

Streetcar

The capital cost estimates included in this document were developed for the Sound Transit 2 streetcar project between International District Station (IDS) and Aloha Street via First Hill.

The cost estimates were developed from a prototypical alignment and representative transit stations for a streetcar system between IDS and Aloha Street. The prototypical alignment was defined for the purpose of cost estimating and does not presume a preferred alignment has been selected for the corridor.

The streetcar corridor is described as follows:

Streetcar System from IDS to Aloha Street:

[N7a International District Station to John Street via First Hill](#)

[N7c Extension from John Street to Aloha Street](#)

The alignment, stations, and transit facilities for the streetcar alignment are presented in detailed project description(s) listed above.

It is anticipated that this initial alignment and cost estimating effort will be supplemented by environmental studies, alternatives analyses and additional engineering as the project advances.

ST has developed scope definitions for ST2 project proposals for the purposes of developing cost estimates, phasing of investments, a financial plan, and the estimation of project benefits. The scope definition(s) should not be construed as a commitment that all defined features will be included in the final developed project(s).

Streetcar: International District to Capitol Hill (John Street) via First Hill

Project Number	N7a
Subarea	North King
Primary Mode Impacted	Link
Facility Type	Link Service
Version Number	7.0
Date Last Modified	5/24/2007

Project Locator Map



Short Project Description

Enhance transit service connections between First Hill, the Central Link light rail line, and downtown Seattle transit hubs with new streetcar service along the Jackson Street / Broadway Avenue corridor between the International District and Broadway/John.

Project Purpose: increase regional transit accessibility to First Hill.

Cost

in Millions of 2006\$

Streetcar	Low	High
Agency Admin	\$7.0	\$8.0
Environmental Clearance and PE	\$3.3	\$3.8
Final Design, Specs, Permitting	\$8.3	\$9.5
ROW Acquisition	\$13.1	\$15.0
Construction	\$72.0	\$82.8
Vehicles	\$19.4	\$22.3
Contingency	\$6.6	\$7.6
Total	\$129.7	\$149.2

Annual O&M	\$5.2
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Design Basis

Conceptual

Environmental Documentation Required

- Environmental Impact Statement Required
- Environmental Assessment Required
- Environmental Checklist Required

Relationships to Other Projects

Relationship	Project
Complements	N7c Enhanced Transit: Streetcar Extension John Street to Aloha Street (Seattle)

Project Partners

City of Seattle DOT
King County Metro

Streetcar: International District to Capitol Hill (John Street) via First Hill

Long Description

This capital project scope, and the companion capital cost estimate, are intended to include the entire project development cycle (agency and project administration, environmental clearance, design, all aspects of property acquisition, permits, agreements, construction, testing, commissioning and contingencies) from project initiation through the start-up of the revenue operations.

This project would enhance transit service connections between First Hill, the Central Link light rail line, and downtown Seattle transit hubs with new transit service (streetcar or bus) along the Jackson Street / Broadway Avenue corridor. Streetcar service would be provided between International District Station and Capitol Hill Station via Jackson Street, 12th Ave, Boren Avenue, and Broadway and would extend as far north as John Street. An extension to Aloha Street is described in project N7c.

Project Elements Included:

- At-grade in-street streetcar generally operating in curbside street lanes in combination of mixed traffic and business access transit-only lanes
- Approximately 2.2 miles in length
- Double-track entire alignment, using a one-way couplet on Jackson / King Street
- Business access transit-only lanes on Jackson (westbound only) from 5th Ave to 12th Ave and on Broadway southbound from James Street to Terrace Street and northbound from Alder Street to Seattle Central Community College at Olive Street
- Streetcar-only lane under I-5 on King Street
- 13 streetcar stops (Seven stops are constructed as a curb bulb-out, six stops fit with existing sidewalk. Amenities include shelters, signage, lighting, seating, and real-time passenger information)
- Light maintenance and vehicle storage facility
- Removal and replacement of the top 12 to 18 inches of pavement in streetcar lanes only
- Transit signal priority at up to 13 intersections
- Transit-only signal phase at 6 intersections
- 1 percent for art per ST policy
- 10 minute peak headways, 15 minute off-peak and weekends, 20 hours per day, 7 days per week
- Skoda-type low-floor vehicles and associated traction power supply facilities including 3 substations and OCS
- One-car trains
- 6 vehicles (including 2 spares)
- Pantograph overhead power supply
- Connection to Waterfront Streetcar on 5th Avenue

