

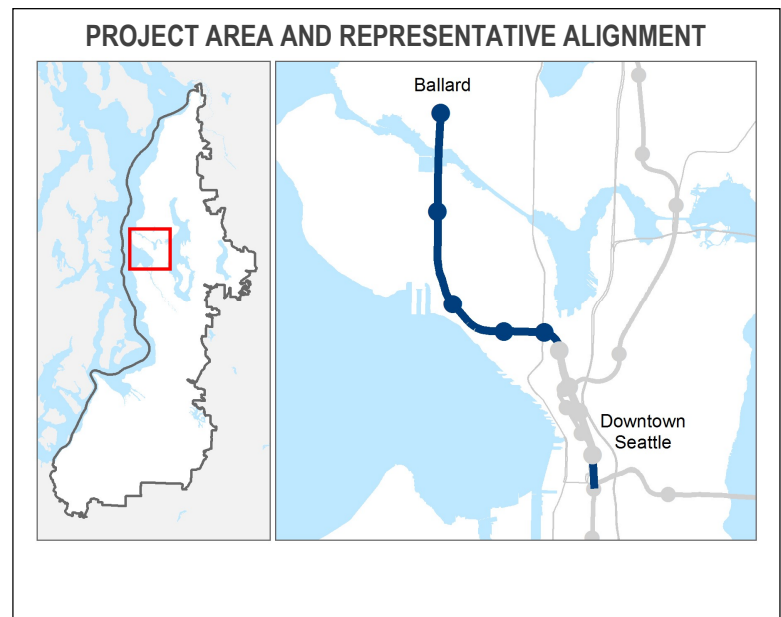
Ballard to Downtown Seattle Light Rail

Subarea	North King
Primary Mode	Light Rail
Facility Type	Corridor
Length	5.4 miles
Date Last Modified	July 1, 2016

SHORT PROJECT DESCRIPTION

This project would build light rail from Downtown Seattle to Ballard’s Market Street area. It would include elevated light rail on 15th Avenue NW and Elliott Avenue West and a rail-only movable bridge over Salmon Bay. It includes a tunnel through Uptown and South Lake Union. It would be constructed in conjunction with a new downtown Seattle light rail tunnel, which would extend from International District/Chinatown to Denny.

Note: The elements included in this representative project will be refined during future phases of project development and are subject to change.



KEY ATTRIBUTES	
REGIONAL LIGHT RAIL SPINE <i>Does this project help complete the light rail spine?</i>	No
CAPITAL COST <i>Cost in Millions of 2014 \$</i>	\$2,383 — \$2,550
RIDERSHIP <i>2040 daily project riders</i>	47,000 — 57,000
PROJECT ELEMENTS	<ul style="list-style-type: none"> • Approximately 5.4 miles of light rail in combination of elevated and tunnel • Three elevated stations: Ballard, Smith Cove, Interbay • Two tunnel stations: Seattle Center, South Lake Union • New rail-only movable bridge over Salmon Bay • Budget for operations and maintenance facility • Peak headways: 6 minutes • 1 percent for art per Sound Transit policy • Non-motorized access facilities (bicycle/pedestrian), transit-oriented development (TOD)/planning due diligence, bus/rail integration facilities, and sustainability measures (see separate document titled “Common Project Elements”)
NOT INCLUDED	<ul style="list-style-type: none"> • Parking not included • Vehicles not included • Operations & maintenance facility not included • See separate document titled “Common Project Elements,” “Light Rail Operations and Maintenance Facilities,” and “Light Rail Vehicles” • See separate document titled “Common Project Elements”
ISSUES & RISKS	<ul style="list-style-type: none"> • Risk and complexity associated with alignment through Fisherman’s Terminal/Salmon Bay and construction of a new movable bridge • Displacing vehicle travel lanes for the alignment • Risk and complexity associated with a tunnel through Uptown and South Lake Union

