail/rail integration | **Higher Performance** = Better opportunities for active bays, layover and/or less route diversion<br>**Comparable Performance** = Opportunities for active bays, layover and/or less route diversion consistent with ST3 Representative Project<br>**Lower Performance** = Fewer opportunities for active bays, layover and/or more route diversion | Comparable | • All stations would likely require minimal to no route diversion<br>• Interbay station would likely not accommodate layover and bus transfers would require street crossings | Higher | • Provides potentially better bus/rail integration at Interbay station but requires route diversion<br>• Bus/rail integration at Smith Cove and Ballard Stations similar to ST3 Representative Project |

# Interbay/Ballard Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | ST3 Representative Project (Elliott/15th/Movable Bridge) | | Elliott/15th/16th/Fixed Bridge | |
| | | | Rating | Evaluation | Rating | Evaluation |
| Station Area Development Opportunities | Bicycle, pedestrian and persons with limited mobility connectivity | **Higher Performance** = Station locations have better access to existing and planned pedestrian and bicycle networks with few barriers and less grade differences within station areas<br>**Comparable Performance** = Station locations have access to existing and planned pedestrian and bicycle networks within station areas consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less access to existing and planned pedestrian and bicycle networks with more barriers and/or grade differences within station areas | Comparable | • Smith Cove Station near Elliott Bay Trail but access to trail limited<br>• Ballard Station near Burke Gilman Trail<br>• Man-made and natural barriers include Salmon Bay (accessible only at bridges) and Burlington Northern-Santa Fe (BNSF) Railway tracks to west of Interbay Station<br>• Grade challenges east and west of Interbay and Smith Cove stations | Comparable | • Similar access opportunities and challenges as ST3 Representative Project<br>• Grade differentials at Interbay and Smith Cove stations similar to ST3 Representative Project |
| | Development potential | **Higher Performance** = Half-mile (0.5 mile) station area includes greater amount of land with compatible zoning for future development (over 10% more)<br>**Comparable Performance** = Half-mile (0.5 mile) station area includes amount of land with compatible zoning for future development consistent with ST3 Representative Project<br>**Lower Performance** = Half-mile (0.5 mile) station area includes lesser amount of land with compatible zoning for future development (over 10% less) | Comparable | • Approximately 500 acres have potential for development opportunities; ST3 Representative Project has lowest amount of land zoned Manufacturing/Industrial | Comparable | • Comparable to ST3 Representative Project |
| *Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices* | | | | | | |
| Environmental Effects | Protected natural resources | **Higher Performance** = Minimal to no potential impacts on natural protected resources (e.g., wetlands, waterbodies, critical areas)<br>**Comparable Performance** = Potential impacts on natural protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to natural protected resources | Comparable | • Piers in Salmon Bay would require permits and mitigation for impacts to waters of the U.S., fish habitat, commercial fishing, subsistence fishing, and tribal treaty fishing<br>• Affects steep slopes in West Queen Anne open space (geology and wildlife impact)<br>• Mostly avoids potential liquefaction areas (Seattle Environmentally Critical Areas [ECA]) | Comparable | • Piers in Salmon Bay would require permits and mitigation for impacts to waters of the U.S., fish habitat, commercial fishing, subsistence fishing, and tribal treaty fishing, but fewer piers than ST3 Representative Project due to longer spans<br>• Affects steep slopes in West Queen Anne open space (geology and wildlife impact)<br>• Greater length in potential liquefaction areas than ST3 Representative Project |
| | Protected built and social environment | **Higher Performance** = Minimal to no potential impacts on built and social protected resources (e.g., parks, cultural resources, contaminated sites)<br>**Comparable Performance** = Potential impacts on built and social protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to built and social protected resources and/or substantial residential or business displacements | Comparable | • Potential for impacts to West Queen Anne open space (park/trail)<br>• Within 1000-foot methane buffer for Interbay abandoned landfill (Seattle ECA)<br>• Crosses over Ship Canal Trail<br>• Potential for contamination along most of corridor (historic industrial uses both on land and in water)<br>• Displaces National Historic Register of Places (NHRP) eligible buildings on east side of Elliott<br>• Potential for visual impacts from higher bridge than current Ballard Bridge<br>• Potential neighborhood impacts (visual, noise and construction) along 15th Avenue W and 15th Avenue NW | Comparable | • Potential for impacts to West Queen Anne open space (park/trail)<br>• Potential for direct and/or constructive use of Interbay Athletic Complex under Section 4(f)<br>• Within 1000-foot methane buffer for Interbay abandoned landfill (Seattle ECA)<br>• Crosses over Ship Canal Trail<br>• Potential for contamination along most of corridor (historic industrial uses both on land and in water)<br>• Displaces NHRP-eligible buildings on east side of Elliott<br>• Potential residential displacements from Interbay Station<br>• Potential for visual impacts from higher bridge than current Ballard Bridge<br>• Potential neighborhood impacts (visual, noise and construction) along 15th Avenue W and 15th Avenue NW |
| | Burden on historically underserved populations | **Higher Performance** = Would have a lesser burden on historically underserved population than ST3 Representative Project<br>**Comparable Performance** = Would have potential to impact historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Would have a greater burden on historically underserved population than ST3 Representative Project | Comparable | • Alignment and stations located in areas with similar low-income and minority populations as rest of the city<br>• Stations located in areas of low to moderate displacement risk | Comparable | • Alignment and stations located in areas with similar low-income and minority populations as rest of the city<br>• Stations located in areas of low to moderate displacement risk |
| Traffic Operations | Traffic circulation and access | **Higher Performance** = Few to no changes in traffic patterns and/or access<br>**Comparable Performance** = Changes to traffic patterns and/or access consistent with ST3 Representative Project<br>**Lower Performance** = Substantial impacts to traffic circulation and/or access, mitigation likely requires substantial road improvements | Comparable | • Potential construction traffic impacts on 15th Avenue W, Elliott Avenue W, 15th Avenue NW, and Dravus interchange<br>• Potential permanent restrictions on property access and changes to traffic circulation along length of alignment<br>• Potential for long-term capacity reduction to 15th Avenue W | Comparable | • Potential construction traffic impacts on 15th Avenue W, Elliott Avenue W, 15th Avenue NW, and NW Market Street<br>• Potential permanent restrictions on property access and changes to traffic circulation along length of alignment<br>• Avoids Dravus interchange |
| Economic Effects | Freight movement and access on land and water | **Higher Performance** = Minimal effects to freight mobility and future freight capacity expansion opportunities<br>**Comparable Performance** = Effects to freight mobility and future freight capacity expansion opportunities consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects to freight mobility and future freight capacity expansion opportunities | Comparable | • Potential changes to Elliott and 15th Avenue W/NW, a major truck route, could affect freight movement and mobility (permanent and construction)<br>• Piers in Salmon Bay could require changes in navigation for freight vessels or types of vessels that could use docks closest to Ballard Bridge | Comparable | • Potential changes to Elliott and 15th Avenue W, a major truck route could affect freight movement and mobility (permanent and construction), but potentially less than ST3 Representative Project<br>• Piers in Salmon Bay could require changes in navigation for freight vessels or types of vessels that could use docks near Ballard Bridge, but potentially less than ST3 Representative Project |

# Interbay/Ballard Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | ST3 Representative Project (Elliott/15th/Movable Bridge) | | Elliott/15th/16th/Fixed Bridge | |
| | | | Rating | Evaluation | Rating | Evaluation |
| | Business and commerce effects | **Higher Performance** = Minimal effects on local businesses, as well as commercial and industrial areas<br>**Comparable Performance** = Effects on local businesses, as well as commercial and industrial areas consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects on local businesses, as well as commercial and industrial areas | Comparable | • Potential business displacements for Smith Cove Station and alignment on east side of Elliott Avenue W<br>• Potential economic impacts to Fishermen's Terminal and commercial fishing (permanent and construction)<br>• Potential business displacements for alignment and station in Ballard<br>• Potential impacts to businesses along alignment during construction | Comparable | • Potential business displacements for Smith Cove Station and alignment on east side of Elliott Avenue W<br>• Potential for greater business displacements for Interbay Station<br>• Potential economic impacts to Fishermen's Terminal and commercial fishing (permanent and construction)<br>• Potential business displacements for alignment and station in Ballard<br>• Potential impacts to businesses along alignment during construction |

# Interbay/Ballard Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | West of BNSF/20th/17th/Fixed Bridge | | West of BNSF/20th/17th/Tunnel | |
| | | | Rating | Evaluation | Rating | Evaluation |
| *Provide high quality rapid, reliable, and efficient peak and off-peak light rail transit service to communities in the project corridors defined in ST3* | | | | | | |
| Reliable Service | Potential service interruptions and recoverability | **Higher Performance** = More grade separation<br>**Comparable Performance** = Grade separation and reliability consistent with ST3 Representative Project<br>**Lower Performance** = Less grade separation | Higher | • Fully grade separated with no movable bridge | Higher | • Fully grade separated with no movable bridge |
| Travel Times | LRT travel times | **Higher Performance** = Travel time approximately 25% faster than ST3 Representative Project<br>**Comparable Performance** = Travel time consistent with ST3 Representative Project<br>**Lower Performance** = Travel time approximately 25% slower than ST3 Representative Project | Comparable | • Travel time comparable to ST3 Representative Project | Comparable | • Travel time comparable to ST3 Representative Project |
| *Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand* | | | | | | |
| Regional Connectivity | Network integration and operational flexibility to meet future demand | **Higher Performance** = Facilitates additional connectivity and operational flexibility beyond spine segmentation<br>**Comparable Performance** = Facilitates spine segmentation for operational flexibility consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate spine segmentation | Comparable | • Consistent with ST3 Representative Project | Comparable | • Consistent with ST3 Representative Project |
| Transit Capacity | Passenger carrying capacity in downtown | **Higher Performance** = Includes new light rail tunnel through downtown with additional improvements<br>**Comparable Performance** = Includes new light rail tunnel through downtown consistent with ST3 Representative Project<br>**Lower Performance** = Does not include new light rail tunnel through downtown | Higher | • Reliability of fixed bridge supports carrying capacity in downtown | Higher | • Reliability of tunnel supports carrying capacity in downtown |
| Projected Transit Demand | Ridership potential | **Higher Performance** = More than 10% greater than ST3 Representative Project<br>**Comparable Performance** = Between 10% less and 10% greater than ST3 Representative Project<br>**Lower Performance** = More than 10% less than ST3 Representative Project | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations 10% less than ST3 Representative Project (approximately 36,400) | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations 14% less than ST3 Representative Project (approximately 34,800); however, the station locations are within similar population and employment areas as alternatives considered comparable and Ballard Station is located within the Ballard core |
| *Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's Long-Range Plan* | | | | | | |
| Regional Centers Served | Station proximity to PSRC-designated regional centers | **Higher Performance** = Serves more PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project<br>**Comparable Performance** = Serves PSRC-designated regional growth centers and manufacturing/industrial centers consistent with ST3 Representative Project<br>**Lower Performance** = Serves fewer PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project | Comparable | • One regional manufacturing/industrial center served (Ballard-Interbay) | Comparable | • One regional manufacturing/industrial center served (Ballard-Interbay) |
| ST Long-Range Plan Consistency | Accommodates future LRT extension beyond ST3 | **Higher Performance** = A future LRT extension per Sound Transit Long-Range Plan more feasible and more direct than ST3 Representative Project<br>**Comparable Performance** = A future LRT extension per Sound Transit Long-Range Plan feasible, consistent with ST3 Representative Project<br>**Lower Performance** = A future LRT extension per Sound Transit Long-Range Plan would have major challenges | Comparable | • Similar profile, location and orientation as ST3 Representative Project | Higher | • Tunnel profile reduces surface impact<br>• Station location and northeasterly orientation reduces length of a connected or independent extension |
| *Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain* | | | | | | |
| ST3 Consistency | Mode, route, and general station locations per ST3 | **Higher Performance** = Not applicable<br>**Comparable Performance** = Mode, route and general station locations consistent with ST3 Representative Project and/or System Plan<br>**Lower Performance** = Mode, route and general station locations not consistent with ST3 Representative Project and/or System Plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan |
| | Potential ST3 operating plan effects | **Higher Performance** = Facilitates special trackwork and/or provides reliable system operations<br>**Comparable Performance** = Facilitates special trackwork and/or system operations consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate special trackwork and/or degrades system operations | Higher | • Fixed bridge facilitates reliable system operations; requires less special trackwork | Higher | • Tunnel facilitates reliable system operations; requires less special trackwork |
| Technical Feasibility | Engineering constraints | **Higher Performance** = Minimal engineering constraints, compliance with applicable codes, design guidelines and regulatory requirements<br>**Comparable Performance** = Engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements consistent with ST3 Representative Project<br>**Lower Performance** = Substantial engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements | Comparable | • Avoids Elliott Avenue W and 15th Avenue W/NW<br>• Constrained width between BNSF railroad and properties along west side of Elliott Avenue W<br>• Long span crossings of BNSF railroad<br>• Constrained width of right-of-way (ROW) between Port of Seattle and BNSF railroad properties north of Magnolia Bridge | Lower | • Avoids Elliott Avenue W and 15th Avenue W/NW<br>• Constrained width between BNSF railroad and properties along west side of Elliott Avenue W<br>• Long span crossings of BNSF railroad<br>• Constrained width of ROW between Port of Seattle and BNSF railroad properties north of Magnolia Bridge<br>• Constrained space for tunnel portal between BNSF railroad and 20th Avenue W<br>• Large diameter combined sewer overflow (CSO) in Shilshole Avenue |

"Higher Performance" = Higher performance relative to ST3 Representative Project; "Comparable Performance" = Comparable performance relative to ST3 Representative Project; "Lower Performance" = Lower performance relative to ST3 Representative Project

# Interbay/Ballard Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | West of BNSF/20th/17th/Fixed Bridge | | West of BNSF/20th/17th/Tunnel | |
| | | | Rating | Evaluation | Rating | Evaluation |
| | Constructability issues | **Higher Performance** = Lower construction complexity (e.g., minimal utility conflicts, building impacts, permit requirements, required schedule, geotechnical constraints, tunnel/station constructability, and construction staging/phasing)<br>**Comparable Performance** = Construction complexity consistent with ST3 Representative Project<br>**Lower Performance** = Higher construction complexity | Comparable | • Avoids Elliott Avenue W and 15th Avenue W/NW<br>• Long skewed elevated guideway crossing over live BNSF railroad tracks<br>• Elevated structure with deep shafts in liquefiable soils near Magnolia Bridge<br>• Elevated station and tail track construction in busy corner of 17th Ave NW and NW Market Street | Comparable | • Avoids Elliott Avenue W and 15th Avenue W/NW<br>• Long skewed elevated crossing over live BNSF railroad tracks<br>• Elevated structure with deep shafts in liquefiable soils near Magnolia Bridge<br>• Tunnel under W Dravus Street may require reconstruction of bridge end spans<br>• Tunnel portal construction in proximity to BNSF railroad yard constrained<br>• Tunnel crossing avoids in water work<br>• Tunnel under Salmon Bay could require cross-passage construction<br>• Tunnel would also require cut-and-cover construction for underground Ballard Station<br>• Potentially greater property acquisitions |
| | Operational constraints | **Higher Performance** = Optimum operational characteristics (e.g., operating efficiency and flexibility)<br>**Comparable Performance** = Operational characteristics consistent with ST3 Representative Project<br>**Lower Performance** = Poor operational characteristics | Higher | • Fixed bridge does not require openings for vessel traffic | Higher | • Tunnel does not impact operations |
| Financial Sustainability | Qualitative capital cost comparison | **Higher Performance** = Capital cost drivers anticipated to be less than ST3 Representative Project<br>**Comparable Performance** = Capital cost drivers anticipated to be consistent with ST3 Representative Project<br>**Lower Performance** = Capital cost drivers anticipated to be greater than ST3 Representative Project | Lower | • Total length of alignment approximately 200 feet longer than ST3 Representative Project<br>• Long span bridge crossing of BNSF railroad<br>• Elevated structure over W Galer Street and Magnolia Bridge<br>• Ground improvements for guideway structure foundations<br>• Approximately 4,800 feet of elevated guideway, which includes 2,200-foot fixed bridge crossing of Salmon Bay, between BNSF railroad at Gilman Avenue W and NW Market Street<br>• Potentially greater property acquisitions | Lower | • Total length of alignment approximately 400 feet shorter than ST3 Representative Project<br>• Long span bridge crossing of BNSF railroad<br>• Elevated structure over W Galer Street and Magnolia Bridge<br>• Ground improvements for elevated guideway structure foundations<br>• Approximately 7,400 feet of tunnel with underground station<br>• Potentially greater property acquisitions<br>• Tunnel costs not included in ST3 financial plan or evaluation methodology |
| *Expand mobility for the corridor and region's residents, which include transit dependent, low income, and minority populations* | | | | | | |
| Historically Underserved Populations | Opportunities for historically underserved populations | **Higher Performance** = Higher access to opportunities for historically underserved populations<br>**Comparable Performance** = Access to opportunities for historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Lower access to opportunities for historically underserved populations | Comparable | • All stations located in areas of moderate access to opportunity<br>• Interbay Station located farther from Census block groups with slightly above average low-income populations (possibly because of proximity to Seattle Pacific University) | Comparable | • All stations located in areas of moderate access to opportunity<br>• Interbay Station located farther from Census block groups with slightly above average low-income populations (possibly because of proximity to Seattle Pacific University |
| *Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies* | | | | | | |
| Station Area Land Use Plan Consistency | General station locations consistent with local land use plans | **Higher Performance** = Station locations have greater consistency with local land use plans<br>**Comparable Performance** = Station locations have consistency with local land use plans consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less consistency with local land use plans | Comparable | • Limited planning conducted at Smith Cove Station and some recent planning efforts at Interbay<br>• Similar to ST3 Representative Project, supportive planning conducted at Ballard Station | Comparable | • Limited planning conducted at Smith Cove Station and some recent planning efforts at Interbay<br>• Similar to ST3 Representative Project, supportive planning conducted at Ballard Station |
| | Station proximity to Seattle-designated Urban Centers and Villages | **Higher Performance** = Station locations closer to center of single or combined Seattle-designated Urban Centers and Villages<br>**Comparable Performance** = Station locations at a similar distance to center of single or combined Seattle-designated Urban Centers and Villages consistent with ST3 Representative Project<br>**Lower Performance** = Stations locations further from center of single or combined Seattle-designated Urban Centers and Villages | Higher | • Ballard Station more centrally located within Ballard Hub Urban Village than ST3 Representative Project | Higher | • Ballard Station more centrally located within Ballard Hub Urban Village than ST3 Representative Project |
| | Bus/rail and rail/rail integration | **Higher Performance** = Better opportunities for active bays, layover and/or less route diversion<br>**Comparable Performance** = Opportunities for active bays, layover and/or less route diversion consistent with ST3 Representative Project<br>**Lower Performance** = Fewer opportunities for active bays, layover and/or more route diversion | Comparable | • Bus/rail integration at Smith Cove and Ballard Stations similar to ST3 Representative Project<br>• Potentially limited bus/rail integration at Interbay Station | Comparable | • Bus/rail integration at Smith Cove and Ballard Stations similar to ST3 Representative Project<br>• Potentially limited bus/rail integration at Interbay Station |
| Modal Integration | Bicycle, pedestrian and persons with limited mobility connectivity | **Higher Performance** = Station locations have better access to existing and planned pedestrian and bicycle networks with few barriers and less grade differences within station areas<br>**Comparable Performance** = Station locations have access to existing and planned pedestrian and bicycle networks within station areas consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less access to existing and planned pedestrian and bicycle networks with more barriers and/or grade differences within station areas | Comparable | • Smith Cove Station similar to ST3 Representative Project<br>• Grade difference at Interbay Station similar to ST3 Representative Project<br>• Similar access considerations to Burke Gilman Trail as ST3 Representative Project<br>• Similar man-made and natural barriers as ST3 Representative Project | Comparable | • Smith Cove Station similar to ST3 Representative Project<br>• Grade difference at Interbay Station similar to ST3 Representative Project<br>• Similar access considerations to Burke Gilman Trail as ST3 Representative Project<br>• Similar man-made and natural barriers as ST3 Representative Project |