Utilities:

- Relocation of major parallel water utilities (one 32" line, one 40" line)
- Relocation of overhead trolleybus wires where necessary (no poles)
- Protection and bridging for major utility crossings
- Installation of new poles for pantograph overhead power supply

Right-of-Way and Property Acquisition:

- ROW for maintenance base and vehicle storage
- Purchase of properties for widening to accommodate three 90 degree right turns at intersections
- Allowance for construction laydown area

Mitigation:

- The final project scope will include all mitigation(s) committed to by ST in pertinent, future project-level environmental documents
- Traffic mitigation during construction

Exclusions:

- Non-structural architectural and aesthetic elements in excess of the ST art program
- Replacement of displaced on-street parking
- Grade-separated pedestrian crossings
- Utility undergrounding
- Central radio communications
- Upgrading of street lighting or pavement type
- Street, sidewalk and utility upgrades or betterments not directly needed to support bus or streetcar facilities and operations
- Demolition of closed bus zones and other costs of stop consolidation
- Bus maintenance base expansion for fleet additions
- Conversion of streetcar vehicles from pantograph to trolley poles
- Additional signage at IDS or Capitol Hill light rail stations
- Other stop (station) and trackway components and amenities not specifically included
- Ticket vending machines or Smart Card readers
- Community development fund
- Third party funding

Streetcar: International District to Capitol Hill (John Street) via First Hill

Permits Required:

- Building, electrical, mechanical, utility, construction-related
- Master use
- Street use

Agreements Required:

- City of Seattle
- WSDOT agreement for undercrossing of I-5
- King County Metro

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Evaluation Measures

Measure	Measurement/ Rating: Streetcar	Notes
Average Weekday Ridership	3,000 - 3,500	
Capital Cost	\$129.7 - \$149.2	in Millions of 2006\$ (Bus in 2005\$)
Annual Operating Cost	\$5.2	in Millions of 2006\$ (Bus in 2005\$)
Travel Time & Reliability	Medium	
Connectivity & Integration	Medium	
Land Use & Development	High	
Customer Experience	Medium	
Risk Avoidance	Medium	

Key Issues and Benefits

Issues

- It is Sound Transit's policy that light rail lines are "provided primarily in separated rights-of-way with traffic signal preemption ..." (ST Long Range Plan, 07/2005). The streetcar would operate in mixed traffic with signal priority, and in transit-only lanes.
- The methodology and assumptions for the conceptual design and cost estimate are based on the example set by the Seattle DOT's South Lake Union (SLU) Streetcar Project. The capital cost estimate developed for the First Hill streetcar is based on the assumption that a similar level of stakeholder coordination and cooperation during design and construction as seen for the SLU Streetcar Project will be achieved.

Benefits

- Improves speed, reliability and capacity of transit connections between the First Hill neighborhood, downtown Seattle and Capitol Hill, in lieu of a station on the regional light rail line.
- May be a catalyst for new mixed use development in the corridor.
- Supports planning goals and policy being proposed in City of Seattle's Livable South Downtown plan.

Enhanced Transit: Streetcar Extension John Street to Aloha Street (Seattle)

Project Number	N7c
Subarea	North King
Primary Mode Impacted	Link
Facility Type	Link Service
Version Number	4.0
Date Last Modified	5/24/2007

Project Locator Map



Short Project Description

Enhance transit service connections between First Hill, the Central Link light rail line, and downtown Seattle transit hubs with extension of streetcar from John Street to Aloha street along Broadway Avenue.

Project Purpose: increase regional transit accessibility to First Hill.

