

FINAL

Purpose and Need
Roosevelt to Downtown High Capacity Transit

*Seattle Department of
Transportation*

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Section 1

Introduction

The Roosevelt to Downtown High Capacity Transit Study represents SDOT's project definition phase and its purpose is to identify how to best provide high-capacity transit service along this corridor. This document describes the purpose and need for the project. It includes information about why transit improvements are needed along this corridor and how recommended improvements will be measured in selecting a locally preferred alternative.

Corridor Description

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. The TMP prioritized several high-capacity transit (HCT) corridors throughout the city, including the Roosevelt to Downtown Corridor. The Seattle Department of Transportation (SDOT) is conducting this study to further explore HCT options along 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). The main goal of HCT is to provide faster, more convenient, and more reliable service for a larger number of passengers.

The Roosevelt to Downtown High Capacity Transit Corridor is illustrated on **Figure 1**. The corridor is approximately 7 miles in length, and is defined as follows:

- begins at the Westlake Hub at 5th Avenue/Westlake Avenue/ Stewart Street (the route will likely continue south of the Westlake Hub and will be determined by a systemwide downtown routing and stops strategy);
- travels north through South Lake Union to the current northern end of the South Lake Union Streetcar at Fairview Avenue N and Yale Avenue N (note: two alternatives exist for the route through South Lake Union, including using Westlake Avenue N or Fairview Avenue N);
- travels on Fairview Avenue N to Eastlake Avenue E;
- travels on Eastlake Avenue E to University Bridge;
- travels on 11th Avenue NE and 12th Avenue NE (Northbound) and Roosevelt Way NE (Southbound) to NE 75th Street;
- travels on Roosevelt Way to NE 80th Street;
- travels on NE 80th Street to 5th Avenue NE;
- travels on 5th Avenue NE to NE 100th/NE 103rd Street; and
- travels on NE 100th/NE 103rd Street to Northgate Transit Center (northern terminus)

Two alternative alignments are considered for the southern segment of the corridor, between the Westlake Hub and the current South Lake Union streetcar terminus: the primary corridor follows Virginia Street/Stewart Street, then Fairview Avenue N; the South Alternative follows Westlake Avenue N/Terry Avenue N, then Valley Street.

This study includes some limited off-path considerations such as intersecting street traffic, intersecting transit operations, parking, and bicycle facilities, as well as station access routes. The boundary shown on **Figure 1** illustrates a one half mile area from the HCT path for consideration of the issues outlined above as well as the relevant demographic and land use information.

The study area is the location of a 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 more than 167,000 jobs. 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 University District.

Employment and residential growth is expected along the corridor, especially in the Northgate, University District, and South Lake Union neighborhoods. Up to 21,000 new households and 36,000 new jobs are projected (EIS forecast years between 2030 and 2035) in these neighborhoods based on area-specific Environmental Impact Statements.¹

The study area also has a relatively large number of major trip attractors such as colleges and universities, theaters, schools, hospitals, museums, and major retail destinations. Included in the Downtown to Roosevelt Corridor is the University of Washington, North Seattle College, the Northgate Mall, the Westlake Center Mall, Pike Place Market, the Seattle Art Museum, the Museum of History and Industry, as well as numerous other shopping, theater, and school trip attractors.

Three Metro bus routes operate along portions of the corridor: Routes 66 (Express), 67, and 70. Routes 66 and 67 go from Northgate transit center to Roosevelt to the University District to Downtown Seattle. Route 70 travels from the University District to Eastlake to Downtown Seattle. The combined frequency along the corridor is 5-10 minutes during weekday peak periods.

¹ Projected growth estimates from area-specific EISs, including: South Lake Union Neighborhood (SLU) Rezone (Final EIS Apr 2012); U District Urban Design Framework (Final EIS Jan 2015); Northgate Urban Center Rezone (Final EIS Dec 2009). Formal growth estimates for 2035 will be assigned through revisions to the Comprehensive Plan this year.

SDOT ROOSEVELT TO DOWNTOWN HCT PLAN



Figure 1
Study Area

Section 2

Purpose and Need Statement

The project purpose and need identifies the overall need for high capacity transit in the corridor and will serve to guide the development and evaluation of service alternatives. This purpose and need also defines the scope of the project and the goals and objectives (see **Section 3**). The project purpose and need was developed based on findings from the Transit Master Plan and public input. The project purpose and need identifies 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 Bicyclists and Pedestrians.** 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, University District, Eastlake, South Lake Union, and Downtown neighborhoods.
- **Serve Growing Population and Employment Centers.** Connect residential developments, especially moderate income housing in the Maple Leaf, Roosevelt, University District, and Eastlake neighborhoods, to new major technology employment and medical service centers, in South Lake Union, University District, and Downtown Seattle.

