



Seattle

# Seattle Transportation Plan

A Vision for the Future of Transportation in Seattle

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## Draft Environmental Impact Statement

August 2023







August 31, 2023

To Affected Tribes, Interested Agencies, and Members of the Public:

The City of Seattle has prepared a draft of the Seattle Transportation Plan (STP). It has just been released for public review.

As the Lead Agency under the Washington State Environmental Policy Act (SEPA), the Seattle Department of Transportation has prepared this non-project Draft Environmental Impact Statement (DEIS) as part of the STP planning process.

The DEIS analyzes potential impacts and proposed mitigation measures for the following elements required by the State Environmental Policy Act:

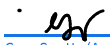
- Air Quality
- Water Resources
- Sea-Level Rise
- Transportation
- Noise
- Land Use Patterns
- Utilities (Electrical Power)

This DEIS evaluates the potential impacts of several transportation network concepts. It analyzes a baseline “No Action” alternative and two potential future investment scenarios—“Moderate Pace” and “Rapid Progress.” These two action scenarios represent bookends of a spectrum of potential transportation investments.

The environmental impact analysis process is an important tool for the public and decision-makers to understand the potential impacts of the future scenarios being considered in the Seattle Transportation Plan. Some combination of the scenarios evaluated in this DEIS could potentially achieve the transportation future we envision and are co-creating with the community.

Comments on the Draft EIS are welcome. Instructions for submitting comments are outlined in “Draft EIS Comment Period” on page v. All comments are due on October 16, 2023.

Sincerely,



[Greg Spotts \(Aug 28, 2023 09:19 PDT\)](#)

Greg Spotts

Director, Seattle Department of Transportation

# FACT SHEET

## Project Title

Environmental Impact Statement (EIS) for the Seattle Transportation Plan

## Proposed Action & Alternatives

The Seattle Transportation Plan (STP) is a 20-year vision document developed in coordination with the One Seattle Plan, the City’s 20-year growth strategy. The STP will serve as a roadmap to guide actions and investments for transportation solutions that coordinate to improve mobility across geography and modes of transportation in the city. The proposal is informed by recommendations from community input collected in 2022 and 2023.

This Environmental Impact Statement (EIS) studies two action alternatives relative to a No Action Alternative. These alternatives illustrate different potential futures for the city’s transportation networks. Studied systems include pedestrian, bike, People Streets and Public Space (PSPS), transit, and freight. These two alternatives evaluate the effects of potential changes to SDOT infrastructure and policy implementation approaches over a 20-year time horizon (to 2044). The “No Action” Alternative is required by SEPA and serves as a baseline for comparison. Alternative 2 and Alternative 3—the bookends of potential implementation scenarios—apply proposed frameworks that are based on community input and are intended to respond to issues, challenges, and opportunities for multimodal mobility in Seattle.

Assumptions considered in each alternative include:

- **General:** Assumptions related to the funding of existing initiatives and committed projects, such as Sound Transit 3, as well as potential electric vehicle (EV) infrastructure investment.
- **Pedestrian:** Assumptions related to sidewalks throughout the city, including destination streets.
- **Bicycle:** Assumptions related to all bicycle-related facilities, excluding sharrows, and committed projects.
- **PSPS:** Assumptions related to Healthy Streets and pedestrian improvements on destination streets, as well as including People Streets in the Seattle Transportation Plan. PSPS refers to People Streets and Public Spaces.
- **Transit:** Assumptions related to transit lanes, facilities, and corridors.
- **Community & Mobility Hubs:** Assumptions related to the introduction of community & mobility hubs throughout the city.
- **Freight:** Assumptions related to the street network for trucks.

Each alternative also considers how the proposed changes implement goals and policies outlined in the STP. To implement the transportation concepts in each of the Action Alternatives the City of Seattle would:

- Engage and co-create with community, boards & commissions, elected officials
- Collaborate with agency partners
- Pursue funding opportunities
- Update policy, processes, and guidelines
- Expand staff capacity and training

Each of the alternatives evaluated in this EIS pose different investment and policy priorities related to the city's pedestrian, bike, PSPS, transit, and freight networks for the purpose of improving the future of mobility in Seattle. The multi-faceted objectives of the proposal are listed in [Section 1.5.1](#) of this EIS.

The following is a summary of the three alternatives:

- **Alternative 1 – No Action:** Alternative 1 – No Action is a SEPA-required alternative that would maintain existing transportation networks and approved funding commitments. Roadway operations are optimized at key intersections, limited spot safety improvements are made throughout the network, and very limited slow zones are implemented on key pedestrian spaces.
- **Alternative 2 – Moderate Pace:** Alternative 2 allocates a moderate amount of new funding for multimodal infrastructure. The pedestrian network increases by 127 linear miles of sidewalks, the bicycle network adds 53 miles with facilities, an additional 45 miles of streets receive additional PSPS improvements, and an additional 33 miles are dedicated as transit corridors. This plan includes some restricted areas for general purpose traffic, a network of People Streets, and a moderate number of community and mobility hubs. The existing freight network is unchanged.
- **Alternative 3 – Rapid Progress:** Alternative 3 focuses on the expansion of Seattle's pedestrian, bicycle, and transit connections. The pedestrian network increases by 848 linear miles of sidewalks, the bicycle network adds 385 miles with facilities, an additional 76 miles of streets receive additional PSPS improvements, and an additional 123 miles are dedicated as transit corridors. In this alternative, the City fully implements overarching policies of the Seattle Transportation Plan with a greater expansion of PSPS, electrification infrastructure, a wider range of community & mobility hubs, and mobility management strategies in concert with the region. The existing freight network is expanded to include 19 miles of shared freight- and- bus (FAB) lanes.

## Proponent & Lead Agency

Seattle Department of Transportation

## Location

The proposal addresses all transportation in the public right of way in the City of Seattle.

## Tentative Date of Plan Adoption

Spring 2024

## Responsible SEPA Official

Greg Spotts

Director, Seattle Department of Transportation (SDOT)

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## Contact Person

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## Required Approvals

The proposal includes the development of legislative proposals for the STP. The proposals will be reviewed by the Seattle City Council Transportation Committee and considered for approval by the City Council. The proposals will be reviewed by the Washington Department of Commerce for a 60-day period prior to City action.

## Principal EIS Authors & Contributors

Under the direction of the Seattle Department of Transportation, the consultant team prepared the EIS as follows:

- BERK Consulting (prime consultant): SEPA documentation, Land Use Patterns, Utilities
- Kimley-Horn: Transportation, Air Quality, Noise, Sea-Level Rise

Additional contributors included:

- City of Seattle. Office of Planning and Community Development: Land Use Patterns Affected Environment.
- City of Seattle. Department of Transportation: Transportation
- City of Seattle. Office of Sustainability and Environment: Air Quality
- City of Seattle. City Light: Utilities
- City of Seattle. Department of Construction and Inspections: Noise, Sea-Level Rise

## Draft EIS Date of Issuance

August 31, 2023

## Draft EIS Comment Period

The City of Seattle is requesting comments from citizens, agencies, tribes, and all interested parties on the Draft EIS from August 31, 2023 to October 16, 2023. Comments are due by **5:00 p.m., October 16, 2023**.

All written comments should be directed to:

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[radcliffe.dacanay@seattle.gov](mailto:radcliffe.dacanay@seattle.gov)

Submittal of comments by email is preferred. Please include in the subject line “Seattle Transportation Plan Draft EIS Comments.”

Please see the project website for information about other public comment opportunities:

<https://www.seattle.gov/transportation/projects-and-programs/programs/seattle-transportation-plan>

Comments can also be offered at a virtual public hearing.

- Public Hearing scheduled for **Tuesday, September 26, 2023 at 2:00 p.m.**

A link to these hearings can be found at:

<https://www.seattle.gov/transportation/projects-and-programs/programs/seattle-transportation-plan>

## Date of Final Action

Anticipated Spring 2024

## Prior Environmental Review

The study area was reviewed as part of the citywide Comprehensive Plan EIS completed in 2016:

- Final Environmental Impact Statement for the Seattle Comprehensive Plan Update, May 5, 2016.

## Location of Background Data

You may review the City of Seattle website for more information at [STP Website](#). If you desire clarification or have questions, please see the contact person above.



## Purchase/Availability of Draft EIS

The Draft EIS can be downloaded from the City of Seattle website at

<https://www.seattle.gov/transportation/projects-and-programs/programs/seattle-transportation-plan>.

A hard copy, compact disk, or thumb drive are available for purchase at cost (see the contact person above to arrange).

# DISTRIBUTION LIST

The Draft EIS has been issued with a notice of availability and methods of publication required in SMC 25.05.510 Public Notice.

## Federally Recognized Tribes

Confederated Tribes and Bands of the Yakama Nation  
Muckleshoot Indian Tribe  
Nisqually Indian Tribe  
Puyallup Tribe  
Snoqualmie Tribe  
Squaxin Island Tribe  
Stillaguamish Tribe of Indians  
Suquamish Tribe  
Swinomish Indian Tribal Community  
Tulalip Tribes of Washington

## Federal Agencies

National Oceanic and Atmospheric Administration Fisheries, National Marine Fisheries Service  
U.S. Army Corps of Engineers  
U.S. Department of Commerce Economic Development Administration  
U.S. Department of Fish & Wildlife Services  
U.S. Department of Housing & Urban Development  
U.S. Environmental Protection Agency  
USDA-Wildlife Services Division

## State Agencies

Department of Archaeology & Historic Preservation  
Department of Commerce  
Department of Commerce, Growth Management Services  
Department of Ecology  
Department of Fish & Wildlife  
Department of Fisheries Habitat

Department of Health  
Department of Natural Resources  
Department of Social & Health Services  
Department of Transportation

## Regional and County Agencies

King County Community and Human Services  
King County Department of Natural Resources  
King County Department of Natural Resources, Parks Division  
King County Department of Permitting and Environmental Review  
King County Department of Transportation  
King County Executive's Office  
King County Metro Transit  
King County Regional Water Quality Committee  
King County Wastewater Treatment Division  
Port of Seattle  
Puget Sound Clean Air Agency  
Puget Sound Regional Council  
Seattle-King County Department of Public Health  
Sound Transit

## Seattle, Adjacent Jurisdictions, Service Providers

See regional providers above and following.

City of Shoreline  
City of Tukwila  
Seattle City Light  
Seattle Housing Authority  
Seattle Public Library, Public Review Documents  
Seattle Public Utilities  
Seattle Public Schools  
Southwest Suburban Sewer District  
Seattle City Council Legislative Department  
Seattle Department of Education and Early Learning  
Seattle Department of Neighborhoods  
Seattle, Department of Neighborhoods, Historic Preservation Program  
Seattle Department of Transportation  
Seattle Fire Department  
Seattle Fleet Management  
Seattle Indian Services Commission  
Seattle Landmarks Preservation Board  
Seattle Law Department

Seattle Office of Arts and Culture  
Seattle Office of Economic Development  
Seattle Office of Emergency Management  
Seattle Office of Housing  
Seattle Office of Planning & Community Development  
Seattle Office of the Mayor  
Seattle Parks and Recreation  
Seattle Police Department

## Community Organizations & Individuals

Duwamish Tribe  
Industrial and Maritime Strategy Council  
Georgetown / South Park Council  
Ballard Council  
Interbay Council  
SODO Council  
Black Indigenous and Persons of Color (BIPOC) Youth Engagement Partners  
Persons providing scoping comments (see [Appendix A](#))

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This Chapter is the first of a series of chapters contained in the Draft EIS that provide a summary and more in-depth environmental review of the proposal and alternatives. The Draft EIS is organized as follows:

- Chapter 1 Summary
- Chapter 2 Proposal & Alternatives
- Chapter 3 Environment, Impacts, & Mitigation Measures
- Chapter 4 Acronyms & References
- Chapter 5 Appendices



## 1.1 Purpose

The Seattle Transportation Plan (STP) is a 20-year plan for the future of our transportation system. It is informed by thousands of people who live, work, and play in Seattle. It represents the first time the City has comprehensively addressed the needs of all people who use our streets on a citywide scale. Altogether, the STP builds upon the foundation of existing plans and initiatives. The STP identifies new ways to accelerate progress on the things that matter most, like safety, equity, and climate action. It identifies important updates to pedestrian, bicycle, transit, and freight networks, priorities related to people streets and public spaces (PSPS), accessing and managing the curb, and the vehicular network. The plan considers a mix of integrated transportation investments to transform how we move and gather, and ways to improve how travel modes work together. This plan works hand-in-hand with the One Seattle Plan to guide City decisions about where we locate housing and jobs, and where and how we invest in transportation, utilities, parks, and other public assets.

This Environmental Impact Statement (EIS) studies three alternatives illustrating different potential futures for the city’s transportation network considered in the STP. The three alternatives evaluate the effects of potential changes to the transportation network over a 20-year time horizon (to 2044).

The “No Action” alternative is required by the State Environmental Policy Act (SEPA) and serves as the baseline for comparison. The two Action Alternatives (Alternative 2, and Alternative 3—the bookends of a range of potential implementation pathways—apply different transportation policy concepts that are based on community input and intended to respond to issues, challenges, and opportunities for transportation.

To implement the policy concepts in each of the Action Alternatives, the City of Seattle would:

- Engage with community, boards & commissions, elected officials
- Collaborate with agency partners
- Pursue funding opportunities
- Update policy, processes, and guidelines
- Expand staff capacity and training.

The objectives of the proposal are listed in [Section 1.5.1](#) below.

### What is an Alternative?

Alternatives are different ways of achieving objectives that allow decisionmakers to compare the effects of different options. The No Action Alternative is based on current plans, policies, and regulations and is a benchmark against which other alternatives can be measured. Action alternatives serve as bookends and can test a range of ideas, implications, and benefits. The Alternatives in the EIS consider the Seattle Transportation Plan policies and different network configurations to achieve the Plan objectives. Alternatives are conceptual, they provide high-level direction, but are not yet project specific.

The three Alternatives presented here are intended to convey **a range** of reasonable options; it is not intended to consider every possible option. The final STP need not be identical to any single alternative but must be within the range of alternatives considered. The STP can mix and match and pull elements from each alternative. Some information, such as a fiscal analysis, will inform and influence STP but is not included in the EIS.

The following is a summary of the three alternatives, which are described further in [Section 1.5](#) below.

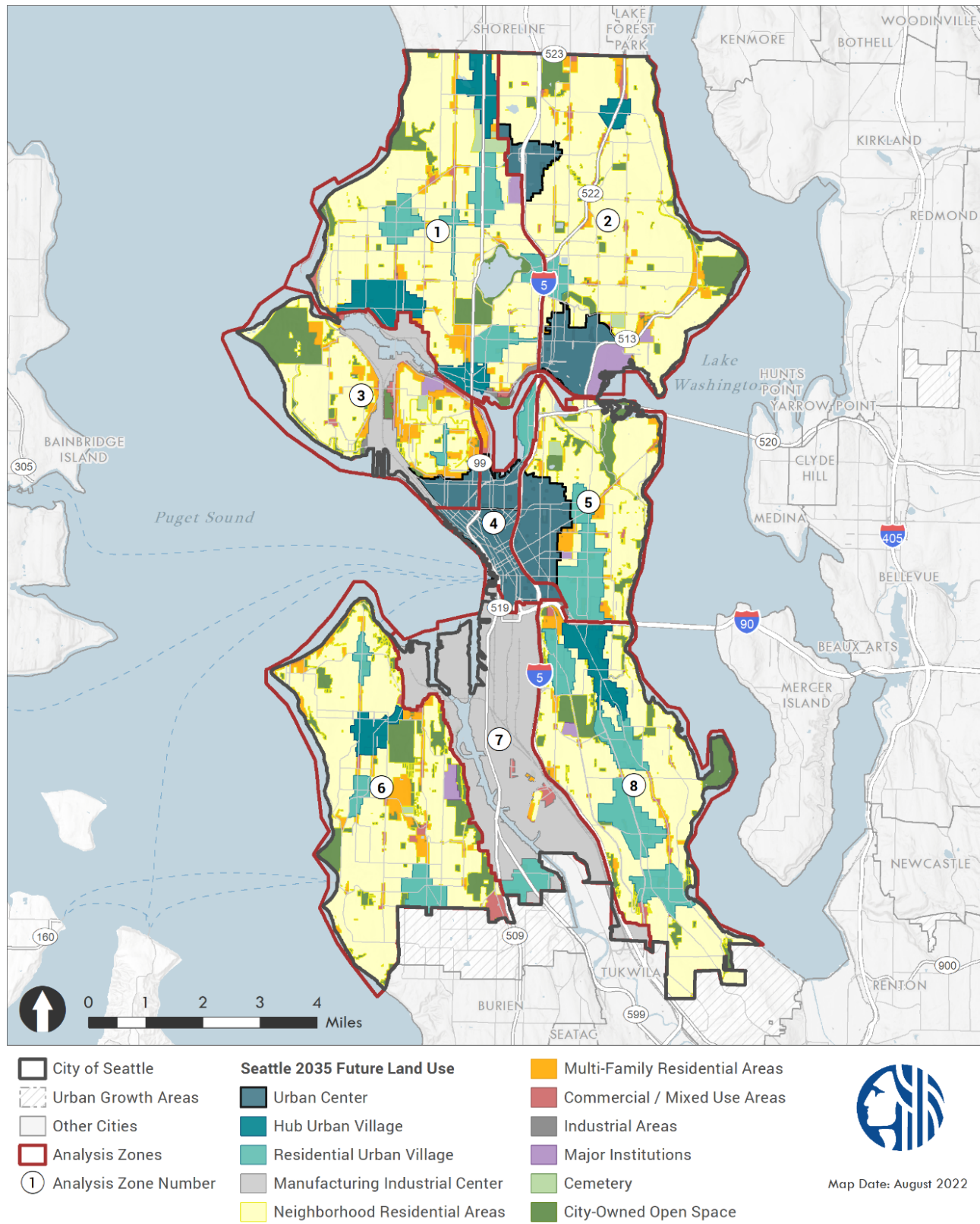
- **Alternative 1—"No Action":** The No Action Alternative is required by SEPA. It describes the future of Seattle's transportation system where the city implements no additional multi-modal or other transportation improvements beyond what is funded today. This alternative focuses on optimizing existing conditions in the transportation system with no new additional dedicated space for transit, pedestrians or bikes. Roadway operations are optimized at key intersections, limited spot safety improvements are made throughout the network, and very limited slow zones are implemented on key pedestrian spaces.
- **Alternative 2—"Moderate Pace":** Alternative 2 envisions a future with moderate growth in funding for new multimodal infrastructure in Seattle's transportation system. This alternative takes a modest approach to expanding pedestrian, bicycle and transit connections. Some space for general purpose vehicular traffic in this alternative would be reprioritized as dedicated spaces for priority modes including some improvements to the public and pedestrian realm. In this alternative, the city implements a modest set of the overarching policies of the Seattle Transportation Plan. These include some areas for a network of People Streets and a moderate number of community & mobility hubs.
- **Alternative 3—"Rapid Progress":** Alternative 3 envisions a future with expanded and enhanced multimodal infrastructure in Seattle's transportation system. This option significantly improves the pedestrian, bicycle, and transit networks. It reprioritizes some general-purpose lanes to dedicated spaces for priority modes—creates more space for all mobility options. This alternative also includes a broad range of improvements to the public and pedestrian realm and additional dedicated space for goods movement through the city. In this alternative, the City fully implements overarching policies of the Seattle Transportation Plan with a wider network of People Streets, electrification infrastructure, a wider range of community & mobility hubs, and also deploys mobility management strategies, in concert with the region.

