What's changed since the DEIS?

New information and other corrections and revisions since issuance of the DEIS are described in cross-out (for deleted text) and underline (for new text) format. Entirely new sections or exhibits may be identified by a sidebar callout instead of underline.

3.4 TRANSPORTATION.

This chapter presents a multimodal transportation analysis prepared to evaluate the potential impacts of implementing the range of land use alternatives under consideration. This chapter of the FEIS presents existing transportation conditions within the City of Seattle, as well as future transportation conditions under three alternatives as found in the Draft EIS (DEIS), plus updates and new information describing the Preferred Alternative. New information and other corrections and revisions since issuance of the DEIS are described in cross-out (for deleted text) and underline (for new text) format. ~~one no action alternative representing a continuation of the City's adopted land use plan and two action alternatives reflecting increases in the amount of growth accommodated over the next twenty years as a result of the proposed legislation.~~ Significant transportation impacts and potential mitigation strategies are identified for each future action alternative based on the policies and recommendations established in local plans.

3.4.1 AFFECTED ENVIRONMENT

This section describes the existing transportation conditions in Seattle. Information is provided on a citywide basis as well as for eight defined areas (or "EIS analysis sectors") as shown in Exhibit 3.4–1 on the following page, including Northwest Seattle, Northeast Seattle, Queen Anne/Magnolia, Downtown/ Lake Union, Capitol Hill/Central District, West Seattle, Duwamish and Southeast Seattle.

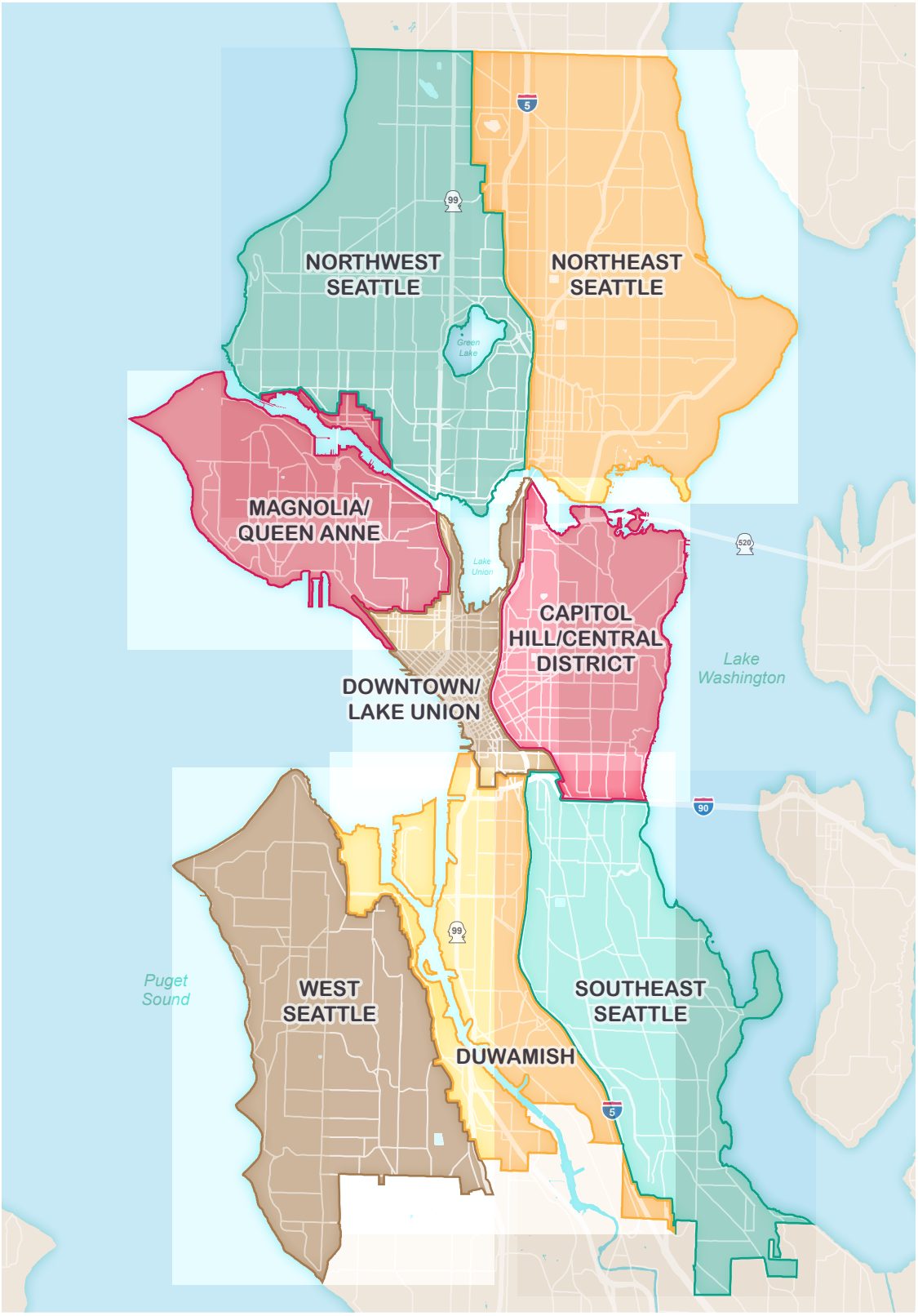

Exhibit 3.4–1 EIS Analysis Sectors

Source: City of Seattle, 2017; Fehr & Peers, 2017.

EXISTING TRANSPORTATION NETWORK

This section describes the existing transportation network in Seattle for all modes, including pedestrians, bicycles, transit, autos and freight.

Pedestrian Network

The Seattle pedestrian network is composed of sidewalks, crosswalks, staircases, pedestrian bridges, curb ramps and trails. Most urban centers and urban villages have well-connected sidewalk networks. The 2017 *Seattle Pedestrian Master Plan* (PMP) states that there are approximately 5,500 marked crosswalks, 33,600 blockfaces of sidewalks, and 27,300 curb ramps in Seattle (SDOT 2017a, 25). However, 26 percent of the blockfaces in the city are missing sidewalks (SDOT 2017a, 62). These locations are mostly found in the Northwest and Northeast Seattle sectors north of NE 85th Street, near the southwest city boundaries in the West Seattle Sector, in sections of the Duwamish Sector and the edges of the Southeast Seattle Sector.

The PMP designates a Priority Investment Network to prioritize the City's efforts on the locations most in need. The network is focused on key pedestrian connections to schools and frequent transit stops. Exhibit 3.4–2 through Exhibit 3.4–7 show the Priority Investment Network throughout the city. The City has made steady progress on pedestrian improvements through the Bridging the Gap levy. From 2007 to 2015, there have been 118 new blocks of sidewalk constructed, 122 curb ramps constructed, 50 stairways rehabilitated, 5,766 crosswalks remarked, and crossing improvements at 266 locations among other improvements (SDOT 2015, 6).

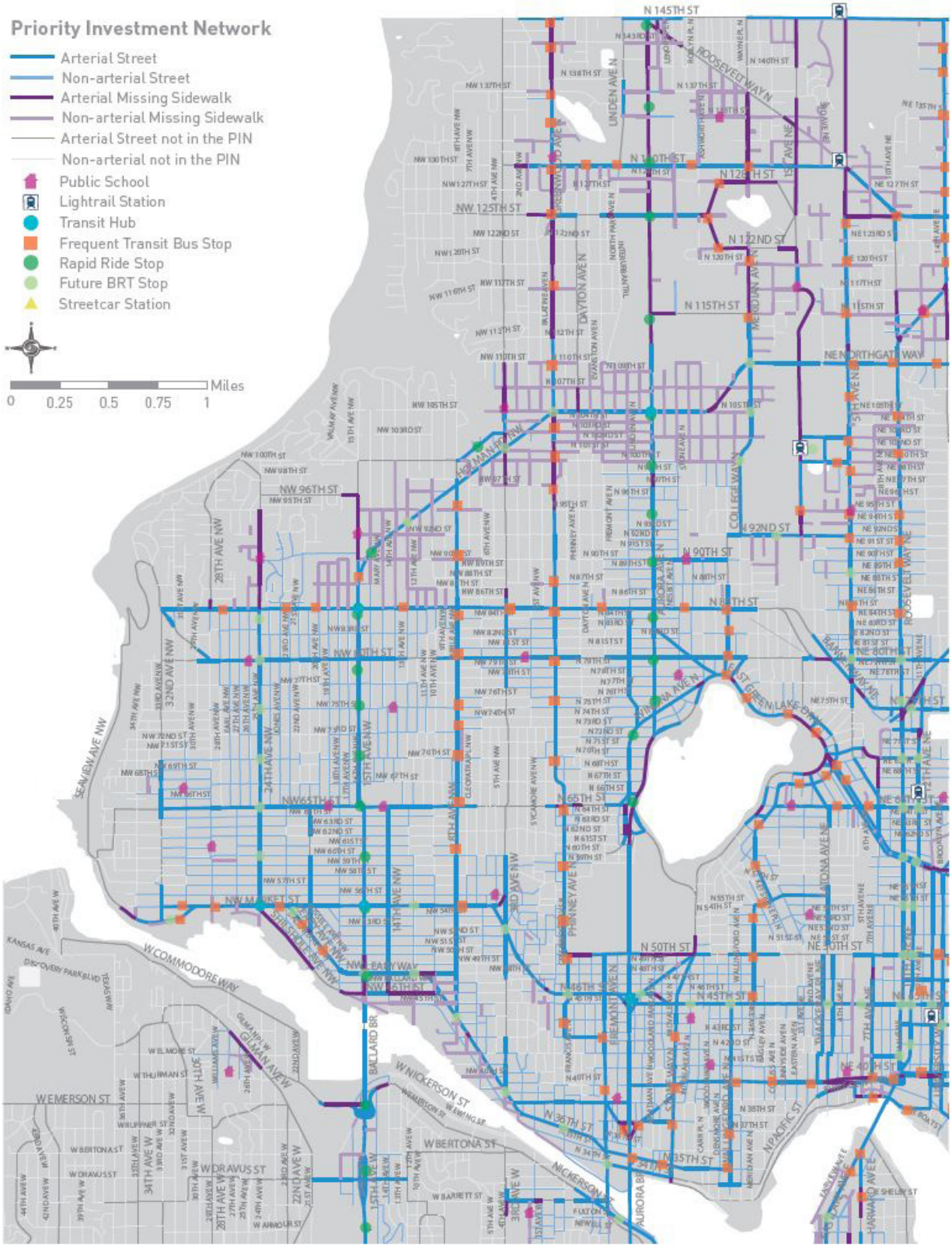

Exhibit 3.4–2 Pedestrian Master Plan Priority Investment Network, Northwest Seattle

Source: City of Seattle, 2017.

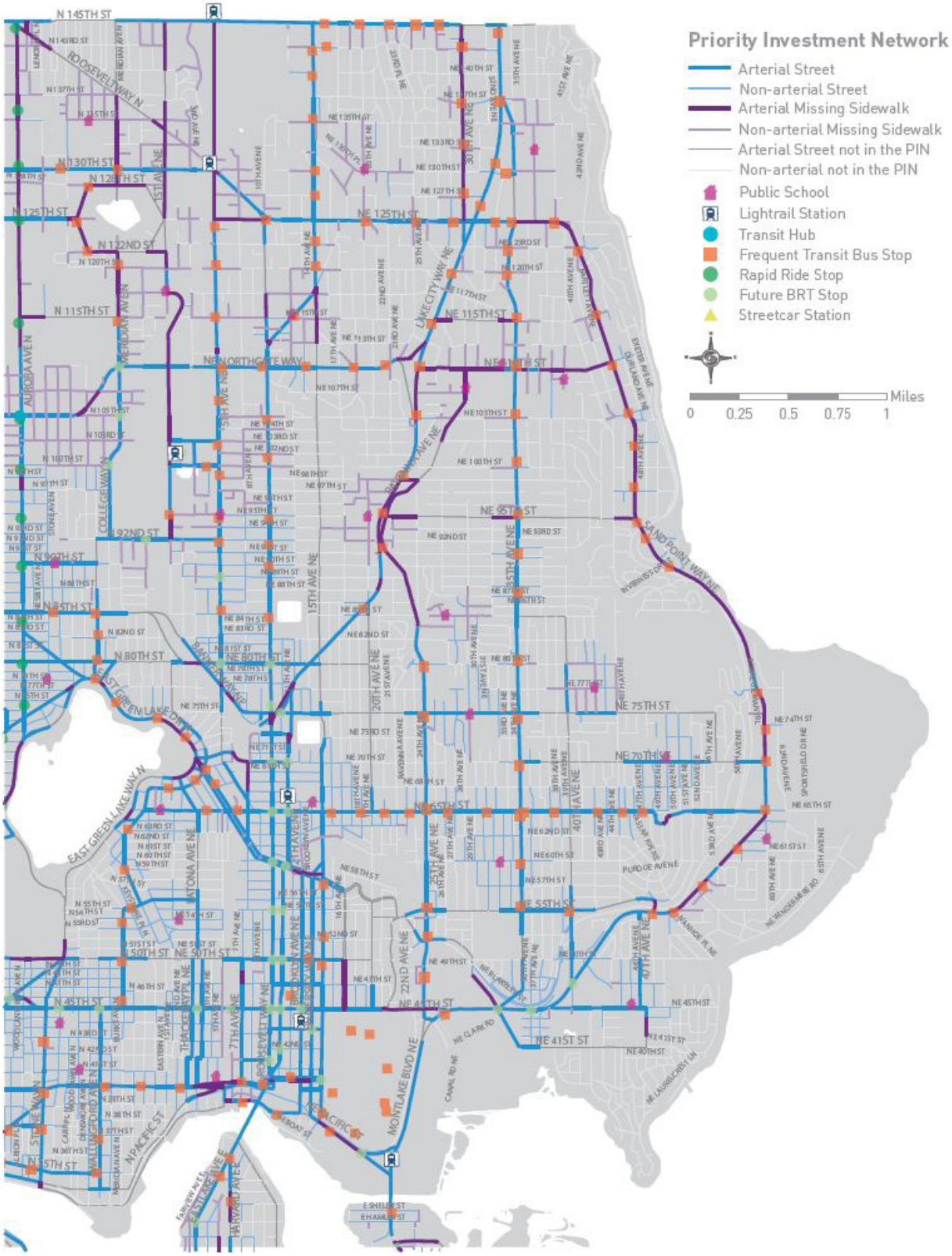

Exhibit 3.4–3 Pedestrian Master Plan Priority Investment Network, Northeast Seattle

Source: City of Seattle, 2017.

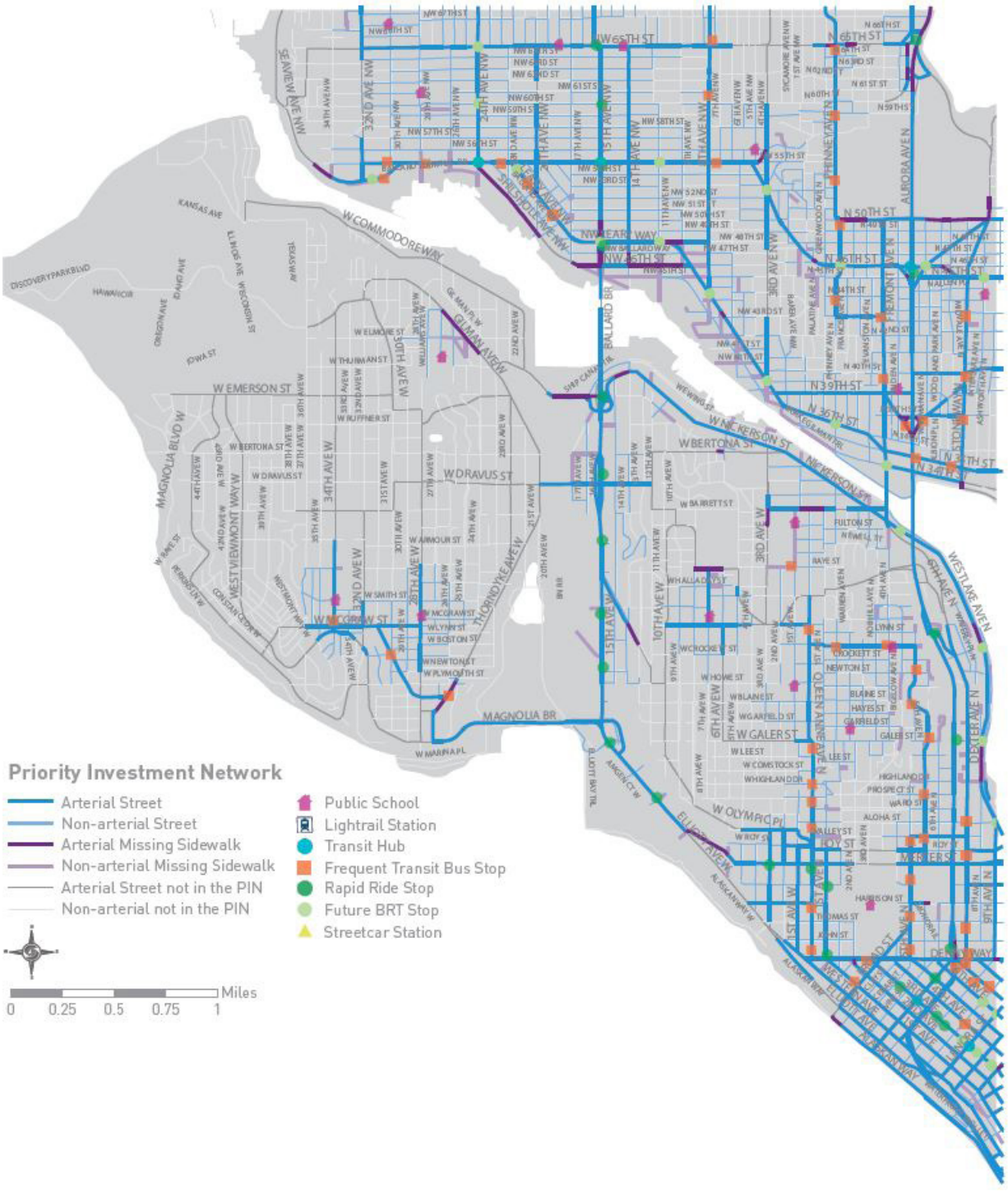

Exhibit 3.4–4 Pedestrian Master Plan Priority Investment Network, West Central Seattle

Source: City of Seattle, 2017.

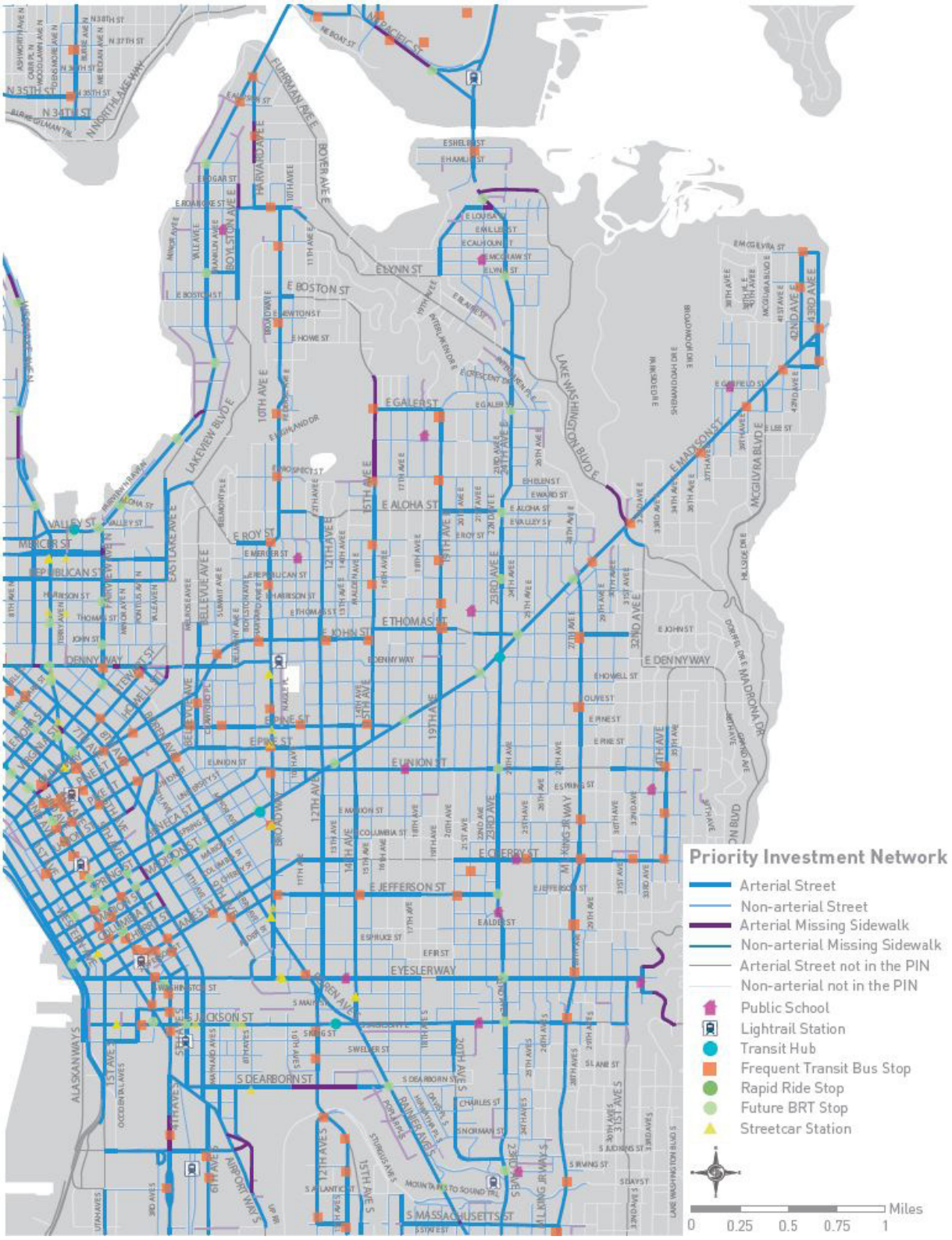

Exhibit 3.4–5 Pedestrian Master Plan Priority Investment Network, East Central Seattle

Source: City of Seattle, 2017.