Each specific purpose and need statement is described in detail in the following sections, with background information and supporting analysis.

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.

Existing transit service along the Roosevelt to Downtown Corridor have several issues, including reliability, crowding, speed and a lack of amenities. On-time performance affects the reliability and consistency of the existing bus routes, including Routes 66, 67, and 70. As shown in **Table 1**, reliability along this corridor suffers with poor on-time performance, especially during the Midday and PM time periods.

Table 1. On-Time Performance

Route	Percent On-time		
	AM (5AM to 9AM)	Midday (9A -3P)	PM (3PM to 7PM)
<i>Southbound</i>			
66	66%	62%	65%
67	95%	100%	90%
70	88%	75%	60%
<i>Northbound</i>			
66	80%	69%	66%
67	81%	68%	73%
70	80%	78%	64%

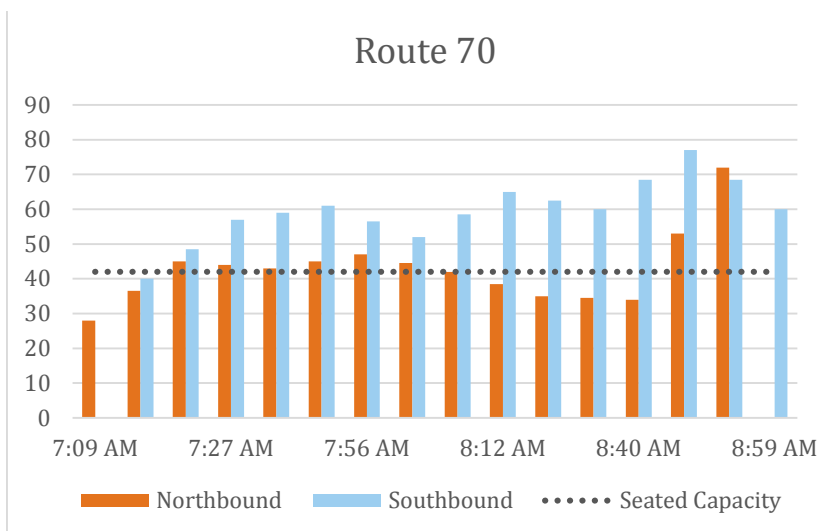
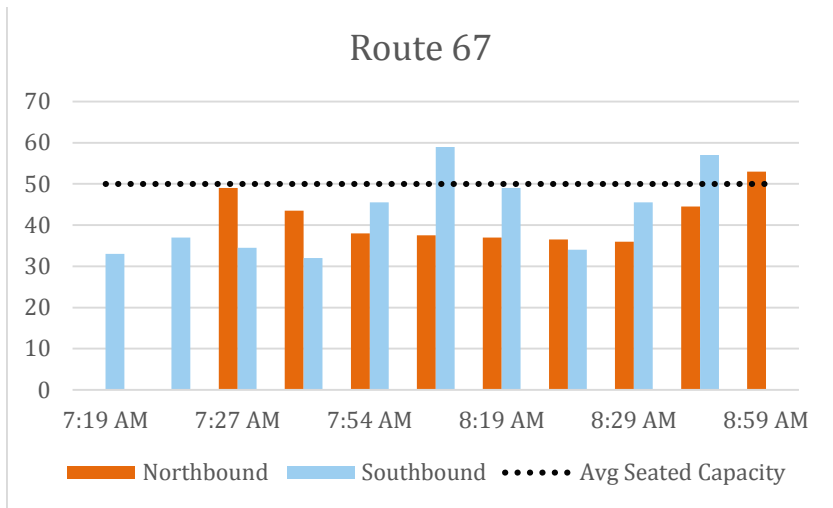
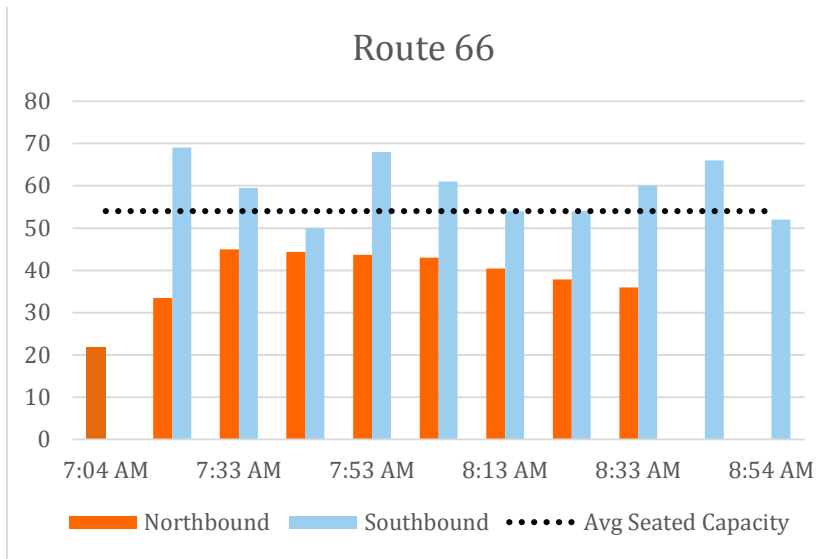
Source: Note: On-time performance based on percent of stops observed that arrived between 1 minute early and 5 minutes late.

