

# Link LRT: Extension from University of Washington Station to Northgate (Seattle)

<b>Project Number</b>	N6
<b>Subarea</b>	North King
<b>Primary Mode Impacted</b>	Link
<b>Facility Type</b>	Link Service
<b>Version Number</b>	6.0
<b>Date Last Modified</b>	4/24/2008

*Project Locator Map*



## Short Project Description

Construct a 4.3-mile extension of Link light rail from the UW station to Northgate, including stations at the University District (Brooklyn), Roosevelt and Northgate.

**Project Purpose:** to continue expansion of the regional light rail system.

## Cost in Millions of 2007\$

	Low	High
Agency Admin	\$85.5	\$94.1
Environmental Clearance and PE	\$0*	\$0*
Final Design, Specs, Permitting	\$75.9	\$83.5
ROW Acquisition	\$169.0	\$185.9
Construction	\$698.9	\$768.8
Vehicles**	\$0.0	\$0.0
Contingency	\$275.3	\$302.8
<b>Total</b>	<b>\$1,304.6</b>	<b>\$1,435.1</b>

\* Already funded

Annual O&M**	N/A
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\*\* Included in LRT maintenance base, vehicles and operations project (SYS-LRT)

## Design Basis Preliminary Eng

### Environmental Documentation Required

- Environmental Impact Statement Completed, April 2006
- Environmental Assessment Required
- Environmental Checklist Required

### Relationships to Other Projects

Relationship	Project
Dependent on	Completion of Link extension from Downtown Seattle to UW station

### Project Partners

City of Seattle - SDOT, Seattle City Light, Seattle Public Utilities
University of Washington
WSDOT
King County Metro

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## 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.*

### **Description:**

This project would construct an extension of Link light rail from the UW station to Northgate, including stations at the University District (Brooklyn), Roosevelt and Northgate, to continue expansion of the regional light rail system. The information below was derived from the "North Link Advanced Conceptual Engineering / Preliminary Engineering Design Report," dated May 2005. For more detailed information on this project, refer to the Design Report, FEIS (April 2006) and/or Record of Decision (June 2006)

### **Project Elements Included:**

- 22,700 feet (4.3 miles) of light rail in a mix of tunnels, retained cut and cut-and-cover tunnel construction, and elevated guideway.
- 3 stations at Brooklyn, Roosevelt, and Northgate, sized to accommodate 4-car trains.
- Central Link maintenance base expansion.
- 1 percent for art per ST policy

### Alignment

#### *UW Stadium to Brooklyn*

North of UW Station, the TBM tunnels cross beneath Montlake Boulevard and continue under campus, passing under or close to several UW buildings, to the west edge of campus at 15th Avenue NE. West of 15th Avenue NE, the route leads north beneath Brooklyn Avenue to an underground Brooklyn Station located south of NE 45th Street and continues north beneath Brooklyn Avenue. North of NE 50th Street, the alignment shifts to the west and then passes beneath NE Ravenna Boulevard and continues north generally west of and parallel to 12th Avenue NE.

#### *Brooklyn to Northgate*

The alignment continues north along the west side of 12th Avenue NE to the underground Roosevelt Station located between NE 65th Street and NE 68th Street. The alignment turns to the west near NE 68th Street and then rises, transitioning from a TBM tunnel to existing grade at the North Portal structure within the I-5 right-of-way near NE 75th Street north of the Lake City Way interchange. The alignment continues north within the I-5 right-of-way in retained cut structures and cut-and-cover tunnels, passing east of the existing bridge structures at 5th Avenue NE, NE 80th Street and NE 92nd Street. Near NE 95th Street, the alignment transitions to a retained fill structure and then to an elevated guideway and double track crossover. The guideway crosses over 1st Avenue NE and continues along the east side of 1st Avenue NE to an elevated Northgate Station spanning NE 103rd Street. Two 400-foot-long elevated tail tracks and one 400-foot-long elevated pocket track are located north of the station platform in the parking lot of the Northgate Mall.

At-grade traction power substation and signal facilities are located along the I-5 corridor near NE 85th Street and NE 95th Street.