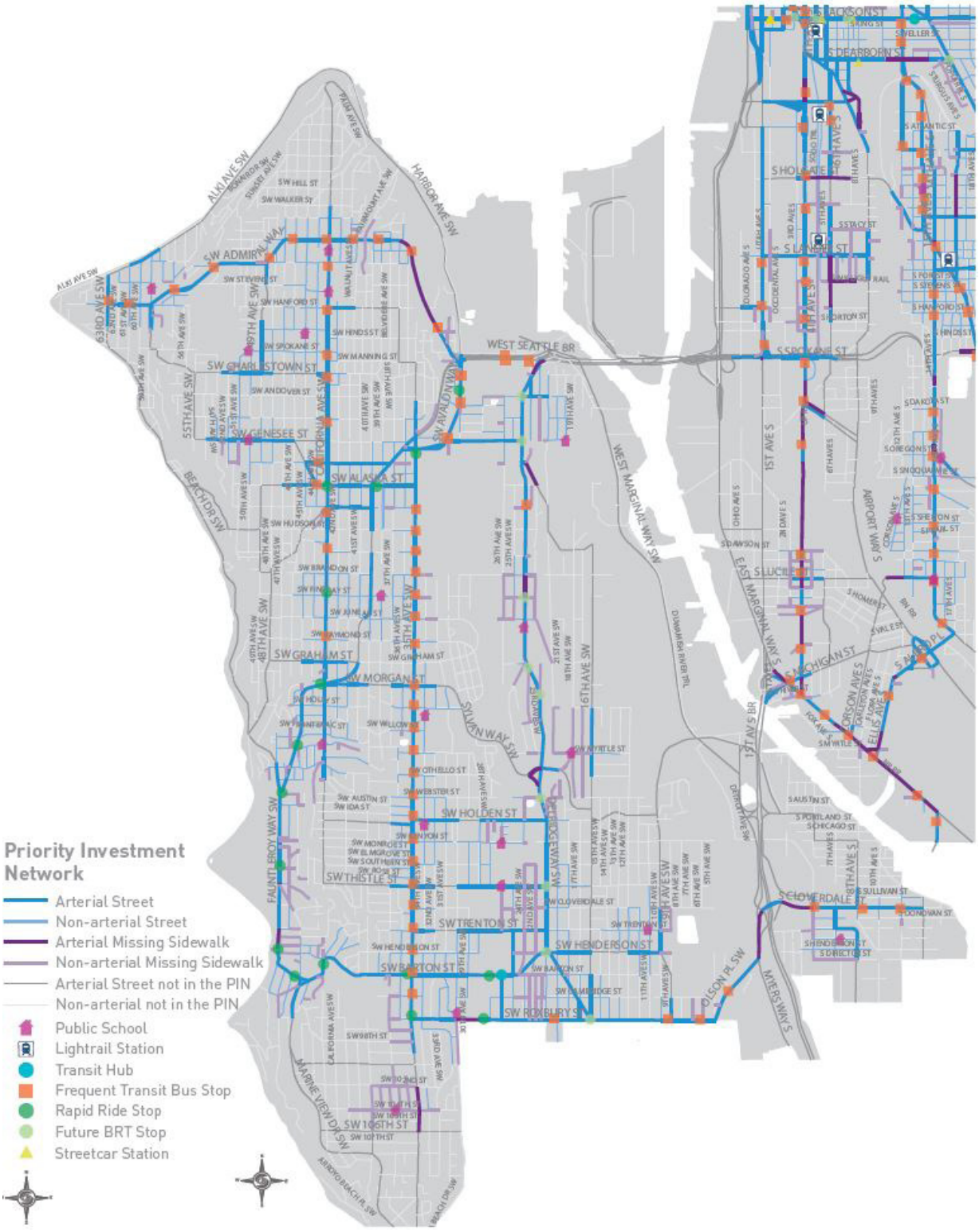

Exhibit 3.4–6 Pedestrian Master Plan Priority Investment Network, Southwest Seattle

Source: City of Seattle, 2017.

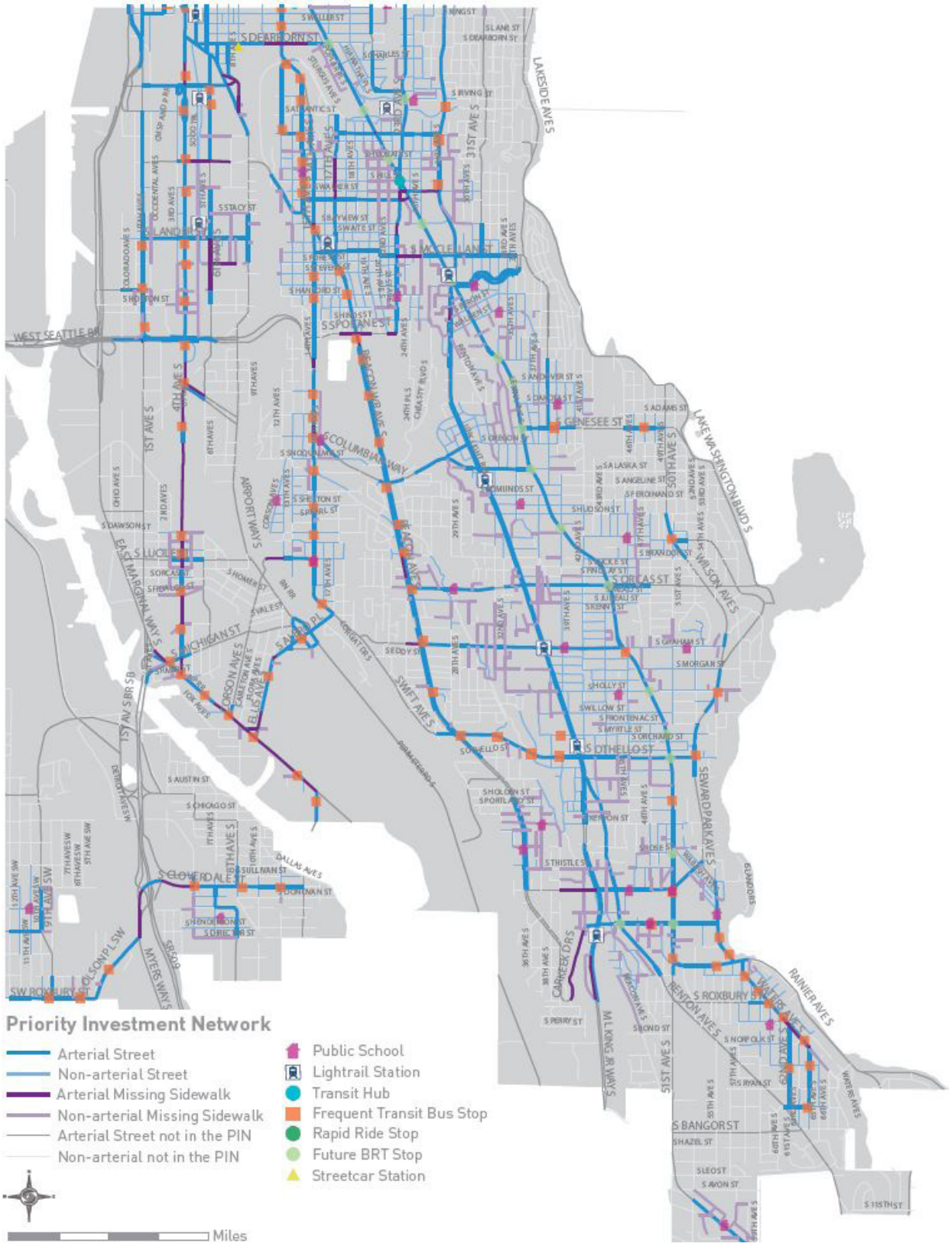

Exhibit 3.4–7 Pedestrian Master Plan Priority Investment Network, Southeast Seattle

Source: City of Seattle, 2017.

Bicycle Network

Seattle's bicycle facilities consist of off-street facilities such as multi-use trails, cycle tracks—protected bicycle lanes, physically separated (raised or with an on-street barrier), neighborhood greenways, bicycle and climbing lanes, shared street bicycle facilities or "sharrows", and signed routes. Exhibit 3.4–88 shows existing bicycle facilities; the planned network is show in Exhibit 3.4–9 through Exhibit 3.4–14.

Bicycle facilities are spread throughout the city and are more prevalent in urban centers such as Downtown, First/Capitol Hill, the University District, South Lake Union, and Uptown (also known as Lower Queen Anne). Trails are generally along the water (Lake Washington, Ship Canal, Puget Sound), while neighborhood greenways are in more residential locations of the Northwest, Northeast, Southeast and West Seattle sectors. Locations of gaps in the bicycle network are identified throughout Seattle in the *Bicycle Master Plan*, which recommends over 400 miles of new bicycle facilities and connections by 2030.

The City collects bicycle counts three times a year at 50 locations in Seattle. The highest bicycle count locations are at ship canal crossings, and in the South Lake Union, Capitol Hill, and the Downtown neighborhoods. Over the past six years, the data has generally shown steadily climbing numbers of bicycle riders, although the 2016 count showed a decline. However, this data is thought to be anomalous due to data errors and weather conditions on the days of the 2016 counts.

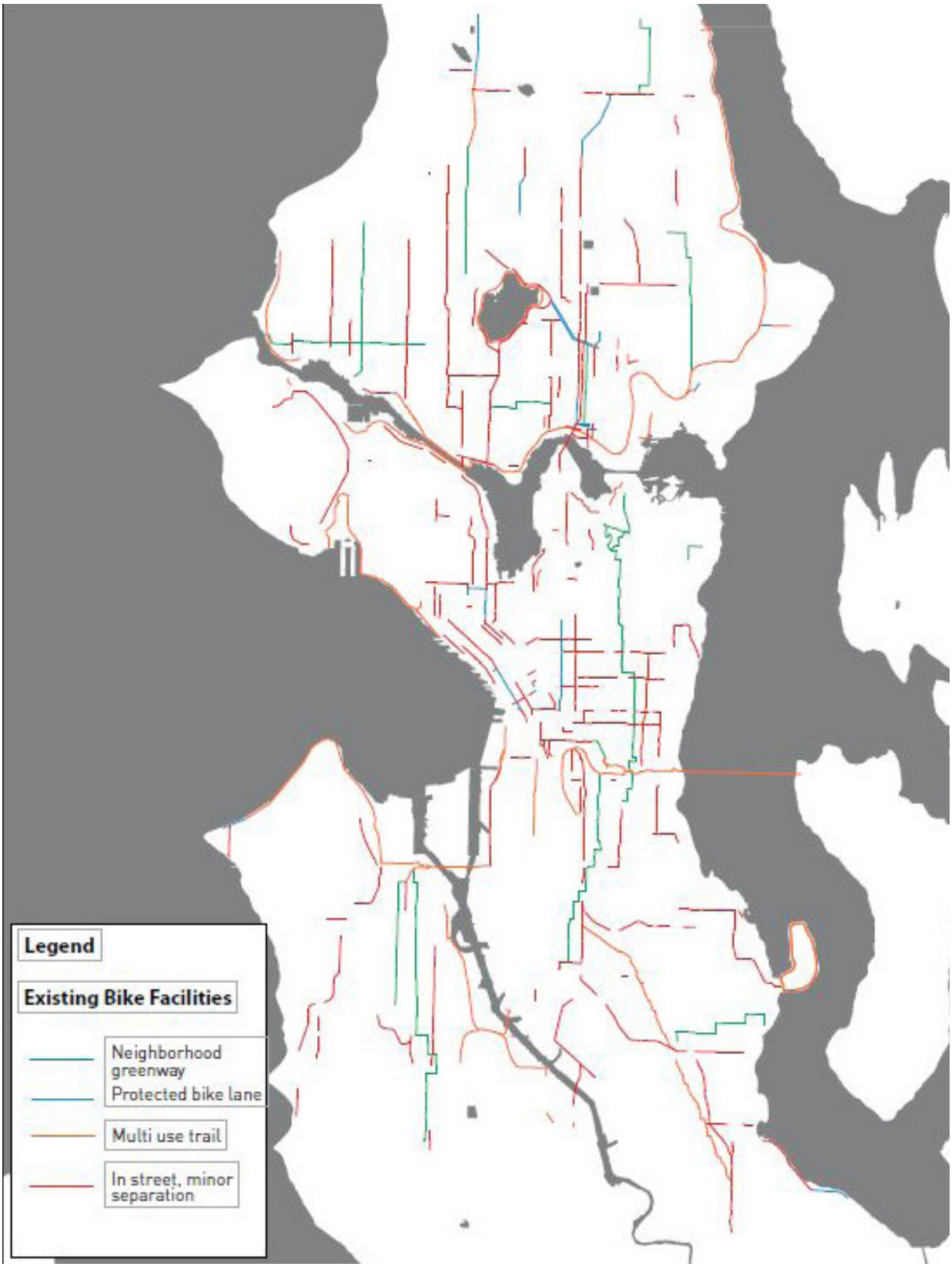

Exhibit 3.4–8 Existing Bicycle Facilities

Source: City of Seattle, 2017.

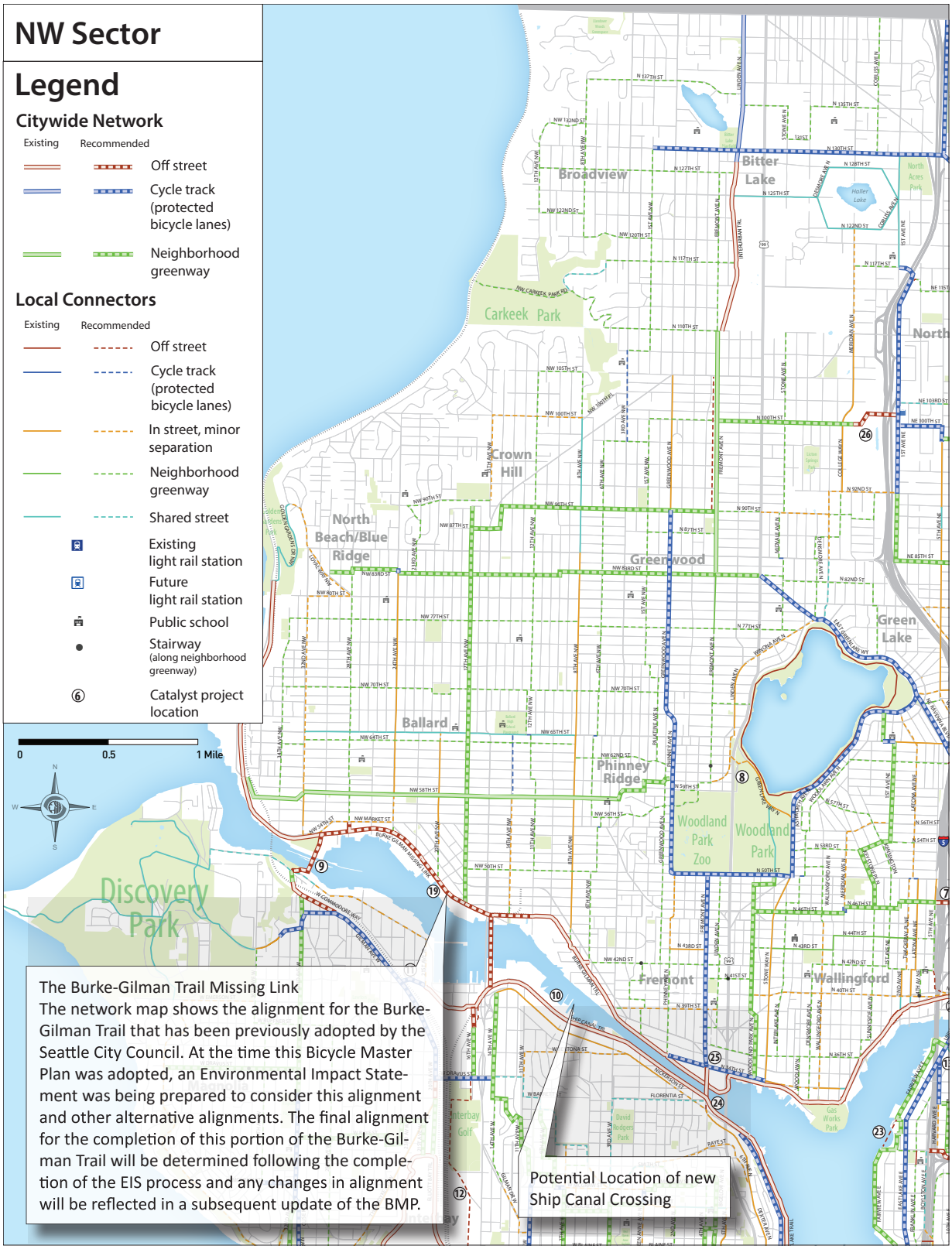

Exhibit 3.4–9 Planned Bicycle Network, Northwest Seattle

Source: City of Seattle, 2017.

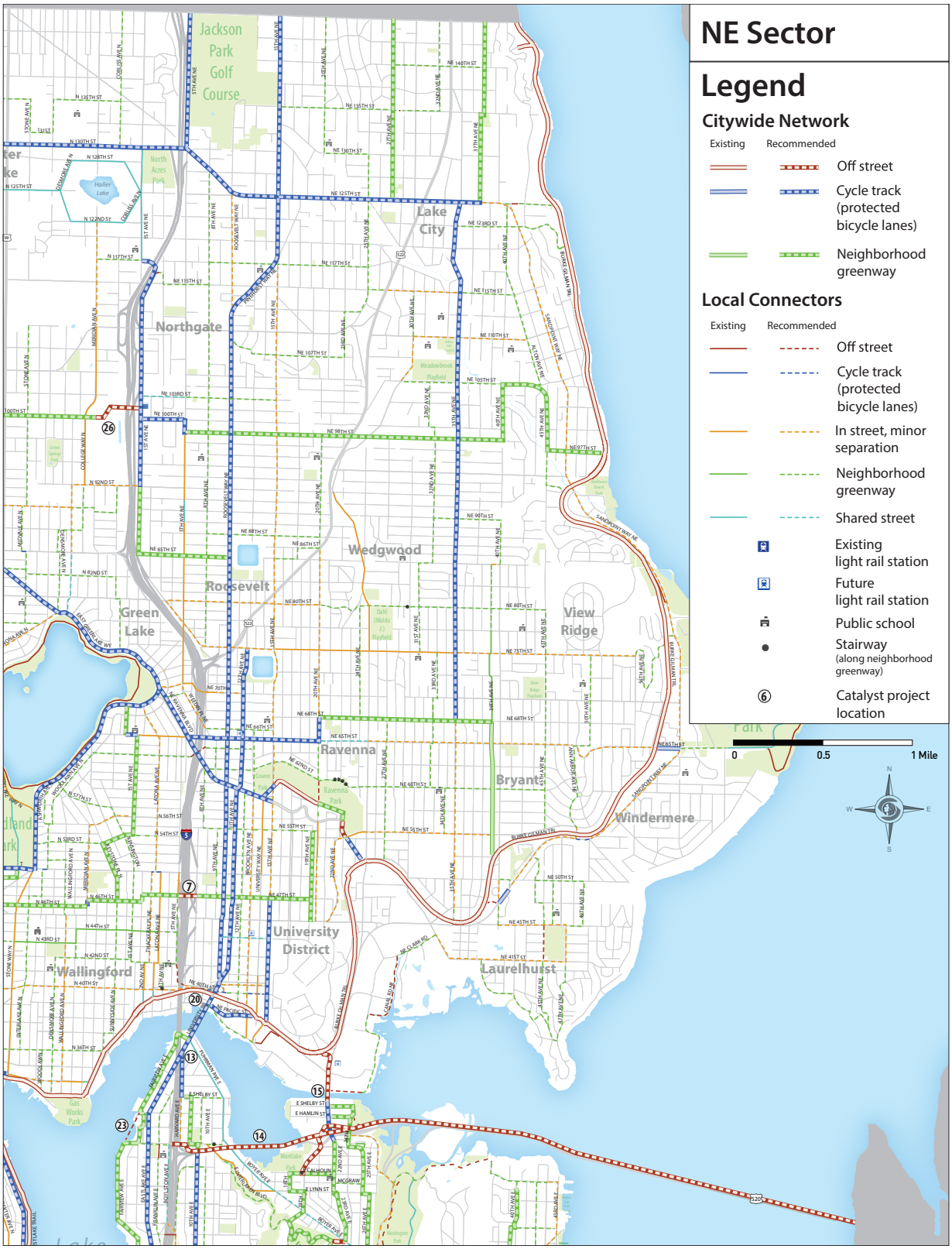

Exhibit 3.4–10 Planned Bicycle Network, Northeast Seattle

Source: City of Seattle, 2017.

