REPORT

RAPIDRIDE ROOSEVELT CORRIDOR EASTLAKE BICYCLE FACILITY EVALUATION

Prepared for

Seattle Department of Transportation

Seattle Department of Transportation

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Attachments

Tables

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ACRONYMS AND ABBREVIATIONS

AAA	all ages and abilities
BMP	Bicycle Master Plan
BRT	bus rapid transit
FTA	Federal Transit Administration
HCT	high-capacity transit
LPA	locally preferred alternative
NACTO	National Association of City Transportation Officials
NB	northbound
NEPA	National Environmental Policy Act
PBL	protected bicycle lane
RPZ	restricted parking zone
SB	southbound
SDOT	Seattle Department of Transportation
TMP	Transit Master Plan

EXECUTIVE SUMMARY

The City of Seattle is in the environmental review phase of the RapidRide Roosevelt bus rapid transit project. In December 2017, Seattle Department of Transportation (SDOT) conducted project scoping to begin the environmental process, inform agencies and the public about the project, and solicit feedback on project alternatives. Based on feedback received during the public scoping period, which included comments on the protected bicycle lanes (PBLs), including both support for PBLs on Eastlake and concerns regarding loss of parking, SDOT decided to complete a more detailed evaluation of bicycle facility options in the Eastlake neighborhood as part of the RapidRide Roosevelt preliminary engineering effort. This document evaluates bicycle facility options in the Eastlake neighborhood as part of the SDOT RapidRide Roosevelt project related to the purpose and needs of the project.

This Executive Summary highlights information included within this report. Refer to the appropriate section in this report for further information.

Project Background and Elements

Seattle's 2012 Transit Master Plan (TMP) identified three high-capacity-transit (HCT) corridors as priorities for further evaluation and implementation, including the Roosevelt-University District-South Lake Union-Downtown Seattle transit corridor (SDOT, 2012). This HCT corridor was the predecessor to what is now the RapidRide Roosevelt project. The first work on the project was a conceptual design phase for the Roosevelt to Downtown HCT Study. The Roosevelt to Downtown HCT Study (SDOT, 2017a) included three rounds of public outreach in 2015 and 2016. The Roosevelt to Downtown HCT Study recommended two-way PBLs on Eastlake Ave E as part of the preferred bicycle facilities for the RapidRide Roosevelt project. In July 2017, a locally preferred alternative (LPA) was adopted by Seattle City Council that addressed the project's adopted purpose and need (Council Resolution 31761).

The purpose of the RapidRide Roosevelt project is to improve transit travel times, reliability, and capacity to increase high-frequency, all-day transit service and enhance transit connections between Downtown Seattle and the Belltown, South Lake Union, Eastlake, University District, and Roosevelt neighborhoods, in order to:

- Address current and future mobility needs for residents, workers, and students
- Address capacity constraints in the transportation network along this north-south corridor
- Provide equitable transportation access to major institutions, employers, and neighborhoods
- Improve pedestrian and bicycle connections and access to RapidRide stops and improve safety along the corridor

The RapidRide Roosevelt project would provide electric trolley bus service along a 6-mile corridor from northeast Seattle to Downtown Seattle. Transit improvements include upgrades to bus stops to provide real-time arrival information and offboard fare payment, transit signal priority upgrades, and new bus lanes. The project also includes bicycle and pedestrian access and safety improvements throughout the corridor. As part of these multimodal improvements, new PBLs are proposed along Eastlake Ave E.

Guiding Plans and Policies

Several plans and policies are used to guide decisions on the allocation of right-of-way in Seattle for travel modes. The relevant plans and polices are described in this report. They include:

- *Seattle Bicycle Master Plan* (SDOT, 2014)
- *Seattle 2035*, the Seattle Comprehensive Plan (City of Seattle, 2017a)
- Streets Illustrated, the Seattle Right-of-Way Improvements Manual (City of Seattle, 2017b)

The Bicycle Master Plan (BMP) recommended two bicycle facilities in the Eastlake neighborhood as part of the citywide recommended bicycle network: PBLs along Eastlake Ave E and a neighborhood greenway along the shore of Lake Union (following the Cheshiahud Lake Union Loop). The recommended PBLs along Eastlake Ave E are identified as part of the regional bicycle network, reflecting the importance of Eastlake Ave E as a cycling corridor.

The Comprehensive Plan identifies priorities for the use of the "flex zone," which is the portion of the right-of-way between travel lanes and the sidewalk. These priorities depend on the surrounding land uses, but in all cases modal plans are the top priority for use of the flex zone. This means that recommendations such as those in the BMP are given priority over other possible uses of the flex zone, including parking and loading.

"Streets Illustrated" is Seattle's right-of-way improvements manual and within the Eastlake neighborhood, Eastlake Ave E is classified as an Urban Village Main street. Urban Village Main streets, as defined in Streets Illustrated, serve as the primary arterials for urban villages. Streets designated Urban Village Main are intended to provide transit priority to support frequent transit service as well as on-street PBLs where recommended by the BMP.

Existing Conditions

The study area for this evaluation roughly corresponds to Seattle's Eastlake neighborhood between the University Bridge in the north and Fairview Ave N bridge in the south (Figure ES-1). PBLs in the area are on the University Bridge and extend north to the University District. These bicycle lanes continue south on Harvard Ave E connecting to Capitol Hill. In the southern part of the study area, the SDOT Fairview Ave N bridge replacement project will include a two-way PBL on Fairview Ave N. Currently there are no dedicated bicycle facilities between Harvard Ave E and Fairview Ave N. This represents a substantial gap in the bicycle network.

As part of this study, bicycle volumes were collected during daylight hours and are shown on Figure ES-2. Bicycle volumes were highest at the Eastlake Ave E/Fuhrman Ave E count location at the north end of the study area, with 2,229 cyclists observed over the 14-hour count period. Bicycles traveling north-south through the Eastlake neighborhood must pass through the intersection of Fairview Ave/Eastlake Ave E at the southern end of the study area, so it provides a good estimate of the total number of cyclists traveling through the Eastlake study area. A total of 1,462 cyclists were observed at this location over the count period.

Two counts were also conducted near the center of the study area, one on Eastlake Ave E and the other on Fairview Ave E. At the Eastlake Ave E/E Lynn St intersection, 855 cyclists were observed over the count period. At the Fairview Ave E/E Lynn St intersection, which is along the Cheshiahud Lake Union Loop (a signed bicycle route), 255 cyclists were counted.

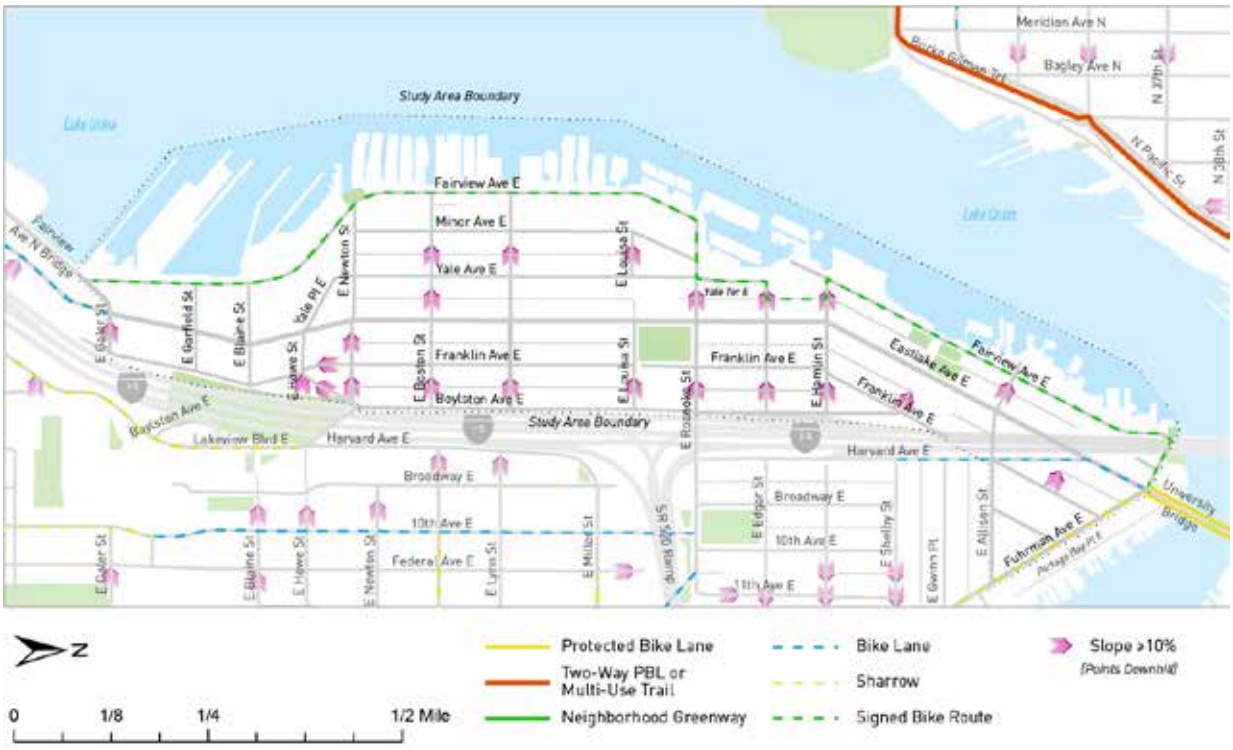

Figure ES-1. Existing Bicycle Facilities in Study Area

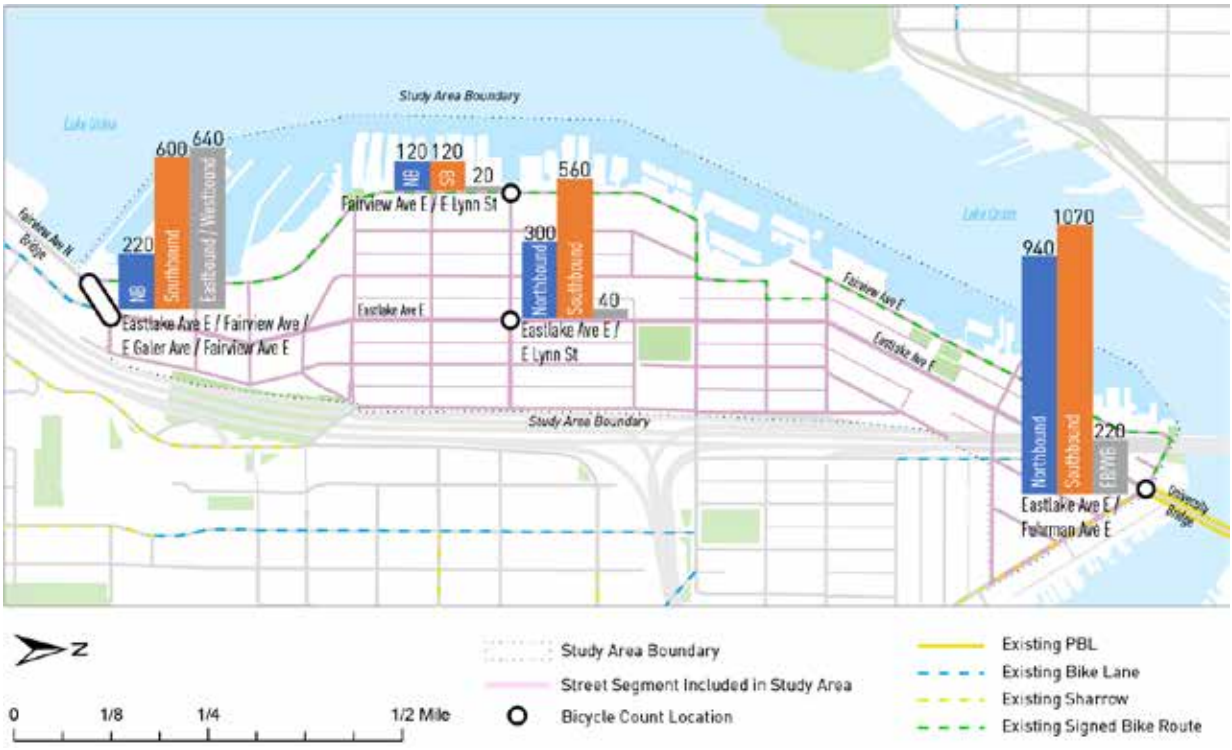

Figure ES-2. Bicycle Volumes at Eastlake Neighborhood Count Locations (14-Hour Duration)

From 2012 through 2017, 40 reported collisions involving bicycles occurred in the Eastlake neighborhood. Of those, 39 collisions occurred at locations along Eastlake Ave E, while one collision occurred off of Eastlake Ave E at the intersection of Fairview Ave E and E Garfield St. Most collisions resulted in injury (95%), including three serious injury collisions (8%). No bicycle-involved fatal collisions occurred in this area during the time period analyzed.

Bicycle Options

Eight bicycle facility options were developed for this study. A no build option with existing bicycle facilities and the future PBL on the Fairview Avenue bridge was also included in the analysis. The nine options evaluated are:

Option 1: No Build	Option 6: Multi-Use Trail on Fairview Ave E
Option 2: Protected Bicycle Lanes on Eastlake Ave E	Option 7: Greenway on Fairview Ave E (following the Cheshiahud Lake Union Loop)
Option 3: Two-Way Protected Bicycle Lanes on Eastlake Ave E	Option 8: Greenway on Minor Ave E and Fairview Ave E
Option 4: Northbound PBL on Eastlake Ave E and Southbound Greenway on Yale Ave E	Option 9: Greenway on Franklin Ave E
Option 5: Northbound PBL on Eastlake Ave E and Southbound PBL on Yale Ave E	

Evaluation Process and Results

Evaluation Process

A no build option along with eight bicycle facility options were evaluated in two stages as shown in Exhibit ES-3. Options were initially evaluated with a pass/fail rating based on criteria pertaining to feasibility of implementation. Concepts that passed this initial screening were then assessed in greater detail to determine their performance on a broader set of criteria.

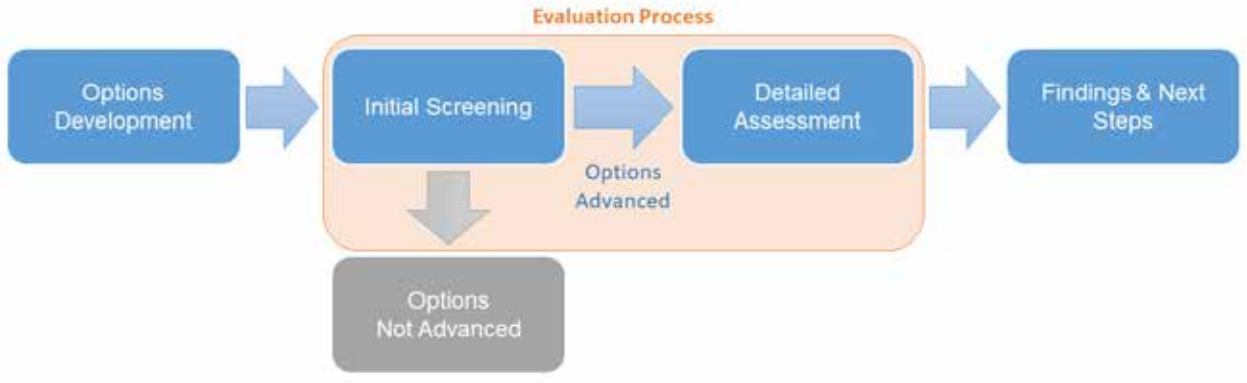

Figure ES-3. Bicycle Facility Options Evaluation Process

The initial screening stage of the evaluation process considered all nine options. The initial screen was performed to identify potential issues that would prevent implementation of the options. This step serves to screen out bicycle facility options with substantial concerns by considering whether each option would:

- Meet the project's purpose and need by providing improved safety and access to transit for bicycles.
- Provide a level bicycle route.
- Meet SDOT's bicycle facility design standards.
- Be constructible within available existing right-of-way.

Options that passed all four screening criteria were advanced beyond the initial screening to the more detailed assessment. While the initial screen was used to determine whether each option is feasible for implementation, the detailed assessment was used to provide a comparison of the benefits and impacts that would be associated with each of the remaining options based on their performance on a range of different measures. This detailed assessment evaluated the remaining options using 14 criteria addressing the following elements:

- Degree to which each option improves bicycle safety and bicycle connections to transit
- Degree to which each option is consistent with City of Seattle policy guidance
- Bicycle route conditions
- Degree to which each option provides neighborhood access
- Impacts to other transportation modes and elements

Evaluation Results

In the initial screening, five of the nine bicycle facility options were screened out due to their poor performance on one or more of the four initial screening criteria. Options that failed to pass any one of the four screening criteria were not advanced to the second stage of the evaluation. Options 2, 3, 4, and 5 passed the initial screening. Additionally, Option 1 (no build) was carried into the detailed assessment for comparison purposes only, although it does not meet the RapidRide Roosevelt purpose and need nor address existing safety concerns for the bicyclists traveling in the study area, and therefore did not pass the initial screening.

With the detailed assessment, Option 2, which would provide continuous PBLs on Eastlake Ave E within the study area, performed the best of the four bicycle facility concepts. Option 2 received a high rating on 11 of the 14 evaluation criteria and a medium rating on two criteria. Option 2 scored well in this assessment because it would provide a high level of safety improvement for bicycles, a bicycle facility adjacent to all transit stops in the study area, a level and direct bicycle route, a direct bicycle access to most businesses in the study area and have a positive impact on traffic and transit operations in the Eastlake neighborhood. Option 2 received a low rating on one criterion, impact to on-street parking, matching the ratings received by Options 3 and 5. No option advanced to the detailed assessment received a high rating for impact to on-street parking as all of the options in the detailed assessment would remove parking in the Eastlake neighborhood.

Option 3, which would also provide continuous PBLs through the study area, performed similarly to Option 2 overall. However, Option 3 received a lower rating than Option 2 on route safety because the two-way PBL layout would result in bicycles traveling in the opposite direction of adjacent motor vehicles. Option 3 also received a lower rating on impact to planted medians, as the two-way PBL would likely require the removal of all existing planted medians on Eastlake Ave E in the study area. Option 3 would result in the same parking impact as Option 2 and did not receive a higher rating than Option 2 on any of the criteria considered.

Options 4 and 5 did not perform as well as Options 2 and 3 in the detailed assessment, with each receiving five high ratings, eight medium ratings, and one low rating. Option 4 performed the best on impact to on-street parking, receiving a medium rating, but performed worst on route safety. Option 5 would result in the greatest total impact to on-street parking, requiring the removal of an estimated 375 parking spaces. Both Options 4 and 5 received lower scores than Options 2 and 3 on several other criteria, including consistency with the BMP, bicycle route legibility, access to businesses, and impact to transit and traffic performance.

1. INTRODUCTION

The City of Seattle has submitted the RapidRide Roosevelt project for federal funding from the Federal Transit Administration (FTA) through a Small Starts grant. This funding requires compliance with the National Environmental Policy Act (NEPA), including a public outreach process. In December 2017, Seattle Department of Transportation (SDOT) conducted project scoping to begin the environmental process, inform agencies and the public about the project, and solicit feedback on project alternatives. Based on feedback received during the public scoping period, which included comments on the protected bicycle lanes (PBLs), including both support for PBLs on Eastlake and concerns regarding loss of parking, SDOT decided to complete a more detailed evaluation of bicycle facility options in the Eastlake neighborhood as part of the RapidRide Roosevelt preliminary engineering effort.

This document evaluates bicycle facility options in the Eastlake neighborhood as part of the SDOT RapidRide Roosevelt project. The project proposes new protected bicycle lanes (PBLs) along the project corridor, including on Eastlake Ave E (PBLs are defined in Section 3.1).

The bicycle options considered in this evaluation include options for routing and bicycle facility type. A number of options were developed based on previous planning efforts, stakeholder and community feedback, and project team discussions. These are described in Section 5. The evaluation is structured in two parts with an initial screening and a subsequent more detailed assessment. Screening criteria include purpose and need, safety, and feasibility. Following the initial screen, the remaining options were further evaluated based on a set of quantitative and qualitative information using a broader range of criteria. The results of this evaluation will be shared with the public and used to inform the selection of a final bicycle facility design in the Eastlake neighborhood to be included as part of the RapidRide Roosevelt project.

2. RAPIDRIDE ROOSEVELT PROJECT DESCRIPTION

2.1 Project Elements

The RapidRide Roosevelt project would provide electric trolley bus service along a 6-mile corridor from northeast to Downtown Seattle. The overall purpose of the RapidRide Roosevelt project is to improve transit travel times, reliability, and capacity to increase high-frequency, all-day transit service and enhance transit connections between Downtown Seattle and the Belltown, South Lake Union, Eastlake, University District, and Roosevelt neighborhoods, in order to:

- Address current and future mobility needs for residents, workers, and students
- Address capacity constraints in the transportation network along this north-south corridor
- Provide equitable transportation access to major institutions, employers, and neighborhoods
- Improve pedestrian and bicycle connections and access to RapidRide stops and improve safety along the corridor.

The Roosevelt corridor has been identified as a high-priority corridor for meeting the following transportation and community needs:

- Provide transit service to support housing and employment growth
- Provide neighborhood connections to future Link light rail stations
- Improve transit travel time and reliability throughout the corridor
- Reduce overcrowding of existing bus capacity
- Improve pedestrian and bicycle safety and connections to transit

2.2 Project Background

2.2.1 Roosevelt to Downtown High Capacity Transit Study

Seattle's 2012 Transit Master Plan (TMP) identified three high-capacity-transit (HCT) corridors as priorities for further evaluation and implementation, including the Roosevelt-University District-South Lake Union-Downtown Seattle transit corridor (SDOT, 2012). This HCT corridor was the predecessor to what is now the RapidRide Roosevelt project. The first work on the project was a conceptual design phase for the Roosevelt to Downtown HCT Study, which included mode analysis and began in November 2014 (SDOT, 2017a). While the TMP included a preliminary recommendation of rapid streetcar for this corridor, bus rapid transit (BRT) was selected as the preferred mode in the Roosevelt to Downtown HCT Study. BRT was chosen for several reasons, with cost being a major consideration along with other criteria such as capacity, safety, rider experience, and right-of-way limitations.

The Roosevelt to Downtown HCT Study included three rounds of public outreach in 2015 and 2016. Two open houses were held along the corridor on consecutive evenings for each round of

outreach. Over 20,000 post cards were mailed to corridor residents in advance of the open houses. Existing conditions and the mode analysis were discussed at May 2015 open houses, types and characteristics of BRT were presented at December 2015 open houses, and in June 2016, a recommended corridor concept was presented along with project phasing options. In July 2017, a locally preferred alternative (LPA) was adopted by Seattle City Council that addressed the project's adopted purpose and need (Council Resolution 31761).

2.2.2 RapidRide Roosevelt Locally Preferred Alternative

The adopted Roosevelt to Downtown HCT corridor LPA is described in the Roosevelt RapidRide Project LPA Report (SDOT, 2017b). The LPA includes electric trolleybus BRT service between Roosevelt and Downtown Seattle with King County Metro's RapidRide service branding. Transit improvements include upgrades to bus stops to provide real-time arrival information and offboard fare payment, transit signal priority upgrades, and new bus lanes.

The LPA also includes bicycle and pedestrian access and safety improvements throughout the corridor. As part of these multimodal improvements, PBLs were assumed on Eastlake Ave E. North of Eastlake Ave E, the Eastlake PBLs would connect to the newly constructed southbound (SB) PBLs on Roosevelt Way and the proposed northbound (NB) PBLs on 11th and 12th Avenues NE. To the south, the Eastlake PBLs would connect to the PBLs planned as part of the project to replace the Fairview Ave N bridge. Both Eastlake Ave E PBLs and neighborhood greenway options were reviewed prior to recommending PBLs on Eastlake Ave E.

3. GUIDING PLANS AND POLICIES

Several plans and policies are used to guide decisions on the allocation of right-of-way in Seattle for all travel modes. These include:

- Seattle Bicycle Master Plan (SDOT, 2014)
- *Seattle 2035*, the Seattle Comprehensive Plan (City of Seattle, 2017a)
- Streets Illustrated, the Seattle Right-of-Way Improvements Manual (City of Seattle, 2017b)
- Complete Streets (Seattle City Council Ordinance 122386)
- Vision Zero (SDOT, 2018a)
- Safe Routes to School (SDOT, 2015)
- Best practices and industry standards

3.1 Seattle Bicycle Master Plan

The Seattle Bicycle Master Plan (BMP) was adopted in 2014 and identifies a citywide priority network of recommended bicycle facilities. The recommended citywide bicycle network is composed of bicycle facilities that are considered "all ages and abilities" (AAA), which are intended to allow a wide range of people to safely and comfortably travel by bicycle regardless of their cycling skill level. AAA bicycle facilities as defined by the BMP include the following:

- Protected bicycle lanes
  - PBLs are separated from traffic lanes and parked cars by physical barriers and buffers to prevent encroachment by motor vehicles.
  - PBLs typically include special intersection treatments to increase cyclist visibility and reduce conflicts with turning vehicles.
  - PBLs may be one-way or two-way facilities.
  - Seattle design standards for one-way PBLs specify a minimum width of 5 feet and a typical width up to 6.5 feet, with a minimum buffer width of 3 feet.
  - Seattle design standards for two-way PBLs specify a minimum width of 10 feet (5 feet per direction) and a preferred width of 12 feet, with a minimum buffer width of 3 feet.
- Off-street trails (including multi-use trails)
  - Multi-use trails are intended to be shared by people walking and biking.
  - Seattle design standards for multi-use trails specify a minimum width of 10 feet; wider trails are preferred to accommodate shared use.
- Neighborhood greenways
  - Neighborhood greenway treatments include speed humps and 20 mile-per-hour speed limits to reduce auto traffic speeds.
  - Stop signs are added to non-arterial streets crossing neighborhood greenways to reduce the risk of collisions at intersections.
  - Neighborhood greenway treatments include improved crossings of busy streets, which typically include flashing beacons or crossing signals to cross arterials.

- Seattle design standards for neighborhood greenways recommend avoiding routes with grades over 8.3%.
- Motor vehicle volumes must be low on neighborhood greenways; the National Association of City Transportation Officials (NACTO) *Urban Bikeway Design Guide* recommends motor vehicle volumes below 1,500 vehicles per day (NACTO, 2014). Traffic diversion measures should be included as part of greenway projects to keep motor vehicle volumes low.

The BMP's recommendations were developed by SDOT in coordination with the public using a robust public engagement process. Monthly briefings with the Seattle Bicycle Advisory Board were held during the BMP's development. SDOT staff also held additional community meetings across the city to gather public feedback and attended district council and community council meetings as well as provided briefings to several city commissions and advisory boards.

In addition to public feedback, the BMP recommendations considered data relating to past bicycle plans, the city's land use pattern, topography, traffic speeds and volumes, and a number of other factors. Geographic information system data and field analysis of Seattle's transportation network were extensively used to determine locations where bicycle facilities can be integrated into the existing street network. Consideration was also given to the City's other modal plans to provide a multimodal approach to locating bicycle facility recommendations.