## 1.2 Study Area

The study area includes the full city limits. The city has been divided into 8 regions based on road and natural features. These 8 regions are delineated in the map below and include:

- EIS Analysis Zone 1 – Northwest Seattle
- EIS Analysis Zone 2 – Northeast Seattle
- EIS Analysis Zone 3 – Queen Anne/Magnolia
- EIS Analysis Zone 4 – Downtown/Lake Union
- EIS Analysis Zone 5 – Capitol Hill/Central District
- EIS Analysis Zone 6 – West Seattle
- EIS Analysis Zone 7 – Duwamish
- EIS Analysis Zone 8 – Southeast Seattle

## Exhibit 1-1. Study Area



Sources: City of Seattle, 2022; BERK, 2022.

## 1.3 Planning Context & Outreach

### 1.3.1 Emerging Factors Affecting Seattle's Transportation Network

The STP addresses the most important factors affecting Seattle's transportation system today and the anticipated needs of the next 20 years. This plan strives to:

- Make the transportation system more equitable.
- Increase safety.
- Foster a clean, sustainable transportation system.
- Strategically link housing and mobility investments.
- Create more low-cost travel options.
- Continue recovery from the COVID-19 pandemic.
- Reflect community priorities in the limited right-of-way.

## 1.4 SEPA Process

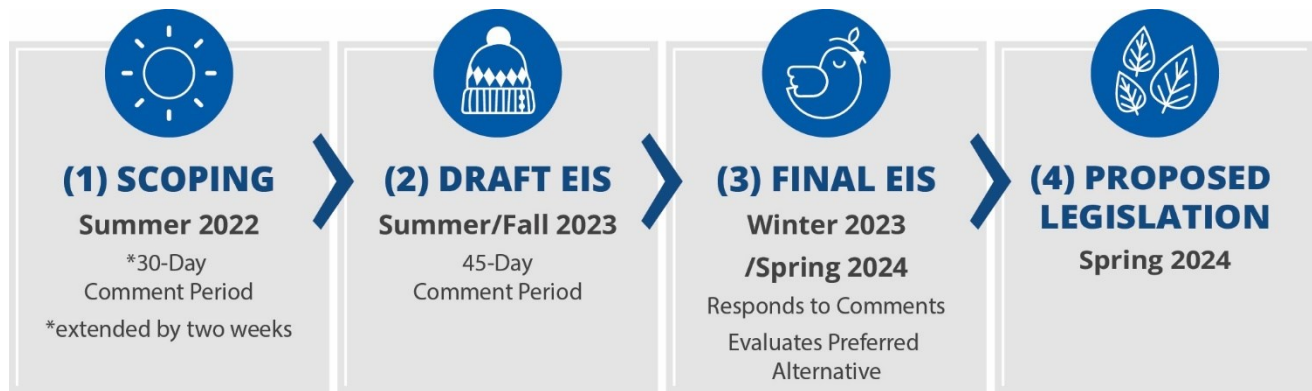
### 1.4.1 Environmental Review

#### Process

Under SEPA agencies conduct environmental review of actions that could affect the environment. For actions that have the potential for significant impacts, preparation of an EIS is required. An EIS is a useful tool that provides detailed information to the public, agencies, tribes, and City decision-makers about the environmental effects of a plan or project before a decision is made.

The EIS process involves the following steps: (1) scoping the contents of the EIS with agencies, tribes, and the public; (2) preparing a draft EIS with a comment period; (3) responding to comments and developing a preferred alternative; and (4) developing legislation. With the issuance of the Draft EIS, the EIS process is in step 2. See Exhibit 1-2.

## Exhibit 1-2. EIS Process



Source: BERK, 2023.

## Non-Project EIS

This document is a non-project EIS that analyzes the proposals and alternatives broadly across the study area. See Exhibit 1-3 below for features of a non-project EIS. SEPA identifies that a non-project EIS is more flexible and studies a range of alternatives comparatively to support the consideration of plans, policies, or programs. (WAC 197-11-442) A non-project EIS does not provide site-specific detailed analysis.

## Exhibit 1-3. Comparison of Project and Non-Project Environmental Review

Feature	Project Environmental Review	Non-Project Environmental Review (WAC 197-11-442, -774)
Location	Site-specific	Areawide
Analysis Level of Detail	Detailed	Broad / order-of-magnitude
Alternatives	Specific construction proposals	Conceptual based on vision
Mitigation	Specific, alters project, project proponent responsibility	Broader; changes policies, plans, or code. City or future developer responsibility.
Future Environmental Review	No additional SEPA review	Subject to additional SEPA Review

Source: WAC 197-11-442, BERK, 2023.



## 1.4.2 Public Comment Opportunities

### Scoping

The scoping process is intended to identify the range of potential significant impacts on the built and natural environment that should be considered and evaluated in the EIS. The City issued a Scoping Notice on June 16, 2022, with a 30-day public comment period, extended by another two weeks, that ran through July 29, 2022. A virtual scoping meeting was held during the comment period on June 21, 2022 at 6:00 p.m. In addition to the opportunity to submit written comments, the City took comments through the Engagement Hub linked on the City's website.

Comments received during the scoping period include:

- Written Comments: 175 commenters
- Online Engagement Hub Comments: 111 comments
- Virtual meeting participants: 8 participants

See [Appendix A](#) for the scoping report.

As part of scoping, the City identified a range of topics to explore in the EIS:

- Air Quality
- Water Resources
- Sea-Level Rise and Climate Change
- Transportation
- Noise
- Land Use Patterns
- Utilities: Electrical Power

Scoping comments indicated that transportation, climate, and land use patterns were most important to address in the EIS. Commenters also gave input on alternatives to be studied, typically by indicating which of the scoping alternatives fit their views of the transportation network of the future or requesting adjustments. In response to the scoping comments the city added an analysis of electric power. A full response to scoping comments can be found in the Scoping Report.

### Draft EIS

This Draft EIS identifies environmental conditions, potential impacts, and measures to reduce or mitigate any unavoidable adverse impacts that could result from an update to the STP. The Draft EIS alternatives and topics were developed based on a review of scoping comments and engagement results.



Public and agency comments are invited on this Draft EIS. Written and verbal comments are invited during the 45-day public comment period following issuance of this Draft EIS. The City will hold future public engagement events during or following the 45-day comment period to help refine its preferred alternative. Public comments will be considered and addressed in the Final EIS. Please see the Fact Sheet at the beginning of this Draft EIS for the dates of the public comment period and public meeting. Meetings and comment periods regarding the proposals are described on the City’s project webpage:

<https://www.seattle.gov/transportation/projects-and-programs/programs/seattle-transportation-plan>

## Final EIS & Proposed Legislation

A Final EIS will be issued in 2024 and will include responses to public comments received during the Draft EIS comment period. Following the EIS process, the City will develop specific policy proposals that will be the subject of public meetings and public hearings by the City Council.

# 1.5 Objectives, Proposal, & Alternatives

## 1.5.1 Objectives (“Goals” in the STP)

SEPA requires a statement of proposal objectives (“Goals” in the STP) and the purpose and need to which the proposal is responding.

Alternatives are different means of achieving objectives.

The proposal would update Seattle’s 20-year Transportation Plan (STP). The objectives behind this proposal are multi-faceted and seek to address the City’s transportation network holistically. The objectives are organized around the six central themes that organize the STP. These themes are: Lead with Transportation Justice; Safety is Central; Climate Action; Connect People and Goods; Streets for People, Places We Love; and Streets that Work, Today and in the Future. See Exhibit 1-4.

### Exhibit 1-4. Objectives of the Proposal

#### Lead with Transportation Justice: Co-Create with community and implement restorative practices to address transportation-related inequities

- TJ1. Center the voices of communities of color and underrepresented groups in our planning and decision-making processes
- TJ2. Address inequities and past harms in our transportation system by prioritizing investments for impacted communities
- TJ3. Ensure everyone can afford to take the trips they need to make

#### Safety is Central: Everyone feels safe traveling in Seattle, and there are no serious injuries or fatal crashes

- S1. Reduce vehicle speeds to increase safety
- S2. Promote safety investments at our most collision-prone locations

S3. Make it safer for everyone traveling in Seattle, particularly users who are walking, biking, rolling, and accessing transit

S4. Provide safer routes to schools, parks, transit, community gathering spaces, and other common destinations

**Climate Action: Respond to climate change with a lens of climate justice to maximize community benefit**

CE1. Improve neighborhood air quality and health outcomes by promoting clean, sustainable travel options

CE2. Green our streets to better handle our changing climate

CE3. Foster neighborhood vitality and improved community health

CE4. Support the transition from fossil fuel to electric vehicles (Evs) for personal, commercial, and delivery trips

CE5. Advance mobility management strategies to improve air quality and encourage transit, walking, and bicycling

**Connect People and Goods: Provide reliable and affordable travel options that help people and goods get where they need to go**

PG1. Create seamless travel connections

PG2. Make walking, biking, and rolling easy and enjoyable travel choices

PG3. Create world-class access to transit and make service more frequent and reliable

PG4. Support economic vitality by accommodating goods movement and growth in deliveries

PG5. Manage curb space to reflect our values and priorities

**Streets for People, Places We Love: Reimagine our streets as inviting places to linger and play**

PP1. Prioritize street space for people while preserving access for goods

PP2. Transform transportation hubs into welcoming community places

PP3. Co-create and enhance public spaces for playing and gathering to improve community health

PP4. Activate public spaces to create a welcoming and age-friendly public realm

**Streets that Work, Today and in the Future: Improve our transportation infrastructure and ready it for the future**

SW1. Transform our system and extend the life of our assets through optimal timing of maintenance and replacement

SW2. Reduce neighborhood disparities in the quality of our streets, sidewalks, public spaces, and bridges

SW3. Ready our streets for new travel options and emerging technologies

Source: Seattle Department of Transportation, Draft Plan, 2023.

## 1.5.2 Proposal

The proposal considers STP policy amendments that could help meet the objectives defined in [Section 1.5.1](#). The EIS includes two multimodal investment alternatives (alternatives 2 and 3) that would make different combinations of multimodal network improvements and degrees of change to existing transportation infrastructure. A “No Action” Alternative is also considered. As the title suggests, it has no changes to existing networks beyond existing commitments and minor spot improvements.



## 1.5.3 Network Concepts

The multimodal investment alternatives (alternatives 2 and 3) would apply proposed network changes that are based on community input and intended to respond to issues, challenges, and opportunities for Seattle's transportation networks. The application of the concepts is provided in areawide maps in [Section 1.5.5](#) through [1.5.8](#).

Five transportation networks (pedestrian, bike, people streets and public space, transit, and freight) are studied with changes integrated to different degrees in the multimodal investment alternatives. Network assumptions studied in each alternative include:

- **General:** Assumptions related to the funding of existing initiatives and committed projects, efficiency via signal optimization, and potential electric vehicle (EV) infrastructure investment.
- **Pedestrian:** Assumptions related to sidewalks throughout the city, including destination streets.
- **Bicycle:** Assumptions related to all bicycle-related facilities, excluding sharrows, and committed projects.
- **PSPS:** Assumptions related to stay healthy streets and pedestrian improvements on destination streets.
- **Transit:** Assumptions related to transit lanes, facilities, and corridors.
- **Community & Mobility Hubs:** Assumptions related to the introduction of community & mobility hubs as outlined in the transit vision network.
- **Freight:** Assumptions related to the street network for trucks.

A description of concept is provided below and following that a full description of each alternative and how it assimilates the mobility concepts.

## General Investments

General assumptions include the funding of existing initiatives and committed projects as well as potential electric vehicle (EV) infrastructure investment. Exhibit 1-5 summarizes the existing plans and initiatives that have already been adopted by Seattle City Council as well as studies, initiatives, and plans developed to guide Seattle’s transportation system.

Implementing **signal optimization** improves the efficiency of traffic operations. Each alternative implements some level of efficiency improvements, but the degree to which these are incorporated varies across the 3 alternatives.

**EV infrastructure investments** include dedicating right-of-way to charging stations, transitioning the City fleet to be zero-emission vehicles, supportive infrastructure for transit agency partners, and policy requirements for EV charging infrastructure with new development.

### Exhibit 1-5. Existing Transportation Plans and Initiatives

YEAR	PLAN
2012	Transit Master Plan (Revised 2016)
2013	Bicycle Master Plan
2015	Vision Zero Action Plan
2016	Freight Master Plan
2017	New Mobility Playbook
	Pedestrian Master Plan
2021	Transportation Electrification Blueprint
2022	Transportation Equity Framework
2023	Climate Response Framework
	Vision Zero Top to Bottom Review
	Transportation Asset Management Plan

Source: City of Seattle, 2023.

## Pedestrian Investments

Seattle’s sidewalk network offers dedicated and safer places for pedestrian traffic across the city. The extent of this network is measured in linear miles, and each alternative offers a different number of sidewalk miles. In addition, crosswalk improvements enhance the safety and comfort of pedestrians when paths cross with vehicular traffic. Each alternative offers a selection of crosswalk improvements, but the extent of these improvements varies across the plans.



Enhanced pedestrian crossing along Linden Avenue. Image source: Seattle Transportation Plan, 2023

## Bicycle Facility Investments

The bicycle network is measured in linear miles of corridors with bike facilities, including multi-use trails, protected bicycle lanes, conventional bicycle lanes that meet “all ages and abilities” guidelines, Healthy Streets, and Neighborhood Greenways. Sharrows are not considered in this calculation. The two action alternatives outline plans to add miles to the existing bike network. Improvements to the bike network can include reallocation of street space for protected bike lanes, enhancing existing bike facilities with additional safety features, and additional accommodations for bike parking.



Protected bike lanes at Green Lake. Image source: Seattle Transportation Plan, 2023

## People Streets and Public Space (PSPS) Investments

People Streets are corridors that provide enhanced, safe, and comfortable walking and rolling environments and access to public spaces, climate-resilient landscapes, transit, and mobility choices. Public Spaces are community-prioritized places in the public realm that invite people to gather, play, and connect with each other and support local businesses (e.g., transit stations, community & mobility hubs). The goals of PSPS investments are to make access to the public right of way more equitable and to encourage the activation of shared spaces. One example of PSPS investments is the network of healthy streets across the city. During the onset of the COVID-19 pandemic in 2020, pedestrian thoroughfares were carved into the existing neighborhood street grid by designating “healthy streets” where nonmotorized users are given the right-of-way and vehicle traffic is prohibited or restricted to local traffic only. The popularity of this program has led to a movement to make these temporary interventions more permanent and expand their presence across Seattle neighborhoods. Each alternative maintains existing and committed PSPS investments. The two action alternatives further expand the street space dedicated to these uses.





Street space reclaimed for public use at Westlake. Image source: Seattle Transportation Plan, 2023

## Transit Investments

Mass public transportation in Seattle is provided by a collection of local and regional service providers that offer light and heavy rail, bus, and streetcar service. Investments include adding bus-only lanes, improvements to make it easier to walk or bike to transit, and upgrades to improve the experience waiting for transit. Each alternative studied in the EIS maintains existing and committed investments to support light rail, bus, and streetcar service improvements. The two action alternatives add to the mileage of dedicated transit corridors, offer bus service expansions, and introduce community & mobility hubs to support transit service (see description below).

## Community & Mobility Hubs

A community & mobility hub is a place where transportation connections, travel information, and community amenities are collocated and coordinated to allow easy transfers between mobility services. Community & mobility hubs also connect with pedestrian and bike networks and incorporate businesses and/or services

that promote vitality and placemaking. Seattle does not currently have intentional community & mobility hubs, and they are not included as part of the No Action Alternative. The two action alternatives, however, integrate community & mobility hubs across Seattle. Alternative 3 also integrates EV charging infrastructure.

## Freight Investments

The freight network highlights the streets well-suited to truck traffic and the movement of goods throughout the city. Alternatives 1 and 2 maintain this network, while Alternative 3 adds 19 miles of dedicated freight and bus lanes.

### 1.5.4 Regulatory Concepts

#### Mobility Management Strategies

Mobility management strategies can employ pricing mechanisms that influence travel choices. They can take a number of different forms such as tolls, per-mile charges, parking pricing, parking taxes, and other charges that help manage travel demand. These types of strategies may be pursued in concert with the region.

#### Implementation of Alternatives

To implement the transportation concepts in each of the Action Alternatives, the City of Seattle would:

- Engage with community, boards & commissions, elected officials
- Collaborate with agency partners
- Pursue funding opportunities
- Update policy, processes, and guidelines
- Expand staff capacity and training

A project list that implements the Preferred Alternative will be generated as part of the STP process and will inform the replacement to the Levy Move Seattle, which expires at the end of 2024.

## 1.5.5 Alternative 1—No Action

The No Action Alternative is required by SEPA. This proposal explores the future of Seattle’s transportation system where the City implements no additional multi-modal or other transportation improvements beyond what is funded today. This alternative focuses on optimizing existing conditions in the transportation system with no new additional dedicated space for transit, pedestrians, or bikes. Roadway operations are optimized at key intersections, limited spot safety improvements are made throughout the network, and very limited slow zones are implemented on key pedestrian spaces.

The table below in Exhibit 1-6 summarizes network, policy, and program changes that would be integrated under Alternative 1 – No Action.