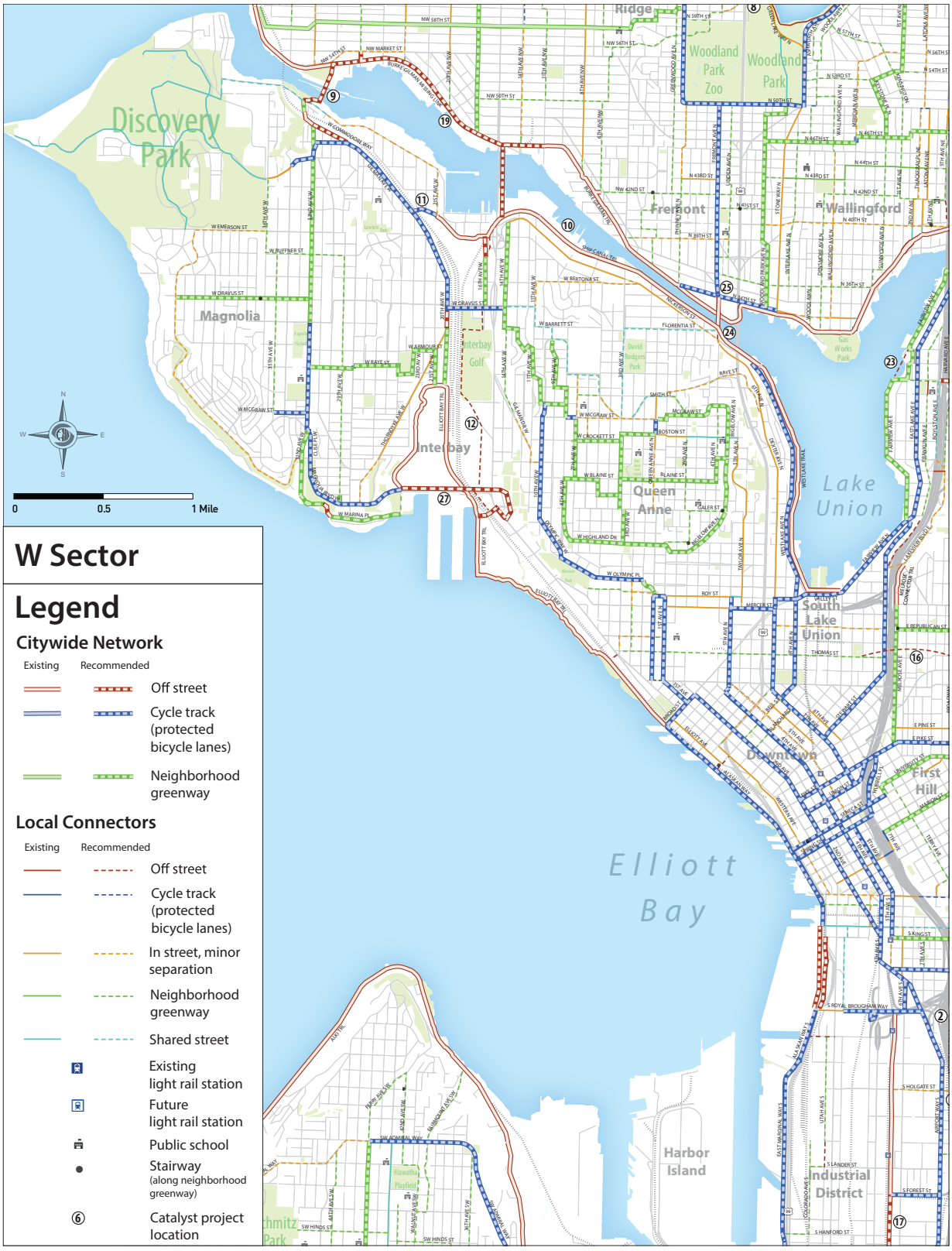

Exhibit 3.4–11 Planned Bicycle Network, West Central Seattle

Source: City of Seattle, 2017.

Exhibit 3.4–12 Planned Bicycle Network, East Central Seattle

Source: City of Seattle, 2017.

Exhibit 3.4–13 Planned Bicycle Network, Southwest Seattle

Source: City of Seattle, 2017.

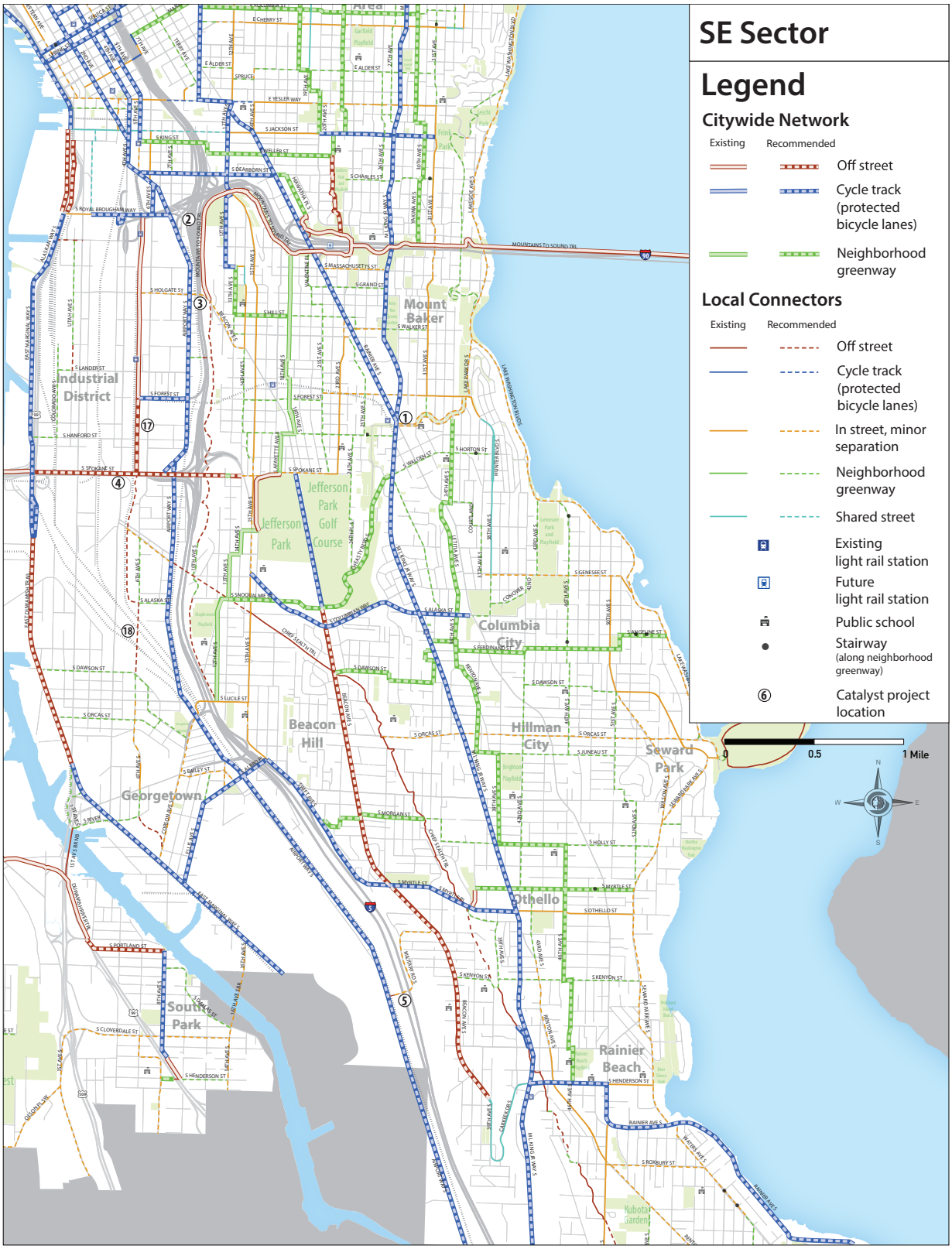

Exhibit 3.4–14 Planned Bicycle Network, Southeast Seattle

Source: City of Seattle, 2017.

Transit Services

Seattle's public transit services are provided by King County Metro, Sound Transit, Community Transit, and the City of Seattle. Transit data shows that there were 332,000 daily transit boardings in Seattle in 2016.[1] According to American Community Survey data, transit mode share for commute trips in Seattle has risen from 16 percent in 2005 to 21 percent in 2015. In the urban core of the city, transit ridership is substantially higher. In 2016, the mode share of workers who arrived to Seattle's center city core on weekdays between 6 AM and 9 AM by public transit was 47 percent. The transit mode share for the center city core has steadily risen since 2010 when it was 42 percent. The share of workers who drove alone to center city was 30 percent, down from 35 percent in 2010 (Commute Seattle 2017, 8).

- King County Metro operates a fixed route bus system that also includes "RapidRide," a separately-branded set of frequent transit routes in West Seattle, Ballard, North Seattle, and Downtown.
- Sound Transit Express and Community Transit operate buses that provide service from outside the City of Seattle.
- Rail transit services include Sound Transit Link Light Rail, City-operated streetcars in South Lake Union and First Hill, the monorail between Downtown and Seattle Center and the Sound Transit Sounder Commuter Train that provides service between Lakewood, Seattle and Everett during peak hours.

In 2016, the City amended its *Transit Master Plan* (TMP), which outlines the transit facilities, services and programs needed over the next 20 years to accommodate anticipated growth in Seattle. The City has designated ten High Capacity Transit (HCT) Corridors and eight Priority Bus Corridors, along with Link light rail and the street car system (see Exhibit 3.4–15). The plan recommends investments into seven HCT corridors to become new bus rapid transit (BRT) lines. These corridors are prioritized for capital investments to ensure mobility within Seattle, one of the key objectives outlined in the TMP. Another goal is to provide frequent transit service on these corridors to create and expand the Frequent Transit Network (a map of which may be found in the Seattle 2035 Comprehensive Plan). The Frequent Transit Network is composed of transit corridors that have, or are recommended for, frequent transit

1 *This daily transit boarding total includes King County Metro, Sound Transit and Community Transit routes. It does not include Pierce Transit routes.*

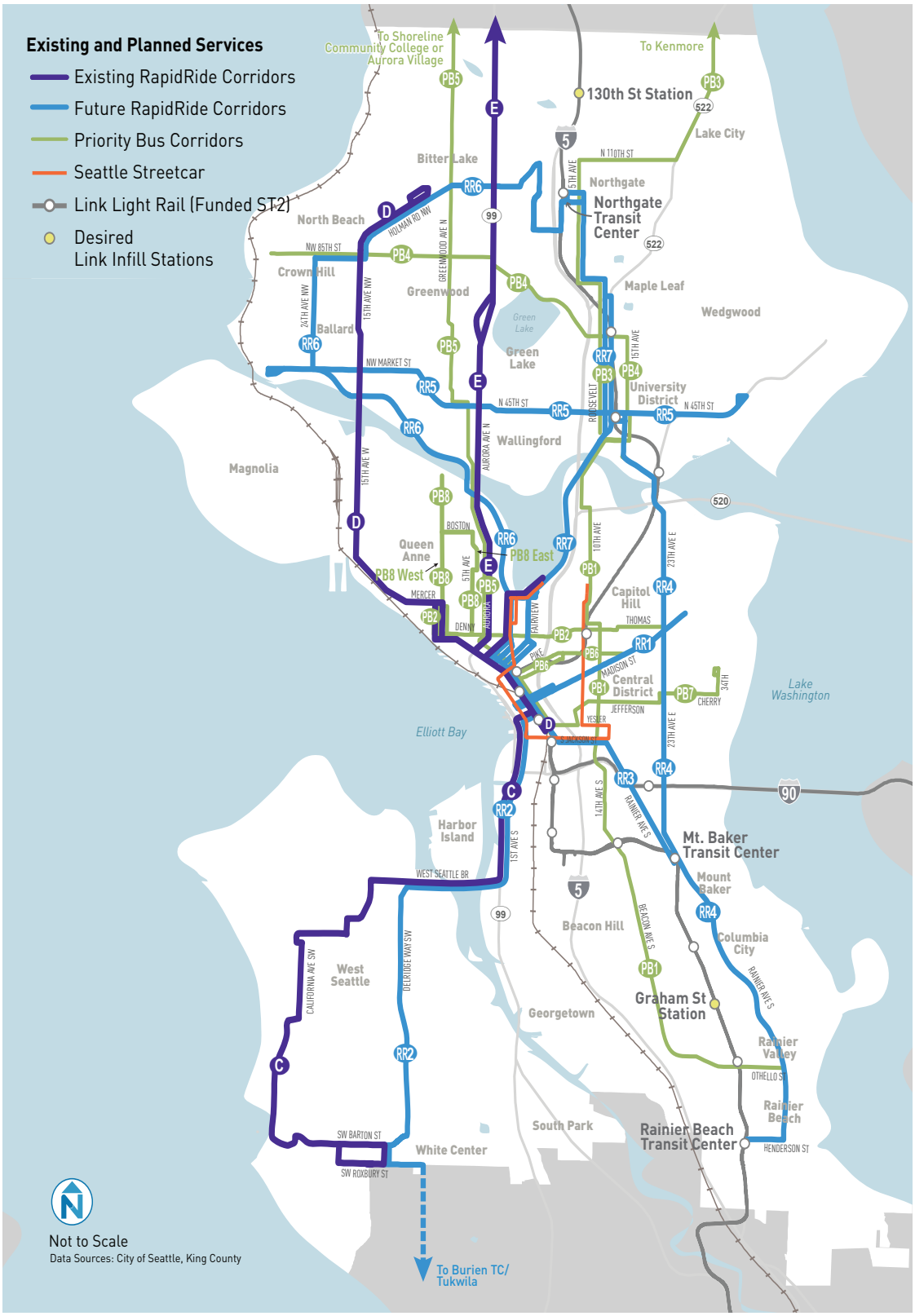

Exhibit 3.4–15 Transit Master Plan, Priority Transit Corridors for Capital Investments

Source: City of Seattle, 2016.

service. This level of service is defined to encompass routes with average service frequency of 15 minutes or better for at least 18 hours per day, with service seven days per week (SDOT 2016b, 4-4).

Roadway Network

The City of Seattle includes roughly 1,550 lane-miles of arterial streets, 2,410 lane-miles of non-arterial streets, 117 bridges and 1,080 signalized intersections (City of Seattle 2017, 182). Much of Seattle's transportation network is constrained by the waterways within and around the city. The Ship Canal divides north Seattle from the rest of the city, with only six crossing points: the Ballard Bridge, the Fremont Bridge, State Route (SR) 99, Interstate 5 (I- 5), the University Bridge and the Montlake Bridge. Likewise, West Seattle is separated from the rest of the city by the Duwamish Waterway, and is accessed via the West Seattle Bridge, Spokane Street Bridge, the First Avenue S Bridge and the South Park Bridge.

I-5 runs north-south throughout the city, serving both local and regional travelers. SR 99 also runs north-south through the city and tends to serve more locally focused trips. To the east, there are two bridges across Lake Washington: SR 520 and Interstate 90 (I-90). Other key state routes within the city include SR 522 connecting to the northeast and SR 509 connecting south to Sea-Tac Airport. City arterials generally follow a grid pattern. The City has designated a major truck street network throughout the city that carries a substantial amount of freight traffic. The state routes, interstates and major arterials linking major freight destinations are part of this network.

Parking

The City of Seattle regulates parking within its right-of-way by issuing on-street permits, charging by the hour, setting time limits and defining load zones. The city regularly assesses the performance of its parking management programs to manage changing demand patterns.

Restricted Parking Zone (RPZ) Program

Seattle designates certain areas as Restricted Parking Zones (RPZ), as shown in Exhibit 3.4–16. These zones have time-limited parking available to the public. Residents with eligible addresses can apply for a permit to use the curb parking in their neighborhood without time limits. The aim is to balance the parking needs of the public and the residents and ease parking congestion in certain locations. There are 31 zones

Exhibit 3.4–16
Restricted Parking Zones
Source: City of Seattle, 2017.

in Seattle, with an additional two zones during University of Washington Husky game days. Seattle is currently evaluating potential changes to the RPZ program to better manage on-street parking supply; however, no changes have been identified at the time of this EIS publication.

On-Street Paid Parking

On-street paid parking is located in most Seattle urban centers (except for the Northgate area) and in select smaller locations near commercial business areas such as the Ballard, Fremont, and Roosevelt neighborhoods. The City manages approximately 12,000 paid on-street spaces in 20 business districts. Through Seattle's Performance-Based Parking Program, on-street parking rates are adjusted in neighborhoods to reach a target parking occupancy. The Seattle Department of Transportation regularly collects citywide parking utilization data to implement the Performance-Based Parking Program, established by Seattle Municipal Code 11.16.121 that states, in part:

> *"The Director shall establish on-street parking rates and shall adjust parking rates higher (up to the Maximum Hourly Rate), or lower (as low as the Minimum Hourly Rate) in neighborhood parking areas based on measured occupancy so that approximately one or two open spaces are available on each blockface."*

The goals of the Performance-Based Parking Program are to:

- Support neighborhood business districts by having available on-street parking;
- Maintain adequate turnover and reduce meter feeding in commercial districts;
- Encourage adequate on-street parking availability, efficient use of off-street parking facilities, and enhanced use of transit and other transportation alternatives; and
- Reduce congestion in travel lanes caused by drivers looking for on-street parking.

Seattle's target on-street parking occupancy is 70–85 percent utilization citywide. Exhibit 3.4–17 shows the 2015 and 2016 daytime and evening occupancy rates by neighborhood. For neighborhoods with high concentrations of residential land uses, evening occupancy tends to be greater than daytime occupancy. In more commercial areas, generally closer to the city's urban centers, peak parking demand tends to occur during the daytime.

In 2016, three-quarters of the 32 surveyed locations experienced parking occupancy above the 85 percent target during either the daytime or evening periods. A quarter of the total locations experienced occupancy of 100 percent or more in at least one of the studied time periods.

The eight locations in which parking demand currently exceeds supply (i.e. occupancy of 100 percent or more) are:

- 12th Ave (evening)
- Ballard (evening)
- Capitol Hill—South (evening)
- Green Lake (daytime and evening)
- Pioneer Square—Core and Edge (daytime)
- Uptown—Core and Edge (evening)

Exhibit 3.4–17 Summary of 2015 and 2016 On-Street Occupancy by Neighborhood

		2015 OCCUPANCY		2016 OCCUPANCY	
Area	**Subarea**	**11:00 AM—5:00 PM**	**7:00 PM**	**11:00 AM—4:00 PM**	**7:00 PM**
12th Avenue		84%	106%	91%	108%
Ballard	Core	81%	103%	75%	105%
	Edge	72%	102%	77%	89%
Ballard Locks	Winter	19%	82%	36%	22%
	Summer	94%	52%	83%	69%
Belltown	North	71%	76%	74%	72%
	South	82%	86%	89%	87%
Capitol Hill	North	79%	101%	76%	91%
	South	77%	100%	72%	105%
Cherry Hill	Paid	93%	70%	98%	68%
Chinatown / ID	Core	92%	95%	96%	99%
	Edge	82%	92%	88%	76%
Commercial Core	Financial	91%	62%	94%	48%
	Retail	89%	63%	77%	65%
	Waterfront	93%	80%	94%	76%
Denny Triangle	North	88%	80%	94%	80%
	South	89%	72%	99%	90%
First Hill		93%	99%	95%	93%
Fremont	Paid	77%	88%	82%	90%
Green Lake	Paid	79%	99%	102%	108%
Pike-Pine	Paid	83%	106%	73%	93%
Pioneer Square	Core	101%	89%	101%	89%
	Edge	99%	83%	103%	80%
Roosevelt		73%	100%	54%	65%
South Lake Union	North	94%	27%	81%	48%
	South	98%	75%	91%	77%
University District	Core	75%	86%	77%	89%
	Edge	66%	30%	77%	51%
Uptown	Core	60%	94%	72%	101%
	Edge	75%	72%	75%	100%
Uptown Triangle		70%	56%	64%	64%
Westlake Ave N		77%	51%	79%	44%

Source: SDOT On-Street Paid Parking Occupancy Annual Report 2016c.