# Interbay/Ballard Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | West of BNSF/20th/17th/Fixed Bridge | | West of BNSF/20th/17th/Tunnel | |
| | | | Rating | Evaluation | Rating | Evaluation |
| Station Area Development Opportunities | Development potential | **Higher Performance** = Half-mile (0.5 mile) station area includes greater amount of land with compatible zoning for future development (over 10% more)<br>**Comparable Performance** = Half-mile (0.5 mile) station area includes amount of land with compatible zoning for future development consistent with ST3 Representative Project<br>**Lower Performance** = Half-mile (0.5 mile) station area includes lesser amount of land with compatible zoning for future development (over 10% less) | Comparable | • Similar to ST3 Representative Project | Comparable | • Similar to ST3 Representative Project |
| *Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices* | | | | | | |
| Environmental Effects | Protected natural resources | **Higher Performance** = Minimal to no potential impacts on natural protected resources (e.g., wetlands, waterbodies, critical areas)<br>**Comparable Performance** = Potential impacts on natural protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to natural protected resources | Comparable | • Piers in Salmon Bay would require permits and mitigation for impacts to waters of the U.S., fish habitat, commercial fishing, subsistence fishing, and tribal treaty fishing, but fewer piers than ST3 Representative Project<br>• Majority of alignment within potential liquefaction area (Seattle ECA)<br>• Avoids West Queen Anne greenbelt habitat and steep slopes | Higher | • Avoids in water work and associated permits<br>• Majority of alignment within potential liquefaction area (Seattle ECA)<br>• Avoids West Queen Anne greenbelt habitat and steep slopes |
| | Protected built and social environment | **Higher Performance** = Minimal to no potential impacts on built and social protected resources (e.g., parks, cultural resources, contaminated sites)<br>**Comparable Performance** = Potential impacts on built and social protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to built and social protected resources and/or substantial residential or business displacements | Comparable | • Crosses over Ship Canal Trail<br>• Potential for contamination along most of corridor (historic industrial uses both on land and in water)<br>• Potential residential displacements in Ballard<br>• Potential for visual impacts from new bridge in area with no bridge currently<br>• Within 1000-foot methane buffer for Interbay abandoned landfill (Seattle ECA)<br>• Potential for neighborhood impacts (visual, noise and construction) impacts along 20th Avenue W<br>• Potential for proximity impacts to Ballard Avenue Historic District/Landmark District | Higher | • Avoids crossing over Section 4(f)/6(f) resources<br>• Potential for contamination along most of corridor (historic industrial uses both on land and in water)<br>• Reduced potential for residential displacements in Ballard<br>• Within 1000-foot methane buffer for Interbay abandoned landfill (Seattle ECA) |
| | Burden on historically underserved populations | **Higher Performance** = Would have a lesser burden on historically underserved population than ST3 Representative Project<br>**Comparable Performance** = Would have potential to impact historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Would have a greater burden on historically underserved population than ST3 Representative Project | Comparable | • Alignment and stations located in areas with similar low-income and minority populations as rest of the city<br>• Stations located in areas of low to moderate displacement risk | Comparable | • Alignment and stations located in areas with similar low-income and minority populations as rest of the city<br>• Stations located in areas of low to moderate displacement risk |
| Traffic Operations | Traffic circulation and access | **Higher Performance** = Few to no changes in traffic patterns and/or access<br>**Comparable Performance** = Changes to traffic patterns and/or access consistent with ST3 Representative Project<br>**Lower Performance** = Substantial impacts to traffic circulation and/or access, mitigation likely requires substantial road improvements | Higher | • Potential construction traffic impacts on Elliott Avenue W, 20th Avenue W, W Dravus Street, and in Ballard core<br>• Avoids potential impacts to 15th Avenue W and 15th Avenue NW | Higher | • Potential construction traffic impacts on Elliott Avenue W, 20th Avenue W, W Dravus Street, and at 20th Avenue NW and NW Market Street for station<br>• Avoids potential impacts to 15th Avenue W and 15th Avenue NW |
| Economic Effects | Freight movement and access on land and water | **Higher Performance** = Minimal effects to freight mobility and future freight capacity expansion opportunities<br>**Comparable Performance** = Effects to freight mobility and future freight capacity expansion opportunities consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects to freight mobility and future freight capacity expansion opportunities | Higher | • Crosses BNSF tracks and Magnolia Bridge<br>• Avoids potential disruption on Elliott and 15th Avenue W/NW<br>• Piers in Salmon Bay could require changes in navigation for freight vessels | Higher | • Crosses BNSF tracks and Magnolia Bridge<br>• Avoids potential disruption on Elliott and 15th Avenue W/NW<br>• Avoids potential changes in navigation in Salmon Bay |
| | Business and commerce effects | **Higher Performance** = Minimal effects on local businesses, as well as commercial and industrial areas<br>**Comparable Performance** = Effects on local businesses, as well as commercial and industrial areas consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects on local businesses, as well as commercial and industrial areas | Higher | • Potential business and commerce displacements in Smith Cove and Ballard, including potential effects to Terminal 91<br>• Avoids potential business displacements in Interbay<br>• Potential economic impacts to commercial fishing during construction<br>• Avoids potential direct impacts to Fishermen's Terminal<br>• Potential impacts to businesses along alignment during construction | Higher | • Potential business and commerce displacements in Smith Cove, including potential effects to Terminal 91<br>• Avoids potential business displacements in Interbay<br>• Fewer potential business displacements in Ballard due to underground alignment<br>• Avoids potential direct impacts to Fishermen's Terminal |

# Interbay/Ballard Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | East of BNSF/14th/Movable Bridge | | Elliott/Armory Way/14th/Tunnel | |
| | | | Rating | Evaluation | Rating | Evaluation |
| *Provide high quality rapid, reliable, and efficient peak and off-peak light rail transit service to communities in the project corridors defined in ST3* | | | | | | |
| Reliable Service | Potential service interruptions and recoverability | **Higher Performance** = More grade separation<br>**Comparable Performance** = Grade separation and reliability consistent with ST3 Representative Project<br>**Lower Performance** = Less grade separation | Comparable | • Fully grade separated with movable bridge | Higher | • Fully grade separated with no movable bridge |
| Travel Times | LRT travel times | **Higher Performance** = Travel time approximately 25% faster than ST3 Representative Project<br>**Comparable Performance** = Travel time consistent with ST3 Representative Project<br>**Lower Performance** = Travel time approximately 25% slower than ST3 Representative Project | Comparable | • Travel time comparable to ST3 Representative Project | Comparable | • Travel time comparable to ST3 Representative Project |
| *Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand* | | | | | | |
| Regional Connectivity | Network integration and operational flexibility to meet future demand | **Higher Performance** = Facilitates additional connectivity and operational flexibility beyond spine segmentation<br>**Comparable Performance** = Facilitates spine segmentation for operational flexibility consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate spine segmentation | Comparable | • Consistent with ST3 Representative Project | Comparable | • Consistent with ST3 Representative Project |
| Transit Capacity | Passenger carrying capacity in downtown | **Higher Performance** = Includes new light rail tunnel through downtown with additional improvements<br>**Comparable Performance** = Includes new light rail tunnel through downtown consistent with ST3 Representative Project<br>**Lower Performance** = Does not include new light rail tunnel through downtown | Comparable | • Comparable to ST3 Representative Project with movable bridge | Higher | • Reliability of tunnel supports carrying capacity in downtown |
| Projected Transit Demand | Ridership potential | **Higher Performance** = More than 10% greater than ST3 Representative Project<br>**Comparable Performance** = Between 10% less and 10% greater than ST3 Representative Project<br>**Lower Performance** = More than 10% less than ST3 Representative Project | Lower | • Total 2040 population and employment within 0.5-mile buffer of stations 21% less than ST3 Representative Project (approximately 32,000), as the Smith Cove Station is located further from higher population and employment areas | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations 11% less than ST3 Representative Project (approximately 35,900); however, the station locations are within similar population and employment areas as alternatives considered comparable |
| *Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's Long-Range Plan* | | | | | | |
| Regional Centers Served | Station proximity to PSRC-designated regional centers | **Higher Performance** = Serves more PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project<br>**Comparable Performance** = Serves PSRC-designated regional growth centers and manufacturing/industrial centers consistent with ST3 Representative Project<br>**Lower Performance** = Serves fewer PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project | Comparable | • One regional manufacturing/industrial center served (Ballard-Interbay) | Comparable | • One regional manufacturing/industrial center served (Ballard-Interbay) |
| ST Long-Range Plan Consistency | Accommodates future LRT extension beyond ST3 | **Higher Performance** = A future LRT extension per Sound Transit Long-Range Plan more feasible and more direct than ST3 Representative Project<br>**Comparable Performance** = A future LRT extension per Sound Transit Long-Range Plan feasible, consistent with ST3 Representative Project<br>**Lower Performance** = A future LRT extension per Sound Transit Long-Range Plan would have major challenges | Comparable | • Ballard Station location results in less surface impact and reduces length of an elevated extension compared to ST3 Representative Project; however, an independent extension could require more surface disruption than ST3 Representative Project to co-locate stations | Higher | • Tunnel profile reduces surface impact<br>• Ballard Station location reduces length of a connected extension; logistics of an independent extension similar to ST3 Representative Project |
| *Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain* | | | | | | |
| ST3 Consistency | Mode, route, and general station locations per ST3 | **Higher Performance** = Not applicable<br>**Comparable Performance** = Mode, route and general station locations consistent with ST3 Representative Project and/or System Plan<br>**Lower Performance** = Mode, route and general station locations not consistent with ST3 Representative Project and/or System Plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan |
| | Potential ST3 operating plan effects | **Higher Performance** = Facilitates special trackwork and/or provides reliable system operations<br>**Comparable Performance** = Facilitates special trackwork and/or system operations consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate special trackwork and/or degrades system operations | Comparable | • Movable bridge would affect system operations; requires special trackwork for movable bridge | Higher | • Tunnel facilitates reliable system operations; requires less special trackwork |
| Technical Feasibility | Engineering constraints | **Higher Performance** = Minimal engineering constraints, compliance with applicable codes, design guidelines and regulatory requirements<br>**Comparable Performance** = Engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements consistent with ST3 Representative Project<br>**Lower Performance** = Substantial engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements | Comparable | • Avoids Elliott Ave W and 15th Avenue W/NW<br>• Engineering constraints include existing Interbay pump station and large diameter CSO; Magnolia Bridge piers; BNSF railroad and landfill | Comparable | • Avoids Elliott Ave W and 15th Avenue W/NW<br>• Tunnel portal area not constrained<br>• Large diameter CSO; BNSF railroad and landfill; Nickerson interchange bridge foundations; large diameter CSO in Shilshole Avenue |

"Higher Performance" = Higher performance relative to ST3 Representative Project; "Comparable Performance" = Comparable performance relative to ST3 Representative Project; "Lower Performance" = Lower performance relative to ST3 Representative Project

# Interbay/Ballard Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | East of BNSF/14th/Movable Bridge | | Elliott/Armory Way/14th/Tunnel | |
| | | | Rating | Evaluation | Rating | Evaluation |
| | Constructability issues | **Higher Performance** = Lower construction complexity (e.g., minimal utility conflicts, building impacts, permit requirements, required schedule, geotechnical constraints, tunnel/station constructability, and construction staging/phasing)<br>**Comparable Performance** = Construction complexity consistent with ST3 Representative Project<br>**Lower Performance** = Higher construction complexity | Comparable | • Avoids Elliott Avenue W and 15th Avenue W/NW<br>• Alignment constrained between BNSF railroad and properties west of Elliott Ave W<br>• Potential relocation of Interbay CSO pump station<br>• Ground improvements for liquefiable soils in Interbay<br>• Alignment constrained between BNSF railroad tracks and large diameter CSO<br>• Proximity to landfill area under golf course may require mitigation<br>• Guideway under existing Magnolia Bridge could require partial bridge reconstruction<br>• Movable bridge crossing further away from existing Ballard Bridge<br>• Elevated guideway piers in center of 14th Avenue may impact parking | Comparable | • Avoids Elliott Avenue W and 15th Avenue W/NW<br>• Alignment at grade through Smith Cove Station<br>• Alignment constrained between BNSF railroad tracks and large diameter CSO<br>• Ground improvements for liquefiable soils in Interbay<br>• Tunnel crossing avoids in water work<br>• Proximity to landfill area under golf course may require mitigation<br>• Tunnel under Salmon Bay could require cross-passage construction<br>• Tunnel would also require cut-and-cover construction for underground Ballard Station |
| | Operational constraints | **Higher Performance** = Optimum operational characteristics (e.g., operating efficiency and flexibility)<br>**Comparable Performance** = Operational characteristics consistent with ST3 Representative Project<br>**Lower Performance** = Poor operational characteristics | Comparable | • Movable bridge clearance assumed at 70 feet with majority of vessels passing without bridge opening; however, it would have an impact on system-wide operations | Higher | • Tunnel does not impact operations |
| Financial Sustainability | Qualitative capital cost comparison | **Higher Performance** = Capital cost drivers anticipated to be less than ST3 Representative Project<br>**Comparable Performance** = Capital cost drivers anticipated to be consistent with ST3 Representative Project<br>**Lower Performance** = Capital cost drivers anticipated to be greater than ST3 Representative Project | Comparable | • Total length of alignment approximately 1,000 feet shorter than ST3 Representative Project<br>• At grade guideway between Elliott Avenue and Smith Cove Station<br>• Potential reconstruction of Magnolia Bridge<br>• Ground improvements for foundations along BNSF railroad<br>• Potential landfill impact mitigation<br>• Partially elevated and partially retained fill guideway between CSO and landfill<br>• Approximately 1,500-foot movable bridge crossing of Salmon Bay<br>• Potential for property acquisitions | Lower | • Total length of alignment approximately 1,600 feet shorter than ST3 Representative Project<br>• At grade guideway between W Roy Street and Smith Cove Station and along hillside<br>• Potential roadway reconstruction at Armory Way<br>• Approximately 6,000 feet of tunnel with underground station<br>• Potential for property acquisitions<br>• Tunnel costs not included in ST3 financial plan or evaluation methodology |
| *Expand mobility for the corridor and region's residents, which include transit dependent, low income, and minority populations* | | | | | | |
| Historically Underserved Populations | Opportunities for historically underserved populations | **Higher Performance** = Higher access to opportunities for historically underserved populations<br>**Comparable Performance** = Access to opportunities for historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Lower access to opportunities for historically underserved populations | Comparable | • All stations located in areas of moderate access to opportunity<br>• Interbay Station located farther from Census block groups with slightly above average low-income populations (possibly because of proximity to Seattle Pacific University) | Comparable | • All stations located in areas of moderate access to opportunity<br>• Interbay Station located farther from Census block groups with slightly above average low-income populations (possibly because of proximity to Seattle Pacific University) |
| *Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies* | | | | | | |
| Station Area Land Use Plan Consistency | General station locations consistent with local land use plans | **Higher Performance** = Station locations have greater consistency with local land use plans<br>**Comparable Performance** = Station locations have consistency with local land use plans consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less consistency with local land use plans | Lower | • Minimal planning for Smith Cove Station (south of Magnolia Bridge)<br>• Ballard Station located on 14th Avenue NW on edge of planning area; planning efforts assume density and development west of this location | Lower | • Minimal planning for Smith Cove Station though a station in this location would better serve planned Expedia campus<br>• Ballard Station located on 14th Avenue NW on edge of planning area; planning efforts assume density and development west of this location |
| | Station proximity to Seattle-designated Urban Centers and Villages | **Higher Performance** = Station locations closer to center of single or combined Seattle-designated Urban Centers and Villages<br>**Comparable Performance** = Station locations at a similar distance to center of single or combined Seattle-designated Urban Centers and Villages consistent with ST3 Representative Project<br>**Lower Performance** = Stations locations further from center of single or combined Seattle-designated Urban Centers and Villages | Lower | • Stations located outside of designated Urban Centers/Villages | Lower | • Stations located outside of designated Urban Centers/Villages |
| | Bus/rail and rail/rail integration | **Higher Performance** = Better opportunities for active bays, layover and/or less route diversion<br>**Comparable Performance** = Opportunities for active bays, layover and/or less route diversion consistent with ST3 Representative Project<br>**Lower Performance** = Fewer opportunities for active bays, layover and/or more route diversion | Comparable | • Potentially limited bus/rail integration at Smith Cove and Ballard Stations<br>• Provides potentially better bus/rail integration at Interbay station but requires route diversion | Comparable | • Bus/rail integration at Smith Cove similar to ST3 Representative Project Potentially limited bus/rail integration at Ballard Station<br>• Provides potentially better bus/rail integration at Interbay station but requires route diversion |
| Modal Integration | Bicycle, pedestrian and persons with limited mobility connectivity | **Higher Performance** = Station locations have better access to existing and planned pedestrian and bicycle networks with few barriers and less grade differences within station areas<br>**Comparable Performance** = Station locations have access to existing and planned pedestrian and bicycle networks within station areas consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less access to existing and planned pedestrian and bicycle networks with more barriers and/or grade differences within station areas | Lower | • Comparable to ST3 Representative Project except access to Smith Cove Station is more limited from points east<br>• Grade difference at Interbay Station similar to ST3 Representative Project but access more limited<br>• Similar access considerations to Burke Gilman Trail as ST3 Representative Project<br>• Similar man-made and natural barriers as ST3 Representative Project | Comparable | • Less grade difference at Interbay Station than ST3 Representative Project but access more limited<br>• Similar access considerations to Burke Gilman Trail as ST3 Representative Project<br>• Similar man-made and natural barriers as ST3 Representative Project |