**Exhibit 1-6. Summary of Policy Concepts for Alternative 1**

<b>Alternative 1: No Action</b>	
<b>Summary of Changes to Network by Mode</b>	
<b>Pedestrian</b> <i>linear miles of sidewalk</i>	2,277 linear miles
<b>Bike</b> <i>linear miles of corridors with bike facilities</i>	161 linear miles
<b>PSPS</b> <i>streets with additional pedestrian improvements</i>	29 linear miles
<b>Transit</b> <i>miles of dedicated transit corridor</i>	38 linear miles of dedicated transit corridors, 31 LRT stations, and 75 linear miles of RapidRide corridors.
<b>Freight</b> <i>linear miles of truck streets and corridors with dedicated lanes</i>	218 linear miles of truck streets
<b>Multimodal Improvements</b>	
<b>Transit System Improvements</b> <i>making connections to light rail, serving non-commute trips, serving underserved communities</i>	Limited increases in frequencies for bus routes connecting to light rails (limited additional bus service hours).
<b>Network of People Streets</b> <i>creating space for other modes on city streets and discouraging general purpose traffic on certain corridors</i>	No additional People Streets or Public Spaces beyond the planned 29 linear miles of stay healthy streets.
<b>Complete Streets</b> <i>reprioritizing street space for bikes, transit, sidewalk cafes</i>	No repurposed parking or limited general purpose (GP) traffic outside of existing and funded improvement: 161 linear miles of bike facilities. 29 linear miles of PSPS streets. 38 miles of dedicated transit corridors.

Alternative 1: No Action	
<b>Crosswalk Improvements</b> <i>prioritize safe crossings for people at arterials, highways, and water</i>	Limited crosswalk improvements focused on the safety and comfort of pedestrians at key intersections.
<b>Community &amp; Mobility Hubs</b>	0 community & mobility hubs, with no associated improvements
<b>Add mobility zones</b> <i>slow traffic in designated areas for emerging micromobility devices</i>	Traffic calmed zones at designated areas.
<b>Improvements at Transit Stops</b> <i>improve comfort and safety at transit stops, especially for riders waiting at night</i>	Limited safety improvements for transit stops in and around downtown.
Traffic Operations	
<b>Traffic operations to increase efficiency</b> <i>optimize operations</i>	Signal optimization for transit and GP traffic at key intersections.
Electrification	
<b>Support electric vehicle adoption</b> <i>encourage electric vehicle charging infrastructure in public streets and new private development</i>	No new EV charging requirements for new development and limited EV infrastructure in public streets (assumed best-fit trendline for EV adoption).
Programs	
<b>Mobility management strategies</b> <i>implement additional mobility management strategies, in concert with the region</i>	No additional mobility management strategies.

### 1.5.6 Alternative 2—Moderate Pace

Alternative 2: Moderate Pace envisions a future for Seattle’s transportation system with moderate growth in in and funding for new multimodal infrastructure in Seattle’s transportation system. This alternative takes a moderated approach to expanding pedestrian, bicycle, and transit connections. Some space for general purpose vehicular traffic in this alternative would be reprioritized as dedicated spaces for priority modes including some improvements to the public and pedestrian realm. In this alternative, the City implements many of the overarching policies of the Seattle Transportation plan including some restricted areas for a network of People Streets and a moderate number of community & mobility hubs.

The table below in Exhibit 1-7 summarizes network, policy, and program changes that would be integrated under Alternative 2.



## Exhibit 1-7. Summary of Policy Concepts for Alternative 2

Alternative 2: Moderate Pace	
Summary of Changes to Network by Mode	
<b>Pedestrian</b> <i>linear miles of sidewalk</i>	2,400 linear miles
<b>Bike</b> <i>linear miles of corridors with bike facilities</i>	214 linear miles
<b>PSPS</b> <i>streets with additional pedestrian improvements</i>	376 linear miles
<b>Transit</b> <i>miles of dedicated transit corridor</i>	71 linear miles of dedicated transit corridors, 31 LRT stations, and 75 linear miles of RapidRide corridors.
<b>Freight</b> <i>linear miles of truck streets and corridors with dedicated lanes</i>	218 linear miles of truck streets
Multimodal Improvements	
<b>Transit System Improvements</b> <i>making connections to light rail, serving non-commute trips, serving underserved communities</i>	Somewhat more frequent bus service connecting to light rail connections and increased off-peak bus frequency (some additional bus service hours).
<b>Network of People Streets</b> <i>creating space for other modes on city streets and discouraging general purpose traffic on certain corridors</i>	29 linear miles of stay healthy streets (limited traffic) 46 linear miles of destination streets
<b>Complete Streets</b> <i>reprioritizing street space for bikes, transit, sidewalk cafes</i>	Some additional repurposed parking areas and GP traffic lanes as part of: 214 linear miles of bike facilities. 74 linear miles of PSPS streets. 71 miles of dedicated transit corridors.
<b>Crosswalk Improvements</b> <i>prioritize safe crossings for people at arterials, highways, and water</i>	Crosswalk improvements focused on the safety and comfort of pedestrians along major arterial roadways including principal and county arterials.
<b>Community &amp; Mobility Hubs</b>	52 community & mobility hubs with multimodal improvements.
<b>Add mobility zones</b> <i>Slow traffic in designated areas for emerging micromobility devices</i>	Traffic calmed zones at designated areas around 69 community & mobility hubs in the city of Seattle.
<b>Improvements at Transit Stops</b> <i>improve comfort and safety at transit stops, especially for riders waiting at night</i>	Moderate safety improvements for transit stops near light rail stations and along RapidRide lines.

Alternative 2: Moderate Pace	
Traffic Operations	
<b>Traffic operations to increase efficiency</b> <i>optimize operations</i>	Signal optimization for GP traffic and transit on all major arterials and improvements to reduce congestion at key intersections.
Electrification	
<b>Support electric vehicle adoption</b> <i>encourage electric vehicle charging infrastructure in public streets and new private development</i>	No new EV charging requirements for new development and limited EV infrastructure in public streets (assumed best-fit trendline for EV adoption).
Programs	
<b>Mobility management strategies</b> <i>implement additional mobility management strategies, in concert with the region</i>	No additional mobility management strategies.

### 1.5.7 Alternative 3—Rapid Progress

Alternative 3—Rapid Progress envisions a future for Seattle’s transportation system with strong growth in and funding for new multimodal infrastructure in Seattle’s transportation system. The focus of this alternative is expanding pedestrian, bicycle and transit connections. This alternative also includes a broad range of improvements to the public and pedestrian realm and additional dedicated space for goods movement through the city. In this alternative, the city fully implements overarching policies of the Seattle Transportation plan with car-free streets, electrification infrastructure, a wider range of community & mobility hubs, and imposes mobility management strategies, in concert with the region.

The table below In Exhibit 1-8 summarizes network, policy, and program changes that would be integrated under Alternative 3.

**Exhibit 1-8. Summary of Policy Concepts for Alternative 3**

Alternative 3: Rapid Progress	
Summary of Changes to Network by Mode	
<b>Pedestrian</b> <i>linear miles of sidewalk</i>	3,125 linear miles
<b>Bike</b> <i>linear miles of corridors with bike facilities</i>	546 linear miles
<b>PSPS</b> <i>streets with additional pedestrian improvements</i>	1,384 linear miles
<b>Transit</b> <i>miles of dedicated transit corridor</i>	161 linear miles of dedicated transit corridors, 31 LRT stations, and 75 linear miles of RapidRide corridors.

<b>Alternative 3: Rapid Progress</b>	
<b>Freight</b> <i>linear miles of truck streets and corridors with dedicated lanes</i>	218 linear miles of truck streets of which 19 miles are shared freight- and bus lanes
<b>Multimodal Improvements</b>	
<b>Transit System Improvements</b> <i>making connections to light rail, serving non-commute trips, serving underserved communities</i>	Much more frequent bus service connecting to light rail and increased off-peak service (more additional bus service hours).
<b>Network of People Streets</b> <i>creating space for other modes on city streets and discouraging general purpose traffic on certain corridors</i>	29 linear miles of stay healthy streets (limited traffic) 46 linear miles of destination streets 29 linear miles of strolling streets 2 linear miles of event streets
<b>Complete Streets</b> <i>reprioritizing street space for bikes, transit, sidewalk cafes</i>	More additional repurposed parking area and GP traffic lanes as part of: 546 linear miles of bike facilities. 105 linear miles of PSPS streets. 161 miles of dedicated transit corridors.
<b>Crosswalk Improvements</b> <i>prioritize safe crossings for people at arterials, highways, and water</i>	Crosswalk improvements focused on the safety and comfort of pedestrians along all classified roadways, including minor and collector arterials.
<b>Community &amp; Mobility Hubs</b>	105 community & mobility hubs with EV infrastructure and multimodal improvements.
<b>Add mobility zones</b> <i>slow traffic in designated areas for emerging micromobility devices</i>	Traffic calmed zones at designated areas around 105 community & mobility hubs in the city of Seattle.
<b>Improvements at Transit Stops</b> <i>improve comfort and safety at transit stops, especially for riders waiting at night</i>	More safety improvements for transit stops along the entire transit system, particularly on high-ridership bus lines.
<b>Traffic Operations</b>	
<b>Traffic operations to increase efficiency</b> <i>optimize operations</i>	Signal optimization for GP traffic and transit on all classified roadways, and improvements to reduce congestion at key intersections.
<b>Electrification</b>	
<b>Support electric vehicle adoption</b> <i>encourage electric vehicle charging infrastructure in public streets and new private development</i>	More EV charging infrastructure required in new development and additional EV infrastructure at 105 community & mobility hubs (assumed best-fit trendline for EV adoption +15%).
<b>Programs</b>	
<b>Mobility management strategies</b> <i>implement additional mobility management strategies, in concert with the region</i>	Introduce additional mobility management strategies, in concert with the region.

## 1.5.8 Comparison of Alternatives

Exhibit 1-9 below summarizes the three alternatives studied in this EIS. In summary, the alternatives are arranged with an increasing degree of investment in multimodal transportation modes, with Alternative 3 having the greatest degree of change. A legislative proposal will be developed once the EIS process is complete which will likely be a hybrid of the alternatives described below.

**Exhibit 1-9. Summary of STP Alternatives**

	Alternative 1: No Action	Alternative 2: Moderate Pace	Alternative 3: Rapid Progress
<b>Summary of Changes to Network by Mode</b>			
<b>Pedestrian</b> <i>linear miles of sidewalk</i>	2,277 linear miles	2,400 linear miles	3,125 linear miles
<b>Bike</b> <i>linear miles of corridors with bike facilities</i>	161 linear miles	214 linear miles	546 linear miles
<b>PSPS</b> <i>streets with additional pedestrian improvements</i>	29 linear miles	376 linear miles	1,384 linear miles
<b>Transit</b> <i>miles of dedicated transit corridor</i>	38 linear miles of dedicated transit corridors, 31 LRT stations, and 75 linear miles of RapidRide corridors.	71 linear miles of dedicated transit corridors, 31 LRT stations, and 75 linear miles of RapidRide corridors.	161 linear miles of dedicated transit corridors, 31 LRT stations, and 75 linear miles of RapidRide corridors.
<b>Freight</b> <i>linear miles of truck streets and corridors with dedicated lanes</i>	218 linear miles of truck streets	218 linear miles of truck streets	218 linear miles of truck streets of which 19 miles are shared freight- and- bus lanes
<b>Multimodal Improvements</b>			
<b>Transit System Improvements</b> <i>making connections to light rail, serving non-commute trips, serving underserved communities</i>	Limited increases in frequencies for bus routes connecting to light rails (limited additional bus service hours).	Somewhat more frequent bus service connecting to light rail connections and increase off-peak bus frequency (some additional bus service hours).	Much more frequent bus service connecting to light rail and increased off-peak service (more additional bus service hours).

	Alternative 1: No Action	Alternative 2: Moderate Pace	Alternative 3: Rapid Progress
<b>Network of People Streets</b> <i>creating space for other modes on city streets and discouraging general purpose traffic on certain corridors</i>	No additional People Streets or Public Spaces on 29 linear miles of stay healthy streets.	29 linear miles of stay healthy streets (limited traffic). 46 linear miles of destination streets	29 linear miles of stay healthy streets (limited traffic). 46 linear miles of destination streets 29 linear miles of strolling streets 2 linear miles of event streets
<b>Complete Streets</b> <i>reprioritizing street space for bikes, transit, sidewalk cafes</i>	No repurposed parking or limited GP traffic outside of existing and funded improvement: 161 linear miles of bike facilities. 29 linear miles of PSPS streets. 38 miles of dedicated transit corridors.	Some additional repurposed parking areas and GP traffic lanes for as part of: 214 linear miles of bike facilities. 74 linear miles of PSPS streets. 71 miles of dedicated transit corridors.	More additional repurposed parking area and GP traffic lanes as part of: 546 linear miles of bike facilities. 105 linear miles of PSPS streets. 161 miles of dedicated transit corridors.
<b>Crosswalk Improvements</b> <i>prioritize safe crossings for people at arterials, highways, and water</i>	Limited crosswalk improvements focused on the safety and comfort of pedestrians at key intersections.	Crosswalk improvements focused on the safety and comfort of pedestrians along major arterial roadways including principal and county arterials.	Crosswalk improvements focused on the safety and comfort of pedestrians along all classified roadways, including minor and collector arterials.
<b>Community &amp; Mobility Hubs</b>	0 community & mobility hubs, with no associated improvements.	52 community & mobility hubs with multimodal improvements.	105 community & mobility hubs with EV infrastructure and multimodal improvements
<b>Add mobility zones</b> <i>slow traffic in designated areas for emerging micromobility devices</i>	Very limited traffic calmed zones at designated areas.	Some traffic calmed zones at designated areas around 69. Community & mobility hubs in the city of Seattle.	More traffic calmed zones at designated areas around 105. Community & mobility hubs in the city of Seattle.
<b>Improvements at Transit Stops</b>	Limited safety improvements for	Moderate safety improvements for	More safety improvements for

	Alternative 1: No Action	Alternative 2: Moderate Pace	Alternative 3: Rapid Progress
<i>improve comfort and safety at transit stops, especially for riders waiting at night</i>	transit stops in and around downtown.	transit stops near light rail stations and along RapidRide lines.	transit stops along the entire transit system, particularly on high-ridership bus lines.
<b>Traffic Operations</b>			
<b>Traffic operations to increase efficiency</b> <i>optimize operations</i>	Signal optimization for transit and GP traffic at key intersections.	Signal optimization for GP traffic and transit on all major arterials and improvements to reduce congestion at key intersections.	Signal optimization for GP traffic and transit on all classified roadways, and improvements to reduce congestion at key intersections.
<b>Electrification</b>			
<b>Support electric vehicle adoption</b> <i>encourage electric vehicle charging infrastructure in public streets and new private development</i>	No new EV charging requirements for new development and limited EV infrastructure in public streets (assumed best-fit trendline for EV adoption).	No new EV charging requirements for new development and limited EV infrastructure in public streets (assumed best-fit trendline for EV adoption).	More EV charging infrastructure required in new development and additional EV infrastructure at 105 community & mobility hubs (assumed best-fit trendline for EV adoption +15%).
<b>Programs</b>			
<b>Mobility Management Strategies</b> <i>implement additional mobility management strategies, in concert with the region</i>	No additional mobility management strategies.	No additional mobility management strategies.	Introduce additional mobility management strategies, in concert with the region.

## 1.6 Key Issues & Options

The key issues facing decision makers include:

- Creation of a network concept that meets objectives of the plan to create an equitable, livable, inclusive, and climate resilient community.
- Approval of a Transportation Plan including a vision, goals, and policies that fulfills Seattle's vision and meets state and regional requirements.

## 1.7 Summary of Impacts & Mitigation Measures

### 1.7.1 Air Quality

#### How did we analyze Air Quality?

We collected data from the following sources to support analysis of existing air quality conditions and potential effects of the project alternatives:

- U.S. Environmental Protection Agency (EPA) Greenbook (EPA 2021)
- Puget Sound Clean Air Agency (PSCAA) and Ecology Air Monitoring Network
- 2016-2021 PSCAA Air Quality Data Summaries (PSCAA)

The analysis of potential impacts from the STP is a qualitative assessment based on efficiency indicators and performance metrics such as travel mode, access to transit, access to pedestrian network, access to jobs, personal vehicle and freight electrification. Analysis also included a map of health disparities in the region to identify communities experiencing a disproportionate share of environmental health burdens and that will need more assistance to reach equitable outcomes.

Four sites within the City were monitored from 2019 to 2021 to provide baseline data on ambient air quality conditions and to compare criteria pollutant levels to current NAAQS (National Ambient Air Quality Standards).

The thresholds of significance consider if the alternative would result in a change to land use patterns or development intensities that is inconsistent with state, regional, and local policy goals, and if the alternative would prevent or deter achieving NAAQS for criteria pollutants.

#### What impacts did we identify?

The analysis found that ambient air conditions of monitored pollutants in the study area met the NAAQS under existing conditions, when excluding wildfire smoke. The Puget Sound region is currently in attainment for all six criteria pollutants (CO, PM, NO<sub>2</sub>, O<sub>3</sub>, VOCs, SO<sub>2</sub> and lead), meaning that levels of these pollutants are below the maximum threshold set by the EPA.

Compared to existing conditions, transportation-related emissions are expected to be lower in the future due to improvements of fuel economy in compliance with federal and state compliance policies.

The future growth of the Puget Sound region indicates an increase of CO, PM<sub>2.5</sub> and ozone emissions, which could lead to future challenges meeting the NAAQS. Citywide vehicle miles traveled (VMT) are expected to increase with population growth; see below for discussions of how each alternative affects VMT reduction.





Future improvements to the transportation system under any alternative would result in similar construction-related impacts, including emissions generated during construction activities, worker vehicle and truck emissions, and fugitive dust emissions from earth-disturbing activities.

The proposal and alternatives are consistent with regional planning and long-term planning goals of the Growth Management Act, Vision 2050's multicounty planning policies, and City's Comprehensive Plan. Alternatives 1, 2, and 3 are also consistent with King County Countywide Planning Policies that promote development and transportation patterns that minimize air pollution and GHG emissions. Implementation of the transportation plan projections will be done in accordance with the SDOT Transportation Equity Program.

## **What is different among the alternatives?**

The action alternatives would reduce air pollutant and GHG emissions below existing conditions. The relative difference in the magnitude of emission reduction is attributed to efforts to reduce VMT through pedestrian facilities, bicycle improvements, transit improvements, land use mix and compactness, mobility management strategies, and EV penetration. No Action would result in the fewest emissions reduction features with respect to VMT and EV penetration when compared to other alternatives. Alternative 2 would see moderate growth in the multimodal infrastructure, which would result in greater emissions reduction features than Alternative 1 with respect to VMT, but fewer emissions reductions features than Alternative 3. Alternative 3 would see the strongest growth in funding for multimodal infrastructure and expansion of pedestrian, bicycle, and transit connections. Alternative 3 would result in the greatest emissions reduction features with respect to VMT and electric vehicle adoption.

## **What are some solutions or mitigation for impacts?**

Future development under the alternatives would be implemented while benefiting from ongoing improvements in vehicle emissions control, fuel economy, technology improvements, and likely enhancements to codes and policies that guide energy efficiency.