Overcrowding exists along the corridor on Routes 66, 67, and 70. **Table 2** shows the percent of trips where loads exceeded seated capacity. This occurs with 32% of trips throughout the day and 63% of trips in the morning peak. Route 70 is shown in **Figure 2** to illustrate how and when crowding occurs in the southern portion of the corridor during the AM peak period (7 a.m. to 9 a.m.).

Table 2. Maximum Load Percent over Seated Capacity

Route	Percent Over Seated Capacity		
	AM Peak (7AM to 9AM)	PM Peak (4PM to 6PM)	All Day
<i>Southbound</i>			
66	75%	25%	29%
67	50%	25%	24%
70	88%	50%	42%
<i>Northbound</i>			
66	67%	100%	27%
67	0%	14%	38%
70	50%	47%	27%
<i>All Routes</i>	63%	45%	32%

Figure 2. Routes 66, 67, and 70 Morning Peak Maximum Load



Transit travel time in the corridor is currently not time-competitive with driving. **Table 3** compares PM peak travel times for autos and buses. Northbound buses are 33% slower compared to autos and southbound buses are 25% slower.

Table 3. Corridor Travel Times - PM Peak (4PM to 6PM)

Direction	Average Speed (MPH)	
	Auto	Bus
Northbound	11.8	7.9
Southbound	12.6	9.5

Amenities at bus stops vary at each stop. Improvements to amenities are needed along the corridor. It is important to note that bus stop consolidation and improvements will be constructed on Roosevelt Way between NE 65th Avenue and the University Bridge as part of the Roosevelt Way NE Paving and Safety Improvement Project.

- **Passenger Amenities:** Less than half of the existing stops have shelters (38%) and fixed benches (44%).
- **Platform Area:** Over half of the existing stops (51%) do not have a clear rear landing pad. More than half of the existing stops (65%) have a sidewalk cross slope that exceed the 1:48 maximum slope allowed by ADA (2010 edition) and ANSI A117.1 (2009 edition).
- **Lighting:** Stop lighting is inconsistent along the corridor. Only 4% of the stops had interior shelter lighting, and 5% had pedestrian-scaled lighting.
- **Passenger Information:** Passenger information provided at the stops is inconsistent along the corridor. Four types of passenger information signs are along the corridor including: schedule, route map, system map, and general bus information. Schedule and general bus information were the most prevalent pieces provided, with both items at 40% of the stops. Only two stops along the corridor had all four types of passenger information signs.

Improve Conditions for Bicyclists and Pedestrians

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.

Streetscape enhancements that improve bicycle and pedestrian facilities are an important part of Seattle’s Complete Streets policy, which mandates that the City develop and maintain complete streets for everyone. Both the Bicycle Master Plan and the Pedestrian Master Plan provide recommends to improve conditions for bicyclists and pedestrians. Bicycle and pedestrian conditions are described in the following two sections.

Bicycles

The Bicycle Master Plan (BMP), adopted in April 2014, provides a vision for the future of bicycling in Seattle and includes a proposed citywide bicycle network to be designed and built over time. The BMP Implementation Plan, last updated in March 2015, identifies projects that will be implemented between 2015 and 2019, including seven projects within the study area. These projects incorporate facilities that improve conditions for bicyclists, such as protected bicycle lanes and neighborhood greenways.

Along the corridor there are several gaps in the bicycle network and facilities that are inconsistent with the BMP. For example, the transition on the north side of the University Bridge is difficult for bicycles to navigate with merging traffic. Also, along portions of Eastlake, Fairview, Stewart, Virginia, and Westlake bicyclists ride with traffic where the BMP recommends bicycle lanes or protected bicycle lanes.