# Interbay/Ballard Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | | | |
|---|---|---|---|---|---|---|
| | | | East of BNSF/14th/Movable Bridge | | Elliott/Armory Way/14th/Tunnel | |
| | | | Rating | Evaluation | Rating | Evaluation |
| Station Area Development Opportunities | Development potential | **Higher Performance** = Half-mile (0.5 mile) station area includes greater amount of land with compatible zoning for future development (over 10% more)<br>**Comparable Performance** = Half-mile (0.5 mile) station area includes amount of land with compatible zoning for future development consistent with ST3 Representative Project<br>**Lower Performance** = Half-mile (0.5 mile) station area includes lesser amount of land with compatible zoning for future development (over 10% less) | Lower | • More land zoned Manufacturing/Industrial (over 250 acres more than ST3 Representative Project) | Lower | • More land zoned Manufacturing/Industrial (over 100 acres more than ST3 Representative Project) |
| *Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices* | | | | | | |
| Environmental Effects | Protected natural resources | **Higher Performance** = Minimal to no potential impacts on natural protected resources (e.g., wetlands, waterbodies, critical areas)<br>**Comparable Performance** = Potential impacts on natural protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to natural protected resources | Comparable | • Piers in Salmon Bay would require permits and mitigation for impacts to waters of the U.S., fish habitat, commercial fishing, subsistence fishing, and tribal treaty fishing, but fewer piers than ST3 Representative Project due to shorter crossing distance<br>• Majority of alignment within potential liquefaction area (Seattle ECA)<br>• Avoids West Queen Anne greenbelt habitat and steep slopes | Higher | • Avoids in-water work in Salmon Bay and associated permits<br>• Majority of alignment within potential liquefaction area (Seattle ECA)<br>• Affects steep slopes in West Queen Anne open space (geology and wildlife impact) |
| | Protected built and social environment | **Higher Performance** = Minimal to no potential impacts on built and social protected resources (e.g., parks, cultural resources, contaminated sites)<br>**Comparable Performance** = Potential impacts on built and social protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to built and social protected resources and/or substantial residential or business displacements | Comparable | • Crosses over Ship Canal Trail and 14th Avenue NW Boat Ramp ( Section 4(f)/6(f) resources)<br>• Potential for contamination along most of corridor (historic industrial uses both on land and in water)<br>• Potential disturbance of old Interbay landfill<br>• Within 1000-foot methane buffer for Interbay abandoned landfill (Seattle ECA)<br>• Lower potential for visual and noise impacts because mostly traveling through light industrial areas<br>• Lower potential residential displacements | Higher | • Avoids crossing over Section 4(f)/6(f) facilities<br>• Reduced potential residential displacements in Ballard<br>• Potential for contamination along most of corridor (historic industrial uses both on land and in water)<br>• Potential disturbance of old Interbay landfill<br>• Within 1000-foot methane buffer for Interbay abandoned landfill (Seattle ECA)<br>• Lower potential for visual and noise impacts because mostly traveling through light industrial areas and in tunnel |
| | Burden on historically underserved populations | **Higher Performance** = Would have a lessen burden on historically underserved population than ST3 Representative Project<br>**Comparable Performance** = Would have potential to impact historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Would have a greater burden on historically underserved population than ST3 Representative Project | Comparable | • Alignment and stations located in areas with similar low-income and minority populations as rest of the city<br>• Stations located in areas of low to moderate displacement risk | Comparable | • Alignment and stations located in areas with similar low-income and minority populations as rest of the city<br>• Stations located in areas of low to moderate displacement risk |
| Traffic Operations | Traffic circulation and access | **Higher Performance** = Few to no changes in traffic patterns and/or access<br>**Comparable Performance** = Changes to traffic patterns and/or access consistent with ST3 Representative Project<br>**Lower Performance** = Substantial impacts to traffic circulation and/or access, mitigation likely requires substantial road improvements | Higher | • Construction and potential circulation and access impacts on 14th Avenue NW (low volumes, predominantly local trips, wide ROW)<br>• Potential construction impacts to Magnolia Bridge and Emerson interchange<br>• Avoids potential impacts to 15th Avenue W and 15th Avenue NW | Higher | • Potential for circulation impacts/modifications along Armory Way and Dravus crossing<br>• Potential for circulation impacts/modifications to 14th Avenue W<br>• Avoids potential impacts to 15th Avenue W and 15th Avenue NW |
| Economic Effects | Freight movement and access on land and water | **Higher Performance** = Minimal effects to freight mobility and future freight capacity expansion opportunities<br>**Comparable Performance** = Effects to freight mobility and future freight capacity expansion opportunities consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects to freight mobility and future freight capacity expansion opportunities | Comparable | • Avoids potential disruption on Elliott and 15th Avenue W/NW, a major truck route<br>• Piers in Salmon Bay could require changes in navigation for freight vessels<br>• Potential changes to 14th Avenue W., could affect freight movement | Higher | • Avoids potential disruption on Elliott and 15th Avenue W/NW, a major truck route<br>• Avoids potential impacts to freight vessels<br>• Potential changes along 14th Avenue W, near Ballard station, could affect freight movements |
| | Business and commerce effects | **Higher Performance** = Minimal effects on local businesses, as well as commercial and industrial areas<br>**Comparable Performance** = Effects on local businesses, as well as commercial and industrial areas consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects on local businesses, as well as commercial and industrial areas | Higher | • Potential displacements of light industrial businesses in Smith Cove, Interbay, and Ballard<br>• Avoids potential direct impacts to Fishermen's Terminal | Higher | • Potential displacements of light industrial businesses in Interbay and Ballard, but lower because in tunnel and wide ROW on 14th Avenue NW<br>• Avoids potential direct impacts to Fishermen's Terminal |

# Interbay/Ballard Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | |
|---|---|---|---|---|
| | | | West of BNSF/20th/Tunnel | |
| | | | Rating | Evaluation |
| *Provide high quality rapid, reliable, and efficient peak and off-peak light rail transit service to communities in the project corridors defined in ST3* | | | | |
| Reliable Service | Potential service interruptions and recoverability | **Higher Performance** = More grade separation<br>**Comparable Performance** = Grade separation and reliability consistent with ST3 Representative Project<br>**Lower Performance** = Less grade separation | Higher | • Fully grade separated with no movable bridge |
| Travel Times | LRT travel times | **Higher Performance** = Travel time approximately 25% faster than ST3 Representative Project<br>**Comparable Performance** = Travel time consistent with ST3 Representative Project<br>**Lower Performance** = Travel time approximately 25% slower than ST3 Representative Project | Comparable | • Travel time comparable to ST3 Representative Project |
| *Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand* | | | | |
| Regional Connectivity | Network integration and operational flexibility to meet future demand | **Higher Performance** = Facilitates additional connectivity and operational flexibility beyond spine segmentation<br>**Comparable Performance** = Facilitates spine segmentation for operational flexibility consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate spine segmentation | Comparable | • Consistent with ST3 Representative Project |
| Transit Capacity | Passenger carrying capacity in downtown | **Higher Performance** = Includes new light rail tunnel through downtown with additional improvements<br>**Comparable Performance** = Includes new light rail tunnel through downtown consistent with ST3 Representative Project<br>**Lower Performance** = Does not include new light rail tunnel through downtown | Higher | • Reliability of tunnel supports carrying capacity in downtown |
| Projected Transit Demand | Ridership potential | **Higher Performance** = More than 10% greater than ST3 Representative Project<br>**Comparable Performance** = Between 10% less and 10% greater than ST3 Representative Project<br>**Lower Performance** = More than 10% less than ST3 Representative Project | Comparable | • Total 2040 population and employment within 0.5-mile buffer of stations 10% less than ST3 Representative Project (approximately 36,400) |
| *Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's Long-Range Plan* | | | | |
| Regional Centers Served | Station proximity to PSRC-designated regional centers | **Higher Performance** = Serves more PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project<br>**Comparable Performance** = Serves PSRC-designated regional growth centers and manufacturing/industrial centers consistent with ST3 Representative Project<br>**Lower Performance** = Serves fewer PSRC-designated regional growth centers and manufacturing/industrial centers than ST3 Representative Project | Comparable | • One regional manufacturing/industrial center served (Ballard-Interbay) |
| ST Long-Range Plan Consistency | Accommodates future LRT extension beyond ST3 | **Higher Performance** = A future LRT extension per Sound Transit Long-Range Plan more feasible and more direct than ST3 Representative Project<br>**Comparable Performance** = A future LRT extension per Sound Transit Long-Range Plan feasible, consistent with ST3 Representative Project<br>**Lower Performance** = A future LRT extension per Sound Transit Long-Range Plan would have major challenges | Lower | • Tunnel profile reduces surface impact but alignment location could require a longer future extension, potentially adding travel time, complexity and cost |
| *Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain* | | | | |
| ST3 Consistency | Mode, route, and general station locations per ST3 | **Higher Performance** = Not applicable<br>**Comparable Performance** = Mode, route and general station locations consistent with ST3 Representative Project and/or System Plan<br>**Lower Performance** = Mode, route and general station locations not consistent with ST3 Representative Project and/or System Plan | Comparable | • Mode, route and general station locations consistent with ST3 system plan |
| | Potential ST3 operating plan effects | **Higher Performance** = Facilitates special trackwork and/or provides reliable system operations<br>**Comparable Performance** = Facilitates special trackwork and/or system operations consistent with ST3 Representative Project<br>**Lower Performance** = Does not facilitate special trackwork and/or degrades system operations | Higher | • Tunnel facilitates reliable system operations; requires less special trackwork |
| Technical Feasibility | Engineering constraints | **Higher Performance** = Minimal engineering constraints, compliance with applicable codes, design guidelines and regulatory requirements<br>**Comparable Performance** = Engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements consistent with ST3 Representative Project<br>**Lower Performance** = Substantial engineering constraints, compliance with applicable codes, design guidelines, and regulatory requirements | Lower | • Avoids Elliott Ave W and 15th Avenue W/NW<br>• Constrained width between BNSF railroad and properties along west side of Elliott Avenue W<br>• Long span crossings of BNSR railroad<br>• Constrained width of ROW between the Port of Seattle and BNSF railroad properties north of Magnolia Bridge<br>• Constrained space for tunnel portal between BNSF railroad and 20th Avenue W<br>• Large diameter CSO in Shilshole Avenue and King County Siphon crossing under Salmon Bay |

# Interbay/Ballard Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | |
|---|---|---|---|---|
| | | | West of BNSF/20th/Tunnel | |
| | | | Rating | Evaluation |
| | Constructability issues | **Higher Performance** = Lower construction complexity (e.g., minimal utility conflicts, building impacts, permit requirements, required schedule, geotechnical constraints, tunnel/station constructability, and construction staging/phasing)<br>**Comparable Performance** = Construction complexity consistent with ST3 Representative Project<br>**Lower Performance** = Higher construction complexity | Comparable | • Long skewed elevated crossing over live BNSF railroad tracks<br>• Elevated structure with deep shafts in liquefiable soils near Magnolia Bridge<br>• Tunnel under W Dravus Street requires reconstruction of bridge end spans<br>• Tunnel crossing avoids in water work<br>• Tunnel under Salmon Bay could require cross-passage construction<br>• Tunnel construction under Historic District requires settlement monitoring<br>• 20th Avenue NW ROW facilitates tunnel station construction<br>• Tunnel would also require cut-and-cover construction for underground Ballard Station<br>• Potentially greater property acquisitions |
| | Operational constraints | **Higher Performance** = Optimum operational characteristics (e.g., operating efficiency and flexibility)<br>**Comparable Performance** = Operational characteristics consistent with ST3 Representative Project<br>**Lower Performance** = Poor operational characteristics | Higher | • Tunnel does not impact operations |
| Financial Sustainability | Qualitative capital cost comparison | **Higher Performance** = Capital cost drivers anticipated to be less than ST3 Representative Project<br>**Comparable Performance** = Capital cost drivers anticipated to be consistent with ST3 Representative Project<br>**Lower Performance** = Capital cost drivers anticipated to be greater than ST3 Representative Project | Lower | • Total length of alignment approximately 400 feet longer than ST3 Representative project<br>• Long span bridge crossing of BNSF railroad<br>• Elevated structure over W Galer Street and Magnolia Bridge<br>• Ground Improvements for elevated guideway structure foundations for seismic design<br>• Approximately 8,200 feet of tunnel with underground station<br>• Potentially greater property acquisitions<br>• Tunnel costs not included in ST3 financial plan or evaluation methodology |
| *Expand mobility for the corridor and region's residents, which include transit dependent, low income, and minority populations* | | | | |
| Historically Underserved Populations | Opportunities for historically underserved populations | **Higher Performance** = Higher access to opportunities for historically underserved populations<br>**Comparable Performance** = Access to opportunities for historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Lower access to opportunities for historically underserved populations | Comparable | • All stations located in areas of moderate access to opportunity<br>• Interbay Station located farther from Census block groups with slightly above average low-income populations (possibly because of proximity to Seattle Pacific University) |
| *Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies* | | | | |
| Station Area Land Use Plan Consistency | General station locations consistent with local land use plans | **Higher Performance** = Station locations have greater consistency with local land use plans<br>**Comparable Performance** = Station locations have consistency with local land use plans consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less consistency with local land use plans | Comparable | • Limited planning conducted at Smith Cove Station and some recent planning efforts at Interbay<br>• Similar to ST3 Representative Project, supportive planning conducted at Ballard Station |
| | Station proximity to Seattle-designated Urban Centers and Villages | **Higher Performance** = Station locations closer to center of single or combined Seattle-designated Urban Centers and Villages<br>**Comparable Performance** = Station locations at a similar distance to center of single or combined Seattle-designated Urban Centers and Villages consistent with ST3 Representative Project<br>**Lower Performance** = Stations locations further from center of single or combined Seattle-designated Urban Centers and Villages | Higher | • Ballard Station more centrally located within Ballard Hub Urban Village than ST3 Representative Project |
| Modal Integration | Bus/rail and rail/rail integration | **Higher Performance** = Better opportunities for active bays, layover and/or less route diversion<br>**Comparable Performance** = Opportunities for active bays, layover and/or less route diversion consistent with ST3 Representative Project<br>**Lower Performance** = Fewer opportunities for active bays, layover and/or more route diversion | Comparable | • Bus/rail integration at Smith Cove similar to ST3 Representative Project<br>• Potentially limited bus/rail integration at Interbay and Ballard Stations |

