

The Seattle Department of Transportation
Roosevelt to Downtown HCT Study

CORRIDOR CONCEPT FINAL REPORT

August 2017





SEATTLE DEPARTMENT OF TRANSPORTATION

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CHAPTER 1

BACKGROUND

The Roosevelt to Downtown High Capacity Transit (RDHCT) Study represents the Seattle Department of Transportation’s (SDOT) project definition phase and its purpose is to identify how to best provide high capacity transit (HCT) service along this corridor. The Roosevelt to Downtown Corridor is one of seven RapidRide corridors funded through the Levy to Move Seattle. They will form the Seattle RapidRide Expansion Network.

This report describes the recommended corridor concept, including the technical background and analysis. The specific analysis assumptions, data, outputs, and recommendations are included in the following documents:

- Mode Analysis Report
- Transit Operating Plan
- Capital Costs
- Traffic Operations Plan
- Multimodal Traffic Analysis Report
- Public Involvement Report

- 10% Conceptual Design
- Project Commitments
- Descriptive Scope of Work
- Decision Memo

PLANNING PROCESS

The RDHCT planning process, shown in Figure 1, included an existing conditions analysis as well as examination of HCT options for mode, alignment, and treatments for transit and bikes. This process culminated in a Recommended Corridor Concept, including 10% design. Technical analysis and cost estimates were developed for the initial design options as well as the final Recommended Corridor Concept. Next steps will involve detailed design, environmental clearance, and construction for a 2021 opening to coincide with the U District, Roosevelt, and Northgate Link stations. The planning process also included three rounds of outreach, shown in Figure 1.

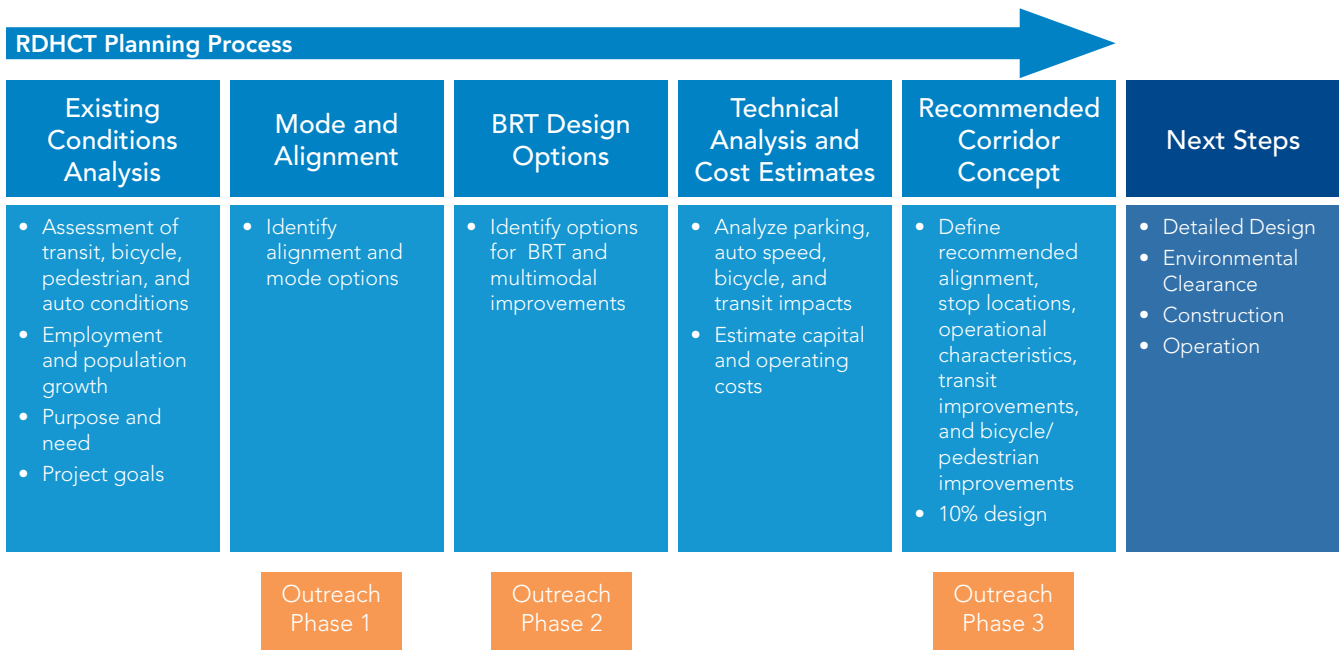


FIGURE 1: RDHCT PROCESS

CORRIDOR DESCRIPTION

For this study the Roosevelt to Downtown Corridor extends from the Northgate Transit Center, south along 5th Avenue NE, the Roosevelt Way NE/11th Avenue NE/12th Avenue NE couplet, Eastlake Avenue E, Fairview Avenue N, the Virginia Street/Stewart Street couplet, and ending at 3rd Avenue and Stewart Street, as shown in Figure 2. RapidRide service along the corridor is expected to extend south of the Westlake Station along the 3rd Avenue Transit Corridor. Analysis for this corridor included multiple alignment options (see Alignment Options section), and it is recommended that Phase 1 of this project extend to NE 67th Street in the north, with a potential future phase serving the Northgate Transit Center. The corridor concept and analysis reflects this recommendation.

The corridor is 5.5 miles in length and passes through several neighborhoods, connecting entertainment and retail destinations, schools and universities including the University of Washington, and several major medical facilities including the Virginia Mason Medical Center and the University of Washington Medical Center. This corridor will connect two urban centers that are experiencing substantial growth—the University District and South Lake Union—with Downtown Seattle.

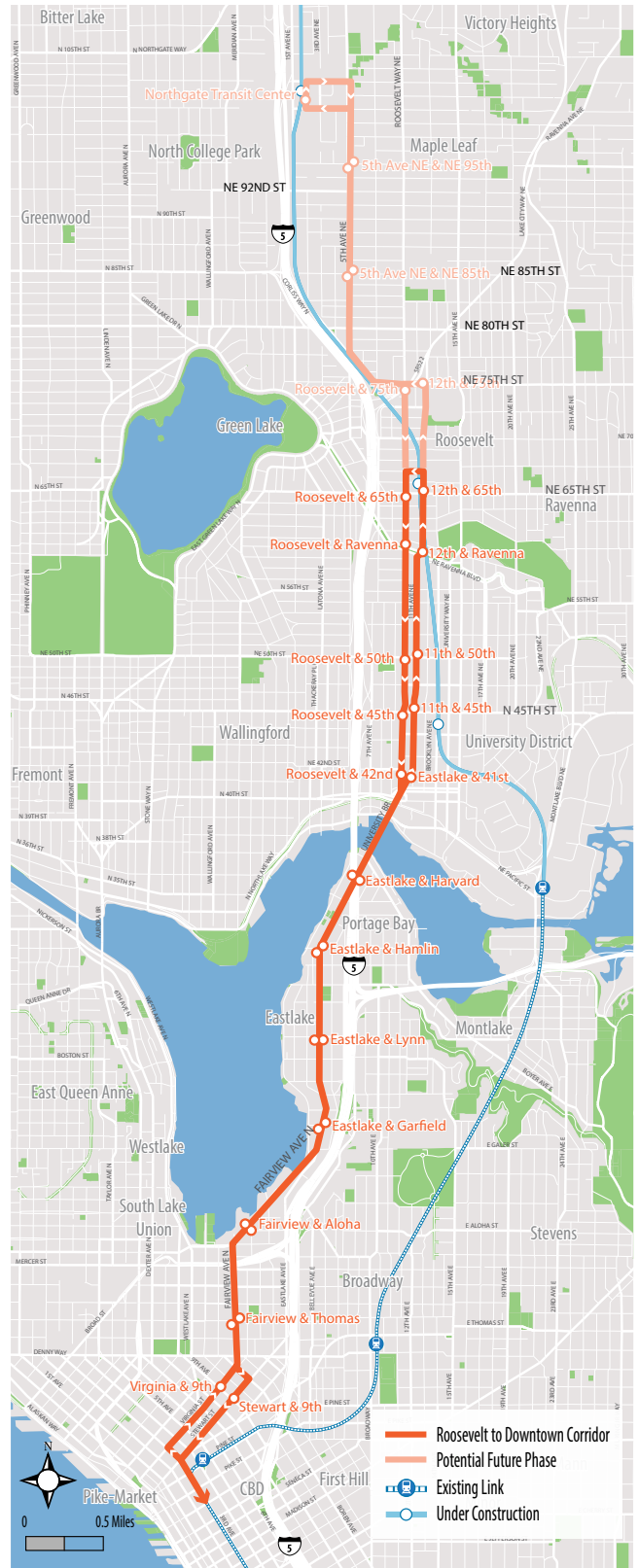


FIGURE 2: RDHCT CORRIDOR

POLICY FRAMEWORK

In April 2012, the Seattle City Council adopted the Transit Master Plan (TMP), which provides a long-range vision for the future of transit in Seattle.

SDOT conducted the RDHCT study to further evaluate HCT options and provide a recommended concept for the Roosevelt to Downtown Corridor. SDOT's definition of HCT includes both rail and rubber-tired transit modes that can operate in exclusive right-of-way or in mixed traffic along with improved or enhanced roadway geometry, traffic signal timing, and vehicle and station amenities. Per the TMP definitions, the mode for HCT can be either Rapid Streetcar (RSC) or Bus Rapid Transit (BRT). BRT was selected as the preferred HCT mode as detailed in the following section and confirmed in the TMP update.