The BMP recommendations include two bicycle facilities in the Eastlake neighborhood as part of the citywide recommended bicycle network:

1) PBLs along Eastlake Ave E
2) A neighborhood greenway along the shore of Lake Union (following the Cheshiahud Lake Union Loop)

The regional bicycle network is shown in Figure 3-1 and the recommended bicycle facilities in the Eastlake neighborhood are shown in Figure 3-2. The recommended PBLs along Eastlake Ave E are identified as part of the regional bicycle network, reflecting the importance of Eastlake Ave E as a cycling corridor.

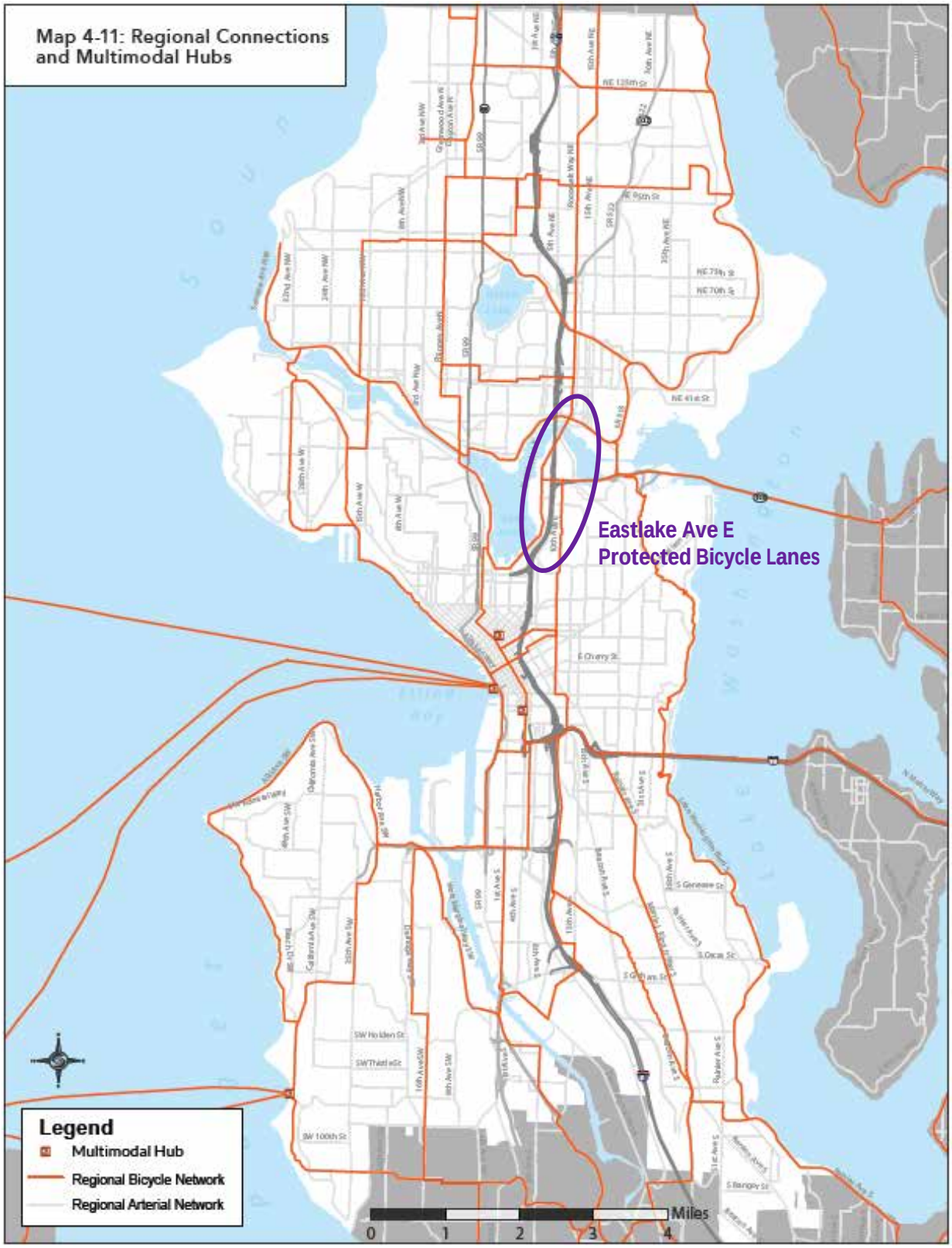

Figure 3-1. Seattle Bicycle Master Plan Regional Bicycle Network
Source: SDOT, 2014

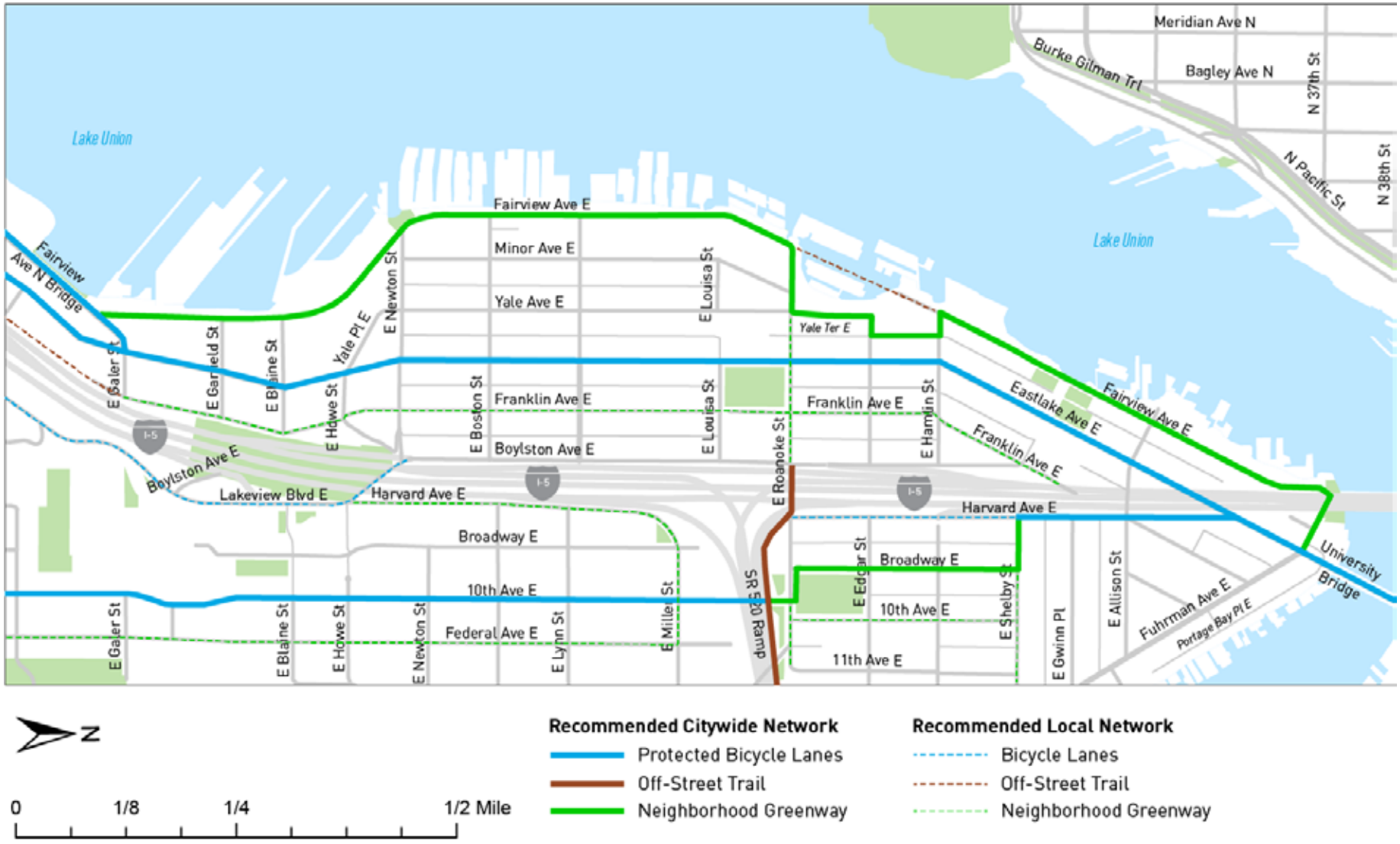

Figure 3-2. BMP-Recommended Bicycle Facilities in Eastlake Neighborhood
Source: Adapted from SDOT, 2014)

3.2 Seattle Comprehensive Plan

Seattle's most recent Comprehensive Plan, *Seattle 2035*, was adopted in 2017 (City Council Resolution 31762) and identifies guiding policies for land use and transportation in Seattle (City of Seattle, 2017a). The Comprehensive Plan's transportation section is focused on improving transportation and reducing single-occupancy vehicle use by supporting alternative transportation modes. Several of the Comprehensive Plan's goals and related transportation policies that address modal and right-of-way priorities are listed in Table 3-1 and 3-2.

Table 3-1. Seattle Comprehensive Plan Goals and Policies That Address Bicycle Facilities

TRANSPORTATION GOALS	TRANSPORTATION GOAL TEXT	TRANSPORTATION POLICIES	TRANSPORTATION POLICY TEXT
TG 1	Ensure that transportation decisions, strategies, and investments support the City's overall growth strategy and are coordinated with this Plan's land use goals.	T 1.2	Improve transportation connections to urban centers and villages from all Seattle neighborhoods, particularly by providing a variety of affordable travel options (pedestrian, transit, and bicycle facilities) and by being attentive to the needs of vulnerable and marginalized communities.
		T 1.5	Invest in transportation projects and programs that further progress toward meeting Seattle's mode-share goals, in Transportation Figures 1 and 2 [*not reproduced in this document*], and reduce dependence on personal automobiles, particularly in urban centers.
TG 2	Allocate space on Seattle's streets to safely and efficiently connect and move people and goods to their destinations while creating inviting spaces within the rights-of-way.	T 2.2	Ensure that the street network accommodates multiple travel modes, including transit, freight movement, pedestrians, people with disabilities, bicycles, general purpose traffic, and shared transportation options.
		T 2.3	Consider safety concerns, modal master plans, and adjacent land uses when prioritizing functions in the pedestrian, travelway, and flex zones of the right-of-way.

Table 3-1. Seattle Comprehensive Plan Goals and Policies That Address Bicycle Facilities

TRANSPORTATION GOALS	TRANSPORTATION GOAL TEXT	TRANSPORTATION POLICIES	TRANSPORTATION POLICY TEXT
		T 2.5	Prioritize mobility needs in the travelway based on safety concerns and then on the recommended networks and facilities identified in the respective modal plans.
		T 2.6	Allocate space in the flex zone to accommodate access, activation, and greening functions, except when use of the flex zone for mobility is critical to address safety or to meet connectivity needs identified in modal master plans. When mobility is needed only part of the day, design the space to accommodate other functions at other times.
		T 2.8	Employ the following tactics to resolve potential conflicts for space in the right-of-way: · Implement transportation and parking-demand management strategies to encourage more efficient use of the existing right-of-way · Allocate needed functions across a corridor composed of several streets or alleys, if all functions cannot fit in a single street · Share space between travel modes and uses where safe and where possible over the course of the day · Prioritize assignment of space to shared and shorter-duration uses · Encourage off-street accommodation for nonmobility uses, including parking and transit layover

Table 3-1. Seattle Comprehensive Plan Goals and Policies That Address Bicycle Facilities

TRANSPORTATION GOALS	TRANSPORTATION GOAL TEXT	TRANSPORTATION POLICIES	TRANSPORTATION POLICY TEXT
TG 3	Meet people's mobility needs by providing equitable access to, and encouraging use of, multiple transportation modes.	T 3.1	Develop and maintain high-quality, affordable, and connected bicycle, pedestrian, and transit facilities.
		T 3.2	Improve transportation options to and within the urban centers and villages, where most of Seattle's job and population growth will occur.
		T 3.10	Provide high-quality pedestrian, bicycle, and bus transit access to high-capacity transit stations, in order to support transit ridership and reduce single-occupant vehicle trips.
TG 4	Promote healthy communities by providing a transportation system that protects and improves Seattle's environmental quality.	T 4.3	Reduce drive-alone vehicle trips, vehicle dependence, and vehicle miles traveled in order to help meet the City's greenhouse gas reduction targets and reduce and mitigate air, water, and noise pollution.
		T 4.4	Manage the transportation system to support modes that reduce the use of fossil fuels and promote the use of alternative fuels.
TG 6	Provide and maintain a safe transportation system that protects all travelers, particularly the most vulnerable users.	T 6.1	Reduce collisions for all modes of transportation and work toward a transportation system that produces zero fatalities and serious injuries by 2030 to attain the City's Vision Zero objectives.
		T 6.4	Minimize right-of-way conflicts to safely accommodate all travelers.

Source: City of Seattle, 2017a

The Comprehensive Plan identifies priorities for the use of the "flex zone," which is the portion of the right-of-way between travel lanes and the sidewalk. These priorities depend on the predominant land use of the surrounding area (Table 3-2), but in all cases modal plans are the top priority for use of the flex zone. This means that recommendations such as those found in the BMP and the recommendations in Seattle's other modal plans for pedestrians, transit, and

freight are given priority over other possible uses of the flex zone, including parking and loading.

Table 3-2. Seattle Comprehensive Plan Priorities for Right-of-Way "Flex Zone" by Predominant Use of Area

COMMERCIAL/MIXED-USE AREAS	INDUSTRIAL AREAS	RESIDENTIAL AREAS
Modal plan priorities	Modal plan priorities	Modal plan priorities
Access for commerce	Access for commerce	Access for people
Access for people	Access for people	Access for commerce
Activation	Storage	Greening
Greening	Activation	Storage
Storage	Greening	Activation

Source: City of Seattle, 2017a, pg. 77

3.3 Complete Streets, Vision Zero, and Safe Routes to School

In addition to the street use and transportation priorities outlined in the Seattle Comprehensive Plan, the City of Seattle has Complete Streets and Vision Zero policies and a Safe Routes to School program that guide management of and investment in the transportation system.

3.3.1 Complete Streets

Seattle's Complete Streets policy was adopted in 2007 by Seattle City Council Ordinance 122386. This policy directs SDOT to design streets for pedestrians, bicyclists, transit riders, and persons of all abilities, while promoting safe operation for all users, including freight. It establishes two priorities for the design of Seattle's streets:

- Highest priority: safety
- Second priority: mobility for people and goods

The Complete Streets policy directs SDOT to consider improving the safety and efficiency of the transportation system whenever improvements are made to transportation facilities. A Complete Streets checklist is used to ensure that safety and mobility for all transportation modes have been considered in all project planning and design stages. The checklist includes traffic volumes; street classification and type; an inventory of sidewalk condition, crosswalks, transit facilities, and parking restrictions; and recommendations from existing bicycle, pedestrian, freight, and transit plans.

3.3.2 Vision Zero

Vision Zero is a multi-national road traffic safety project that aims to achieve a highway system with no fatalities or serious injuries involving road traffic. It started in Sweden and was approved by their parliament in October 1997. As of April 2016, 17 U.S. cities have committed to Vision Zero, with many more exploring it, according to the newly formed Vision Zero Network.

Seattle formally launched its Vision Zero plan in February 2015 with a goal of eliminating transportation- and traffic-related deaths and serious injuries by 2030. The plan is being jointly implemented by SDOT and the Seattle Police Department. The Vision Zero objectives were incorporated into the most recent Seattle Comprehensive Plan in 2017.

Vision Zero projects that have been completed or are currently underway include corridor improvements to several arterials, such as Rainier Ave S, NE 65th St, and 35th Ave SW, as well as numerous Safe Routes to Schools projects, new neighborhood greenways, and new PBLs. Vision Zero corridor projects include speed reductions, new or improved pedestrian crossings, and, where practical, reductions in the total number of vehicle lanes.

3.3.3 Safe Routes to School

Safe Routes to School is a national movement to ensure safe walking or biking for students to and from school. SDOT is implementing a 5-year action plan for Safe Routes to School in Seattle as part of Vision Zero.

3.4 Streets Illustrated

Streets Illustrated is Seattle's Right-of-Way Improvements Manual and was adopted in 2017. Streets Illustrated provides design guidance for various street type designations and right-of-way within Seattle and is based on a guiding principle of Complete Streets, balancing the needs of all travel modes and users, including pedestrians, bicyclists, transit riders, freight, and motor vehicle drivers. The design guidance provided in Streets Illustrated is consistent with applicable City of Seattle plans and regulations, including the Seattle Comprehensive Plan; the City of Seattle *Standard Specifications for Road, Bridge, and Municipal Construction* (City of Seattle, 2017c); and the Seattle Municipal Code.

Within the Eastlake neighborhood, Eastlake Ave E is classified as an Urban Village Main street. Urban Village Main streets, as defined in Streets Illustrated, serve as the primary arterials for urban villages. Streets designated Urban Village Main are intended to provide transit priority to support frequent transit service as well as on-street PBLs where recommended by the BMP.

Alleys and adjacent side streets are intended to provide loading and parking access for retail and residential uses along Urban Village Main streets due to the to the need to accommodate transit and bicycles along the curb. The Streets Illustrated Urban Village Main street type is illustrated in Figure 3-3.

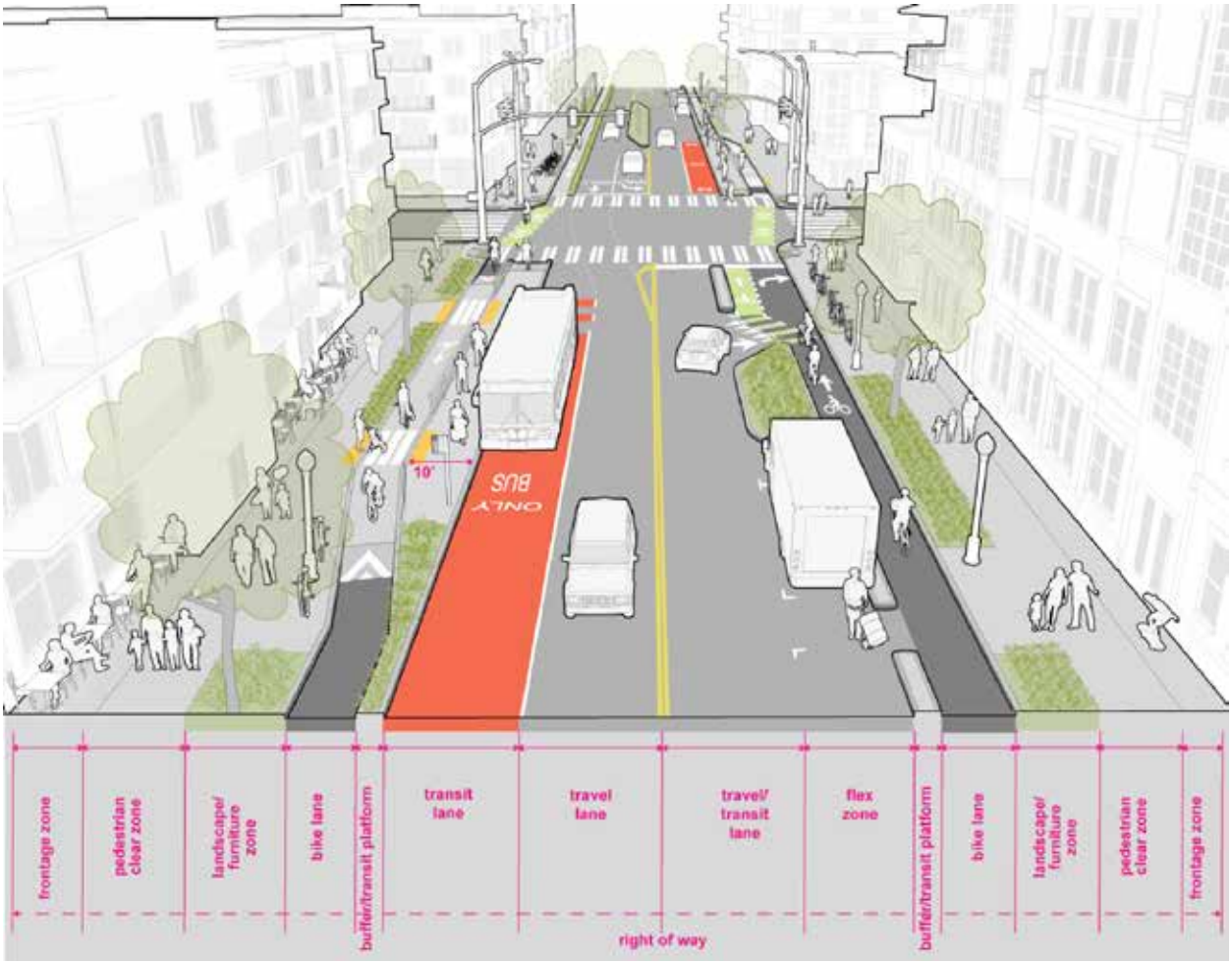

Figure 3-3. Urban Village Main Recommended Design in Streets Illustrated (Not Specific to RapidRide Roosevelt Project)

Image Source: Streets Illustrated, City of Seattle, 2017b

Most other streets within the Eastlake neighborhood are designated as Urban Village Neighborhood Access streets. Urban Village Neighborhood Access streets are intended to serve a supporting role for nearby Urban Village Main streets. Urban Village Neighborhood Access streets are generally narrower and residential, and may accommodate parking, loading, and other curbside uses where needed. This is shown in Figure 3-4.

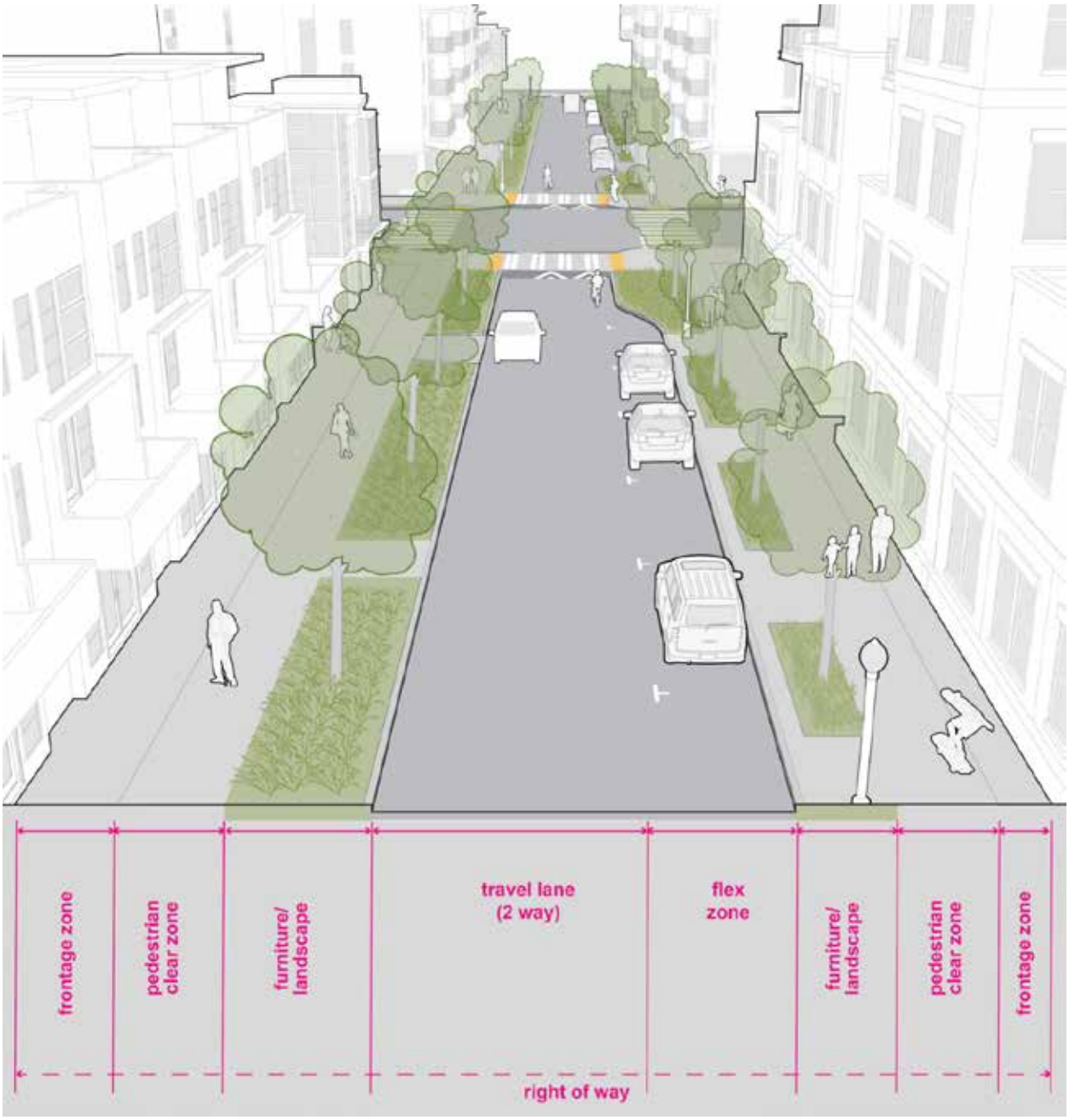

Figure 3-4. Urban Village Neighborhood Access Recommended Design in Streets Illustrated (Not Specific to RapidRide Roosevelt Project)
Image Source: Streets Illustrated, City of Seattle, 2017b

3.5 Best Practices and Industry Standards

3.5.1 AASHTO

The American Association of State Highway Transportation Officials (AASHTO) publishes standards for design of bicycle facilities in the *Guide for the Development of Bicycle Facilities* (AASHTO, 2012). The most recent edition, published in 2012, includes recommendations for bicycle facility design and identifies appropriate types of bicycle facilities for a wide range of different contexts, including urban, suburban, and rural roads and highways.

3.5.2 National Association of City Transportation Officials

NACTO publishes the *Urban Bikeway Design Guide.* The most recent edition of the guide was published in 2014. The guide is focused primarily on urban streets and provides specific guidelines for the design of a number of different bicycle facilities. Its guidance for designing bicycle facilities for all ages and abilities is generally consistent with Seattle's standards for AAA bicycle facilities.

4. STUDY AREA AND EXISTING CONDITIONS

4.1 Study Area

The study area for this evaluation roughly corresponds to Seattle's Eastlake neighborhood and extends from the University Bridge in the north to the Fairview Ave N bridge in the south (Figure 4.1). The University Bridge includes PBLs extending north to the University District and provides a logical connection point for a bike facility within the Eastlake neighborhood. The Fairview Ave N bridge replacement project will include a two-way PBL, and this new bike facility will provide the southern connection point for a bicycle facility within Eastlake.

Interstate 5 (I-5) and Lake Union provide the general eastern and western boundaries of the study area, respectively. A small portion of the northern study area extends east of I-5 along E Allison St and Fuhrman Ave E. These streets are included in the study area because they could provide bicycle connections to Harvard Ave E or Fuhrman Ave E east of the freeway.

As the intended connection points for a bicycle facility in the Eastlake neighborhood lie at the north and south end of the study area, most of the analysis was focused on north-south roads through the area, including the following streets:

- Fairview Ave E
- Minor Ave E
- Yale Ave E
- Eastlake Ave E
- Franklin Ave E

The road segments included in the study area are shown on Figure 4-1.