# Interbay/Ballard Segment – Level 1 Alternatives Evaluation

| Criteria | Measure | Rating Threshold | Alternatives | |
|---|---|---|---|---|
| | | | West of BNSF/20th/Tunnel | |
| | | | Rating | Evaluation |
| | Bicycle, pedestrian and persons with limited mobility connectivity | **Higher Performance** = Station locations have better access to existing and planned pedestrian and bicycle networks with few barriers and less grade differences within station areas<br>**Comparable Performance** = Station locations have access to existing and planned pedestrian and bicycle networks within station areas consistent with ST3 Representative Project<br>**Lower Performance** = Station locations have less access to existing and planned pedestrian and bicycle networks with more barriers and/or grade differences within station areas | Comparable | • Smith Cove Station similar to ST3 Representative Project<br>• Grade difference at Interbay Station similar to ST3 Representative Project<br>• Similar access considerations to Burke Gilman Trail as ST3 Representative Project<br>• Similar man-made and natural barriers as ST3 Representative Project |
| Station Area Development Opportunities | Development potential | **Higher Performance** = Half-mile (0.5 mile) station area includes greater amount of land with compatible zoning for future development (over 10% more)<br>**Comparable Performance** = Half-mile (0.5 mile) station area includes amount of land with compatible zoning for future development consistent with ST3 Representative Project<br>**Lower Performance** = Half-mile (0.5 mile) station area includes lesser amount of land with compatible zoning for future development (over 10% less) | Comparable | • Comparable to ST3 Representative Project |
| *Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices* | | | | |
| Environmental Effects | Protected natural resources | **Higher Performance** = Minimal to no potential impacts on natural protected resources (e.g., wetlands, waterbodies, critical areas)<br>**Comparable Performance** = Potential impacts on natural protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to natural protected resources | Higher | • Avoids in water work and associated permits<br>• Majority of alignment within potential liquefaction area (Seattle ECA)<br>• Avoids West Queen Anne greenbelt habitat and steep slopes |
| | Protected built and social environment | **Higher Performance** = Minimal to no potential impacts on built and social protected resources (e.g., parks, cultural resources, contaminated sites)<br>**Comparable Performance** = Potential impacts on built and social protected resources consistent with ST3 Representative Project<br>**Lower Performance** = Substantial regulatory process for impacts to built and social protected resources and/or substantial residential or business displacements | Higher | • Avoids crossing over Section 4(f)/6(f) trails<br>• Potential for contamination along most of corridor (historic industrial uses both on land and in water)<br>• Within 1000-foot methane buffer for Interbay abandoned landfill (Seattle ECA)<br>• Avoids potential residential displacements in Ballard |
| | Burden on historically underserved populations | **Higher Performance** = Would have a lesser burden on historically underserved population than ST3 Representative Project<br>**Comparable Performance** = Would have potential to impact historically underserved populations consistent with ST3 Representative Project<br>**Lower Performance** = Would have a greater burden on historically underserved population than ST3 Representative Project | Comparable | • Alignment and stations located in areas with similar low-income and minority populations as rest of the city<br>• Stations located in areas of low to moderate displacement risk |
| Traffic Operations | Traffic circulation and access | **Higher Performance** = Few to no changes in traffic patterns and/or access<br>**Comparable Performance** = Changes to traffic patterns and/or access consistent with ST3 Representative Project<br>**Lower Performance** = Substantial impacts to traffic circulation and/or access, mitigation likely requires substantial road improvements | Higher | • Potential construction traffic impacts on Elliott Avenue W, 20th Avenue W, W Dravus Street, and at 20th Avenue NW and NW Market Street for cut-and-cover station<br>• Avoids potential impacts to 15th Avenue W and 15th Avenue NW |
| Economic Effects | Freight movement and access on land and water | **Higher Performance** = Minimal effects to freight mobility and future freight capacity expansion opportunities<br>**Comparable Performance** = Effects to freight mobility and future freight capacity expansion opportunities consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects to freight mobility and future freight capacity expansion opportunities | Higher | • Crosses BNSF tracks and Magnolia Bridge<br>• Avoids potential disruption on Elliott and 15th Avenue W/NW<br>• Avoids potential changes in navigation in Salmon Bay |
| | Business and commerce effects | **Higher Performance** = Minimal effects on local businesses, as well as commercial and industrial areas<br>**Comparable Performance** = Effects on local businesses, as well as commercial and industrial areas consistent with ST3 Representative Project<br>**Lower Performance** = Substantial effects on local businesses, as well as commercial and industrial areas | Higher | • Potential business and commerce displacements in Smith Cove, including potential effects to Terminal 91<br>• Avoids potential business displacements in Interbay<br>• Fewer potential business displacements in Ballard due to underground alignment<br>• Avoids potential direct impacts to Fishermen's Terminal |

# APPENDIX E

## Stakeholder Advisory Group
## Meeting Summaries (4/24/18 and 7/16/18)

**West Seattle and Ballard Link Extensions**
Stakeholder Advisory Group Meeting #4 – April 24, 2018
Meeting Summary

**Agenda Item #1 – Welcome and introductions**

Diane Adams, Facilitator, welcomed the Stakeholder Advisory Group (SAG) members to the group's fourth meeting. She noted that the meeting was the second part of the Level 1 alternatives evaluation discussion with the goal of meeting #4 being to reach a recommendation on which alternatives should and should not be carried forward into Level 2 screening.

Agency directors, project leads and staff in attendance were:

- Cathal Ridge, Central Corridor Director, Sound Transit
- Diane Adams, Facilitator
- Jim Parsons, Consultant Project Manager, HNTB
- Ron Endlich, Project Director, Sound Transit
- Kate Lichtenstein, Senior Project Manager, Sound Transit
- Stephen Mak, High Capacity Transit Development Manager, Sound Transit
- Leda Chahim, Government & Community Relations Manager, Sound Transit
- Carrie Avila-Mooney, Government & Community Relations Manager, Sound Transit
- Andrea Burnett, Community Outreach Supervisor, Sound Transit
- Sandra Fann, High Capacity Transit Development Manager, Sound Transit
- Wesley King, Central Corridor Operations Director, Sound Transit
- Jeanne Krikawa, Station Area Planning, The Underhill Company
- Dennis Sandstrom, External Engagement, EnviroIssues

SAG members in attendance were:

- Abigail Doerr, Transportation Choices Coalition
- Andres Arjona, Community Representative – Ballard
- Brian King, Community Representative – West Seattle
- Bryce Yadon, Futurewise
- Colleen Echohawk, Chief Seattle Club
- Deb Barker, Community Representative – West Seattle
- Erin Goodman, SODO Business Improvement Area
- Ginny Gilder, Force 10 Hoops/Seattle Storm
- Greg Nickels, Former Mayor of Seattle
- Hamilton Gardiner, West Seattle Chamber
- Jon Scholes, Downtown Seattle Association
- Julia Park, Community Representative – Ballard
- Larry Yok, Community Representative – Chinatown-International District
- Maiko Winkler-Chin, Seattle Chinatown-International District Preservation & Development Authority
- Mike Stewart, Ballard Alliance
- Peter Schrappen, Northwest Marine Trade Association



- Robert Cardona, Community Representative – Uptown
- Ron Sevart, Space Needle
- Scott Rusch, Fred Hutchinson Cancer Research Center
- Steve Lewis, Alliance of People with disAbilities
- Walter Reese, Nucor Steel
- Warren Aakervik, Community Representative – Freight

NOTE – the following SAG members were not in attendance:

- Becky Asencio, Seattle Public Schools
- Dave Gering, Manufacturing Industrial Council
- Katie Garrow, Martin Luther King Labor Council
- Mark Nagle, Expedia
- Paul Lambros, Plymouth Housing
- Savitha Reddy Pathi, Wing Luke Museum of the Asian Pacific American Experience
- Willard Brown, Delridge Neighborhood Development Association

**Agenda Item #2 – Recap of meeting #3**

Diane reviewed the meeting summary from the April 17 SAG meeting, which was included in SAG member binders. During the April 17 meeting, SAG members broke up into small groups, and with a facilitator, discussed the following:

- Alternatives for each segment
- Level 1 evaluation measures
- Segment summaries with key findings

Cathal Ridge followed up on the following questions posed during the April 17 SAG meeting:

- ST3 Plan consistency: The voter-approved ST3 Plan identifies the mode, corridor, number of stations and general station locations. Some of the suggestions during Early Scoping were considered not consistent with the plan.
- 3rd Party funding: The potential need for third-party funding is based on qualitative cost assessments. During Level 2 screening, Sound Transit will work to identify quantitative cost estimates. If 3rd party funding is found to be necessary and funding is not identified, some alternatives may ultimately be deemed impractical.

**Agenda Item #3 – How we get to a recommendation**

Cathal Ridge presented an overview of the process to be used in the meeting to reach a Level 1 recommendation. Starting with the non-practical suggestions raised during early scoping, SAG members would be asked to discuss whether any of the alternatives should be carried forward. Next, SAG members would be asked to discuss the alternatives with greater challenges and determine whether the alternatives should be carried forward and whether there were any suggestions for refinements. Finally, the SAG members would be asked to discuss the alternatives with more potential to identify how they might be refined.

**Agenda Item #4 – Level 1 recommendation discussions**

SAG members worked in groups of five to seven to discuss the alternatives and summary sheets for each segment, ask any clarification questions, and make recommendations.

**Smith Cove, Interbay and Ballard**

Kate Lichtenstein, Sound Transit, reviewed the evaluation measures and segment summaries for the Interbay/Ballard segment. See the PowerPoint presentation for additional details about each alternative/suggestion.

- Elliott/15th/16th/Fixed Bridge
- West of BNSF/20th/17th/Fixed Bridge
- East of BNSF/14th/Moveable Bridge
- West of BNSF/20th/17th/Tunnel
- Elliott/Armory Way/14th/Tunnel
- West of BNSF/20th/Tunnel
- Tunnel through Queen Anne/Interbay
- Extensions to 65th/85th/Northgate
- Multi-modal Salmon Bay bridge
- Eliminate or add stations

Questions (Q) and answers (A), comments (C) and refinements (R) from SAG members during the breakout group discussion included the following:

Elliott/15th/16th/Fixed Bridge

Q: How high would a fixed bridge be compared to the existing Ballard Bridge?
A: The existing Ballard Bridge has a clearance of approximately 45 feet high above water; a fixed bridge would likely need to have a clearance of approximately 136 feet to allow for vessel traffic.

R: The alignment on 15th and Elliott Ave should be relocated to avoid traffic and freight impacts.

*There was agreement amongst the SAG members to carry this alternative forward.*

West of BNSF/20th/17th/Fixed Bridge

Q: Could the light rail tracks go over or under the BNSF yard?
A: This alternative includes an elevated crossing over BNSF property. The "West of BNSF/20th/17th/Tunnel" and "West of BNSF/20th/Tunnel" alternatives include tunneling under BNSF property.

C: Future land use plans in the Interbay area should inform where the station is located.

C: Ensure the stations are in locations that are accessible, especially for people with disabilities.



*There was agreement amongst the SAG members to carry this alternative forward.*

East of BNSF/14th/Moveable Bridge

Q: How many times per day is the movable bridge expected to be opened?
A: Sound Transit is studying how often a movable bridge would potentially open. Opening frequency depends on the height of the bridge and is potentially affected by the seasons. The ST3 plan assumed a movable bridge of about 70 feet in height which was estimated to open between two and four times per day.

Q: What are the challenges with a 14th Avenue station?
A: The alternatives with a Ballard Station on 14th Avenue are rated lower in terms of development potential because they are currently within industrial-zoned land outside (within one block of) the Ballard Hub Urban Village boundary. However, during recent stakeholder outreach and agency workshops, we have heard ideas about potentially shifting 14th Ave stations further north and northwest, closer to Market Street and 15th Ave. If those shifts were to happen, the stations would potentially be within the Ballard Hub Urban Village boundary and closer to areas zoned for transit-supportive development.

C: Additional analysis needs to be done to determine how much a movable bridge would impact reliability. (Several SAG members expressed concerns about the reliability of a movable bridge.)

R: The Smith Cove station should be located closer to Smith Cove, rather than the cruise ship terminal due to variable seasonal demand.

R: Move the station further north in Ballard, closer to the density and out of the industrial area.

*There was agreement amongst the SAG members to carry this alternative forward.*

West of BNSF/20th/17th/Tunnel

Q: Could private funding be used?
A: Potentially. Sound Transit will be conducting quantitative cost estimates during Level 2, which may clarify whether 3rd party funding is needed.

C: This alternative has received widespread community support and should be carried forward.

*There was agreement amongst the SAG members to carry this alternative forward.*

Elliott/Armory Way/14th/Tunnel

C: The station location east of 15th Avenue is not preferred because it is in an industrial area and people would have to cross 15th Avenue to reach old Ballard.

R: Stations should be located close to current and future density in Interbay.

R: Move the station further north in Ballard, closer to the density and out of the industrial area.

*There was agreement amongst the SAG members to carry this alternative forward.*

West of BNSF/20th/Tunnel

Q: Are there fatal flaws with the 20th Avenue tunnel?
A: Conceptually, it is the longest tunnel and could potentially be the most expensive of the tunnel options.

C: Tunnel stations are preferred because their location is more flexible than above ground stations.

C: This alternative has community support from those who feel the Ballard station should be close to the center of Ballard.

*There was a mix of opinions on this alternative, but SAG members agreed to carry this alternative forward.*

Tunnel through Queen Anne/Interbay

*There was agreement amongst the SAG members to not carry this suggestion forward.*

Extensions to 65th/85th/Northgate

C: Sound Transit should be mindful of future extensions to the north and east when planning the configuration of the terminus station.

*There was agreement amongst the SAG members to not carry this suggestion forward.*

Multi-modal Salmon Bay bridge

Q: What would a multi-modal bridge accommodate? What would it look like?
A: Conceptually, an intermodal bridge would have space for modes other than light rail including bikes, pedestrians, cars, etc.. Such a bridge would need to be designed much differently than a rail-only bridge due to the different requirements for various modes.

C: This option should not be precluded if the funding options have not been fully explored.

*There was agreement amongst the SAG members to not carry this suggestion forward, with a minority opinion to carry it forward.*

Eliminate or add stations

*There was agreement amongst the SAG members to not carry this suggestion forward.*

**Downtown, South Lake Union and Seattle Center**



Ron Endlich, Sound Transit, reviewed the evaluation measures and segment summaries for the Downtown segment. See the PowerPoint presentation for additional details about each alternative/suggestion.

- 5th/Harrison
- 6th/Boren/Roy
- 5th/Mercer
- 5th/Roy/Consolidated SLU Station
- 8th/6th/Republican (First Hill)
- Use Downtown Seattle Transit Tunnel
- Design for potential extensions to north and/or east

Questions and answers, comments and refinements from SAG members during the breakout group discussion included the following:

5th/Harrison

C: The station should serve Uptown residents. They will be the daily users, whereas Key Arena patrons will only use light rail for events.

R: The tunnel portal should be relocated to Kinnear Park, if possible.

*There was agreement amongst the SAG members to carry this alternative forward.*

6th/Boren/Roy

C: Stations should have entrances on both sides of Roy Street.

C: The stations on Boren and Roy streets are less accessible because they are adjacent to steep grades.

*There was agreement amongst the SAG members to carry this alternative forward.*

5th/Mercer

Q: How would Sound Transit mitigate the sewer line issue?
A: Solutions would be explored during ongoing analysis.

C: Mercer is a major freight corridor and should be avoided to limit impacts on freight and traffic.

R: Stations should be bored rather than cut-and-cover to minimize impacts to traffic on Mercer Street.

*There was consensus amongst the SAG members to not carry this alternative forward.*

5th/Roy/Consolidated SLU Station

C: Consolidating stations is not preferred.

*There was consensus amongst the SAG members to not carry this alternative forward.*

8th/6th/Republican (First Hill)

Q: What are the soil conditions under First Hill?
A: Sound Transit has not yet evaluated the soil conditions in this particular location.

C: Providing access to healthcare facilities is an important consideration, especially for people who frequently use the human service centers in Pioneer Square and Downtown.

C: There is still a significant gap between where the station is located on 8th and the healthcare facilities on First Hill.

C: The constructability challenges with tunneling under I-5 twice are difficult to justify when there are limits on how far east the First Hill station could be located.

C: A First Hill station should not be eliminated because of consistency with ST3 because it was promised in Sound Move. First Hill is a major employment center and residential hub that would benefit from having access to light rail.

C: The station location is not accessible for people with disabilities from Downtown because of the steep grades west of the station.

*There was a mix of opinions on this alternative, but SAG members agreed to carry this alternative forward.*

Use Downtown Seattle Transit Tunnel

Q: What are the specifics about the station capacity constraints?
A: There is not sufficient long-term capacity in the existing downtown transit tunnel to achieve future service frequency goals.

*There was agreement amongst the SAG members to not carry this suggestion forward.*

Design for potential extensions to north and/or east

*There was agreement amongst the SAG members to not carry this suggestion forward.*

General questions and comments

C: Impacts to freight should be carefully considered, especially on Mercer Street.

C: More information about walksheds and population density is needed to make decisions about station locations.



**SODO, Stadium and Chinatown-International District**

Ron Endlich reviewed the evaluation measures and segment summaries for the SODO segment. See the PowerPoint presentation for additional details about each alternative/suggestion.

- Surface E-3
- Massachusetts Tunnel Portal
- Maintain buses on E-3
- First Ave alignment
- Design for potential extension south to Georgetown

Questions and answers, comments and refinements from SAG members during the breakout group discussion included the following:

Surface E-3

C: A cut-and-cover tunnel in the Chinatown-International District could result in substantial community impacts and should be avoided if possible.

C: Construction impacts on Royal Brougham should be mitigated.

*There was agreement amongst the SAG members to carry this alternative forward.*

Massachusetts Tunnel Portal

Q: Can additional grade crossings be added to this alternative?
A: Grade crossings could be added as refinements.

Q: How much longer would the Massachusetts Tunnel be?
A: This alternative results in a net increase in tunnel length of 800 linear feet (It replaces 2600 linear feet of cut-and-cover tunnel with 3400 linear feet of bored tunnel length).

R: There should be a Stadium station included in this alternative, or a way to access the stadiums.

R: Add a vehicle overcrossing at S. Lander Street.