Ballard to Downtown Seattle Light Rail

KEY ATTRIBUTES

ISSUES & RISKS

- Reliability issues related to movable bridge over Salmon Bay
- Construction would require some impacts to Link operations, which could potentially be limited so they occur during off-peak conditions
- Constructing a new rail-only movable bridge over Salmon Bay
- Maintenance of traffic during construction on arterials
- Potential limitations to left turns along portions of the alignment
- US Coast Guard approval is needed for Salmon Bay crossing
- An alignment running west of the Ballard Bridge could require acquiring property from the Fisherman’s Terminal and impact buildings, docks, vessels, and equipment associated with maritime businesses
- The alignment would need to vertically clear certain intersections, including 15th Avenue NW/NW Leary Way, 15th Avenue W/W Emerson Street, and Elliott Avenue W/W Mercer Place
- Potential conflicts with existing utilities
- Tunnel construction in mature urban environment, including potential of encountering elevator shafts, electrical grounding rods, geothermal wells
- Light rail currently operates in Seattle and specific station area standards are codified; light rail is included in the Comprehensive Plan and other planning documents

Ballard to Downtown Seattle Light Rail

Sound Transit developed a conceptual scope of work for this project for the purpose of generating a representative range of costs, both capital and operating; and benefits, including ridership forecasts, TOD potential, multi-modal access and others. This information was developed to assist the Sound Transit Board as it developed the ST3 system plan, including phasing of investments and financial plan, for voter consideration. Final decisions on project elements (e.g., alignment, profile, station locations, and number of parking stalls) will be determined after completion of system planning, project level environmental review, and preliminary engineering during which additional opportunities for public participation will be provided. Therefore, this scope definition should not be construed as a commitment that all representative features will be included in the final developed project.

Long Description:

This project would build light rail from downtown Seattle to Ballard's Market Street area. The representative alignment for this light rail project would be elevated along 15th Avenue NW starting at Market Street, crossing Salmon Bay on a rail-only new bridge near the Ballard Bridge. South of Salmon Bay, the alignment would continue in an elevated profile along 15th Avenue NW through the Interbay corridor and Elliott Avenue W, and then transition to a tunnel alignment through the Uptown and South Lake Union neighborhoods. This project would be constructed in conjunction with the Downtown Seattle Light Rail Tunnel project, which would continue the tunnel alignment through downtown to International District/Chinatown. This project also constructs the connection of the Downtown Seattle Light Rail Tunnel to the existing Central Link tracks at S Massachusetts Street. This project includes five stations –three elevated and two underground.

Assumptions:

- Alignment generally along existing arterials
- Traction power substations are generally placed at 1-mile intervals, close to stations, if possible, with additional right-of-way acquisition included
- For non-motorized station access allowances, the Ballard, Seattle Center and South Lake Union stations are categorized as Urban stations; the Interbay and Ballard stations are categorized as Urban stations with a Major Bicycle Intercept
- For bus/rail integration, facilities have been assumed at the Ballard and Smith Cove stations

Environmental:

Sound Transit will complete project-level state and federal environmental reviews as necessary; provide mitigation for significant impacts; obtain and meet the conditions of all required permits and approvals; and strive to exceed compliance and continually improve its environmental performance.

Utilities:

Utility relocation as needed to complete the project, including fiber optics, sewer, water, overhead electric/communications, etc.

Right-of-Way and Property Acquisition:

- Generally located within existing city-owned street right-of-way
- The alignment would require displacing vehicle turn lanes in some locations, and would not expand ROW except at some intersections and stations
- Potential property acquisitions anticipated at stations and some intersections where protected turns are to be maintained
- Potential easements anticipated for tunnel alignments under privately-owned properties
- The alignment would require property acquisition for traction power substations

Potential Permits/Approvals Needed:

- Building permits: Electrical, Mechanical, Plumbing
- Utility connection permits
- Construction-related permits (clearing and grading, stormwater management, street use, haul routes, use of city right-of-way)
- Land use approvals (Conditional use, design review, site plans, Comprehensive Plan or development code consistency, Special Use Permits)
- USCG Bridge Permit
- US Army Corps of Engineers Section 10
- FAA/Air Navigation Review
- All required local, state, and federal environmental permits; NEPA/SEPA and related regulations