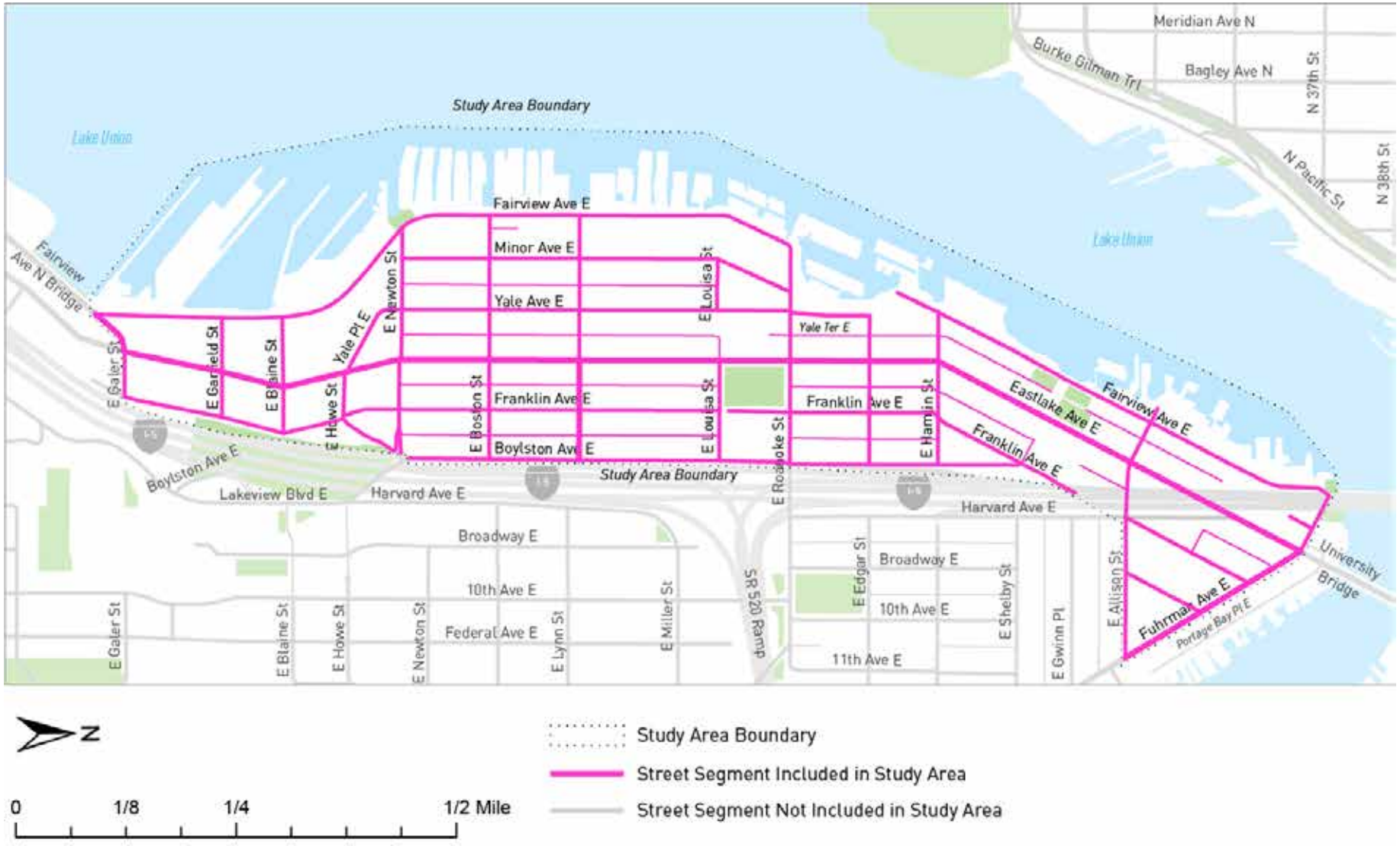

Figure 4-1. Study Area

4.2 Existing Conditions in the Eastlake Neighborhood

4.2.1 Existing Roadway Conditions

Eastlake Ave E is the primary arterial in the study area. It runs primarily north-south, connecting to the University Bridge in the north and continuing south through South Lake Union and into Downtown Seattle. Average daily traffic volumes along Eastlake Ave E are approximately 14,000 from Harvard Ave E to E Lynn St and 15,800 from E Lynn St to Fairview Ave according to SDOT's 2017 Traffic Report (SDOT, 2017c). Eastlake Ave E primarily has a five-lane configuration through the study area as shown in Figure 4-2, with two travel lanes in each direction plus a two-way center turn lane. The curb lane on either side serves as a parking lane during most hours of the day, but peak-direction peak-period parking restrictions are in place. Parking is prohibited on the west side in the morning (7-9 AM) and on the east side in the evening (3-6 PM). The peak parking restrictions are illustrated on Figure 4-3.

Figure 4-2. Eastlake Ave E in the Eastlake Neighborhood
View facing north toward E Lynn St from Eastlake Ave E. Curb lanes function as additional peak hour/peak direction travel lanes. Image source: Google Maps Street View, July 2017; image captured May 2018.

Eastlake Ave E serves as the main commercial corridor in the Eastlake neighborhood and includes a number of retail and mixed-use buildings. Most other streets in the study area are non-arterial streets, which are narrower, carry lower volumes of traffic, and are primarily residential. Non-arterial streets within the study area are typically 25 feet wide from curb to curb and allow parking on both sides of the street, leaving narrow shared two-way travel lanes between parked cars. Existing conditions on a number of non-arterial streets in the study area are shown in Figure 4-4 through Figure 4-10. The location and direction of these representative pictures within the study area are shown in Figure 4-11. These streets encourage low-speed travel but can be difficult for bicyclists to navigate through as little space is available to allow passage of multiple bicyclists and motor vehicles. Most of the residential streets within the study area provide parking within a restricted parking zone (RPZ), which requires permits to park longer than 2 hours. Most streets in Eastlake include sidewalks, although Fairview Ave E lacks sidewalks and curbs throughout the study area (Figure 4-9).

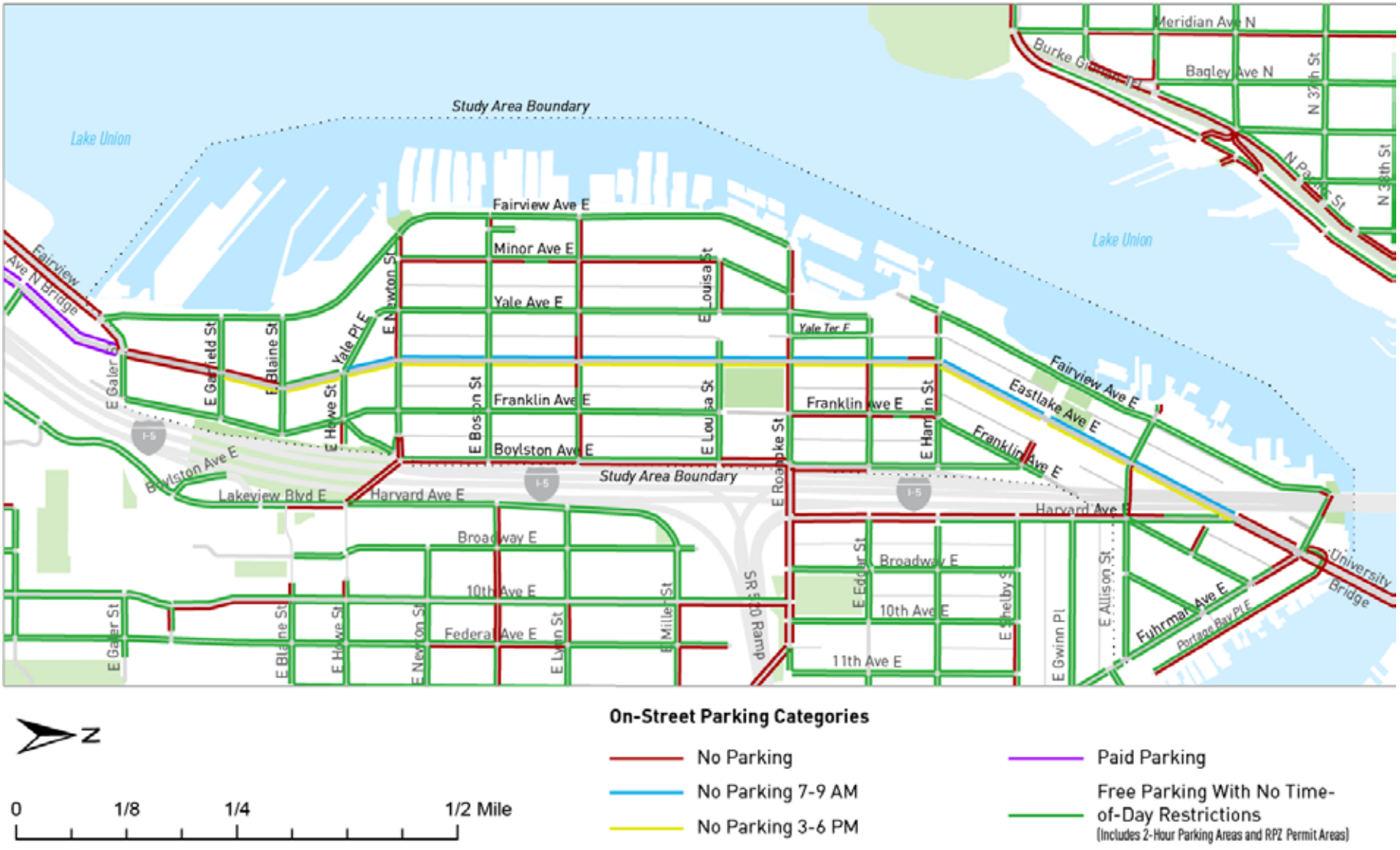

Figure 4-3. Existing On-Street Parking in Study Area

Figure 4-4. Franklin Ave E in the Eastlake Neighborhood
View facing north toward E Lynn St from Franklin Ave E. Parking is allowed on both sides of Franklin Ave E (subject to RPZ restrictions), leaving a single two-way travel lane between parked cars. Image source: Google Maps Street View, August 2015; image captured May 2018.

Figure 4-5. Yale Ave E in the Eastlake Neighborhood
View facing north toward E Lynn St from Yale Ave E. Parking is allowed on both sides of Yale Ave E (subject to RPZ restrictions), leaving a single two-way travel lane between parked cars. Image source: Google Maps Street View, August 2015; image captured May 2018.

Figure 4-6. Yale Place E in the Eastlake Neighborhood
View facing west-northwest toward Yale Ave E from Yale Place E. Parking is allowed on both sides of Yale Place E (subject to RPZ restrictions), leaving a single two-way travel lane between parked cars. Image source: Google Maps Street View, July 2017; image captured May 2018.

Figure 4-7. Minor Ave E in the Eastlake Neighborhood
View facing north toward E Lynn St from Minor Ave E. Parking is not allowed on the east side of Minor Ave E, while parking on the west side is subject to RPZ restrictions. Image source: Google Maps Street View, July 2017; image captured May 2018.

Figure 4-8. E Roanoke St in the Eastlake Neighborhood
View facing west toward Yale Ave E from E Roanoke St. This segment of E Roanoke St includes two separate travel lanes with perpendicular parking built into the north side of the right-of-way. This parking configuration presents a safety challenge for bicycles as visibility is poor for cars backing out of parking spaces, and a grade exceeding 10% requires long stopping distances for cyclists headed downhill. Image source: Google Maps Street View, August 2015; image captured May 2018.

Figure 4-9. Fairview Ave E (also Cheshiahud Lake Union Loop) in the Eastlake Neighborhood
View facing north toward E Lynn St from Fairview Ave E. The Cheshiahud Lake Union Loop follows this segment of Fairview Ave E, but Fairview Ave E lacks sidewalks, curbs, bicycle lanes, and defined parking areas and travel lanes. Image source: Google Maps Street View, July 2017; image captured May 2018.

Figure 4-10. Yale Terrace E Alley (also Cheshiahud Lake Union Loop)
View facing north toward E Hamlin St from Yale Terrace E alley. This alley is part of the Cheshiahud Lake Union Loop. Two-way traffic is allowed, but the alley is too narrow to allow bicycles and cars to pass one another. Image source: Google Maps Street View, May 2014; image captured May 2018.

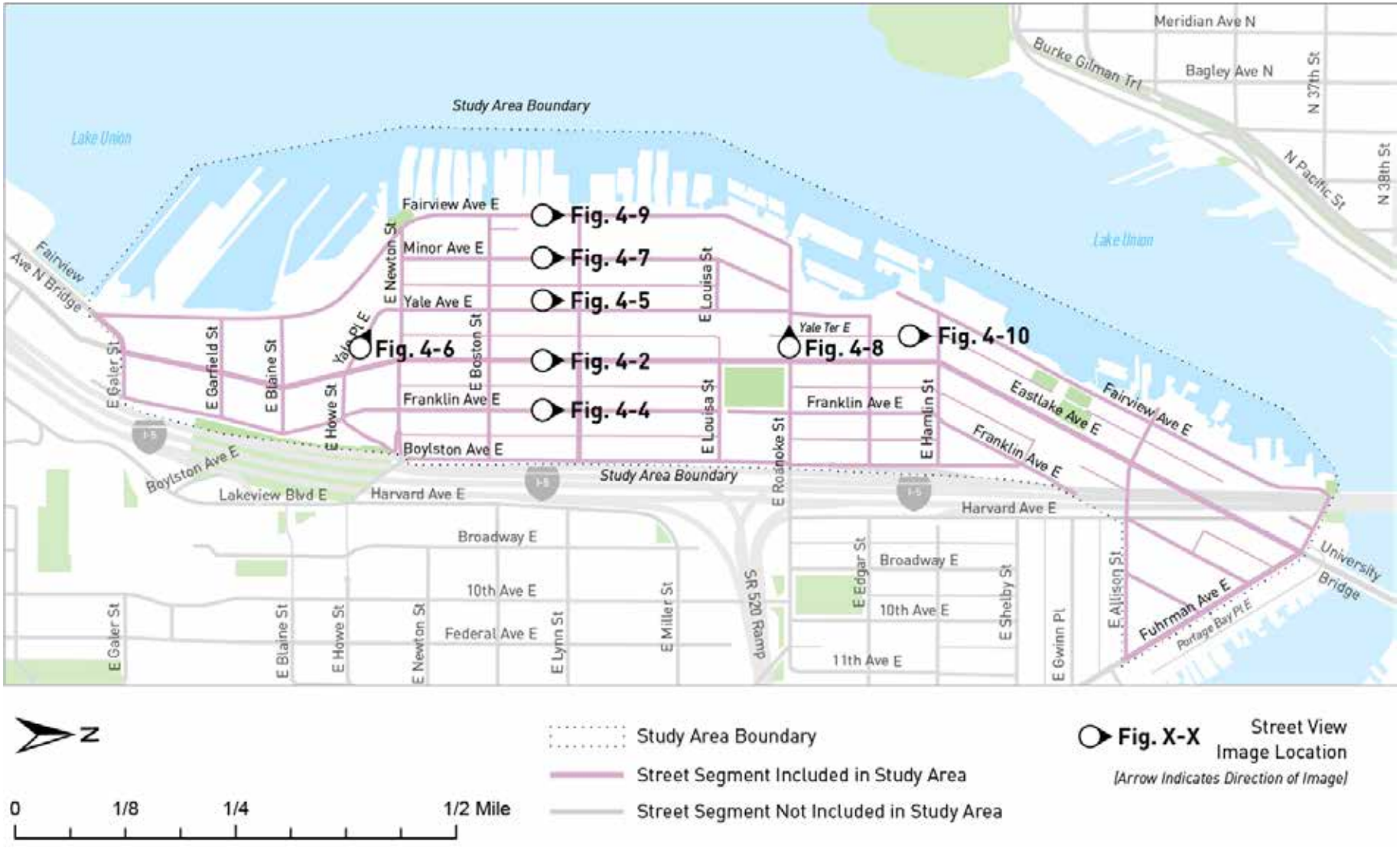

Figure 4-11. Locations of Street View Images Within Study Area (Figure 4-2 and Figures 4-4 through 4-10)

4.2.2 Existing Bicycle Facilities in the Eastlake Neighborhood

Existing bicycle facilities in the study area are shown on Figure 4-12. The PBLs on University Bridge connect to non-protected bicycle lanes, which extend for a block south along Eastlake Ave E. These bicycle lanes continue south up Harvard Ave E, providing a connection to Capitol Hill on the east side of I-5.

At the southern end of the study area, bike lanes begin on Eastlake Ave E at the intersection of E Galer St/Fairview Ave N and extend south toward Downtown Seattle. The current Fairview Ave N bridge carries a SB PBL; this will be expanded to off-street two-way PBLs as part of the Fairview Ave N bridge replacement project.

There are many steep slopes throughout the study area and the street grid is discontinuous due to the proximity to Lake Union and I-5. Figure 4-12 shows street segments with slopes greater than 10% in the study area. Hills in the study area generally slope towards Lake Union.

Currently there are no dedicated bicycle facilities between Harvard Ave E and Fairview Ave N. This represents a substantial gap in the bicycle network. Based on collected bicycle counts, Eastlake Ave E currently serves as the primary bicycle route within the neighborhood despite not having bicycle lanes (see bicycle counts in Section 4.2.3). Peak-period parking restrictions extend nearly the full length of Eastlake Ave E within the study area, with parking prohibited on the west side in the morning (7-9 AM) and on the east side in the evening (3-6 PM). These peak-period lanes function as de facto shared bicycle and bus lanes, although open to all traffic. Outside of peak periods or in reverse-peak directions, cyclists on Eastlake Ave E share the travel lane with cars and buses. See Figure 4-3 for existing on-street parking in the study area.

While not a bicycle facility, the Cheshiahud Lake Union Loop follows the shoreline within Eastlake and serves as a signed walking and bicycling route. The Cheshiahud Lake Union Loop primarily uses Fairview Ave E. The signed route has no painted bicycle lanes or other bicycle provisions beyond signage. Walking and cycling conditions along the Cheshiahud Lake Union Loop are generally poor. As shown in Figure 4-9 and Figure 4-10, the route lacks curbs and sidewalks in many locations and passes through a very narrow alley for one block. This route also includes very steep slopes, with a 15% grade on E Hamlin St and a 12% grade on E Roanoke St.

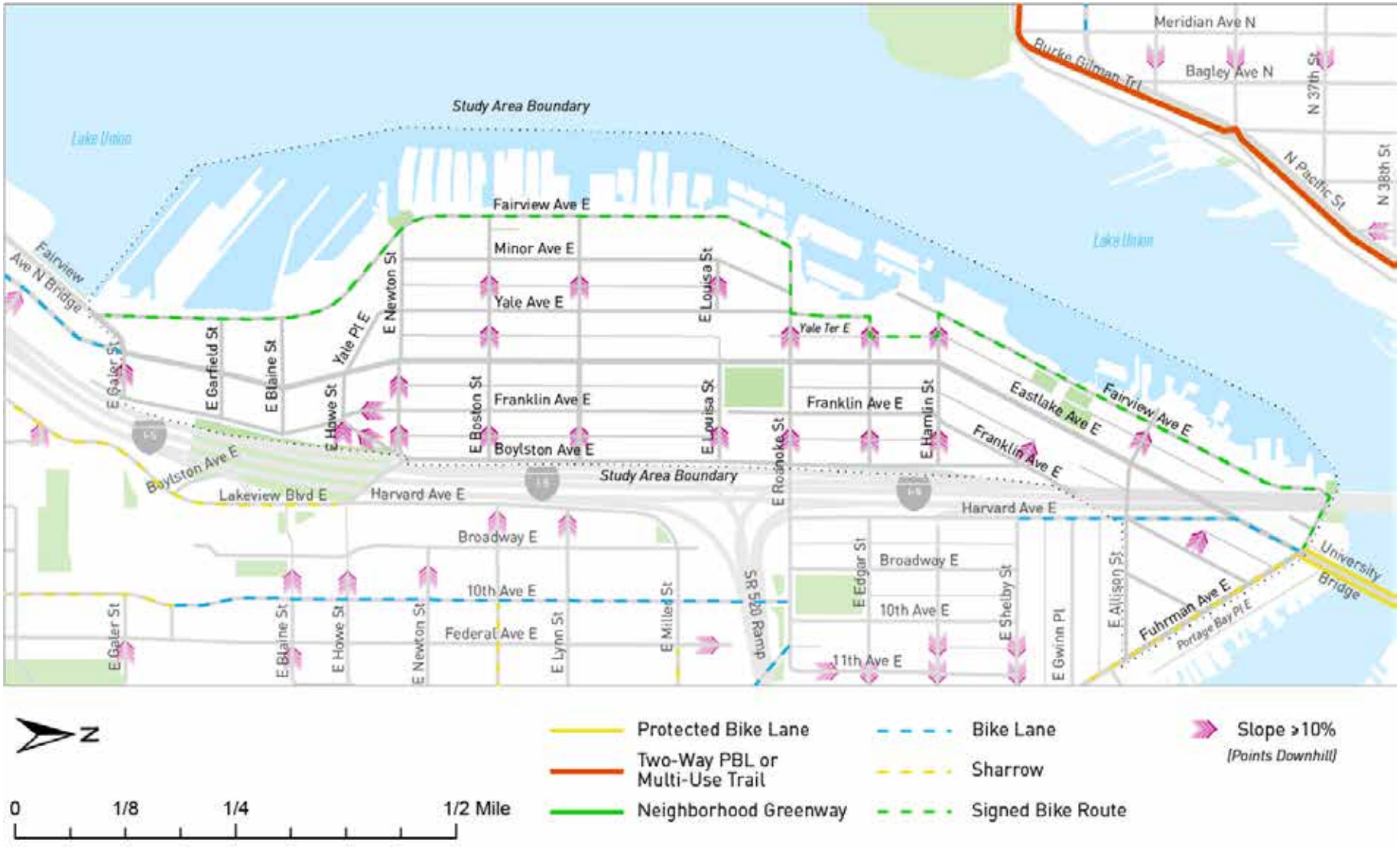

Figure 4-12. Existing Bicycle Facilities in Study Area

4.2.3 Bicycle Volumes

Eastlake Ave E currently serves as a major bicycle route in Seattle with a high number of bicyclists despite a lack of bicycle facilities in the Eastlake neighborhood. A set of citywide bicycle counts conducted at over 100 locations in Seattle in 2016 showed that the University Bridge had a volume of approximately 1,720 riders per day (SDOT, 2017c). This was the second-highest average daily bicycle volume in the city following the Fremont Bridge (see Figure 4-13). Additional bicycle counts collected in 2018 (Attachment A) showed that over 2,200 riders crossed the University Bridge in a single day and many of these cyclists continued through the Eastlake neighborhood (see Attachment A, Table A1).

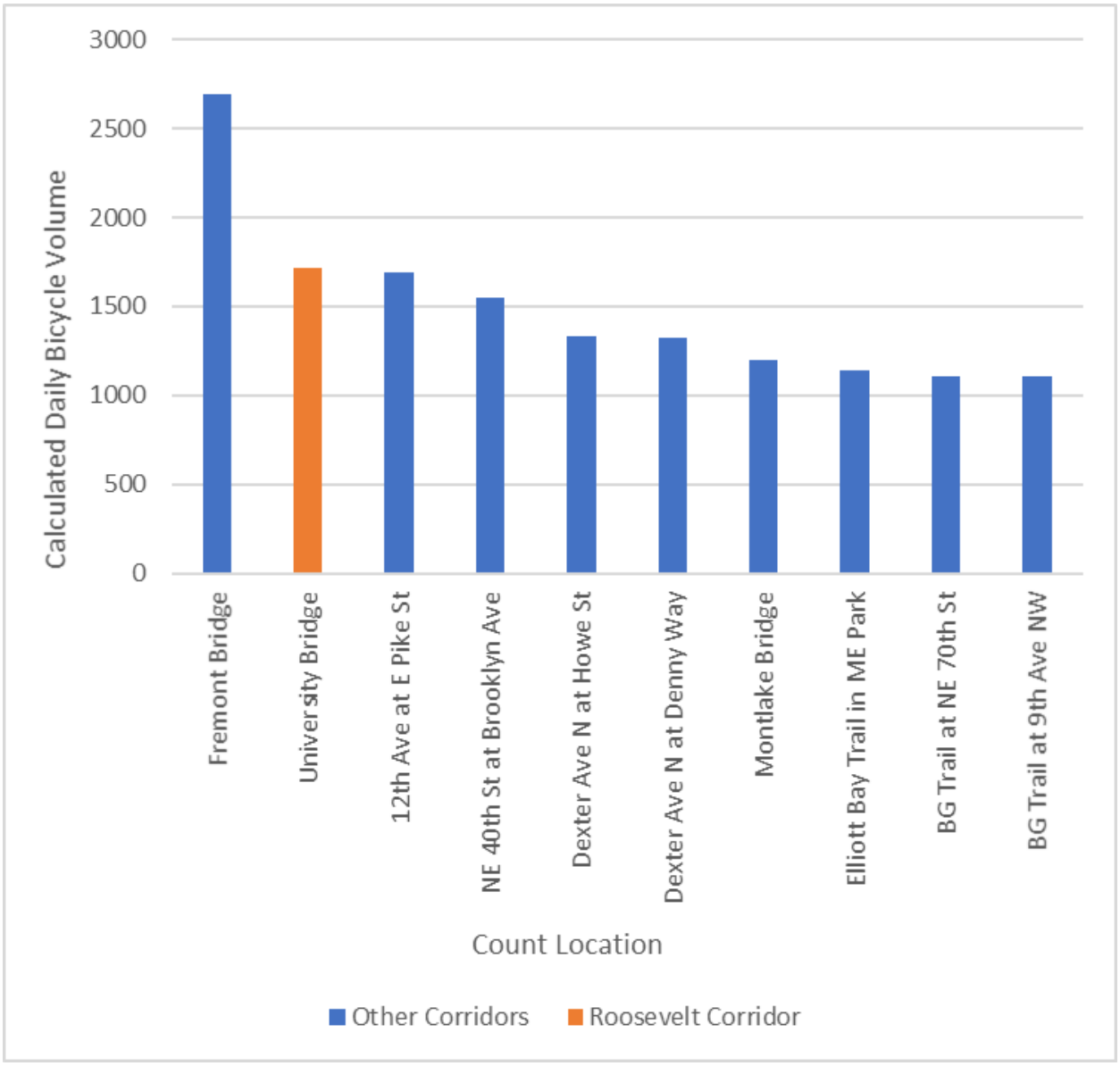

Figure 4-13. The 10 Highest-Volume Bicycle Locations in Seattle, 2016

Source: Adapted from SDOT, 2017c

BG = Burke Gilman
ME = Myrtle Edwards

To better understand bicycle movements and the distribution of bicycle volumes in the study area, single-day bicycle counts were conducted at four intersections in the Eastlake neighborhood on May 23, 2018 during daylight hours. These counts are included in Attachment A with additional information on count methodology. The four intersections were:

- Eastlake Ave E and Fuhrman Ave E
- Eastlake Ave E and E Lynn St
- Fairview Ave E and E Lynn St (also Cheshiahud Lake Union Loop)
- Fairview Ave and Eastlake Ave E (this intersection also includes Fairview Ave E and E Galer St legs)

Bicycle volumes are shown for the four count locations on Figure 4-14. Bicycle volumes were highest at the Eastlake Ave E/Fuhrman Ave E count location at the north end of the study area, with 2,229 cyclists observed over the count period. Some of these cyclists do not continue through the rest of the study area, instead continuing up Harvard Ave E toward the Capitol Hill area.