The Bicycle Master Plan Implementation Program, includes several near-term bicycle improvement projects on or near the corridor (as illustrated on **Figure 3**):

- 2015 – Protected bike lanes on:
 - Roosevelt Way NE from NE 45th Street to NE 65th Street (as part of the Roosevelt Paving and Safety Project)
 - University Bridge between Furhman Avenue and NE Campus Parkway (also part of the Roosevelt Paving and Safety Project)
 - NE Ravenna Boulevard/Cowen Place NE/15th Avenue NE
 - NE Campus Parkway between Eastlake Avenue and University Way
- 2016 – New bike lane on Banner Way and NE 75th Street between Roosevelt Way and 5th Avenue
- 2017 – Protected bike lane on NE 40th Street between Brooklyn Avenue and 7th Avenue
- 2017 – Broadway to Eastlake Greenway (3.5 mile long north-south greenway linking First Hill and Eastlake).

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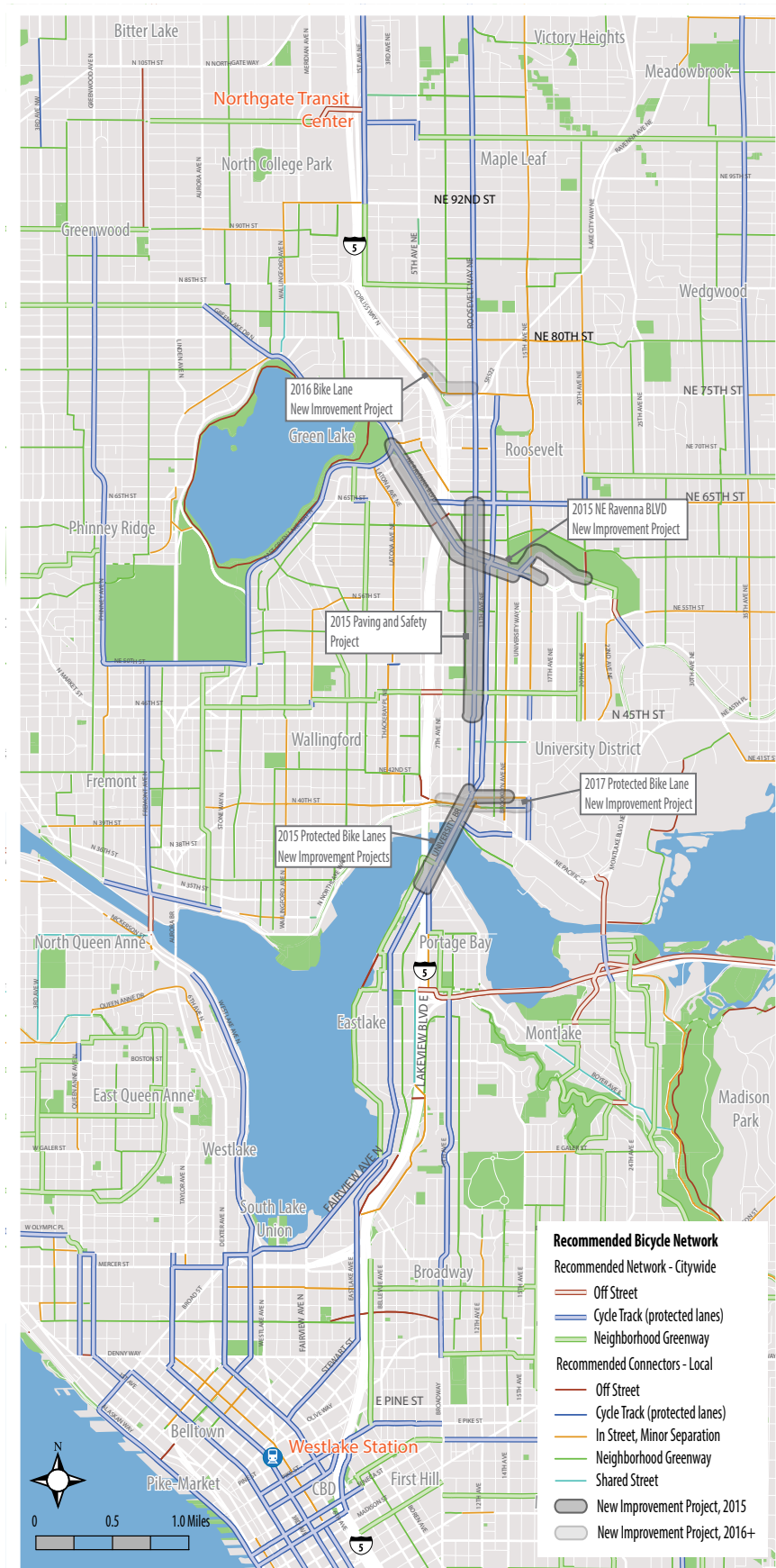


Figure 3
Bicycle Master Plan Existing Network and Improvement Projects

Pedestrians

Pedestrian and sidewalk conditions vary along the corridor, from wide tree-lined sidewalks in downtown to instances of cracked and raised sidewalks in the University District and Roosevelt neighborhoods. Improvements to mobility and access for pedestrians will focus on the following:

- Improving intersection and crossing conditions;
- Increasing landscape buffers;
- Improving pedestrian lighting;
- Fixing sidewalk obstructions and conditions; and,
- Upgrading curb ramps for ADA accessibility.