In Spring 2015, *Move Seattle: Mayor Edward B. Murray's 10-Year Strategic Vision for Transportation* was released. The RDHCT was identified in this document along with other Seattle RapidRide network corridors. Then, in November 2015 voters passed The Levy to Move Seattle, which also included the RDHCT corridor as a proposed project. In February 2016 the Seattle City Council adopted an update to the TMP, which described the seven new RapidRide corridors.

In addition to the TMP, a number of plans and studies prepared by SDOT and other agencies were identified and reviewed for relevant information to this corridor study, including the following:

- Seattle Comprehensive Plan
- Bicycle Master Plan
- Pedestrian Master Plan
- South Lake Union Neighborhood Rezone
- U District Urban Design Framework
- Northgate Urban Center Framework
- Sound Transit University Link Extension
- Sound Transit Northgate Link Extension
- Roosevelt Way NE Paving and Safety Improvements Project

Additional detail on the plans and projects described here and their relevance to the RDHCT project is provided in the RDHCT Multimodal Traffic Analysis Report.

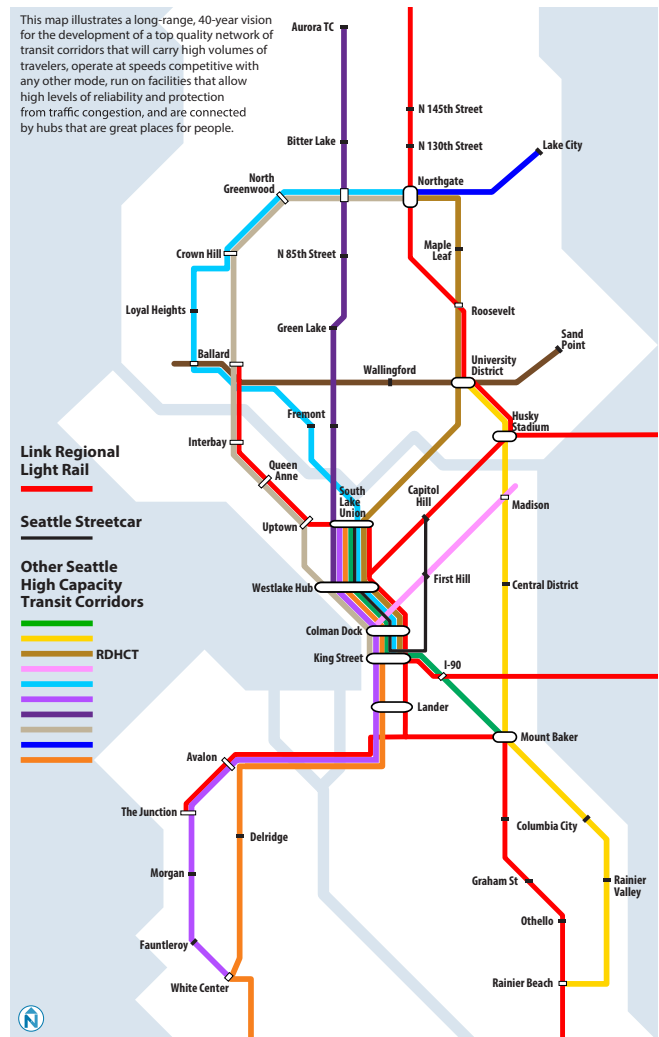


FIGURE 3: SEATTLE LONG-RANGE HIGH CAPACITY TRANSIT VISION (TMP, AMENDED 2016)

PROJECT PURPOSE AND NEED

The project purpose and need identifies the overall need for high capacity transit in the corridor and guides the development and evaluation of potential improvements. The project purpose and need was developed based on findings from the Transit Master Plan, existing conditions, and public input. The project purpose and need is comprised of a series of distinct statements that address issues along the corridor, and include the following:

- **Improve Transit Service** Provide high capacity transit service that is fast, reliable, comfortable, and easy to use to replace existing crowded, unreliable, and slow service along the Roosevelt to Downtown corridor
- **Improve Conditions for People Biking and Walking** Develop streetscape enhancements to existing pedestrian and bicycle facilities, including smooth sidewalks, ADA-compliant curb ramps, and improve the bicycle network, to promote access, circulation, and safety
- **Meet Transit Mode Share Goals** Provide high capacity transit service to support the transit mode share goals defined in the Seattle Comprehensive Plan
- **Strengthen the North-South Connection** Strengthen the north-south connections to the regional transit system, including future Link light rail stations, to improve livability and support growth in the Northgate, Maple Leaf, Roosevelt, U District, Eastlake, South Lake Union, and Downtown neighborhoods
- **Serve Growing Population and Employment Centers** Connect residential developments, especially moderate income housing in the Roosevelt, U District, and Eastlake neighborhoods, to new major technology employment and medical service centers, in South Lake Union, U District, and Downtown Seattle

CHAPTER 2 STUDY AREA

The study area (Figure 4) for the existing conditions analysis extends from Stewart Street and 3rd Avenue north to the Northgate Transit Center (see Figure 4). Existing conditions presented reflect analysis that was conducted in 2015 and includes an option for the South Lake Union Alignment (also described in Route Alignment Options section in Chapter 3). The north terminus for the purpose of the final corridor concept is the Roosevelt Link Station (NE 65th Street) with an assumed turn-around and layover extending to NE 67th Street.

JOBS AND POPULATION

The study area has several residential, employment, and activity centers in Seattle. According to 2013 U.S. Census data, the study area has a population of more than 83,000 people and there are 169,710 primary jobs within the Roosevelt to Downtown Corridor, which is 36 percent of the total jobs in the City of Seattle. The Downtown to Roosevelt Corridor includes land uses that are more high-density residential and more commercial than the City of Seattle overall. Jobs are concentrated in the far southern portion of the corridor, within and near South Lake Union and Downtown, and the central portion of the corridor near the U District.



FIGURE 4: EXISTING CONDITIONS STUDY AREA

Three of the city's urban centers (South Lake Union, U District, and Northgate) and two urban villages (East Lake and Roosevelt) would be connected along the Roosevelt to Downtown Corridor if the corridor were extended to the Northgate Transit Center. As shown in Figure 5, the three urban centers are identified as areas of employment and residential growth, including up to 21,000 new households and 36,000 new jobs based on planning documents for these areas. A description of population and employment growth in these plans is provided below.

- South Lake Union Neighborhood Rezone: The incentive zoning program will provide affordable housing and new infrastructure investment, including roads, sidewalks, and other neighborhood amenities. This will support growth of 12,000 households and 22,000 jobs over the next 20 years.
- U District Urban Design Framework: The city published the Final Environmental Impact Statement (EIS) in January 2015. Based on the EIS, the estimated growth resulting from this proposal would be 5,000 new households and 4,800 new jobs by 2035.
- Northgate Urban Center Rezone: According to the FEIS published in December 2009, the estimated growth for Northgate Urban Center Rezone alternatives would vary between 1,000 and 4,000 new households, and between 900 and 10,000 new jobs by 2030.

The current corridor as recommended would connect the South Lake Union and U District urban centers and the Roosevelt neighborhood to Downtown Seattle.



FIGURE 5: JOBS AND POPULATION

Jobs and Population

Existing

	1/2 -mile of Corridor	City of Seattle
Population	83,920	624,681
Jobs	169,710	469,566

Source: 2013 American Community Survey (5-year estimates)

Future Growth

Three urban centers, Northgate, U District, and South Lake Union, are identified as areas of employment and residential growth, including up to 21,000 new households and 36,000 new jobs (growth projections for the year 2030-2035).

TRANSIT

When analysis was conducted in 2015, three Metro bus routes operated along portions of the corridor: Routes 66 (Express), 67, and 70. Route 67 travelled from Northgate Transit Center to Roosevelt to the U District (see Figure 6). Route 70 travelled from the U District to Eastlake to Downtown Seattle. Route 66 was discontinued in Spring 2016 and ran express service throughout the corridor. The combined frequency along the corridor is 5 to 10 minutes during weekday peak periods. Bus speeds are 50 percent slower than those for general traffic. Buses make frequent stops to board/alight passengers, and have physical limitations when driving in congested traffic. Buses also experience long dwell times at stops due to slow passenger boarding or passenger payment procedures.