The intersection of Fairview Ave/Eastlake Ave E at the southern end of the study area is at a narrow point between Lake Union and I-5. All bicycles traveling north-south through the Eastlake neighborhood must pass through this complex intersection, and thus the observed bicycle volume at this location provides a good estimate of the total number of cyclists traveling through the study area on all routes. A total of 1,462 cyclists were observed at this location over the 14-hour count duration, approximately two-thirds the number observed at the Eastlake Ave E/Fuhrman Ave E intersection.

Two count locations were included along E Lynn St near the center of the study area, one at Eastlake Ave E and the other at Fairview Ave E. At the Eastlake Ave E/E Lynn St intersection, 855 cyclists were observed over the count period. At the Fairview Ave E/E Lynn St intersection, which is along the Cheshiahud Lake Union Loop (a signed bicycle route), 255 cyclists were counted. This is less than a third of the number of cyclists counted at the Eastlake Ave E/E Lynn St intersection.

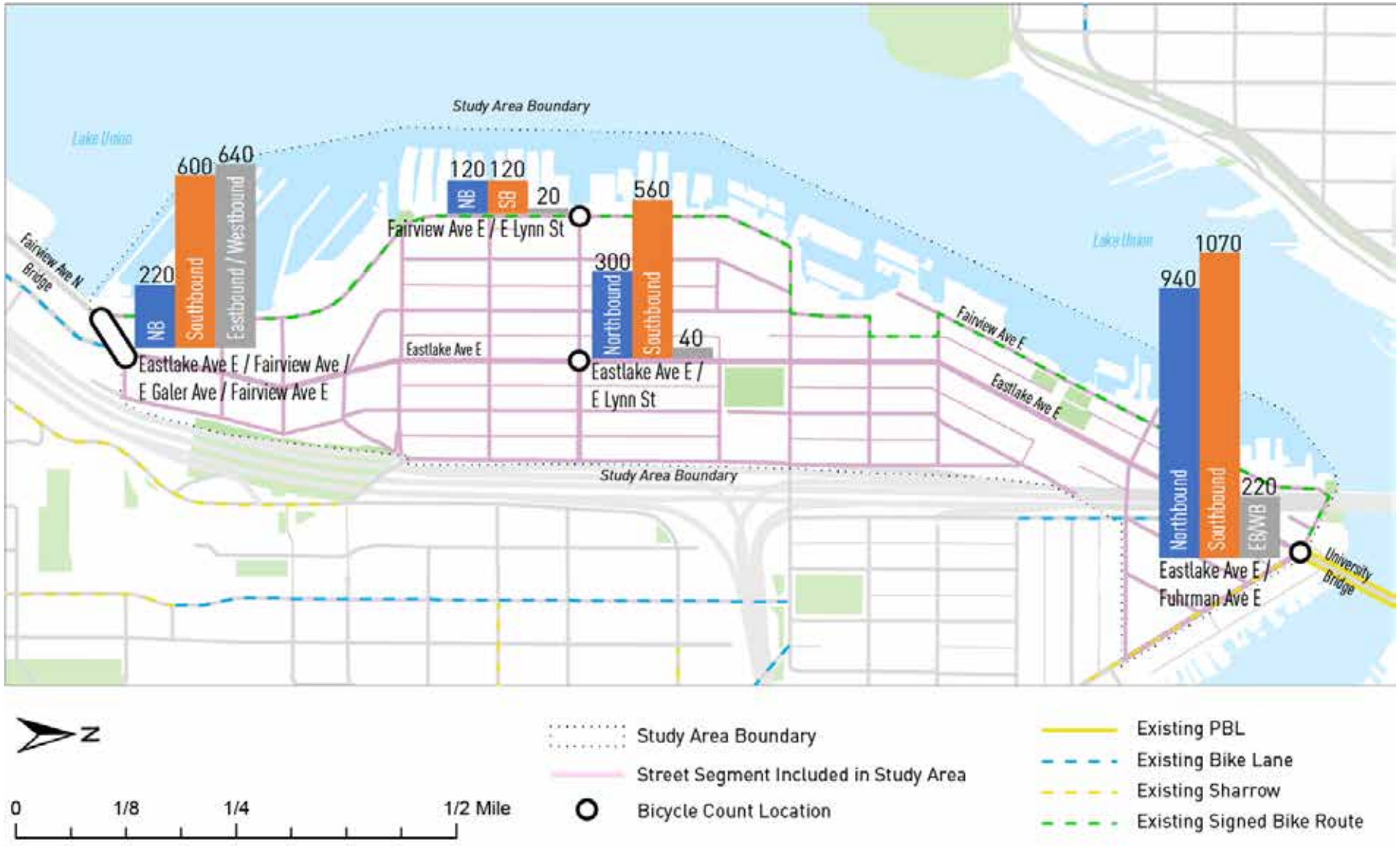

Figure 4-14. Daylight Bicycle Volumes at Eastlake Neighborhood Count Locations (14-Hour Duration)

The Eastlake Ave E/E Lynn St intersection provides the best picture of bicycle volumes on Eastlake Ave E in the study area. At this location, 855 bicyclists were observed traveling on Eastlake Ave E over the 14-hour count duration. Peak-hour volumes were approximately 130 cyclists per hour in both the AM and PM peaks. Most observed cyclists were traveling SB in the morning and NB in the evening, consistent with typical commuting patterns. Hourly counts at Eastlake Ave E/E Lynn St are shown on Figure 4-15.

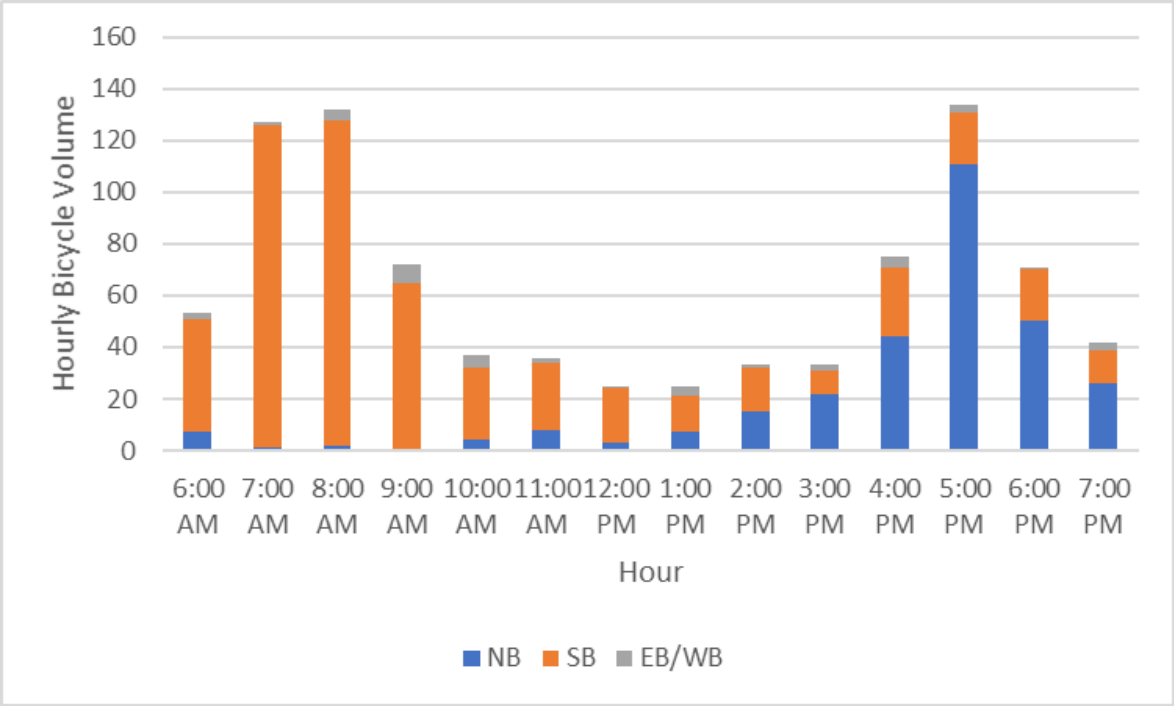

Figure 4-15. Hourly Bicycle Volumes at Eastlake Ave E and E Lynn St Intersection, May 23, 2018

4.2.4 Bicycle Safety

From 2012 through 2017, 40 collisions involving bicycles occurred in the Eastlake neighborhood. Of those, 39 collisions occurred at locations along Eastlake Ave E, while one collision occurred off of Eastlake Ave E at the intersection of Fairview Ave E and E Garfield St (Table 4-1). Most collisions resulted in injury (95%), including three serious injury collisions (8%). No bicycle-involved fatal collisions occurred in this area during the time period analyzed. Most collisions in this area were front end angle collisions between cars and bicyclists, with a smaller number of instances where cars struck bicycles in rear end or sideswipe collisions, primarily at midblock locations.

The north end of Eastlake Ave E, including the intersection with Fuhrman Ave E and the midblock segment between Fuhrman Ave E and Harvard Ave E, had the highest rate of collisions involving bicycles with a total of 13 collisions between 2012 and 2017. This high collision rate is reflective of high bicycle volumes near the University Bridge. No other location along Eastlake Ave E saw more than four collisions during the time period reviewed, but the number of bicycle collisions along this road is relatively high compared to other streets in the city. Including all collisions listed in Table 4-1, the average rate of collisions involving bicycles in the Eastlake neighborhood is 6.7 per year. The portion of Eastlake Ave E that lacks any bicycle facilities (south of Harvard Ave E and north of Fairview Ave N) has an average rate of collisions involving bicycles of 4.3 per year.

The high rate of collisions between bicycles and cars in the Eastlake neighborhood, primarily along Eastlake Ave E, indicates a need for improved bicycle facilities in this area. The RapidRide Roosevelt project's purpose and need statement identifies a need for improved bicycle safety along the project corridor (including Eastlake Ave E) to address this issue.

Table 4-1. Collisions Involving Bicycles in the Eastlake Study Area (2012-2017)

LOCATION	LOCATION TYPE	PROPERTY DAMAGE	INJURY	SERIOUS INJURY	TOTAL
COLLISIONS ON EASTLAKE AVE E					
Eastlake Ave E and Fuhrman Ave E	Signal Intersection	1	5	2	**8**
Eastlake Ave E Between Harvard Ave E and Fuhrman Ave E	Midblock		5		**5**
Eastlake Ave E Between E Hamlin St and E Shelby St	Midblock		2		**2**
Eastlake Ave E and E Hamlin St	Signal Intersection	1	2		**3**
Eastlake Ave E Between E Edgar St and E Hamlin St	Midblock		1		**1**
Eastlake Ave E and E Edgar St	Non-Signal Intersection		3		**3**
Eastlake Ave E Between E Roanoke St and E Edgar St	Midblock		3	1	**4**
Eastlake Ave E and E Roanoke St	Signal Intersection		1		**1**
Eastlake Ave E Between E Lynn St and E Louisa St	Midblock		3		**3**
Eastlake Ave E Between E Howe St and E Newton St	Midblock		2		**2**
Eastlake Ave E Between E Blaine St and E Howe St	Midblock		2		**2**
Eastlake Ave E and E Blaine St	Non-Signal Intersection		3		**3**
Eastlake Ave E and E Garfield St	Signal Intersection		1		**1**
Eastlake Ave E Between Fairview Ave N and E Garfield St	Midblock		1		**1**
Total Collisions on Eastlake Ave E	**All**	**2**	**34**	**3**	**39**
COLLISIONS ON OTHER STREETS IN STUDY AREA					
Fairview Ave E and E Garfield St	Non-Signal Intersection		1		**1**
Total Collisions on Other Streets	**All**	**0**	**1**	**0**	**1**
GRAND TOTAL (ALL LOCATIONS)	***ALL***	***2***	***35***	***3***	***40***

Source: SDOT, 2018b
Note: Data cover January 2012 through December 2017.

5. BICYCLE FACILITY OPTIONS DEVELOPMENT

The Roosevelt to Downtown HCT Study (SDOT, 2017a) recommended two-way PBLs on Eastlake Ave E as part of the preferred bicycle facilities for the RapidRide Roosevelt project. These PBLs were incorporated into the LPA approved by City Council in 2017. This current evaluation effort considers the recommendations included in the LPA along with a broader range of bicycle facility options for the Eastlake neighborhood, including off-corridor options.

Additional options were developed by the project team considering all north-south streets through the study area to identify possible off-corridor connections. In developing additional options the following attributes were considered:

- Bicycle facility options must provide a continuous connection between the University Bridge and Fairview Ave N bridge bicycle facilities.
- Bicycle facility options should also attempt to connect to the existing bicycle lanes on Eastlake Ave E south of Fairview Ave.
- Bicycle facility options should be composed of the AAA bicycle facility types outlined in the BMP, which include:
  - PBLs
  - Off-street/multi-use trails
  - Neighborhood greenways
- Bicycle facility options should attempt to balance the needs of other modes, including maintaining on-street parking where possible.

Eight bicycle facility options were developed for this study. A no-build option with existing bicycle facilities and the future PBL on the Fairview Ave N bridge was also included in the analysis. The nine options are summarized in Table 5-1 and illustrated in Figures 5-1 to 5-18.

The bicycle facility options included in this evaluation cover all north-south streets in the study area except for Boylston Ave E, an arterial road located just west of I-5. No options were developed using Boylston Ave E because Boylston Ave E:

- Is narrow for a busy arterial at 29 feet from curb to curb. Adequate space is not available to provide bicycle facilities on this street.
- Includes freeway on- and off-ramps, which are not compatible with the design of AAA bicycle facilities.
- Is at the highest elevation of all roads in the study area; bicyclists would have to climb long steep hills to reach it from either the University Bridge or the Fairview Ave N bridge.

Table 5-1. Eastlake Bicycle Facility Options

BICYCLE FACILITY OPTION	DESCRIPTION
Option 1: No Build	· This option includes the bicycle facilities in the study area identified in the existing conditions section and the PBL on the Fairview Ave N bridge. · No parking removal would be required. · Cyclists in the study area would likely continue to use their existing routes.
Option 2: Protected Bicycle Lanes on Eastlake Ave E	· This option adds PBLs on each side of Eastlake Ave E within the study area. · This option matches the LPA and one of the Seattle BMP's recommendations for bicycle facilities in the study area to complete the citywide bicycle network. · On-street parking would be removed from both sides of Eastlake Ave E between Harvard Ave E and E Blaine St.
Option 3: Two-Way Protected Bicycle Lanes on Eastlake Ave E	· This option adds a two-way PBL facility on the west side of Eastlake Ave E within the study area. · On-street parking would be removed from both sides of Eastlake Ave E between Harvard Ave E and E Blaine St.
Option 4: Northbound PBL on Eastlake Ave E and Southbound Greenway on Yale Ave E	· This option adds a NB PBL on Eastlake Ave E and a SB greenway on Yale Ave E between E Roanoke St and E Howe St. · This option adds PBLs on both sides of Eastlake Ave E north of E Roanoke St and south of E Howe St. · On-street parking would be removed from both sides of Eastlake Ave E from Harvard Ave E to E Roanoke St and from E Howe St to E Blaine St. · On-street parking would be removed from the east side of Eastlake Ave E from E Roanoke St to E Howe St.
Option 5: Northbound PBL on Eastlake Ave E and Southbound PBL on Yale Ave E	· This option adds a NB PBL on Eastlake Ave E and a SB PBL on Yale Ave E between E Roanoke St and E Howe St. · This option adds PBLs on both sides of Eastlake Ave E north of E Roanoke St and south of E Howe St. · On-street parking would be removed from both sides of Eastlake Ave E from Harvard Ave E to E Roanoke St and from E Howe St to E Blaine St. · On-street parking would be removed from the west side of Yale Ave E/Yale Place E and the east side of Eastlake Ave E from E Roanoke St to E Howe St.

Table 5-1. Eastlake Bicycle Facility Options

BICYCLE FACILITY OPTION	DESCRIPTION
Option 6: Multi-Use Trail on Fairview Ave E	· This option adds a multi-use trail on the west side of Fairview Ave E throughout the study area. · This option includes a multi-use trail in new right-of-way along the Lake Union shoreline between E Hamlin St and E Roanoke St (this would require new right-of-way). · This option does not add bicycle facility improvements on Eastlake Ave E. · On-street parking would be changed reconfigured or removed on both sides of Fairview Ave E from Fuhrman Ave E to Fairview Ave.
Option 7: Greenway on Fairview Ave E (following the Cheshiahud Lake Union Loop)	· This option adds typical greenway treatments to the existing Cheshiahud Lake Union Loop, which primarily uses Fairview Ave N. · This option matches one of the Seattle BMP's recommendations for bicycle facilities in the study area to complete the citywide bicycle network. · This option does not add bicycle facility improvements on Eastlake Ave E.
Option 8: Greenway on Minor Ave E and Fairview Ave E	· This option adds typical greenway treatments to Fairview Ave E and Minor Ave E within the study area. · This option would follow the existing Cheshiahud Lake Union Loop signed bike route (primarily on Fairview Ave E) north of E Roanoke St and south of E Newton St, using Minor Ave E in between. · This option does not add any bicycle facility improvements on Eastlake Ave E.
Option 9: Greenway on Franklin Ave E	· This option adds PBLs on each side of Eastlake Ave E between Fuhrman Ave E (the University Bridge) and E Hamlin St, and from E Garfield St to Fairview Ave N. · This option adds typical greenway treatments to Franklin Ave E between E Hamlin St and E Garfield St. · This option does not add bicycle facility improvements on Eastlake Ave E between E Hamlin St and E Garfield St.

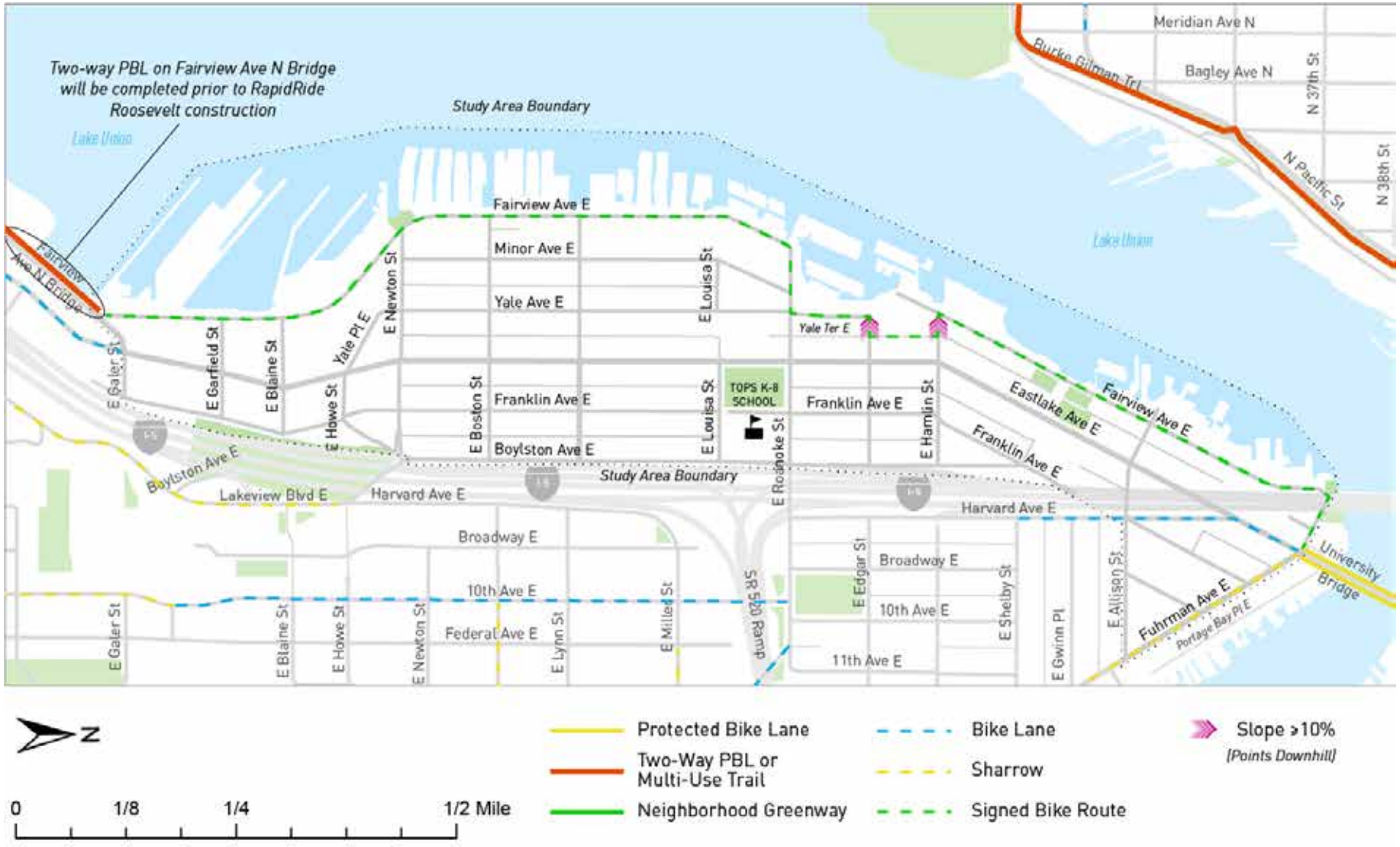

Figure 5-1. Option 1: No Build Option

Option 1 would provide no bike facilities in Eastlake beyond the Cheshiahud Lake Union Loop signed route. Commuter cyclists would continue to use their existing routes. The Fairview Ave N bridge replacement would still provide a two-way PBL south of the study area.

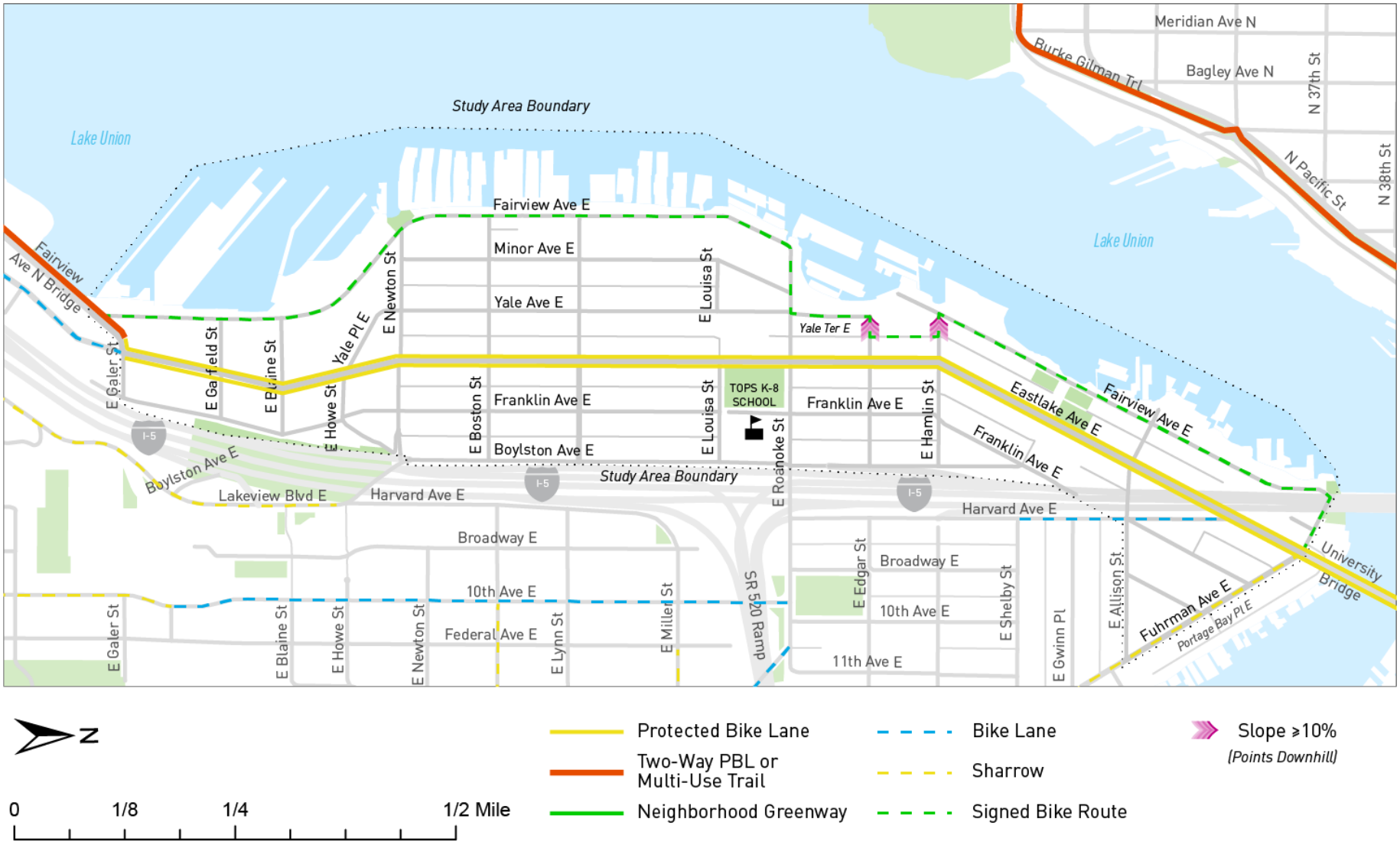

Figure 5-2. Option 2: Protected Bicycle Lanes on Eastlake Ave E

Option 2 would add PBLs on each side of Eastlake Ave E within the study area, connecting to the existing University Bridge bike lanes in the north and the Fairview Ave N bridge two-way PBL to the south. This option matches one of the BMP's recommendations within the study area for completing the citywide bicycle network.