The pedestrian quality along the corridor is at its highest in the downtown area with a high amount of mid-block features and street crossings with safety improvements across most of the streets. Pedestrian quality lowers in the Eastlake neighborhood as fewer mid-block features are present. The University District and Roosevelt neighborhoods have lower pedestrian quality as fewer mid-block crossings are present, sidewalks are cracked and raised at some locations, fewer main arterial crosswalks exist at unsignalized intersections, narrower sidewalks exist in many places, and large or continuous curb cuts for businesses are present in some places. Further ADA-accessible curb ramp upgrades are needed at certain locations along the entire corridor. **Figure 4** shows overall pedestrian quality and connectivity.

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Figure 4
Walkshed and Sidewalk Conditions

Meet Transit Mode Share Goals

Provide high capacity transit service to support the transit mode share goals defined in the Seattle Comprehensive Plan.

The Draft Seattle Comprehensive Plan identifies mode share targets for non-single occupancy vehicle (SOV) trips in urban centers, including Downtown, South Lake Union, University District and Northgate. **Table 4** shows the Comprehensive Plan's mode share targets for urban centers that are in the study area. Improving transit, bicycle, and pedestrian connections is a key strategy identified in the Comprehensive Plan for increasing non-SOV trips. Of particular note is the low percentage of non-SOV work trips in the South Lake Union Urban Center; this area is positioned to see the greatest job and population growth in the Study Area. The improvements to transit, bicycle, and pedestrian connections will improve mobility to the South Lake Union neighborhood and contribute significantly in meeting mode share targets.

Table 4. Draft Seattle Comprehensive Plan Mode Share Targets (Percentage of trips made by travel modes other than driving alone)

Urban Center	Work Trips		Non-Work Trips	
	2014	2035 Target	2014	2035 Target
Downtown	77%	85%	88%	90%
South Lake Union	48%	55%	82%	85%
University District	73%	85%	79%	90%
Northgate	30%	40%	46%	55%
Seattle	57%	65%	67%	75%

Data Source: Seattle Comprehensive Plan - Travel Demand Model

Figure 5 uses 2012 US Census data (American Community Survey 2009-1013) to show the percentage of work trips made by travel modes other than driving alone for residents in the study area. The non-SOV mode share is highest in the downtown and University neighborhoods along the corridor. However, SOV mode share is higher in the Eastlake Neighborhood and north of NE 65th Street.