To further mitigate the impact of emissions on sensitive land uses near highways or other high-traffic roadways, building standards could integrate higher-efficiency ventilation systems into HVAC systems to improve indoor air quality. These ventilation systems could filter finer particulate matter; EPA recommends higher efficiency filters with a MERV rating of 13 or higher for HVAC filtration.

## **With mitigation, what is the ultimate outcome?**

Improvements in the transportation network under all three alternatives would result in VMT reduction through the addition of multi-modal facilities and land use policy. In addition, implementation of the proposal, regardless of alternative, would result in increases in EV charging infrastructure, supporting the transition to zero emission vehicles. Changes to the transportation network and city policy that would result in the greatest emissions reduction features with respect to VMT and electric vehicle adoption are greatest in Alternative 3, followed by Alternative 2, with the fewest emissions reduction features in Alternative 1. No significant unavoidable adverse impacts are identified with respect to criteria pollutant emissions.



## 1.7.2 Water Resources

### How did we analyze Water Resources?

We conducted a desktop analysis of existing information sources to characterize current conditions for water quality, locations of water resources within project limits, including wetlands and floodplains. We then analyzed impacts for all alternatives. Mitigation measures were determined based on city, state, and federal regulations, codes, plans, and policies. Water resources scientists used best professional judgement to determine how each alternative would affect water resources. Thresholds of significance used in the impact analysis include pollution generating impervious surface (PGIS) thresholds and groundwater quality.



Duwamish River

### What impacts did we identify?

Changes to the transportation networks under the studied alternatives do not result in significant impacts in terms of PGIS that would degrade surface or ground water quality. All three Alternatives include replacement of PGIS and addition of non-pollution generating impervious surface (NPGIS) areas. However, the addition of PGIS or NPGIS reduces the available land for groundwater recharge. More frequent flooding and higher peak flows result from the removal of these vegetated areas.

Vehicular traffic is a source of pollutants that can negatively impact waterways for all three alternatives. Pollutant sources from cars include emissions, particulates from tire, brake, and pavement wear, chemicals discharged by motor vehicles including motor oil, and heavy metals and other pollutants emitted as exhaust. Without treatment, rainwater carries these pollutants into local waterways. To help alleviate impacts from these pollutants, pollution generating hard surfaces (roadways) can be replaced with non-pollution generating hard surfaces (sidewalks) and converted pervious surfaces (landscaped areas). Converted pervious surfaces provide more opportunity for infiltration and groundwater recharge, adding a level of pretreatment and reducing the runoff entering the City sewer systems.

### What is different among the alternatives?

The alternatives differ in the amount of area subject to new or replaced PGIS or NPGIS. Without mitigation, alternatives with additional impervious surfaces will have an adverse impact on water quality and flow control. These additional impervious areas can increase runoff, impact sensitive wetlands or other surface waters directly, or result in additional runoff where combined sewer is already capacity constrained. Capacity constrained systems are typically the public drainage systems, mostly the ditch and culvert systems. A very small part of the combined sewer in South Park is the only section noted in the Stormwater Code and Manual.

Alternatives 2 and 3 create a significant amount of new sidewalk NPGIS, particularly in NW Seattle where there are capacity constrained combined sewer systems that would require flow control to mitigate increases in peak flow. The improvements in Alternatives 2 and 3 would have a moderate impact in terms of increased peak flow, but those impacts would be mitigated by flow control measures. Alternatives 2 and 3 also include extensive transit improvements and potential for roadway reconstruction to accommodate dedicated transit lanes and more frequent transit surface. Alternative 2 would have no significant adverse impacts on water quality beyond existing concerns. Regarding Alternative 3, the transit network improvements results in replacement of existing hard surface PGIS that exceed the 10,000 square-foot threshold for PGIS replacement in the City's Stormwater code, which would likely require water quality treatment and flow control mitigation.

## **What are some solutions or mitigation for impacts?**

Alternatives 2 and 3 include better access to alternative modes of transportation, which result in less vehicle traffic and provides a net benefit to water quality. To help alleviate impacts from pollutants, converted pervious surfaces will provide more opportunity for infiltration and groundwater recharge, adding a level of pretreatment and reduction in the runoff entering the City sewer systems.

Additional impervious surfaces and replaced impervious surfaces produced in Alternatives 2 and 3 must be mitigated through water quality and flow control measures, such as oil control, phosphorous treatment, enhanced treatment, removal of suspended solids/basic treatment, and infiltration or detention to control the discharge rate, flow duration, or both. Because of this requirement, impacts from both Alternatives 2 and 3 are anticipated to be fully mitigated due to the large quantity of impervious area being added or replaced.

Other mitigation measures could include additional water quality measures for treatment in areas that currently do not have one. The City could also seek opportunities to combine projects in the plan with opportunities to improve existing capacity constrained combined sewers for additional added benefit to water quality. An approved landscape management plan (LMP) could be used as an alternative to remove pollutants and reduce flow volumes.

Improvements to the PSPS network can potentially provide additional opportunities for stormwater treatment in areas where additional landscaping green spaces can be used to create an added benefit of less impervious surfaces along with new treatment opportunities for PGIS that remains. However, green stormwater infrastructure (GSI) such as specially designed landscaping requires regular maintenance to ensure runoff is being properly treated.

Pervious pavement is a potential mitigation measure to offset the added NPGIS. While these systems reduce the size of required flow control facilities, the systems require regular and substantial maintenance to properly function.

## **With mitigation, what is the ultimate outcome?**

Under all proposed alternatives, any transportation improvements involving construction of new infrastructure will require compliance with all applicable regulations to avoid, minimize, or mitigate any

impacts to water resources. Development will need to meet stormwater requirements to protect surface and groundwater from increased flow or water quality impacts. Therefore, no significant unavoidable adverse impacts are anticipated on water resources under any of the proposed alternatives.



### 1.7.3 Sea-Level Rise/Climate Change

#### How did we analyze Sea-Level Rise/Climate Change?

We conducted a desktop analysis of existing information sources to support analysis of existing greenhouse gas (GHG) emissions and potential impacts of the project alternatives. Mitigation measures were determined based upon city, state, and federal regulations, codes, plans, and policies. Thresholds of significance used include consistency with goals related to the Growth Management Act (GMA), regional planning, and local policies, as well as vulnerability of transportation infrastructure to sea-level rise.

#### What impacts did we identify?

All alternatives are consistent with the planning goals in the GMA, Vision 2050 multicounty climate policies to reduce the impact of sea-level rise and greenhouse gases, and King County countywide planning policies to reduce GHG emissions, limit VMT, and expand use of zero emission vehicles.

Short-term impacts could result from GHGs during the construction of new and improvement of existing transportation infrastructure. These temporary emissions would not represent an ongoing burden to the City's inventory. However, the cumulative impact would contribute to GHG emissions within the city. Longer-term impacts may result from transportation-related emissions. However, emissions would be lower for all alternatives when compared to existing conditions due to improvements in fuel economy.

Transportation infrastructure located in coastal and low-lying areas are more vulnerable to sea-level rise, with pavement and structures as most vulnerable. Among all three alternatives, very limited sections of the transportation network would be vulnerable to sea-level rise based on the high end of sea-level rise projections provided by Seattle Public Utilities.

## What is different among the alternatives?

The alternatives differ in the level of support for implementation of policies and goals. The No Action Alternative would not support the achievement of climate goals in terms of VMT reduction to the same degree as Alternatives 2 or 3. Compared to Alternative 1, Alternatives 2 and 3 would prioritize investments that contribute to GHG reductions, with more features that would lower VMT. Alternatives 2 and 3 would also provide greater implementation of policies with more transit and multimodal improvements that can support compact development and encourage modes of travel other than driving and more electrification infrastructure. The mode shift under Alternatives 2 and 3 would better support the City's climate action goals of 20% VMT reduction.

Alternative 1 would likely result in a moderate impact to GHG emissions by 2044. However, overall GHG emissions would be lower in both Alternatives 2 and 3 compared to Alternative 1, with Alternatives 2 and 3 offering more VMT reduction factors than Alternative 1.

Alternative 3 would see denser development combined with a mix of land uses that is likely to support compact and transit-oriented development. Improvements to the transportation network would result in greater emissions reduction features than Alternatives 1 and 2, with more multimodal infrastructure that is likely to reduce VMT and more EV infrastructure. Alternative 3 would advance electrification through changes in policy and regulation than Alternatives 1 and 2.

Regarding transportation infrastructure vulnerable to sea-level rise, Alternative 3 would see nearly 14 more linear miles of sidewalk at risk of five feet of sea-level rise, as compared to Alternatives 1 and 2. These pedestrian facilities are primarily in low lying coastal areas and along the Duwamish River in SODO, Harbor Island, South Park, and Georgetown, representing a moderate adverse impact.

## What are some solutions or mitigation for impacts?

The incorporated plan features of the STP include "Key Moves" to mitigate the effects of climate change and reduce GHG emissions. These strategies are aimed at reducing vehicle trips through incentives, development regulation, and supporting transit-oriented design (TOD), along with localized neighborhood-based strategies. Other policy features include a commitment to expanded green infrastructure that may help mitigate the effects for more frequent flooding and sea-level rise on transportation infrastructure.

The City's 2013 Climate Action Plan (CAP) and 2018 Climate Action Strategy offer goals and actions to protect the City from the effects of climate change. In 2019, the City adopted an Electric Vehicle Readiness ordinance to encourage EV adoption, which was implemented through changes to the city's land use code requiring EV-ready parking spaces as part of new development. The City of Seattle also has an explicit goal of a 100% fossil fuel free municipal fleet by 2030.

Other mitigation measures focus on reducing VMT and emissions through improvements to the transportation system and incentives to support mode shift and electrification. The City could also implement transportation demand management strategies beyond the City's current policies, such as expanded

commute trip reduction programs, expanded bike and scooter share programs, more conveniently located bicycle parking, and expanded subsidized ORCA programs.

Potential measures to mitigate impacts of sea-level rise to vulnerable transportation infrastructure include elevated infrastructure, relocation of infrastructure to further inland, improved drainage systems, and planting coastal vegetation to help reduce erosion and protect against storm surges.

## With mitigation, what is the ultimate outcome?

Changes to the transportation network and City policy would result in emission reduction features with respect to VMT and electrical vehicle adoption. All alternatives include small sections of the bike, pedestrian and transit networks that would be vulnerable to five feet of sea-level rise, a moderate but not significant impact, as these represent under 1% of the networks across all alternatives. With the implementation of minimization and mitigation measures, no significant unavoidable adverse impacts are anticipated with respect to sea-level rise and GHG emissions for all alternatives.

### 1.7.4 Noise

#### How did we analyze Noise?

A desktop survey using handbooks and guidance, local and state code, and regional monitoring systems was used to determine locations of noise sensitive land uses in the project area. Six sites within the City were monitored to provide site-specific baseline data on existing average annual noise levels for the analysis. Eight subareas were defined to provide additional analysis on predominant noise sources in that subarea, approximate noise levels, and overall environmental effect.

After describing existing noise levels and the methods used for impact analysis, each alternative was analyzed to determine the effects on noise sensitive land uses within the project area. This includes primarily increased noise levels associated with increases in traffic and potential noise associated with construction and stationary industrial activities. Thresholds of significance used include consistency with goals related to the GMA, regional planning, and local policies, as well as future traffic noise levels of 10 dBA or more above existing noise conditions.



#### What impacts did we identify?

All alternatives are consistent with the planning goals in the GMA, Vision 2050 multicounty planning policies, and King County Countywide Planning Policies. The alternatives aim to reduce impacts to vulnerable populations and prevent or mitigate the effect of pollutants, such as noise, that contribute to environmental health disparities. The alternatives are not likely to have a significant effect in areas that are



disproportionately affected by transportation noise, as the largest transportation sources in those areas are highway and airport traffic.

Under all alternatives, there would be temporary impacts in noise during construction associated with the expansion of transportation infrastructure, which may affect nearby noise sensitive land uses. These construction activities would primarily occur in urban areas, where noise and vibrations would be less noticeable; impact equipment would be restricted to daytime hours.

All alternatives would expand the dedicated transit corridors and RapidRide corridor network in the City. Transit improvements and increased transit frequencies will lead to increases in noise levels. Newly constructed (or modified) dedicated transit lanes (bus or streetcar) could increase transit vehicle noise along transit corridors. A reduction in VMT per capita throughout the City is expected for all Alternatives, which could help offset any noise increases from additional bus/transit volumes. However, dedicated transit lane projects could result in an increase in ambient noise levels at adjacent noise-sensitive land uses (e.g., residential), resulting in potential moderate noise impacts. Mitigation is identified below to reduce this impact.

All alternatives include ST3 Sound Transit Link Light Rail Extensions. Light rail train pass-bys, bus access/trips, vehicle parking, and community & mobility hubs at transit stations can result in increased ambient noise levels and a moderate noise impact. Mitigation to reduce this impact is identified below.

## **What is different among the alternatives?**

With transit improvement and increased transit frequencies, Alternative 2 and 3 will lead to higher increases in noise levels as compared to Alternative 1. Alternative 3 includes transit improvements across a much larger area of the city and has the greatest potential extent of roadway reconstruction compared to other alternatives. As a result, Alternative 3 has more potential for temporary noise impacts during construction.

Many of the proposed transit corridors and community & mobility hubs in Alternatives 2 and 3 are near major traffic noise sources, such as highways and major arterials. Potential noise impacts from community & mobility hubs in these areas would be minimal as traffic on these roadways is the primary noise source with relatively high noise levels. Thus, noise from community & mobility hubs and transit improvements within close proximity of these roadways would be minimal and have a very small contribution to increases in overall noise levels.

## **What are some solutions or mitigation for impacts?**

Incorporated in the plan are the following mitigation features:

- Inclusion of circulation routes for non-motorized travel to reduce motorized traffic and associated noise.
- Incentivizing the use of transit and discouraging the use of single-occupancy vehicles, reducing overall traffic volumes and associated noise.
- Expanded sidewalks and people spaces, creating greater separation between sensitive uses and vehicular traffic and a decrease in exterior noise levels.

City noise regulations establish exterior sound level limits for various land use zones with the limits varying depending on the source zone and the receiving zone. These limits are intended to result in acceptably low interior noise levels for residences and other sensitive noise receptors. City noise regulations also address construction noise, limiting the times during the day when construction noise, both impact and non-impact, can exceed exterior noise limits.

Transportation noise emanating from mobile vehicles and rail/transit sources are governed by FHWA, FTA, and WSDOT and employ maximum noise level limits for combustion engines and tire noise for various vehicle/engine types. In addition, federal agencies (e.g., FHWA) and WSDOT also mandate transportation noise thresholds and methodologies to evaluate and provide abatement for traffic noise impacts for established land uses.

Other mitigation efforts could include the following:

- An update to the Seattle Noise Ordinance to require best practices for noise control, such as “quiet” pile-driving technology and usage of temporary sound walls or cushion blocks to dampen impact noise.
- A requirement for individual transit projects to prepare a Noise Study to evaluate and mitigate noise impacts to adjacent noise-sensitive uses, with abatement measures that could include construction of sound walls, berms, or the provision of upgraded windows at residences.
- The use of noise-reducing paving materials (e.g., rubberized asphalt) in full roadway construction to reduce road noise.

## **With mitigation, what is the ultimate outcome?**

The potential increases in noise are not expected to exceed 3 dBA over existing conditions. With the application of mitigation measures described above, no significant unavoidable adverse noise impacts would occur under any of the alternatives.

## 1.7.5 Land Use



### How did we analyze Land Use?

The EIS uses an inventory of existing land uses based on parcel level GIS data provided by the City. State, regional, and local land use policies were also reviewed and evaluated. Mitigation measures were determined based upon city, state, and federal regulations, codes, plans, and policies. Thresholds of significance used include consistency with goals related to the GMA, regional planning, and local policies; compatibility with current and future land use; effects on increasing displacement risk; and access to community assets.

### What impacts did we identify?

All alternatives would focus the majority of future growth into urban centers and villages currently characterized by higher densities, more compact building forms, and a more diverse mix of uses than other areas of the City. All alternatives would include projects that invest in and improve the transportation network, including pedestrian, transit, and bicycle infrastructure improvements.

All alternatives are consistent with the planning goals of the Growth Management Act, Vision 2050, King County Countywide Planning Policies, and local goals. No policy inconsistency is identified across the three alternatives including the No Action alternative.



Alternative 1 has the potential to result in significant adverse impacts with respect to land use compatibility and access to community assets. These impacts are primarily due to the lower level of transportation improvements to support future land use growth compared to Alternatives 2 and 3. No other potential significant adverse land use impacts are identified for any of the alternatives.

## **What is different among the alternatives?**

The alternatives differ in the level of investment in the transportation infrastructure. The analysis showed Alternative 1 has adverse impacts on land use compatibility. Alternatives 2 and 3 have no adverse impacts. Alternatives 2 and 3 both anticipate more investments in transportation improvements in areas of planned growth than Alternative 1. Alternatives 2 and 3 support both land use compatibility and increase access to community assets.

Alternative 1 would effectively be an intensification of existing transportation conditions and committed projects. It assumes no additional EV infrastructure, no community & mobility hubs, and no additional PSPS. With the Comprehensive Plan Action Alternative 5 distributing more growth to a greater number of locations and in a denser land use pattern citywide, the No Action Alternative has the potential for an adverse impact on future land use compatibility due to the limited scope of future transportation investments and lack of transportation integration with the new Neighborhood Centers and Corridors described in Alternative 5. There is an adverse impact associated with limited access to community assets in specific subareas.

Alternatives 2 and 3 are more supportive of the future land use pattern envisioned in the Seattle Comprehensive Plan EIS Alternative 5 Future, with a more complete bicycle, transit, and pedestrian network. Alternatives 2 and 3 propose a network of PSPS and community & mobility hubs that are compatible with the corridors and neighborhood centers, as well as a transit network that enhances multimodal connections throughout the City while supporting primary/high volume transit capacity along corridors and within urban village/urban center boundaries. The action alternatives are more supportive of a future growth strategy that plans for continued growth within urban centers and new areas of growth within neighborhood centers, corridors, and in urban neighborhoods across the city.

Alternative 2 introduces more improvements compared to Alternative 1 to increase access to community assets in Seattle. It expands access to multimodal transportation in urban centers/villages. The Alternative includes more linear miles of sidewalks, corridors with bike facilities, and streets with additional pedestrian improvements. The transit system improvements are also more frequent, with more dedicated transit corridors, light rail stations, and RapidRide corridors. Additionally, there is the implementation of community & mobility hubs and a network of PSPS. These improvements increase access to community assets in areas of the city beyond frequent transit corridors and outside of urban village/urban center boundaries.