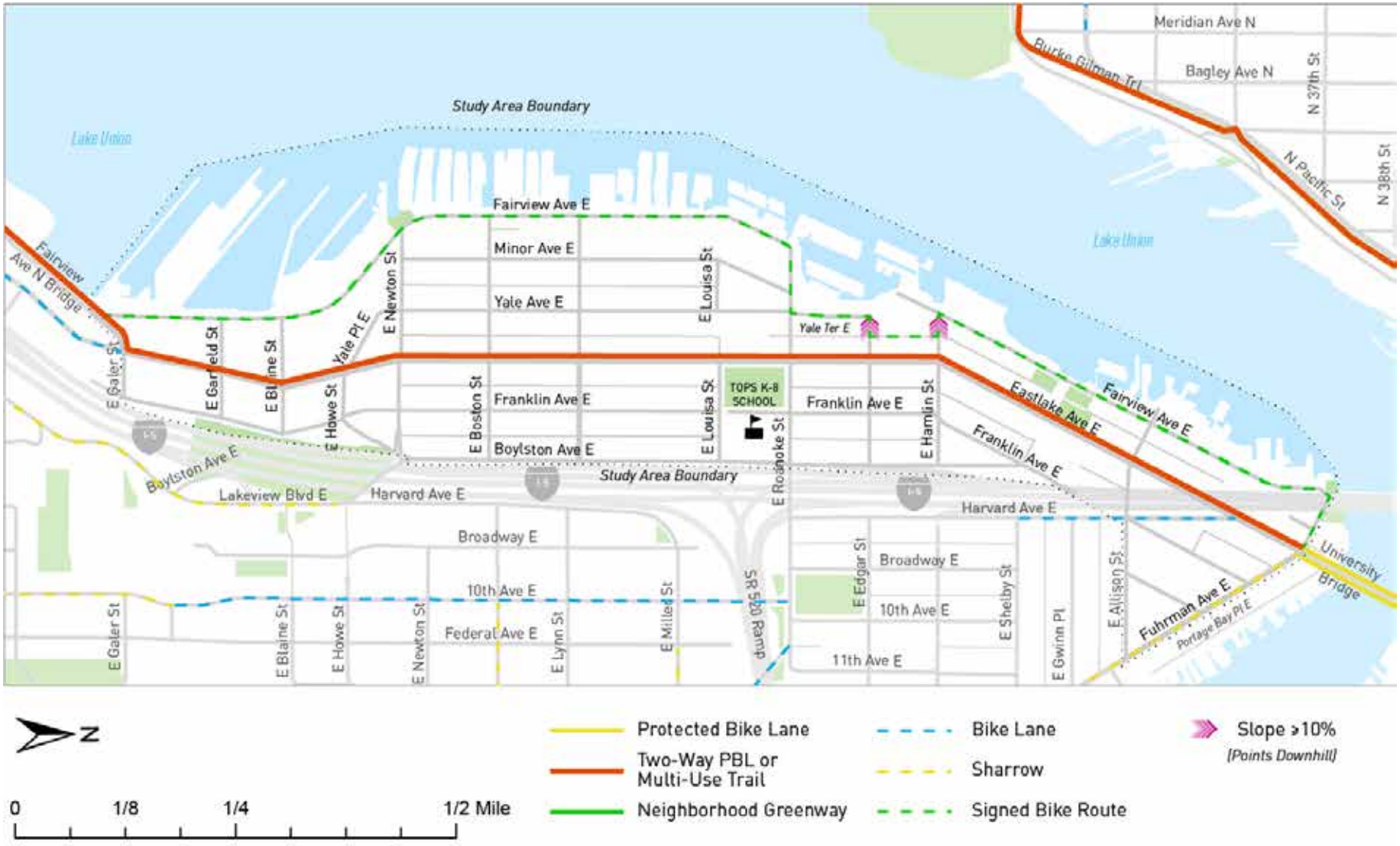

Figure 5-3. Option 3: Two-Way Protected Bicycle Lanes on Eastlake Ave E

Option 3 would add a two-way PBL on the west side of Eastlake Ave E within the study area, connecting to the existing University Bridge bike lanes in the north and the Fairview Ave N bridge two-way PBL to the south.

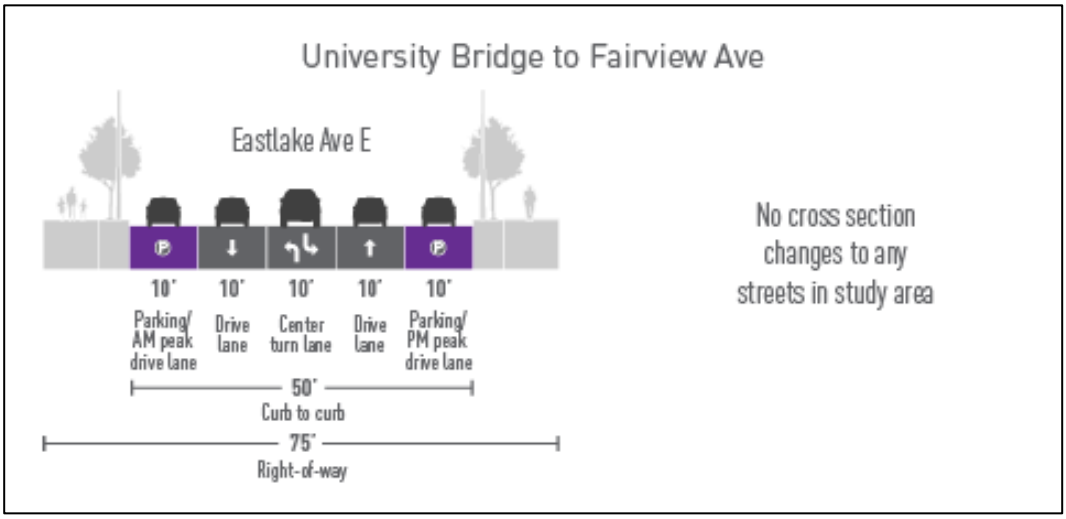

Figure 5-4. Option 1: No Build Option Representative Cross Section

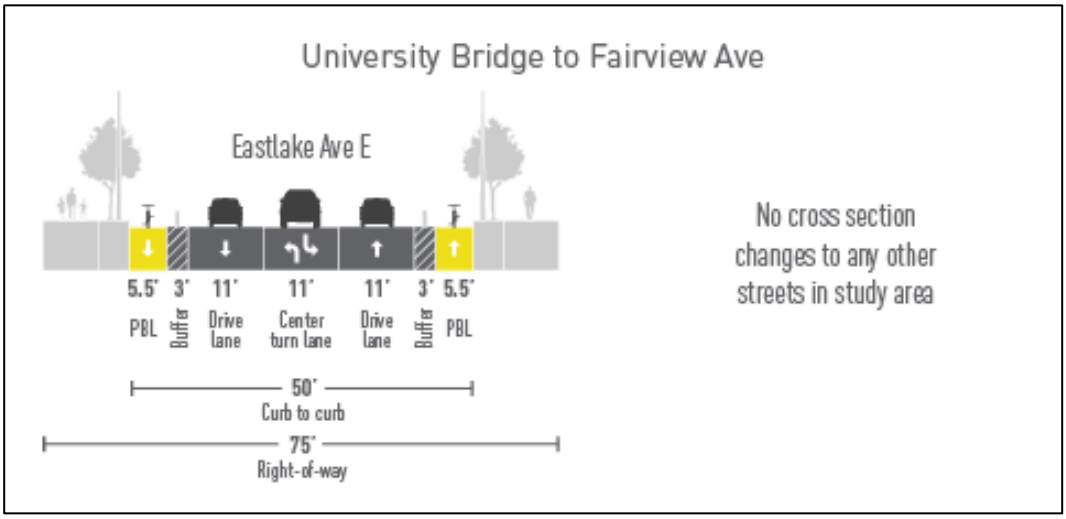

Figure 5-5. Option 2: Protected Bicycle Lanes on Eastlake Ave E Representative Cross Section

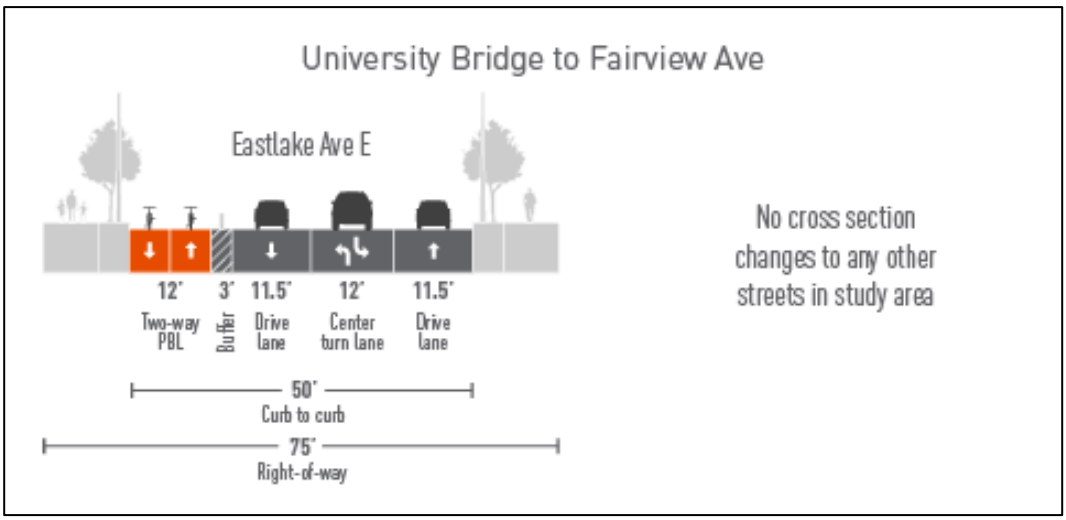

Figure 5-6. Option 3: Two-Way Protected Bicycle Lane on Eastlake Ave E Representative Cross Section

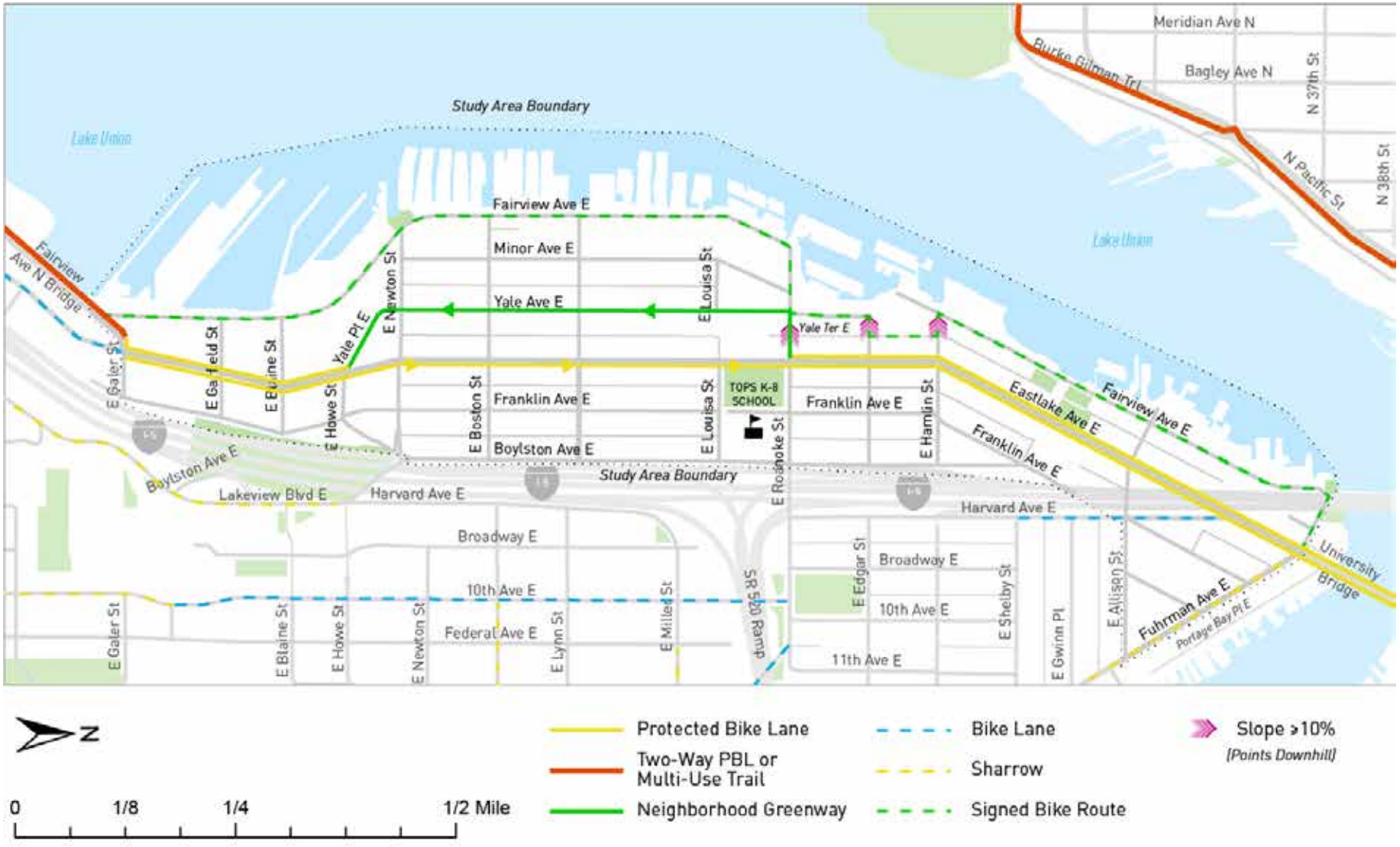

Figure 5-7. Option 4: Northbound Protected Bicycle Lane on Eastlake Ave E and Southbound Greenway on Yale Ave E

Option 4 would add a NB PBL on Eastlake Ave E and a corresponding SB greenway on Yale Ave E between E Roanoke St and E Howe St. PBLs would be provided on both sides of Eastlake Ave E north of E Roanoke St and south of E Howe St.

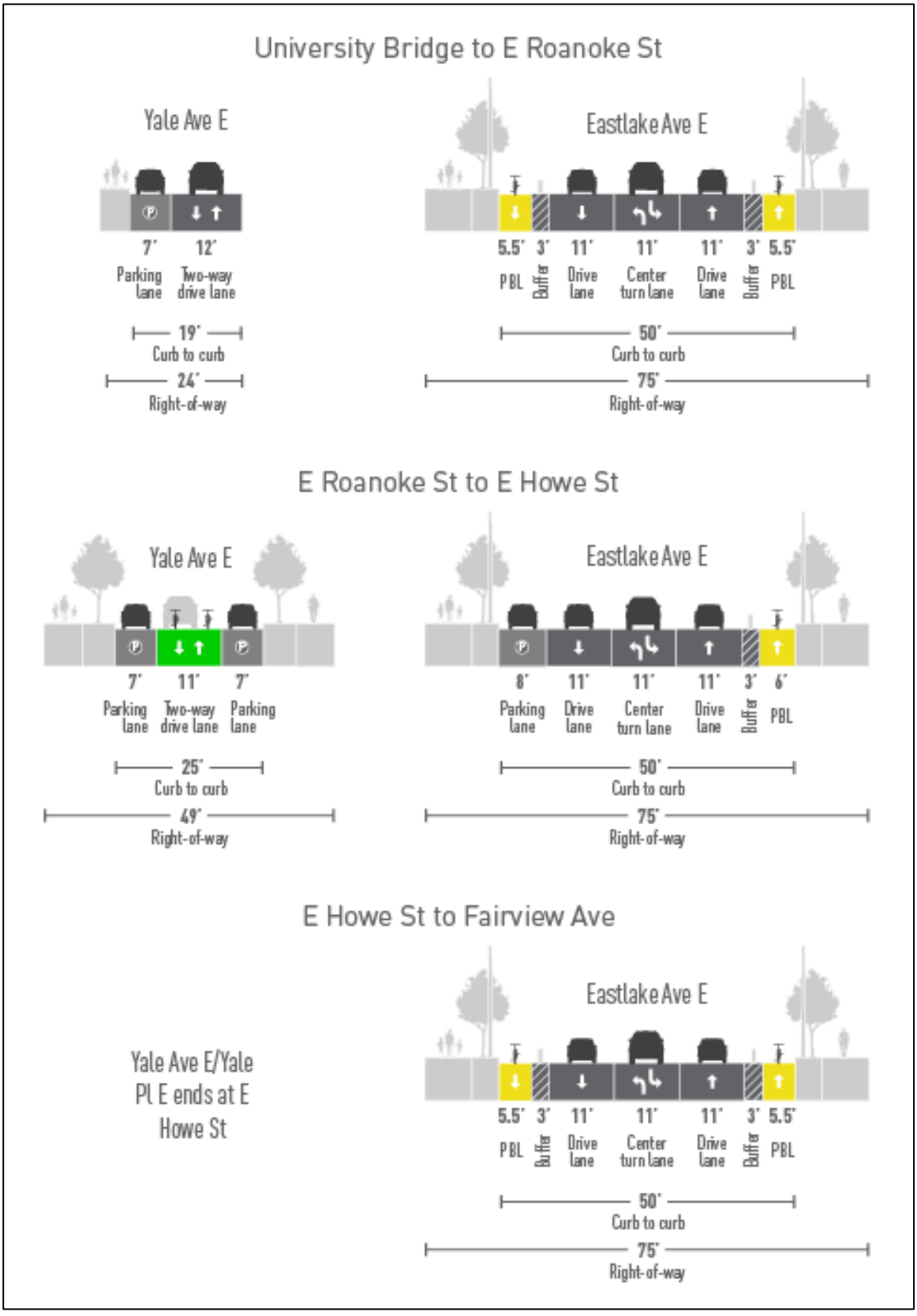

Figure 5-8. Option 4: Northbound Protected Bicycle Lane on Eastlake Ave E and Southbound Greenway on Yale Ave E Representative Cross Sections

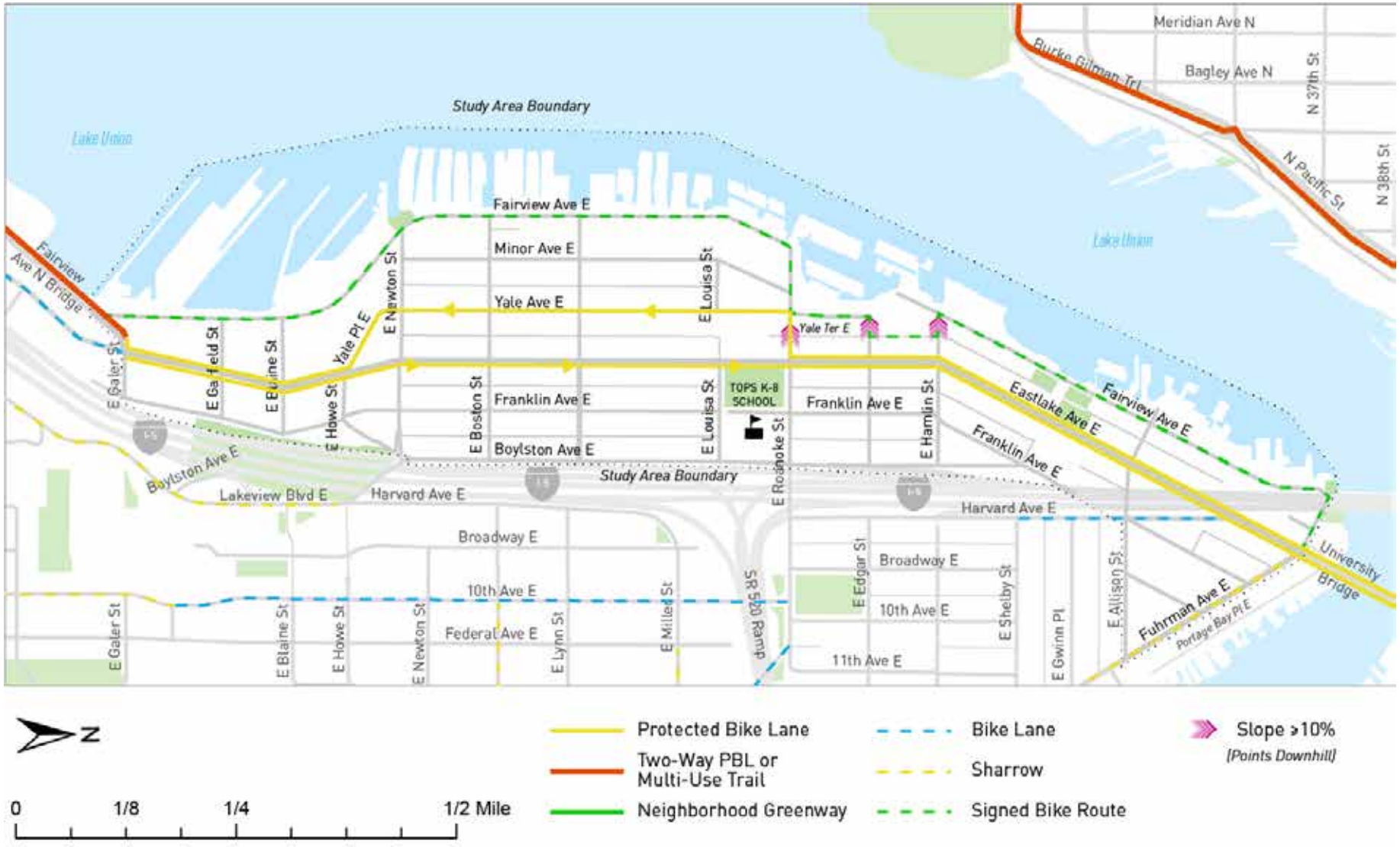

Figure 5-9. Option 5: Northbound Protected Bicycle Lane on Eastlake Ave E and Southbound Protected Bicycle Lane on Yale Ave E

Option 5 would add a NB PBL on Eastlake Ave E and a corresponding SB PBL on Yale Ave E between E Roanoke St and E Howe St, with connections via PBLs on E Roanoke St and Yale Place E. PBLs would be provided on both sides of Eastlake Ave E north of E Roanoke St and south of E Howe St.

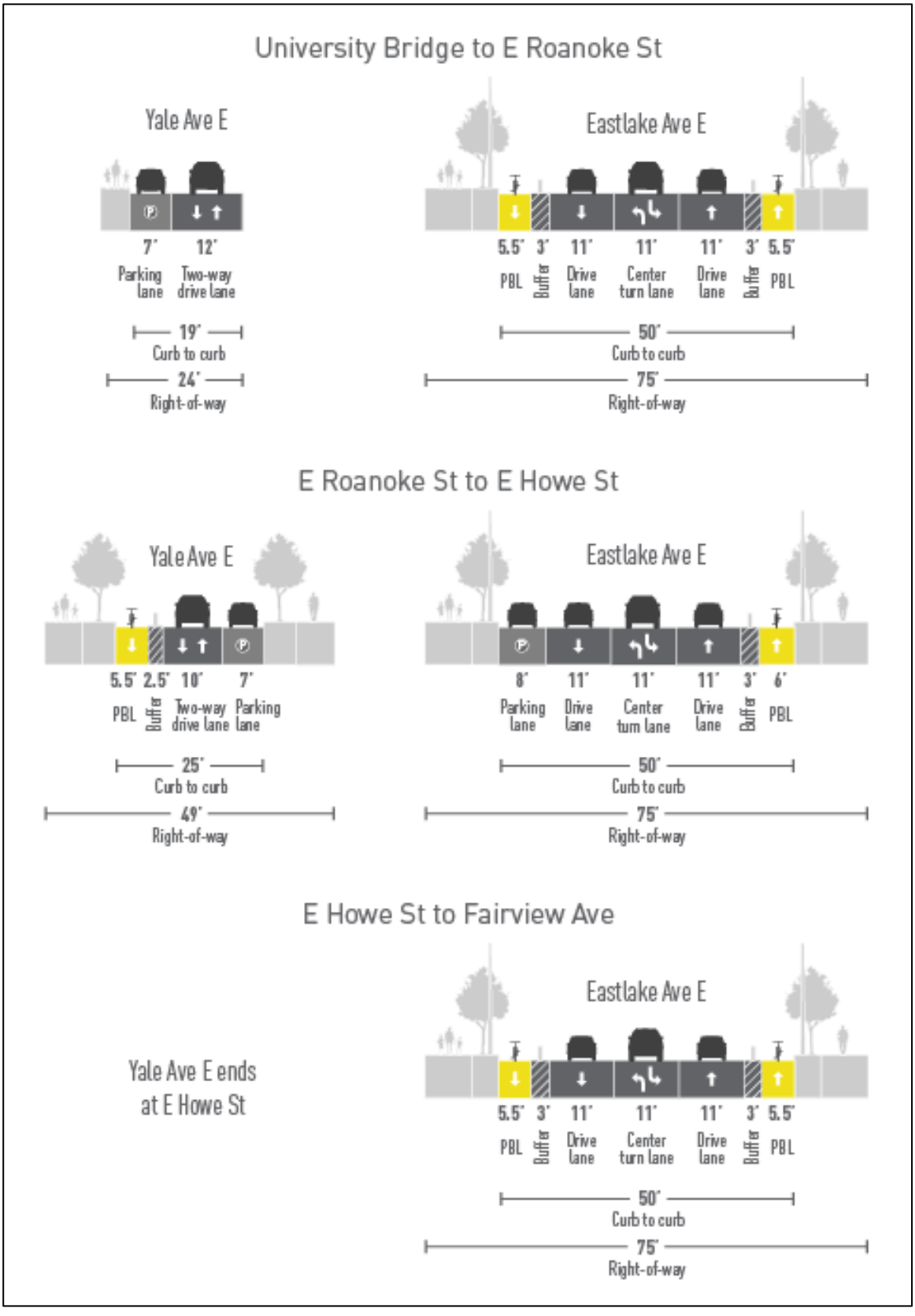

Figure 5-10. Option 5: Northbound Protected Bicycle Lane on Eastlake Ave E and Southbound Protected Bicycle Lane on Yale Ave E Representative Cross Sections

Figure 5-11. Option 6: Multi-Use Trail on Fairview Ave E

Option 6 would add a multi-use trail on the west side of Fairview Ave E throughout the study area. This option includes a multi-use trail in new right-of-way along the Lake Union shoreline between E Hamlin St and E Roanoke St to provide a flat and continuous bike route. This would require right-of-way acquisition along about 740 feet of the shoreline. This option would not add bicycle facility improvements on Eastlake Ave E between the University Bridge and the Fairview Ave N bridge.