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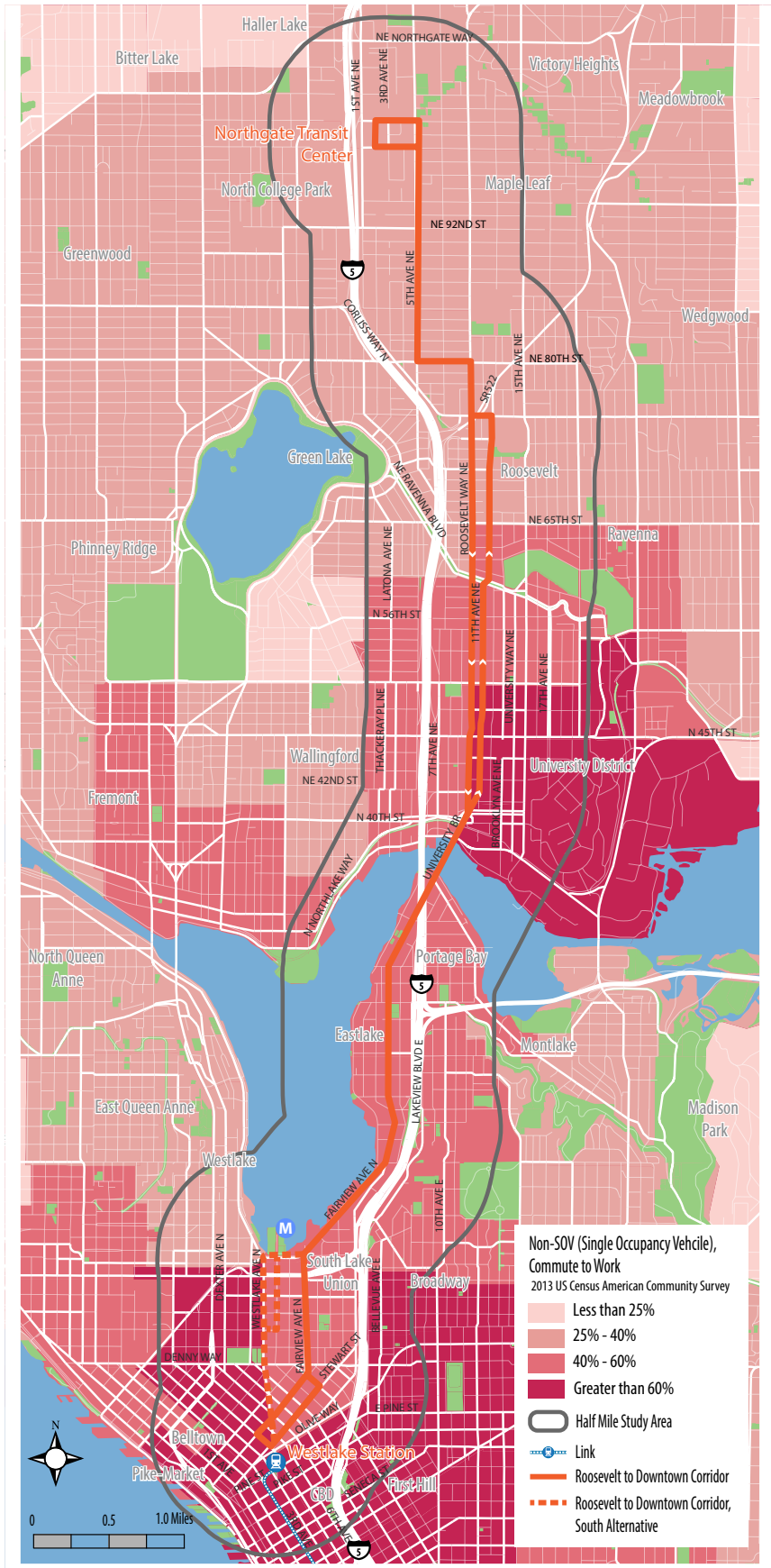


Figure 5
Non-Single Occupancy Vehicle Mode Share

Strengthen the North-South Connection

Strengthen the north-south connections to the regional transit system, including future Link stations, to improve livability and support growth in the Northgate, Maple Leaf, Roosevelt, University District, Eastlake, South Lake Union, and Downtown neighborhoods.

The Roosevelt to Downtown Corridor connects areas with high population and employment density, providing direct connections between the Northgate, Maple Leaf, Roosevelt, University District, Eastlake, South Lake Union, and Downtown neighborhoods as shown in **Figure 6** and **Figure 7**. This corridor provides a north-south connection that incorporates connections where future Link stations will not provide service, including, South Lake Union and Eastlake. Further, Metro service does not provide a direct connection among all these neighborhoods and South Lake Union.

Making strong bicycle, pedestrian, and transit connections is an important part of improving mobility and north-south connections between these neighborhoods. Using U.S. Census data from 2012, Longitudinal Employer-Household Dynamics (LEHD) data shows that 12,500 residents within the study area also work in the study area. Concentrations of jobs in Northgate, near the University of Washington, in South Lake Union, and in Downtown are a draw for residents living within the study area. The number of commuters along this corridor is expected to increase as residential and employment developments are constructed over the next 20 years.