Overall, Alternative 3 represents the most comprehensive and transformative approach to improving the City's transportation network and is most supportive of broad changes to the land use pattern. Transit system improvements are also the most frequent, with the most dedicated transit corridors, light rail stations, and RapidRide corridors. This alternative introduces more EV charging infrastructure required in new development and additional EV infrastructure in public streets. These improvements create the most

access to community assets in areas of the city beyond frequent transit corridors and outside of urban village/urban center boundaries.

## What are some solutions or mitigation for impacts?

Potential significant land use impacts identified for Alternative 1 could be mitigated through adoption of one of the action alternatives, or through amendment of Alternative 1 to ensure that transportation improvements more adequately serve planned growth.

Although no significant unavoidable adverse impacts to displacement risk are identified, measures that could be taken to continue to reduce the risk of future displacement include the following:

- Work closely with affected BIPOC and low-income communities to better understand community-specific displacement pressures and goals around anti-displacement. Listen to and advance community-driven solutions by disproportionately impacted groups.
- Invest in creation and preservation of affordable housing in areas where transportation improvements could increase market pressures, ideally ahead of or alongside those improvements.
- Invest in community-owned and community-driven development by communities that are at high risk of displacement.
- Build capacity within affected communities to use anti-displacement resources and ensure the City is prepared to support where needed through technical assistance.
- Stabilize vulnerable tenants and community-serving entities through direct funding support and technical assistance toward affected communities to help them stay in place in the face of market pressures.
- Supplement knowledge shared by affected communities with data that tracks high displacement risk areas and the outcomes of policy actions.

## With mitigation, what is the ultimate outcome?

With the implementation of mitigation measures, no significant unavoidable adverse impacts are anticipated.

## 1.7.6 Transportation

### How did we analyze Transportation?

We conducted a desktop analysis of existing information sources and analyzed potential impacts of the various alternatives. We looked at city, state, and federal data to describe the existing network, gaps, and future investments. Existing transportation conditions are documented throughout the project area and present findings related to current transportation network, circulation, and coverage in the subareas. Primary focus points include pedestrian and bicycle infrastructure, transit facilities, and freight.



Thresholds of significance include consistency with the GMA, Vision 2050, and countywide planning policies; increase in people walking or biking; increase in VMT per capita; approximate proximity of future job or housing growth to future sidewalk network, future bicycle network, community & mobility hubs and light rail stations, improved transit lanes and Rapid Ride Lanes; and traffic capacity.

### What impacts did we identify?

All alternatives include various levels of investment in bicycle, pedestrian and transit facilities and would be accessible to different numbers of housing units and jobs citywide. All alternatives are consistent with the GMA planning goals, the Vision 2050 policies, and King County's Countywide Planning Policies, though, the alternatives differ in how supportive they are of specific policies. None of the studied alternatives are likely to result in any additional VMT per capita from the forecast VMT in the comprehensive plan alternatives and are likely to reduce VMT per capita citywide.

Alternatives 2 and 3 increase the mobility throughput of people and goods by reprioritizing ROW space for priority modes consistent with the City's STP objectives. No significant adverse impacts to mobility throughput for people and goods are anticipated.

Alternative 1 has the potential to result in significant adverse impacts with respect to future job or housing growth and its connections to the sidewalk, bicycle, and transit network. These impacts are primarily due to the lower level of sidewalk, bicycle, and transit network investments compared to Alternatives 2 and 3. Potential for significant adverse impacts identified for Alternative 1 could be mitigated through adoption of one of the action alternatives, or through amendment of Alternative 1 to include transportation improvements that more adequately provide access to existing and future jobs and housing.

No other potential significant adverse impacts are identified for any of the alternatives.

## What is different among the alternatives?

Exhibit 3-156 compares the housing and job growth among the alternatives. While none of the STP alternatives are inconsistent with GMA planning goals, Alternative 2 and Alternative 3 are more supportive of a comprehensive multimodal transportation system than the No Action Alternative. The action alternatives have a more complete network of bicycle and pedestrian facilities and contain more improvements to the transit system. Alternatives 2 and 3 also have more of an emphasis on alternatives to driving compared to Alternative 1, supporting compact development around transit. Alternatives 2 and 3 increase the mobility throughput of people and goods by reprioritizing ROW space for priority modes consistent with the City's STP objectives.

None of the STP alternatives would have an impact on VMT per capita, but Alternative 1 would support the least reduction in VMT per capita across the citywide network. The expanded multimodal network in Alternatives 2 and 3 are likely to result in lower overall VMT and VMT per capita compared to Alternative 1 or the baseline VMT in Comprehensive Plan Alternative 5. Alternatives 2 and 3 have more emissions reduction factors than Alternative 1, with the most sidewalk availability, bicycle infrastructure and transit improvements under Alternative 3, followed by Alternative 2.

Compared to Alternative 1, Alternative 2 includes stronger policy language and more potential improvements to the pedestrian, bicycle, and transit network to advance implementation of these regional policies within the City of Seattle. Alternative 3 includes policies that most closely reflect the County's policy to advocate for new funding methods, with implementation of mobility management strategies. Alternative 3 includes the most features that support PSRC's multi-county planning policies, including electrification, zero emission vehicle goals and financing, and places the greatest focus on modes other than driving. Alternative 3 also supports the transition to zero-emission vehicles and electrification infrastructure more than Alternative 1 and 2.

## What are some solutions or mitigation for impacts?

Alternative 1 has the potential to result in significant adverse impacts with respect to future job or housing growth and its connections to the sidewalk, bicycle, and transit network. These impacts are primarily due to the lower level of sidewalk, bicycle, and transit network investments compared to Alternatives 2 and 3. Potential for significant adverse impacts identified for Alternative 1 could be mitigated through adoption of one of the action alternatives, or through amendment of Alternative 1 to include transportation improvements that more adequately provide access to existing and future jobs and housing.

No other significant adverse impacts to transportation have been identified and no additional mitigation strategies are required.

## With mitigation, what is the ultimate outcome?

Alternative 1 has the potential to result in significant adverse impacts with respect to future job or housing growth and its connections to the sidewalk, bicycle, and transit network. These impacts are primarily due to the lower level of sidewalk, bicycle, and transit network investments compared to Alternatives 2 and 3.

Potential for significant adverse impacts identified for Alternative 1 could be mitigated through adoption of one of the action alternatives, or through amendment of Alternative 1 to include transportation improvements that more adequately provide access to existing and future jobs and housing.

No other significant adverse impacts to transportation have been identified.



## 1.7.7 Utilities

### How did we analyze Utilities?

We conducted a desktop analysis of existing information sources from Seattle City Light (SCL) to characterize current conditions of the power infrastructure, a grid modernization plan, long-term strategy plans for resources and investment, and future need. Plans included an electrification assessment to determine the impacts of varying levels of electric transportation adoption. Thresholds of significance used in the impact analysis included consistency with utility system planned growth and capital plans, and the potential to require major new projects or initiatives for upgrades to accommodate redevelopment. Other information sources include related local, regional, state, and national regulations.

### What impacts did we identify?

Due to future growth and development, demand for electrical power is expected to increase into the future, with all alternatives seeing increased demands on the City's electrical infrastructure.



## What is different among the alternatives?

Alternative 1 and 2 are consistent with SCL's planned growth and capital plans, including additional infrastructure for EVs. These alternatives would not exceed what has already been planned for, nor would they require major new projects or initiatives for the energy system upgrades to accommodate. No adverse impacts to the electrical system would be anticipated.

Alternative 3 includes increased electrification infrastructure as part of its new development and added at its community & mobility hubs. Demand would be greater under Alternative 3 than under Alternatives 1 or 2. However, the electrification needed fits within SCL's planned infrastructure and is unlikely to require system upgrades to accommodate new development or redevelopment. No adverse impacts to the electrical system would be anticipated.

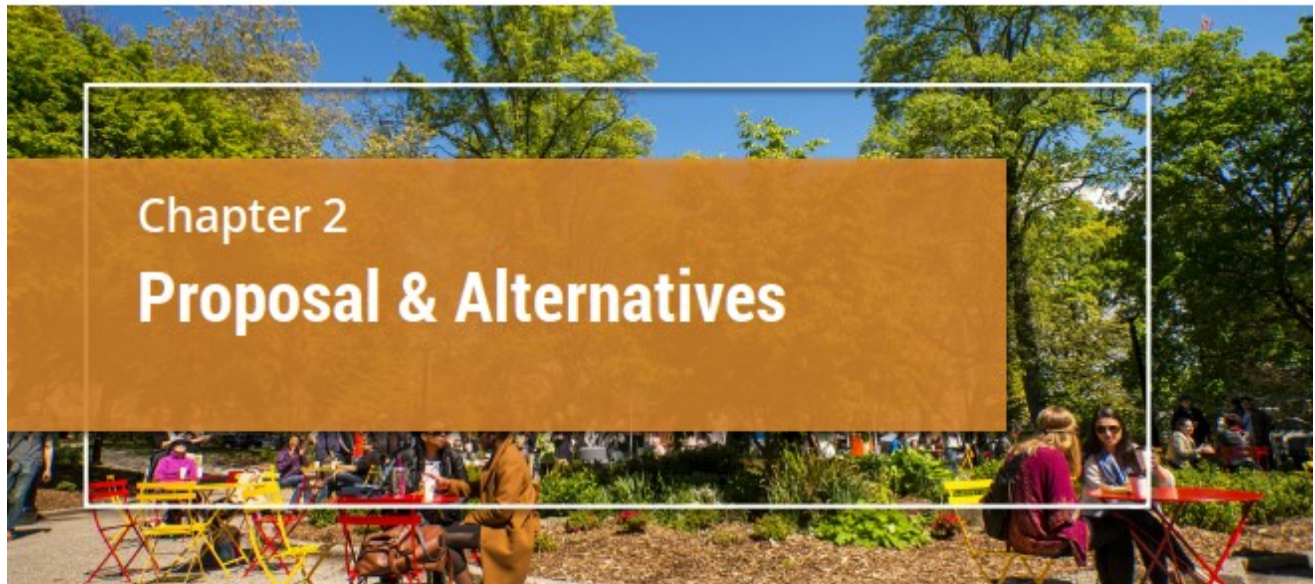
## What are some solutions or mitigation for impacts?

SCL has undertaken planning efforts to accommodate a greater increase in electrification of the City's transportation and building sectors, as shown in its 2022 Integrated Resource Plan, 2020 Transportation Electrification Strategic Investment Plan, and its Grid Modernization Plan. These plans identify needed resources and infrastructure to accommodate increased electrification beyond what would be required under Alternative 1: No Action and the Action Alternatives. Furthermore, SCL continues to improve its infrastructure through ongoing capital improvement projects. These types of ongoing improvements improve system reliability and reduce any potential for impacts associated with ongoing electrification, including the electrification components of the alternatives evaluated.

## With mitigation, what is the ultimate outcome?

No significant unavoidable adverse impacts are anticipated for the electrical utilities under any of the alternatives. The levels of development and electrification proposed under all alternatives will be managed by the current infrastructure and existing, ongoing processes, such as capital improvement planning.





## 2.1 Introduction

### 2.1.1 Overview of the Proposal

The Seattle Transportation Plan (STP) is a 20-year vision document developed in coordination with the One Seattle Plan, the city's 20-year growth strategy. Seattle is a worldclass metropolitan area and job center that invites workers and visitors from around the world. SDOT is committed to creating safer and reliable transportation systems for all users – those going to a doctor's appointment, commuting to a worksite, delivering a package, or visiting a stadium. The proposal is informed by recommendations from community input collected in 2022 and 2023.

The STP will serve as a roadmap to guide actions and investments for transportation solutions that coordinate to improve mobility across geography and modes of transportation in the city. The STP represents the first time that SDOT is tackling the needs of all road users simultaneously, comprehensively, and at a citywide scale. Building on a strong foundation of plans that address the pedestrian, bicycle, transit, and freight environments, the STP updates these efforts and includes new elements for curbside management, urban goods delivery, new and emerging forms of mobility, vehicular needs, and people streets and public spaces. Through the STP, these plans are blended together to optimize Seattle streets in a way that harmonizes and balances the needs of all users across the entire system. SDOT will organize its work around the STP's vision and goals.

This Environmental Impact Statement (EIS) studies a No Action Alternative and two action alternatives illustrating different potential futures for the city's transportation networks. Studied systems include pedestrian, bike, People Streets and Public Space (PSPS), transit, and freight. These two action alternatives evaluate the effects of potential changes to SDOT infrastructure and policy implementation approaches over a 20-year time horizon (to 2044). The No Action Alternative represents current networks/commitments and is required by SEPA; it is a basis for comparison. The two Action Alternatives (Alternatives 2 and 3) apply proposed frameworks to respond to issues, challenges, and opportunities for

#### What is an Alternative?

Alternatives are different ways of achieving objectives that allow decisionmakers to compare the effects of different options. The No Action Alternative is based on current plans, policies, and regulations and is a benchmark against which other alternatives can be measured. Action alternatives serve as bookends and can test a range of ideas, implications, and benefits. The Alternatives in the EIS consider the Seattle Transportation Plan policies and different network configurations to achieve the Plan objectives. Alternatives are conceptual, they provide high-level direction, but are not yet project specific.

The three Alternatives presented here are intended to convey a **range** of reasonable options; it is not intended to consider every possible option. The final STP need not be identical to any single alternative but must be within the range of alternatives considered. The STP can mix and match and pull elements from each alternative. Some information, such as a fiscal analysis, will inform and influence STP but is not included in the EIS.

multimodal mobility in Seattle that are based on community input.

Network assumptions considered in each alternative include:

- **General:** Assumptions related to the funding of existing initiatives and committed projects, such as ST3 which expands light rail service in Seattle with increased capacity downtown and extensions to neighborhoods of Ballard and West Seattle, as well as potential EV infrastructure investment.
- **Pedestrian:** Assumptions related to sidewalks throughout the city, including destination streets.
- **Bicycle:** Assumptions related to all bicycle-related facilities, excluding sharrows, and committed projects.
- **PSPS:** Assumptions related to stay healthy streets and pedestrian improvements on destination streets.
- **Transit:** Assumptions related to transit lanes, facilities, and corridors.
- **Community & Mobility Hubs:** Assumptions related to the introduction of community & mobility hubs throughout the city.
- **Freight:** Assumptions related to the street network for trucks.
- **People Street and Public Spaces:** Assumptions related to streets that prioritize walking and transit experience, including Healthy Streets and School Streets, which are open for people walking, rolling, biking and playing and closed to pass-through traffic. These may also include low-/zero-emission zones or low-pollution neighborhoods. They may allow some traffic for local access

To implement the transportation concepts in each of the Action Alternatives, the City of Seattle would:

- Engage with community, boards & commissions, elected officials
- Collaborate with agency partners
- Pursue funding opportunities
- Update policy, processes, and guidelines
- Expand staff capacity and training

Each of the alternatives evaluated in this EIS poses different investment and policy priorities related to the city's pedestrian, bike, PSPS, transit, and freight networks for the purpose of improving the future of mobility in Seattle. The multi-faceted objectives of the proposal are listed in Section 2.1.3 of this EIS.

The following is a summary of the three alternatives. A detailed description of each alternative can be found in Section 1.5:

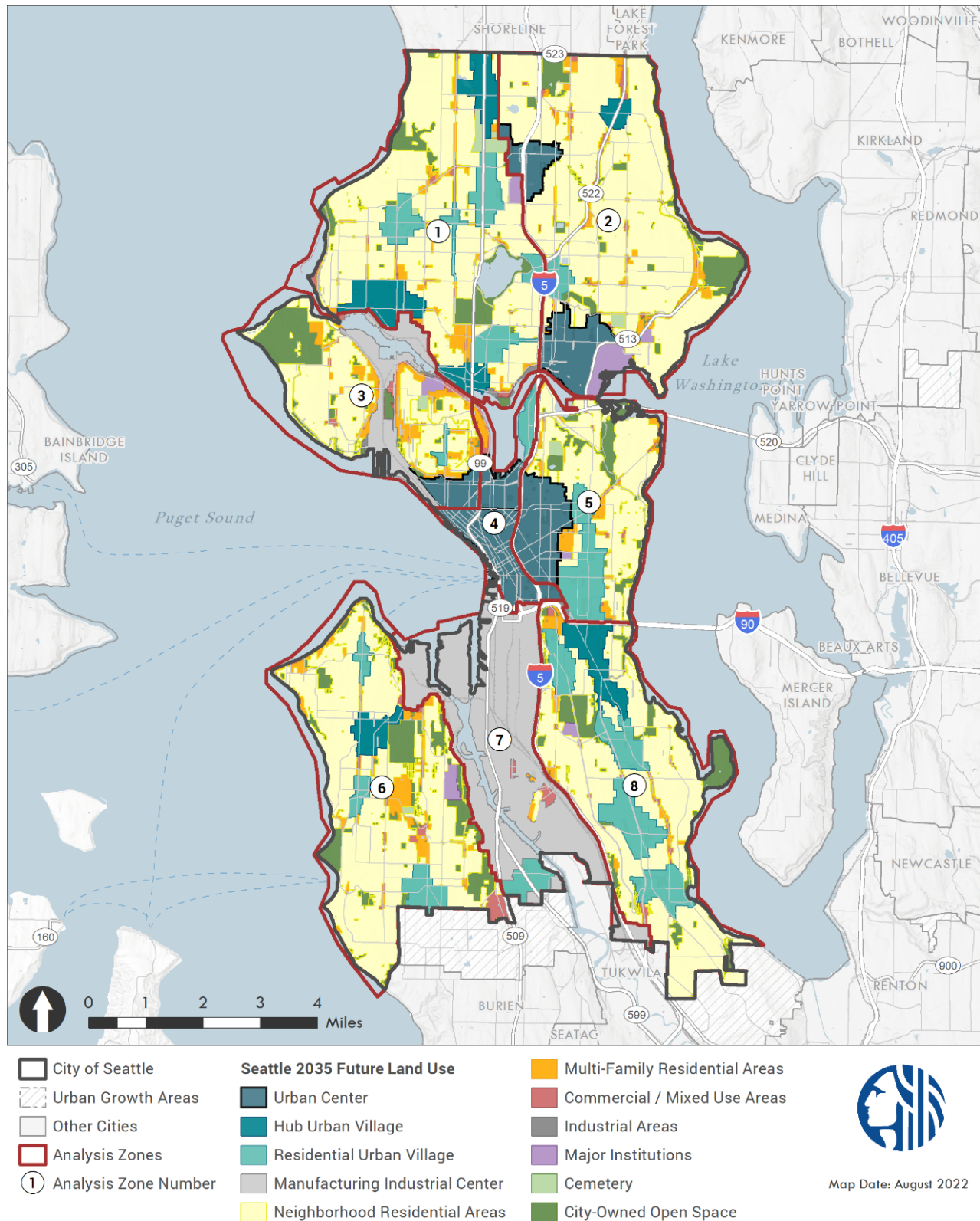
- **Alternative 1 – No Action:** The SEPA-required alternative that would maintain existing transportation networks and approved funding commitments. Roadway operations are optimized at key intersections, limited spot safety improvements are made throughout the network, and very limited slow zones are implemented on key pedestrian spaces.
- **Alternative 2 – Moderate Pace:** Alternative 2 allocates a moderate amount of new funding for multimodal infrastructure. The pedestrian network increases by 127 linear miles of sidewalks, the bicycle network adds 53 miles with facilities, an additional 45 miles of streets receive additional PSPS improvements, and an additional 33 miles are dedicated as transit corridors. This plan includes some restricted areas for general purpose traffic, a network of People Streets, and a moderate number of community & mobility hubs. The existing freight network is unchanged.