R: If possible, the tunnel portal should be located further south to avoid impacts in SODO.

R: If possible, a second Stadium station should be included in this alternative. It would be ideal to have two stations and impact Chinatown-International District as little as possible.

*There was agreement amongst the SAG members to carry this alternative forward.*

Maintain buses on E-3

C: There must be a plan for bus service during construction and once the E-3 busway is utilized by light rail.

*There was agreement amongst the SAG members to not carry this suggestion forward.*

1st Ave alignment

C: The current alternatives in SODO are limited. A 1st Ave alignment should be carried forward to provide something to weigh in on.

C: There is lot of potential for growth along 1st Avenue S. over the next 12 years and beyond. An alternative that provides access to those employment centers should be explored.

C: Several SAG members requested additional explanation about a potential 4th Avenue station site in the Chinatown-International District. They noted that the connections to other modes, including Amtrak and the Sounder, limited neighborhood impacts in Chinatown-International District, and future land use plans could make it an attractive option.

*There was a mix of opinions regarding a 1st Ave alignment, but SAG members agreed to carry this suggestion forward.*

*The group also asked for further information regarding the feasibility of a 4th Avenue station location in the Chinatown-International District.*

Design for potential extension south to Georgetown

*There was consensus amongst the SAG members to not carry this suggestion forward.*

General questions and comments

Q: What is a cut-and-cover station?
A: It is a method of construction that allows workers to excavate ("cut") and build an underground station below temporary roadway decking ("cover") while maintaining two-way vehicle and pedestrian traffic above.

C: More alternatives should be explored that provide benefits to SODO.

C: The SODO station area is currently being used as a park-and-ride and does not provide easy access to the employment centers on 1st Avenue S.

**West Seattle and Duwamish**

Stephen Mak, Sound Transit, reviewed the evaluation measures and segment summaries for the West Seattle/Duwamish segment. See the PowerPoint presentation for additional details about each alternative/suggestion.

- Oregon Street/Alaska Junction
- West Seattle Bridge/Fauntleroy
- Pigeon Ridge/West Seattle Tunnel



- Yancy Street/West Seattle Tunnel
- West Seattle Golf Course/Alaska Junction (Tunnel)
- Tunnel under Duwamish
- West Seattle Bridge
- Gondola, rail/bus bridge
- Extensions to Alki, Admiral, etc.

Questions and answers, comments and refinements from SAG members during the breakout group discussion included the following:

Oregon Street/Alaska Junction

C: Carry forward and include a study of a tunnel alternative.

R: The western portion (from Avalon to the Junction) of this alternative should be in a tunnel to avoid neighborhood impacts in West Seattle and near the Junction.

*There was agreement amongst the SAG members to carry this alternative forward.*

*There was also agreement to carry forward an additional alternative that would refine this alternative to include a tunnel option from Avalon to the terminus.*

West Seattle Bridge/Fauntleroy

C: Stations should provide easy access to neighborhood centers, and the Delridge station location would not achieve that.

*There was agreement amongst the SAG members to not carry this alternative forward.*

Pigeon Ridge/West Seattle Tunnel

C: This tunnel option should be carried forward because there are many unknowns with what costs will arise during the property acquisition phase.

*There was agreement amongst the SAG members to carry this alternative forward.*

Yancy Street/West Seattle Tunnel

C: The Junction station location does not serve the density in the area. However, the north-south orientation of the tunnel Alaska Junction Station is preferred.

*There was agreement amongst the SAG members to not carry this alternative forward.*

West Seattle Golf Course/Alaska Junction

Q: Could the alignment be moved to the north side of the golf course to reduce the 4(f) impacts?
A: This would be similar to the alignment of the suggested refinement of the Oregon Street/Alaska Junction alternative.

C: The consolidation of stations is not preferred.

C: The Delridge station location is preferred, because it is further south.

R: The West Seattle station location should be closer to the Junction.

R: The Avalon station should be located near key bus transfer points.

*There was agreement amongst the SAG members to not carry this alternative forward.*

Tunnel under Duwamish

*There was agreement amongst the SAG members to not carry this suggestion forward.*

West Seattle Bridge

*There was agreement amongst the SAG members to not carry this suggestion forward.*

Gondola, rail/bus bridge

*There was agreement amongst the SAG members to not carry this suggestion forward.*

Extensions to Alki, Admiral, etc.

C: Future extensions should not be precluded.

*There was agreement amongst the SAG members to not carry this suggestion forward.*

General questions and comments

C: Impacts to Harbor Island should be minimized.

**Agenda Item #5 – Review group's recommendations**

Diane Adams reviewed the completed recommendation worksheets for each segment which noted whether each alternative was recommended to be carried forward, as well as comments and notes from SAG members.



**Interbay and Ballard**

| | Alternative | Carry forward? | Comments |
|---|---|---|---|
| Alternatives with more potential | Elliott/15th/16th/Fixed Bridge | Yes | |
| | West of BNSF/20th/17th/ Fixed Bridge | Yes | |
| | East of BNSF/14th/Movable Bridge | Yes | |
| | West of BNSF/20th/17th/ Tunnel | Yes | |
| | Elliott/Armory Way/14th/Tunnel | Yes | |
| Alternatives with greater potential | West of BNSF/20th/Tunnel | Yes | • Mixed opinions, but agreement to carry forward |
| Not practical suggestions | Tunnel through Queen Anne/Interbay | No | |
| | Extensions to 65th, 85th, Northgate | No | |
| | Multi-modal Salmon Bay bridge | No | • Minority opinion to carry forward |
| | Eliminate or add stations | No | |

**Downtown, South Lake Union and Seattle Center**

| | Alternative | Carry forward | Comments |
|---|---|---|---|
| Alternatives with more potential | 5th/Harrison | Yes | |
| | 6th/Boren/Roy | Yes | • Move Seattle Center station south |
| Alternatives with greater potential | 5th/Mercer | No | • Freight impacts on Mercer; some prefer Seattle Center station location |
| | 5th/Roy/Consolidated SLU Station | No | |
| | 8th/6th/Republican | Yes | • Mix of opinions on carrying forward |
| Not practical suggestions | Use Downtown Seattle Transit Tunnel | No | |
| | Design for potential extensions to north and/or east | No | |

**SODO, Stadium and Chinatown-International District**

| | Alternative | Carry forward | Comments |
|---|---|---|---|
| Alternatives with more potential | Surface E-3 | Yes | |
| | Massachusetts Tunnel Portal | Yes | • Consider hybrid with full grade separation |
| Not practical suggestions | Maintain buses on E-3 | No | • Need to study impacts to buses during construction and long term |
| | First Ave alignment | Yes | • Explore modifications that meet operational requirements, including potential additional station to serve First Avenue |
| | Design for potential extension south to Georgetown | No | |
| New suggestion | Alternative station location | Yes | • Consider 4th Ave Station in Chinatown/ID |

**West Seattle and Duwamish**

| | Alternative | Carry forward | Comments |
|---|---|---|---|
| Alternatives with more potential | Oregon Street / Alaska Junction | Yes | • Explore elevated and tunnel options |
| | West Seattle Bridge / Fauntleroy | No | |
| | Pigeon Ridge / West Seattle Tunnel | Yes | |
| Alternatives with greater challenges | Yancy Street / West Seattle Tunnel | No | |
| | West Seattle Golf Course / Alaska Junction | No | • Add Avalon station, modify to reduce 4(f) impacts |
| Not practical suggestions | Tunnel under Duwamish | No | |
| | West Seattle Bridge | No | |
| | Gondola, rail/bus bridge | No | |
| | Extensions to Alki, Admiral, etc. | No | |



**Agenda Item #6 – Next steps and next meeting**

Diane Adams thanked the SAG members for attending the meeting. Cathal Ridge explained the next steps with the SAG's recommendations: the completed recommendation worksheets, notes and refinements will be summarized and passed along to the ELG for their reference when making a recommendation to the Sound Transit Board.

One SAG member asked if there would be a recommendation from Sound Transit staff in addition to the SAG recommendation. Cathal explained that Sound Transit staff would only be passing along the SAG's recommendations. The next SAG meeting is scheduled for May 30 at Union Station.

**West Seattle and Ballard Link Extensions**
Stakeholder Advisory Group Meeting #7 – July 16, 2018
Meeting Notes

**Agenda Item #1 – Welcome and introductions**

Diane Adams, Facilitator, welcomed Stakeholder Advisory Group (SAG) members to the group's seventh meeting. She confirmed the agenda and stated the meeting's objective: reaching a recommendation on which additional alternatives for the SODO and Chinatown-International District area should be carried forward into Level 2 screening.

Agency directors, project leads and staff in attendance were:

- Cathal Ridge, Central Corridor Director, Sound Transit
- Diane Adams, Facilitator
- Jim Parsons, Consultant Project Manager, HNTB
- Ron Endlich, Project Director, Sound Transit
- Stephen Mak, High Capacity Transit Development Manager, Sound Transit
- Leda Chahim, Government & Community Relations Manager, Sound Transit
- Andrea Burnett, Community Outreach Supervisor, Sound Transit
- Rebecca McAndrew, Senior Environmental Planner, Sound Transit
- Sandra Fann, High Capacity Transit Development Manager, Sound Transit
- Wesley King, Central Corridor Operations Director, Sound Transit
- David Shelton, Central Segment Lead, HNTB
- Jeanne Krikawa, Station Area Planning Lead, The Underhill Group
- KaDeena Yerkan, External Engagement Lead, EnviroIssues
- Jenifer Chao, Department of Neighborhoods, City of Seattle

SAG members in attendance were:

- Andres Arjona, Community Representative – Ballard
- Becky Asencio, Seattle Public Schools
- Brian King, Community Representative – West Seattle
- Bryce Yadon, Futurewise
- Deb Barker, Community Representative – West Seattle
- Erin Goodman, SODO Business Improvement Area
- Ginny Gilder, Force 10 Hoops/Seattle Storm
- Greg Nickels, Former Mayor of Seattle
- Hamilton Gardiner, West Seattle Chamber
- Larry Yok, Community Representative – Chinatown-International District
- Maiko Winkler-Chin, Seattle Chinatown-International District Preservation & Development Authority
- Peter Schrappen, Northwest Marine Trade Association
- Robert Cardona, Community Representative – Uptown
- Ron Sevart, Space Needle
- Scott Rusch, Fred Hutchinson Cancer Research Center



- Steve Lewis, Alliance of People with disAbilities
- Walter Reese, Nucor Steel
- Warren Aakervik, Community Representative – Freight
- Willard Brown, Delridge Neighborhood Development Association

NOTE – the following SAG members were not in attendance:

- Abigail Doerr, Transportation Choices Coalition *(no longer able to participate as a SAG member)*
- Colleen Echohawk, Chief Seattle Club
- Dave Gering, Manufacturing Industrial Council
- Jon Scholes, Downtown Seattle Association
- Julia Park, Community Representative – Ballard
- Katie Garrow, Martin Luther King Labor Council
- Mark Nagle, Expedia
- Mike Stewart, Ballard Alliance
- Paul Lambros, Plymouth Housing *(no longer able to participate as a SAG member)*
- Savitha Reddy Pathi, Wing Luke Museum of the Asian Pacific American Experience

**Agenda Item #2 – Previous meeting summary**

Diane reviewed the following topics discussed at the June 20 SAG meeting:

- Community engagement and collaboration
- Level 2 alternatives
- Level 2 screening criteria
- Additional concepts in Chinatown-International District and SODO
- Station planning

Cathal Ridge, Sound Transit, updated the group on the alternatives development process, revisited the Level 1 screening results and listed the alternatives being analyzed during Level 2.

**Agenda Item #3 – Community engagement update**

Andrea Burnett, Sound Transit, provided an update on ongoing and upcoming community engagement activities. She presented the monthly report for June 2018, noting that Sound Transit held 15 community briefings, three social service provider interviews and engaged more than 2,700 people at recent fairs and festivals. Finally, Andrea invited SAG members to attend the next round of neighborhood forums, scheduled for September.

**Agenda Item #4 – SODO evaluation results and recommendation discussion**

Ron Endlich, Sound Transit, reviewed the process and timeline to identify, review and evaluate the additional alternatives for SODO. Community feedback on the SODO alternatives during Level 1 screening centered around providing access to key destinations in the area. Ron explained the following community concerns and operational needs that informed the additional alignments and station alternatives in SODO:

- Community concerns:
  - Providing service to destinations within SODO
  - Facilitating transfers at the SODO station
  - Determining how the E-3 Busway can be utilized
  - Maintaining freight mobility within and through SODO
  - Providing safe access to the station
- Operational needs:
  - Providing a connection to the maintenance facility
  - Connecting the new line to the existing transit tunnel
  - Establishing an interim terminus
  - Managing track connections

Building on the concepts presented at the June 20 SAG meeting, Sound Transit has developed and analyzed (using Level 1 criteria) the below alternatives. See the PowerPoint presentation for additional details about each alternative.

- Occidental Avenue S
- 6th Avenue S
- Track interlining
- Extended Ballard line

SAG members discussed the new SODO alternatives and worked towards recommendations in small groups. Questions (Q) and comments (C) from SAG members, as well as answers (A) provided by Sound Transit staff, for each alternative during the breakout group discussions included the following:

Occidental Avenue S

Q: Would Occidental Avenue S be closed to traffic if it is used by light rail?
A: During construction, Occidental Avenue S would likely be closed completely. Following construction, access would likely be more restricted than it is today.

Q: Could there be any crossover between tracks with this alternative?
A: There would not be any crossover between the two lines with this alternative.

C: Starbucks is not the only employer in the area. There are over 45,000 people who work in the SODO area who would also benefit from a light rail station closer to employment centers along 1st Avenue S.

C: Given potential redevelopment in the area, there should be plans to improve access and safety for people walking to, from and around the station area.

C: Since people will be able to transfer at the nearby stations north of SODO, maintaining the option to transfer should not outweigh improving access for people working in SODO.

Q: When you talk about development on Occidental or 1st Avenue S, are you talking about a change in zoning?
A: We are assuming the same zoning as today.



Q: Occidental may provide access to another part of SODO, but I don't understand the benefits of the 6th Avenue S alternative.
A: The 6th Avenue S alternative avoids using a portion of the E-3 Busway. However, it would likely still displace the E-3 Busway north of S Massachusetts Street.

C: Going down Occidental is like going down 1st Avenue. It's problematic for freight. Putting a station at S Lander Street puts a lot of pressure on development in that area.

C: The Occidental alternative must go over the BNSF rail yard, which is challenging. Seems like a non-starter.

C: Having more options through SODO is a good thing. I don't drive a truck, so I don't think about that aspect.

C: Starbucks is located along 1st Avenue S and has a lot of employees. There could be more employment in the future.

*There was agreement amongst the SAG members to carry this alternative forward.*

6th Avenue S

Q: What is the road configuration of 6th Avenue S for this alternative?
A: The street would likely be reconfigured to allow for elevated light rail to operate in the middle of the roadway, although this is not yet a firm plan. The guideway columns would likely impact some of the street right of way.

Q: Does the 6th Avenue S alternative still impact the E-3 Busway north of S Massachusetts Street?
A: Yes.

C: It all depends on what happens with E-3 buses and the demand.

C: You could keep the option, but it looks like a lot of disruption to businesses and a lot of property takes.

C: Seems to have a lot of downsides and not a lot of upsides. Seems needlessly complicated.

*There was agreement amongst the SAG members to not carry this alternative forward.*

Track interlining

C: Having a potential bottleneck in this area is not preferred.

*There was agreement amongst the SAG members to not carry this concept forward.*

Extended Ballard line

*There was agreement amongst the SAG members to not carry this concept forward.*

**Agenda Item #4 – Chinatown-International District evaluation results and recommendation discussion**

Ron Endlich, Sound Transit, reviewed the process and timeline to identify, review and evaluate additional alternatives in Chinatown-International District. Feedback for the Chinatown-International District during Level 1 screening was focused on improving connections, activating Union Station and avoiding construction impacts in Chinatown-International District. Ron reviewed the various construction methods and their respective impacts, including cut-and-cover stations, open-cut stations and mined stations. He highlighted the technical challenges being considered and provided examples of stations in the Seattle area utilizing the above construction methods for context. Ron recapped the following community concerns and construction constraints, as presented during the June 20 SAG meeting:

- Community concerns:
  - Avoiding construction impacts
  - Improving intermodal connections
  - Activating Union Station
- Construction constraints:
  - Limited right of way
  - Poor soil conditions
  - Deep piles under 4th Avenue S, Union Station and the International District/Chinatown Station
  - Conflicts with the existing transit tunnel structures

Building on the concepts presented at the June 20 SAG meeting, Sound Transit has developed and analyzed (using Level 1 criteria) the below alternatives. See the PowerPoint presentation for additional details about each alternative.

- 5th Avenue bored tunnel / mined station
- 4th Avenue cut-and-cover tunnel and station
- 4th Avenue bored tunnel / mined station
- Union station bored tunnel / mined station

SAG members discussed the new Chinatown-International District alternatives and worked towards recommendations in small groups. Questions (Q) and comments (C) from SAG members, as well as answers (A) provided by Sound Transit staff, for each alternative during the breakout group discussions included the following:

5th Avenue bored tunnel / mined station

Q: How deep would a mined station likely be?
A: It would likely be approximately 120 feet underground.

C: Given the requirement for an above-ground portal to access the mined station during construction, there would still be community impacts. This option would be more advantageous if there were no community impacts during construction.



*There was agreement amongst the SAG members to carry this alternative forward.*

4th Avenue cut-and-cover tunnel and station

C: The city of Seattle's plan for the 4th Avenue viaduct replacement should inform which option is preferred. If the viaduct was replaced after major construction on 5th Avenue, the impacts to the Chinatown-International District would be extremely difficult to overcome.