Ballard to Downtown Seattle Light Rail

Project Dependencies:

This project would be constructed in conjunction with a new tunnel through downtown Seattle, extending from South Lake Union to the International District/Chinatown. This project also requires the connection of the existing Central Link line currently running through the Downtown Seattle Transit Tunnel to a line extension to West Seattle. The operations plan assumes that trains from Ballard would connect to the existing Central Link line at S Massachusetts Street and continue south to Rainier Valley and beyond. Purchase of additional light rail vehicles is required to operate service on this corridor. Construction of new operations and maintenance base capacity is required to accommodate the fleet required for this corridor.

Potential Project Partners:

- City of Seattle
- King County
- U.S. Army Corps of Engineers
- Transit partner serving this project: King County Metro
- U.S. Coast Guard
- FTA
- Port of Seattle

Ballard to Downtown Seattle Light Rail

Cost:

Sound Transit developed a conceptual scope of work for this project for the purpose of generating a representative range of costs, both capital and operating; and benefits, including ridership forecasts, TOD potential, multi-modal access and others. This information was developed to assist the Sound Transit Board as it developed the ST3 system plan, including phasing of investments and financial plan, for voter consideration. Final decisions on project elements (e.g., alignment, profile, station locations, and number of parking stalls) will be determined after completion of system planning, project level environmental review, and preliminary engineering during which additional opportunities for public participation will be provided. Therefore, this scope definition should not be construed as a commitment that all representative features will be included in the final developed project.

In Millions of 2014\$

ITEM	COST	COST WITH RESERVE
Agency Administration	\$126.70	\$135.56
Preliminary Engineering & Environmental Review	\$72.69	\$77.78
Final Design & Specifications	\$144.79	\$154.93
Property Acquisition & Permits	\$257.94	\$275.99
Construction	\$1,476.89	\$1,580.28
Construction Management	\$130.31	\$139.44
Third Parties	\$28.96	\$30.99
Vehicles	\$0.00	\$0.00
Contingency	\$144.79	\$154.93
Total	\$2,383.08	\$2,549.89

Design Basis:












Conceptual

The costs expressed above include allowances for TOD planning and due diligence, Sustainability, Bus/rail integration facilities, and Non-Motorized Access. These allowances, as well as the costs for Parking Access included above, are reflected in the following table. Property acquisition costs are not included in the table below, but are included within the total project cost above. For cost allowances that are not applicable for this project, "N/A" is indicated.

ITEM	COST	COST WITH RESERVE
TOD planning and due diligence	\$0.30	\$0.32
Sustainability	\$9.20	\$9.84
Parking access	N/A	N/A
Non-motorized (bicycle/pedestrian) access	\$24.17	\$25.86
Bus/rail integration facilities	\$5.50	\$5.89

Ballard to Downtown Seattle Light Rail

Evaluation Measures:

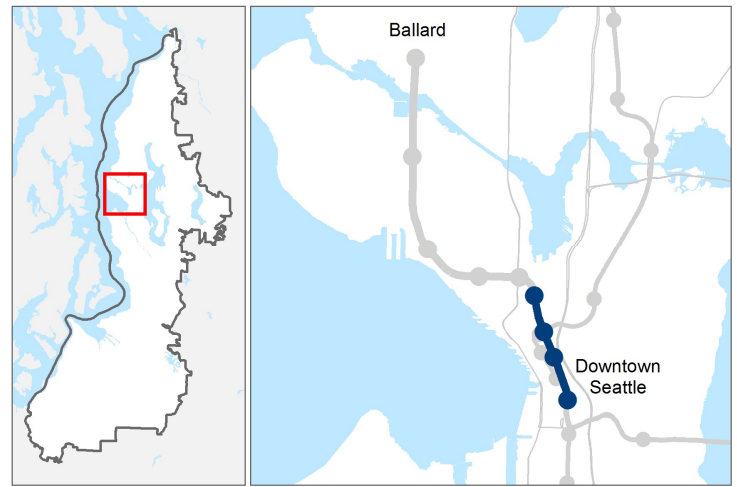
MEASURE	MEASUREMENT/RATING	NOTES
 Regional Light Rail Spine <i>Does project help complete regional light rail spine?</i>	No	
 Ridership <i>2040 daily project riders</i>	47,000 — 57,000	
 Capital Cost <i>Cost in Millions of 2014 \$</i>	\$2,383 — \$2,550	
 Annual O&M Cost <i>Cost in Millions of 2014 \$</i>	\$18	
 Travel Time <i>In-vehicle travel time along the project (segment)</i>	11 min	
 Reliability <i>Quantitative/qualitative assessment of alignment/route in exclusive right-of-way</i>	Medium-High	100% in exclusive right-of-way; reliability could be affected by movable bridge over Salmon Bay
 System Integration <i>Qualitative assessment of issues and effects related to connections to existing local bus service and potential future integration opportunities</i>	Medium-High	Medium-low to medium-high number of existing transit connections and strong opportunities for integration with realigned bus service
 Ease of Non-motorized Access <i>Qualitative assessment of issues and effects related to non-motorized modes</i>	Medium	Low to medium intersection densities providing non-motorized access, with rail lines and steep hillsides as barriers
	Percent of Non-motorized Mode of Access <i>Percent of daily boardings</i>	70-80%
 Connections to PSRC-designated Regional Centers <i>Number of PSRC-designated regional growth and manufacturing/industrial centers served</i>	3 centers	Ballard-Interbay MIC, Uptown, South Lake Union
 Land Use and Development/TOD Potential <i>Quantitative/qualitative assessment of adopted Plans & Policies and zoning compatible with transit-supportive development within 0.5 mile of potential stations</i> <i>Qualitative assessment of real estate market support for development within 1 mile of potential corridor</i>	Medium	Moderate support in local and regional plans; approx. 30% land is compatibly zoned
	Density of activity units (population and employment for 2014 and 2040) within 0.5 mile of potential station areas	Medium-High Pop/acre: 2014: 19; 2040: 33 Emp/acre: 2014: 29; 2040: 46 Pop+Emp/acre: 2014: 48; 2040: 78
 Socioeconomic Benefits <i>Existing minority / low-income populations within 0.5 mile of potential station areas</i> <i>2014 and 2040 population within 0.5 mile of potential station areas</i> <i>2014 and 2040 employment within 0.5 mile of potential station areas</i>	24% Minority; 11% Low-Income Pop: 2014: 40,700; 2040: 69,700 Emp: 2014: 62,100; 2040: 97,800	

For additional information on evaluation measures, see <http://soundtransit3.org/document-library>

Downtown Seattle Light Rail Tunnel

Subarea	North King
Primary Mode	Light Rail
Facility Type	Corridor
Length	1.7 miles
Date Last Modified	July 1, 2016

PROJECT AREA AND REPRESENTATIVE ALIGNMENT



SHORT PROJECT DESCRIPTION

This project would build a new light rail tunnel through Downtown Seattle between the International District and South Lake Union. It would be constructed as part of the Ballard to Downtown Seattle light rail project, which includes a tunnel through Uptown and South Lake Union.

Note: The elements included in this representative project will be refined during future phases of project development and are subject to change.