Transit

- Transit Peak Hour Speed:**
 - 7.0 mph
- Reliability:**
 - *On-time performance of transit is below 70% for routes 66 and 70 during the morning or evening peaks*
- Overcrowding:**
 - *Occurs on 32% of trips throughout the day and 63% of trips in the morning peak*
- Average Weekday Ridership (Existing King County Metro routes 66, 67, & 70):**
 - *Total - 8,270 daily riders*

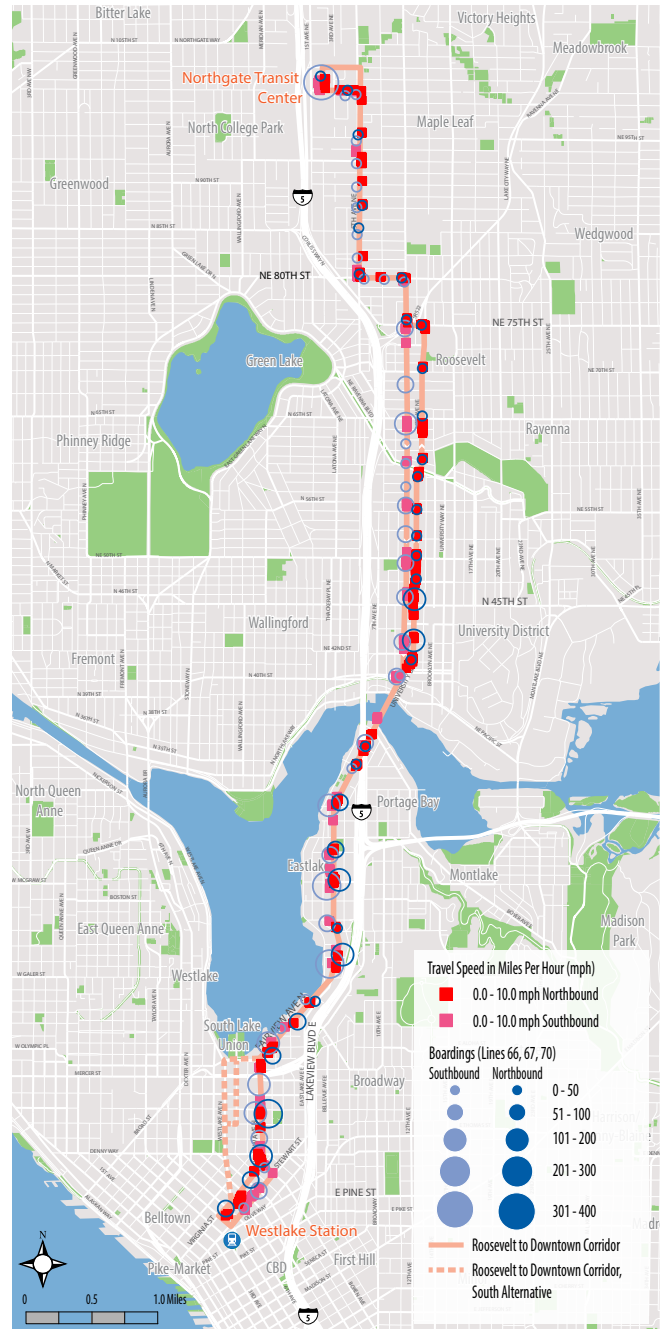


FIGURE 6: TRANSIT CONDITIONS

BICYCLE AND PEDESTRIAN SAFETY

Most segments along the corridor have sidewalks on both sides of the street as well as planting strips between the sidewalk and curb. There are locations with missing sidewalks as well as sidewalk conditions with cracking and raised unevenness. While bicycle facilities are provided on certain portions of the corridor, there is a need for a continuous bicycle network. There are several locations with higher than average bicycle and pedestrian collisions (Figure 7).

Bicycle and Pedestrian Safety

Pedestrian Network

- Missing sidewalk at six locations along corridor
- Fair or poor sidewalk conditions along portions of Roosevelt Way NE, 11th Avenue NE, and Eastlake Avenue E.

High Pedestrian Collisions:

- Roosevelt Way NE and NE 45th Street
- Denny Way and Fairview Avenue
- 12th Avenue NE and NE 75th Street
- Roosevelt Way NE and NE 65th Street

Bicycle Network:

- Need for continuous network

High Bicycle Collisions:

- Eastlake Avenue E and Fuhrman Avenue E
- 11th Avenue NE and NE 45th Street
- Eastlake Avenue E between Harvard Avenue E and Fuhrman Avenue E
- Roosevelt Way NE and NE 66th Street
- Eastlake Avenue E and E Edgar Street

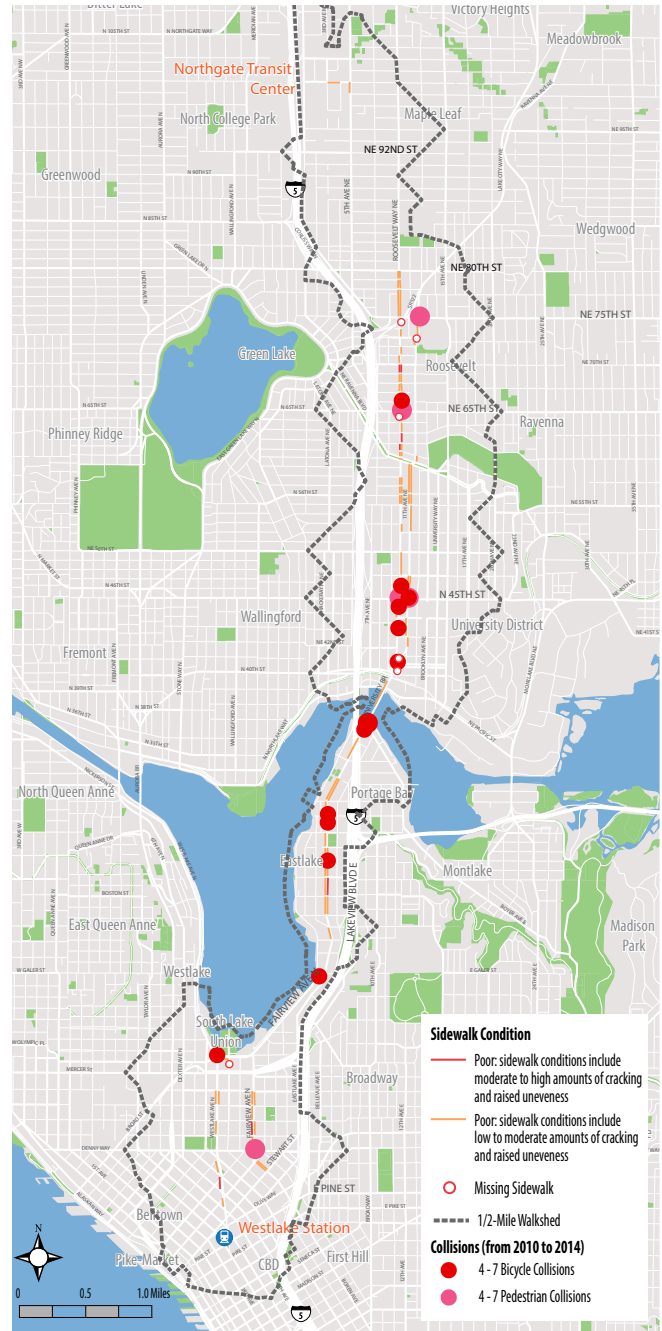


FIGURE 7: BICYCLE AND PEDESTRIAN CONDITIONS

TRAFFIC

There are 63 signalized intersections along the corridor between Stewart Street and 3rd Avenue and the Northgate Transit Center. Traffic and congestion are present at some intersections, including on Roosevelt Way NE, 11th Avenue NE/12th Avenue NE, Eastlake Avenue E, Fairview Avenue N, Virginia Street, and Mercer Street (Figure 8). Congestion at these locations not only impacts general traffic, but also bus speeds.

Traffic

Northgate:

- All intersections operate at LOS D or better

Roosevelt and University:

- Roosevelt Way NE & NE 65th Street: LOS E (AM and PM)
- 12th Avenue NE & NE 65th Street: LOS E (PM)
- Roosevelt Way NE & NE 45th Street: LOS E (AM)
- All other intersections operate at LOS D or better

Eastlake:

- Fairview Avenue N and Fuhrman Avenue E: LOS E (PM)
- All other intersections operate at LOS D or better

Downtown and South Lake Union:

- Valley Street and Westlake Avenue: LOS E (AM and PM)
- Mercer Street and Westlake Avenue: LOS E (AM and PM)
- Valley Street and Fairview Avenue: LOS F (AM) and LOS E (PM)
- Mercer Street and Fairview Avenue: LOS F (AM) and LOS E (PM)
- All other intersections operate at LOS D or better



FIGURE 8: TRAFFIC CONDITIONS

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CHAPTER 3

DESIGN OPTIONS AND EVALUATION

Screening of options for the Roosevelt to Downtown Corridor included mode options, route alignment options, and level of investment for HCT design options. The routing and design of bicycle facilities was ongoing during the project planning process and coincided with design of transit facilities.

MODE

In the 2012 TMP, rapid streetcar was identified as the mode for this corridor. The TMP also recommended that the mode be validated during the planning phase. As such, the mode analysis was completed as an early task of the RDHCT study.

Two mode alternatives were considered for providing HCT along the Roosevelt to Downtown Corridor: Bus Rapid Transit (BRT) or Rapid Streetcar (RSC). These two alternatives were analyzed in the Mode Alternatives

Memo prepared in October of 2015. As shown in Table 1, the analysis revealed that RSC held advantages for three variables, while BRT had advantages in the remaining eight. Concerning the two variables rated as being of very high importance, RSC had an advantage with ridership while BRT had an advantage in costs. Even though both RSC and BRT are viable for the corridor, BRT was selected as the preferred mode due to its advantages in more variable categories and minimal disadvantage in others. The 2016 amendment of the TMP identified the Roosevelt to Downtown Corridor as one of Seattle’s seven RapidRide corridors, confirming BRT as the preferred mode. A detailed version of this analysis is available in the RDHCT Mode Analysis Report.