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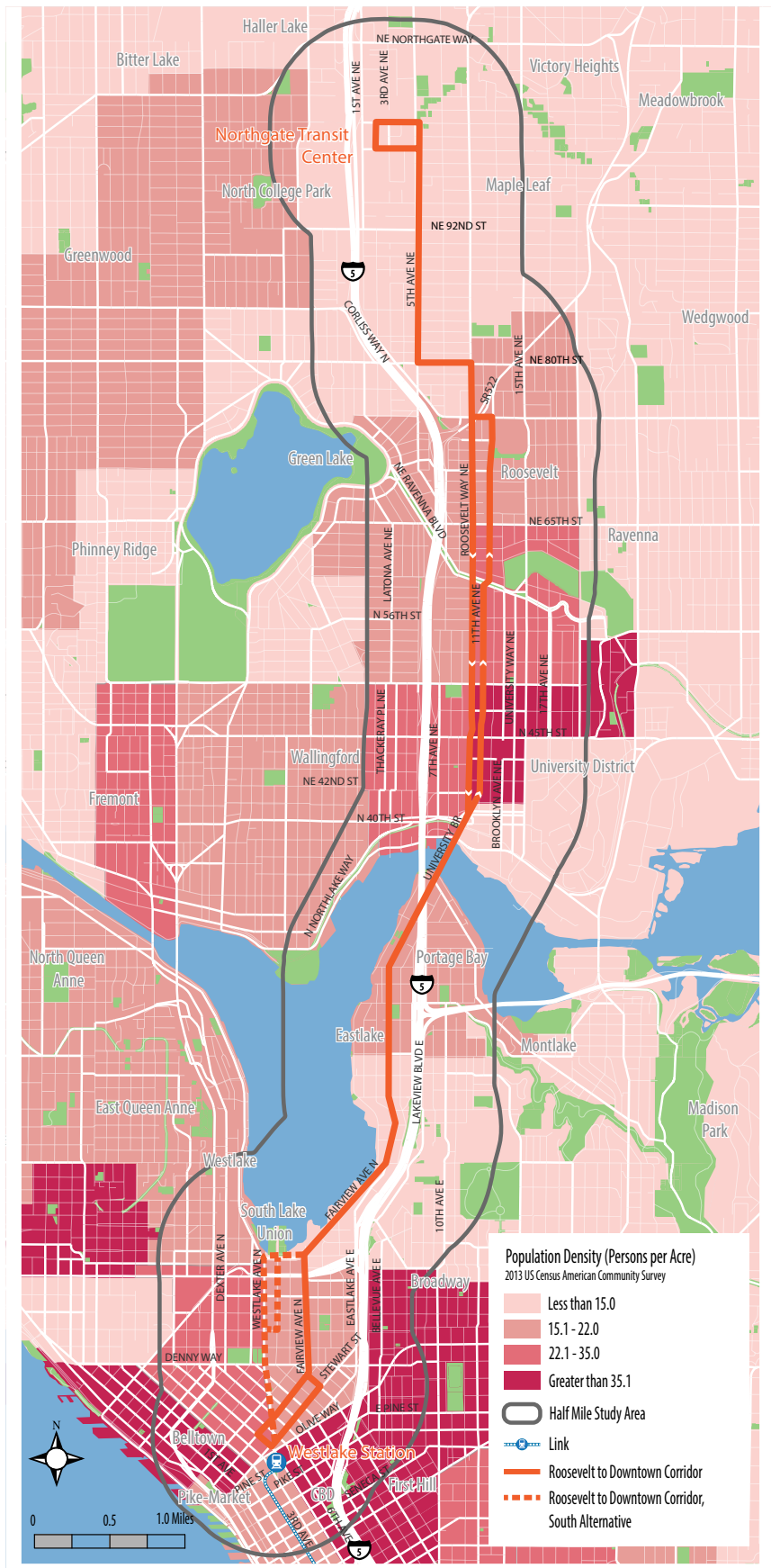


Figure 6
Population Density (Residents per Acre)