Cost

in Millions of 2006\$

Streetcar	Low	High
Agency Admin	\$1.1	\$1.3
Environmental Clearance and PE	\$0.6	\$0.7
Final Design, Specs, Permitting	\$1.6	\$1.8
ROW Acquisition	\$0.0	\$0.0
Construction	\$13.6	\$15.6
Vehicles	\$3.2	\$3.7
Contingency	\$1.3	\$1.4
Total	\$21.4	\$24.6

Annual O&M	\$1.6
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Design Basis

Conceptual

Environmental Documentation Required

- Environmental Impact Statement Required
- Environmental Assessment Required
- Environmental Checklist Required

Relationships to Other Projects

Relationship	Project
Dependent on	N7a Enhanced Transit: Streetcar or Bus Connection between Downtown Seattle and Capitol Hill Station via First Hill (John Street) (Seattle)

Project Partners

City of Seattle DOT
King County Metro

Enhanced Transit: Streetcar Extension John Street to Aloha Street (Seattle)

Long Description

This capital project scope, and the companion capital cost estimate, are intended to include the entire project development cycle (agency and project administration, environmental clearance, design, all aspects of property acquisition, permits, agreements, construction, testing, commissioning and contingencies) from project initiation through the start-up of the revenue operations.

This project would extend the streetcar option in project N7a north from John Street to Aloha street along Broadway Avenue, linking north Capitol Hill to the Capitol Hill light rail station, First Hill, and south downtown Seattle regional transit connections. This project should be preceded by or implemented with project N7a.

Project Elements Included:

- At-grade in-street streetcar operating in mixed traffic
- Approximately 0.6 miles in length
- Double-track entire alignment of extension except turnback between Roy and Aloha Streets
- 3 streetcar stops (2 constructed as a curb bulb-out, 1 fit into existing sidewalk. Amenities include shelters, signage, lighting, seating, and real time passenger information)
- Removal and replacement of the top 12 to 18 inches of pavement in streetcar lanes only
- Transit signal priority at up to 5 intersections
- 1 percent for art per ST policy
- 10 minute peak headways, 15 minute off-peak and weekends, 20 hours per day, 7 days per week
- Skoda-type low-floor vehicles and associated traction power supply facilities including 1 substation and OCS
- One-car trains
- 1 vehicle
- Pantograph overhead power supply

Utilities:

- Relocation of overhead trolleybus wires where necessary
- Protection and bridging for major utility crossings where necessary
- Installation of new poles for pantograph overhead power supply

Right-of-Way and Property Acquisition:

- Miscellaneous easements

Mitigation:

- The final project scope will include all mitigation(s) committed to by ST in pertinent, future project-level environmental documents
- Traffic mitigation during construction

Exclusions:

- Non-structural architectural and aesthetic elements in excess of the ST art program
- Replacement of displaced on-street parking
- Grade-separated pedestrian crossings
- Utility undergrounding
- Central radio communications
- Upgrading of street lighting or pavement type
- Street, sidewalk and utility upgrades or betterments not directly needed to support bus or streetcar facilities and operations
- Demolition of closed bus zones and other costs of stop consolidation
- Bus maintenance base expansion for fleet additions
- Conversion of streetcar vehicles from pantograph to trolley poles
- Additional signage at IDS or Capitol Hill light rail stations
- Other stop (station) and trackway components and amenities not specifically included
- Ticket vending machines or Smart Card readers
- Community development fund
- Third party funding

Permits Required:

- Building, electrical, mechanical, utility, construction-related
- Master use
- Street use

Agreements Required:

- City of Seattle
- King County Metro

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Enhanced Transit: Streetcar Extension John Street to Aloha Street (Seattle)

Evaluation Measures

<i>Measure</i>	<i>Measurement/ Rating</i>	<i>Notes</i>
Average Weekday Ridership	500	Incremental increase over ridership estimate for IDS-John Street
Capital Cost	\$21.4 - \$24.6	in Millions of 2006\$
Annual Operating Cost	\$1.6	in Millions of 2006\$
Travel Time & Reliability	Medium	
Connectivity & Integration	Medium	
Land Use & Development	High	
Customer Experience	Medium	
Risk Avoidance	Medium	

Key Issues and Benefits

Issues

- The methodology and assumptions for the conceptual design and cost estimate are based on the example set by Seattle DOT's South Lake Union (SLU) Streetcar Project. The capital cost estimate developed for the First Hill streetcar is based on the assumption that a similar level of stakeholder coordination and cooperation during design and construction as seen for the SLU Streetcar Project will be achieved.
- Cost estimates are valid for simultaneous construction of this extension with Project N7a (First Hill Streetcar to John Street); additional costs would be encountered if extension were implemented at a later date.

Benefits

- Improves speed, reliability and capacity of transit connections between the First Hill neighborhood and Capitol Hill.
- Enhances service between North Capitol Hill and University Link station at John Street.