TABLE 1: SUMMARY OF MODE OPTIONS ANALYSIS

Criteria	BRT Unique Advantage	Rapid Street Car Unique Advantage	Importance	Overall Advantage
Vehicles	More availability and increased flexibility	Higher capacity	Medium	Max BRT
Fuel/Power	Brief ‘off-track’ use possible	N/A	Low	Min BRT
Stations	Higher service interoperability	N/A	High	Max BRT
Service	Greater frequency, reliability, and flexibility	Higher passenger capacity	High	Min BRT
Ridership	N/A	Higher expected ridership	Very High	Max RSC
Transit Experience	N/A	Greater comfort	Medium	Min RSC
Impacts to Other Modes	Greater interoperability with existing modes	Less wear on pavement	Medium	Min BRT
Project Phasing	Smaller minimum segments	N/A	Medium	Max BRT
Construction	Simpler construction	N/A	Medium	Max BRT
Land Use	Less exterior noise and vibration	May spur greater development	High	Min RSC
Costs	Significantly lower capital costs	Slightly lower operating costs	Very High	Max BRT

ROUTE ALIGNMENT

The route alignment options include South Lake Union alignment, the Northgate extension, and the southern extension into Downtown Seattle, as shown in Figure 9.

HCT service along this corridor will extend south of Westlake Station with routing in Downtown to be determined by the One Center City planning process. For the purposes of planning and analysis, it is assumed the RDHCT service travels through Downtown along 3rd Avenue to the Pioneer Square area, ultimately terminating on S Main Street between 3rd Avenue and 4th Avenue. This segment was included in ridership and operations planning, but infrastructure improvements are not included in this study.

South Lake Union

For the southern segment of the corridor, between the Westlake Hub and the current South Lake Union Streetcar terminus, the 2012 TMP identified the following two potential alignments:

- Westlake Avenue N: Westlake Avenue N and Valley Street
- Fairview Avenue N: Fairview Avenue N and Stewart Street/Virginia Street

The two alignment options were evaluated based on existing transit planning projects that could impact service, access, and connections.

Three high frequency routes already use Westlake Avenue N, including the South Lake Union Streetcar, RapidRide C, and Route 40. Potential capacity issues were cited and for this reason, the Fairview Avenue N alignment was recommended as the preferred route.

Northgate Extension

The northern terminus for the Roosevelt to Downtown Corridor was initially recommended to be located at NE 65th Street, adjacent to the Roosevelt Link Station. However, SDOT decided to also study an extension of the corridor to the Northgate Transit Center, where future population and job growth and a Link Station are planned and as recommended in the 2012 TMP. This potential extension or future phase is assumed to travel along Roosevelt/12th Avenue NE to NE 75th Street to Banner Way NE to 5th Avenue NE. Along 5th Avenue NE

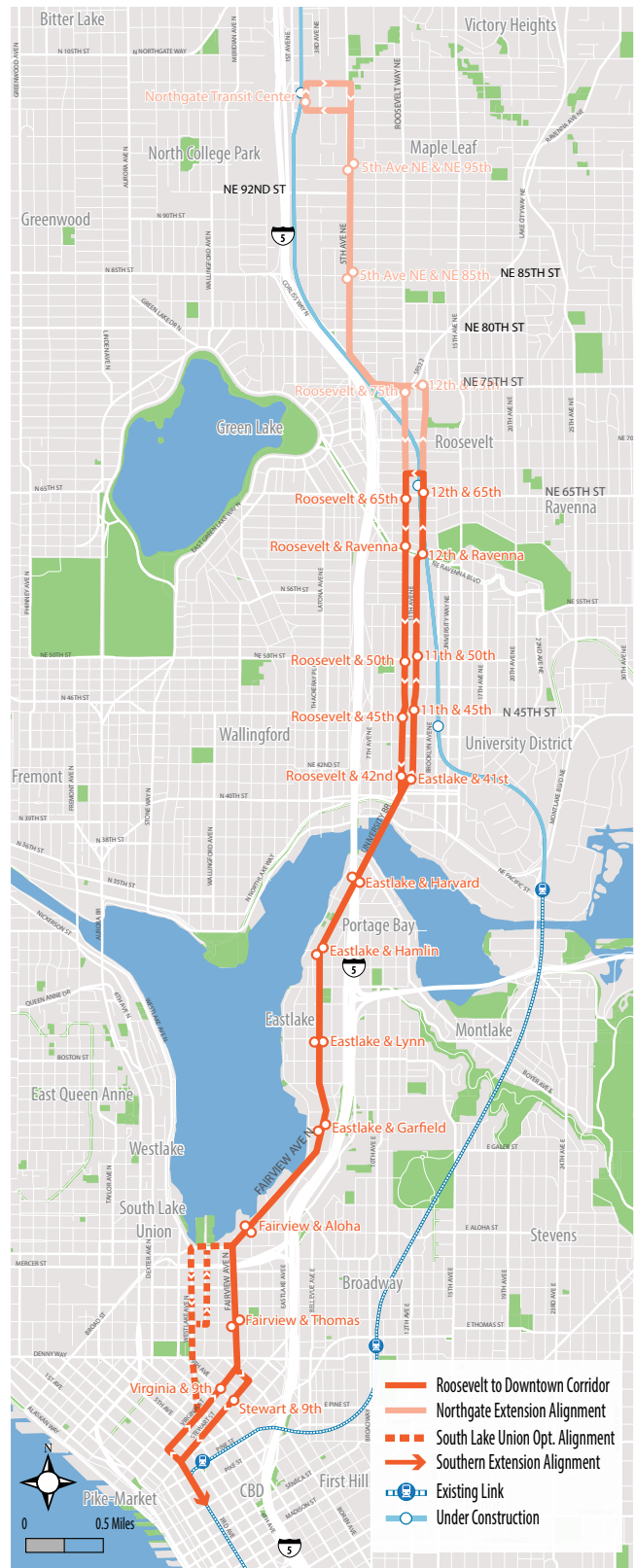


FIGURE 9: ROUTE ALIGNMENT OPTIONS

the route will use NE 100th Street and NE 103rd Street to connect to the Northgate Transit Center. The capital costs to extend catenary to the Northgate Transit Center, where no existing catenary infrastructure exists, is cost prohibitive. Thus, it is recommended that the preferred northern terminus of the RDHCT project be NE 67th Street (northernmost station at NE 65th Street), with consideration of a future phase serving the Northgate Transit Center and connecting the Maple Leaf and Northgate neighborhoods.

LEVEL OF BRT

Three HCT design options were identified based on three levels of BRT investment:

- RapidRide**
 Branded RapidRide service with consolidated stops, improved stations with off-board fare payment, pedestrian improvements near stations, and transit signal priority
- Targeted Investments**
 RapidRide service with additional transit priority treatments, such as queue jump lanes and transit-only lanes at select, high priority locations and bicycle facility investments
- Full BRT**
 Service with center-running and side-running transit-only lanes along the entire length of the corridor

Table 2 shows characteristics included in each of the HCT design options. Estimated costs proved to vary widely between the options.

The Targeted Investments approach is recommended as the cost is more consistent with the planning level budget identified in Move Seattle, the City's 10-year strategic transportation vision. It also addresses right-of-way limitations along the corridor.

Initial consideration of design included concepts for side-running or center-running transit-only lanes. Both were presented as possible alignments for the Full BRT option, with center identified as initially preferred due to fewer right turn vehicle conflicts, fewer bicycle conflicts, and shared platform opportunities for northbound and southbound service.

However, side-running design was selected for the RapidRide and Targeted Investments options because it provided consistency with existing RapidRide service, enabled existing transit to use transit stations, and right-door buses were preferred for better interoperability with other routes.

TABLE 2: TRANSIT CHARACTERISTICS COMPARISON

Characteristics	RapidRide	Targeted Investments	Full BRT
Stop Consolidation	✓	✓	✓
Curb-running service with right-door loading articulated vehicles	✓	✓	
Maximize center-running service with articulated vehicles			✓
Potential for left-door loading vehicles			✓
Transit signal priority and communications	✓	✓	✓
Enhanced stations with shelters, off-board fare collection, real time arrival information, lighting and level boarding	✓	✓	✓
Station area pedestrian enhancements	✓	✓	✓
Corridorwide pedestrian facility improvements		✓	✓
Corridorwide bicycle facility improvements		✓	✓
Minor roadway geometric changes that may include use of queue jump, business access and transit lanes, or dedicated transit lanes		✓	✓
Limited/targeted parking and access modifications		✓	
Significant parking and access modifications			✓
Redistribution of curb-to-curb or ROW width allocation by travel mode		✓	✓

BICYCLE FACILITIES

Route options were considered both on corridor and off corridor and ultimately, the bicycle facilities recommended for implementation with this project provide continuous protected bike lanes and other options for bicyclists who are more comfortable riding with traffic. Additional details are available in the RDHCT Bicycle Decision Memo.

The RDHCT recommended bicycle facilities must be all ages and abilities. In some segments, a commuter facility using sharrows or minor in-lane separation is maintained or added, while the all ages and abilities facility is off corridor on a parallel street. This is the case in South Lake Union.