Safety

The City periodically releases reports summarizing citywide collision data. The most recently available data is for 2015, which had 10,930 police reported collisions. This number was slightly higher than the previous three years, but well below the highs of roughly 14,000–15,000 in years 2003 through 2008 (SDOT 2017b). The City has a Vision Zero policy that aims to reduce the number of fatalities and serious injuries to zero by 2030. The Vision Zero program includes a variety of strategies, including reduced speed limits, Safe Routes to Schools investments, safety improvements at high-risk locations, enforcement, and education. In 2016, there were 21 fatalities in the city. Although fatalities on city streets had been on a downward trend, there has been a recent increase. This trend is similar to what has been observed nationwide; a major factor in the uptick of fatalities is thought to be the increase in distracted driving.

RELEVANT PLANS AND POLICIES

Relevant policies related to transportation in Seattle are summarized below. The City of Seattle has a 10-year strategic plan outlined in *Move Seattle* (2015). Seattle also has master plans for transit, freight, pedestrians and bicyclists. More detailed information is available in the specified documents.

Move Seattle (2015)

Move Seattle is a strategic document published in 2015 that guides SDOT's work over the next ten years. The plan identifies the following three key elements:

- Organizing daily work around core values: a safe, interconnected, vibrant, affordable, and innovative city.
- Integrating modal plans to deliver transformational projects: this includes creating a near-term strategy to integrate recommendations from the freight, transit, walking, and bicycling 20-year modal plans.
- Prioritizing projects and work to identify funding: in 2015, voters approved a nine-year $930 million Levy to Move Seattle. This funding source replaces the prior Bridging the Gap levy which expired in 2015. SDOT is using the levy funds to implement projects including safety improvements, new facilities, as well as maintenance of existing infrastructure.

Transportation Strategic Plan (2005)

The *Transportation Strategic Plan (TSP)* is the Seattle Department of Transportation's (SDOT's) 20-year work plan developed in 2005. This strategic plan was updated in 2015 as part of the Move Seattle initiative. It includes the strategies and actions required to achieve the goals and policies outlined in the Seattle Comprehensive Plan and to comply with PSRC regional planning documents. The TSP guides prioritization of resources to projects, programs and services. The TSP includes supporting data such as street classifications and traffic volumes, planning areas, transit routes and sidewalk inventory, among others. In addition annual reports show the progress made toward reaching the set goals.

Transit Master Plan (2016)

The *Transit Master Plan (TMP)* is a 20-year plan that outlines the needs to meet Seattle's transit demand through 2030. It prioritizes capital investment to create frequent transit services that meet the needs of residents and workers. It outlines the high priority transit corridors and the preferred modes (see Exhibit 3.4–15). This document refers to the Transportation Strategic Plan and specifies capital projects to improve speed and reliability. Goals include:

- Meet sustainability, growth management and economic development goals.
- Make it easier and more desirable to take transit.
- Respond to needs of transit-reliant populations.
- Create great places where modes connect.
- Advance implementation within constraints. The elements of the document include policies and programs, transit corridors and service, access and connections to transit and funding and performance monitoring.

Pedestrian Master Plan (2017)

The *Pedestrian Master Plan (PMP)* envisions Seattle as the most walkable and accessible city in the nation. To achieve that vision, the following goals are identified:

- Reduce the number and severity of crashes involving pedestrians;
- Develop a connected pedestrian environment that sustains healthy communities and supports a vibrant economy;
- Make Seattle a more walkable city for all through public engagement, service delivery, accessibility, and capital investments that promote equity; and
- Get more people moving to improve health and increase mobility.

The plan documents existing pedestrian facilities and creates a Priority Investment Network to guide future improvements (see Exhibit 3.4–2 through Exhibit 3.4–7).

Seattle Bicycle Master Plan (2014)

The *Seattle Bicycle Master Plan (BMP)* provides guidance on future investments in bicycle facilities in Seattle, with a vision for bicycling as a safe and convenient mode for people of all ages and abilities on a daily basis. Goals include increasing bicycle ridership, safety, connectivity, equity and livability. The document outlines the existing network and over 400 miles of planned future network for the city. Strategies for end-of-trip facilities, programs, maintenance, project prioritization and funding are included. SDOT publishes annual reports to update the public on its progress toward implementing BMP projects and meeting the identified performance measures.

Freight Master Plan (2016)

The *Freight Master Plan* was adopted by the city in 2016. Its purpose is to ensure efficient and predictable goods movement in the region to promote economic activity and international trade. It analyzes the current freight facilities and their ability to accommodate future freight growth. The plan identifies six main goals with a total of 92 actions that address economy, safety, mobility, state of good repair, equity, and the environment in order to create a comprehensive freight network. This document is especially important for the two designated manufacturing and industrial centers, Ballard-Interbay-Northend and Greater Duwamish, the Port of Seattle, and the railroad operations throughout the city.

City Of Seattle 2017–2022 Transportation Capital Improvement Program

For the 2017 to 2022 period, the *Capital Improvement Program (CIP)* plans to invest more than $1.5 billion on developing, maintaining and operating Seattle's transportation system. The CIP aims to promote safe and efficient movement of people and goods and to enhance the quality of life, environments and economy within the city and surrounding areas. Funding has been designated for projects in the *Seattle Pedestrian Master Plan*, *Transit Master Plan*, *Bicycle Master Plan*, and *Freight Master Plan*. Highlighted improvement projects include:

- New sidewalks, particularly near schools
- School safety improvements
- Pedestrian crossing improvements and stairway rehabilitation
- Focus on ADA compliance for curb ramps
- Neighborhood greenways, bicycle lanes, and bicycle parking
- City Center Streetcar Connector project
- New Bus Rapid Transit corridors
- South Lander St Grade Separation
- Traffic camera replacement and maintenance
- Bridge replacement and repair
- 23rd Avenue Corridor Improvements
- Alaskan Way Viaduct and Seawall Replacement
- Elliott Bay Seawall Project
- Permitting System Integration
- Accessible Mt. Baker safety improvements
- Rainier Avenue Road Safety Corridor project

Complete Streets

This 2006 policy directs SDOT to consider roadway designs that balance the needs of all roadway users, including pedestrians, bicyclists, transit riders and people of all abilities, as well as automobiles and freight. Design decisions are based on data, such as the adjacent land uses and anticipated future transportation needs. There is no set design template for complete streets as every situation requires a unique balance of design features within the available right-of-way. However, examples include providing wider sidewalks, landscaping, bicycle lanes, transit stop amenities and adequate lane widths for freight operations.

ANALYSIS METHODOLOGY

The proposed actions being evaluated in this document are area-wide and programmatic in nature, rather than location specific. Therefore, the methodology used to evaluate potential changes and impacts to the transportation network is broad-based as is typical for the analysis of large-scale plan updates.[2]

This section describes the methodology used to analyze base year transportation conditions in Seattle. The base year for this analysis is 2015. For some metrics, the most recently available data is provided while others use estimates from the 2015 project travel demand model. The project travel demand model is discussed in more detail in 3.4.2 Impacts.

The analyses conducted for this EIS fall into two categories: those used to determine significant adverse transportation impacts and those provided for informational purposes only. These metrics are described in the following sections.

Metrics Used for Impact Identification

The standards included in Seattle's two most recent Comprehensive Plans (*Toward a Sustainable Seattle* first adopted in 2005 and *Seattle 2035* adopted in 2016) are used to determine significant transportation impacts in this EIS. Seattle 2035 included a shift in the way that transportation level of service is measured, from screenlines to mode share. While mode share is a better way to evaluate how the city is shifting travel to more space-efficient modes, screenlines will continue to be evaluated in this EIS to identify potential traffic congestion impacts. Pedestrian, bicycle, safety and parking conditions are also qualitatively evaluated and used for impact identification

Vehicle Volume-to-Capacity Screenlines

The 2005 Comprehensive Plan previously set the PM peak hour level of service (LOS) standards for locally-owned arterials and transit routes using the concept of "screenlines." Screenlines are used to evaluate autos (including freight) and transit as buses generally travel in the same traffic stream as autos. A screenline is an imaginary line that may intersect multiple arterials and across which the number of passing vehicles is counted. Each screenline's LOS standard is in the form of a volume-to-capacity (V/C) ratio: the number of vehicles crossing

2 *This large-scale analysis approach differs from the intersection-level analysis that may be more appropriate for assessing the effects of development on individual parcels or blocks.*

the screenline compared to the designated capacity of the roadways crossing the screenline. The 2005 Comprehensive Plan evaluated 28 screenlines during the PM peak hour. Exhibit 3.4–18 and Exhibit 3.4–19 summarize the location of each screenline, as well as its LOS standard as designated in the 2005 Comprehensive Plan. The City no longer uses screenlines as its level of service standard, but it remains a useful metric for identifying areas experiencing congestion.

Exhibit 3.4–18 Screenline Level of Service Thresholds

Screenline #	Screenline Location	LOS Standard
1.11	North City Limit—3rd Ave NW to Aurora Ave N	1.20
1.12	North City Limit—Meridian Ave N to 15th Ave NE	1.20
1.13	North City Limit—30th Ave NE to Lake City Way NE	1.20
2	Magnolia	1.00
3.11	Duwamish River—West Seattle Bridge & Spokane St	1.20
3.12	Duwamish River—1st Ave S & 16th Ave S	1.20
4.11	South City Limit—Martin Luther King Jr. Way to Rainier Ave S	1.00
4.12	South City Limit—Marine Dr SW to Meyers Way S	1.00
4.13	South City Limit—SR 99 to Airport Way S	1.00
5.11	Ship Canal—Ballard Bridge	1.20
5.12	Ship Canal—Fremont Bridge	1.20
5.13	Ship Canal—Aurora Bridge	1.20
5.16	Ship Canal—University & Montlake Bridges	1.20
6.11	South of NW 80th St—Seaview Ave NW to 15th Ave NW	1.00
6.12	South of N(W) 80th St—8th Ave NW to Greenwood Ave N	1.00
6.13	South of N(E) 80th St—Linden Ave N to 1st Ave NE	1.00
6.14	South of NE 80th St—5th Ave NE to 15th Ave NE	1.00
6.15	South of NE 80th St—20th Ave NE to Sand Point Way NE	1.00
7.11	West of Aurora Ave—Fremont Pl N to N 65th St	1.00
7.12	West of Aurora Ave—N 80th St to N 145th St	1.00
8	South of Lake Union	1.20
9.11	South of Spokane St—Beach Dr SW to W Marginal Way SW	1.00
9.12	South of Spokane St—E Marginal Way S to Airport Way S	1.00
9.13	South of Spokane St—15th Ave S to Rainier Ave S	1.00
10.11	South of S Jackson St—Alaskan Way S to 4th Ave S	1.00
10.12	South of S Jackson St—12th Ave S to Lakeside Ave S	1.00
12.12	East of CBD	1.20
13.11	East of I-5—NE Northgate Way to NE 145th St	1.00
13.12	East of I-5—NE 65th St to NE 80th St	1.00
13.13	East of I-5—NE Pacific St to NE Ravenna Blvd	1.00

Source: Toward a Sustainable Seattle, 2005 Comprehensive Plan.

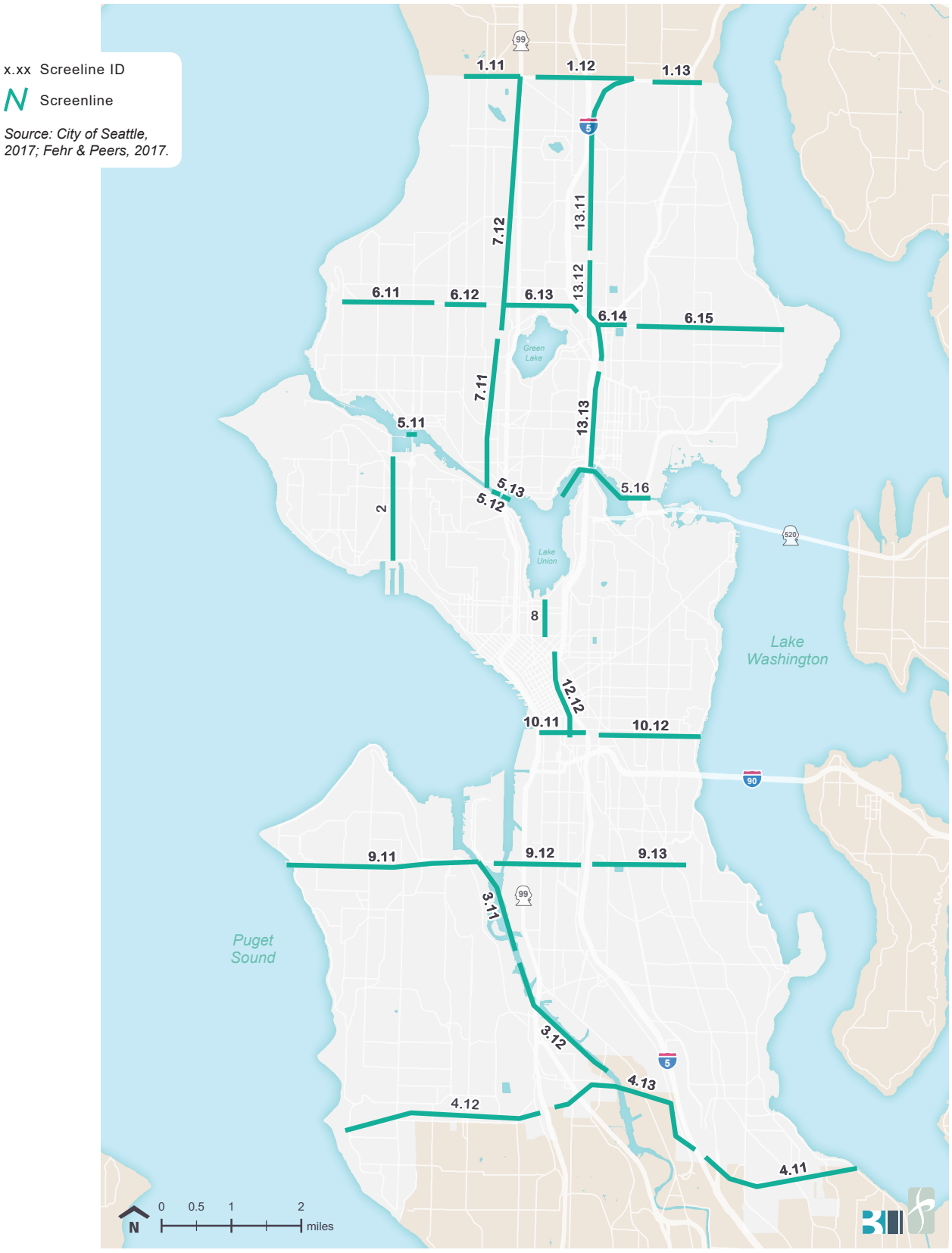

Exhibit 3.4–19 City of Seattle Screenlines

Mode Share

Seattle 2035 uses the concept of mode share to evaluate Seattle's transportation network. Mode share and single occupant vehicle (SOV) trips were evaluated for trips originating from or destined to each of the eight sectors during the PM peak period. All trip types are included in the analysis (as opposed to the commute trip mode share data from Commute Seattle or the US Census Bureau). The base year mode share estimates used in this analysis are from the 2014 PSRC Household Travel Survey. Forecasted future year mode shares pivot from the household survey results and are estimated using the projected change in mode share forecasted by the project travel demand model.

The City's new LOS concurrency mode share standard establishes as a goal that at least five percent of PM peak hour vehicle trips that would otherwise travel by SOV will shift to other modes (carpool, transit, bike, or walk) as a result of transportation demand management (TDM) strategies and public investments. This shift in travel modes is only assumed for new development—no additional mode shift is assumed for existing development. This results in drive alone mode share targets for each sector as shown in Exhibit 3.4–20.

Exhibit 3.4–20 Drive Alone Mode Share Targets

Sector	SOV Target (2035)
Northwest Seattle	37
Northeast Seattle	35
Queen Anne/Magnolia	38
Downtown/Lake Union	18
Capitol Hill/Central District	28
West Seattle	35
Duwamish	51
Southeast Seattle	38

Source: Seattle 2035 Comprehensive Plan, 2016.

Transit Daily Boardings

Transit is a critical part of maintaining the city's mobility. To assess the demand for transit against the system's capacity, daily transit boardings are evaluated under each alternative. King County Metro's Long-Range Plan anticipates providing a 70 percent increase in transit service hours by 2040 to serve more than double the number of existing daily boardings. The growth in projected AM period transit boardings in Seattle is evaluated to assess against King County Metro plans.

Overcrowding on specific transit lines is an indicator of whether or not adequate transit service is provided to support the planned growth and ridership demand in particular areas of the city. This EIS also evaluates transit overcrowding on the ten future BRT lines which cover the core transit corridors in Seattle. Most of these new BRT lines are enhancing existing transit routes with more frequent service, along with other capital investments.

King County Metro service guidelines measures bus overcrowding by setting a "crowding" threshold which represents what the maximum average passenger load should be for each transit trip. The crowding threshold allows for some standing passengers in addition to having all seats filled. To evaluate the transit service in this EIS, a ratio of the projected average maximum passenger load to the crowding threshold was calculated. Existing AM average maximum passenger loads were reported for each route using Fall 2016 data. Future year transit demand was estimated based on the increase in each BRT route's ridership growth forecasted in the project travel demand model.

Other Metrics

This EIS includes additional metrics to help illustrate the differences between existing conditions and each of the future year alternatives. However, the City has not adopted any formal standards for these metrics and they are not used to identify deficiencies or impacts within this environmental document.

State Facilities

The designated screenlines include some facilities owned by the Washington Department of Transportation (WSDOT), such as SR 99 and SR 522. To provide a complete assessment, this analysis was supplemented to include state facilities not included in the screenlines.

These include I-5, I-90, SR 509, SR 519 and SR 520, which are designated as Highways of Statewide Significance by WSDOT. Exhibit 3.4–21 summarizes the segments analyzed. WSDOT sets the standard for these facilities at LOS D for the PM peak hour.[3] The purpose of the evaluation of state facilities is to monitor performance and facilitate coordination between the city and state per the Growth Management Act.

Exhibit 3.4–21 State Facility Analysis Locations

State Facility	Location	LOS Standard
I-5	North of NE Northgate Way	D
I-5	Ship Canal Bridge	D
I-5	North of West Seattle Bridge	D
I-5	North of Boeing Access Rd	D
I-90	East of Rainier Ave S	D
SR 509	Between S 112th St and Cloverdale St	D
SR 519	West of 4th Ave	D
SR 520	Lake Washington Bridge	D

Source: WSDOT Community Planning Portal, 2017.

The freeway segments are analyzed using the same V/C concept that the City uses for its screenlines. Average daily volumes were collected from WSDOT's online Community Planning Portal. Capacities were determined using a set of tables developed by the Florida Department of Transportation (FDOT) based on the 2010 Highway Capacity Manual. The capacities are based on the characteristics of the roadway including number of lanes, presence of auxiliary lanes and presence of ramp metering.[4]

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3 LOS D is defined using the methodologies outlined in the Highway Capacity Manual, Transportation Research Board, 2010 and other methods based on this document.

4 Daily capacities for each LOS threshold are based upon equivalent PM peak hour conditions; they are factored to a time period for which data is more readily available. Therefore, this evaluation is representative of PM peak hour conditions as defined by WSDOT's LOS standard.