- **Alternative 3 – Rapid Progress:** Alternative 3 focuses on the expansion of Seattle’s pedestrian, bicycle, and transit connections. The pedestrian network increases by 848 linear miles of sidewalks, the bicycle network adds 385 miles with facilities, an additional 76 miles of streets receive additional PSPS improvements, and an additional 123 miles are dedicated as transit corridors. In this alternative, the city fully implements overarching policies of the STP with a network of People Streets, electrification infrastructure, a wider range of community & mobility hubs, and mobility management strategies. The existing freight network is expanded to include 19 miles of dedicated freight and transit lanes.

## 2.1.2 Study Area

The study area includes the full city limits. The city has been divided into regions based on road and natural features to organize the EIS evaluation and results. See Exhibit 2-1.

Exhibit 2-1. Study Area



Sources: City of Seattle, 2022; BERK, 2022.



## 2.1.3 Objectives of the Proposal

The State Environmental Policy Act (SEPA) requires a statement of proposal objectives and the purpose and need to which the proposal is responding. Alternatives are different means of achieving the objectives. The proposal would update the STP. The objectives behind this proposal are multi-faceted and seek to address the City’s transportation network holistically. The objectives are organized around the six central themes of the STP: Lead with Transportation Justice; Safety is Central; Climate Action; Connect People and Goods; Streets for People, Places We Love; and Streets that Work, Today and in the Future. See Exhibit 2-2.

### Exhibit 2-2. Objectives of the Proposal

#### Lead with Transportation Justice: Co-Create with community and implement restorative practices to address transportation-related inequities

- TJ1. Center the voices of communities of color and underrepresented groups in our planning and decision-making processes
- TJ2. Address inequities and past harms in our transportation system by prioritizing investments for impacted communities
- TJ3. Ensure everyone can afford to take the trips they need to make

#### Safety is Central: Everyone feels safe traveling in Seattle, and there are no serious injuries or fatal crashes

- S1. Reduce vehicle speeds to increase safety
- S2. Promote safety investments at our most collision-prone locations
- S3. Make it safer for everyone traveling in Seattle, particularly users who are walking, biking, rolling, and accessing transit
- S4. Provide safer routes to schools, parks, transit, community gathering spaces, and other common destinations

#### Climate Action: Respond to climate change with a lens of climate justice to maximize community benefit

- CE1. Improve neighborhood air quality and health outcomes by promoting clean, sustainable travel options
- CE2. Green our streets to better handle our changing climate
- CE3. Foster neighborhood vitality and improved community health
- CE4. Support the transition from fossil fuel to electric vehicles (EVs) for personal, commercial, and delivery trips
- CE5. Advance mobility management strategies to improve air quality and encourage transit, walking, and bicycling

#### Connect People and Goods: Provide reliable and affordable travel options that help people and goods get where they need to go

- PG1. Create seamless travel connections
- PG2. Make walking, biking, and rolling easy and enjoyable travel choices
- PG3. Create world-class access to transit and make service more frequent and reliable
- PG4. Support economic vitality by accommodating goods movement and growth in deliveries
- PG5. Manage curb space to reflect our values and priorities

#### Streets for People, Places We Love: Reimagine our streets as inviting places to linger and play

- PP1. Prioritize street space for people while preserving access for goods



PP2. Transform transportation hubs into welcoming community places

PP3:. Co-create and enhance public spaces for playing and gathering to improve community health

PP4. Activate public spaces to create a welcoming and age-friendly public realm

**Streets that Work, Today and in the Future: Improve our transportation infrastructure and ready it for the future**

SW1. Transform our system and extend the life of our assets through optimal timing of maintenance and replacement

SW2. Reduce neighborhood disparities in the quality of our streets, sidewalks, public spaces, and bridges

SW3. Ready our streets for new travel options and emerging technologies

Source: City of Seattle, 2021.

Each alternative is evaluated according to 11 policy assumptions that implement the objectives of the proposal. Those policy assumptions are:

- **Reorganize Transit System** *making connections to light rail, serving non-commute trips, serving underserved communities.*
- **Network of People Streets** *creating space for other modes on city streets and discouraging general purpose traffic on certain corridors*
- **Align traffic operations to increase efficiency** *optimize operations and level of service (LOS) to be consistent with our goals.*
- **Complete Streets** *reprioritizing street space for bikes, transit, sidewalk cafes.*
- **Introduce vehicular grid breaks** *designate alternative routes for cars that make direct routes for people walking, biking, and rolling car-free.*
- **Make transit stops safe** *improve comfort and safety at transit stops, especially for riders waiting at night.*
- **Add safe crossings on major roads** *prioritize safe crossings for people at arterials, highways, and water.*
- **Add mobility zones** *slow traffic in designated areas for emerging micromobility devices.*
- **Support electric vehicle adoption** *encourage electric vehicle charging infrastructure in public streets and new private development.*
- **Mobility management strategies** *implement additional mobility management strategies, in concert with the region.*

## 2.2 Planning Context & Outreach

### 2.2.1 Emerging Factors Affecting Seattle's Transportation

STP addresses the most important factors affecting Seattle transportation today and the anticipated needs of the next 20 years. This plan strives to:

- Make the transportation system more equitable.
- Protect people traveling on the streets.

- Foster a clean, sustainable transportation system.
- Strategically link housing and mobility investments
- Create more low-cost travel options.
- Continue recovery from the COVID-19 pandemic.
- Reflect community priorities in the limited right-of-way.

Solutions and responses to these seven challenges can be effectively grouped into 3 categories: Emerging Technologies & Processes, Climate Change, and Equity & Accessibility.

## Emerging Technologies & Processes

**Advances in electric vehicle (EV) technology allows SDOT to make meaningful impact in the City’s effort to be net-zero and carbon-free.** Vehicle electrification reduces carbon emissions. Today, transportation emissions make up 61% of Seattle’s pollution and 90% of transportation pollution comes from gasoline.<sup>1</sup> Solutions to reduce emissions include the electrification of city fleets and creating low-emission neighborhoods. It also means making transit fast and reliable and supporting other ways of sharing a ride.

**New and better street design standards can improve safety.** Safer streets protect all travelers. Solutions for safer street design include narrowing roadways, reducing speeds, and traffic signal improvements. It also means more visible pedestrian crossings and protected bike lanes.

## Climate Change

**STP aligns with Seattle’s Climate Action Plan to achieve the city’s larger vision and goals for addressing climate change.** SDOT’s role in changing transportation behavior includes making investments that support low-cost transportation options for the future that are not gasoline dependent. This drives STP’s emphasis on multimodal transportation networks as the future of mobility in and around Seattle. Expanding transit access, improving walkability and bike networks, and building infrastructure that supports EV charging are all important steps that leverage public right-of-way to achieve climate goals.

## Equity & Accessibility

**This plan seeks to reverse harms to our low-income and**

**Seattle has always been a leader in climate action.**

**And we still have more to do.**

- 2013 Seattle adopts its first Climate Action Plan
- 2017 A New Mobility Playbook is developed to promote new mobility options
- 2018 The Seattle Climate Strategy serves as an update to the 2013 Climate Action Plan
- 2021 Transportation Electrification Blueprint is released to help us achieve our goal of a decarbonized transportation system
- 2022 A Transportation Equity Framework (TEF) is created to guide us toward an equitable transportation system
- 2022 Seattle’s Green New Deal sets aside millions to advance an equitable clean energy transition
- 2023 Our Climate Response Framework (CERF) is developed to describe our climate action agenda for transportation



These actions continue to yield results. Since 2008, our transportation emissions have remained flat, even though we added more than 250,000 new residents. While this is a positive trend, our city remains very vulnerable to the impacts of climate change and we are committed to doing more.

<sup>1</sup> STP, page 11

**Black, Indigenous, and People of Color (BIPOC) communities.** It plays a critical role in identifying the most impactful actions we can take to reverse historic damage, repair trust with the people who have been harmed, and protect the rights of all community members to have safer access to opportunities. As housing costs in the city center rise, many low-income and BIPOC residents are moving further out to find better affordability. More often than not, the more transit-rich areas are also not where affordable housing is located. Coupling mobility and housing investments is an important step to greater equity in access to affordable transportation options.

**The COVID-19 pandemic changed the way many people work and commute, and increased the importance of public spaces where people can safely walk, roll, and bike.** Concepts such as “stay healthy streets” transformed driving space into public space, serving as an extension of trail networks in neighborhoods across Seattle. The pandemic also highlighted our community’s essential workforce, who often work on timetables outside the norm for office-based employment. As Downtown and local commercial areas are beginning to come back to life, it will be important to remember the transit needs of our essential workforce.

## 2.3 SEPA Process

### 2.3.1 Environmental Review Process

Under SEPA agencies conduct environmental review of actions that could affect the environment. For actions that have the potential for significant impacts, preparation of an EIS is required. An EIS is a useful tool that provides detailed information to the public, agencies, tribes, and City decision-makers about the environmental effects of a plan or project before a decision is made.

The EIS process involves the following steps: (1) scoping the contents of the EIS with agencies, tribes, and the public; (2) preparing a draft EIS with a comment period; (3) responding to comments and developing a preferred alternative in the Final EIS; and (4) developing legislation. With the issuance of the Draft EIS, the EIS process is in phase 2. See Exhibit 2-3.

**Exhibit 2-3. EIS Process**



Source: BERK, 2023.

## 2.3.2 Public Comment Opportunities

### Scoping

The scoping process is intended to identify the range of potential significant impacts on the built and natural environment that should be considered and evaluated in the EIS. The City issued a Scoping Notice on June 16, 2022, with a 30-day public comment period, extended by another two weeks, that ran through July 29, 2022. A virtual scoping meeting was held during the comment period on June 21 at 6:00 p.m. In addition to the opportunity to submit written comments, the City took comments through the Engagement Hub linked on the City's website.

Comments received during the scoping period include:

- Written Comments: 175 commenters
- Online Engagement Hub Comments: 111 comments
- Virtual meeting participants: 8 participants

See [Appendix A](#) for the scoping report.

As part of scoping, the City identified a range of topics to explore in the EIS:

- Air Quality
- Water Resources
- Sea-Level Rise
- Transportation
- Noise
- Land Use Patterns
- Utilities: Electrical Power

Scoping comments indicated that transportation, climate, and land use patterns were the most important to address in the EIS. Commenters also gave input on alternatives to be studied, typically by indicating which of the scoping alternatives fit their views of the transportation network of the future or requesting adjustments. In response to the scoping comments the city added an analysis of electric power. A full response to scoping comments can be found in the Scoping Report in [Appendix A](#).

### Draft EIS

This Draft EIS identifies environmental conditions, potential impacts, and measures to reduce or mitigate any unavoidable adverse impacts that could result from an update to the Seattle Transportation Plan. The Draft EIS alternatives and topics were developed based on a review of scoping comments and engagement results.



Public and agency comments are invited on this Draft EIS. Written and verbal comments are invited during the 45-day public comment period following issuance of this Draft EIS. The City will hold future public engagement events during or following the 45-day comment period to help refine its preferred alternative. Public comments will be considered and addressed in the Final EIS. Please see the Fact Sheet at the beginning of this Draft EIS for the dates of the public comment period and public meeting. Meetings and comment periods regarding the proposals are described on the City's project webpage:

<https://www.seattle.gov/transportation/projects-and-programs/programs/seattle-transportation-plan>

## Final EIS & Proposed Legislation

A Final EIS will be issued in 2023 and will include responses to public comments received during the Draft EIS comment period. Following the EIS process, the City will develop specific policy and zoning proposals that will be the subject of public meetings and public hearings by the City Council.

## 2.4 Proposed Action & Alternatives

The proposal considers an update to the Transportation Plan that could help meet the objectives defined in Section 2.1.3. The EIS includes two action alternatives (alternatives 2 and 3) that would make different networks and transportation investments. A No Action Alternative with no changes to policies is also considered (alternative 1).

**Exhibit 2-4. Comparison of Alternatives by Mode of Network Changes**

Network	Alternative 1: No Action	Alternative 2: Moderate Pace	Alternative 3: Rapid Progress
Pedestrian	Includes 2,277 linear miles of existing sidewalks. No new sidewalk connections.	<b>Adds 125 miles</b> of new sidewalks in urban centers and villages and neighborhood anchors.	<b>Adds 829 miles</b> of new sidewalks for all excess right-of-way designated as sidewalks but currently unimproved or gravel.
Bike	Includes 161 linear miles of corridors with existing and funded bike facilities. No additional bike projects.	<b>Adds 53 miles</b> of new bike facilities on principal arterials.	<b>Adds 285 miles</b> of new bike facilities.
People Streets and Public Spaces	Includes 29 linear miles of corridors with existing and funded Healthy Streets. No additional improvements.	<b>Adds 347 miles</b> of additional pedestrian realm improvements	<b>Adds 1,008 miles</b> of additional pedestrian realm improvements.
Transit	Includes 38 miles of dedicated transit lanes, 31 LRT stations, and 75 linear miles of RapidRide	<b>Adds 33 miles</b> of dedicated transit corridors, including premium transit priority streets, and <b>52 community</b>	<b>Adds 123 miles</b> of dedicated transit corridors and <b>105 community &amp; mobility hubs.</b>

Network	Alternative 1: No Action	Alternative 2: Moderate Pace	Alternative 3: Rapid Progress
	corridors that exist or are currently funded. No community & mobility hubs or transit improvements.	<b>&amp; mobility hubs.</b>	
Freight	Includes 218 linear miles of truck streets.	No change from Alternative 1.	<b>Adds 19 miles</b> of corridors with dedicated freight and transit lanes.

## Street Concepts

The sections below define some of the key concepts included in the Alternatives.

### People Streets and Public Spaces

**People Streets and Public Spaces (PSPS):** People Streets are corridors that provide enhanced, safe, and comfortable walking and rolling environments and access to public spaces, climate-resilient landscapes, transit, and mobility choices. Public Spaces are community-prioritized places in the public realm that invite people to gather, play, and connect with each other and support local businesses (e.g., transit stations, community & mobility hubs).

**Healthy Streets:** Healthy Streets were initially implemented during the COVID-19 pandemic in 2020 and are included as part of the PSPS network. These streets are closed to pass through traffic, but open to people walking, rolling, biking, and playing. The goal of this program is to open up more space for people rather than cars—improving community and individual health.

**Destination Streets:** Destination streets are part of the PSPS network in the heart of a neighborhood with a high density of destinations - shops, restaurants, cultural centers, and more. Improvements to these would make it safer and more enjoyable to walk and roll across and along these streets.

**Strolling Streets:** Strolling streets are local streets in the PSPS network used for recreation, exercise, and to connect with nature or community. Vehicle volumes and speeds would be low. Improvements to these could include any of the following:

- Lots of trees and climate-resilient landscaping
- Abundant café seating and social activity
- Streets for walking, rolling, and biking only (no vehicles)
- Plazas for gathering, playing, and connecting.

**Event Streets:** Event streets are streets in the PSPS network hosting intermittent community events, such as Farmer’s Markets. Improvements to these would make it easier for a community to host events.



## Transit Streets

**Premium Transit Corridors:** Corridors that would have the highest levels of transit investment. These could include current and future RapidRide corridors, future light rail corridors, and corridors that have multiple bus routes that arrive frequently. This could include adding bus-only lanes, improvements to make it easier to walk or bike to transit, and upgrades to improve the experience waiting for transit.

**High Priority Bus Corridors:** Corridors that would have significant levels of transit investment, especially where buses are regularly delayed. This could include adding bus-only lanes, improvements to make it easier to walk or bike to transit, upgrades to improve the experience waiting for transit, and more.

**Priority Bus Corridors:** Corridors that would have some targeted transit investment. This would include improvements to address bus delays at specific locations.

**Community & Mobility Hubs:** Places of connectivity where different modes of transportation, such as walking, rolling, ride-sharing, and public transit, come together seamlessly at key community locations.

**Dedicated Transit Lanes:** Dedicated transit lanes keep transit vehicles moving by separating it from other vehicles and traffic, making transit service faster and more reliable. These can include bus-only lanes or space for the exclusive use of streetcar or light rail vehicles.

## Roadway Classifications

**Unclassified roadways:** Unclassified roadways are primarily residential streets with no roadway hierarchy classification assigned to them by the City.

**Principal and County Arterials:** Principal and County arterials are two arterial street classifications assigned to roadways by the City of Seattle to describe major arterial roadways that are not limited access highways.

**General Purpose Traffic Lanes:** General purpose traffic lanes are lanes that are open to general purpose vehicular traffic as opposed to lanes that are dedicated to transit, high-occupancy vehicles, or other specific vehicle times or moves.

## Other Definitions

**Mobility management strategies:** Mobility management strategies can employ pricing mechanisms that influence travel choices. They can take a number of different forms such as tolls, per-mile charges, parking pricing, parking taxes, and other charges that help manage travel demand. These types of strategies may be pursued in concert with the region.

### 2.4.1 Alternative 1—No Action

Alternative 1: No Action explores the future of Seattle’s transportation system where the city implements no additional multi-modal or other transportation improvements beyond what is funded today. This alternative

focuses on optimizing existing conditions in the transportation system with no new additional dedicated space for transit, pedestrians, or bikes. Roadway operations are optimized at key intersections, limited spot safety improvements are made throughout the network, and very limited slow zones are implemented on key pedestrian spaces.

## 2.4.2 Network and Policy Summary

### Network Assumptions

**General:** Existing transportation conditions and committed projects including ST3 and projects funded through the modal implementation plans and 12% of the overall fleet (including freight) is electric or plug in hybrid (2021 EMFAC for model year 2044) with no additional EV infrastructure.

**Pedestrian:** Existing sidewalks citywide.

**Bicycle:** Existing bicycle facilities citywide (excluding sharrows) and committed bicycle projects.

**PSPS:** Existing and committed stay healthy streets and no additional People Streets.

**Transit:** Existing and committed dedicated transit lanes and on-street light rail, along with RapidRide corridors, and no community & mobility hubs.