KEY ATTRIBUTES

REGIONAL LIGHT RAIL SPINE <i>Does this project help complete the light rail spine?</i>	No
CAPITAL COST <i>Cost in Millions of 2014 \$</i>	\$1,638 — \$1,752
RIDERSHIP <i>2040 daily project riders</i>	110,000 — 136,000
PROJECT ELEMENTS	<ul style="list-style-type: none"> • Approximately 1.7 miles of light rail in tunnel • Four tunnel stations: Denny, Westlake, Midtown, International District/Chinatown • Peak headways: 6 minutes • 1 percent for art per Sound Transit policy • Non-motorized access facilities (bicycle/pedestrian), transit-oriented development (TOD)/planning due diligence, bus/rail integration facilities, and sustainability measures (see separate document titled “Common Project Elements”)
NOT INCLUDED	<ul style="list-style-type: none"> • Parking not included • Vehicles not included • Operations & maintenance facility not included • See separate document titled “Common Project Elements,” “Light Rail Operations and Maintenance Facilities,” and “Light Rail Vehicles”
ISSUES & RISKS	<ul style="list-style-type: none"> • Risk and complexity associated with a tunnel through Downtown Seattle • Construction would require some impacts to Link operations, which could potentially be limited so they occur during off-peak conditions • Potential conflicts with existing utilities • Tunnel construction in mature urban environment, including potential of encountering elevator shafts, electrical grounding rods, geothermal wells • Light rail currently operates in Seattle and specific station area standards are codified; light rail is included in the Comprehensive Plan and other planning documents

Downtown Seattle Light Rail Tunnel

Sound Transit developed a conceptual scope of work for this project for the purpose of generating a representative range of costs, both capital and operating; and benefits, including ridership forecasts, TOD potential, multi-modal access and others. This information was developed to assist the Sound Transit Board as it developed the ST3 system plan, including phasing of investments and financial plan, for voter consideration. Final decisions on project elements (e.g., alignment, profile, station locations, and number of parking stalls) will be determined after completion of system planning, project level environmental review, and preliminary engineering during which additional opportunities for public participation will be provided. Therefore, this scope definition should not be construed as a commitment that all representative features will be included in the final developed project.

Long Description:

This project would build light rail from South Lake Union to the International District. The representative alignment for this light rail project would be underground along Westlake Avenue at Denny to 6th Ave then 5th Ave until the International District. This project would be constructed in conjunction with the Ballard to Downtown Seattle Light Rail project that connects the north end of this project alignment to Ballard and the south end to a connection with Central Link at S Massachusetts Street. This project contains four underground stations.

Assumptions:

- Alignment generally along existing arterials
- Traction power substations are generally placed at 1-mile intervals, close to stations, if possible, with additional right-of-way acquisition included
- For non-motorized station access allowances, the Denny, Westlake, Midtown, and International District/Chinatown stations are categorized as Urban/CBD stations

Environmental:

Sound Transit will complete project-level state and federal environmental reviews as necessary; provide mitigation for significant impacts; obtain and meet the conditions of all required permits and approvals; and strive to exceed compliance and continually improve its environmental performance.

Utilities:

Utility relocation as needed to complete the project, including fiber optics, sewer, water, overhead electric/communications, etc.

Right-of-Way and Property Acquisition:

- Generally located within existing city-owned street right-of-way
- Potential property acquisitions anticipated at stations
- Potential easements anticipated for tunnel alignments under privately-owned properties

Potential Permits/Approvals Needed:

- Building permits: Electrical, Mechanical, Plumbing
- Utility connection permits
- Construction-related permits (clearing and grading, stormwater management, street use, haul routes, use of city right-of-way)
- Land use approvals (Conditional use, design review, site plans, Comprehensive Plan or development code consistency, Special Use Permits)
- All required local, state, and federal environmental permits; NEPA/SEPA and related regulations

Project Dependencies:

This project requires the connection of the existing Central Link line currently running through the Downtown Seattle Transit Tunnel to a line extension to West Seattle. The operations plan assumes that trains from Ballard would connect to the existing Central Link line at S Massachusetts Street and continue south to Rainier Valley and beyond.

Potential Project Partners:

- City of Seattle
- King County
- Transit partner serving this project: King County Metro
- FTA

Downtown Seattle Light Rail Tunnel

Cost:

Sound Transit developed a conceptual scope of work for this project for the purpose of generating a representative range of costs, both capital and operating; and benefits, including ridership forecasts, TOD potential, multi-modal access and others. This information was developed to assist the Sound Transit Board as it developed the ST3 system plan, including phasing of investments and financial plan, for voter consideration. Final decisions on project elements (e.g., alignment, profile, station locations, and number of parking stalls) will be determined after completion of system planning, project level environmental review, and preliminary engineering during which additional opportunities for public participation will be provided. Therefore, this scope definition should not be construed as a commitment that all representative features will be included in the final developed project.