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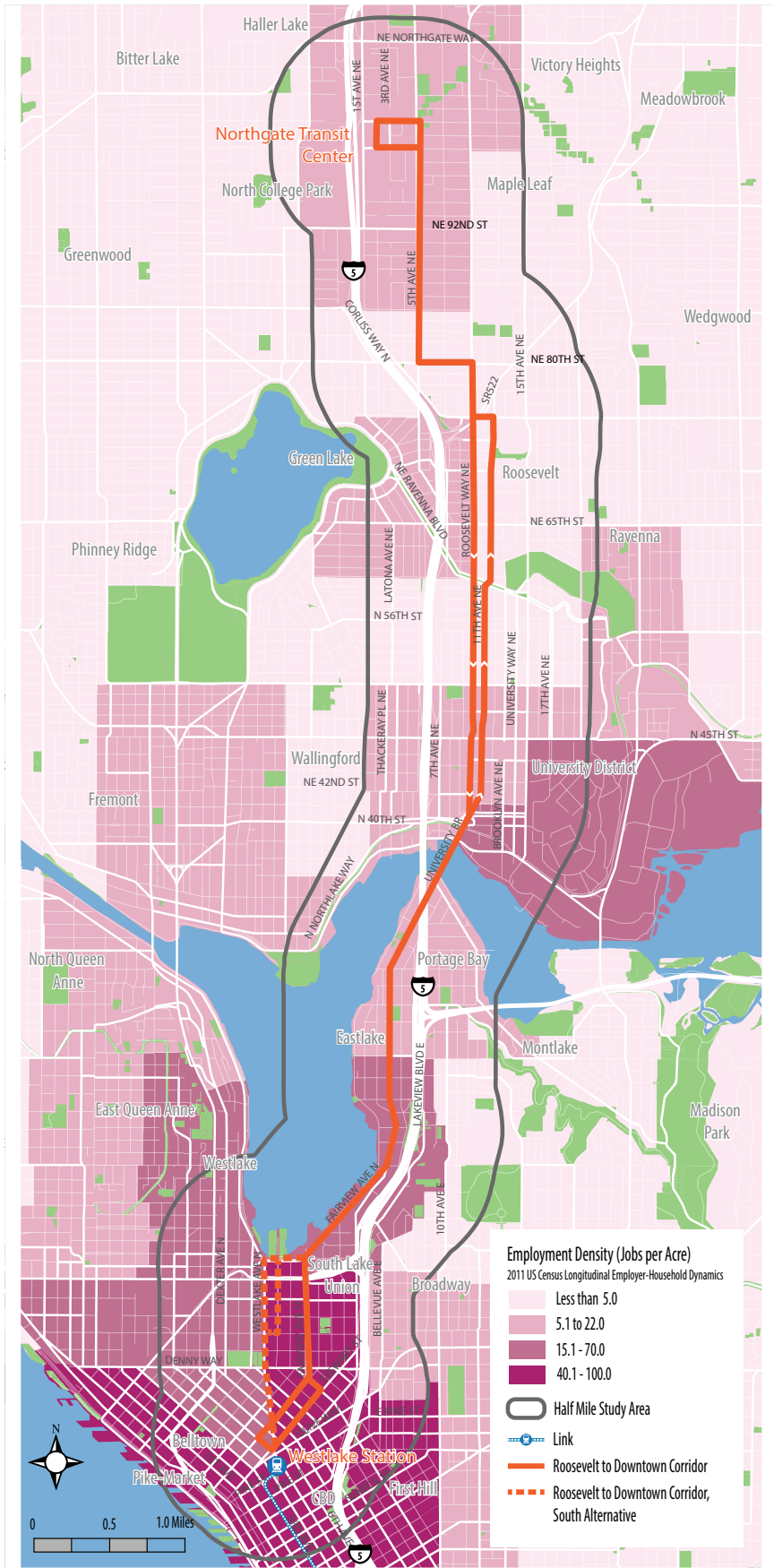


Figure 7
Employment Density (Jobs per Acre)

Serve Growing Population and Employment Centers

Connect residential developments, especially moderate income housing in the Maple Leaf, Roosevelt, University District, and Eastlake neighborhoods, to new major technology employment and medical service centers, in the South Lake Union, University District, and Downtown Seattle neighborhoods.

The City's Comprehensive Plan Update provides a strategy for growth in urban centers, urban villages, and manufacturing/industrial centers. The Comprehensive Plan notes that serving these areas as they develop will require an integrated transportation network with various modes and service throughout the day. The Plan states:

“In all parts of Seattle, improvements that connect people to urban centers and urban villages, especially by transit and bicycle. Serving growth will need to be balanced with the need for an equitable transportation investment strategy that provides transportation service where it is needed, including those parts of Seattle which have historically had less investment in transportation.”

Three of the city's urban centers (South Lake Union, University District, and Northgate) and two urban villages (East Lake and Roosevelt) will be connected along the Roosevelt to Downtown Corridor. As shown in **Figure 8**, 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 (SLU) Rezone.* The incentive zoning program will provide affordable housing and new infrastructure investment (investment in 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.

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Figure 8
Areas of Future Growth

Section 3

Goals and Objectives

Using the five purpose and need statements, a set of goals and objectives have been developed to provide a comparative analysis of alternatives for this project. As the project moves forward a detailed description of the quantitative and qualitative criteria for each of these goals and objectives will be established.

Improve Transit Service

- Improve transit speed
- Improve reliability
- Improve ride quality
- Cost-effectiveness (Costs of the project, both capital and operating, be commensurate with its benefits)

Improve Conditions for Bicyclists and Pedestrians

- Enhance Streetscape
- Address pedestrian realm deficiencies
- Bring pedestrian facilities up to City standards
- Improve pedestrian experience
- Improve pedestrian access
- Improve pedestrian safety
- Improve bicycle experience
- Improve bicycle access
- Improve bicycle safety
- Address ADA Accessibility

Meet Transit Mode Share Goals

- Reduce greenhouse gas emissions
- Shift mode share to bicycling, walking, and transit

Strengthen the North-South Connection

- Expand premium transit network
- Design interconnectivity with Link

Serve Growing Population and Employment Centers

- Provide service to locations with population and employment growth