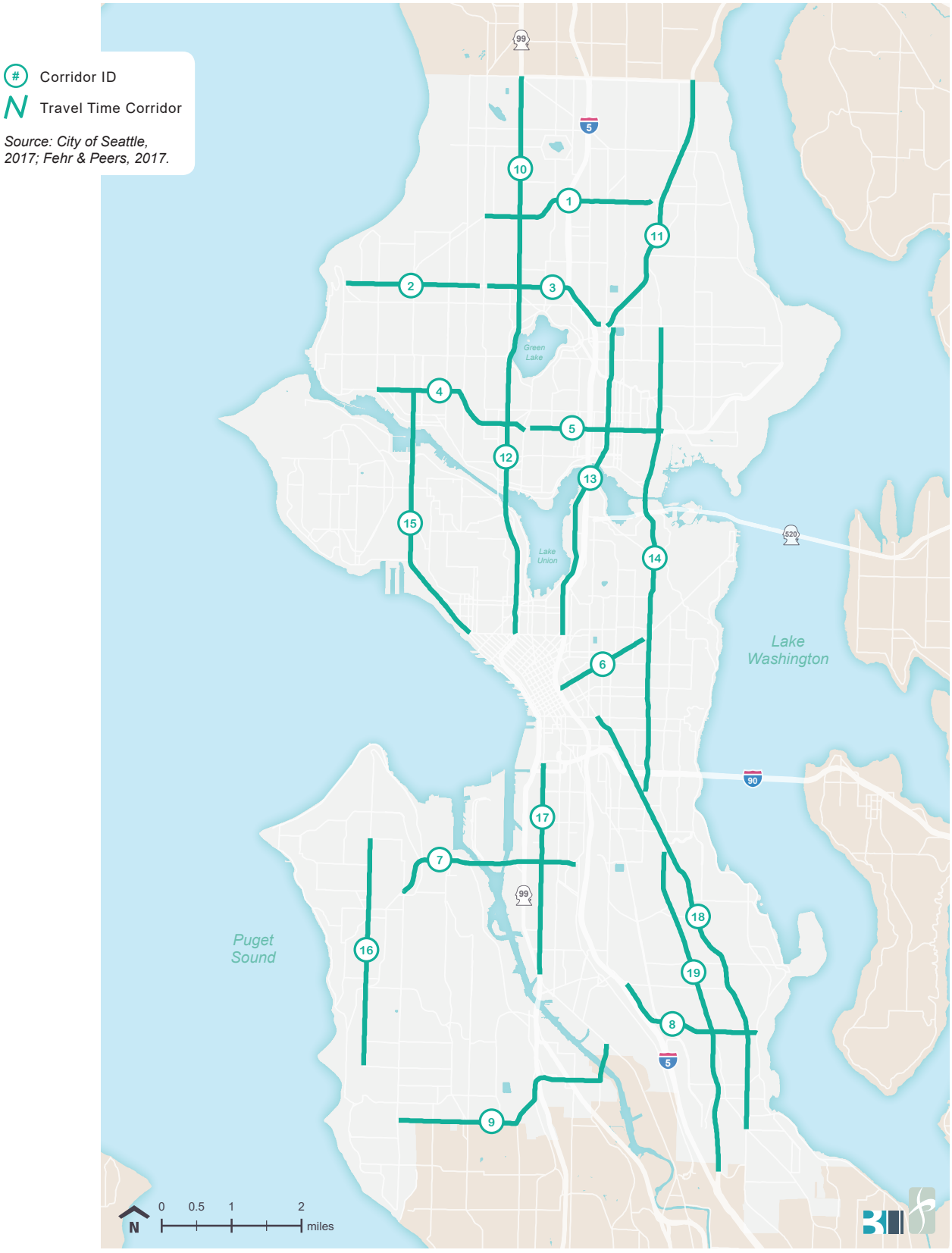

Exhibit 3.4–22 Travel Time Corridors

Travel Time

Travel time was selected as a performance measure for autos, freight and transit because it addresses the fundamental concern of most travelers—how long does it take to move within the city? Nineteen study corridors were selected throughout the city, as shown in Exhibit 3.4–22. Travel times were collected along each study corridor during the weekday PM peak hour from Google's travel time estimates.[5]

The 2010 Highway Capacity Manual (HCM) defines thresholds for speed along urban streets to describe traffic operations by assigning a letter grade of A through F, where A represents free-flow conditions and F represents highly congested conditions.

Since speed is the inverse of travel time, these thresholds can be communicated in terms of travel time as shown in Exhibit 3.4–23. In simple terms, if you are traveling at half the posted speed limit, your travel time will be double what it would take traveling at the speed limit.

Exhibit 3.4–23 Thresholds for Travel Speeds and Travel Time

	SPEED THRESHOLD	TRAVEL TIME THRESHOLDS
LOS	**Percent of Free-Flow Speed**	**Ratio Between PM Peak Hour Travel Time and Travel Time at Free-Flow Speed**
A-C	>50%	<2.0
D	>40-50%	2.0 to <2.5
E	>30-40%	2.5 to <3.33
F	≤30%	≥3.33

Source: Highway Capacity Manual 2010, Transportation Research Board.

The HCM criteria were developed for urban areas and therefore assume some level of delay at intersections because it is unrealistic to not encounter a red light on a typical trip.

5 *Google's travel time estimates are based on a variety of sources, including INRIX speed data.*

ANALYSIS RESULTS

This section summarizes the results of the analysis used to evaluate existing transportation conditions in Seattle.

Metrics Used for Impact Identification

Screenlines

The most recently available PM peak hour traffic counts collected by the City of Seattle were compiled for the screenline analysis. Because traffic counts can vary considerably from year to year (due to unique factors on the day the count was taken, construction, etc.), an average of the available counts between 2012 and 2017 was used for each location.

As shown in Exhibit 3.4–24, none of the City's screenlines exceeded the standard that was in place for 2015. The screenline nearest to the capacity threshold is the Ballard Bridge at 0.99 in the northbound direction. However, the threshold there was set at 1.2.

Exhibit 3.4–24 2015 PM Peak Hour Screenline Volume-to-Capacity

Screenline #	Screenline Location	LOS Standard	NB/EB	SB/WB
1.11	North City Limit—3rd Ave NW to Aurora Ave N	1.20	0.74	0.55
1.12	North City Limit—Meridian Ave N to 15th Ave NE	1.20	0.76	0.45
1.13	North City Limit—30th Ave NE to Lake City Way NE	1.20	0.92	0.60
2	Magnolia	1.00	0.48	0.62
3.11	Duwamish River—West Seattle Bridge & Spokane St	1.20	0.60	0.85
3.12	Duwamish River—1st Ave S & 16th Ave S	1.20	0.36	0.37
4.11	South City Limit—Martin Luther King Jr. Way to Rainier Ave S	1.00	0.52	0.71
4.12	South City Limit—Marine Dr SW to Meyers Way S	1.00	0.38	0.45
4.13	South City Limit—SR 99 to Airport Way S	1.00	0.29	0.47
5.11	Ship Canal—Ballard Bridge	1.20	0.99	0.55
5.12	Ship Canal—Fremont Bridge	1.20	0.88	0.63
5.13	Ship Canal—Aurora Bridge	1.20	0.81	0.62
5.16	Ship Canal—University & Montlake Bridges	1.20	0.82	0.89
6.11	South of NW 80th St—Seaview Ave NW to 15th Ave NW	1.00	0.41	0.42
6.12	South of N(W) 80th St—8th Ave NW to Greenwood Ave N	1.00	0.74	0.65
6.13	South of N(E) 80th St—Linden Ave N to 1st Ave NE	1.00	0.49	0.41
6.14	South of NE 80th St—5th Ave NE to 15th Ave NE	1.00	0.55	0.50
6.15	South of NE 80th St—20th Ave NE to Sand Point Way NE	1.00	0.47	0.45
7.11	West of Aurora Ave—Fremont Pl N to N 65th St	1.00	0.52	0.66
7.12	West of Aurora Ave—N 80th St to N 145th St	1.00	0.46	0.58
8	South of Lake Union	1.20	0.49	0.42
9.11	South of Spokane St—Beach Dr SW to W Marginal Way SW	1.00	0.40	0.50
9.12	South of Spokane St—E Marginal Way S to Airport Way S	1.00	0.50	0.52
9.13	South of Spokane St—15th Ave S to Rainier Ave S	1.00	0.43	0.59
10.11	South of S Jackson St—Alaskan Way S to 4th Ave S	1.00	0.54	0.61
10.12	South of S Jackson St—12th Ave S to Lakeside Ave S	1.00	0.52	0.59
12.12	East of CBD	1.20	0.41	0.41
13.11	East of I-5—NE Northgate Way to NE 145th St	1.00	0.62	0.58
13.12	East of I-5—NE 65th St to NE 80th St	1.00	0.54	0.50
13.13	East of I-5—NE Pacific St to NE Ravenna Blvd	1.00	0.60	0.53

Source: SDOT count data, 2012–2017.

Mode Share

The PM peak period SOV mode share for all trips for each of the sectors is shown in Exhibit 3.4–25. Downtown/Lake Union has the lowest SOV share at 23 percent and Duwamish has the highest SOV share at 54 percent. The 2035 mode share targets are two to five percentage points lower than the existing SOV mode shares, which is expected because ongoing transit, pedestrian, and bicycle improvements are expected to reduce SOV trips over the coming years.

Transit Daily Boardings and Crowding

There was an average of 332,000 transit boardings in Seattle in 2016.[6] Exhibit 3.4–26 summarizes the ratio of the existing maximum load to the crowding threshold for the AM period. Only peak direction of transit travel is shown for each route. As not all ten planned BRT routes currently exist, equivalent existing routes are reported. All routes have a ratio of maximum passenger load to crowding threshold at less than 1.0 during the AM period. Because the crowding threshold is larger than the number of seats on each bus trip, it means that some routes, such as the C Line and E Line with a ratio greater than 0.64, will have portions of the route with standing room only. The demand used for analysis is the average of the maximum loads during the AM peak. Some trips may have no capacity and be unable to accommodate all passengers resulting in skipped stops, but over the entire peak period, there is capacity on the corridors.

6 This daily transit boarding total includes King County Metro, Sound Transit and Community Transit routes. It does not include Pierce Transit routes.

Exhibit 3.4–25 2015 PM Peak Period Mode Share by Sector (Percentage)

Sector	SOV Target (2035)	SOV (2015)
Northwest Seattle	37	39
Northeast Seattle	35	37
Queen Anne/Magnolia	38	40
Downtown/Lake Union	18	23
Capitol Hill/Central District	28	33
West Seattle	35	37
Duwamish	51	54
Southeast Seattle	38	40

Note: PSRC Household Survey, 2014; Seattle 2035 Comprehensive Plan EIS Project Travel Demand Model, 2016; Fehr & Peers, 2016.

Exhibit 3.4–26 Existing Transit Crowding Ratio

BRT Route	Ratio of Existing Max Passenger Load to Crowding Threshold
C Line—West Seattle/Downtown	0.67
D Line—Ballard/Downtown	0.51
E Line—Aurora/Downtown	0.76
RR 1 (Route 12)—Madison	0.47
RR 2 (Route 120)—West Seattle/Downtown	0.50
RR 3 (Route 7)—Mt Baker/Downtown	0.28
RR 4 (Route 7 / 48)—Rainier/23rd Ave	0.28
RR 5 (Route 44)—Ballard/45th/UW	0.55
RR 6 (Route 40)—Northgate/Ballard/Westlake	0.60
RR 7 (Route 70)—Northgate/Roosevelt/Eastlake/Downtown	0.44

Source: King County Metro, 2016.

Other Metrics

Travel Times

Exhibit 3.4–27 and Exhibit 3.4–28 summarize existing auto travel times (minutes) in each direction along the study corridors. None of the study corridors currently operate at LOS F. However, ten of the corridors operate at LOS E in at least one direction, indicating traffic congestion throughout the city during the PM peak hour. Traffic congestion is more difficult for freight to navigate and trucks typically travel at slower speeds than general auto traffic. However, much of the daily freight movement activity occurs in the midday when traffic congestion is less pronounced.

Exhibit 3.4–27 Existing Corridor Travel Times

		LOS/TRAVEL TIME IN MINUTES	
Corridor ID	**Study Facility**	**NB / EB**	**SB / WB**
1	N 105th St—Greenwood Ave N to SR 522	D / 17.5	E / 20.0
2	NW 85th—32nd Ave NW to Greenwood Ave N	E / 12.5	D / 11.0
3	NW 85th St—Greenwood Ave N to SR 522	D / 11.5	E / 15.5
4	NW Market St—24th Ave NW to Stone Way N	E / 18.0	E / 20.0
5	N 45th St—Stone Way N to 25th Ave NE	E / 18.0	E / 18.5
6	E Madison St—I-5 to 23rd Ave	E / 15.0	E / 15.0
7	West Seattle Bridge—35th Ave SW to I-5	D / 8.5	D / 9.5
8	Swift Ave S—S Graham St to Seward Park Ave S	A-C / 10.0	A-C / 9.5
9	SW Roxbury St—35th Ave SW to E Marginal Way S	A-C / 16.0	A-C / 16.5
10	SR 99—N 145th St to N 80th St	E / 21.5	D / 17.5
11	SR 522—SR 523 to I-5	E / 26.0	D /17.5
12	SR 99—N 80th St to Denny Way	D / 16.5	D / 16.5
13	Roosevelt Way NE / 12th Ave NE/Eastlake Ave—NE 75th St to Denny Way	E / 32.0	E / 34.5
14	25th Ave NE—NE 75th St to S Grand St	D / 41.5	E / 48.5
15	15th Ave/Elliott Ave—Market St to Denny Way	D / 20.0	A-C / 14.5
16	California Ave SW—SW Hanford St to SW Thistle St	A-C / 15.0	D / 16.5
17	1st Ave S—S Royal Brougham Way to E Marginal Way S	D / 16.5	D / 17.0
18	Rainier Ave S—E Yesler Way to Renton Ave S	D / 34.5	D / 41.5
19	MLK Jr Way S—Rainier Ave S to S Boeing Access Rd	A-C / 22.0	A-C / 24.0

Source: Google Maps, 2017.

Exhibit 3.4–28 Existing Corridor Travel Times (2015)

State Facilities

Exhibit 3.4–29 summarizes the existing conditions on the state facility locations not included in the screenline analysis. Bold cells indicate that the volume-to-LOS D capacity ratio is over 1.0 meaning the facility is not meeting WSDOT's LOS standard. These include all four segments on I-5 and I-90 east of Rainier Avenue S. SR 520, which has tolling that limits demand, is currently meeting the LOS D standard, as are SR 509 and SR 519.

Exhibit 3.4–29 Existing Conditions of State Facility Analysis Locations

State Facility	Location	Daily Traffic Volume	Maximum Daily Capacity for LOS D	Volume-To-LOS D Capacity Ratio
I-5	North of NE Northgate Way	213,000	204,225	**1.04**
I-5	Ship Canal Bridge	206,000	162,015	**1.27**
I-5	North of West Seattle Bridge	242,000	194,500	**1.24**
I-5	North of Boeing Access Rd	206,000	194,500	**1.06**
I-90	East of Rainier Ave S	132,000	116,600	**1.13**
SR 509	Between S 112th St and Cloverdale St	57,000	93,100	0.61
SR 519	West of 4th Ave	28,000	32,400	0.86
SR 520	Lake Washington Bridge	68,000	77,900	0.87

Note: The WSDOT standard for all of the study facilities is LOS D. Volumes and capacities do not include express lanes on I-5 and I-90.
Source: WSDOT Community Planning Portal, 2015.

3.4.2 IMPACTS

This section describes the planning scenarios evaluated, the methodology used for the future year analysis and the results of the future year analysis. The future analysis year is 2035.

PLANNING SCENARIOS EVALUATED

Three alternatives ~~a~~were evaluated in the DEIS under future year 2035 conditions: the no action alternative and two action alternatives. The no action alternative assumes approximately 77,000 new housing units in the 2015–2035 timeframe; the action alternatives assume roughly 95,000 new housing units in the 2015–2035 timeframe, but vary in how the growth would be distributed (see Chapter 2, Exhibit 2–7). This FEIS includes analysis of an additional Preferred Alternative. The Preferred

Alternative is a modified version of the action alternatives in the DEIS and includes roughly the same amount of new housing units. The same transportation network is assumed under each alternative.

ANALYSIS METHODOLOGY

This section summarizes the analysis methodology used to evaluate future year (2035) conditions.

Transportation Network and Land Use Assumptions

The analysis for this EIS used a citywide travel demand forecasting model to distribute and assign vehicle traffic to area roadways. The travel demand forecasting model used for the Seattle 2035 Comprehensive Plan EIS served as the starting point for this analysis, but was refined with newer data regarding trip making characteristics and 2035 network assumptions. The model is based on the PSRC regional model with refinements within the City of Seattle. More information may be found in Appendix J. Key changes to the Seattle 2035 Comprehensive Plan model include:

- Updated land use within the City based on the Seattle 2035 land use map adopted by the City Council and recent zoning changes adopted for Downtown/South Lake Union, the University District, and Uptown;
- Updated land use outside of the City based on the latest available data from PSRC;
- Updated Public Use Microdata Sample (PUMS) data from the U.S. Census Bureau which provide household characteristics for different areas within the city, including income level, household size, and number of workers; and
- Updated transit network assumptions following the passage of the ST3 ballot measure and the amended Transit Master Plan.

Key elements of the travel demand model's structure are described below:

- **Analysis Years.** This version of the model has a base year of 2015 and a horizon year of 2035.
- **Land Use.** The City of Seattle developed land use forecasts for 2015 using a combination of sources including data from the Puget Sound Regional Council, Employment Securities Department, and Office of Planning and Community Development. Land use forecasts were then developed for each of the 2035 alternatives by distributing the expected growth according to each alternative's assumed development pattern.

- **Highways and Streets.** The existing highway and major street systems within the City of Seattle are fully represented in the 2015 model; those planned to be present by 2035 are included in the 2035 model.
- **Transit.** The travel model has a full representation of the transit system under base year (2015) conditions. The horizon year transit system is based on assumptions of service from Sound Transit's 2035 travel demand model (released in September 2013), Sound Transit 3 project information for high capacity transit projects expected to open by 2035, and the Seattle Transit Master Plan.
- **Travel Costs.** The model accounts for the effects of auto operating costs, parking, transit fares and tolls (on SR 520 and SR 99) on travel demand.
- **Travel Demand.** The model predicts travel demand for seven modes of travel: drive alone, carpool (2 person), carpool (3 or more people), transit, trucks, walking and bicycling. Travel demand is estimated for five time periods. This analysis will focus on the PM peak period.

The 2035 network was modified to reflect completion of the City's transportation modal plans, thus providing a test of the City's planned infrastructure. This includes rechannelization that could occur with implementation of the City's Bicycle Master Plan. Key Transit Master Plan projects such as frequent service on priority transit corridors and dedicated bus lanes were included in the model. Detailed assumptions may be found in Appendix J. The assumptions were determined in conjunction with City staff using the best knowledge available at the time.

Consideration of Affordable Housing Characteristics

The proposed alternatives are aimed at providing additional affordable housing within the City of Seattle. To capture the varying trip-making characteristics of different income levels, the inputs to the project travel demand model were modified to reflect the proportion of affordable housing proposed under each alternative. This was completed through modifications to the PUMS household characteristic dataset.

Forecast Development

Travel demand forecasts including traffic volumes, travel times, transit trips, and mode shares, were prepared for each of the three alternatives during the PM peak period using the travel model. To reduce model error, a technique known as the "difference method" was applied for traffic volumes, travel times and mode share. Rather than take the direct output from the 2035 model, the difference method calculates the growth between the base year and 2035 models and adds that growth

to existing data when available. For example, assume a road has an existing hourly volume of 500 vehicles. If the base year model showed a volume of 400 vehicles and the future year model showed a volume of 650 vehicles, 250 vehicles would be added to the existing count for a future expected volume of 750 vehicles.

Thresholds of Significance

In an EIS, the action alternatives (Alternatives 2, ~~and~~ 3, and the Preferred Alternative) are assessed against Alternative 1 No Action to identify impacts. The rationale behind this approach is to compare changes in the transportation system expected to result from City actions against transportation changes expected under "business-as-usual" conditions. Pedestrian, bicycle, safety and parking impacts are evaluated qualitatively. Thresholds of significance for other metrics used for impact identification are described below.

Screenlines

Screenlines are intended to measure the extent of traffic congestion impacts across the city. A deficiency is identified for the no action alternative if it would cause a screenline to exceed the threshold (shown in Exhibit 3.4–18).

The above criterion also applies to action alternatives provided no deficiency has been identified for the no action alternative. However, if the no action alternative already exceeds the threshold, then a potentially significant impact will only be identified if the action alternative would exceed the threshold by at least 0.01 more than the no action alternative.

Mode Share

A deficiency is identified for the no action alternative if it would cause a sector of the city to exceed its stated SOV target (see Exhibit 3.4–20).