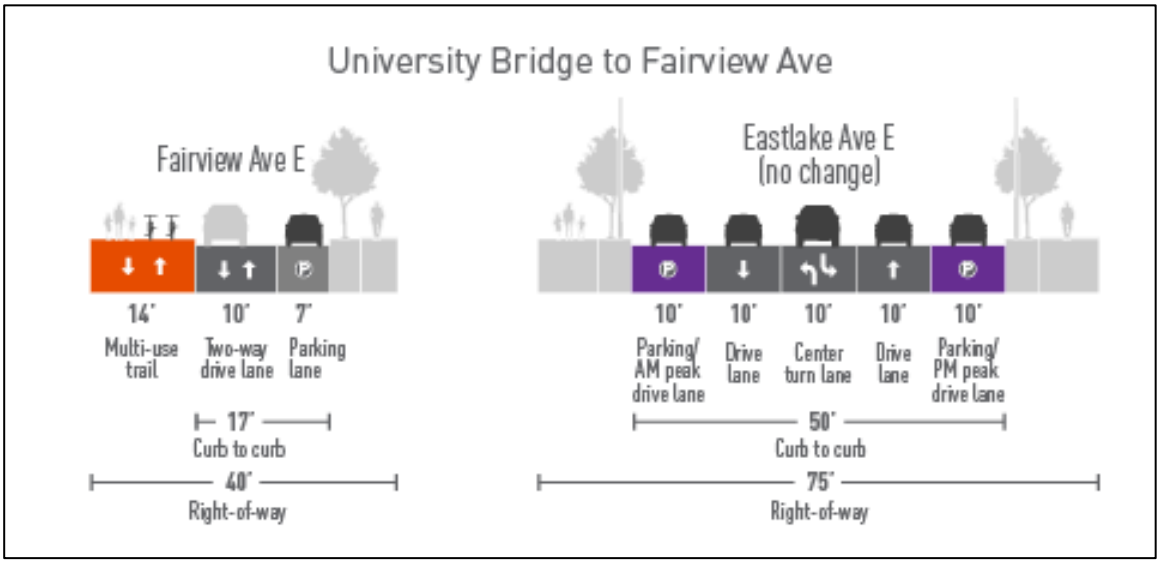

Figure 5-12. Option 6: Multi-Use Trail on Fairview Ave E Representative Cross Sections

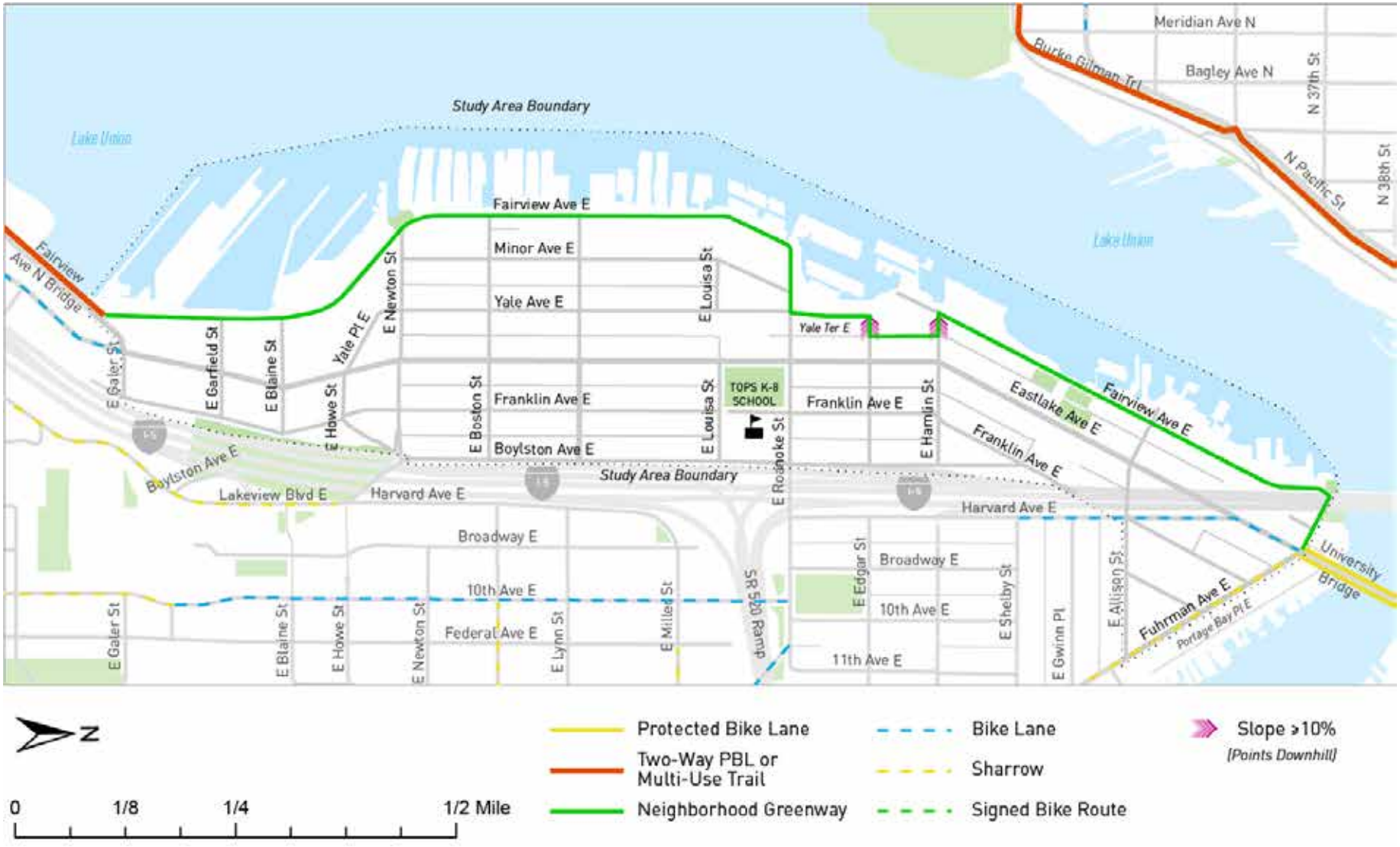

Figure 5-13. Option 7: Greenway on Fairview Ave E (following the Cheshiahud Lake Union Loop)

Option 7 would add typical greenway treatments to the existing Cheshiahud Lake Union Loop, a signed bike route that primarily uses Fairview Ave N. This option would not add any bicycle facility improvements on Eastlake Ave E between the University Bridge and the Fairview Ave N bridge This option matches one of the BMP's recommendations within the study area for completing the citywide bicycle network.

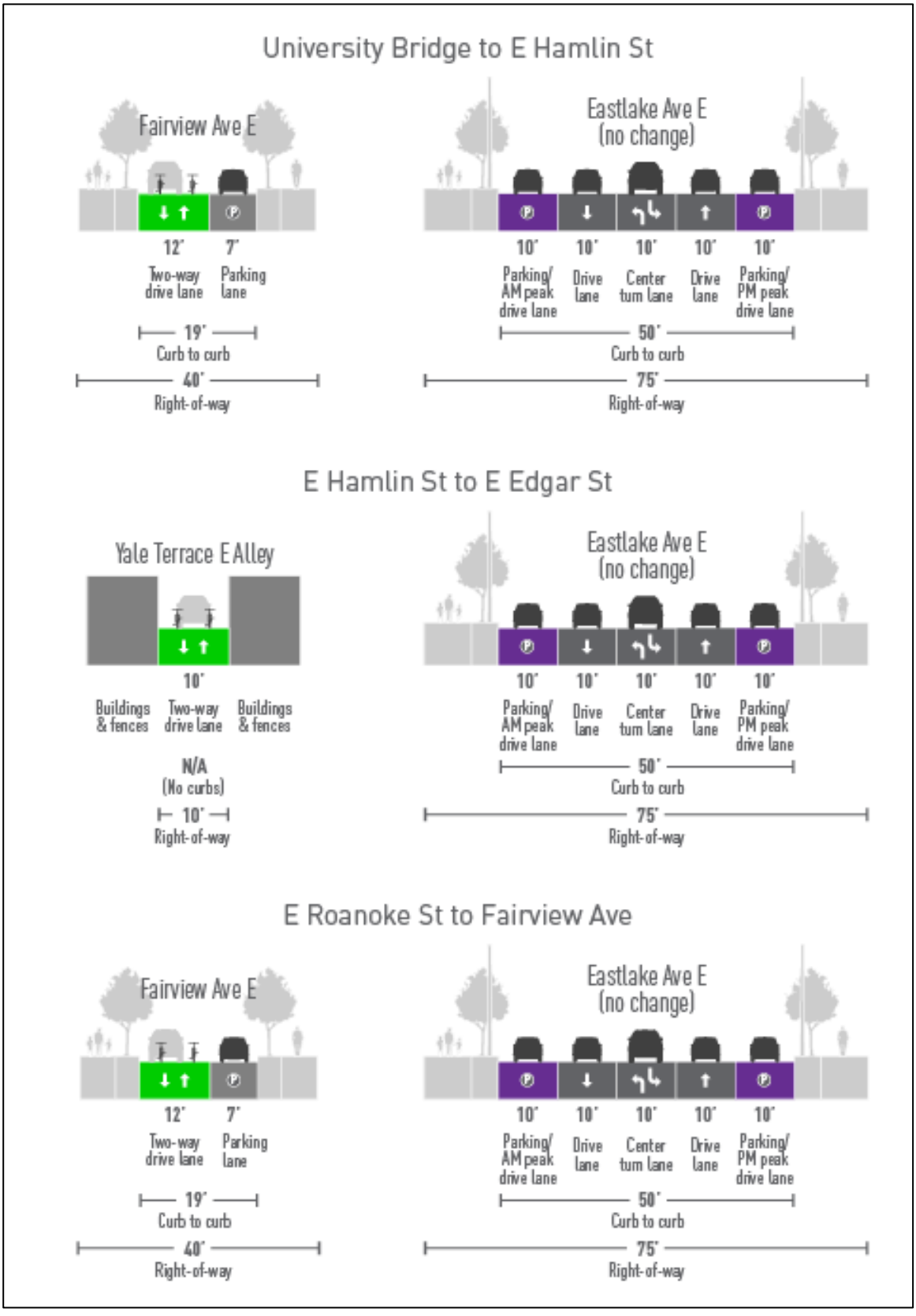

Figure 5-14. Option 7: Greenway on Fairview Ave E Representative Cross Sections

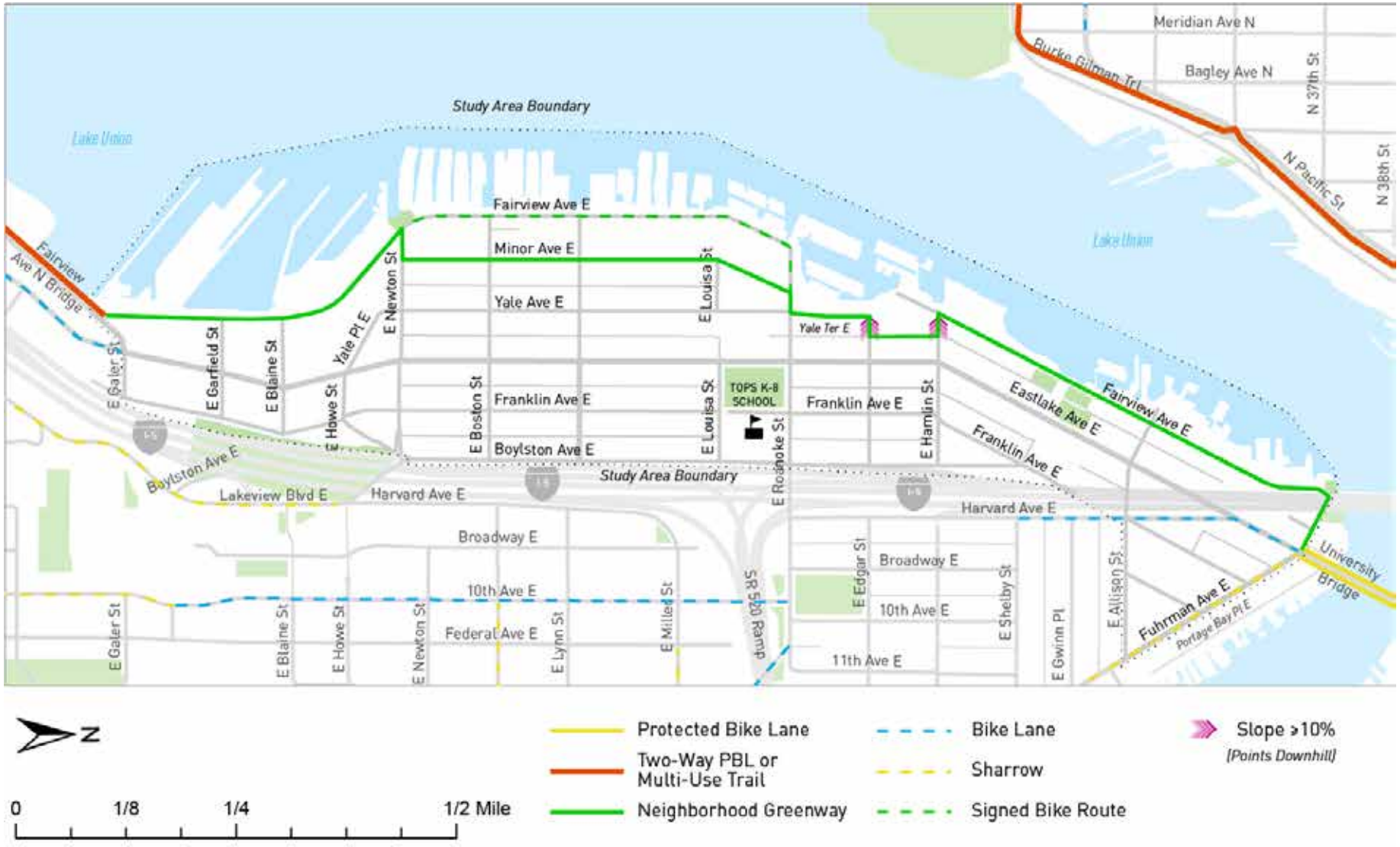

Figure 5-15. Option 8: Greenway on Minor Ave E and Fairview Ave E

Option 8 would add typical greenway treatments to Fairview Ave E and Minor Ave E within the study area. This option would follow the existing Cheshiahud Lake Union Loop signed bike route (primarily on Fairview Ave E) north of E Roanoke St and south of E Newton St, using Minor Ave E in between. This option would not add bicycle facility improvements on Eastlake Ave E between the University Bridge and the Fairview Ave N bridge.

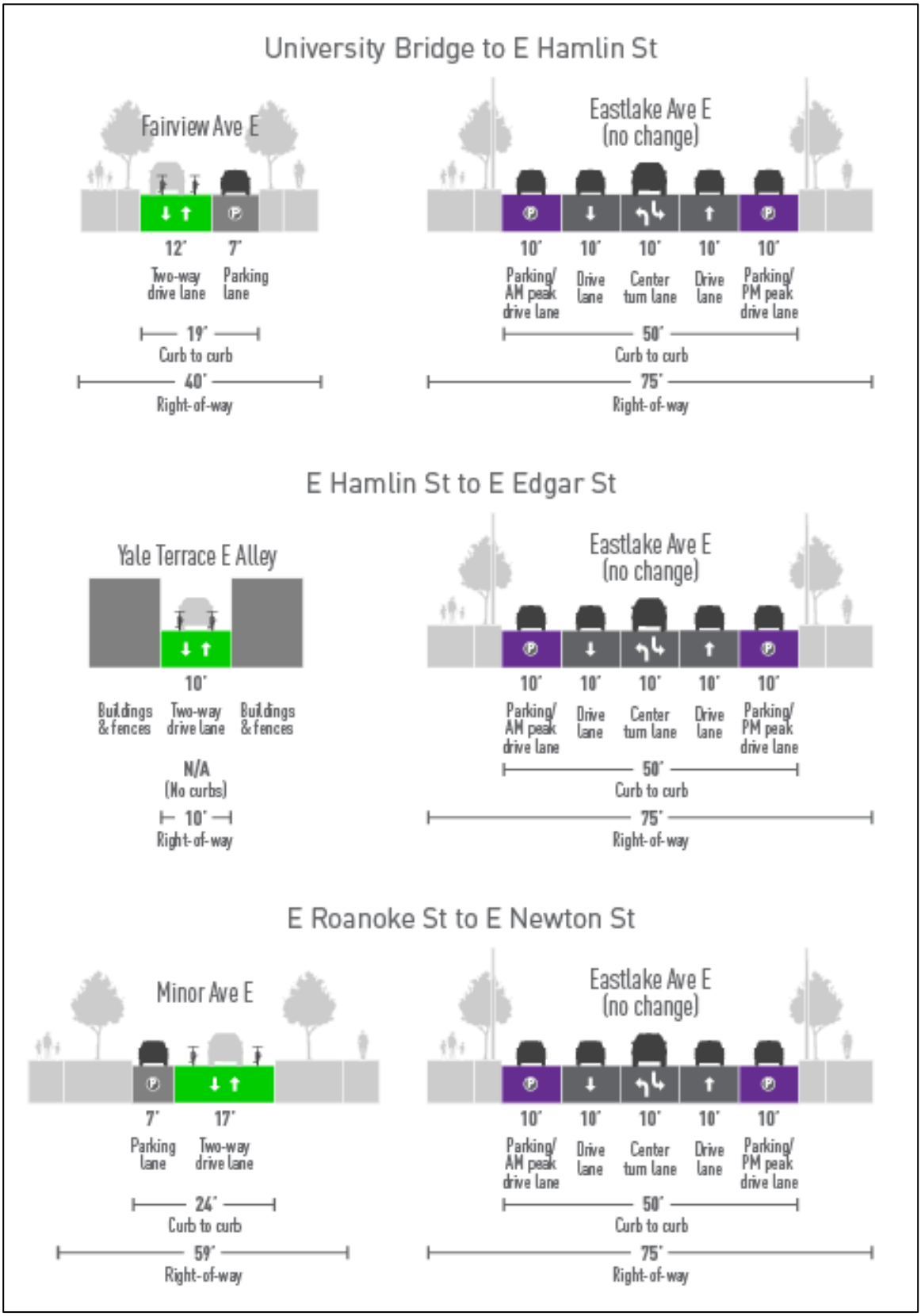

Figure 5-16. Option 8: Greenway on Minor Ave E and Fairview Ave E Representative Cross Sections

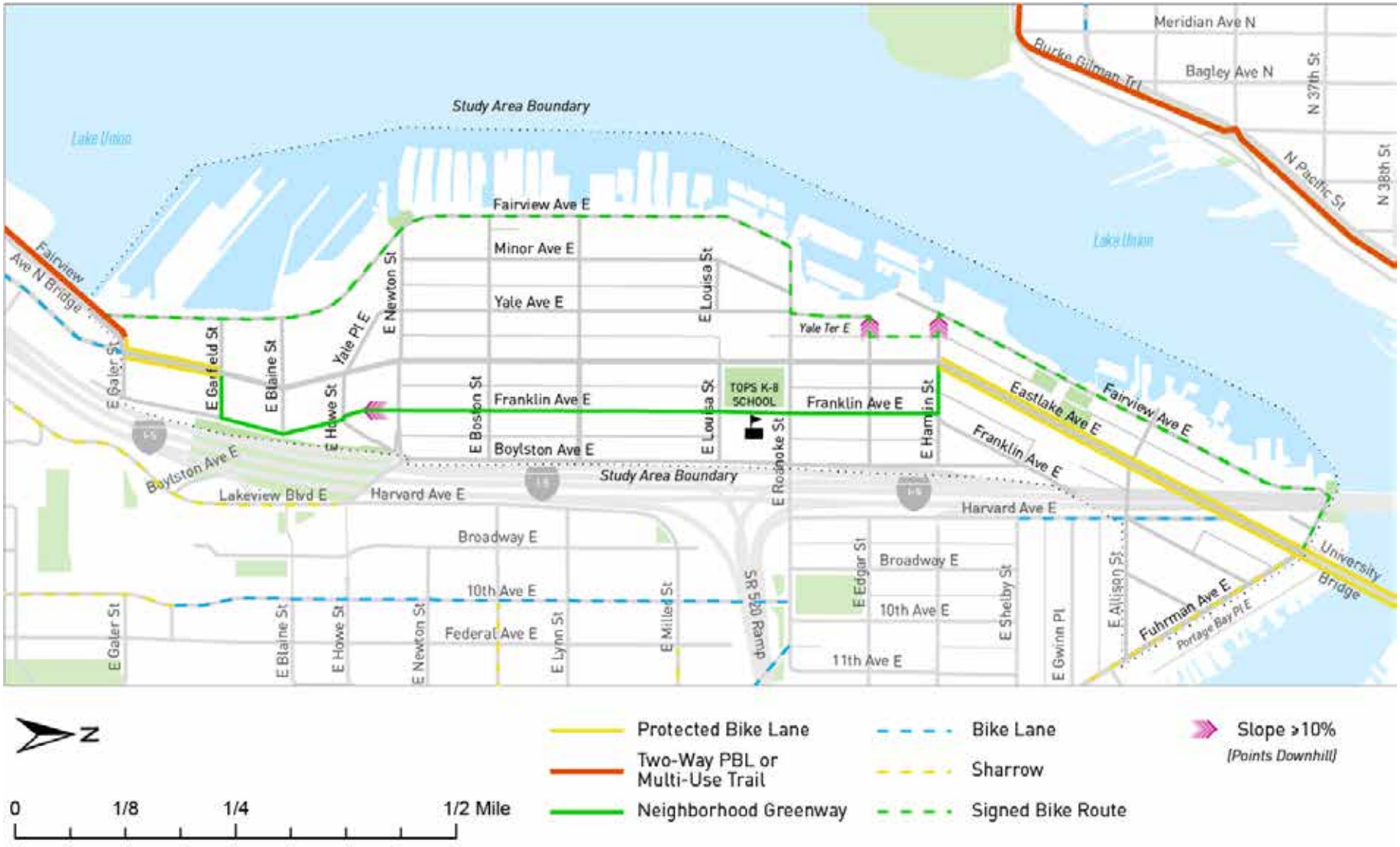

Figure 5-17. Option 9: Greenway on Franklin Ave E

Option 9 would add PBLs on each side of Eastlake Ave E between Fuhrman Ave E (the University Bridge) and E Hamlin St, and from E Garfield St to Fairview Ave N. Between E Hamlin St and E Garfield St, typical greenway treatments would be added to Franklin Ave E to make a continuous bike route.

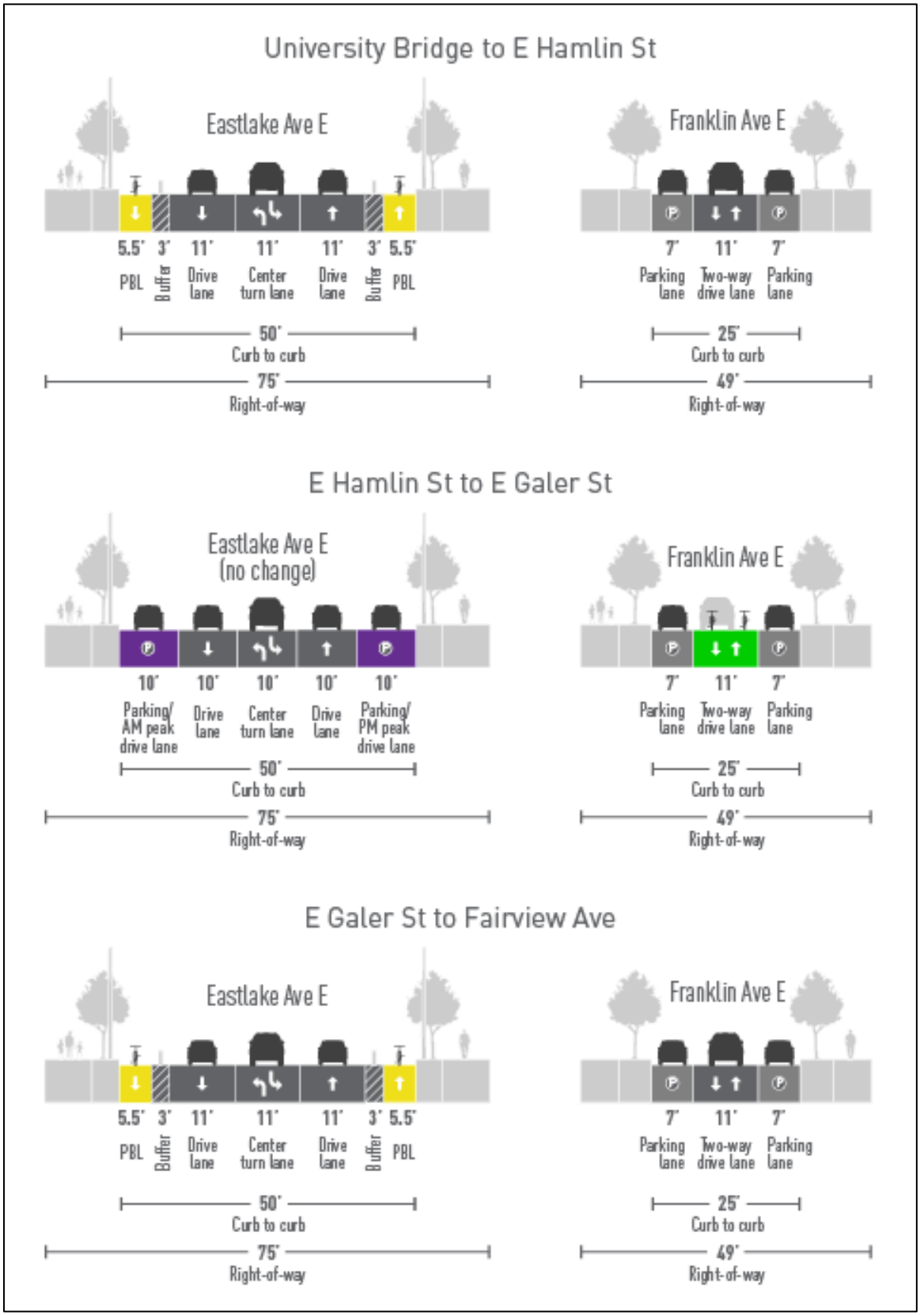

Figure 5-18. Option 9: Greenway on Franklin Ave E Representative Cross Sections

6. EVALUATION METHODOLOGY AND RESULTS

The nine bicycle facility options described in Section 5 were evaluated in two stages following the process shown in Figure 6-1. Options were initially evaluated with a pass/fail rating based on criteria pertaining to feasibility of implementation. Concepts that passed this initial screening were then assessed in greater detail to determine their performance on a broader set of criteria. The evaluation criteria and methods are described in Section 6.1.

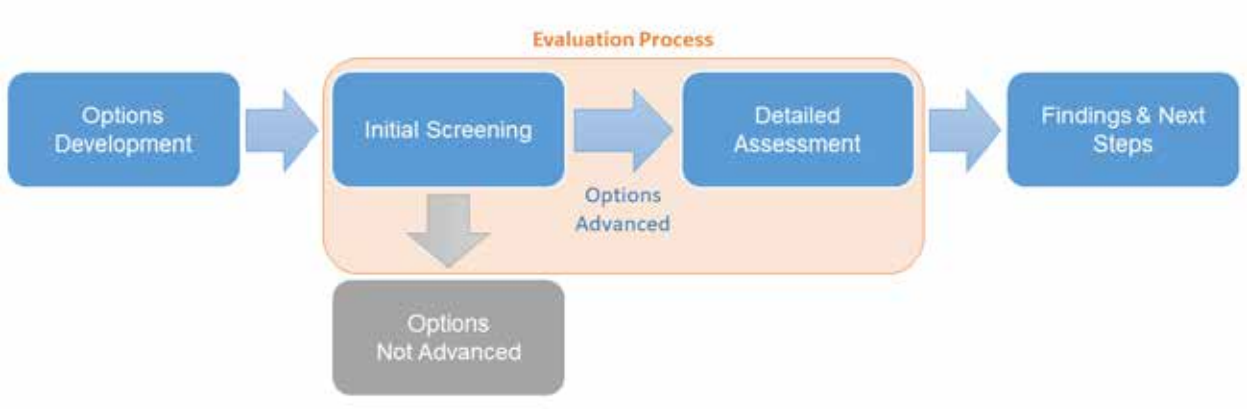

Figure 6-1. Bicycle Facility Options Evaluation Process

6.1 Methodology

6.1.1 Initial Screening Methodology

The initial screening stage of the evaluation process considered all nine bicycle facility options described in Section 5. The initial screen was performed to identify potential issues that would prevent implementation of the options. This step serves to screen out bicycle facility options with substantial concerns by considering whether each option would:

- Meet the project's purpose and need by providing improved safety and access to transit for bicycles. These are identified as key goals in the RapidRide Roosevelt project purpose and need, and thus any bicycle facility design included in the project must represent an improvement over the existing conditions for both of these goals.
- Provide a level bicycle route. Steep slopes, particularly uphill slopes, are not appropriate for AAA cycling routes as they present a potential barrier to all but the strongest cyclists and could discourage most potential users from using the facility.
- Meet SDOT's bicycle facility design standards. Design standards ensure that bicycle facilities are functional and safe for all users. Options that do not meet design standards and therefore introduce potential safety conflicts for people biking or for people walking are not suitable for implementation.