**Freight:** Existing freight network.

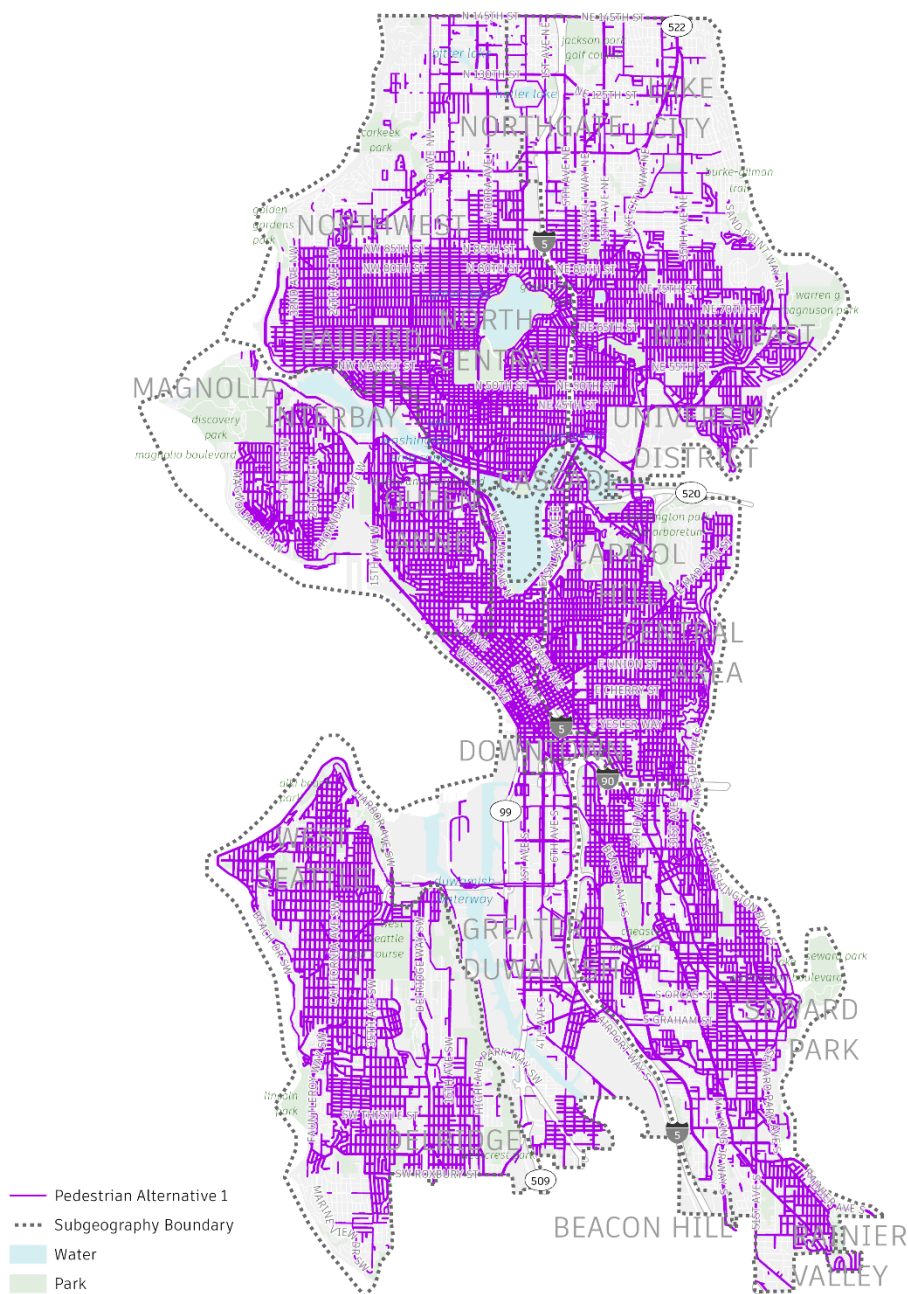
## Policy Assumptions

Policy	Alternative 1 Implementation
<b>Transit System Improvements</b> <i>making connections to light rail, serving non-commute trips, serving underserved communities</i>	Limited increases in frequencies for bus routes connecting to light rails (limited additional bus service hours).
<b>Network of People Streets</b> <i>creating space for other modes on city streets and discouraging general purpose traffic on certain corridors</i>	No additional PSPS beyond the planned 29 linear miles of stay healthy streets.
<b>Traffic operations to increase efficiency</b> <i>optimize operations</i>	Signal optimization for transit and GP traffic at key intersections.
<b>Complete Streets</b> <i>reprioritizing street space for bikes, transit, sidewalk cafes</i>	No repurposed parking or limited GP traffic outside of existing and funded improvements: 161 linear miles of bike facilities. 29 linear miles of PSPS streets. 38 miles of dedicated transit corridors.
<b>Introduce low-emission zones</b> <i>prioritize direct routes for people walking, biking, and rolling</i>	No car-free streets but limited through traffic on 29 linear miles of stay healthy streets.
<b>Improvements at Transit Stops</b> <i>improve comfort and safety at transit stops, especially for riders waiting at night</i>	Limited safety improvements for transit stops in and around downtown.
<b>Crosswalk Improvements</b> <i>prioritize safe crossings for people at arterials, highways, and water</i>	Limited crosswalk improvements focused on the safety and comfort of pedestrians at key intersections.
<b>Add mobility zones</b> <i>slow traffic in designated areas for emerging micromobility devices</i>	Traffic calmed zones at designated areas
<b>Support electric vehicle adoption</b> <i>encourage electric vehicle charging infrastructure in public streets and new private development</i>	No new EV charging requirements for new development and limited EV infrastructure in public streets (assumed best-fit trendline for EV adoption).
<b>Advance mobility management strategies</b> <i>implement additional mobility management strategies, in concert with the region</i>	No additional mobility management strategies

### 2.4.3 Alternative 1 Pedestrian Network

Alternative 1: No Action would include **2,277 linear miles** of existing sidewalks, adding no new sidewalk connection to the pedestrian network as shown in Exhibit 2-5.

## Exhibit 2-5 Alternative 1 Pedestrian Network

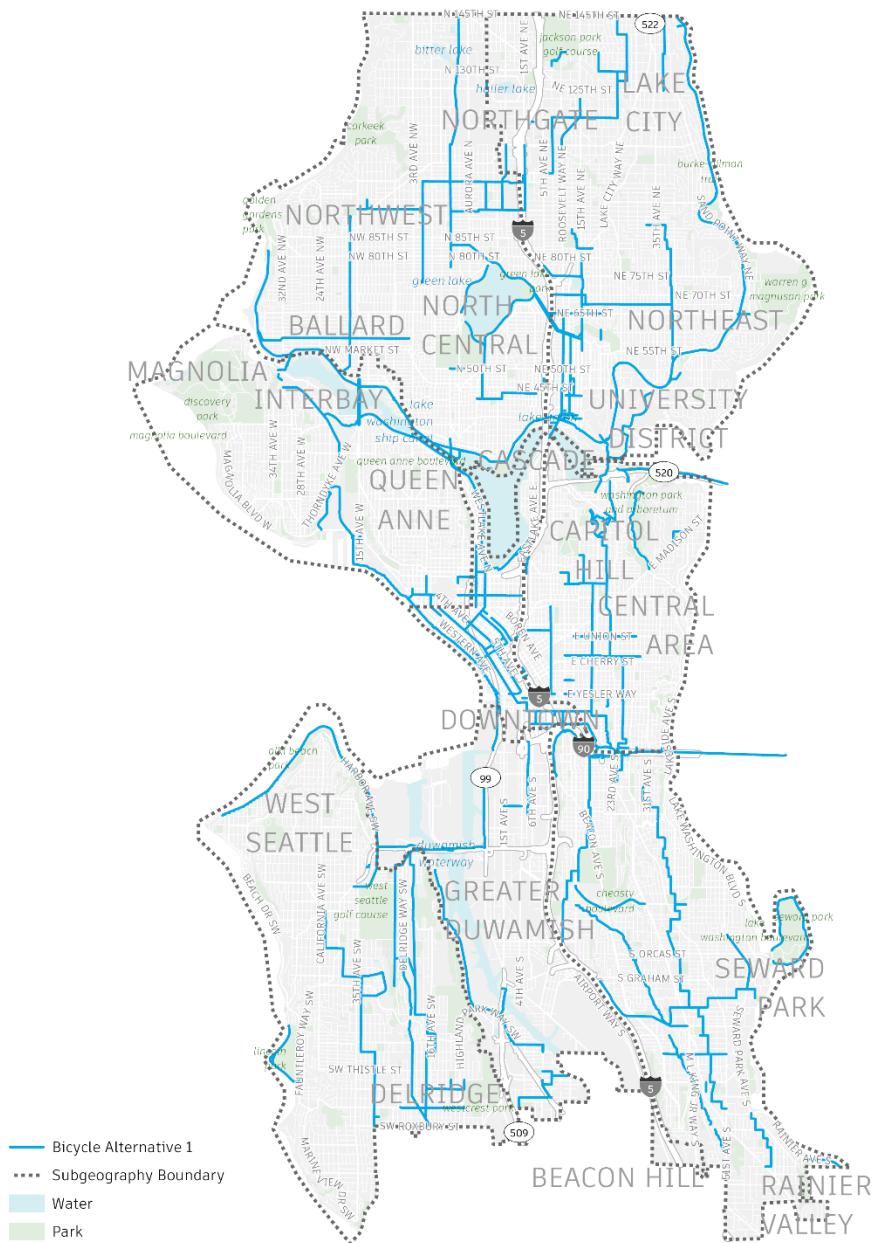


Source: City of Seattle, 2022

## 2.4.4 Alternative 1 Bike Network

Alternative 1: No Action includes **161 Linear Miles** of corridors with existing and funded bike facilities (excluding sharrows), with no additional bicycle projects beyond what is funded through the Bicycle Implementation Plan as shown in Exhibit 2-6.

**Exhibit 2-6. Bike Infrastructure in Alternative 1**

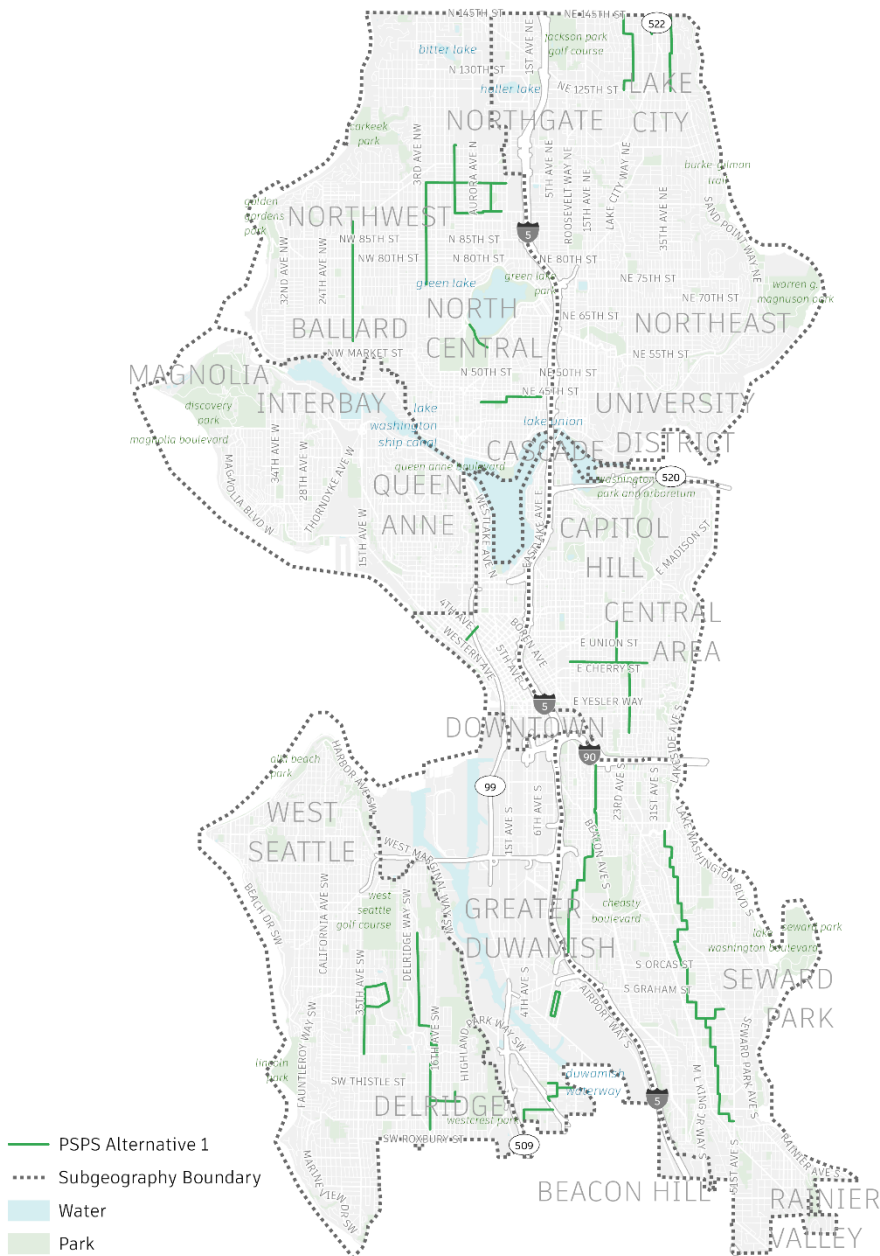


Source: City of Seattle, 2022

## 2.4.5 Alternative 1 PSPS Network

Alternative 1: No Action includes **29 linear miles** of corridors with existing and funded Healthy Streets as shown in Exhibit 2-7, and no additional people streets and public space improvements beyond those projects.

**Exhibit 2-7. Potential People Streets and Public Space Improvements in Alternative 1**



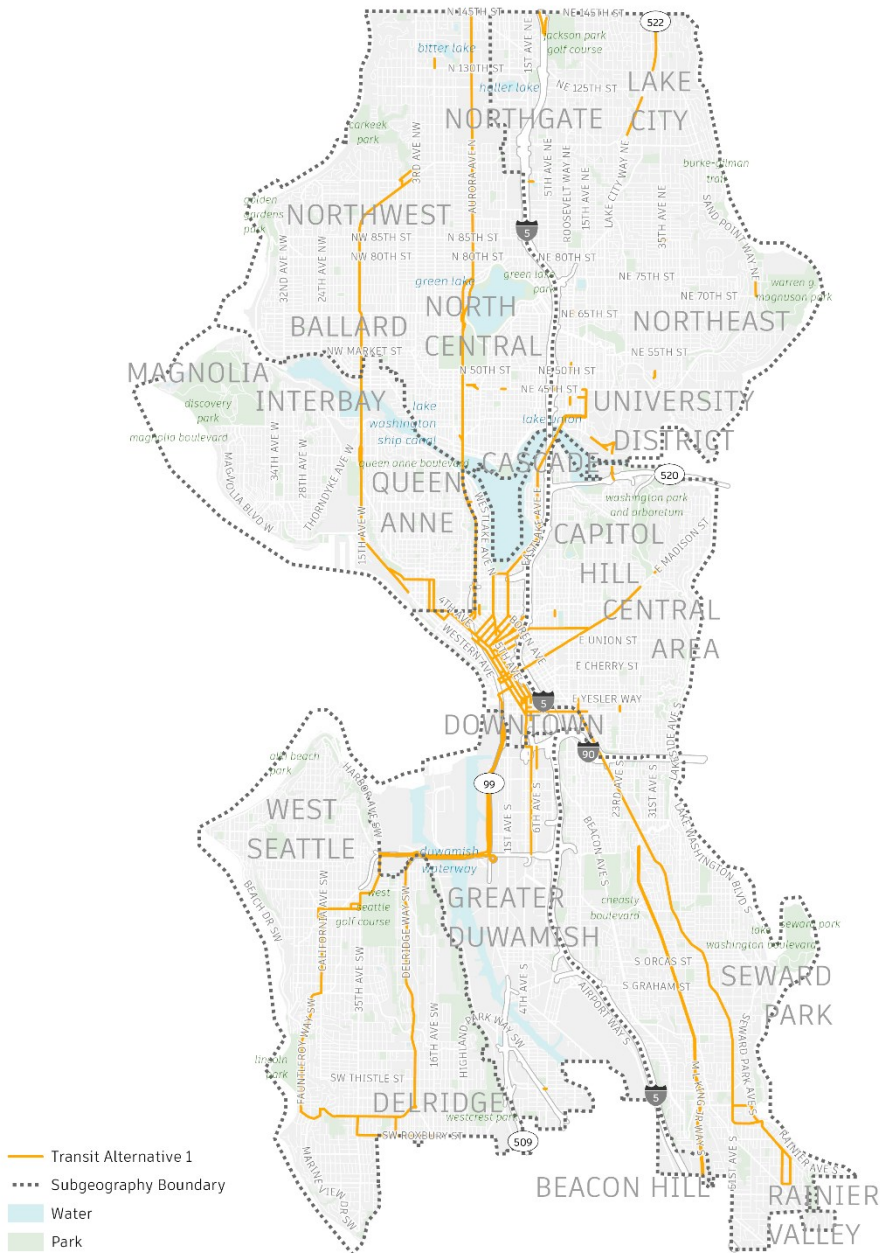
Source: City of Seattle, 2022



## 2.4.6 Alternative 1 Transit Network

Alternative 1: No Action includes **38 miles** of dedicated transit lanes, **31 LRT stations** in the City of Seattle, and **75 linear miles** of RapidRide corridors that exist or are currently funded as shown in Exhibit 2-8. This alternative does not include any community & mobility hubs or transit improvements.