An on corridor bicycle facility will be built as part of RDHCT between Fairview Avenue and Valley Street intersection and the Roosevelt Link Station. The remainder of the all ages and abilities facility will be off corridor and provided through planned projects identified in the Implementation Plan for the Bicycle Master Plan and connecting to the 2nd Avenue protected bicycle lanes. A more detailed description of the RDHCT corridor bicycle facilities can be found in Chapter 4.

The design concepts shown for the portion of the corridor north of NE 65th Street through the Maple Leaf and Northgate neighborhoods will be refined and validated as part of the potential future phase conceptual design process.

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CHAPTER 4

RECOMMENDED CORRIDOR CONCEPT

This section describes the Recommended Corridor Concept for RapidRide service along the Roosevelt to Downtown High Capacity Transit Corridor, including alignment, station locations, transit priority, targeted improvements, and operating characteristics. This section also includes early implementation improvements and project phasing recommendations.

ALIGNMENT AND STATIONS

The RDHCT Recommended Corridor Concept alignment and stations are illustrated in Figure 10. The recommended study corridor is 5.5 miles in length, extending from 3rd Avenue and Stewart Street in Downtown to Roosevelt Way NE and NE 67th Street. While outside of the study area for the RDHCT study, RapidRide service will extend into Downtown with a path determined through the One Center City planning process. With future phasing the route may also extend past NE 67th Street to the Northgate Transit Center.

Described from south to north, the following provides a physical description of the streets used for the recommended alignment:

- Beginning at 3rd Avenue and Stewart Street, the bus will travel northbound using Virginia Street to Fairview Avenue and southbound using Stewart Street and Boren Avenue.
- The alignment continues through South Lake Union on Fairview Avenue to the current northern terminus of the South Lake Union Streetcar at Fairview Avenue N and Yale Avenue N.
- North of the Streetcar station, the corridor alignment follows Fairview Avenue N and Eastlake Avenue E through the Eastlake neighborhood.
- On the north side of the University Bridge, the alignment travels through the U District and Roosevelt neighborhoods along 11th Avenue NE and 12th Avenue NE (Northbound) and Roosevelt Way NE (Southbound) to NE 65th Street, connecting with the Roosevelt Link Station.

- Northbound buses will use NE 67th Street to navigate from 12th Avenue NE onto Roosevelt Way NE. Buses are assumed to layover on 67th Street when converting from northbound to southbound service.

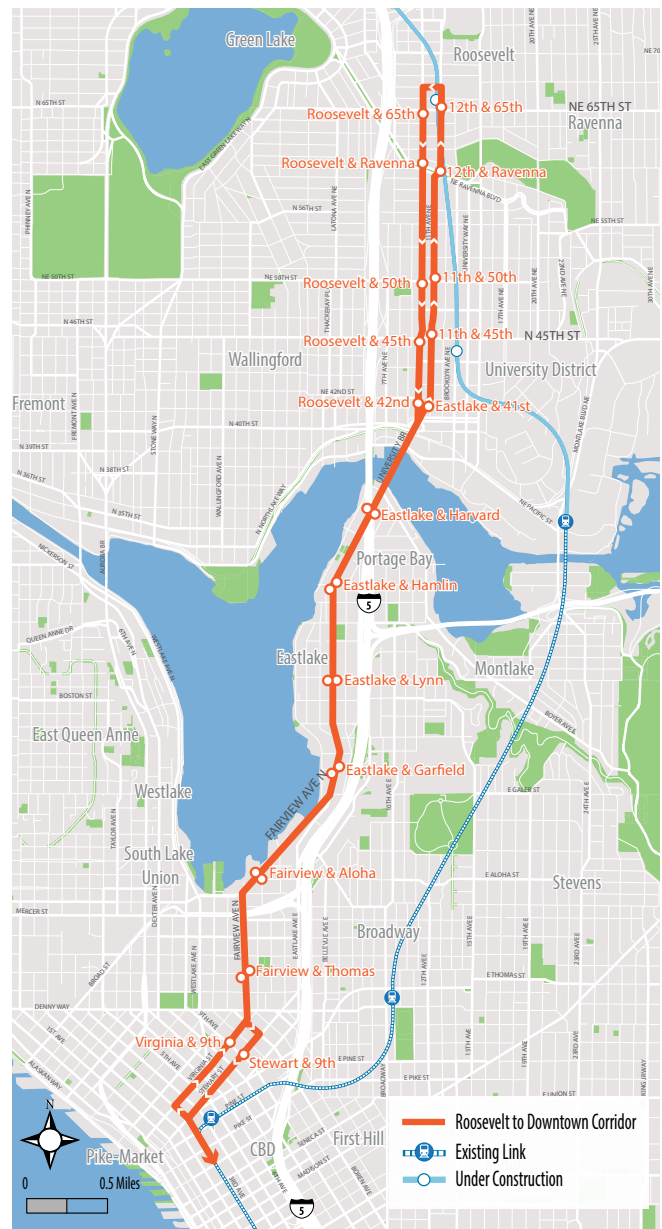


FIGURE 10: RECOMMENDED RDHCT ALIGNMENT AND STATIONS

There are a total of 24 stations situated along the corridor. Attempts were made to provide farside stations to improve transit speeds, while additional adjustments to the station location were made based on curb cuts and driveways. Station type and amenities were determined based on space availability and location. Stations in Downtown are designed as urban canopy stations. However, along most of the corridor, stations are designed as transit islands with a free standing shelter. The Fairview and Aloha southbound station

shares a platform with the Seattle Streetcar, which is recommended to be moved to the west of the transit-only and auto lanes in a separate alignment. Table 1 provides a description of station locations and types. They are presented in northbound and southbound pairs.

TRANSIT PRIORITY IMPROVEMENTS

As previously described, the selection of BRT as the corridor transit mode occurred early in the planning process. Budget and right-of-way constraints led to the concept of using RapidRide features as a starting point and building from there to incorporate as much full-featured BRT capabilities as possible within an efficient design package.

Existing and future no-build peak hour transit speed and reliability were evaluated and the plan took form with the overall objective of significantly improving transit speed and reliability with more frequent service. Modeling of the Roosevelt to Downtown Corridor revealed that by targeting investments at key segments and intersections, transit speeds between Downtown and NE 65th Street during the AM and PM peak hour and off-peak hours could be improved by 22 percent and 25 percent, respectively. To achieve these improvements, the following targeted transit performance improvements and strategies are included in the RDHCT Recommended Corridor Concept.

- The design includes in-lane RapidRide stations using existing curb space or station platforms (concrete islands) that allow the bus to remain in traffic lanes, avoiding delays associated with re-entering the traffic stream.
- Bus stop spacing was increased and stops were consolidated.
- Transit-only lanes were included at key segments where traffic congestion exists. These lanes allow for the bus to proceed without being delayed by traffic congestion or right-turning traffic.
- Business Access and Transit Only (BAT) lanes were used at key links of the Roosevelt to Downtown Corridor where congestion is problematic, but where right-turning movement is also important for General Purpose (GP) traffic mobility. With the BAT lanes, RapidRide buses can avoid traffic queues and

TABLE 3: STATION LOCATIONS

Street	Cross Street	Direction	Type
Virginia St	9 th Ave	Northbound	Urban / Canopy
Stewart St	9 th Ave	Southbound	Urban / Canopy
Fairview Ave	Thomas St	Northbound	Urban / Canopy
Fairview Ave	Thomas St	Southbound	Urban / Canopy
Fairview Ave	Aloha St	Northbound	Sidewalk w/Shelter
Fairview Ave	Aloha St	Southbound	Transit Island w/Shelter
Eastlake Ave E	E Garfield St	Northbound	Transit Island w/Shelter
Eastlake Ave E	E Garfield St	Southbound	Transit Island w/Shelter
Eastlake Ave E	E Lynn St	Northbound	Transit Island w/Shelter
Eastlake Ave E	E Lynn St	Southbound	Transit Island w/Shelter
Eastlake Ave E	E Hamlin St	Northbound	Transit Island w/Shelter
Eastlake Ave E	E Hamlin St	Southbound	Transit Island w/Shelter
Eastlake Ave E	Harvard Ave E	Northbound	Transit Island w/Shelter
Eastlake Ave E	Harvard Ave E	Southbound	Transit Island w/Shelter
Eastlake Ave E	NE 41 st St	Northbound	Transit Island w/Shelter
Roosevelt Way NE	NE 42 St (east leg)	Southbound	Transit Island w/Shelter
11 th Ave NE	NE 45 th St	Northbound	Transit Island w/Shelter
Roosevelt Way NE	NE 45 th St	Southbound	Transit Island w/Shelter
11 th Ave NE	NE 50 th St	Northbound	Transit Island w/Shelter
Roosevelt Way NE	NE 50 th St	Southbound	Transit Island w/Shelter
12 th Ave NE	NE Ravenna Blvd	Northbound	Transit Island w/Shelter
Roosevelt Way NE	NE Ravenna Blvd	Southbound	Transit Island w/Shelter
12 th Ave NE	NE 65 th St	Northbound	Transit Island w/Shelter
Roosevelt Way NE	NE 65 th St	Southbound	Transit Island w/Shelter

delays at critical intersections where traffic modeling identified long delays for GP traffic. The BAT lanes can also be used by GP vehicles making right turns at intersections or driveways.