The above criterion also applies to action alternatives provided no deficiency has been identified for the no action alternative. However, if the no action alternative exceeds the target, then a significant impact will only be identified if the action alternative exceeds the target by at least 0.5 percent more than the no action alternative.

Transit Daily Boardings

King County Metro's Long-Range Plan anticipates a doubling (a 100 percent increase) of daily bus boardings by 2040. Because this EIS

looks out only to year 2035, a transit ridership increase of greater than 80 percent was selected as the threshold of significance. Therefore, a deficiency is identified for the no action alternative if citywide transit boardings increase by more than 80 percent. This threshold acknowledges that some trips on certain routes may be overcrowded and that stops may be skipped because the bus is full. However, overall system capacity is not exceeded unless the total boardings grow at a rate higher

This criterion also applies to action alternatives provided no deficiency has been identified for the no action alternative. However, if the no action alternative already exceeds the threshold, then an impact will only be identified if the action alternative exceeds the threshold by at least one percentage point more than the no action alternative.

Other Metrics

Other metrics have been prepared in this analysis, including state facility v/c ratios and corridor travel times. Because the City has not adopted standards for those metrics, they are not currently used to determine significant transportation impacts. They are provided for informational purposes only.

IMPACTS COMMON TO ALL ALTERNATIVES

Pedestrian and Bicycle Network

The City has identified robust plans to improve the pedestrian and bicycle network through its *Pedestrian Master Plan*, *Bicycle Master Plan* and various subarea planning efforts. These plans are actively being implemented and are expected to continue to be implemented regardless of which land use alternative is selected. However, the prioritization and/or phasing of projects may vary depending on the expected pattern of development.

Although Alternatives 2, ~~and~~ 3, and the Preferred Alternative would result in increased numbers of pedestrian and bicycle trips compared to the no action alternative, capacity constraints on non-motorized facilities are not expected. Therefore, given that the pedestrian and bicycle environment is expected to become more robust regardless of alternative, no significant impacts are expected to the pedestrian and bicycle system under any of the alternatives.

Safety

The City has a goal of zero traffic fatalities and serious injuries by 2030. This goal, and the policies and strategies supporting it, will be pursued regardless of the land use alternative selected. The City will continue to monitor traffic safety and take steps, as necessary, to address areas with high collision rates. It is expected that the safety program will result in decreases to the number of traffic fatalities and serious injuries over time. ~~The action a~~ As reported in the DEIS, Alternatives 2 and 3 are expected to have roughly two percent more vehicle trips than the no action alternative, which could potentially lead to an increase in the number of citywide collisions. Another main contributing factor to the number of traffic fatalities and serious injuries is speed. The travel demand model indicates that speeds throughout the network would be slightly lower under ~~the action a~~Alternatives 2 and 3 than under the no action alternative, which could have a beneficial effect on safety. Due to the similarities in levels of growth between Alternatives 2, 3, and the Preferred Alternative, the safety findings for Alternatives 2 and 3 are also representative of the Preferred Alternative.

The minor magnitude of these safety indicators are not expected to substantively change the level of safety among the future year alternatives. Therefore, at this programmatic level of analysis, no significant impacts are expected under any of the alternatives.

Parking

The City prioritizes the use of its streets to balance competing needs, including pedestrians, bicycles, transit, autos, and freight. As stated in *Seattle 2035*, the City considers the "flex zone" along the curb to provide parking, bus stops, passenger loading, freight loading, travel lanes during peak times or other activating uses such as parklets or play streets (City of Seattle 2016, 75). Decisions about how flex zones are used will continue to evolve by location depending on the transportation and land use context of each area. It is assumed the supply of on-street parking is unlikely to increase by 2035.

As stated in the Affected Environment section, there are currently some areas of the city where on-street parking demand exceeds parking supply. Given the projected growth in the city and the fact that the supply of on-street parking is unlikely to increase by 2035, a parking deficiency is expected under the no action alternative. With the increase in development expected under Alternatives 2, ~~and~~ 3, and the Preferred Alternative, particularly in urban villages which already tend to have high on-street

parking utilization, parking demand will be higher than the no action alternative. Therefore, significant adverse parking impacts are expected under Alternatives 2, ~~and~~ 3, and the Preferred Alternative.

The location and severity of impacts would vary by alternative depending on the concentrations of land use. The degree of the parking supply deficiency and impacts experienced in any given neighborhood would depend on factors including how much off-street parking is provided by future development projects, as well as varying conditions related to on-street parking patterns, city regulations (e.g., how many RPZ permits are issued, enforcement, etc.) within each neighborhood.

DEFICIENCIES OF ALTERNATIVE 1 NO ACTION

Metrics Used for Impact Identification

Screenlines

Exhibit 3.4–30 and Exhibit 3.4–31 summarize the projected PM peak hour volumes across each screenline in 2035. Over the next twenty years, traffic volumes are expected to increase throughout the city due to growth that would occur regardless of the proposed alternatives. Three screenlines are expected to exceed their thresholds in the PM peak hour:

- Screenline 4.11: South City Limit–Martin Luther King Jr. Way to Rainier Ave S in the southbound direction
- Screenline 5.11: Ship Canal–Ballard Bridge in the northbound direction
- Screenline 10.12: South of S Jackson St–12th Ave S to Lakeside Ave S in the southbound direction

Therefore, deficiencies under the no action alternative are expected for automobile traffic, freight, and transit at those locations.

Exhibit 3.4–30 2035 PM Peak Hour Screenline Volume-to-Capacity, Alternative 1 No Action

			2015		ALTERNATIVE 1 NO ACTION	
Screenline #	**Screenline Location**	**LOS Standard**	**NB/EB**	**SB/WB**	**NB/EB**	**SB/WB**
1.11	North City Limit—3rd Ave NW to Aurora Ave N	1.20	0.74	0.55	1.07	0.81
1.12	North City Limit—Meridian Ave N to 15th Ave NE	1.20	0.76	0.45	0.93	0.56
1.13	North City Limit—30th Ave NE to Lake City Way NE	1.20	0.92	0.60	1.14	0.78
2	Magnolia	1.00	0.48	0.62	0.54	0.64
3.11	Duwamish River—West Seattle Bridge & Spokane St	1.20	0.60	0.85	0.68	1.13
3.12	Duwamish River—1st Ave S & 16th Ave S	1.20	0.36	0.37	0.40	0.40
4.11	South City Limit—Martin Luther King Jr. Way to Rainier Ave S	1.00	0.52	0.71	0.63	1.05
4.12	South City Limit—Marine Dr SW to Meyers Way S	1.00	0.38	0.45	0.58	0.76
4.13	South City Limit—SR 99 to Airport Way S	1.00	0.29	0.47	0.46	0.81
5.11	Ship Canal—Ballard Bridge	1.20	0.99	0.55	1.27	0.74
5.12	Ship Canal—Fremont Bridge	1.20	0.88	0.63	0.97	0.80
5.13	Ship Canal—Aurora Bridge	1.20	0.81	0.62	0.95	0.84
5.16	Ship Canal—University & Montlake Bridges	1.20	0.82	0.89	0.97	1.03
6.11	South of NW 80th St—Seaview Ave NW to 15th Ave NW	1.00	0.41	0.42	0.48	0.47
6.12	South of N(W) 80th St—8th Ave NW to Greenwood Ave N	1.00	0.74	0.65	0.98	0.93
6.13	South of N(E) 80th St—Linden Ave N to 1st Ave NE	1.00	0.49	0.41	0.62	0.55
6.14	South of NE 80th St—5th Ave NE to 15th Ave NE	1.00	0.55	0.50	0.66	0.63
6.15	South of NE 80th St—20th Ave NE to Sand Point Way NE	1.00	0.47	0.45	0.62	0.55
7.11	West of Aurora Ave—Fremont Pl N to N 65th St	1.00	0.52	0.66	0.72	0.98
7.12	West of Aurora Ave—N 80th St to N 145th St	1.00	0.46	0.58	0.63	0.75
8	South of Lake Union	1.20	0.49	0.42	0.64	0.49
9.11	South of Spokane St—Beach Dr SW to W Marginal Way SW	1.00	0.40	0.50	0.48	0.67
9.12	South of Spokane St—E Marginal Way S to Airport Way S	1.00	0.50	0.52	0.64	0.72
9.13	South of Spokane St—15th Ave S to Rainier Ave S	1.00	0.43	0.59	0.61	0.91
10.11	South of S Jackson St—Alaskan Way S to 4th Ave S	1.00	0.54	0.61	0.63	0.82
10.12	South of S Jackson St—12th Ave S to Lakeside Ave S	1.00	0.52	0.59	0.83	1.01
12.12	East of CBD	1.20	0.41	0.41	0.39	0.45
13.11	East of I-5—NE Northgate Way to NE 145th St	1.00	0.62	0.58	0.74	0.74
13.12	East of I-5—NE 65th St to NE 80th St	1.00	0.54	0.50	0.61	0.63
13.13	East of I-5—NE Pacific St to NE Ravenna Blvd	1.00	0.60	0.53	0.80	0.75

Source: Fehr & Peers, 2017.

x.xx Screeline ID

N Screenline

N Screenline Above Threshold

Source: City of Seattle, 2017; Fehr & Peers, 2017.

Exhibit 3.4–31 2035 Screenline V/C Ratios, All Alternatives

Mode Share

As noted in the Methodology section, the mode share estimates presented here are based on the travel demand forecasting model. By 2035, the SOV mode share is expected to decrease (a positive trend), although the amount of the decrease varies depending on the sector, as shown in Exhibit 3.4–32. Downtown/Lake Union is expected to see the highest SOV decrease of six percentage points, while West Seattle and Southeast Seattle are each projected to have a 2 percentage point decrease. All of the sectors are expected to meet the 2035 SOV target under the no action alternative.

Exhibit 3.4–32 2035 PM Peak Period Mode Share by Sector (Percentage), Alternative 1 No Action

Sector	SOV Target (2035)	Existing (2015)	Alternative 1 No Action (2035)
Northwest Seattle	37	39	36
Northeast Seattle	35	37	34
Queen Anne/Magnolia	38	40	37
Downtown/Lake Union	18	23	17
Capitol Hill/Central District	28	33	28
West Seattle	35	37	35
Duwamish	51	54	51
Southeast Seattle	38	40	38

Note: Fehr & Peers, 2017.

Transit Daily Boardings

The project model forecasts a 74 percent increase in transit boardings in Seattle under the no action alternative. Because this is lower than the 80 percent significance threshold, no deficiency is identified. Moreover, the projected increase in transit boardings from the model includes both bus and light rail, while the threshold is based on bus boardings only. Therefore, this is a very conservative assessment as much of the 74 percent increase would occur on light rail.

For informational purposes, crowding ratios were also forecasted along the ten BRT routes within the city, as shown in Exhibit 3.4–33. The results indicate that additional transit trips would operate with standing room only and be unable to accommodate all passengers resulting in skipped stops. ~~o~~Others would have ridership growth beyond the crowding thresholds, particularly on the RR 2, RR 6, and RR 7 corridors. Note that the transit

assumptions in the model are only estimates of the future year routes, stops, and headways that will be in place. In practice, King County Metro continually adjusts its service to accommodate demand on the busiest corridors by shifting buses from less crowded to more crowded routes. Therefore, while crowding would likely occur on some routes and for only some trips on those routes, Metro's overall plans for increased service hours and boardings are in line with the increase in boardings expected under the no action alternative. It is reasonable to assume that Metro could add more buses to the busiest routes to accommodate some or all of the crowding identified in Exhibit 3.4–33.

Exhibit 3.4–33 2035 Transit Crowding Ratio, Alternative 1 No Action

	PASSENGER LOAD TO CROWD THRESHOLD RATIO		
BRT Route	**Existing**	**Alternative 1 No Action (2035)**	**Additional Riders per Peak Hour Trip**
C Line—West Seattle/Downtown	0.67	0.75	6
D Line—Ballard/Downtown	0.51	0.51	0
E Line—Aurora/Downtown	0.76	0.89	10
RR 1 (Route 12)—Madison	0.47	0.49	12
RR 2 (Route 120)—West Seattle/Downtown	0.50	**1.06**	40
RR 3 (Route 7)—Mt Baker/Downtown	0.28	0.30	0
RR 4 (Route 7 / 48)—Rainier/23rd Ave	0.28	0.30	0
RR 5 (Route 44)—Ballard/45th/UW	0.55	0.91	24
RR 6 (Route 40)—Northgate/Ballard/Westlake	0.60	**1.45**	60
RR 7 (Route 70)—Northgate/Roosevelt/Eastlake/Downtown	0.44	**1.03**	43

Note: King County Metro, Fehr & Peers, 2017.

Other Metrics

State Facilities

Exhibit 3.4–34 summarizes 2035 conditions on the state facilities not included in the screenline analysis. Bold cells indicate that the v/c ratio is over 1.0 meaning the facility would not meet WSDOT's LOS standard in 2035.

Exhibit 3.4–34 State Facility Analysis—2035 Volume-to-LOS D Capacity Ratio, Alternative 1 No Action

State Facility	Location	2015	Alternative 1 No Action (2035)
I-5	North of NE Northgate Way	**1.04**	**1.22**
I-5	Ship Canal Bridge	**1.27**	**1.39**
I-5	North of West Seattle Bridge	**1.24**	**1.35**
I-5	North of Boeing Access Rd	**1.06**	**1.23**
I-90	East of Rainier Ave S	**1.13**	**1.34**
SR 509	Between S 112th St and Cloverdale St	0.61	0.84
SR 519	West of 4th Ave	0.86	0.99
SR 520	Lake Washington Bridge	0.87	**1.10**

Note: Forecasted average daily traffic volumes do not include express lane volumes on I-5 and I-90.
Source: WSDOT, 2015; Fehr & Peers, 2017.

As indicated by the rising v/c ratios, traffic is expected to increase along the major freeway corridors between 2015 and 2035. This growth in traffic is due in part to increased development in Seattle, but regional and statewide growth also contribute to increased traffic on the freeways. With this increase in traffic, six study segments are expected to exceed WSDOT's LOS D standard under Alternative 1 No Action. SR 509 and SR 519 are expected to meet WSDOT's LOS D standard.

Travel Time

Exhibit 3.4–35 and Exhibit 3.4–36 summarize 2035 Alternative 1 No Action auto travel times along 19 corridors in each direction. Travel times for 2015 are also shown to illustrate how travel times would change over time regardless of the proposed action alternatives. Note that these results also represent freight operations which travel in the same lanes as auto traffic. However, traffic congestion is more difficult for freight to navigate, and trucks typically travel at slower speeds than general auto traffic.

By 2035, five study corridors are expected to drop to LOS F:

- NW 85th St between Greenwood Avenue N and SR 522;
- NW Market Street between 24th Avenue NE and Stone Way N;
- West Seattle Bridge between I-5 and 35th Ave SW;
- SR 99 between SR 523 and N 80th St; and
- SR 522 between SR 523 and I-5.

Auto travel times are expected to increase by up to 11.5 minutes between 2015 and 2035, with the largest increases projected along the westbound West Seattle Bridge, 25th Avenue NE, southbound Rainier Avenue S, and southbound MLK Jr Way S. However, travel time increases vary considerably depending on location with some corridors projected to experience very little change.

Exhibit 3.4–35 2035 Corridor Travel Times, Alternative 1 No Action

		2015 *LOS/Minutes*		ALT. 1 NO ACTION (2035) *LOS/Minutes*	
Corridor ID	**Study Facility**	**NB / EB**	**SB / WB**	**NB / EB**	**SB / WB**
1	N 105th St—Greenwood Ave N to SR 522	D / 17.5	E / 20.0	D / 18.0	E / 20.5
2	NW 85th—32nd Ave NW to Greenwood Ave N	E / 12.5	D / 11.0	E / 13.0	D / 11.5
3	NW 85th St—Greenwood Ave N to SR 522	D / 11.5	E / 15.5	E / 12.0	F / 16.0
4	NW Market St—24th Ave NW to Stone Way N	E / 18.0	E / 20.0	E / 19.5	F / 22.5
5	N 45th St—Stone Way N to 25th Ave NE	E / 18.0	E / 18.5	E / 19.0	E / 19.5
6	E Madison St—I-5 to 23rd Ave	E / 15.0	E / 15.0	E / 15.5	E / 15.5
7	West Seattle Bridge—35th Ave SW to I-5	D / 8.5	D / 9.5	D / 9.0	F / 15.0
8	Swift Ave S—S Graham St to Seward Park Ave S	A-C / 10.0	A-C / 9.5	A-C / 10.5	A-C / 10.0
9	SW Roxbury St—35th Ave SW to E Marginal Way S	A-C / 16.0	A-C / 16.5	A-C / 17.0	D / 20.5
10	SR 99—N 145th St to N 80th St	E / 21.5	D / 17.5	F / 26.0	E / 19.0
11	SR 522—SR 523 to I-5	E / 26.0	D /17.5	F / 31.0	D / 19.5
12	SR 99—N 80th St to Denny Way	D / 16.5	D / 16.5	E / 20.0	E / 20.0
13	Roosevelt Way NE / 12th Ave NE/Eastlake Ave—NE 75th St to Denny Way	A-C / 32.0	E / 34.5	E / 37.0	E / 38.5
14	25th Ave NE—NE 75th St to S Grand St	D / 41.5	E / 48.5	E / 47.0	E / 56.5
15	15th Ave/Elliott Ave—Market St to Denny Way	D / 20.0	A-C / 14.5	E / 24.5	A-C / 17.0
16	California Ave SW—SW Hanford St to SW Thistle St	E / 15.0	D / 16.5	D / 15.5	D / 17.0
17	1st Ave S—S Royal Brougham Way to E Marginal Way S	D / 16.5	D / 17.0	D / 17.0	E / 21.0
18	Rainier Ave S—E Yesler Way to Renton Ave S	D / 34.5	D / 41.5	D / 36.0	E / 53.0
19	MLK Jr Way S—Rainier Ave S to S Boeing Access Rd	A-C / 22.0	A-C / 24.0	A-C / 23.5	E / 33.5

Source: Google Maps, 2017; Fehr & Peers, 2017.

Exhibit 3.4–36 2035 Corridor Travel Times, Alternative 1 No Action

IMPACTS OF ALTERNATIVE 2

Metrics Used for Impact Identification

Screenlines

Exhibit 3.4–37 and Exhibit 3.4–31 summarize the projected PM peak hour volumes across each screenline in 2035. Alternative 2 is expected to result in modest increases in traffic volumes across some screenlines; the increased traffic results in a volume-to-capacity ratio increase of up to 0.03 depending on location. Alternative 2 is projected to result in volume-to-capacity ratios at least 0.01 higher than the no action alternative at the following screenlines:

- Screenline 4.11: South City Limit–Martin Luther King Jr. Way to Rainier Ave S in the southbound direction
- Screenline 5.11: Ship Canal–Ballard Bridge in the northbound direction
- Screenline 10.12: South of S Jackson St–12th Ave S to Lakeside Ave S in the southbound direction

Therefore, a potentially significant adverse impact is expected to automobile traffic, freight, and transit under Alternative 2.