C: As a potential transit user, this station location and depth are appealing.

C: Having an option that does not impact 5th Avenue would be good to carry forward to compare impacts to Chinatown-International District.

Q: What would the traffic impacts likely be if 4th Avenue was closed during construction?
A: The specific construction details are not yet known. It may be possible to replace the 4th Avenue viaduct one half at a time. In total, construction is anticipated to last five to six years.

C: The additional depth necessary for a 4th Avenue station location may make it more difficult to construct the connection to the new downtown transit tunnel.

Q: Could the temporary roadway above a cut-and-cover tunnel be modified to be permanent?
A: It would be possible, but due to work that would need to happen just underneath the roadway, it would be much more expensive because of additional excavation needs.

*There was agreement amongst the SAG members to carry this alternative forward.*

4th Avenue bored tunnel / mined station

Q: What would likely happen to the 33,000 cars using 4th Avenue daily?
A: As with any major closure, there would be a traffic and detour plan to spread the traffic out through parallel roadways.

*There was agreement amongst the SAG members to carry this alternative forward.*

Union station bored tunnel / mined station

C: The 4th Avenue station locations have more benefits and seem more feasible.

C: While it would be great to use Union Station as a hub, it does not seem feasible to have a station in this area.

*There was agreement amongst the SAG members to not carry this alternative forward.*

**Agenda Item #5 – Technical briefings**

Equity and Inclusion

Leda Chahim, Sound Transit, introduced Jenifer Chao, Seattle Department of Neighborhoods. Leda provided an overview of how Sound Transit, in partnership with the city of Seattle, is incorporating principles of equity and inclusion into the planning process and evaluating the alternatives to identify components that would provide benefits or would disproportionately affect low-income and minority populations.

Jenifer Chao presented on the goals and processes of the city's Race and Social Justice Initiative (RSJI). As part of the RSJI, the city uses the Racial Equity Toolkit (RET) to assess how projects impact racial equity. Jenifer walked through the following steps involved in the toolkit:

1. Set outcomes.
2. Involve stakeholders and analyze data.
3. Determine benefit and/or burden.
4. Advance opportunity or minimize harm.
5. Evaluate. Raise racial awareness. Be accountable.
6. Report back.

Sound Transit and the city are applying the RET process to the project and have established shared project outcomes. To date, an equity lens has informed modifications to the screening criteria as well as community engagement efforts, including the development of the Community Engagement Guide, engagement in Chinatown-International District, social service provider interviews, and the addition of a Delridge station area planning charrette. Collaboration on these and other efforts support the following shared project outcomes:

- Enhancing mobility and access to create opportunity for communities of color and low-income populations.
- Creating opportunities for equitable development that benefit communities of color.
- Avoiding disproportionate adverse impacts on communities of color and for low-income populations.
- Meaningfully involving communities of color and low-income populations.

Leda reviewed the Level 1 findings related to historically underrepresented populations within the project area. Key points included the following:

- Communities of color tend to have lower incomes and access to opportunity than majority white communities.
- Chinatown-International District is the only station area along the alignments that is densely populated by communities of color in the project corridor.
- In Delridge, densely populated communities of color lie within the bike and transit sheds of the Delridge and Avalon station areas, but not within those stations' immediate walksheds.

During Level 2 screening, Sound Transit will continue to build on the collaborative work done during Level 1 to continue to elevate issues and considerations to better inform the alternatives development process, provide information that data cannot provide and develop a memo detailing Level 2 evaluation and community feedback.



<u>Water crossings</u>

Diane Adams introduced Stephen Mak, Sound Transit, to present on the various water crossings and key design considerations that go into the planning process for these crossings.

For the Duwamish crossing, Stephen highlighted the following design considerations:

- Terminal operations and freight movement
- Railroad operations
- Waterway navigation channel
- Waterway user needs
- Tribal fishing within the Duwamish River basin
- Fish and wildlife habitats
- Cultural resources
- Objects affecting navigable airspace

For the Salmon Bay crossing, Stephen highlighted the following design considerations:

- Railroad operations
- Existing and future marine business and commerce
- Existing and future transportation projects
- Tribal fishing in Salmon Bay and access to Puget Sound
- Fish and wildlife habitats
- Cultural resources
- Federal navigation channel
- Waterway user needs

Stephen introduced Rebecca McAndrew, Sound Transit, to describe the above considerations in more detail and explain how related permits may impact the project. Rebecca listed the considerations and permit requirements related to the following entities:

- Tribes
- U.S. Army Corps of Engineers
- U.S. Coast Guard
- National Oceanic and Atmospheric Administration
- U.S. Fish and Wildlife Services
- Washington State Department of Ecology
- Washington Department of Fish and Wildlife
- City of Seattle

Following Rebecca's presentation, Stephen closed by providing a high-level overview of the following types of water crossings:

- High-level fixed bridge
- Moveable bridge
- Tunnel

**Agenda Item #6 – SODO and Chinatown-International District results and recommendation discussion**

Diane Adams reviewed the completed recommendation worksheets for the SODO and Chinatown-International District areas. The slides included whether each alternative was recommended to be carried forward, as well as comments from SAG members.

**SODO**

| Alternative | Carry forward? |
|---|---|
| ST3 Representative Project | Yes |
| Surface E-3 | Yes |
| Massachusetts Tunnel Portal | Yes |
| Occidental Avenue | Yes |
| 6th Avenue | No |
| "Track interlining" | No |
| "Extended Ballard line" | No |

Comments captured from the SAG members' group discussion included:

- Concern that station located on Occidental could put pressure on industrial areas and freight mobility.
- Felt need to continue to have an alternative to the west of existing line.
- Station planning focus on improving bus and other access in SODO.

**Chinatown-International District**

| Alternative | Carry forward |
|---|---|
| 5th Avenue cut-and-cover tunnel and station (ST3 representative project) | Yes |
| 5th Avenue bored tunnel / cut-and-cover station | Yes |
| 5th Avenue bored tunnel / mined station | Yes |
| 4th Avenue cut-and-cover tunnel and station | Yes |
| 4th Avenue bored tunnel / mined station | Yes |
| Union Station bored tunnel / mined station | No |

Comments captured from the SAG members' group discussion included:

- Desire to carry forward multiple alternatives until more is known about construction impacts and duration.
- Lack of full consensus but majority support to carry forward both 5th Ave Bored Tunnel/Mined Station and 4th Ave Bored Tunnel/Mined Station alternatives.
- Need for clarity from City of Seattle regarding 4th Avenue viaduct replacement need and funding availability.



**Agenda Item #7 – Next steps and next meeting**

Diane Adams thanked the SAG members for attending the meeting. Cathal Ridge explained the next steps with the SAG's recommendations: the completed recommendation worksheets will be passed along to the ELG for their reference when making a recommendation.

One SAG member asked about the upcoming station area planning charrettes. Cathal explained the topics and goals of the charrettes. He noted that the groups, comprised of agency staff and community representatives, would be discussing and providing input on how the stations function in the respective station areas. Leda offered to set up briefings with SAG members, or the groups they represent, to present the information being discussed in the charrettes, should that be of interest.

Diane Adams thanked SAG members for attending the group's seventh meeting. The next SAG meeting is scheduled for September 5th at Union Station.

# APPENDIX F

## Elected Leadership Group
## Meeting Summaries (5/17/18 and 7/19/18)

**West Seattle and Ballard Link Extensions**
Elected Leadership Group Meeting #2 – May 17, 2018
Meeting Notes

**Agenda Item #1 – Welcome and introductions**

King County Councilmember and Sound Transit Board Member Joe McDermott welcomed the Elected Leadership Group (ELG) members to the group's second meeting. He noted that the number of Seattle City Councilmembers in the group will make the ELG meeting double as an official city of Seattle Sustainability and Transportation Committee meeting. He highlighted that extensive work on alternatives development has been completed since the last ELG meeting, including a series of open houses, neighborhood forums and four Stakeholder Advisory Group (SAG) meetings. McDermott thanked individuals, businesses, community organizations, the SAG and partner agencies for their time, effort and work performed during the Level 1 alternatives development phase. He noted the purpose of the second ELG meeting is to discuss which alternatives should be recommended to the Sound Transit Board for Level 2 alternatives development.

Peter Rogoff, Sound Transit CEO, welcomed ELG members and thanked the public for attending. He noted that Mayor Jenny Durkan could not attend the meeting. He emphasized gratitude for progress made on the project and for the partnerships that have developed with the public and stakeholders to present a series of recommendations to the Sound Transit Board. He noted that in less than one year, the Sound Transit Board will make a decision on a preferred project. He stressed the importance of delivering a project that meets the future community's needs and vision and that the West Seattle and Ballard Link Extensions are a fundamental part of the 116-mile Link light rail network. Rogoff noted that the results of today's ELG meeting will be shared with the Sound Transit Board at a briefing on May 21, 2018.

Seattle City Councilmember Lorena González announced that she has a conflict of interest with several alternatives under consideration for the West Seattle Link Extension, as she owns property in the neighborhood. She noted that she will excuse herself during public comment and when the ELG discusses the West Seattle/Duwamish segment.

Agency directors, project leads and staff in attendance were:

- Peter Rogoff, Sound Transit CEO
- Cathal Ridge, Sound Transit
- Leda Chahim, Sound Transit
- Desmond Brown, Sound Transit
- Diane Adams, Facilitator

ELG members in attendance were:

- Executive Dave Somers, Sound Transit Board Chair
- Executive Dow Constantine, Sound Transit Board Member
- Councilmember Rob Johnson, Sound Transit Board Member
- Councilmember Joe McDermott, Sound Transit Board Member



- Councilmember Lisa Herbold, Seattle City Council
- Councilmember Bruce Harrell, Seattle City Council
- Councilmember Sally Bagshaw, Seattle City Council
- Councilmember Mike O'Brien, Seattle City Council (by phone)
- Councilmember Lorena González, Seattle City Council
- Commissioner Stephanie Bowman, Port of Seattle

NOTE – the following member was not in attendance:

- Mayor Jenny Durkan, Sound Transit Board Member

**Agenda Item #2 – Public comment**

Councilmember Rob Johnson, Sound Transit Board Member, led the public comment period, nothing that commenters would be allowed one minute to speak, and Seattle Channel would be recording and posting the meeting online to ensure visibility and documentation of the meeting.

Members of the public provided the following comments:

- One attendee voiced support for an alternative that would serve the First Hill neighborhood. First Hill is a heavily transit-dependent neighborhood and noted that transit is necessary to meet the needs of hospital staff and First Hill neighbors. Public transit in the First Hill neighborhood would reduce the number of vehicles on the streets, making it possible for first responders to access nearby hospitals.
- One attendee, on behalf of Stand Up America, noted their concerns with collusion between large companies and the government. They voiced frustration with having one minute to address the ELG, stating that the ELG is not interested in listening to the public.
- One attendee voiced support for a station in the First Hill neighborhood to help serve senior populations who have mobility challenges. They noted that living without a car in the city has its challenges and would like to see a transit system that would make it easier for employees to get to their jobs on First Hill.
- One attendee, on behalf of the First Hill Improvement Association, expressed support for a First Hill station and requested that public engagement with the First Hill community continue. They noted First Hill's community partnerships with other agencies who are bringing transit projects to the neighborhood.
- One attendee, on behalf of the Ballard Alliance, expressed support for any alternative that includes a tunnel for the Ballard Link Extension. They made two requests of the ELG: 1) Provide visual representations of the alternatives considered in Level 2 to inform the discussion about place-making and urban design, and 2) Provide a cost comparison of the different alternatives and the associated economic impacts. Lastly, they stated that Fishermen's Terminal is critical to the Ballard community and to factor it into the decision-making process for which alternatives get advanced to Level 2.
- One attendee said they are excited about light rail coming to West Seattle. They shared that having three stations in the West Seattle Link Extension is a priority, as well as avoiding negative

impacts to green space. They asked the ELG not to advance the West Seattle Golf Course/Alaska Junction (Tunnel) alternative because it would negatively impact Delridge Park.

- One attendee asked that the ELG consider a First Hill station, as it is one of the densest neighborhoods and home to three of Seattle's largest hospitals. They emphasized that neighborhoods that are zoned for affordable housing must have adequate transit and frequent service.
- One attendee, on behalf of the First Hill Improvement Association, stated that First Hill is a regional employment center, is a highly transit-dependent neighborhood that has higher than average poverty levels, when compared to other neighborhoods in Seattle. They stated that all breakout groups at the Downtown Neighborhood Forum supported a First Hill station over a Midtown station.
- One attendee, on behalf of the First Hill Improvement Association, noted that First Hill is projected to experience a 71 percent population growth in the next five years. There are tens of thousands of jobs that provide economic opportunities, many of which rely on high-capacity transit to get to. They noted that the SAG and attendees of the Downtown Neighborhood Forum suggested a First Hill station to move to Level 2 alternatives development and asked the ELG to recommend a First Hill station to the Sound Transit Board.
- One attendee, a long-time resident of First Hill, noted appreciation for the First Hill neighborhood and how welcoming it's been to density, to people who need affordable housing and those who need access to transit. They noted there are few places left to park a personal vehicle in First Hill.
- One attendee supported a First Hill station, noting that they moved to First Hill for more transit opportunities. With three hospitals, two high schools and a college nearby, First Hill needs accessible transit for people who don't drive.
- One attendee, on behalf of Virginia Mason, shared support for a First Hill station, stressing the importance of commuters to access services that are critically important to the growth and health of the region.
- One attendee, on behalf of the Alliance for Pioneer Square, the Chinatown-International District Business Improvement Association, and the Pioneer Square Business Improvement Area, asked Sound Transit to consider an alternative on Fourth Avenue that would use Union Station. They added that the proposed alternatives along Fifth Avenue may negatively impact workers, residents and the public.
- One attendee commented on the large number of senior facilities and hospitals on First Hill. They noted that service workers rely on public transit to access their jobs and encouraged a station to be located on First Hill.

**Agenda Item #3 – Community Engagement and Collaboration**

Diane Adams, facilitator, reiterated that the goal of the meeting is for the Elected Leadership Group to provide a consensus-based decision to the Sound Transit Board on which alternatives should advance to Level 2. Diane noted that David Shelton of HNTB will summarize the alternatives discussion and a short summary will be presented before the meeting concludes.

Cathal Ridge, Sound Transit, provided background on the West Seattle and Ballard Link Light Rail Extensions project. He described the representative project as identifying mode, corridor and station areas, as well as informing cost, schedule and operating needs. Cathal discussed the project timeline for



West Seattle and Ballard Link Extensions, noting that service on the Ballard Link Extension will start five years after the West Seattle Link Extension is operational, due to the construction of a new Downtown Transit Tunnel.

Cathal highlighted the volume of public input that Sound Transit received during Level 1 alternatives development, which began in early 2018. Sound Transit conducted early scoping in February 2018, which included a comment period, three public meetings, one agency meeting and an online open house. Over 2,800 comments were received during early scoping, which are captured in the Early Scoping Summary Report. Other public involvement opportunities that have occurred include the first series of Neighborhood Forums and four Stakeholder Advisory Group meetings.

Cathal gave a brief overview of how each segment would be presented:

1. Feedback received during early scoping
2. A map of segment alternatives and evaluation measures
3. Feedback received at Neighborhood Forums
4. A full segment summary
5. Recommendations made by the Stakeholder Advisory Group

Questions from ELG members included the following:

Q: Will the ELG have the opportunity to discuss and build consensus around each segment after it's presented?
A: *Correct, there will be an opportunity after each segment is presented to discuss the alternatives and share which alternatives the ELG would like to advance to Level 2.*

**Agenda Item #4: West Seattle/Duwamish Alternatives, Evaluation Results, Feedback and Recommendations**

Cathal Ridge reviewed feedback received during early scoping on the West Seattle alternatives, highlighting input to consider a tunnel option, accommodate future extensions to the south, minimize neighborhood disruption and preserve industrial operations. Feedback received at the Neighborhood Forums included some mixed opinions on the Junction station location, consolidating stations and usage of open space, primarily the West Seattle Golf Course. Cathal stated that there was support for the Pigeon Ridge/West Seattle Tunnel alternative, a tunnel in the Junction area and support for a north-south station orientation.

***Discussion***

The following comments were provided by ELG members:

- Priorities for West Seattle alignment:
  - Orient stations in a north-south direction to build future extensions southward.
  - Build three stations.
  - Preserve Longfellow Creek.
  - Design bus transfers to be seamless.
- Support for moving Delridge station location south of Southwest Andover Street to create a larger walkshed to serve the Delridge community.

- Support for an alternative that will place the West Seattle alignment south of South Spokane Street.
- Support for providing convenient access to light rail that serve neighborhoods like White Center, Arbor Heights and High Point.
- Support for elevated or tunnel options in the Oregon Street/Alaska Junction alternative.
- Support for three stations to serve walksheds, transit-oriented development and provide strong bus and rail integration.
- Consider combining the ST3 representative project or the West Seattle Golf Course/Alaska Junction alternative with the Oregon Street/Alaska Junction alternative.
- Consider mixing and matching numerous alternatives for the recommended project.
- Consider regional context and ST3 plan consistency.
- Concerns about impacts to industrial areas along Harbor Island, including Terminal 5 and Terminal 18.
- Concerns about an elevated structure through the Junction and neighborhood impacts.
- Concerns about budget and risk of bearing expenditures made up front, in the event the economy downturns or project funding does not come through as expected.
- Concerns about cost of tunnel for the Pigeon Ridge/West Seattle Tunnel alternative.
- Request for future evaluation related to walksheds/ridership, multimodal and transit integration, cost, anticipated impacts to neighborhoods and visual representatives of alternatives.
- Request for more information about Longfellow Creek.
- Request to reduce the 4(f) impacts related to the West Seattle Golf Course/Alaska Junction alternative.
- Request for the Junction station location to be close to California Avenue Southwest.
- Reduce the need for property acquisition.
- Thankful for Sound Transit's community engagement thus far; receiving accolades and satisfaction from the West Seattle community.
- Invitation for ELG members to tour Harbor Island and Fishermen's Terminal to discuss potential impacts the West Seattle and Ballard Link Extensions may have.