- Transit signal priority (TSP) will be used at all of the signalized locations from Denny Way to the north corridor boundary at NE 67th Street. TSP modifies the traffic signal operation by providing an earlier green for an approaching bus or holding a green longer than normal, allowing a bus to pass through an intersection where it would otherwise need to stop.
- Off-board fare collection using the One Regional Card for All (ORCA) readers will be deployed at stations. This will enable all door boarding/alighting of passengers, which relates to a reduction in dwell time at stations. Riders will also have the option of using paper transfers or cash. Cash tickets will be available for purchase at off-board ticket vending machines at stations.
- Transit queue jump signals will be used at intersections with transit-only or BAT lanes where the number of receiving lanes is less than the number of feeding lanes. Queue jump signals will allow the bus to get an early green interval of about eight seconds to jump ahead of general traffic. Thus, the bus will not incur merge delays associated with re-entering a traffic stream. In many cases, the bus will leave the queue jump and make a stop at a far-side RapidRide station.

Targeted transit improvements along the Roosevelt to Downtown Corridor were developed for the following six focus areas and are shown in Figure 11.

Virginia and Stewart Streets

- Provide a southbound transit-only lane along Stewart Street between Boren Avenue and 5th Avenue.
- Provide a northbound shared transit-bike lane along Virginia Street from 3rd Avenue to north of 9th Avenue.

Fairview Avenue (Yale Avenue to Denny Way)

- Move streetcar tracks along Fairview Avenue N between Aloha Street and Valley Street to the northwest from the center of the roadway onto exclusive space located on the northwest side of the



FIGURE 11: TARGETED TRANSIT PERFORMANCE IMPROVEMENTS

roadway, and moving streetcar terminus south from Ward Street to Aloha Street.

- Provide a southbound transit-only lane along Fairview Avenue between Yale Avenue N and Mercer Street and between Republican Street and Denny Way.
- Provide a northbound transit-only lane along Fairview Avenue between Denny Way and Valley Street.
- Provide a queue jump traffic signal phase northbound along Fairview Avenue at Valley Street.

Eastlake Avenue E/Fuhrman Avenue E

- Provide a northbound curbside transit-only lane along Eastlake Avenue E between E Allison Street and Harvard Avenue E.
- Provide a queue jump traffic signal phase along northbound Eastlake Avenue E at Harvard Avenue E.

Roosevelt Way NE/NE 45th Street

- Provide a southbound queue jump lane along Roosevelt Way at NE 45th Street. The queue jump lane would be one block long and located between NE 47th and NE 45th Streets.

11th Avenue NE/NE 50th Street

- Provide a northbound queue jump lane along 11th Avenue NE at NE 50th Street. The queue jump lane would be one block long and located between NE 47th Street and NE 50th Street.

Roosevelt Way NE/12th Avenue NE/NE 65th Street

- Provide queue jump lanes along southbound Roosevelt Way NE and northbound 12th Street NE at NE 65th Street. These block-long queue jump lanes would be provided between NE 66th Street and NE 65th Street in the southbound direction, and between NE 64th Street and NE 65th Street in the northbound direction.

TRANSIT OPERATING CHARACTERISTICS

The following provides a summary of transit operating characteristics.

Service Plan

The recommended daily span of service is:

- Monday through Saturday up to 20 hours (5 a.m. to 1 a.m.)
- Sundays/Holidays up to 17 hours (6 a.m. to 11 p.m.)

Proposed headways are:

- Every six minutes between 6 a.m. and 7 p.m. on weekdays
- Every 15 minutes during all other hours of operation

Assuming RapidRide is implemented in this corridor in the same manner that it has been implemented in other corridors, the existing Route 70 will be replaced with RDHCT RapidRide service. It is assumed that all other King County Metro and regional transit agency bus, streetcar, and light rail routes that use any portion of the RDHCT alignment would remain without any service modifications.

Vehicle Technology

The vehicle used is expected to be the New Flyer XT60 60-foot electric trolleybus, operated using catenary for power supply. It is estimated 16 vehicles will be needed for this service.

Fare Collection

Off-board fare collection using the ORCA readers will be deployed at stations in order to allow all-door boarding and alighting of passengers. This service will incorporate the “proof-of-payment” policy based on off-board fare payment, all-door boarding, and fare enforcement officers.

Riders will also have the option of using paper transfers or cash. Cash tickets will be available for purchase at off-board ticket vending machines.

Operating and Maintenance Cost

The estimated annual operating and maintenance cost for the Recommended Corridor Concept is \$13.1 million with a fleet cost of \$33.3 million.¹ The operating cost model is based on the following high-level, planning based approach:

- Identify proposed RDHCT RapidRide service characteristics
- Estimate annual revenue hours
- Estimate annual operating cost

Fleet costs represent the net change in fleet requirements between existing and Route 70 and the proposed RapidRide service. However, the elimination of Route 70 and any potential associated cost savings are not included in the operating and maintenance costs. A detailed description of the operating and maintenance cost estimate can be found in the Transit Operating Plan.

PEDESTRIAN IMPROVEMENTS

The RDHCT project includes design improvements to help create a vibrant, walkable environment that enhances safety, accommodates people with disabilities (in accordance with ADA requirements), and provides lighting and other amenities that are inviting to all pedestrians. Pedestrian improvements are summarized below.

- Countdown pedestrian signal displays that identify the number of seconds before the end of the flashing don't walk interval will be added at signalized intersections adjacent to stations that do not have this feature.
- Accessible Pedestrian Signal (APS) push buttons will be added to all pedestrian crossings that require push buttons or for any signalized crossing directly nearby a transit station (even if no push button is required – such push buttons are on a continuous recall to provide the walk interval, and most importantly – serve to inform blind and deaf-blind pedestrians of traffic signal indications).
- Intersection crossings will be designed to meet the SDOT lighting guidelines for pedestrian walking.
- The light levels throughout the corridor sidewalk areas, and at all transit stations, will be designed for light levels consistent with SDOT lighting guidelines.
- Light levels within the project walking areas will incorporate guidance strategies within the Pedestrian Lighting Citywide Plan.
- Crossings within the project boundary where any concrete work is being completed on the roadway or at intersection corners shall include new curb ramps and detectable warnings for the blind and deaf-blind where they do not already exist or are not in compliance with SDOT standards.

¹ O&M and fleet costs based on 2015 dollars; O&M cost per hour \$157.21 (2016 dollars), was taken from the 2015 Transit Service Funding Agreement by and between King County and the City of Seattle.

BICYCLE FACILITIES

This section presents key decisions made regarding the design for bicycle facilities along the corridor. A continuous all ages and abilities bicycle facility, either on corridor or on a parallel street, achieves SDOT's complete streets goals, making RDHCT a multimodal corridor. Connecting to existing and planned bicycle facilities is also a key consideration in the planning process. The approach to design considered sharrows, bike lanes, protected bike lanes, and off-street bike paths. Details on bicycle facility decisions are included in the RDHCT Bicycle Facilities Decision Memo. Additionally, the RDHCT 10% design, provided in Appendix A, includes bicycle facilities. The following describes design decisions and attributes for bicycle facilities by neighborhood to be constructed in conjunction with this project or alongside through a separate planning process, also see Figure 12.

Downtown and South Lake Union

- A connection to the 2nd Avenue bike lanes in Downtown is provided through planned bike lanes on Bell Street, 9th Avenue, and Valley Street to the RDHCT developed bicycle facility on Fairview Avenue.
- A two-way protected bicycle facility will be located adjacent to Fairview Avenue N (to the west) and Valley Street (to the north).
- In Downtown and South Lake Union, existing and planned facilities are incorporated to the extent possible. The two-way bicycle facility design developed for the Fairview Bridge reconstruction determined the design and location of the Fairview Avenue N bicycle facility.
- While the all ages and abilities facility (protected bike lanes) will be located to the west of the corridor, community meeting input indicated that more advanced commuter bicyclists would still prefer Fairview Avenue N in South Lake Union to connect into Downtown. For this reason, sharrows were incorporated into the design along Fairview Avenue N within a wider curbside transit-only lane.
- At the intersection of Fairview Avenue N and Eastlake Avenue E the recommended design will transition from a two-way protected bike lane on west side of Fairview Avenue N to one-way protected bike



FIGURE 12: RECOMMENDED RDHCT BICYCLE FACILITIES

lanes along both sides of Eastlake Avenue E, and incorporate that transition into the physical design of the intersection as well as signal phasing.

Eastlake

- One-way protected bike lanes (on each side of roadway in general traffic direction) are recommended along Eastlake Avenue E after reviewing off corridor options and the high volume of bicycles currently on Eastlake Avenue. The East Lake Community Council sent a letter to the project team proposing a cross section with protected bike lanes, a travel lane in each direction and a center left turn lane. Given the high volume of bicyclists already using Eastlake Avenue E, it was determined most bicyclists will still use Eastlake Avenue E with or without a protected bike lane causing transit speed and reliability issues as well as creating safety concerns. Both Eastlake Avenue E and the Roosevelt Way NE/11th Avenue NE/12th Avenue NE couplet connect directly to the University Bridge, making any off corridor bicycle facility out-of-direction for most people bicycling, and less likely to be used, even if designed to be safe and comfortable.
- There is a short segment on both sides of the University Bridge where protected bike lanes were not possible due to right-of-way constraints. However, the bike lane segments from Harvard Avenue E to Fuhrman Avenue E are recommended to be raised to sidewalk height and marked as bike lanes to provide safer transit for bicycles and eliminate intrusion into the lanes by vehicles.
- In general, bike lanes adjacent to RDHCT stations are raised and located between the station platform and the sidewalk. This design will slow bicycles as the lane rises to sidewalk height behind the bus station and will minimize conflicts with buses. This is consistent with the recently constructed protected bike lanes and transit islands on Roosevelt Way NE as part of the Paving and Safety Improvements Project.