Exhibit 3.4–37 2035 PM Peak Hour Screenline Volume-to-Capacity, Alternative 2

			ALT. 1 NO ACTION (2035)		ALT. 2 (2035)	
Screenline #	**Screenline Location**	**LOS Standard**	**NB/EB**	**SB/WB**	**NB/EB**	**SB/WB**
1.11	North City Limit—3rd Ave NW to Aurora Ave N	1.20	1.07	0.81	1.08	0.83
1.12	North City Limit—Meridian Ave N to 15th Ave NE	1.20	0.93	0.56	0.93	0.56
1.13	North City Limit—30th Ave NE to Lake City Way NE	1.20	1.14	0.78	1.14	0.78
2	Magnolia	1.00	0.54	0.64	0.54	0.65
3.11	Duwamish River—West Seattle Bridge & Spokane St	1.20	0.68	1.13	0.69	1.14
3.12	Duwamish River—1st Ave S & 16th Ave S	1.20	0.40	0.40	0.40	0.40
4.11	South City Limit—Martin Luther King Jr. Way to Rainier Ave S	1.00	0.63	1.05	0.66	1.08
4.12	South City Limit—Marine Dr SW to Meyers Way S	1.00	0.58	0.76	0.59	0.76
4.13	South City Limit—SR 99 to Airport Way S	1.00	0.46	0.81	0.47	0.81
5.11	Ship Canal—Ballard Bridge	1.20	1.27	0.74	1.28	0.75
5.12	Ship Canal—Fremont Bridge	1.20	0.97	0.80	0.98	0.81
5.13	Ship Canal—Aurora Bridge	1.20	0.95	0.84	0.96	0.85
5.16	Ship Canal—University & Montlake Bridges	1.20	0.97	1.03	0.99	1.05
6.11	South of NW 80th St—Seaview Ave NW to 15th Ave NW	1.00	0.48	0.47	0.48	0.47
6.12	South of N(W) 80th St—8th Ave NW to Greenwood Ave N	1.00	0.98	0.93	0.98	0.95
6.13	South of N(E) 80th St—Linden Ave N to 1st Ave NE	1.00	0.62	0.55	0.62	0.56
6.14	South of NE 80th St—5th Ave NE to 15th Ave NE	1.00	0.66	0.63	0.66	0.65
6.15	South of NE 80th St—20th Ave NE to Sand Point Way NE	1.00	0.62	0.55	0.62	0.56
7.11	West of Aurora Ave—Fremont Pl N to N 65th St	1.00	0.72	0.98	0.72	0.99
7.12	West of Aurora Ave—N 80th St to N 145th St	1.00	0.63	0.75	0.64	0.76
8	South of Lake Union	1.20	0.64	0.49	0.65	0.50
9.11	South of Spokane St—Beach Dr SW to W Marginal Way SW	1.00	0.48	0.67	0.49	0.67
9.12	South of Spokane St—E Marginal Way S to Airport Way S	1.00	0.64	0.72	0.65	0.72
9.13	South of Spokane St—15th Ave S to Rainier Ave S	1.00	0.61	0.91	0.62	0.91
10.11	South of S Jackson St—Alaskan Way S to 4th Ave S	1.00	0.63	0.82	0.63	0.82
10.12	South of S Jackson St—12th Ave S to Lakeside Ave S	1.00	0.83	1.01	0.84	1.02
12.12	East of CBD	1.20	0.39	0.45	0.39	0.46
13.11	East of I-5—NE Northgate Way to NE 145th St	1.00	0.74	0.74	0.74	0.74
13.12	East of I-5—NE 65th St to NE 80th St	1.00	0.61	0.63	0.61	0.64
13.13	East of I-5—NE Pacific St to NE Ravenna Blvd	1.00	0.80	0.75	0.80	0.77

Source: Fehr & Peers, 2017.

Mode Share

As shown in Exhibit 3.4–38, Alternative 2 is expected to have the same SOV mode share as Alternative 1 for all sectors and all sectors are expected to meet the 2035 SOV targets. Therefore, no mode share impacts are expected under Alternative 2.

Exhibit 3.4–38 2035 PM Peak Period Mode Share by Sector (Percentage), Alternative 2

Sector	SOV Target (2035)	Alternative 1 No Action (2035)	Alternative 2 (2035)
Northwest Seattle	37	36	36
Northeast Seattle	35	34	34
Queen Anne/Magnolia	38	37	37
Downtown/Lake Union	18	17	17
Capitol Hill/Central District	28	28	28
West Seattle	35	35	35
Duwamish	51	51	51
Southeast Seattle	38	38	38

Note: Fehr & Peers, 2017.

Transit Daily Boardings

The project model forecasts a 79 percent increase beyond existing transit boardings in Seattle under Alternative 2. Because this is lower than the 80 percent significance threshold, no impact is identified. Again, this is a conservative assessment because much of the increase would occur on light rail while the threshold is based on bus boardings only.

For informational purposes, crowding ratios were also forecasted along the ten BRT routes within the city, as shown in Exhibit 3.4–39. The results indicate that conditions along many routes would be similar to the no action alternative where some transit trips would operate with standing room only and be unable to accommodate all passengers resulting in skipped stops. Others would have ridership growth beyond the crowding thresholds~~; however, transit rider loads would increase on~~

~~several of the routes~~. The largest transit rider increases would occur on RR 2 between West Seattle and Downtown, RR 5 between Ballard and UW, and RR 6 between Northgate, Ballard and Westlake.

Exhibit 3.4–39 2035 Transit Crowding Ratio, Alternative 2

	PASSENGER LOAD TO CROWD THRESHOLD RATIO		
BRT Route	**Alternative 1 No Action (2035)**	**Alternative 2 (2035)**	**Additional Riders per Peak Hour Trip**
C Line—West Seattle/Downtown	0.75	0.75	0
D Line—Ballard/Downtown	0.51	0.51	0
E Line—Aurora/Downtown	0.89	0.89	0
RR 1 (Route 12)—Madison	0.49	0.51	1
RR 2 (Route 120)—West Seattle/Downtown	**1.06**	**1.11**	3
RR 3 (Route 7)—Mt Baker/Downtown	0.30	0.31	1
RR 4 (Route 7 / 48)—Rainier/23rd Ave	0.30	0.30	0
RR 5 (Route 44)—Ballard/45th/UW	0.91	0.94	3
RR 6 (Route 40)—Northgate/Ballard/Westlake	**1.45**	**1.53**	7
RR 7 (Route 70)—Northgate/Roosevelt/Eastlake/Downtown	**1.03**	**1.03**	0

Note: King County Metro, Fehr & Peers, 2017.

Note that the transit assumptions in the model are only estimates of the future year routes, stops, and headways that will be in place. In practice, King County Metro continually adjusts its service planning to accommodate demand on the busiest corridors. Therefore, while crowding would likely occur on some routes, Metro's overall plans for increased service hours and boardings are in line with the increase in boardings expected under Alternative 2.

Other Metrics

State Facilities

Exhibit 3.4–40 summarizes 2035 conditions on the state facilities not included in the screenline analysis. Bold cells indicate that the v/c ratio is over 1.0 meaning the facility would not meet WSDOT's LOS standard in 2035.

Exhibit 3.4–40 State Facility Analysis—2035 Volume-to-LOS D Capacity Ratio, Alternative 2

State Facility	Location	Alt. 1 No Action (2035)	Alt. 2 (2035)
I-5	North of NE Northgate Way	**1.22**	**1.22**
I-5	Ship Canal Bridge	**1.39**	**1.41**
I-5	North of West Seattle Bridge	**1.35**	**1.35**
I-5	North of Boeing Access Rd	**1.23**	**1.23**
I-90	East of Rainier Ave S	**1.34**	**1.35**
SR 509	Between S 112th St and Cloverdale St	0.84	0.84
SR 519	West of 4th Ave	0.99	0.99
SR 520	Lake Washington Bridge	**1.10**	**1.13**

Note: Forecasted average daily traffic volumes do not include express lane volumes on I-5 and I-90.
Source: WSDOT, 2015; Fehr & Peers, 2017.

With the increase in traffic associated with Alternative 2, six study segments are expected to exceed WSDOT's LOS D standard.

Note that the difference in the v/c ratios between the no action alternative and Alternative 2 is very small, no more than 0.03 v/c. The largest differences are projected to occur along the I-5 Ship Canal Bridge and the SR 520 Lake Washington Bridge. Daily traffic fluctuations tend to be of this magnitude or larger and this difference may not be noticed by drivers.

Travel Time

Exhibit 3.4–41 and Exhibit 3.4–42 summarize 2035 auto travel times along 19 corridors for Alternative 2 compared to the no action alternative. Note that these results are also relevant for freight operations which travel in the same lanes as auto traffic. However, traffic congestion is more difficult for freight to navigate, and trucks typically travel at slower speeds than general auto traffic. Compared to the no action alternative, Alternative 2 would result in minimal changes to travel times, with all increases expected to be no more than one minute.

Exhibit 3.4–41 2035 Corridor Travel Times, Alternative 2

		ALT. 1 NO ACTION (2035) *LOS/Minutes*		ALT. 2 (2035) *LOS/Minutes*	
Corridor ID	**Study Facility**	**NB / EB**	**SB / WB**	**NB / EB**	**SB / WB**
1	N 105th St—Greenwood Ave N to SR 522	D / 18.0	E / 20.5	D / 18.0	E / 21.0
2	NW 85th—32nd Ave NW to Greenwood Ave N	E / 13.0	D / 11.5	E / 13.0	D / 11.5
3	NW 85th St—Greenwood Ave N to SR 522	E / 12.0	F / 16.0	E / 12.0	F / 16.0
4	NW Market St—24th Ave NW to Stone Way N	E / 19.5	F / 22.5	E / 19.5	F / 22.5
5	N 45th St—Stone Way N to 25th Ave NE	E / 19.0	E / 19.5	E / 19.51	F / 19.5
6	E Madison St—I-5 to 23rd Ave	E / 15.5	E / 15.5	E / 15.5	E / 15.5
7	West Seattle Bridge—35th Ave SW to I-5	D / 9.0	F / 15.0	D / 9.0	F / 15.5
8	Swift Ave S—S Graham St to Seward Park Ave S	A-C / 10.5	A-C / 10.0	A-C / 10.5	A-C / 10.0
9	SW Roxbury St—35th Ave SW to E Marginal Way S	A-C / 17.0	D / 20.5	A-C / 17.0	D / 20.5
10	SR 99—N 145th St to N 80th St	F / 26.0	E / 19.0	F / 26.0	E / 19.0
11	SR 522—SR 523 to I-5	F / 31.0	D / 19.5	F / 31.0	D / 19.5
12	SR 99—N 80th St to Denny Way	E / 20.0	E / 20.0	E / 20.5	E / 20.0
13	Roosevelt Way NE / 12th Ave NE/Eastlake Ave—NE 75th St to Denny Way	E / 37.0	E / 38.5	E / 37.0	E / 39.0
14	25th Ave NE—NE 75th St to S Grand St	E / 47.0	E / 56.5	E / 47.5	E / 57.0
15	15th Ave/Elliott Ave—Market St to Denny Way	E / 24.5	A-C / 17.0	E / 24.5	A-C / 17.0
16	California Ave SW—SW Hanford St to SW Thistle St	D / 15.5	D / 17.0	D / 15.5	D / 17.0
17	1st Ave S—S Royal Brougham Way to E Marginal Way S	D / 17.0	E / 21.0	D / 17.0	E / 21.5
18	Rainier Ave S—E Yesler Way to Renton Ave S	D / 36.0	E / 53.0	D / 36.5	E / 53.5
19	MLK Jr Way S—Rainier Ave S to S Boeing Access Rd	A-C / 23.5	E / 33.5	A-C / 23.5	E / 33.5

Source: Google Maps, 2017; Fehr & Peers, 2017.

Exhibit 3.4–42 2035 Corridor Travel Times, Alternative 2

IMPACTS OF ALTERNATIVE 3

Metrics Used for Impact Identification

Screenlines

Exhibit 3.4–43 and Exhibit 3.4–31 summarize the projected PM peak hour volumes across each screenline in 2035. Similar to Alternative 2, Alternative 3 is expected to result in modest increases in traffic volumes across some screenlines compared to the no action alternative. The increased traffic results in a volume-to-capacity ratio increase of up to 0.03 depending on location. Alternative 3 is projected to result in volume-to-capacity ratios at least 0.01 higher than the no action alternative at the following screenlines:

- Screenline 4.11: South City Limit–Martin Luther King Jr. Way to Rainier Ave S in the southbound direction
- Screenline 5.11: Ship Canal–Ballard Bridge in the northbound direction
- Screenline 10.12: South of S Jackson St–12th Ave S to Lakeside Ave S in the southbound direction

Therefore, a potentially significant adverse impact is expected to automobile traffic, freight, and transit under Alternative 3.

Exhibit 3.4–43 2035 PM Peak Hour Screenline Volume-to-Capacity, Alternative 3

			ALT. 1 NO ACTION (2035)		ALT. 3 (2035)	
Screenline #	**Screenline Location**	**LOS Standard**	**NB/EB**	**SB/WB**	**NB/EB**	**SB/WB**
1.11	North City Limit—3rd Ave NW to Aurora Ave N	1.20	1.07	0.81	1.07	0.83
1.12	North City Limit—Meridian Ave N to 15th Ave NE	1.20	0.93	0.56	0.92	0.56
1.13	North City Limit—30th Ave NE to Lake City Way NE	1.20	1.14	0.78	1.14	0.78
2	Magnolia	1.00	0.54	0.64	0.54	0.66
3.11	Duwamish River—West Seattle Bridge & Spokane St	1.20	0.68	1.13	0.69	1.15
3.12	Duwamish River—1st Ave S & 16th Ave S	1.20	0.40	0.40	0.40	0.40
4.11	South City Limit—Martin Luther King Jr. Way to Rainier Ave S	1.00	0.63	1.05	0.66	1.08
4.12	South City Limit—Marine Dr SW to Meyers Way S	1.00	0.58	0.76	0.59	0.76
4.13	South City Limit—SR 99 to Airport Way S	1.00	0.46	0.81	0.48	0.81
5.11	Ship Canal—Ballard Bridge	1.20	1.27	0.74	1.29	0.75
5.12	Ship Canal—Fremont Bridge	1.20	0.97	0.80	0.98	0.81
5.13	Ship Canal—Aurora Bridge	1.20	0.95	0.84	0.97	0.85
5.16	Ship Canal—University & Montlake Bridges	1.20	0.97	1.03	1.00	1.05
6.11	South of NW 80th St—Seaview Ave NW to 15th Ave NW	1.00	0.48	0.47	0.48	0.47
6.12	South of N(W) 80th St—8th Ave NW to Greenwood Ave N	1.00	0.98	0.93	0.99	0.96
6.13	South of N(E) 80th St—Linden Ave N to 1st Ave NE	1.00	0.62	0.55	0.62	0.57
6.14	South of NE 80th St—5th Ave NE to 15th Ave NE	1.00	0.66	0.63	0.66	0.66
6.15	South of NE 80th St—20th Ave NE to Sand Point Way NE	1.00	0.62	0.55	0.62	0.57
7.11	West of Aurora Ave—Fremont Pl N to N 65th St	1.00	0.72	0.98	0.72	1.00
7.12	West of Aurora Ave—N 80th St to N 145th St	1.00	0.63	0.75	0.63	0.77
8	South of Lake Union	1.20	0.64	0.49	0.64	0.49
9.11	South of Spokane St—Beach Dr SW to W Marginal Way SW	1.00	0.48	0.67	0.50	0.67
9.12	South of Spokane St—E Marginal Way S to Airport Way S	1.00	0.64	0.72	0.65	0.72
9.13	South of Spokane St—15th Ave S to Rainier Ave S	1.00	0.61	0.91	0.62	0.91
10.11	South of S Jackson St—Alaskan Way S to 4th Ave S	1.00	0.63	0.82	0.63	0.82
10.12	South of S Jackson St—12th Ave S to Lakeside Ave S	1.00	0.83	1.01	0.84	1.02
12.12	East of CBD	1.20	0.39	0.45	0.39	0.46
13.11	East of I-5—NE Northgate Way to NE 145th St	1.00	0.74	0.74	0.74	0.76
13.12	East of I-5—NE 65th St to NE 80th St	1.00	0.61	0.63	0.61	0.65
13.13	East of I-5—NE Pacific St to NE Ravenna Blvd	1.00	0.80	0.75	0.81	0.77

Source: Fehr & Peers, 2017.

Mode Share

As shown in Exhibit 3.4–44, Alternative 3 is expected to have the same SOV mode share as Alternative 1 for all sectors and all sectors are expected to meet the 2035 SOV targets. Therefore, no mode share impacts are expected under Alternative 3.

Exhibit 3.4–44 2035 PM Peak Period Mode Share by Sector (Percentage), Alternative 3

Sector	SOV Target (2035)	Alternative 1 No Action (2035)	Alternative 3 (2035)
Northwest Seattle	37	36	36
Northeast Seattle	35	34	34
Queen Anne/Magnolia	38	37	37
Downtown/Lake Union	18	17	17
Capitol Hill/Central District	28	28	28
West Seattle	35	35	35
Duwamish	51	51	51
Southeast Seattle	38	38	38

Note: Fehr & Peers, 2017.

Transit Daily Boardings

The project model forecasts a 79 percent increase beyond existing transit boardings in Seattle under Alternative 3. Because this is lower than the 80 percent significance threshold, no impact is identified. Again, this is a conservative assessment because much of the increase would occur on light rail while the threshold is based on bus boardings only.

For informational purposes, crowding ratios were also forecasted along the ten BRT routes within the city, as shown in Exhibit 3.4–45. The results indicate that conditions along many routes would be similar to the no action alternative where some transit trips would operate with standing room only and be unable to accommodate all passengers resulting in skipped stops. Others would have ridership growth beyond the crowding thresholds.~~; however, transit rider loads would increase on several of the routes.~~ The largest transit rider increases would occur on RR 2 between West Seattle and Downtown, RR 5 between Ballard and UW, RR 6 between Northgate, Ballard and Westlake, and RR7 between Northgate, Roosevelt, Eastlake, and Downtown.

Exhibit 3.4–45 2035 Transit Crowding Ratio, Alternative 3

BRT Route	PASSENGER LOAD TO CROWD THRESHOLD RATIO		
	Alternative 1 No Action (2035)	Alternative 3 (2035)	Additional Riders per Peak Hour Trip
C Line—West Seattle/Downtown	0.75	0.77	2
D Line—Ballard/Downtown	0.51	0.51	0
E Line—Aurora/Downtown	0.89	0.89	0
RR 1 (Route 12)—Madison	0.49	0.50	1
RR 2 (Route 120)—West Seattle/Downtown	**1.06**	**1.11**	3
RR 3 (Route 7)—Mt Baker/Downtown	0.30	0.31	1
RR 4 (Route 7 / 48)—Rainier/23rd Ave	0.30	0.30	0
RR 5 (Route 44)—Ballard/45th/UW	0.91	0.97	5
RR 6 (Route 40)—Northgate/Ballard/Westlake	**1.45**	**1.59**	12
RR 7 (Route 70)—Northgate/Roosevelt/Eastlake/Downtown	**1.03**	**1.10**	5

Note: King County Metro, Fehr & Peers, 2017.

Note that the transit assumptions in the model are only estimates of the future year routes, stops, and headways that will be in place. In practice, King County Metro continually adjusts its service planning to accommodate demand on the busiest corridors. Therefore, while crowding would likely occur on some routes, Metro's overall plans for increased service hours and boardings are in line with the increase in boardings expected under Alternative 3.

Other Metrics

State Facilities

Exhibit 3.4–46 summarizes 2035 conditions on the state facilities not included in the screenline analysis. Bold cells indicate that the v/c ratio is over 1.0 meaning the facility would not meet WSDOT's LOS standard in 2035.

Exhibit 3.4–46 State Facility Analysis—2035 Volume-to-LOS D Capacity Ratio, Alternative 3

State Facility	Location	Alt. 1 No Action (2035)	Alt. 3 (2035)
I-5	North of NE Northgate Way	**1.22**	**1.22**
I-5	Ship Canal Bridge	**1.39**	**1.41**
I-5	North of West Seattle Bridge	**1.35**	**1.35**
I-5	North of Boeing Access Rd	**1.23**	**1.23**
I-90	East of Rainier Ave S	**1.34**	**1.35**
SR 509	Between S 112th St and Cloverdale St	0.84	0.84
SR 519	West of 4th Ave	0.99	0.99
SR 520	Lake Washington Bridge	**1.10**	**1.13**

Note: Forecasted average daily traffic volumes do not include express lane volumes on I-5 and I-90.
Source: WSDOT, 2015; Fehr & Peers, 2017.

With the increase in traffic associated with Alternative 3, six study segments are expected to exceed WSDOT's LOS D standard.

Note that the difference in the v/c ratios between the no action alternative and Alternative 3 is very small, no more than 0.03 v/c. The largest differences are projected to occur along the I-5 Ship Canal Bridge and the SR 520 Lake Washington Bridge. Daily traffic fluctuations tend to be of this magnitude or larger and this difference may not be noticed by drivers.

Travel Time

Exhibit 3.4–47 and Exhibit 3.4–48 summarize 2035 auto travel times along 19 corridors for Alternative 3 compared to the no action alternative. Again, these results are relevant for freight operations which travel in the same lanes as auto traffic. However, traffic congestion is more difficult for freight to navigate, and trucks typically travel at slower speeds than

general auto traffic. As with Alternative 2, the travel time increases under Alternative 3 are expected to be minimal compared to the no action alternative. All increases are expected to be no more than one minute.