### Stations

#### *Brooklyn Station*

The Brooklyn Station has a two-track, 28-foot-wide center platform located beneath Brooklyn Avenue immediately south of NE 45th Street at an average depth of approximately 75 feet below street grade. The station is served by two entrances. The north entrance is adjacent to the Safeco Tower near the southwest corner of the intersection of Brooklyn Avenue and NE 45th Street. The south entrance is located along the east side of Brooklyn Avenue north of NE 43rd Street. Entrances include elevators, escalators and stairs leading to the station platform. Emergency exits and ventilation shafts for emergency tunnel ventilation fans are located near each station entrance. The vent at the north end of the platform is located on the east side of Brooklyn Avenue south of the Neptune Theatre. The Brooklyn Station will be built using cut-and-cover construction. The width of the station structure is approximately 70-feet-wide and will occupy most of the street right-of-way. The station structure is sited to avoid right-of-way impacts to the Safeco Tower. (Sound Transit will reconsider the location of this station given conflicts with recent Safeco development plans at this location.)

#### *Roosevelt Station*

The Roosevelt Station is located west of 12th Avenue NE between NE 65th and NE 68th Streets and consists of a two track, 28-ft-wide center platform with two station entrances; one entrance in the northwest quadrant of the intersection of NE 65th Street and 12th Avenue NE and a second entrance in the southwest quadrant of the intersection of NE 67th Street and 12th Avenue NE. Elevators, escalators and stairs lead from the south entrances to the platform, approximately 80 feet below grade. The north station entrance provides stairs, two elevators and a mezzanine that could accommodate the future design and construction of escalators. The above-ground station buildings include ventilation shafts, bike storage and emergency stairs. The Roosevelt Station will be built using cut-and-cover construction. The station site will also be used during construction for the removal of tunnel spoils created by tunnel boring machines.

#### *Northgate Station*

Northgate Station is configured as an elevated two-track, 30-foot-wide, center-platform station located east of 1st Avenue NE and spanning NE 103rd Street with station entrances located north and south of NE 103rd Street. The north station entrance is located at Northgate Mall and the south station entrance at the King County Metro Transit Center. Access to the platform from the south entrance is made via a mezzanine.

# Link LRT: Extension from University of Washington Station to Northgate (Seattle)

## Other Major Project Elements

### *North Portal near NE 75th Street, Fan Room and Unit Substation*

Preliminary engineering provides for jet fans and a unit substation within the I-5 right-of-way at the tunnel portal near NE 75th Street. The unit substation and headhouse access structure are sited above the portal. Access to the portal area will be required for construction, transit operations and emergency vehicles and may be provided from either the I-5 mainline roadway or ramps or from city streets. Provision for both construction and permanent access will require coordination with WSDOT, FHWA and the City of Seattle during final design.

### *Traction Power Substation near NE 85th Street*

A traction power substation (TPSS) is located above the running tunnel within the WSDOT right-of-way at NE 85th Street. The TPSS structure also houses a unit substation for the jet fans that are provided for the cut-and-cover tunnel segments. Access to the traction power substation will be made via NE 85th Street.

### *Traction Power Substation near the Northgate Station Crossover*

A traction power substation and signal bungalow serving the elevated Northgate station and crossover is located within the WSDOT right-of-way south of NE 100th Street. The TPSS is sited at-grade and below the LRT guideway structure and west of 1st Avenue NE. Access to the traction power substation facilities will be made from 1st Avenue NE via the driveway serving the WSDOT-owned Park and Ride lot that is currently leased and operated by King County Metro.

### *Maintenance Base Expansion*

It is anticipated that the maintenance base under construction in the Initial Segment will be expanded to provide for the increased light rail fleet required to operate North Link. Design of the civil, track, facilities, and systems work to accommodate the increased fleet size will be developed during final design. The expansion will include construction of the deferred maintenance-of-way building.