University-Roosevelt

- Protected bike lanes are recommended on 11th Avenue NE and 12th Avenue NE in the northbound direction and Roosevelt Way NE in the southbound direction. The southbound protected bike lane was

implemented by the Roosevelt Way paving project from NE 65th Street to the University Bridge.

- Adding the protected bike lanes on 11th Avenue NE and 12th Avenue NE improves legibility of the bicycle network.
- In general, bike lanes adjacent to RDHCT stations are raised and located between the station platform and the sidewalk. This design will slow bicycles as the lane rises to sidewalk height behind the bus stations and will minimize conflicts with buses.

MULTIMODAL TRAFFIC OPERATIONS

The RDHCT project will require roadway geometry, transit stations, and traffic signal timing plans to improve transit frequency, speed, and reliability. These changes will affect traffic operations for all modes along the corridor. Key changes in traffic operating characteristics include:

- Installation of TSP at all signalized intersections along the corridor will reduce transit travel times by 8 to 12 percent.
- The transit priority targeted improvements will reduce transit travel times in the focus areas by 5 to 65 percent, depending on location and time period.
- Transit service reliability will improve with dedicated transit-only and BAT lanes, queue jump lanes, and in-lane RapidRide stations.
- Relocation of the streetcar tracks and station along Fairview Avenue N will improve streetcar reliability by removing the service from mixed-flow traffic lanes.
- The various bicycle facilities along the corridor will provide safe, comfortable, and separate travel options for cyclists.
- The transit targeted improvements will result in slightly lower vehicle travel times along the corridor, compared to no-build conditions.
- The majority of signalized intersections located along the corridor (50 of the 59 study intersections) will continue to operate under acceptable conditions – level of service (LOS) D or better. The remaining nine intersections will operate at LOS E or F; eight of these intersections are located in Downtown Seattle.

Additional detail on traffic operations can be found in the RDHCT Multimodal Traffic Analysis Report.

PARKING AND LOADING

The Recommended Corridor Concept design results in a loss of on-street parking spaces throughout the corridor. A summary of parking spaces removed is provided in Table 4. The estimated number of spaces removed may change as the corridor concept design moves forward to 30% and final design.

The effect of removing parking spaces can be mitigated through a variety of strategies. For the Roosevelt to Downtown concept design, these strategies include:

- An evaluation of parking utilization and the net effect of parking spaces removed

- Absorption of parking demand by private parking capacity
- Replacement of select load/unload spaces through design
- Implementation of parking management strategies
- Providing all day, high frequency transit service throughout the corridor that connects to other high frequency bus lines and Link light rail

TABLE 4: PARKING AND LOADING CHANGES

Street Segment	Existing Parking Spaces	Parking Spaces (Recommended Corridor Concept Spaces Removed)							Total Reduction in Spaces
		Paid	Time-Limited	Restricted Parking Zone (RPZ)	30-minute Load Zone	3-minute Passenger Load Zone	Unrestricted		
<i>Westlake to South Lake Union</i>									
Virginia Street, 3 rd Avenue to 8 th Ave	35	33 (3)				1	1		(3)
Virginia Street, 8 th Avenue to Fairview Ave	18	7 (7)		77 (7)		2	2 (2)		(16)
Stewart Street, 6 th Avenue to Boren Avenue	63	54 (54)				5 (5)	4 (4)		(63)
Fairview Avenue N, Denny Way to Valley Street	69	62 (62)				5 (5)	2 (2)		(69)
<i>Fairview to Eastlake</i>									
Fairview Avenue N Roadway	90	90 (42)							(42)
Eastlake Avenue E, Galer Street to University Bridge (including Fairview Avenue E)	346		57 (57)	15 (15)		12 (9)	6 (5)	256 (256)	(342)
<i>U District to Roosevelt</i>									
Roosevelt Way NE, University Bridge to NE 45 th Street	28	22				4	2		
Eastlake Avenue NE/11 th Avenue NE, Campus Parkway to NE 45 th Street	74	17 (10)				2 (2)	4 (3)	51 (22)	(37)
Roosevelt Way NE, NE 45 th Street to NE 55 th Street	79	30 (10)	28			6	1	14	(10)
11 th Avenue NE, NE 45 th Street to NE 55 th Street	198	75 (41)	2 (2)	36 (4)		1	1 (1)	83 (60)	(108)
Roosevelt Way NE, NE 55 th Street to NE 67 th Street	104	33 (14)	19			3 (1)		49	(15)
11 th Avenue E/12 th Avenue E, NE 55 th Street to NE 67 th Street	170		40 (9)	53 (18)		4 (2)	1 (1)	72 (51)	(81)
Totals	1,274	423 (243)	146 (68)	111 (44)		45 (24)	24 (18)	525 (389)	(786)

10% DESIGN

Conceptual engineering to the 10% design level has been completed and is provided as Appendix A. These plans provide information on:

- Lane channelization
- Stations
- Bike lanes, protected bike lanes, cycle tracks, sharrows
- Transit only lanes, BAT lanes, and queue jumps
- Relocation of South Lake Union Streetcar and the northern most stop
- Basic signal and ITS infrastructure elements
- Loading zone reconfigurations / replacements
- Parking impacts

Conceptual architectural design for example station locations has been completed and is provided in Appendix F. These plans provide additional detail on:

- Station component layout including signage, shelters, ORCA readers, ticket vending machines, seating, lighting, real-time arrival information kiosks and tech pylons
- Pedestrian crossings/ station access
- Bicycle accommodation through station areas
- Urban form rendering

CAPITAL COSTS

The estimated capital cost for the Recommended Corridor Concept is \$67.3 million, which includes \$10.6 million for extension of the overhead contact system (OCS). The unit costs assume year 2016 costs. This estimate includes:









- Bus Stations (including amenities)
- Bus lane and queue jump improvements
- Streetcar Relocation (including roadway improvements)
- Utility Relocations for Streetcar
- Signal Modifications
- Transit Signal Priority and ITS (TSP vehicle costs not included)
- Protected Bike Lanes
- OCS

The estimate includes a 30 percent contingency and 30 percent for engineering services. A detailed description of the capital cost estimate is provided in Appendix B.

ANALYSIS SUMMARY

Table 5 below provides a summary analysis of the Recommended Corridor Concept. Further details are provided in the previous sections.

TABLE 5: ANALYSIS SUMMARY

		Future without Project	With Targeted Investment
Transportation	 Daily Boardings (Average Weekday)	2,300 Daily boardings	4,800 Daily boardings 109% over existing
	 Peak Bus Speed	4.8 mph Average peak speed	5.9 mph Average peak speed 22% faster than existing
	 Peak Bus Travel Time	71 minutes	58 minutes 13 minutes average time savings compared to existing
	 Peak Auto Speed	12.9 mph Average peak speed	9.7 mph Average peak speed 25% slower than existing
Costs (2016\$)	 Capital Cost (Does not include fleet)	Not Applicable	\$67.3 million Includes \$10.6 million for overhead contact system
	 Annual Operating Cost	Not Applicable	\$13.1 million
Parking and Loading	 Parking	1274 spaces Includes 328 peak-restricted spaces	488 spaces retained 38% spaces retained
	 Loading Zones	69 zones	27 zones 39% zones retained (12 additional new load zone locations identified)

Notes: Information provided is preliminary and subject to change as additional analysis is conducted and the project is refined. Peak-restricted parking spaces are those where parking is not allowed during peak commute hours.

CHAPTER 5

PUBLIC INVOLVEMENT

A full-scale public involvement approach was used during the course of this project to seek valuable input from the residents and stakeholders and keep the community informed of the proposed corridor improvements. The goal of public outreach was to educate community members about the project, goals and timeline, and to gather feedback to be incorporated into the Recommended Corridor Concept. Public outreach efforts were held in three phases:

1. Mode Analysis and Existing Conditions
2. Characteristics of BRT and Multimodal Components
3. Recommended Corridor Concept

A summary of each phase is described below and a full description of the public involvement process can be found in the RDHCT Public Involvement Summary.

MODE ANALYSIS AND EXISTING CONDITIONS

The team started by conducting one-on-one outreach with key stakeholders including community leaders, large businesses, and community organizations as a means of assessing what those in the corridor wanted or needed from the corridor. Fourteen stakeholders participated in the interviews, which took place between March and April 2015. Key topics covered during the interviews:

- Current use of the Roosevelt to Downtown transportation corridor
- Stakeholder experience along the corridor
- Opportunities for improving current use
- Stakeholders' preferred HCT mode for future improvements

This information was used to shape the materials and information shared at future outreach meetings and also provided SDOT with clarification of existing conditions and a profile of perceptions and needs along the corridor.