The ELG members were in general agreement with the recommendations put forth by the SAG, with the exception to carry forward the West Seattle Golf Course/Alaska Junction alternative. They recommended exploring a refined version that avoids 4(f) impacts, as well as exploring a crossing on the south side of the West Seattle Bridge in the Oregon Street/Alaska Junction alternative.

**Agenda Item #5 – SODO, Stadium, Chinatown/International District Alternatives, Evaluation Results, Feedback and Recommendations**

Cathal Ridge reviewed feedback received during early scoping on the SODO and Chinatown/International District alternatives, highlighting interest in the Stadium station location serving both extensions, minimizing cut-and-cover construction impacts along Fifth Avenue South and concerns about E-3 busway utilization.

Cathal noted that Sound Transit has been working with city partners to create and apply a Racial Equity Toolkit to improve community engagement in this area of the project.



Feedback received at the Neighborhood Forums included support for grade-separated roadways, concerns about displacing bike lanes and bus lanes, and mixed opinions on closing South Royal Brougham Way. Cathal addressed a new suggestion to consider a Fourth Avenue South Station in Chinatown/ID that was not originally developed by Sound Transit nor included as part of the early scoping feedback. Peter Rogoff, Sound Transit CEO, noted that the Fourth Avenue South Station alternative has not received as much analysis as the other alternatives have. He highlighted there may be geometric challenges to the alignment, but Sound Transit is committed to reviewing options to overcome these challenges and present a viable alternative for further consideration.

Peter Rogoff addressed ELG members noting that Sound Transit plans to host a meeting with business leaders in Chinatown/ID that wrote a letter to the agency. The meeting will serve as an opportunity to engage with community leaders and create an open dialogue that Sound Transit hopes to continue throughout the alternatives development process.

***Discussion***

The following comments were provided by ELG members:

- Support for the Fourth Avenue South station in Chinatown/ID.
- Support for evaluation of alignments further west of the ST3 representative project on First Avenue South.
- Support for further study on which alternative will allow for a better transfer environment, as the SODO station will serve as an interim terminus for five years before the Ballard Link Extension is operational.
- Support for providing Chinatown/ID community members with better connections to transit.
- Support for an alignment that serves employees along First Avenue South. If First Avenue South is not a viable option, request to further study walksheds, bike paths and other transit connections to First Avenue South.
- Concerns about closing E-3 busway.
- Concerns about transfer points at SODO station for riders headed to West Seattle during the five-year interim before Ballard Link Extension becomes operational.
- Concerns about impacts to freight mobility and operations on First Avenue South.
- Request to reduce impacts in the Chinatown/ID neighborhood to the highest extent possible.
- Request to work closely with King County Metro to ensure bus service and frequency on E-3 is sustained.

ELG members agreed with the recommendations put forth by the SAG, with a request to explore alignments further west of the ST3 representative project and to evaluate potential freight impacts for a First Avenue South alternative.

**Agenda Item #6 – Downtown, South Lake Union, Seattle Center Alternatives, Evaluation Results, Feedback and Recommendations**

Cathal Ridge presented feedback received during early scoping and at the Neighborhood Forums for the Downtown, South Lake Union and Seattle Center alternatives. He highlighted input such as ensuring good connections at transfer points, support for connections to Seattle Center, mixed opinions on

consolidating or spreading the Denny and South Lake Union stations farther apart and support for a First Hill station. Cathal noted there are major constructability concerns in building the First Hill Station.

***Discussion***

The following questions were asked by ELG members:

Q: Is the First Hill alternative inconsistent with the ST3 Plan presented to voters? Are there legal restrictions to consider when evaluating this alternative?
A: *Sound Transit's General Counsel, Desmond Brown, was asked to address the ELG members to discuss legalities surrounding the First Hill alternative. Desmond explained that a plan was required to be submitted to voters, and the plan identified specific stations, so that the public could make informed decisions before voting. After approval, Sound Transit is required to build the stations outlined in the ST3 Plan that voters approved. The Plan can be modified if the proposed station cannot be built as planned due to infrastructure or cost changes. The Plan provides limited opportunities to change after it is approved by voters.*

Q: Would the First Hill alternative require high-speed elevators to access the underground station and does that add a significant cost?
A: *Correct. By estimate, the tunnel for the First Hill station would be about 160 feet deep, compared to the University of Washington station at a depth of 105 feet. A deeper station is expected to cost more money.*

Q: Can Sound Transit explain why the First Hill alternative is recommended for further evaluation, but the agency has voiced concerns about constructability?
A: *The First Hill station was not included in the ST3 Plan. The recommendation to advance the First Hill alternative to Level 2 was provided by the SAG based on public input received. The ELG can recommend advancing the alternative to the Sound Transit Board if they choose to.*

Q: During alternatives development for the ST2 Plan, the Sound Transit Board was informed that a station on First Hill was unfeasible from an engineering perspective. This led to funding for the First Hill Streetcar to be included in the ST2 Plan. Is it fair to say that the engineering assessments conducted years ago are sufficient for Sound Transit to state that there are similar concerns about feasibility from an engineering perspective for a First Hill station?
A: *The previous engineering assessment is helpful information, but Sound Transit has not conducted specific geotechnical and soil analysis for a First Hill station in this location.*

The following comments were provided by ELG members:

- Support for further discussion of First Hill alternative with more information about cost, potential ridership and engineering feasibility.
- Support for creating seamless transfers at Westlake station.
- Support for the Denny and South Lake Union stations to be further apart to increase walksheds.
- Consider how Madison BRT will operate, frequency of service and how it can connect to the Midtown station.
- Consider the residents and major employers on First Hill who would greatly benefit from a First Hill station.



- Consider if moving the First Hill station a couple blocks from the proposed location could benefit one community over another, while remaining inside the bounds of the general station location outlined in ST3.
- Consider the city of Seattle's large investment of properties on Mercer Street and consider potential collaborations between Sound Transit and the city.
- Concerns about engineering stability with crossing Interstate 5 twice for a First Hill station.
- Concerns about additional cost spent further evaluating the First Hill alternative when it has been categorized as unfeasible from a technical perspective.
- Concerns about a First Hill station and inconsistencies with the ST3 Plan.
- Concerns that a station on Sixth Avenue would not benefit as many potential riders as a station on Eighth Avenue.
- Concerns about access to the University of Washington facilities on Republican Street and Eighth Avenue.
- Noted that there is a significant transit investment already made in First Hill with the Seattle Streetcar.

ELG members provided mixed opinions on whether the First Hill alternative should advance. Diane Adams, facilitator, asked if ELG members would agree to advance the First Hill alternative, with additional evaluations performed, knowing that the alternative might not advance past a Level 2 recommendation to the Sound Transit Board. Peter Rogoff noted that any further analysis of the First Hill alternative will require additional staff time and resources. He encouraged ELG members to be rigorous in selecting which alternatives move forward.

There was further discussion about advancing the First Hill alternative and requests to advance the alternative slightly, but not quite to the Level 2 recommendation. Ultimately, the ELG decided to not advance the First Hill alternative but requested to address ridership needs for the First Hill neighborhood, in coordination with Madison BRT. ELG members agreed with the SAG's recommendations to advance the 5th/Harrison and 6th/Boren/Roy alternatives, requesting to explore availability of city-owned properties in the Fifth/Mercer alternative.

**Agenda Item #7 – Smith Cove, Interbay, Ballard Alternatives, Evaluation Results, Feedback and Recommendations**

Cathal Ridge reviewed feedback received during early scoping on the Interbay/Ballard alternatives, highlighting the input to further consider a tunnel or fixed bridge, alternate terminal station locations and request to preserve industrial and maritime operations.

Cathal reviewed some of the evaluation measures considered and shared feedback received at the Neighborhood Forums. He stated that public input included considerations like building stations near 15th Avenue Northwest and 17th Avenue Northwest to facilitate intermodal connections, access between the Smith Cove station and current and future land uses, and to consider effects to traffic on Elliott Avenue West and 15th Avenue Northwest.

***Discussion***

Q: How much longer is the tunnel in the BNFS/20th/Tunnel alternative compared to other alternatives that involve a tunnel?

A: *The tunnel is slightly longer than the other tunnel alternatives. The BNFS/20th/Tunnel alternative would include an underground station and therefore, be more expensive.*

Q: What's the difference between a fixed bridge and a movable bridge?
A: *The movable bridge was identified in the ST3 Plan as a 70-foot bridge that would open less frequently than the Ballard Bridge does today, which is approximately twice per day. The fixed bridge would need to be approximately 30 to 40 feet higher than the Ballard Bridge. Sound Transit will need to assess how much a fixed bridge is estimated to cost.*

The following comments were provided by ELG members:

- Community support to tunnel across Salmon Bay.
- Support for a station in Interbay that will serve current and future development.
- Support for mixing and matching elements of different alternatives for the preferred project.
- Support for a station at 15th Avenue Northwest.
- Support for alternatives that minimize impacts to the Port.
- Support for removing the BNSF/20th/Tunnel alternative due to anticipated high costs.
- Support for stations with high development potential.
- Consider combination of central Interbay location with tunnel to 15th Avenue Northwest and 17th Avenue Northwest area.
- Concerns about freight impacts if the alignment is on 15th Avenue Northwest.
- Concerns about impacts of a fixed bridge.
- Concerns about impacts to Fishermen's Terminal and maritime activities.
- Concerns about a station at 17th Avenue Northwest based on community input.
- Request for the Port to be a constructive partner as the alternatives development process advances.
- Request for additional information of potential terminus locations.

ELG members agreed with the recommendations put forth by the SAG, with the exception to remove the West of BNSF/20th/Tunnel alternative from moving forward.

**Agenda Item #8 – Review Recommendations and Next Steps**

David Shelton, HNTB, presented a summary of the ELG recommendations and general discussion for each segment.

Councilmember Rob Johnson highlighted that as the project moves forward to Level 2 alternatives development, it will be helpful for the ELG, SAG and the public to have visual representations of alternatives to understand tradeoffs and to help inform the alternatives analysis.

Councilmember Joe McDermott thanked committee members, Sound Transit staff and Diane Adams for facilitating the meeting. He highlighted that he was impressed with the quality of work achieved by the committee and that ELG members look forward to continuing to work with Sound Transit as the alternatives development process continues.



Diane Adams noted that the recommendations made by the ELG will be shared with the Sound Transit Board at a briefing on May 24, 2018. The next ELG meeting will be held on July 19, 2018.

**West Seattle and Ballard Link Extensions**
Elected Leadership Group Meeting #3 – July 19, 2018
Meeting Summary

**Agenda Item #1 – Welcome and introductions**

King County Councilmember and Sound Transit Board Member Joe McDermott welcomed the Elected Leadership Group (ELG) members to the group's third meeting. He noted that the number of Seattle City Councilmembers in the group will make the ELG meeting double as an official city of Seattle Sustainability and Transportation Committee meeting. He highlighted that the project is midway through the alternatives screening process and the Sound Transit Board will identify a preferred alternative in spring 2019. He recognized the amount of work that has been completed thus far and noted that there is more work to be done, screening out options to get closer to identifying a preferred alternative. Looking ahead, ELG members will convene in October to make recommendations on Level 2 alternatives. Recommendations on Level 2 alternatives will be driven by data, analysis and community engagement. McDermott noted the purpose of the third ELG meeting is to discuss new alternatives in Chinatown-International District and SODO and provide recommendations to Sound Transit if the alternatives should carry forward to Level 2 for additional analysis. Lastly, he thanked the project Stakeholder Advisory Group and the community for their engagement in the alternatives development process.

Seattle City Councilmember Mike O'Brien commented that Sound Transit is working with a variety of constituencies to jointly decide how to build mass transit infrastructure to help people get around. He recognized that it can be easy to get lost in the details with large projects but encouraged attendees to not lose sight of the bigger picture and goal. He emphasized that the role of the Elected Leadership Group is to listen to community input and partner agencies, to weigh the strengths and challenges of each alternative and to ensure the project timeline is on track for the Sound Transit Board to identify a preferred alternative by spring 2019.

Peter Rogoff, Sound Transit CEO, welcomed ELG members and thanked the public for attending. He highlighted that the project is entering a process of narrowing down potential alternatives to recommend to the Sound Transit Board, emphasizing that alternatives moving forward should meet community needs and be affordable to design and build. Peter noted that feasibility and cost data for each alternative will be available soon. Sound Transit staff are prepared to brief ELG members as the data becomes available and are working to develop visual renderings for several alternatives to share with members. Joe McDermott thanked Sound Transit for their offer to brief ELG members and encouraged members to meet with Sound Transit at the earliest opportunity.

Seattle City Councilmember Lorena González announced that she has a conflict of interest with several alternatives under consideration for the West Seattle Link Extension, as she owns property in the neighborhood. She noted that she will excuse herself during public comment and when the ELG discusses the West Seattle/Duwamish segment.

Agency directors, project leads and staff in attendance were:

- Peter Rogoff, Sound Transit CEO
- Cathal Ridge, Sound Transit



- Ron Endlich, Sound Transit
- Leda Chahim, Sound Transit
- Diane Adams, Facilitator

ELG members in attendance were:

- Mayor Jenny Durkan, Sound Transit Board Member
- Executive Dow Constantine, Sound Transit Board Member
- Councilmember Rob Johnson, Sound Transit Board Member
- Councilmember Joe McDermott, Sound Transit Board Member
- Councilmember Sally Bagshaw, Seattle City Council
- Councilmember Mike O'Brien, Seattle City Council
- Councilmember Lorena González, Seattle City Council
- Commissioner Stephanie Bowman, Port of Seattle (phone)

NOTE – the following members were not in attendance:

- Executive Dave Somers, Sound Transit Board Chair
- Councilmember Lisa Herbold, Seattle City Council
- Councilmember Bruce Harrell, Seattle City Council

**Agenda Item #2 – Public comment**

Councilmember Mike O'Brien, Seattle City Council, led the public comment period and noted that commenters would be allowed two minutes to speak. The Seattle Channel recorded and posted the meeting online to ensure visibility and documentation of the meeting.

Members of the public provided the following comments:

- One attendee, on behalf of Stand Up America, noted their concerns with collusion between agencies and government. They shared concerns about the feasibility of large transit infrastructure projects that do not serve tax-payers who help fund the projects.
- One attendee shared concerns and frustrations that Sound Transit is unwilling to meet and discuss issues with citizens and vocalized that citizens ought to have the right to address the government without fear of retaliation, discrimination or racism.
- One attendee expressed concerns about the feasibility of the West Seattle and Ballard Link Extensions, noting that tax payers will end up paying large sums of money to build and operate trains.
- One attendee, on behalf of south Downtown, requested Sound Transit consider coordinating project timelines between the West Seattle and Ballard Link Extensions project in the Chinatown-International District and the replacement of the 4th Avenue Viaduct.
- One attendee, shared their preference for the 4th Avenue S alternative in the Chinatown-International District because it would present an opportunity to re-activate Union Station and make it a multi-modal hub. They also noted that the 4th Avenue S alternative presents fewer

business impacts than other alternatives under consideration and is critical to consider because many businesses along 5th Avenue S are owned by people of color.

**Agenda Item #3 – Community Engagement and Collaboration**

Diane Adams, facilitator, stated the purpose of the meeting is for Sound Transit to present project updates to the Elected Leadership Group and receive direction on whether to advance additional Level 1 alternatives in Chinatown-International District and SODO.

Cathal Ridge, Sound Transit, discussed the community engagement and collaboration process for the West Seattle and Ballard Link Extensions project. He noted that early scoping informed the alternatives considered in Level 1, followed by community input received at neighborhood workshops, and multiple Stakeholder Advisory Group and Elected Leadership Group meetings. The Sound Transit Board received an overview of the alternatives to move forward for further analysis in Level 2 in May 2018. Since then, additional alternatives in the Chinatown-International District and SODO were recommended for further analysis. Cathal highlighted that Sound Transit has started to conduct interviews with social service providers in the project corridor, are continuing to brief organizations and are reaching the community through fairs and festivals during the summer. Sound Transit will hold neighborhood forums in September 2018 to share Level 2 alternatives with the public for feedback.

**Agenda Item #4: Level 2 Alternatives**

Cathal Ridge provided a brief description of the Level 1 alternatives under consideration and the refinements made to alternatives due to feedback received from the public and advisory groups in May 2018.