In Millions of 2014\$

ITEM	COST	COST WITH RESERVE
Agency Administration	\$86.50	\$92.56
Preliminary Engineering & Environmental Review	\$55.11	\$58.97
Final Design & Specifications	\$109.39	\$117.05
Property Acquisition & Permits	\$40.90	\$43.77
Construction	\$1,115.77	\$1,193.88
Construction Management	\$98.45	\$105.34
Third Parties	\$22.08	\$23.62
Vehicles	\$0.00	\$0.00
Contingency	\$109.39	\$117.05
Total	\$1,637.60	\$1,752.23

Design Basis:












Conceptual

The costs expressed above include allowances for TOD planning and due diligence, Sustainability, Bus/rail integration facilities, and Non-Motorized Access. These allowances, as well as the costs for Parking Access included above, are reflected in the following table. Property acquisition costs are not included in the table below, but are included within the total project cost above. For cost allowances that are not applicable for this project, "N/A" is indicated.

ITEM	COST	COST WITH RESERVE
TOD planning and due diligence	\$0.62	\$0.66
Sustainability	N/A	N/A
Parking access	N/A	N/A
Non-motorized (bicycle/pedestrian) access	\$21.97	\$23.51
Bus/rail integration facilities	N/A	N/A

Downtown Seattle Light Rail Tunnel

Evaluation Measures:

MEASURE	MEASUREMENT/RATING	NOTES	
 Regional Light Rail Spine <i>Does project help complete regional light rail spine?</i>	No		
 Ridership <i>2040 daily project riders</i>	110,000 — 136,000	Some of the riders shown will also use other corridors	
 Capital Cost <i>Cost in Millions of 2014 \$</i>	\$1,638 — \$1,752		
 Annual O&M Cost <i>Cost in Millions of 2014 \$</i>	\$19		
 Travel Time <i>In-vehicle travel time along the project (segment)</i>	6 min		
 Reliability <i>Quantitative/qualitative assessment of alignment/route in exclusive right-of-way</i>	High	100% in exclusive right-of-way	
 System Integration <i>Qualitative assessment of issues and effects related to connections to existing local bus service and potential future integration opportunities</i>	High	Medium-high to High number of existing transit connections and strong opportunities for integration with realigned bus service	
	Ease of Non-motorized Access <i>Qualitative assessment of issues and effects related to non-motorized modes</i>	High	High intersection density with limited barriers to non-motorized access
	Percent of Non-motorized Mode of Access <i>Percent of daily boardings</i>	75-85%	
 Connections to PSRC-designated Regional Centers <i>Number of PSRC-designated regional growth and manufacturing/industrial centers served</i>	2 centers	South Lake Union, Seattle CBD	
	Land Use and Development/TOD Potential <i>Quantitative/qualitative assessment of adopted Plans & Policies and zoning compatible with transit-supportive development within 0.5 mile of potential stations</i>	High	Strong support in local and regional plans; approx. 50% land is compatibly zoned
	<i>Qualitative assessment of real estate market support for development within 1 mile of potential corridor</i> <i>Density of activity units (population and employment for 2014 and 2040) within 0.5 mile of potential station areas</i>	High Pop/acre: 2014: 28; 2040: 78 Emp/acre: 2014: 132; 2040: 207 Pop+Emp/acre: 2014: 161; 2040: 285	Very strong market support
 Socioeconomic Benefits <i>Existing minority / low-income populations within 0.5 mile of potential station areas</i> <i>2014 and 2040 population within 0.5 mile of potential station areas</i> <i>2014 and 2040 employment within 0.5 mile of potential station areas</i>	41% Minority; 24% Low-Income Pop: 2014: 40,000; 2040: 110,600 Emp: 2014: 188,700; 2040: 295,100		

For additional information on evaluation measures, see <http://soundtransit3.org/document-library>