- Be constructible within available existing right-of-way. Options that require property acquisition present a substantial risk of community concerns, delays to the project schedule, and project cost overruns.

Options that passed all four screening criteria were advanced beyond the initial screening to a more detailed assessment. Table 6-1 summarizes the initial screening criteria.

Table 6-1. Initial Screening Criteria

CRITERION	REASON FOR INCLUSION	HOW ASSESSED	RATING
Meets the project purpose and need	· The project purpose and need includes improving safety and access to transit for people biking in the project corridor. Only bicycle facilities that represent an improvement over the existing conditions for both of these goals receive a 'pass' rating.	Options were qualitatively evaluated based on how they improve connections to transit and improve safety for non-motorized users. This considered both providing AAA bicycle facilities within the study area and providing bicycle facilities that directly connect with transit stops.	**Pass:** Option meets purpose and need by improving both safety and access to transit for bicycles within study area. **Fail:** Option does not improve safety and/or access to transit for bicycles within study area.
Provides a level bicycle route	· Steep slopes, particularly uphill slopes, are not appropriate for AAA cycling routes as they present a potential barrier to all but the strongest cyclists. · Steep uphill climbs can be physically taxing and are likely to discourage cyclists from using the new bicycle facility, leading to little change in bicycle volumes along Eastlake Ave E and limited safety improvement over existing conditions. · Streets Illustrated recommends slopes below 8.3% for greenways; a 10% threshold is more flexible and corresponds to the maximum slope generally allowed in other cities.	Options were evaluated based on whether routing would require climbing grades of 10% or greater.	**Pass:** Option does not require uphill travel on grades of 10% or more. **Fail:** Option requires uphill travel on grades of 10% or more.

Table 6-1. Initial Screening Criteria

CRITERION	REASON FOR INCLUSION	HOW ASSESSED	RATING
Meets SDOT's bicycle facility design standards	· Streets Illustrated includes design standards for the AAA bicycle facility types considered. Each bicycle facility option must be checked against these standards to ensure that the facility would be safe and functional for intended users.	Options were qualitatively evaluated on whether the bicycle facility design would meet relevant standards for bicycle facility design including: · Inadequate street lighting for bicycle travel in low- or no-light conditions (applies to all facilities) · Slopes greater than 5% on two-way bicycle facilities leading to risk of head-on bicycle collisions (specific to two-way PBLs) · Roadway width too narrow to allow cars and bicycles to pass when two-way mixed traffic is present (specific to greenways)	**Pass:** Option meets design standards as outlined. **Fail:** Option does not meet one or more design standards as outlined.
Able to be constructed within available existing right-of-way	· Acquiring property would delay project delivery and increase costs; options that require property acquisition to expand right-of-way or establish new right-of-way are not considered feasible.	Options were evaluated quantitatively based on whether they would require property acquisition to provide new or expanded right-of-way. Minimum facility widths are from Streets Illustrated: · One-way PBL pair: 5' lane and 3' buffer each direction; 16' total · Two-Way PBL: 10' lane and 3' buffer; 13' minimum · Greenway: no minimum width identified · Multi-use path: 10' minimum; 12' recommended	**Pass:** Option does not require property acquisition to construct. **Fail:** Option requires property acquisition to construct.

6.1.2 Detailed Assessment Methodology

Bicycle facility options that advanced through the initial screening were then assessed in greater detail. While the initial screen was used to determine whether each option is feasible for implementation, the detailed assessment was used to provide a comparison of the benefits and impacts that would be associated with each of the remaining options based on their performance on a range of different measures. This detailed assessment evaluated the remaining options using criteria addressing the following elements:

- Degree to which each option improves bicycle safety and bicycle connections to transit
- Degree to which each option is consistent with City of Seattle policy guidance
- Bicycle route conditions
- Degree to which each option provides neighborhood access
- Impacts to other transportation modes and elements

Within each of the elements, a variety of measures was assessed to create a broad evaluation of the remaining bicycle facility options. The evaluation criteria and evaluation methods for each criterion are listed in Table 6-2.

Table 6-2. Detailed Assessment Criteria and Methodology

CRITERION	REASON FOR INCLUSION	HOW ASSESSED	RATING
BICYCLE SAFETY AND TRANSIT CONNECTIONS			
Route Safety	Improving safety for people biking in the project corridor, including the Eastlake neighborhood, is an explicit goal of the RapidRide Roosevelt project. While options have already been screened for safety concerns, the remaining options may still vary in the degree of safety benefit provided.	Quantitative and qualitative – based on bike route characteristics and considers: · Frequency of driveway conflict points · Whether physical separation between bicycles and motor vehicles is provided · Whether the facility results in bicycles traveling against the direction of motor vehicle traffic	**High:** Minimizes the occurrence of all identified safety considerations **Medium:** Minimizes two of three identified safety considerations **Low:** Minimizes the occurrence of one or none of the identified safety considerations
Bicycle Connection to Transit	Improving access to transit for people biking in the project corridor, including the Eastlake neighborhood, is an explicit goal of the RapidRide Roosevelt project.	Quantitative – Number of transit stops directly along signed or designated bicycle route. Within the study area there are eight proposed stops.	**High:** 7-8 **Medium:** 3-6 **Low:** 0-2

Table 6-2. Detailed Assessment Criteria and Methodology

CRITERION	REASON FOR INCLUSION	HOW ASSESSED	RATING
CITY OF SEATTLE POLICY GUIDANCE			
Consistency with Bicycle Master Plan	The BMP produced specific recommendations for bicycle facilities to be completed as part of the citywide bicycle network, including facility type and route.	Qualitative – Compare to BMP citywide bicycle network recommendations in the study area (shown in Section 3.1): · PBLs along Eastlake Ave E · Neighborhood greenway along the shore of Lake Union (following the Cheshiahud Lake Union Loop)	**High:** Matches a BMP citywide network recommendation over the full length of the study area with no deviations **Medium:** Mostly matches a BMP citywide network recommendation over the full length of the study area with one-block deviations **Low:** Does not match a BMP citywide network recommendation or includes significant deviations of more than one block
ROUTE CONDITIONS			
Route Distance	Bicyclists typically choose the shortest routes assuming other factors are equal. Cyclists currently using Eastlake Ave E are unlikely to divert to bicycle facilities that require traveling longer distances.	Quantitative – Route distance from the University Bridge to the Fairview Ave N bridge as measured using Google Maps (total for both NB and SB directions).	**High:** < 3 miles **Medium:** 3-3.5 miles **Low:** > 3.5 miles
Elevation Gain	Bicyclists typically choose flatter routes that require less elevation gain assuming other factors are equal. Cyclists currently using Eastlake Ave E are unlikely to divert to bicycle facilities that require greater elevation gain.	Quantitative – Vertical elevation gain from the University Bridge to the Fairview Ave N bridge as measured using Google Maps (total for both NB and SB directions).	**High:** <50 feet **Medium:** 50-100 feet **Low:** >100 feet

Table 6-2. Detailed Assessment Criteria and Methodology

CRITERION	REASON FOR INCLUSION	HOW ASSESSED	RATING
Maximum Uphill Slope	Bicyclists typically choose flatter routes with more gradual slopes assuming other factors are equal. Cyclists currently using Eastlake Ave E are unlikely to divert to bicycle facilities that require climbing hills with steep slopes.	Quantitative – Maximum uphill grade along the route per SDOT's "Street Slope 2017" geographic information system data.	**High:** 0-2% **Medium:** 3-6% **Low:** 7-8%
Route Legibility and Directness	Cyclists currently using Eastlake Ave E are unlikely to divert to bicycle facilities that are indirect and thus more difficult to follow.	Quantitative –Turns required to travel along route from the University Bridge to the Fairview Ave N bridge (total for both NB and SB directions).	**High:** 0-2 **Medium:** 3-6 **Low:** ≥7
Number of Arterial Crossings Required	Cyclists currently using Eastlake Ave E are unlikely to divert to bicycle facilities that require a large number of arterial crossings as these add delay and increase travel time.	Quantitative – Arterial crossings required to navigate the route (total for both NB and SB directions).	**High:** 0-1 **Medium:** 2-3 **Low:** ≥4
NEIGHBORHOOD ACCESS			
Access to Businesses	Bicycle facilities that allow direct access to businesses along Eastlake Ave E will support nonmotorized access to businesses, supporting Seattle's goals of reducing driving rates and greenhouse gas emissions.	Qualitative – Direct access to businesses provided by signed or designated bicycle route.	**High:** Provides direct access to businesses on Eastlake Ave E in both directions **Medium:** Provides direct access to businesses on Eastlake Ave E in one direction **Low:** Does not provide direct access to businesses on Eastlake Ave E

Table 6-2. Detailed Assessment Criteria and Methodology

CRITERION	REASON FOR INCLUSION	HOW ASSESSED	RATING
Access to Schools	Bicycle facilities that connect to schools in the Eastlake neighborhood support the Safe Routes to Schools program. Safe Routes to School is a national movement to ensure safe walking or biking for students to and from school; this program is implemented by SDOT as part of Vision Zero in Seattle.	Qualitative – Direct access to schools provided by signed or designated bicycle route.	**High:** Provides direct access to TOPS K-8 School grounds in both directions **Medium:** Provides direct access to TOPS K-8 School grounds in one direction **Low:** Does not provide direct access to TOPS K-8 School grounds
IMPACTS TO OTHER TRANSPORTATION MODES AND ELEMENTS			
Transit Performance	RapidRide Roosevelt buses operating on Eastlake Ave E are subject to delay due to interaction with other travel modes. Minimizing these interactions will benefit travel time and reliability for RapidRide Roosevelt service.	Qualitative – Assessment of potential for transit delay along Eastlake Ave E. Considers: · Interaction between buses and bicycles · Interaction between buses and parallel parking cars Note: This analysis assumes that some cyclists will not divert off of Eastlake Ave E if a bicycle route is built off of Eastlake.	**High:** Minimizes potential interaction of buses with bicycles and parallel parking cars for the full length of the study area **Medium:** Minimizes potential interaction of buses with bicycles and parallel parking cars for part of the length of the study area **Low:** Does not minimize potential interaction of buses with bicycles or parallel parking cars

Table 6-2. Detailed Assessment Criteria and Methodology

CRITERION	REASON FOR INCLUSION	HOW ASSESSED	RATING
Auto Traffic Performance	General-purpose traffic on Eastlake Ave E is subject to delay due to interaction with other travel modes. Minimizing these interactions will benefit travel time and reliability for through traffic on Eastlake Ave E.	Qualitative – Assessment of potential for general-purpose traffic delay along Eastlake Ave E. Considers: · Interaction between buses and bicycles · Interaction between buses and parallel parking cars Note: This analysis assumes that some cyclists will not divert off of Eastlake Ave E if a bicycle route is built off of Eastlake.	**High:** Minimizes potential interaction of general-purpose traffic with bicycles and parallel parking cars for the full length of the study area **Medium:** Minimizes potential interaction of general-purpose traffic with bicycles and parallel parking cars for part of the length of the study area **Low:** Does not minimize the potential interaction of general-purpose traffic with either bicycles or parallel parking cars
On-Street Parking	Construction of bicycle facilities in the Eastlake neighborhood will require repurposing existing road space. In practice, this will mean removing on-street parking spaces to provide space for bicycle facilities. Parking impact is an area of significant community concern in the Eastlake neighborhood (see the Curb Space Management Study, Appendix F of the *RapidRide Roosevelt Project Transportation Technical Report)*.	Quantitative – The number of on-street parking spaces removed within study area.	**High:** <200 spaces removed **Medium:** 200-300 spaces removed **Low:** >300 spaces removed

Table 6-2. Detailed Assessment Criteria and Methodology

CRITERION	REASON FOR INCLUSION	HOW ASSESSED	RATING
Planted Medians	The Eastlake Community Council submitted scoping comments for the RapidRide Roosevelt project's environmental assessment that included a desire to protect or, if possible, expand planted medians located along Eastlake Ave E within the study area. Some bicycle facility options may require removing or significantly altering these medians to provide adequate space for bicycle facilities and other travel lanes.	Qualitative – Based on required bicycle facility width, width of other travel lanes required, and the locations of existing planted medians along Eastlake Ave E. Minimum bicycle facility widths are from Streets Illustrated: · One-way PBL pair: 5' lane and 3' buffer each direction; 16' total · Two-way PBL: 10' lane and 3' buffer; 13' minimum · Greenway: no minimum width identified · Multi-use path: 10' minimum; 12' recommended	**High:** The existing planted medians are not expected to be impacted by the bicycle facility design **Medium:** Partial removal (or replacement) of existing planted medians likely required due to bicycle facility design **Low:** Complete removal (or replacement) of existing planted medians likely required due to bicycle facility design

6.2 Evaluation Results

6.2.1 Initial Screening Results

Five of the nine bicycle facility options were screened out due to their poor performance on one or more of the four initial screening criteria. Table 6-3 shows the results of the initial screen.

Table 6-3. Initial Screening Results

CRITERION	OPTION 1	OPTION 2	OPTION 3	OPTION 4	OPTION 5	OPTION 6	OPTION 7	OPTION 8	OPTION 9
Meets the project purpose and need	**Fail** – Does not improve bicycle safety or access to transit	**Pass** – Improves bicycle safety and access to transit	**Pass** – Improves bicycle safety and access to transit	**Pass** – Improves bicycle safety and access to transit	**Pass** – Improves bicycle safety and access to transit	**Fail** – Does not improve bicycle access to transit	**Fail** – Does not improve bicycle access to transit	**Fail** – Does not improve bicycle access to transit	**Pass** – Improves bicycle safety and access to transit
Provides a level bicycle route	**Not applicable** – No route	**Pass** – Max uphill grade 5%	**Pass** – Max uphill grade 5%	**Pass** – Max uphill grade 6%	**Pass** – Max uphill grade 6%	**Pass** – Max uphill grade 5%	**Fail** – Max uphill grade 15%	**Fail** – Max uphill grade 15%	**Fail** – Max uphill grade 17%
Meets SDOT's bicycle facility design standards	**Not applicable** – No facility/design to evaluate	**Pass** – Meets design standards	**Pass** – Meets design standards	**Pass** – Meets design standards	**Pass** – Meets design standards	**Pass** – Meets design standards	**Fail** – Yale Terrace E alley travelway is too narrow to accommodate two-way auto and bike traffic	**Fail** – Yale Terrace E alley travelway is too narrow to accommodate two-way auto and bike traffic	**Pass** – Meets design standards
Able to be constructed within available existing right-of-way	**Pass** – Does not require property acquisition	**Pass** – Does not require property acquisition	**Pass** – Does not require property acquisition	**Pass** – Does not require property acquisition	**Pass** – Does not require property acquisition	**Fail** – Property acquisition required to implement design between E Hamlin St and E Roanoke St	**Pass** – Does not require property acquisition	**Pass** – Does not require property acquisition	**Pass** – Does not require property acquisition
RESULT	***Advanced for Comparison Only***	***Advanced to Detailed Assessment***	***Advanced to Detailed Assessment***	***Advanced to Detailed Assessment***	***Advanced to Detailed Assessment***	***Not Advanced***	***Not Advanced***	***Not Advanced***	***Not Advanced***

Options that failed to pass any one of the four screening criteria were not advanced to the second stage of the evaluation.

- **Option 1 – No Build (did not pass initial screening; used for comparison purposes only).** Option 1 does not meet the RapidRide Roosevelt purpose and need, as it does not provide any AAA bicycle facilities in the study area and therefore would also not provide any bicycle connection to transit stops. Option 1 would also not address the existing bicycle safety issues in the study area, including a lack of continuous bicycle facilities through the study area and a high number of bicycle collisions on Eastlake Ave E. Option 1 would therefore present a continuing safety concern for cyclists. Because Option 1 would not provide a bicycle facility or designated bicycle route, it was not assessed for the presence of steep uphill slopes or for compliance with design standards. The no build option would not require property acquisition. Option 1 did not pass the initial screening because it does not meet the project purpose and need and does not address bicycle safety concerns in the study area, but it was considered as part of the subsequent detailed assessment to provide a point of comparison with the advanced options.
- **Option 2 – PBLs on Eastlake Ave E: Advanced.** Option 2 meets the project purpose and need by improving bicycle safety in the study area with the addition of new AAA bicycle facilities. It also improves bicycle access to transit as the PBLs would provide cyclists direct access to bus stops along Eastlake Ave E. This option would not encounter steep slopes; the maximum slope along the route in Option 2 is 5%. The PBL facility in Option 2 meets design standards and would not require property acquisition as it fits within available right-of-way on Eastlake Ave E. Option 2 was advanced to the detailed assessment because it passed all of the initial screening criteria.
- **Option 3 – Two-Way PBL on Eastlake Ave E: Advanced.** Option 3 improves safety and access to transit by providing AAA bicycle facilities adjacent to transit stops, meeting the project purpose and need. Option 3 would not include bicycle facilities with steep uphill slopes as the maximum slope is 5%. This option meets design standards and fits within the existing right-of-way on Eastlake Ave E, so this option would not require property acquisition. Option 3 was therefore advanced to the detailed assessment.
- **Option 4 – Northbound PBL on Eastlake Ave E and Southbound Greenway on Yale Ave E: Advanced.** Option 4 meets all four screening criteria. It meets the project purpose and need, it meets bicycle facility design standards, and it does not require property acquisition as it would fit within existing right-of-way along Eastlake Ave E, E Roanoke St, Yale Ave E, and Yale Place E. This option does include one street segment with a grade over 10% (along E Roanoke St), but this street segment would only be used by SB cyclists in Option 4 and they would therefore be traveling downhill. The steepest uphill slope along Option 4 is 6% on Yale Ave E. Option 4 passed all screening criteria and was advanced to the detailed assessment.
- **Option 5 – Northbound PBL on Eastlake Ave E and Southbound PBL on Yale Ave E: Advanced.** Option 5 uses the same route as Option 4, but Option 5 substitutes a PBL on Yale Ave E in place of the greenway used in Option 4. Option 5 performed the same on all screening criteria as Option 4, and was therefore advanced to the detailed assessment.

- **Option 6 – Multi-Use Trail on Fairview Ave E: Not Advanced.** Option 6 would provide a complete AAA bicycle facility through the study area, which would address the need for safety improvements identified in the RapidRide Roosevelt purpose and need statement. However, the multi-use trail in Option 6 would not provide access to any transit stops in the study area, and therefore would not meet the project's purpose and need because it would not improve access to transit for bicycles.
  - Option 6 does not include steep uphill slopes and it complies with the identified design standards. This option would require property acquisition to connect the trail between E Hamlin St and E Roanoke St. Fairview Ave E does not connect across this section due to the shoreline of Lake Union, and no continuous public right-of-way is available through this area. Property would need to be acquired along the Lake Union shoreline between E Hamlin St and E Roanoke St to establish new right-of-way to implement this bicycle facility. Option 6 was not advanced to the detailed assessment because it does not meet the project purpose and need and because it would require property acquisition to implement.
- **Option 7 – Greenway on Fairview Ave E (following the Cheshiahud Lake Union Loop): Not Advanced.** Option 7 would provide a complete AAA bicycle facility through the study area, which would address the need for safety improvements identified in the RapidRide Roosevelt purpose and need statement. However, the multi-use trail in Option 7 would not provide access to any transit stops in the study area, and therefore would not meet the project's purpose and need because it would not improve access to transit for bicycles.
  - Option 7 includes steep uphill slopes for cyclists traveling in both the NB and SB directions. These grades are 12% on E Roanoke St for NB cyclists and 17% on E Hamlin St for SB cyclists. This option also requires travel through a narrow and tightly constrained two-way alley on Yale Terrace E between E Hamlin St and E Edgar St. The alley does not have sufficient space for cars and bicycles to move past one another and so does not meet design standards. Option 7 would not require property acquisition. Option 7 was not advanced to the detailed assessment because it does not meet the project purpose and need, it includes steep uphill slopes, and it does not meet design standards.
- **Option 8 – Greenway on Minor Ave E and Fairview Ave E: Not Advanced.** Option 8 has drawbacks similar to Option 7, including not meeting the project purpose and need by not improving bicycle access to transit stops, routing cyclists up steep uphill slopes, and not meeting design standards due to routing through a narrow alley that is shared with two-way car traffic. Option 8 was therefore not advanced to the detailed assessment.
- **Option 9 – Greenway on Franklin Ave E: Not Advanced.** Option 9 meets the RapidRide Roosevelt project purpose and need because it would provide a continuous AAA bicycle facility through the study area, improving bicycle safety, and it would include PBLs that provide direct access to bus stops on Eastlake Ave E, improving access to transit for bicyclists. However, Option 9 would route bicycle facilities along steep uphill slopes; Franklin Ave E has a 17% grade between E Newton St and E Howe St. This option does not present any apparent safety concerns and would not require property acquisition. Option 9 was not advanced to the detailed assessment due to the inclusion of steep uphill slopes.

In summary, Options 2, 3, 4, and 5 passed the initial screening. Additionally, Option 1 (no build) was carried into the detailed assessment for comparison purposes only, although it does not meet the RapidRide Roosevelt purpose and need nor address existing safety concerns for the bicyclists traveling in the study area, and therefore did not pass the initial screening.

6.2.2 Detailed Assessment Results

Four options, Options 2, 3, 4, and 5, were advanced from the initial screening and evaluated in the detailed assessment. Option 1, the no-build condition, was also carried into the detailed assessment for comparison although it did not pass the initial screening. The evaluation results are summarized in Table 6-4. Each option was given a high, medium, or low rating for each criterion as described in Table 6-2.

- Option 1 – No Build
  - ***Bicycle Safety and Transit Connections:*** Option 1 would not improve bicycle safety or access to transit within the study area because it would not provide any bicycle facilities. All other options considered in the detailed assessment would perform better with respect to these measures.
  - ***City of Seattle Policy Guidance:*** Option 1 does not implement any recommendations from the BMP. All other options considered in the detailed assessment would implement BMP recommendations.
  - ***Route Conditions:*** Since Option 1 would not create a bicycle facility, it is assumed that cyclists would continue to travel on their current routes through the study area. Traveling via Eastlake Ave E is relatively flat, level, and continuous, but also requires cyclists to interact with cars and buses with no separation. Using other routes to travel through the study area (such as the Cheshiahud Lake Union Loop) would require climbing steep slopes, greater total elevation gain, and less direct routes with several turns.
  - ***Neighborhood Access:*** Option 1 would not provide direct bicycle access to businesses on Eastlake Ave E or to the TOPS K-8 School grounds.
  - ***Impacts to Other Transportation Modes and Elements:*** Under Option 1, many cyclists would continue to ride in mixed traffic on Eastlake Ave E, which is the primary arterial through the study area. This would result in the most significant impacts to transit and auto traffic operations, as buses and cars would interact with bicycles in shared travel lanes along Eastlake Ave E throughout the study area. Bicycles can have a particularly acute impact on transit travel time and reliability, since bicycles and buses typically travel at similar average speeds but different maximum speeds. In practice, this means that buses and bicycles must continually pass each other as buses make stops, resulting in buses traveling slowly behind bicycles until they have space to pass safely. Option 1 would not make any changes to on-street parking in the study area or require removal of any of the existing planted medians.
- Option 2 – PBLs on Eastlake Ave E:
  - ***Bicycle Safety and Transit Connections:*** Option 2 received the highest rating for potential improvement to bicycle safety. Option 2 would provide separated bicycle facilities through the full length of the study area, avoiding mixed-traffic operation for

bicycles. Option 2 would result in a low frequency of driveway conflicts by staying on Eastlake Ave E. This option would also keep bicycles traveling in the same direction as other traffic by providing a one-way PBL on each side of the street, reducing the potential for conflicts at intersections. Option 2 would also provide direct access to all eight planned RapidRide stops in the study area—the most of all the options considered in the detailed assessment.

- ***City of Seattle Policy Guidance:*** Option 2 would fully implement one of the BMP's two recommendations for bicycle facilities as part of the citywide bicycle network by providing PBLs on Eastlake Ave E from the University Bridge to the Fairview Ave N bridge. This option does not include any deviations off of Eastlake Ave E. Option 2 received a high rating on this measure.
- ***Route Conditions:*** Option 2 would provide the best bicycle route conditions of the options considered based on the evaluated criteria, tied with Option 3. Option 2 would create a short, direct, and legible bicycle route in the study area that would be easy for cyclists to follow, receiving high ratings on these criteria. Option 2 received medium ratings for elevation gain and maximum slope, but Options 3, 4, and 5 also received medium ratings on these criteria, reflecting the hilly topography in the study area.
- ***Neighborhood Access:*** Option 2 would provide direct bicycle access to businesses along the full length of Eastlake Ave E through the study area, receiving a high rating along with Option 3 and scoring higher than Options 4 and 5. Options 2, 3, 4, and 5 would all provide direct bicycle access to the TOPS K-8 School grounds, representing an improvement over Option 1 and existing conditions.
- ***Impacts to Other Transportation Modes and Elements:*** Option 2 would minimize the interaction of bicycles with buses and auto traffic on Eastlake Ave E by providing PBLs through the full length of the study area with no deviation from Eastlake Ave E. This would result in the greatest benefit to transit and auto travel time and reliability.
  - § Option 2 would require the removal of approximately 325 on-street parking spaces from Eastlake Ave E, receiving a low rating on this criterion and matching the parking removal required by Option 3. This option and Option 3 both result in less total on-street parking removal than Option 5, but they require the greatest amount of parking removal from Eastlake Ave E of the options evaluated in the detailed assessment.
  - § Option 2 would not require the removal of any of the existing planted medians on Eastlake Ave E and received a high rating on this criterion.

· Option 3 – Two-Way PBL on Eastlake Ave E:

- ***Bicycle Safety and Transit Connections:*** Option 3 received a medium rating for potential improvement to bicycle safety. While Option 3 would provide separated bicycle facilities through the full length of the study area and result in a low frequency of driveway conflicts, it would result in bicycles traveling in the opposite direction to adjacent motor vehicle traffic due to the two-way PBL layout, increasing the potential for conflicts at intersections. Option 3 would provide direct access to all eight planned

RapidRide stops in the study, receiving a high rating and tying with Option 2 for the best performance of all options considered on this criterion.