Following the stakeholder interviews, the first round of public open houses were held in May 2015. The open

houses were held at the Y @ Cascade People's Center in South Lake Union and the UW Tower in the U District on consecutive evenings. The public was presented with project goals, timeline, existing conditions, and transit modes. A total of 95 people signed in at the two open houses.

BRT AND MULTIMODAL COMPONENTS

This phase of the project focused on incorporating BRT design and operational elements in the Roosevelt to Downtown Corridor. Three different levels of BRT investment were presented, including RapidRide, RapidRide with targeted investments, and full BRT.

A forum group was developed as a means of getting early input on concepts to be presented at public open houses. The informal forum group included representatives from local businesses, community councils, bicycle and pedestrian advocacy groups, and citizens. Participants were largely drawn from the those who participated in stakeholder interviews held in Phase 1.

Forum group meetings were held in September and November 2015. Participants were engaged in interactive break-out groups to discuss different segments of the corridor and to share their thoughts on the needs and recommendations for improvements in each neighborhood.

Information gathered at the forums and overall project refinement was presented at the second round of public open houses, which took place on December 9 and 10, 2015 at TOPS Elementary in Eastlake and UW Tower in the U District. A total of 116 people signed in at the open houses. Attendees listened to a brief presentation on the results of the mode analysis, the chosen mode (BRT), and next steps for the project. They were then invited to visit tables dedicated to corridor segments where they could see maps with options, ask questions of project staff, provide feedback, and suggest improvements. Additional displays included information on the corridor within the context of the SDOT RapidRide expansion program, the

benefits and impacts of the three different levels of BRT investment, and visualizations of different station types to gather public perception.

SDOT also conducted an online open house to ensure that people who were not able to attend the open houses would have an opportunity to comment. The online open house walked people through a variety of specific questions about the corridor, the modal priorities, and other station locations. A total of 307 online surveys were submitted.

RECOMMENDED CORRIDOR CONCEPT

This phase solicited feedback on the draft corridor concept, which included a mix of targeted BRT improvements, protected bicycle lanes, and signal and roadway improvements. A third meeting of the forum group was held in May 2016 to gather input on the draft corridor concept and prepare for the third round of open houses.

The third round of open houses took place in June 2016. The open houses were held on June 15, 2016 at TOPS Elementary in Eastlake and June 16, 2016 at UW Tower in the U District. A total of 92 people signed in at the open houses. The meetings featured a brief presentation on the draft corridor concept to supplement open house information. Tables were set up around the room to allow people to view the proposed changes to each section of the corridor on large plotted maps. Another display included transit station visualizations for community context conversations. Comments were gathered at all stations and in a general comment box.



CHAPTER 6

NEXT STEPS

The next steps for the RDHCT project will include advancing the design, environmental analysis and clearance, construction of improvements, and ultimately operation of Roosevelt to Downtown RapidRide service.

This chapter examines other near-term and long-term considerations, including identifying early implementation projects, describing future project phasing, and outlining issues to be resolved in future planning and design phases.

EARLY IMPLEMENTATION

Throughout the study process, early implementation projects have been identified, such as the Roosevelt Way NE repaving project and the associated bicycle facilities for the north side of the University Bridge. Early implementation projects are those that would, on their own, improve transit performance and are not reliant on other projects to enhance corridor travel. Early implementation projects are summarized below.

- **Queue Jumps:** The proposed queue jumps on Roosevelt Way NE, 11th Avenue NE and 12th Avenue NE could be beneficial to existing bus routes. If implemented early, the design would need to be compatible with the Recommended Corridor Concept 10% design documents.
- **Virginia Street:** Providing a northbound shared transit lane along Virginia Street between 3rd and 9th Avenues would benefit current bus routes.
- **Fairview Avenue N Transit Only Lanes (Denny Way to Republican, Mercer, or Valley Streets):** The extent of the early implementation requires further study to see how it would interact with downstream project phasing, including the relocation of the streetcar tracks and reallocation of Fairview Avenue N lanes. If implemented early, this improvement would benefit existing bus routes.
- **Loading Zones:** There are several recommended relocations, removals, and replacements of loading zones. These could occur alongside development-related street and signage work prior to RDHCT.

While these improvements would not directly benefit transit speeds or bicycle facilities, it would help move forward RDHCT implementation.

- Expanding or making programmatic improvements to the Restricted Parking Zone and moving shared parking recommendations forward would improve parking management independent of RDHCT implementation. Exploring potential for shared use parking in Eastlake could also advance RDHCT implementation.
- **11th Avenue NE/12th Avenue NE Protected Bicycle Lanes and Transit Islands:** Similar to the Roosevelt repaving project, this project could be implemented prior to RDHCT completion to be used by existing buses and improving bicycle facilities. Implementation would need to consider plans for transit signal priority and queue jump improvements.

Projects that would likely need to wait for RDHCT construction and opening include:

- Streetcar relocation, Fairview Avenue N reconfiguration, Fairview Avenue N west side two-way protected bike lanes and sidewalk
- Reconfiguration of Fairview Avenue N/Eastlake Avenue E intersection, including southbound free right removal, pedestrian and bicycle connection through the intersection, and exclusive phasing for bicycles and pedestrians
- Protected bicycle lanes on Eastlake Avenue E
- RapidRide stations (however, could construct transit islands as part of other projects, utilities, etc.)
- Fuhrman Avenue E/Harvard Avenue E area traffic changes, station changes, lane markings, queue jump, signal revision
- Catenary extension north along the corridor to NE 67th Street turn around / layover

PROJECT PHASING

The south terminus for the initial implementation phase of the Roosevelt to Downtown Corridor will be determined by One Center City planning efforts, but is assumed to be in the area of 3rd Avenue and S Main Street and the north terminus will be the Roosevelt Link Station. Extending the corridor to the Northgate Transit Center in the initial phase of implementation is not feasible. It is expected that Roosevelt to Downtown Corridor will be implemented in 2021 to coordinate with the Link Station openings. No time frame has been identified for a potential future extension to the Northgate Transit Center

PLANNING AND DESIGN PHASE CONSIDERATIONS

The following considerations have been identified for future planning and design for the RDHCT project.

- Work with Vulcan to allow the two-way cycle track to continue west across their Daniel's Broiler property to the Boren Avenue ROW.
- Review impacts of transit only lanes and protected bike lanes on alley access and garages and refine design to show these accesses.
- Work with property owners at key station locations where additional changes may be needed.
 - Particular locations include: Virginia Street at 9th Avenue (NB), Fairview Avenue N at Thomas Street (NB and SB), Eastlake Avenue E at E Lynn Street (NB and SB), Eastlake Avenue E at E Hamlin Street (NB and SB), 12th Avenue NE and NE Ravenna Boulevard (NB)
- Consider utility location implications and impacts for design and relocations.
 - Locations include: Fairview Avenue N at Thomas Street (SB), Fairview Avenue N at Aloha Street (SB), Eastlake Avenue E at E Garfield Street (SB), Eastlake Avenue E at E Lynn Street (NB and SB), NB/SB Eastlake Avenue E at Harvard Avenue E (NB and SB).
 - Implications for OCS: In some locations OCS may need to be shifted to accommodate RapidRide shelter and RapidRide Blade signs.
- Survey roadway to verify baseline conditions.
- Understand landscaping and trees impacts, and identify potential mitigation.
- Identify concepts for shared use parking (primarily in Eastlake).
- Review operations and alternatives for the dedicated transit lane at Fairview Avenue and Mercer Street.
- Review Streetcar relocation, focusing on traffic operation and utility impacts.
- Review Fairview Avenue reconfiguration between Mercer street and Aloha Street and identify potential impact on private properties.
- Review the turnaround for RapidRide C Line at Valley Street and Fairview Avenue. Consider options for alleviating traffic blocking westbound C Line on Valley Street.
- Review the two-way protected bike lane from Valley Street to Aloha Street. Likely will be influenced by what the adjacent property owners would prefer. Goal is to provide high quality pedestrian and bicycle facilities.
- Review selected alternative on Eastlake Avenue between Allison Street and Fuhrman Avenue/ University Bridge for best operations and multimodal accommodations.
- Confirm NE 67th Street as the westbound transit turnaround between 12th Avenue NE and Roosevelt Way NE and review general bus and traffic operations near the Roosevelt Link station.
- Consider RDHCT operations Downtown south of 3rd Avenue, to be determined as part of the One Center City planning process.
- Investigate enhanced pedestrian connection from alignment to the U District Link station.
- Review and confirm near-side versus far-side station approaches.
- Coordinate with SDOT development review to identify potential partnerships with developers to construct portions of the project in conjunction with their developments, especially at stations.
- Work with SDOT and Metro to see if RDHCT can create a pool of interchangeable vehicles with other RapidRide projects, which may reduce fleet purchases and reduce the number of required spare vehicles.

- Eastlake/Yale/Howe intersection could use additional review to improve pedestrian crossing visibility.
- Continue to work with the Coast Guard to limit University Bridge openings during peak periods and/or have a communications protocol that lets Metro dispatch have advanced warning of bridge openings.
- SDOT operations proposed an ITS concept to facilitate transit queue jumping during University Bridge openings. Concepts, modeling, and analysis of this approach will need to be conducted during 30% design.

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APPENDIX A

RECOMMENDED CORRIDOR CONCEPT 10% DESIGN

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APPENDIX B

CAPITAL COSTS MEMO

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