## **Utilities:**

### Drainage

Construction of the North Link light rail guideway, structures and traction power substations will result in new impervious areas. Storm water drainage resulting from the impervious areas created by the North Link construction must be collected and conveyed to drainage facilities. The primary drainage considered for the alignment is the drainage of storm water collected on the guideway at retained and elevated structures. Appendix A of the Design Report references a memorandum entitled North Link Conceptual Stormwater Drainage Design [CIN 2200-0503-1286] which summarizes the work completed and technical considerations for advancing the design of the storm water drainage facilities. This memo presents the initial drainage assessment, describes the requirements for conveyance and detention, and identifies alternate drainage design concepts for advancing the design. Drainage design for stations and transit facilities will be addressed during final design. Construction staging areas will be restored to the existing surface conditions and will not result in new additional impervious areas. The Final Designer will need to coordinate the design of the stormwater management facilities through the City of Seattle, King County and WSDOT.

### Other Utilities

The composite utility base plans were prepared in 2004-2005 based on information obtained from various sources during the preliminary engineering phase. No utility survey, test pits or pot holes were prepared as part of the utility investigations for North Link. Field survey, test pits and potholing of utilities will be required during the final design phase to prepare the utility design. Meetings were held with the utility agencies during preliminary design to identify potential utility impacts and discuss required utility mitigations. Agency comments have been incorporated into the Utility disposition drawings and are described in a technical memorandum entitled North Link Utilities Inventory and Disposition Report [CIN 2200-0505-1366] identified in Appendix A. Preliminary utility composite drawings and utility disposition drawings will be sent to the various agencies affected by the LRT alignment for review. The Final Designer will address utility owner review comments and prepare the final utility relocation plans that will meet the approval of the agencies involved.

The Final Designer will be required to address the following issues:

- Impact of stray current on existing water lines and other ferrous utilities.
- Overhead electric lines will be relocated by Seattle City Light. The decision to relocate overhead electric lines in-kind or to underground will be made before Final Design starts.
- Storm water quality/detention.
- Coordinate fire hydrant locations with the City of Seattle.
- Continue discussion with the individual utility agencies to confirm final disposition of utilities.
- Prepare utility relocation plans in coordination with affected utility agencies.

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**Right-of-Way and Property Acquisition:**  
 Final Design will confirm the right-of-way requirements and prepare right-of-way plans for all property acquisitions, temporary and permanent easements necessary for construction and operation of North Link light rail.

**Mitigation:**  
 The potential impacts of the Link Light Rail system are described in the FEIS along with proposed mitigation measures for system wide impacts. The Final Designer shall refer to the FEIS to put in application all the aspects of this mitigation relevant to this segment. For other impacts more specific to this project, special mitigation will be provided for construction noise, vibration mitigation, electromagnetic interference mitigation, ecosystems mitigation, and water resources.

**Exclusions:**

- Anything not included in the project definition in the design report
- Community development fund

**Permits Required:**

- building, electrical, mechanical, utility, construction-related

**Agreements Required:**

- WSDOT
- City of Seattle - SDOT, Seattle City Light, Seattle Public Utilities
- King County Metro
- University of Washington

*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. This scope definition should not be construed as a commitment that all defined features will be included in the final developed project.*

## Evaluation Measures

<b>Measure</b>	<b>Measurement/ Rating</b>	<b>Notes</b>
Average Weekday Ridership	N/A	See light rail system ridership estimates
Capital Cost	\$1304.6 - \$1435.1	in Millions of 2007\$
Annual Operating Cost	N/A	See LRT maintenance base, vehicles and operations project (SYS-LRT)
Travel Time & Reliability	High	
Connectivity & Integration	High	
Land Use & Development	High	
Customer Experience	High	
Risk Avoidance	Low	

## Key Issues and Benefits

Issues

- Necessary agreements with the University of Washington have not yet been finalized.

Benefits

- Completes the top priority of the Sound Transit Board expressed in the 1996 Sound Move plan.
- This project has the single highest ridership benefit of any candidate ST2 investment.
- Connects the Northgate designated urban center with the University District, Capitol Hill, Seattle CBD and SeaTac designated urban centers.
- Significantly improves speed and reliability of transit service between Northgate and the University District, Capitol Hill, and downtown Seattle.
- Provides opportunities to restructure bus services, producing savings that could be reinvested elsewhere in the transit system.