- ***City of Seattle Policy Guidance:*** Option 3 would fully implement one of the BMP's two recommendations for bicycle facilities as part of the citywide bicycle network by providing PBLs on Eastlake Ave E from the University Bridge to the Fairview Ave N bridge. This option includes no deviations from Eastlake Ave E, receiving a high rating.
- ***Route Conditions:*** Option 3 would provide the best bicycle route conditions of the options considered based on the evaluated criteria, tied with Option 2. Option 3 would create a short, direct, and legible bicycle route in the study area that would be easy for cyclists to follow, receiving high ratings on these criteria. Option 3 received medium ratings for elevation gain and maximum slope, but Options 2, 4, and 5 also received medium ratings on these criteria, reflecting the hilly topography in the study area.
- ***Neighborhood Access:*** Option 3 would provide direct bicycle access to businesses along the full length of Eastlake Ave E through the study area, performing the highest of the options considered on this criterion. Options 2, 3, 4, and 5 would all provide direct bicycle access to the TOPS K-8 School grounds, representing an improvement over Option 1 and existing conditions.
- ***Impacts to Other Transportation Modes and Elements:*** Option 3 would minimize the interaction of bicycles with buses and auto traffic on Eastlake Ave E by providing PBLs through the full length of the study area with no deviation from Eastlake Ave E. This would result in the greatest benefit to transit and auto travel time and reliability.
  - Option 3 would require the removal of approximately 325 on-street parking spaces from Eastlake Ave E, receiving a low rating on this criterion and matching the parking removal required by Option 2. Though the two-way PBL design of Option 3 requires less total right-of-way width than the separated PBL design in Option 2, the difference is only approximately three feet and is not enough to retain any of the existing on-street parking on Eastlake Ave E. Option 2 and Option 3 would both result in less total on-street parking removal than Option 5, but they require the greatest amount of parking removal from Eastlake Ave E of the options evaluated in the detailed assessment.
  - Option 3 would require the removal of all of the existing planted medians on Eastlake Ave E because adding a two-way PBL to one side of the street requires shifting all other lanes over from their current positions within the street. Option 3 received a low rating on this criterion.

· Option 4 – Northbound PBL on Eastlake Ave E and Southbound Greenway on Yale Ave E:

- ***Bicycle Safety and Transit Connections:*** Option 4 did not perform as well as Options 2, 3, or 5 for its benefit to bicycle safety and connections to transit, although it would represent an improvement over the existing conditions. Option 4 would provide the lowest safety improvement compared to Options 2, 3, and 5 because it has a higher frequency of driveway conflict points than routing on Eastlake Ave E and it requires SB cyclists to share a single travel lane with two-way auto traffic on E Roanoke St, Yale Ave E, and Yale Place E. Option 4 received a low rating on this criterion.

  - Option 4 would provide direct access to seven of the eight planned RapidRide stops in the study area, skipping the SB stop at E Lynn St where the bicycle route would be along Yale Ave E. This would require some cyclists to travel a longer distance or off of a AAA bicycle facility to access the SB E Lynn St stop, but Option 4 still received a high rating on this criterion. Option 4 would represent an improvement in bicycle access to transit over existing conditions.

- ***City of Seattle Policy Guidance:*** Option 4 would implement one of the BMP's two recommendations for bicycle facilities as part of the citywide bicycle network by providing PBLs on Eastlake Ave E from the University Bridge to the Fairview Ave N bridge. However, Option 4 includes a five-block route deviation from the BMP as the bicycle facility would be routed along Yale Ave E for SB cyclists. Option 4 received a medium rating on this criterion.
- ***Route Conditions:*** Option 4 would provide an improvement in bicycle route conditions over existing conditions. This route would offer a short route between the University Bridge and the Fairview Ave N bridge in both directions, receiving a high rating. Like Options 2, 3, and 5, Option 4 received medium ratings for elevation gain and maximum slope, reflecting the hilly topography in the study area. This route would be more circuitous than Options 2 and 3, requiring SB cyclists to make several turns to divert off of Eastlake Ave E onto a parallel greenway route. This may result in some rider confusion and would require clear wayfinding signage. Option 4 received a medium rating for this criterion.
- ***Neighborhood Access:*** Option 4 would provide direct bicycle access to many businesses along Eastlake Ave E in the study area, but the bicycle facility diverts off of Eastlake Ave E for several blocks through the center of the Eastlake business district under Option 4. This criterion received a medium rating. Options 2, 3, 4, and 5 would all provide direct bicycle access to the TOPS K-8 School grounds, representing an improvement over Option 1 and existing conditions.
- ***Impacts to Other Transportation Modes and Elements:*** Option 4 would reduce the interaction of bicycles with buses and auto traffic on Eastlake Ave E by providing PBLs through most of the study area. However, it is likely that some cyclists will continue to ride SB on Eastlake Ave E in mixed traffic where the bicycle facility is along Yale Ave E. Cyclists may choose to continue on Eastlake Ave E to access businesses and RapidRide stops or prefer to travel on a shorter, flatter route. This would result in somewhat higher transit and auto travel time and lower reliability in the SB direction as vehicles and bicyclists would mix together in travel lanes, resulting in a medium rating on these criteria.
  - Option 4 would require the removal of approximately 250 on-street parking spaces from Eastlake Ave E, the lowest amount of on-street parking removal of the options considered in the detailed assessment. Option 4 received a medium rating on this criterion.
  - Option 4 would not require the removal of any of the existing planted medians on Eastlake Ave E and received a high rating on this criterion.

- Option 5 – Northbound PBL on Eastlake Ave E and Southbound PBL on Yale Ave E:
  - ***Bicycle Safety and Transit Connections:*** Option 5 performed better than Options 3 and 4 but not as well as Option 2 for its benefit to bicycle safety. Option 5 would have more driveway conflict points than Options 2 and 3, but it does not require cyclists to operate in mixed traffic, maintaining continuous PBLs along the full length of the route. Option 5 also would not require bicycles to travel against the flow of adjacent motor vehicle traffic. Option 5 received a medium rating on the safety criterion.
    - Option 5 would provide direct access to seven of the eight planned RapidRide stops in the study area, skipping the SB stop at E Lynn St where the bicycle route would divert to Yale Ave E. This would require some cyclists to travel a longer distance or off of an AAA bicycle facility to access the SB E Lynn St stop, but Option 5 still received a high rating on this criterion. Option 5 would represent an improvement in bicycle access to transit over existing conditions.
  - ***City of Seattle Policy Guidance:*** Option 5 would implement one of the BMP's two recommendations for bicycle facilities as part of the citywide bicycle network by providing PBLs on Eastlake Ave E from the University Bridge to the Fairview Ave N bridge. However, Option 5 includes a five-block route deviation from the BMP as the bicycle facility would be along Yale Ave E for SB cyclists. Option 5 received a medium rating on this criterion.
  - ***Route Conditions:*** Option 5 would provide an improvement in bicycle route conditions over existing conditions. This route would offer a short route between the University Bridge and the Fairview Ave N bridge in both directions, receiving a high rating. Like Options 2, 3, and 4, Option 5 received medium ratings for elevation gain and maximum slope, reflecting the hilly topography in the study area. This route would be more circuitous than Options 2 and 3, requiring SB cyclists to make several turns to divert off of Eastlake Ave E onto a parallel route. This may result in some rider confusion, although the continuous PBL would provide a clearly delineated path for cyclists. Option 5 received a medium rating for this criterion.
  - ***Neighborhood Access:*** Option 5 would provide direct bicycle access to many businesses along Eastlake Ave E in the study area, but the bicycle facility diverts off of Eastlake Ave E for several blocks through the center of the Eastlake business district. This criterion received a medium rating. Options 2, 3, 4, and 5 would all provide direct bicycle access to the TOPS K-8 School grounds, representing an improvement over Option 1 and existing conditions.
  - ***Impacts to Other Transportation Modes and Elements:*** Option 5 would reduce the interaction of bicycles with buses and auto traffic on Eastlake Ave E by providing PBLs through most of the study area. However, it is likely that some cyclists will continue to ride SB on Eastlake Ave E in mixed traffic when the bicycle facility is along Yale Ave E. Cyclists may choose to continue on Eastlake Ave E to access businesses and RapidRide stops or prefer to travel on a shorter, flatter route. This would result in somewhat higher transit and auto travel time and lower reliability in the SB direction as vehicles and bicyclists would mix together in travel lanes, resulting in a medium rating on these criteria.

- Option 5 would require the removal of approximately 375 on-street parking spaces in total, including 250 spaces from Eastlake Ave E. This option had the highest total amount of on-street parking removed of the options considered in the detailed assessment, although it would require removing fewer parking spaces from Eastlake Ave E than Options 2 and 3. Option 5 received a low rating for on-street parking impact.

  Option 5 would not require the removal of any of the existing planted medians on Eastlake Ave E and received a high rating on this criterion.

6.2.3 Detailed Evaluation Results Summary

Option 2, which would provide continuous PBLs on Eastlake Ave E within the study area, performed the best of the four bicycle facility concepts advanced to the detailed assessment. Option 2 received a high rating on 11 of the 14 evaluation criteria and a medium rating on two criteria. Option 2 scored well on most criteria in this detailed assessment because it would provide a high level of safety improvement for bicycles, a bicycle facility adjacent to all transit stops in the study area, a level and direct bicycle route, a direct bicycle access to most businesses in the study area and have a positive impact on traffic and transit operations in the Eastlake neighborhood. Option 2 received a low rating on one criterion, impact to on-street parking, matching the ratings received by Options 3 and 5. No option advanced to the detailed assessment received a high rating for impact to on-street parking as all of the options in the detailed assessment would remove parking in the Eastlake neighborhood.

Option 3, which would also provide continuous PBLs through the study area, performed similarly to Option 2 overall. However, Option 3 received a lower rating than Option 2 on route safety because the two-way PBL layout would result in bicycles traveling in the opposite direction of adjacent motor vehicles. Option 3 also received a lower rating on impact to planted medians, as the two-way PBL would likely require the removal of all existing planted medians on Eastlake Ave E in the study area. Option 3 would result in the same parking impact as Option 2 and did not receive a higher rating than Option 2 on any of the criteria considered.

Options 4 and 5 did not perform as well as Options 2 and 3 in the detailed assessment, with each receiving five high ratings, eight medium ratings, and one low rating. Option 4 performed the best on impact to on-street parking, receiving a medium rating, but performed worst on route safety. Option 5 would result in the greatest total impact to on-street parking, requiring the removal of an estimated 375 parking spaces. Both Options 4 and 5 received lower scores than Options 2 and 3 on several other criteria, including consistency with the BMP, bicycle route legibility, access to businesses, and impact to transit and traffic performance.

Table 6-4. Detailed Assessment Results

CRITERION	OPTION 1: NO BUILD	OPTION 2: PBLs ON EASTLAKE		OPTION 3: TWO-WAY PBL ON EASTLAKE		OPTION 4: NB PBL ON EASTLAKE, SB GREENWAY ON YALE		OPTION 5: NB PBL ON EASTLAKE, SB PBL ON YALE	
BICYCLE SAFETY AND CONNECTION TO TRANSIT									
Route Safety	No change from existing conditions		**High** – Few conflict points, bicycle and motor vehicles separated, bicycles travel in the same direction as adjacent motor vehicle traffic		**Medium** – Few conflict points, bicycles and motor vehicles separated, bicycles travel in the opposite direction of adjacent motor vehicle traffic		**Low** – Many conflict points, no separation between bicycles and motor vehicles, bicycles travel in the opposite direction of adjacent motor vehicle traffic on greenway segment		**Medium** – Many conflict points, bicycles and motor vehicles separated, bicycles travel in the same direction as adjacent motor vehicle traffic
Bicycle Connection to Transit	Does not provide a signed or designated bicycle route to any transit stops in study area		**High** – Direct bicycle connection to 8 stops		**High** – Direct bicycle connection to 8 stops		**High** – Direct bicycle connection to 7 stops		**High** – Direct bicycle connection to 7 stops

Table 6-4. Detailed Assessment Results

CRITERION	OPTION 1: NO BUILD	OPTION 2: PBLs ON EASTLAKE	OPTION 3: TWO-WAY PBL ON EASTLAKE	OPTION 4: NB PBL ON EASTLAKE, SB GREENWAY ON YALE	OPTION 5: NB PBL ON EASTLAKE, SB PBL ON YALE
CITY OF SEATTLE POLICY GUIDANCE					
Consistency with Bicycle Master Plan	Does not implement any BMP recommendations	**High** – Matches BMP recommendation on Eastlake Ave E with no deviations	**High** – Matches BMP recommendation on Eastlake Ave E with no deviations	**Medium** – Matches BMP recommendation on Eastlake Ave E with partial one-block deviation	**Medium** – Matches BMP recommendation on Eastlake Ave E with partial one-block deviation
ROUTE CONDITIONS					
Route Distance	· Via Eastlake Ave E: 1.42 miles each way (2.84 miles total) · Via Cheshiahud Lake Union Loop: 1.67 miles each way (3.34 miles total)	**High** – 1.42 miles NB, 1.42 miles SB, 2.84 miles total	**High** – 1.42 miles NB, 1.42 miles SB, 2.84 miles total	**High** – 1.42 miles NB, 1.51 miles SB, 2.93 miles total	**High** – 1.42 miles NB, 1.51 miles SB, 2.93 miles total

Table 6-4. Detailed Assessment Results

CRITERION	OPTION 1: NO BUILD	OPTION 2: PBLs ON EASTLAKE		OPTION 3: TWO-WAY PBL ON EASTLAKE		OPTION 4: NB PBL ON EASTLAKE, SB GREENWAY ON YALE		OPTION 5: NB PBL ON EASTLAKE, SB PBL ON YALE	
Elevation Gain	· Via Eastlake Ave E: +49 feet NB, +35 feet SB, +85 feet total · Via Cheshiahud Lake Union Loop: +82 feet NB, +56 feet SB, +138 feet total		**Medium** – +49 feet NB, +36 feet SB, +85 feet total		**Medium** – +49 feet NB, +36 feet SB, +85 feet total		**Medium** – +49 feet NB, +33 feet SB, +82 feet total		**Medium** – +49 feet NB, +33 feet SB, +82 feet total
Maximum Uphill Slope	· Via Eastlake Ave E: 5% max uphill slope (encountered NB) · Via Cheshiahud Lake Union Loop: 15% max uphill slope (encountered SB)		**Medium** – 5% max uphill slope (encountered NB)		**Medium** – 5% max uphill slope (encountered NB)		**Medium** – 6% max uphill slope (encountered SB)		**Medium** – 6% max uphill slope (encountered SB)

Table 6-4. Detailed Assessment Results

CRITERION	OPTION 1: NO BUILD	OPTION 2: PBLs ON EASTLAKE		OPTION 3: TWO-WAY PBL ON EASTLAKE		OPTION 4: NB PBL ON EASTLAKE, SB GREENWAY ON YALE		OPTION 5: NB PBL ON EASTLAKE, SB PBL ON YALE	
Route Legibility and Directness	· Via Eastlake Ave E: 1 turn NB, 1 turn SB, 2 turns total · Via Cheshiahud Lake Union Loop: 8 turns NB, 8 turns SB, 16 turns total		**High** – 1 turn NB, 1 turn SB, 2 turns total		**High** – 1 turn NB, 1 turn SB, 2 turns total		**Medium** – 1 turn NB, 4 turns SB, 5 turns total		**Medium** – 1 turn NB, 4 turns SB, 5 turns total
Number of Arterial Crossings Required	· Via Eastlake Ave E: 1 crossing NB, 0 crossings SB, 1 crossing total · Via Cheshiahud Lake Union Loop: 2 crossings NB, 0 crossings SB, 2 crossings total		**High** – 1 crossing NB, 0 crossings SB, 1 crossing total		**High** – 1 crossing NB, 0 crossings SB, 1 crossing total		**High** – 1 crossing NB, 0 crossings SB, 1 crossing total		**High** – 1 crossing NB, 0 crossings SB, 1 crossing total

Table 6-4. Detailed Assessment Results

CRITERION	OPTION 1: NO BUILD	OPTION 2: PBLs ON EASTLAKE	OPTION 3: TWO-WAY PBL ON EASTLAKE	OPTION 4: NB PBL ON EASTLAKE, SB GREENWAY ON YALE	OPTION 5: NB PBL ON EASTLAKE, SB PBL ON YALE
NEIGHBORHOOD ACCESS					
Access to Businesses	Does not provide a signed or designated bicycle route to Eastlake businesses	 **High** – Direct bicycle access to Eastlake businesses in both directions	 **High** – Direct bicycle access to Eastlake businesses in both directions	 **Medium** – Direct bicycle access to Eastlake businesses in one direction (NB)	 **Medium** – Direct bicycle access to Eastlake businesses in one direction (NB)
Access to Schools (Supports Safe Routes to Schools)	Does not provide a signed or designated bicycle route to TOPS K-8 School grounds	 **High** – Direct bicycle access to TOPS K-8 School grounds in both directions	 **High** – Direct bicycle access to TOPS K-8 School grounds in both directions	 **High** – Direct bicycle access to TOPS K-8 School grounds in both directions	 **High** – Direct bicycle access to TOPS K-8 School grounds in both directions
IMPACT TO OTHER TRANSPORTATION MODES AND ELEMENTS					
Transit Performance	Does not reduce interaction of buses with bicycles or parallel parking cars	 **High** – Minimizes interaction of buses with bicycles and parallel parking cars over full length of study area	 **High** – Minimizes interaction of buses with bicycles and parallel parking cars over full length of study area	 **Medium** – Minimizes interaction of buses with bicycles and parallel parking cars over partial length of study area	 **Medium** – Minimizes interaction of buses with bicycles and parallel parking cars over partial length of study area

Table 6-4. Detailed Assessment Results

CRITERION	OPTION 1: NO BUILD	OPTION 2: PBLs ON EASTLAKE	OPTION 3: TWO-WAY PBL ON EASTLAKE	OPTION 4: NB PBL ON EASTLAKE, SB GREENWAY ON YALE	OPTION 5: NB PBL ON EASTLAKE, SB PBL ON YALE
Auto Traffic Performance	Does not reduce interaction of general-purpose vehicles with bicycles or parallel parking cars	**High** – Minimizes interaction of general-purpose vehicles with bicycles and parallel parking cars over full length of study area	**High** – Minimizes interaction of general-purpose vehicles with bicycles and parallel parking cars over full length of study area	**Medium** – Minimizes interaction of general-purpose vehicles with bicycles and parallel parking cars over partial length of study area	**Medium** – Minimizes interaction of general-purpose vehicles with bicycles and parallel parking cars over partial length of study area
On-Street Parking	Does not require removal of any parking spaces in study area	**Low** – 325 parking spaces removed on Eastlake Ave E	**Low** – 325 parking spaces removed on Eastlake Ave E	**Medium** – 250 parking spaces removed on Eastlake Ave E	**Low** – 375 total parking spaces removed (250 spaces on Eastlake Ave E, 110 spaces on Yale Ave E, 15 spaces on E Roanoke St)
Planted Medians	Does not require any removal of planted medians	**High** – Does not require any removal of planted medians	**Low** –Requires removal of all planted medians in study area	**High** – Does not require any removal of planted medians	**High** – Does not require any removal of planted medians

Table 6-4. Detailed Assessment Results

CRITERION		OPTION 1: NO BUILD	OPTION 2: PBLs ON EASTLAKE	OPTION 3: TWO-WAY PBL ON EASTLAKE	OPTION 4: NB PBL ON EASTLAKE, SB GREENWAY ON YALE	OPTION 5: NB PBL ON EASTLAKE, SB PBL ON YALE
TOTAL SCORES						
●	**High**	N/A	**11**	**9**	**5**	**5**
◑	**Medium**		**2**	**3**	**8**	**8**
○	**Low**		**1**	**2**	**1**	**1**

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Attachment A
Eastlake Bicycle Counts and Methodology

ATTACHMENT A
EASTLAKE BICYCLE COUNTS AND METHODOLOGY

Single-day bicycle counts were conducted during daylight hours on Wednesday, May 23, 2018, at four intersections in the evaluation study area. Counts were conducted during daylight hours, covering a 14-hour period between 6 AM and 8 PM. The four intersections where counts were conducted are:

- Eastlake Ave E and Fuhrman Ave E
- Eastlake Ave E and E Lynn St
- Fairview Ave E and E Lynn St (also Cheshiahud Lake Union Loop)
- Fairview Ave and Eastlake Ave E (this intersection also includes Fairview Ave E and E Galer St legs)

Bicycle counts were conducted by IDAX Data Solutions. Bicycle volumes at the four intersections were recorded by video camera, with counts generated by manual post-processing of the recorded video. The direction indicated in the counts is based on the direction of the intersection leg on which each cyclist approached the intersection and does not reflect movement through the intersection itself – for example, a cyclist who approached an intersection on its northbound leg (approaching from the south) may have continued north or turned east or west to continue through the intersection. Bicycle counts by hour at each location are shown in Table A-1.

The selected count date of May 23, 2018, reflects a time of year in which bicycle ridership is typically above average but below summertime peaks. SDOT maintains bicycle counters at the Fremont Bridge (not in the RapidRide Roosevelt project corridor), which collect southbound bicycle counts daily. Bicycle counts are aggregated monthly and reported online. Reviewing the available data from the Fremont Bridge bicycle counters from January 2013 through December 2017 shows that bicycle counts are typically highest in June or July, with May exhibiting bicycle volumes above the annual average (see Figure A-1). While comprehensive data are not available for locations within the Eastlake study area or along the RapidRide Roosevelt project corridor, it is reasonable to assume that bicycle ridership exhibits similar patterns to those observed at the Fremont Bridge. Bicycle counts collected in May are likely to reflect the level of bicycle ridership that occurs during warm months but not the summertime peak.

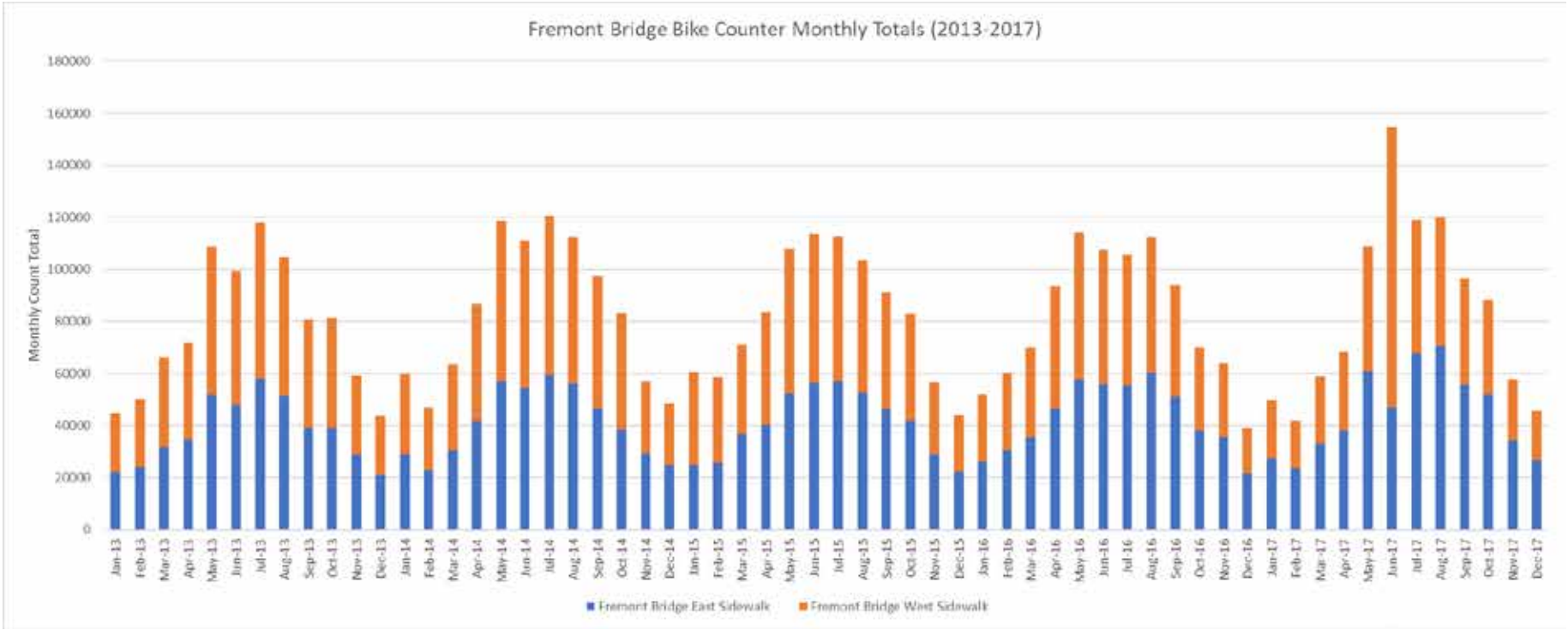

Figure A-1. Monthly Bicycle Volumes Recorded by the Fremont Bridge Bicycle Counters 2013-2017
Source: Adapted from SDOT, 2018c

Table A-1. Single-Day Bicycle Counts at Select Locations in the Study Area

HOUR	EASTLAKE AVE E & FUHRMAN AVE E				EASTLAKE AVE E & E LYNN ST				FAIRVIEW AVE E & E LYNN ST				FAIRVIEW AVE & EASTLAKE AVE E			
	NB	SB	OTHER	*TOTAL*	NB	SB	OTHER	*TOTAL*	NB	SB	OTHER	*TOTAL*	NB	SB	OTHER	*TOTAL*
6 AM	23	97	9	*129*	7	44	2	*53*	0	3	1	*4*	5	47	12	*64*
7 AM	60	182	28	*270*	1	125	1	*127*	3	6	3	*12*	12	130	41	*183*
8 AM	**83**	**180**	**34**	***297***	**2**	**126**	**4**	***132***	**5**	**26**	**1**	***32***	**4**	**143**	**81**	***228***
9 AM	53	86	21	*160*	0	65	7	*72*	4	10	2	*16*	5	74	41	*120*
10 AM	27	51	7	*85*	4	28	5	*37*	0	3	4	*7*	3	30	18	*51*
11 AM	31	43	8	*82*	8	26	2	*36*	5	3	1	*9*	7	27	20	*54*
12 PM	30	47	13	*90*	3	21	1	*25*	14	5	0	*19*	6	23	21	*50*
1 PM	31	34	4	*69*	7	14	4	*25*	4	8	0	*12*	6	18	25	*49*
2 PM	49	27	13	*89*	15	17	1	*33*	5	5	2	*12*	6	20	18	*44*
3 PM	52	47	9	*108*	22	9	2	*33*	4	7	0	*11*	14	9	32	*55*
4 PM	109	59	19	*187*	44	27	4	*75*	9	11	0	*20*	38	26	71	*135*
5 PM	**197**	**97**	**26**	***320***	**111**	**20**	**3**	***134***	**29**	**18**	**0**	***47***	**59**	**28**	**142**	***229***
6 PM	134	57	20	*211*	50	20	1	*71*	28	9	0	*37*	36	19	81	*136*
7 PM	64	61	7	*132*	26	13	3	*42*	8	5	4	*17*	18	9	37	*64*
Total	***943***	***1,068***	***218***	***2,229***	***300***	***555***	***40***	***895***	***118***	***119***	***18***	***255***	***219***	***603***	***640***	***1,462***

Source: Counts collected May 23, 2018.

NB = northbound

SB = southbound