Exhibit 3.4–47 2035 Corridor Travel Times, Alternative 3

		ALT. 1 NO ACTION (2035) *LOS/Minutes*		ALT. 3 (2035) *LOS/Minutes*	
Corridor ID	**Study Facility**	**NB / EB**	**SB / WB**	**NB / EB**	**SB / WB**
1	N 105th St—Greenwood Ave N to SR 522	D / 18.0	E / 20.5	D / 18.0	E / 20.5
2	NW 85th—32nd Ave NW to Greenwood Ave N	E / 13.0	D / 11.5	E / 13.0	D / 11.5
3	NW 85th St—Greenwood Ave N to SR 522	E / 12.0	F / 16.0	E / 12.0	F / 16.0
4	NW Market St—24th Ave NW to Stone Way N	E / 19.5	F / 22.5	E / 19.5	F / 22.5
5	N 45th St—Stone Way N to 25th Ave NE	E / 19.0	E / 19.5	E / 19.5	F / 20.0
6	E Madison St—I-5 to 23rd Ave	E / 15.5	E / 15.5	E / 15.5	E / 15.5
7	West Seattle Bridge—35th Ave SW to I-5	D / 9.0	F / 15.0	D / 9.0	F / 15.5
8	Swift Ave S—S Graham St to Seward Park Ave S	A-C / 10.5	A-C / 10.0	A-C / 10.5	A-C / 10.0
9	SW Roxbury St—35th Ave SW to E Marginal Way S	A-C / 17.0	D / 20.5	A-C / 17.0	D / 20.5
10	SR 99—N 145th St to N 80th St	F / 26.0	E / 19.0	F / 26.0	E / 19.0
11	SR 522—SR 523 to I-5	F / 31.0	D / 19.5	F / 31.0	D / 19.5
12	SR 99—N 80th St to Denny Way	E / 20.0	E / 20.0	E / 21.0	E / 20.0
13	Roosevelt Way NE / 12th Ave NE/Eastlake Ave—NE 75th St to Denny Way	E / 37.0	E / 38.5	E / 37.5	E / 39.0
14	25th Ave NE—NE 75th St to S Grand St	E / 47.0	E / 56.5	E / 47.5	E / 57.5
15	15th Ave/Elliott Ave—Market St to Denny Way	E / 24.5	A-C / 17.0	E / 25.0	A-C / 17.0
16	California Ave SW—SW Hanford St to SW Thistle St	D / 15.5	D / 17.0	D / 15.5	D / 17.0
17	1st Ave S—S Royal Brougham Way to E Marginal Way S	D / 17.0	E / 21.0	D / 17.0	E / 21.0
18	Rainier Ave S—E Yesler Way to Renton Ave S	D / 36.0	E / 53.0	D / 36.5	E / 53.5
19	MLK Jr Way S—Rainier Ave S to S Boeing Access Rd	A-C / 23.5	E / 33.5	A-C / 23.5	E / 33.5

Source: Google Maps, 2017; Fehr & Peers, 2017.

Exhibit 3.4–48 2035 Corridor Travel Times, Alternative 3

IMPACTS OF THE PREFERRED ALTERNATIVE

New to the FEIS

Impacts of the Preferred Alternative is a new section since issuance of the DEIS

Within most urban villages, the estimated growth under the Preferred Alternative falls within the range, or very near the range, of the growth studied in the DEIS alternatives. The exceptions are the land use growth in the Madison-Miller Urban Village and the First Hill-Capitol Hill Urban Village. Under the Preferred Alternative, the Madison-Miller Urban Village is expected to have 45 more households and 23 more jobs than the closest DEIS alternative (Alternative 3). The First Hill-Capitol Hill Urban Village would have 2,186 fewer households and 501 more jobs than the closest DEIS alternative (Alternative 2).

Metrics Used for Impact Identification

Screenlines

Because the planned land use growth for most urban villages under the Preferred Alternative falls within the range of land use growth assumed under the DEIS alternatives, the screenline results would be within the ranges reported for Alternatives 1 (No Action), 2, or 3.

Screenline v/c ratios at least 0.01 higher than the No Action alternative, which results in a potentially significant impact, are expected at the following screenlines.

- Screenline 4.11: South City Limit–Martin Luther King Jr. Way to Rainier Ave S in the southbound direction
- Screenline 5.11: Ship Canal–Ballard Bridge in the northbound direction
- Screenline 10.12: South of S Jackson St–12th Ave S to Lakeside Ave S in the southbound direction

The locations where the planned land use growth was distinctly different or higher than the other alternatives include Madison-Miller and the First Hill-Capitol Hill urban village. Under the Preferred Alternative, the Madison-Miller area would generate an additional 100 PM peak hour vehicle trips to or from this area compared to Alternative 3. The First Hill-Capitol Hill urban village would have an additional 200 PM peak hour vehicle trips to or from the area compared to Alternative 2.

The screenlines most likely to be affected by the additional trips from the Preferred Alternative were similar to Alternatives 2 and 3. Screenline 10.12, was already identified as an impact under the DEIS action alternatives. The v/c ratio would be slightly higher under the Preferred

Alternative. The other two adjacent screenlines (5.16-University and Montlake Bridges to the north and 12.12-East of CBD to the west) are both well under their thresholds and therefore the additional trips are not expected to cause an impact at those screenlines.

Mode Share

The change in mode share by sector varied by less than one percentage point between all DEIS alternatives. As the expected growth under the Preferred Alternative is very close to the ranges assumed in action alternatives, the SOV mode shares would not change meaningfully change compared to the DEIS alternatives and no significant impacts are expected under the Preferred Alternative.

Transit Daily Boardings

Citywide, the Preferred Alternative plans for 470 fewer households than Alternative 3 and 620 more jobs than Alternative 2. The significance threshold of an 80 percent increase over existing daily boardings is equivalent to a growth of 60,950 transit boardings from the base year over the three-hour AM period. This allows for an additional 170 AM peak hour boardings compared to Alternative 3 (the action alternative with the highest transit boardings) before reaching the threshold.

While transit boardings under the Preferred Alternative would be marginally higher than the alternatives studied in the DEIS, they are not expected to exceed the 80 percent threshold. Moreover, as stated previously, the daily transit boarding increases cited in this document include light rail while the threshold is based on bus boardings only. Therefore, this is a conservative assessment and the Preferred Alternative is not expected to result in a significant transit impact.

For informational purposes, the transit line crowding ratios for the planned BRT routes throughout the City were analyzed. The results are expected to be similar to results for Alternatives 2 and 3. The Madison-Miller and First Hill-Capitol Hill area may have a few more transit riders on the nearby routes RR 1 and RR 4 compared to Alternatives 2 and 3, however these routes are still not expected to have crowding issues as the crowding threshold ratio is expected to be less than 0.5. The identified crowding issues under Alternative 2 and 3 (RR 2, RR 6 and RR 7) are expected to occur under the Preferred Alternative.

Other Metrics

State Facilities

As the total household and jobs growth under the Preferred Alternative is very similar to the total planned growth under Alternatives 2 and 3, the state facility volume-to-LOS D capacity ratios are not expected to meaningfully change. The same six state facilities that would exceed WSDOT's LOS D threshold in Alternatives 2 and 3 would also do so under the Preferred Alternative.

Corridor Travel Times

The corridor travel times under the Preferred Alternative are not expected to meaningfully differ from the range of forecasted travel times for Alternatives 2 and 3. Corridor travel times would increase by a negligible amount; with none adding enough travel time to push any corridors beyond the one minute threshold increase compared to the No Action alternative.

SUMMARY OF IMPACTS

Exhibit 3.4–49 summarizes the impacts for each alternative. Note that the table only includes the metrics used for impact identification.

Exhibit 3.4–49 Summary of Transportation Impacts

Sector	Alternative 1 No Action (2035)	Alternative 2 (2035)	Alternative 3 (2035)	Preferred Alternative (2035)
Screenline (Auto, Freight, and Transit)	Potentially	Potentially	Potentially	Potentially
Mode Share	No	No	No	No
Transit Daily Boardings	No	No	No	No
Pedestrian and Bicycle	No	No	No	No
Safety	No	No	No	No
Parking	Yes	Yes	Yes	Yes

Note: Fehr & Peers, 2017.

3.4.3 MITIGATION MEASURES

Seattle is committed to investing in the City's transportation system to improve access and mobility for residents and workers and to reduce the potential severity of transportation impacts identified above. Reducing the share of SOV travel is key to Seattle's transportation strategy. Lower SOV mode share would not only reduce screenline and parking demand impacts; it is consistent with numerous other goals and policies in the Comprehensive Plan. From a policy perspective, the City has prioritized reducing vehicular demand rather than increasing operating capacity.

This section identifies a range of potential mitigation strategies that could be implemented to help reduce the severity of the adverse impacts identified in the previous section. These include impacts that would affect screenlines and parking.

INCORPORATED PLAN FEATURES

The City of Seattle is currently working on numerous strategies to support non-SOV travel modes and this increase the overall efficiency of the transportation system for all Seattle residents and employees. These strategies would be executed regardless of which land use alternative is chosen and are therefore incorporated into all three alternatives.

- **Improving the Pedestrian and Bicycle Network:** The City has developed a citywide Pedestrian Master Plan (PMP) and citywide Bicycle Master Plan (BMP) along with other subarea plans focused on particular neighborhoods. These plans and documents include myriad projects that, if implemented, would improve the pedestrian and bicycle environment. SDOT also has ongoing safety programs that are aimed at reducing the number of collisions, benefiting both safety and reliability of the transportation system.
- **Implementing Transit Speed and Reliability Improvements:** The Seattle Transit Master Plan (TMP) has identified numerous projects, including Intelligent Transportation Systems (ITS), to improve transit speed and reliability throughout the city.
- **Implementing Actions Identified in the Freight Master Plan:** The City is recently prepared a revised Freight Master Plan, including measures to increase freight accessibility and travel time reliability. These projects could be implemented on key freight corridors to improve conditions for goods movement.
- **Expanding Travel Demand Management ~~and Parking Strategies~~:** Managing demand for auto travel is an important element of reducing

overall congestion impacts that affect auto, freight, transit and parking demand. There are well-established travel demand management programs in place, including Transportation Management Programs (TMPs) and the State's Commute Trip Reduction (CTR) program which could be expanded to include new parking-related strategies. CTR and TMP programs could evolve substantially toward smaller employer, residential buildings and other strategies (CTR and TMPs are now largely focused on large employers).

- **Expanding Parking Strategies:** The City has several ongoing programs to manage on-street parking including the Community Access and Parking Program, Performance-Based Parking Program, and Restricted Parking Zone Program. These approaches could be modified and/or applied at the neighborhood level to manage the increased demand for the City's limited parking supply.
- **Working With Partner Agencies:** WSDOT, King County Metro, Sound Transit and PSRC all provide important transportation investments and facilities for the City of Seattle. The City has a long history of working with these partner agencies to expand multimodal access to and within the City. The City should continue to work with these agencies. Key issue areas include regional roadway pricing and increased funding for transit operations.

The incorporated transportation improvement features are discussed in more detail below. It should be noted that some projects could have secondary impacts. For example, converting a general purpose travel lane to a transit lane or a cycle track would reduce capacity for autos. As required, the City would prepare additional analysis before implementing specific transportation improvement projects. Given the programmatic nature of this study, this EIS simply lists the types of projects that could be considered to mitigate potential secondary impacts.

Pedestrian and Bicycle System Improvements

Improvements to the pedestrian and bicycle system would provide a better connected and safer walking and riding environment, thereby encouraging travelers to choose walking or biking rather than driving. There is a well-documented link between improved, safer bicycle and pedestrian accessibility and reduced demand for vehicle travel (CAPCOA 2010).

- Specific projects and/or high priority areas for improvement may be found in the City's adopted Pedestrian and Bicycle Master Plans.

- Development codes could also be modified to include requirements for wider sidewalks, particularly along greenways and green streets, to promote walking and bicycling.
- In conjunction with other funding sources, new private and public development could pay for a share of PMP and BMP improvements.

Speed and Reliability Improvements

Transit and freight travel times could be reduced by providing targeted speed and reliability improvements on key routes frequented by transit and freight. The *Transit Master Plan* identifies such improvements throughout the city. The City's Freight Master Plan identifies near- and long-term improvements that would benefit freight mobility. In conjunction with other funding sources, new development could pay for a share of improvements on key routes. Some of the transit improvements could be funded through the passage of 2014's Proposition 1 or similar future funding measures.

Travel Demand Management ~~and Parking Strategies~~

The City of Seattle currently has travel demand management programs in place including strategies outlined in the transportation modal plans: the Pedestrian Master Plan, the Bicycle Master Plan and the Transit Master Plan. In addition, the City could consider enhancing the travel demand management programs already in place. Research by the California Air Pollution Control Officers Association (CAPCOA), which is composed of air quality management districts in that state, has shown that implementation of travel demand management programs can substantially reduce vehicle trip generation, which in turn reduces congestion for transit, freight and autos. Reduced auto travel can indirectly mitigate on-street parking impacts; in addition,some residents may choose to forgo owning private vehicles. The specific measures described below are all potential projects that the City could consider to modify or expand current strategies:

- Parking maximums that would limit the number of parking spaces which can be built with new development.
- Review the parking minimums currently in place for possible revisions.
- Review on-street parking management strategies in concert with any adjustment to off-street parking standards to reduce the impact of spillover parking.

- Unbundling of parking to separate parking costs from total property cost, allowing buyers or tenants to forgo buying or leasing parking spaces.
- Increased parking taxes/fees.
- Review and revise transit pass provision programs for employees.
- Encourage or require transit pass provision programs for residents—King County Metro has a Passport program for multifamily housing that is similar to its employer-based Passport program. The program discounts transit passes purchased in bulk for residences of multifamily properties.

~~The City could also consider encouraging or requiring parking operators to upgrade their parking revenue control systems (PARC) to the latest hardware and software technology so it could be incorporated into an electronic guidance system, compatible with the e-Park program that is currently operating Downtown. This technology would help direct drivers to off-street parking facilities with available capacity. The City could also continue to manage on-street paid parking through existing programs and refine them to redefine subareas and manage them with time-of-day pricing and paid parking to new areas.~~

~~In the absence of a new ITS parking program, the City is expected to continue managing on-street paid parking through SDOT's Performance-Based Parking Program which evaluates data to determine if parking rates, hours of operation and/or time limits could be adjusted to achieve the City's goal of one to two available spaces per block face throughout the day.~~

The City could also consider establishing new subarea transportation management partnership organizations to provide programs, services and strategies to improve access to employment and residences while decreasing the SOV rate, particularly during peak periods. This could include partnerships with transit providers. Local Transportation Management Associations (TMAs) could provide some of these services. Programs like the state's Growth and Transportation Efficiency Center (GTEC) or the City's Business Improvement Area (BIA) are possible models for future funding sources. The programs could include features of relevant programs such as Seattle Center City's Commute Seattle, Whatcom County's SmartTrip or Tacoma's Downtown on the Go programs.

The City could consider updating municipal code and/or Director's Rules related to Transportation Management Plans required for large buildings to include transportation demand management measures that are most

effective in reaching the City's mode share goals. This may include membership in a TMA and discounted or free transit passes and/or car share and bike share memberships. For residential buildings, the City could also consider extending Transportation Management Plans or requiring travel options programs (such as Green Trips in Oakland, CA and Residential Services in Arlington, VA).

~~The City could seek to improve monitoring of the parking occupancy and RPZs to determine if changes are necessary. These changes could include splitting existing RPZs into multiple zones, adding new RPZs or adjusting RPZ boundaries. The City could also review the RPZ program and its policies in areas that are oversubscribed (where there are more permits issued than parking spaces).~~

Parking Strategies

New to the FEIS

Parking Strategies is a new section since issuance of the DEIS

The City has several ongoing programs aimed at managing its on-street parking supply. Those programs and strategies are described here and could be used to manage the increased demand expected under the Action Alternatives.

SDOT's Community Access and Parking Program works with community members to identify parking challenges and opportunities within a neighborhood and implement changes. Parking recommendations could include new time-limit signs, load zones, paid parking, restricted parking zones, bicycles parking, or other changes.

The City is expected to continue managing on-street paid parking through SDOT's Performance-Based Parking Program which evaluates data to determine if parking rates, hours of operation and/or time limits could be adjusted to achieve the City's goal of one to two available spaces per block face throughout the day. The City could continue to manage on-street paid parking through existing programs and refine them to redefine subareas and manage them with time-of-day pricing and paid parking to new areas.

The City could also consider encouraging or requiring parking operators to upgrade their parking revenue control systems (PARC) to the latest hardware and software technology so it could be incorporated into an electronic guidance system, compatible with the e-Park program that is currently operating Downtown. This technology would help direct drivers to off-street parking facilities with available capacity.

Additionally, the City could seek to improve monitoring of the parking occupancy and RPZs to determine if changes are necessary. These

changes could include splitting existing RPZs into multiple zones, adding new RPZs or adjusting RPZ boundaries. The City could also review the RPZ program and its policies in areas that are oversubscribed (where there are more permits issued than parking spaces) to limit the number of permits issued.

New to the FEIS

Intelligent Transportation Systems is a new section since issuance of the DEIS

Intelligent Transportation Systems

Seattle has an ongoing program to improve the operations of traffic signals and provide drivers with more information about congestion and travel times in an effort to make more efficient use of the City's streets. The City will continue to implement new traffic signal systems, such as the recently introduced adaptive signal control strategy for the Mercer Street Corridor throughout the City. These programs are designed to specifically reduce traffic congestion and improve freight and vehicle flow.

Potential Mitigation Measure Implementation

Funding for mitigation projects could come from a variety of sources. One way to generate additional funding would be a citywide development impact fee program that could include monitoring, project prioritization and use of collected fees to construct street system projects. The program could emulate practices used in the existing South Lake Union and Northgate Voluntary Impact Fee Programs. This type of program would require additional analysis to identify needed projects and a fee schedule before it could be implemented. Most cities in Washington State have a transportation impact fee program to fund transportation capacity projects.

OTHER PROPOSED MITIGATION MEASURES

Potential mitigation measures for the three potential screenline impacts are discussed here:

Screenline 4.11—South City Limit from Martin Luther King Jr. Way to Rainier Ave S

Screenline 4.11 along the south city limit from Martin Luther King Jr. Way to Rainier Ave S is expected to potentially exceed its threshold under the no action alternative and both action alternatives. The following mitigation measures could be implemented to reduce the significance of this potential impact:

- Purchase additional bus service from King County Metro along affected corridors.

- Strengthen TDM requirements for new development to reduce SOV trips, specifically in areas in the Rainier Valley.
- Increase the screenline threshold from 1.0 to 1.2 to acknowledge the City is willing to accept higher congestion levels in this area. A screenline threshold of 1.2 is consistent with other higher density areas of the city.

Screenline 5.11—Ballard Bridge

Screenline 5.11 across the Ballard Bridge is expected to potentially exceed its threshold under the no action alternative and both action alternatives. The following specific mitigation measures could be implemented to reduce the significance of this potential impact:

- Continue ongoing monitoring of volumes across the Ballard Bridge and complete a feasibility study of a bridge replacement (or new Ship Canal crossing) with increased non-auto capacity if ongoing traffic monitoring identifies a substantial increase in PM peak hour traffic volumes across the bridge.
- Purchase additional bus service from King County Metro along the 15th Ave NW corridor.
- Strengthen TDM requirements for new development to reduce SOV trips, particularly in the Ballard, Crown Hill, and Greenwood urban villages.

Screenline 10.12—South of S Jackson St from 12th Ave S to Lakeside Ave S

Screenline 10.12 along S Jackson Street from 12th Ave S to Lakeside Ave S is expected to potentially exceed its threshold under the no action alternative and both action alternatives. The following mitigation measures could be implemented to reduce the significance of this potential impact:

- Purchase additional bus service from King County Metro along affected corridors.
- Strengthen TDM requirements for new development to reduce SOV trips, particularly in the Capitol Hill, First Hill, and Central District areas.
- Increase the screenline threshold from 1.0 to 1.2 to acknowledge the City is willing to accept higher congestion levels in this area. A screenline threshold of 1.2 is consistent with other higher density areas of the city.

3.4.4 SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

Travel demand and associated congestion is expected to increase over time regardless of the alternative pursued. In addition to citywide transportation capacity improvements that are largely focused on improved transit, bicycle, pedestrian, and freight connections, the City will manage demand using policies, programs, and investments aimed at shifting travel to non-SOV modes. Seattle will also continue to invest in Intelligent Transportation Systems to improve the operations of streets for vehicles and freight. However, city streets will remain congested during peak periods as growth continues to occur. With respect to the three~~wo~~ action alternatives studied in the DEIS and this ~~Draft~~ Final EIS, potentially significant adverse impacts are identified for screenline volumes and on-street parking.

The parking impacts are anticipated to be brought to a less-than-significant level by implementing a range of possible mitigation strategies such as those discussed in 3.4.3 Mitigation Measures. While there may be short-term impacts as individual developments are completed (causing on-street parking demand to exceed supply), it is expected that over the long term with expanded paid parking zones, revised RPZ permitting, more sophisticated parking availability metrics, and continued expansion of non-auto travel options, the on-street parking situation will reach a new equilibrium. Therefore, no significant unavoidable adverse impacts to parking are expected.

Potential mitigation measures for the three screenlines impacted by the action alternatives have been proposed. If one or more of those measures are implemented, it is expected that the impact could be brought to a less-than-significant level. Therefore, no significant unavoidable impacts to screenlines are expected.