**West Seattle alternative refinements:**

- Pigeon Ridge/West Seattle Tunnel: Avalon station shifted to straddle Fauntleroy Way SW
- Oregon Street/Alaska Junction/Elevated: Route shifted south of West Seattle Bridge crossing; continues from Oregon Street to 44th Avenue SW in an elevated configuration
- Oregon Street/Alaska Junction/Tunnel: A new alternative that includes the Avalon station straddling Fauntleroy Way SW and continues into a tunnel at 38th Avenue SW to Alaska Junction
- Golf Course/Alaska Junction/Tunnel: Delridge station shifted south; route shifted to north edge of West Seattle Golf Course to avoid major Section 4(f) impacts; Avalon station straddling Fauntleroy Way SW

**SODO/Chinatown-International District alternative refinements:**

- Massachusetts Tunnel Portal: Added new Lander Street roadway overcrossing and at-grade SODO station
- Additional feedback is to consider 4th Avenue location for Chinatown-International District station and to explore routes further west of the ST3 Representative Project in SODO

**Downtown alternative refinements:**

- ST3 Representative Project: South Lake Union station shifted to avoid conflict with SR 99



- 5th/Harrison: South Lake Union shifted to avoid conflict with SR 99; Denny station shifted to expand walkshed
- 6th/Boren/Roy: South Lake Union station shifted to avoid conflict with SR 99 and sewer
- 5th/Terry/Roy/Mercer: Denny station shifted to Terry Avenue N; South Lake Union station shifted to avoid sewer and traffic conflicts on Mercer; Seattle Center station shifted to a more central location on Mercer Street; north end of route (tunnel portal) shifted off park property

**Ballard alternative refinements:**

- ST3 Representative Project: Route shifted farther from existing Ballard Bridge
- 15th/Fixed Bridge/15th: Smith Cove station and guideway shifted out of roadway; shifted guideway out of roadway and re-oriented Ballard station
- 20th/Fixed Bridge/17th: Shifted Interbay station to straddle W Dravus Street
- 20th/Tunnel/15th: Shifted Interbay station to straddle W Dravus Street
- Central Interbay/Movable Bridge/14th: Smith Cove station shifted south to Galer Street; shifted Ballard station to straddle NW Market Street
- Amory Way/Tunnel/14th: Shifted Ballard station to straddle NW Market Street
- Central Interbay/Fixed Bridge/14th: Fixed bridge crossing; Ballard station straddling NW Market Street
- Central Interbay/Tunnel/15th: Combined central Interbay location with tunnel to 15th/17th area

Cathal noted that elements of the various alternatives could be mixed-and-matched and encouraged members to consider this as the alternatives development process continues.

**Agenda Item #5 – SODO Alternatives and Evaluation Results**

Ron Endlich, Sound Transit, noted that there was interest and requests to evaluate new alternatives in SODO. Sound Transit, City of Seattle, Washington State Department of Transportation and King County Metro participated in workshops in June and July to identify potential refinements to the routes under consideration, with community engagement on the topic occurring in parallel.

Ron noted that the desires expressed were to serve additional ridership markets in the 1st Avenue S corridor, to ensure a high-quality transfer at SODO Station, ensure good freight mobility in the area and consider ways to improve safety at stations.

Ron noted the operational needs are to provide a connection to the maintenance facility, connect the lines to the Downtown Seattle Transit Tunnel, provide an interim terminus for the West Seattle Extension before the Ballard Extension comes online and provide a track connections between the lines. He described the importance of providing a connection to the Link maintenance facility for future trains that serve West Seattle. In addition, he noted that the SODO station will be a temporary transfer point between the West Seattle Extension and the rest of the system until the Ballard Extension comes online. He also noted the need to have track connections between the lines in case of emergency or long-term maintenance needs.

Sound Transit explored a number of potential alignments in SODO and further advanced two new alternatives to address the community desires and the operational needs of the extensions. The two new alternatives in the SODO segment were as follows:

1. Occidental Avenue: Elevated line that ties into existing system, south of the Stadium area.
    - Key findings include:
        - Property impacts and long-span crossing over BNSF tracks
        - Traffic and freight access impacts
        - No track connections between extension lines
        - Long track connection to the maintenance facility

2. 6th Avenue: Elevated line east of E-3 transitway that ties into the E-3 transitway near the Stadium area
    - Key findings include:
        - Traffic and freight access impacts on 6th Avenue S due to construction of the elevated guideway
        - Connection to maintenance facility is technically challenging
        - Property impacts to locate the SODO station adjacent to the existing SODO Station
        - Construction challenges and service disruptions

**Other suggestions**

The agency workshops also raised other suggestions to help serve the SODO area. Those suggestions included:

1. Track interlining: The West Seattle Extension would tie into the existing Central Link line, using a single set of tracks through SODO.
    a. Challenges include potential bottleneck of trains, reduces long-term service capacity and requires the construction of two individual grade-separated tracks to tie West Seattle to the existing Central Link line.
2. Extended Ballard line: Trains would move through a longer tunnel, become elevated along the 1st Avenue S corridor and tie into the existing line near the maintenance facility at Forest Street.
    a. Challenges include major service disruption to build the E-3 track connection for the West Seattle Extension, replacing the existing elevated Forest Street structure, no track connections between lines and the International-District station would be deep mined, up to 200 feet in an area with bad soil conditions that is challenging to mine a station.

Track interlining and extending the Ballard line suggestions were considered as non-practical for the reasons listed above and were not moved forward for further consideration.

**E-3 Transitway**

The E-3 transitway currently serves 60 buses in the PM peak hour but many of the existing routes that use the transitway today will be intercepted or discontinue service once new light rail extensions come online in the future. Sound Transit is continuing to look at opportunities to improve integration of local bus service, improve pedestrian and bicycle connections and safety at station locations. Ron explained the complexity of adding new Link light rail lines in the E-3 transitway and discussions with partner agencies will continue throughout the process.



Ron briefly described a summary of the SODO alternatives and noted that the Stakeholder Advisory Group identified the Occidental Avenue alternative to move forward into Level 2.

***Discussion***

The following questions were asked by ELG members:

Q: What are the current zoning plans in the 1st Avenue corridor in SODO?
*C: There are no current or future zoning changes proposed in the SODO area.*

Q: What is the need to build an additional maintenance facility track connection?
*A: Sound Transit would like to build in the flexibility to assign trains northbound and southbound from the Forest Street maintenance facility. The challenge is the amount of operating trains at one time, using central Link lines and tracks. Without a direct track connection to the West Seattle line, sending a train northbound and reversing direction to head southbound on live tracks would worsen operating headways and could limit Sound Transit's ability to deploy the early morning fleet to Ballard.*

Q: How did new alternatives to study get added to the list of potential alternatives in SODO? There was clear direction from ELG members to Sound Transit staff about what to study in SODO in Level 2 since the last ELG meeting.
*A: ELG members asked Sound Transit to look at alternatives west of the E-3 transitway corridor. Sound Transit sought input from partner agencies to help identify alternatives. Many new alternatives were discussed and Sound Transit advanced the two most promising alternatives for further analysis.*

C: The list of alternatives is growing when the list should be narrowed down.

Q: Can Sound Transit expand on some of the challenges, such as service disruption, for the option considered to extend the Ballard line?
*A: Consultant staff did some early analysis for extending the Ballard line. The initial concept includes the assumption that if the West Seattle Extension is operational before Ballard Extension, there are two points of disruption at Forest Street due to the current Link line from Beacon Hill travels on an elevated guideway, curves and comes into SODO at-grade. To tie West Seattle into the current configuration, Sound Transit would need to build two additional ramps to tie into the existing structure and to the Ballard Extension. The existing ramps would need to be demolished and a new structure would have to be built that crosses the E-3 transitway. The initial estimate is that it would take several months of service disruption to build the new ramps required for both extensions to be operational.*

Q: Has analysis been conducted on the E-3 transitway, evaluating the gap of time between construction of new light rail tracks and when service of new extensions would start?
*A: King County Metro has a long-range bus plan that forecasts transit volumes between 2025 and 2042. Construction of the new light rail line is projected to begin in 2025. There would be a substantial reduction in buses coming to Seattle as new light rail lines come online and are extended, decreasing the volume of buses along the E-3 transitway. The assumption is that buses will be intercepted at suburban rail station locations to bring riders to light rail stations to get into Downtown Seattle, rather than making the entire trip by bus. Sound Transit will continue to work with King County Metro to understand the potential impacts to the E-3 transitway.*

Q: Has analysis been conducted on the Seattle City Light transmission lines that run under the E-3 transitway?
*A: Yes, Sound Transit is in discussion with Seattle City Light about the potential to relocate the transmission lines. Sound Transit has identified that some portion of the lines will need to be relocated and have identified potential relocation routing options for the lines with preliminary feedback from City Light staff.*

Q: What is the projected cost and impact to buses and Seattle City Light due to the construction of new extensions?
*A: Sound Transit will be able to identify some cost estimates for components of major work and estimates will be refined as the project moves forward and undergoes additional analysis.*

Q: Which alternatives avoid a forced transfer from West Seattle to the SODO station?
*A: Sound Transit is evaluating alternatives for SODO to be the interim terminus point of the line. Other options under analysis are to connect the West Seattle line to the existing Chinatown-International District Station.*

Q: What analysis has been conducted to shift the Chinatown-International District station north of 4th and 5th Avenues?
*A: The Chinatown-International District station would need to be located north of 4th and 5th avenues if the extended Ballard line concept was to move forward. The station would need to be very deep because of the soil conditions and deep piles in the area. There would not be a good connection between the new station and the existing International District Station.*

The following comments were provided by ELG members:

- Support for a station west of the ST3 Representative Alignment in SODO
- Concern about potential impacts to Seattle City Light transmission lines and E-3 transitway
- Concern about a forced transfer for five years between extensions
- Concerns about a station location west of BNSF tracks

ELG members agreed with the SAG's recommendations to advance the Occidental Avenue alterative for further analysis in Level 2.

**Agenda Item #6 – Chinatown-ID Alternatives and Evaluation Results**

Ron Endlich, Sound Transit, noted that there was interest and requests to evaluate new alternatives along 4th Avenue and to explore alignments further west of the ST3 Representative Project in Chinatown-International District. Sound Transit, City of Seattle, Washington State Department of Transportation and King County Metro participated in workshops in June and July to identify potential refinements to the routes under consideration.

Ron noted that the community desires were to improve intermodal connections, activate Union Station and minimize construction impacts in Chinatown-International District. Feedback received from the agency workshops included: desire for a safer connection to King Street Station, avoid impacts to affordable housing, fire station, emergency operations center, traffic impacts of construction on 4th



Avenue and trolley bus access. Agencies also noted an opportunity to partner on a 4th Avenue Viaduct rebuild.

Ron presented the different types of underground stations and mining techniques required for various alternatives.

Cut-and-cover station construction:

- Examples of cut-and-cover stations: Pioneer Square and University Street stations
- 4.5-year construction timeline for a typical station
- Temporary roadway deck is installed as the "Cover" that helps minimize surface disruption during construction
- 1.5-year surface level disruption timeline; generally, at beginning and end of construction timeline

Open cut station:

- Examples of open cut stations: U-District and Roosevelt stations
- In the examples, the station location was not in the roadway and a deck (i.e. cover) was not needed
- Construction is generally faster and more cost effective

Mined station

- Example of mined station: Beacon Hill (~160 ft. deep)
- Requires excavation of a large construction shaft to access the platform level of the station to begin mining

The technical challenges with constructing a new station in Chinatown-International District is the limited right of way space, poor soil conditions, deep piles under 4th Avenue, Union Station, existing International-District Station and conflicts with the existing Downtown Seattle Transit Tunnel (DSTT) structures.

Sound Transit developed five new alternatives to address the community concerns and the construction constraints in Chinatown-International District.

1. 4th Avenue S: Cut-and-cover tunnel and station
    - Key findings include:
        - Constructability challenges
        - Requires replacement of 4th Avenue Viaduct
        - Requires additional cut-and-cover under I-90 ramps
        - Potential business displacement
        - Potential service disruption during construction over existing tunnel (DSTT)
        - High volume of traffic diverted from 4th Avenue to neighborhood streets (vehicle volumes on 4th Avenue are almost four times greater than 5th Avenue)
        - 4.5-5.5 years of construction over four phases
2. 4th Avenue S: Bored tunnel/mined station
    - Key findings include:
        - Constructability challenges
        - Required deep station construction

- Requires replacement of 4th Avenue Viaduct
- Requires additional cut-and-cover under I-90 ramps
- High volume of traffic diverted from 4th Avenue to neighborhood streets (vehicle volumes on 4th Avenue are almost four times greater than 5th Avenue)
- 5-6 years of construction over two phases

3. 5th Avenue Bored tunnel/cut-and-cover station
   - Key findings include:
     - Reduces extent of cut-and-cover construction impacts
4. 5th Avenue Bored tunnel/mined station
   - Key findings include:
     - Reduces extent of cut-and-cover construction impacts
     - Deep mined station construction technically challenging
5. Union Station: Bored tunnel/mined station
   - Key findings include:
     - Constructability challenges
     - Requires tunneling under I-90 ramps
     - Requires a very deep station due to pile depths
     - Difficult to build shallow tunnels due to existing obstructions in the area
     - Lacks construction staging and access shaft sites

Ron briefly described a summary of the Chinatown-International District alternatives and noted that the Stakeholder Advisory Group identified the following alternatives to move forward into Level 2:

- 5th Avenue cut-and-cover tunnel and station (ST3 Representative Project)
- 5th Avenue bored tunnel/cut-and-cover station
- 5th Avenue bored tunnel/mined station
- 4th Avenue cut-and-cover tunnel and station
- 4th Avenue bored tunnel/mined station

***Discussion***

The following questions were asked by ELG members:

Q: What is the reasoning for an extended construction timeline of 4 years of surface and traffic disruptions for the 4th Avenue cut-and-cover station, when most cut-and-cover stations have construction timelines of 1.5 years for surface disruption?
*A: The 4th Avenue Viaduct will need to be torn down and rebuilt first before station construction begins.*

The following comments were provided by ELG members:

- Support to explore more 4th Avenue options
- Request for more information on the Chinatown-International District alternatives to make more informed decisions about which alternatives should move forward
- Important to continue considering numerous options in Chinatown-International District because it is one of the neighborhoods along the route with the fewest alternatives
- Important to consider the potential impacts of the staging equipment area in Chinatown-International District



ELG members agreed with the SAG's recommendations to advance the 5th Avenue cut-and-cover tunnel and station (ST3 Representative Project), 5th Avenue bored tunnel/cut-and-cover station, 5th Avenue bored tunnel/mined station, 4th Avenue cut-and-cover tunnel and station and the 4th Avenue bored tunnel/mined station alternatives for further analysis in Level 2.

**Agenda Item #7 – Equity Inclusion Briefing**

Leda Chahim, Sound Transit, and Jennifer Chao, Seattle Department of Neighborhoods, presented on the equity and inclusion process for the West Seattle and Ballard Link Extensions project.

Leda noted the commitment to early engagement with the public, specifically in under-represented communities. Sound Transit strives to enhance collaboration and increase transparency with communities along the project alignment and enhance access to the light rail system. During environmental review, Sound Transit conducts an environmental justice analysis that evaluates demographics, benefits and impacts to communities of color and documents efforts to involve people of color and people who are experiencing low-incomes.

Sound Transit has a partnering agreement with the City of Seattle, which provides a framework for the two agencies to work closely together during the alternatives development phase of the project to identify a preferred alternative, as well as other alternatives to study in the Environmental Impact Statement.

Mayor Durkan administered an Executive Order affirming the City's commitment to the Race and Social Justice Initiative (RSJI). The City of Seattle requires major capital projects to create a Racial Equity Toolkit (RET), as an assessment tool to address project impacts on racial equity. Sound Transit and the City of Seattle work in collaboration to develop the RET, which is data-driven and inclusive in nature.

Leda presented the data findings from Level 1 alternatives analysis, which included mapping concentration of communities of color along the project corridor. The RET analysis key findings included:

- Chinatown-International District station area is the only area densely populated by communities of color in the project corridor
- Densely populated communities of color lie within the bike and transit sheds of the Delridge and Avalon stations but are outside of those stations' immediate walksheds
- Most stations are located in areas identified as "high opportunity" in terms of access to opportunities for financial and/or social advancement
- Correlations were identified between race and class, where communities of color tend to have lower incomes and access to opportunity than majority white communities

The RET has informed community engagement thus far by:

- Establishing shared outcomes
- Collaborating on alternatives development with community leaders in the Chinatown-International District
- Conducting social service provider interviews centering race
- Providing modifications to the criteria used to screen alternatives
- Adding a station area workshop focused on the Delridge station

During Level 2 alternatives development, Sound Transit and the City of Seattle strive to continue collaboration to elevate issues and considerations to better inform the alternatives development process, provide information that data alone cannot provide, and share findings of Level 2 data analysis and community engagement.



***Discussion***

Q: Are there additional criteria being added or are criteria modified?
*A: Sound Transit and the City of Seattle are evaluating what other criteria can be useful to measure.*

Q: Thank you for making equity and inclusion an integral part of the project. What is being done to ensure that Sound Transit and the City are reaching communities where English may not be the primary language spoken and to communities who may not engage in traditional public involvement?
*A: The City of Seattle has a community liaison program that is comprised of individuals who speak multiple languages. Liaisons attend meetings and meet people where they currently gather in different communities to help communicate project information.*

C: Thank you for the work you've done so far. We're grateful to have you as part of this team. Thank you to Mayor Durkan for committing the City of Seattle to this important work.

C: Thank you Sound Transit for committing to incorporate this level of equity and inclusion into your work. The project will significantly change the City's mobility and it's critical to think about how to make the system equitable.

C: I encourage Sound Transit to share results with the communities they're engaging with. Oftentimes, we hear from the community, "You didn't listen to us." Sound Transit has the opportunity to demonstrate that they heard the community and how their input informed decisions.

**Agenda Item #8 – Next Steps**

Diane Adams, facilitator, noted that the technical team will begin additional analysis for alternatives approved to move forward into Level 2. Cost estimates and visualizations are anticipated to be available before the next ELG meeting.

Councilmember Joe McDermott provided closing remarks, encouraging members that as data becomes available to proactively meet with Sound Transit staff for a briefing, prior to the next ELG meeting. The next Elected Leadership Group meeting will be held on Oct. 5, 2018 where members will recommend which alternatives move forward into Level 3.