**Exhibit 2-8. Transit Corridors and Community & Mobility Hubs in Alternative 1**

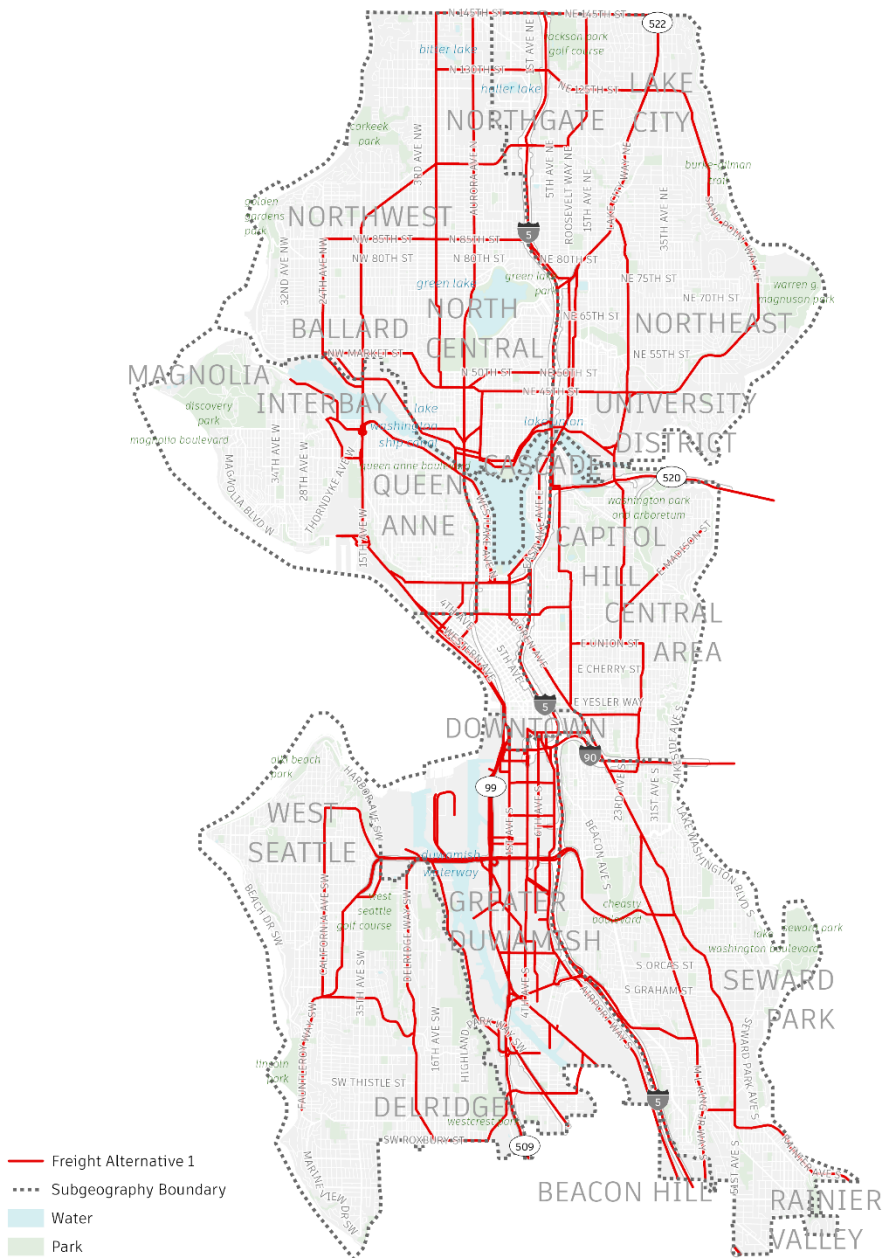


Source: City of Seattle, 2022

## 2.4.7 Alternative 1 Freight Network

Alternative 1: No Action includes **218 linear miles** of truck streets that are designated in the City's 2016 Freight Master Plan as shown in Exhibit 2-9.

**Exhibit 2-9. Designated Truck Streets in Alternative 1**



Source: City of Seattle, 2022

## 2.4.8 Alternative 2—Moderate Pace

Alternative 2: Moderate Pace envisions a future for Seattle’s transportation system with moderate growth in in and funding for new multimodal infrastructure in Seattle’s transportation system. This alternative takes a moderated approach to expanding pedestrian, bicycle, and transit connections. Some space for general purpose vehicular traffic in this alternative would be reprioritized to dedicated spaces for priority modes including some improvements to the public and pedestrian realm. In this alternative, the implements many of overarching policies of the Seattle Transportation plan some restricted areas for a network of People Streets and a moderate number of community & mobility hubs.

## 2.4.9 Network and Policy Summary

### Network Assumptions

**General:** Existing transportation conditions and committed projects including ST3 and projects funded through the modal implementation plans and 12% of the overall fleet (including freight) is electric or plug in hybrid (2021 EMFAC for model year 2044) with no additional EV infrastructure.

**Pedestrian:** Existing sidewalks citywide and sidewalks on destination streets from the PSPS network where none exist.

**Bicycle:** Existing bicycle facilities citywide (excluding sharrows) and committed bicycle projects and bike facilities on portions of the vision network segments that are principal and county Arterials.

**PSPS:** Existing and committed stay healthy streets and additional pedestrian improvements on destination streets.

**Transit:** Existing and committed dedicated transit lanes and light rail, RapidRide corridors, and dedicated transit facilities on premium transit corridors in the vision network.

**Community & Mobility Hubs:** Community & mobility hubs from the transit vision network that are located on premium transit corridors and within Urban Centers or Urban Villages in Land Use Alternative 5.

**Freight:** Existing freight network.

## Policy Assumptions

Policy	Alternative 2 Implementation
<b>Transit System Improvements</b> <i>making connections to light rail, serving non-commute trips, serving underserved communities</i>	Somewhat more frequent bus service connecting to light rail connections and increased off-peak bus frequency (some additional bus service hours).
<b>Network of People Streets</b> <i>creating space for other modes on city streets and discouraging general purpose traffic on certain corridors</i>	29 linear miles of stay healthy streets (limited traffic) 46 linear miles of destination streets
<b>Traffic operations to increase efficiency</b> <i>optimize operations and level of service (LOS) to be consistent with our goals</i>	Signal optimization for GP traffic and transit on all major arterials and improvements to reduce congestion at key intersections.
<b>Complete Streets</b> <i>reprioritizing street space for bikes, transit, sidewalk cafes</i>	Some additional repurposed parking areas and GP traffic lanes for as part of: 214 linear miles of bike facilities. 74 linear miles of PSPS streets. 71 miles of dedicated transit corridors.
<b>Improvements at Transit Stops</b> <i>improve comfort and safety at transit stops, especially for riders waiting at night</i>	Moderate safety improvements for transit stops near light rail stations and along RapidRide lines.
<b>Crosswalk Improvements</b> <i>prioritize safe crossings for people at arterials, highways, and water</i>	Crosswalk improvements focused on the safety and comfort of pedestrians along major arterial roadways including principal and county arterials.
<b>Add mobility zones</b> <i>Slow traffic in designated areas for emerging micromobility devices</i>	Traffic calmed zones at designated areas around 69 community & mobility hubs in the city of Seattle.
<b>Support electric vehicle adoption</b> <i>encourage electric vehicle charging infrastructure in public streets and new private development</i>	No new EV charging requirements for new development and limited EV infrastructure in public streets (assumed best-fit trendline for EV adoption).
<b>Mobility management strategies</b> <i>implement additional mobility management strategies, in concert with the region</i>	No additional mobility management strategies.

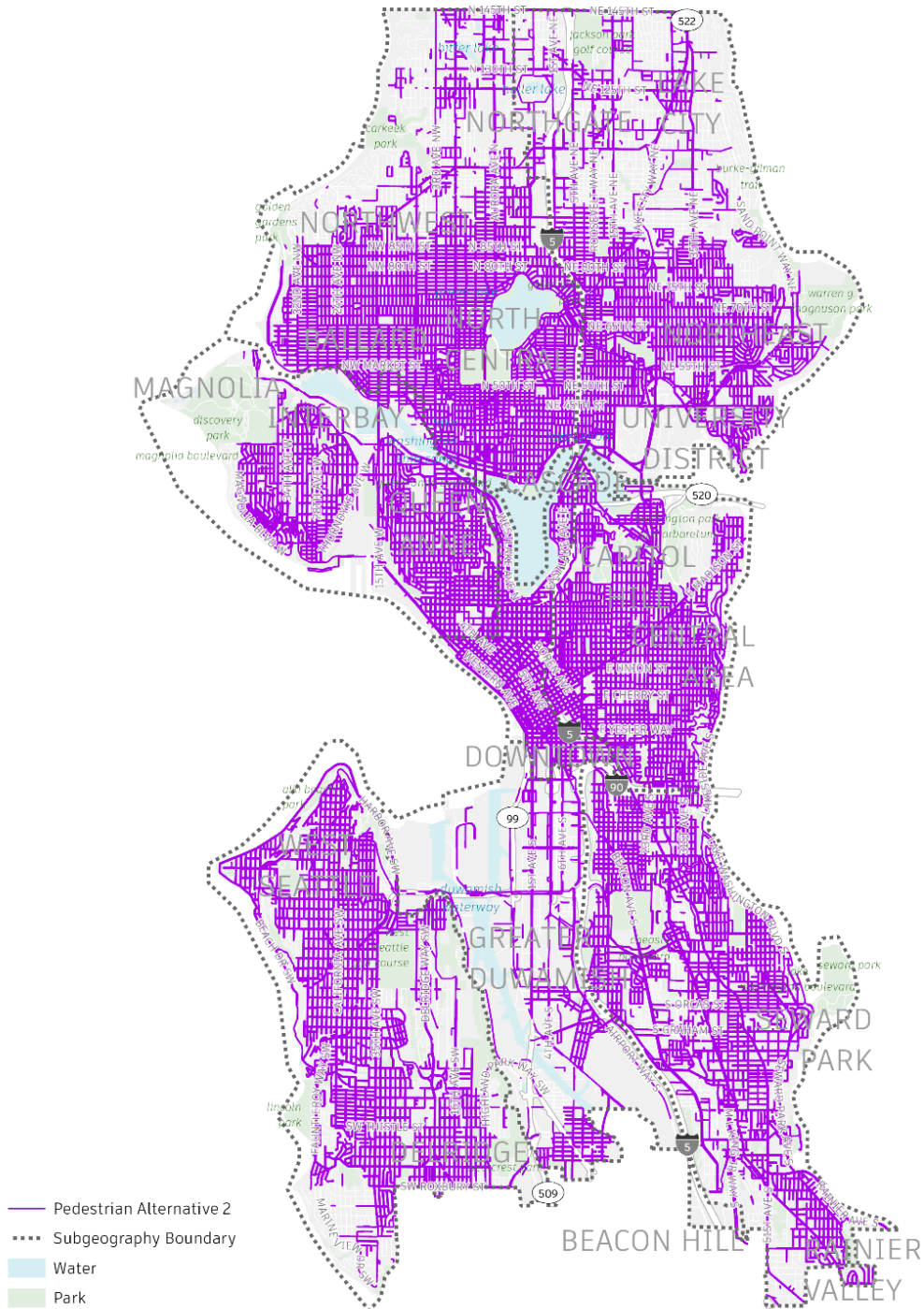
### 2.4.10 Alternative 2 Pedestrian Network

Alternative 2: Moderate Pace includes **2,400 linear miles** of sidewalks, **125 miles** of new sidewalks in urban

Pedestrian Network (in linear miles)	Alternative 1	Alternative 2
	2,277	+ 125

centers and villages and neighborhood anchors from land use Alternative 5 as shown in Exhibit 2-10.

### Exhibit 2-10. Sidewalk Network in Alternative 2



Source: City of Seattle, 2022



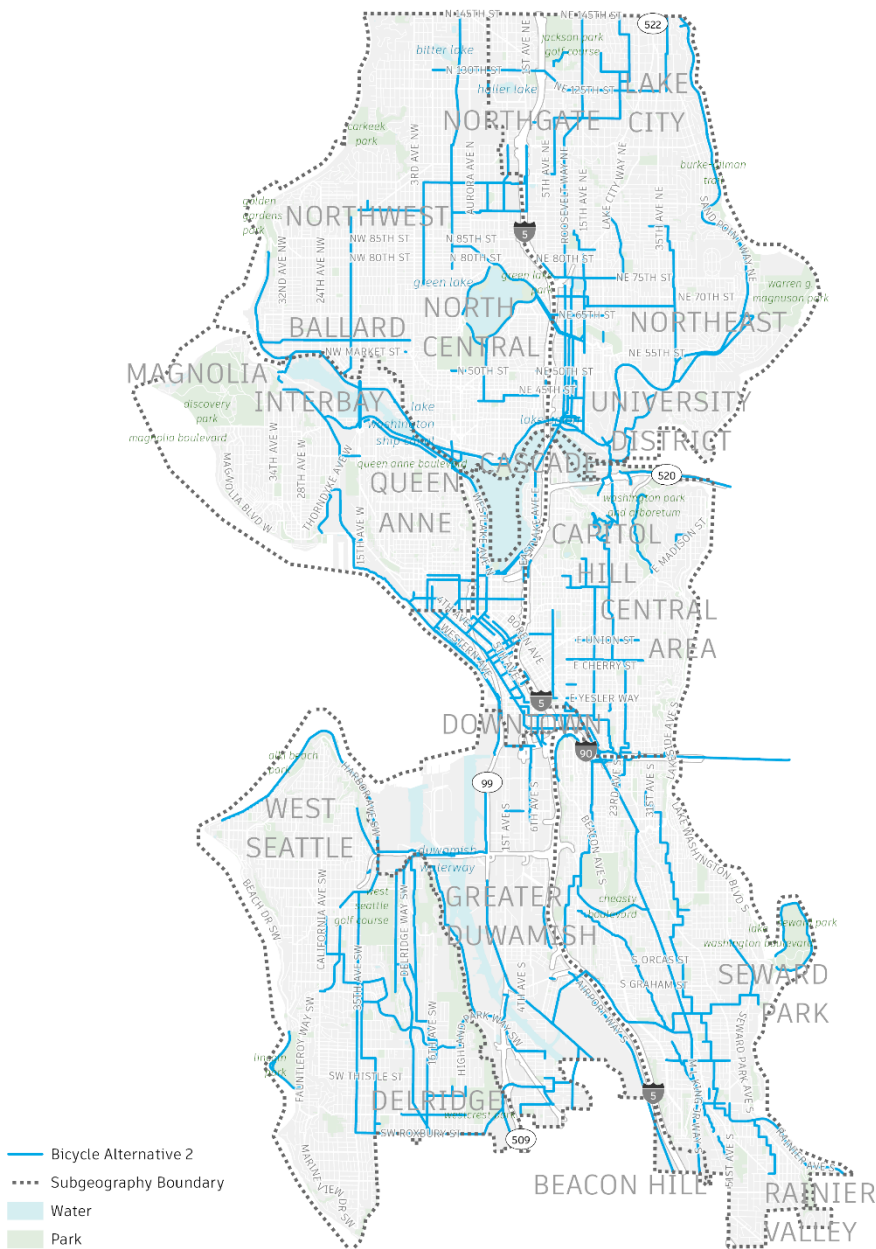
## 2.4.11 Alternative 2 Bike Network

Alternative 2: Moderate Pace includes **214 linear miles** of corridors with bike facilities, with **53 linear miles** of new corridors with bicycle facilities as shown in Exhibit 2-11. This includes all proposed new bike facilities on the vision network that are also on principal arterials.

Bike Network  
(in linear miles)

Alternative 1	Alternative 2
161	+ 53

Exhibit 2-11. Bike Infrastructure in Alternative 2



Source: City of Seattle, 2022



## 2.4.12 Alternative 2 PSPS Network

Alternative 2: Moderate Pace includes **376 linear miles** of corridors within the PSPS network, with **347 miles** of additional pedestrian realm improvements based on PSPS designations shown in Exhibit 2-12.

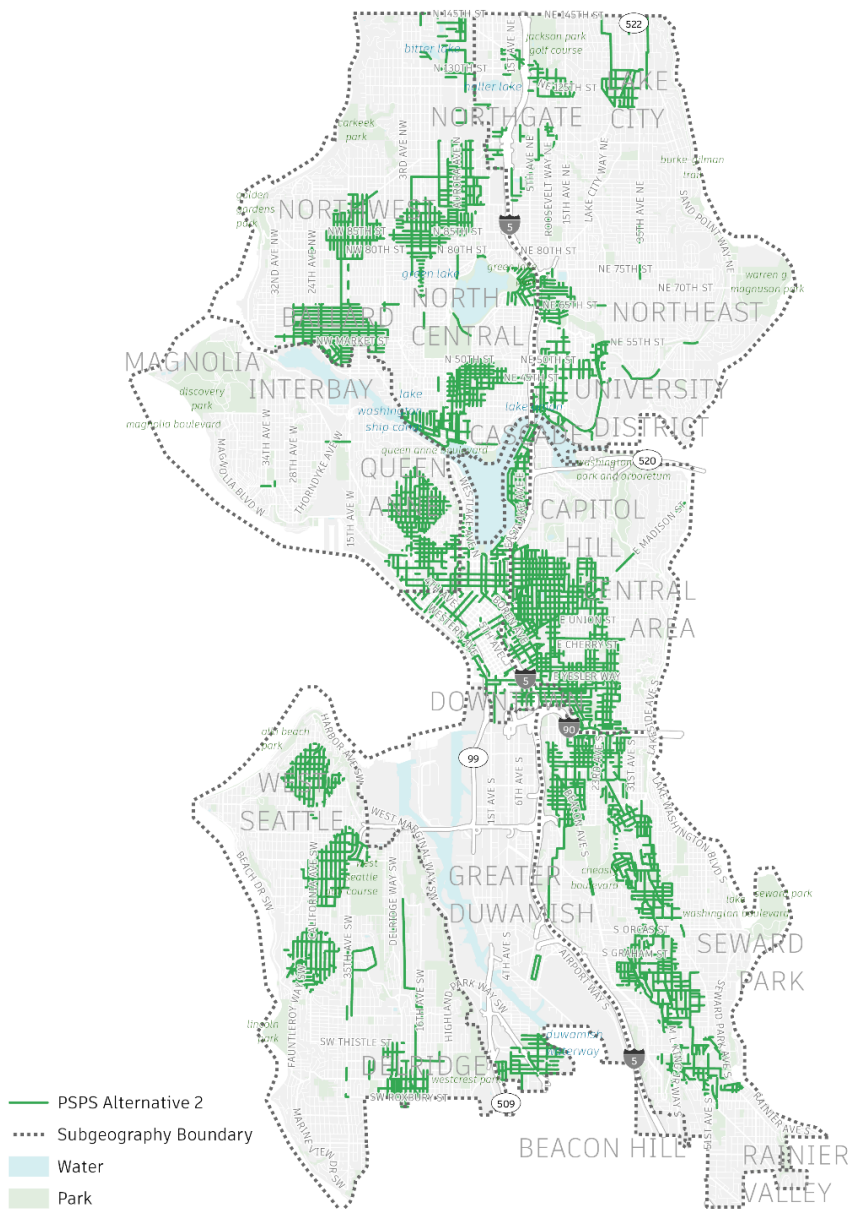
People Streets and  
Public Spaces  
(in linear miles)

Alternative 1 **Alternative 2**

29

+ 46

**Exhibit 2-12. Potential People Streets and Public Space Improvements in Alternative 2**



Source: City of Seattle, 2022

## 2.4.13 Alternative 2 Transit Network

Alternative 2: Moderate Pace includes **71 linear miles** of dedicated transit corridors of including premium transit priority streets, **31 LRT stations**, **75 linear miles** RapidRide corridors, and **52 community & mobility hubs** as shown in Exhibit 2-13.

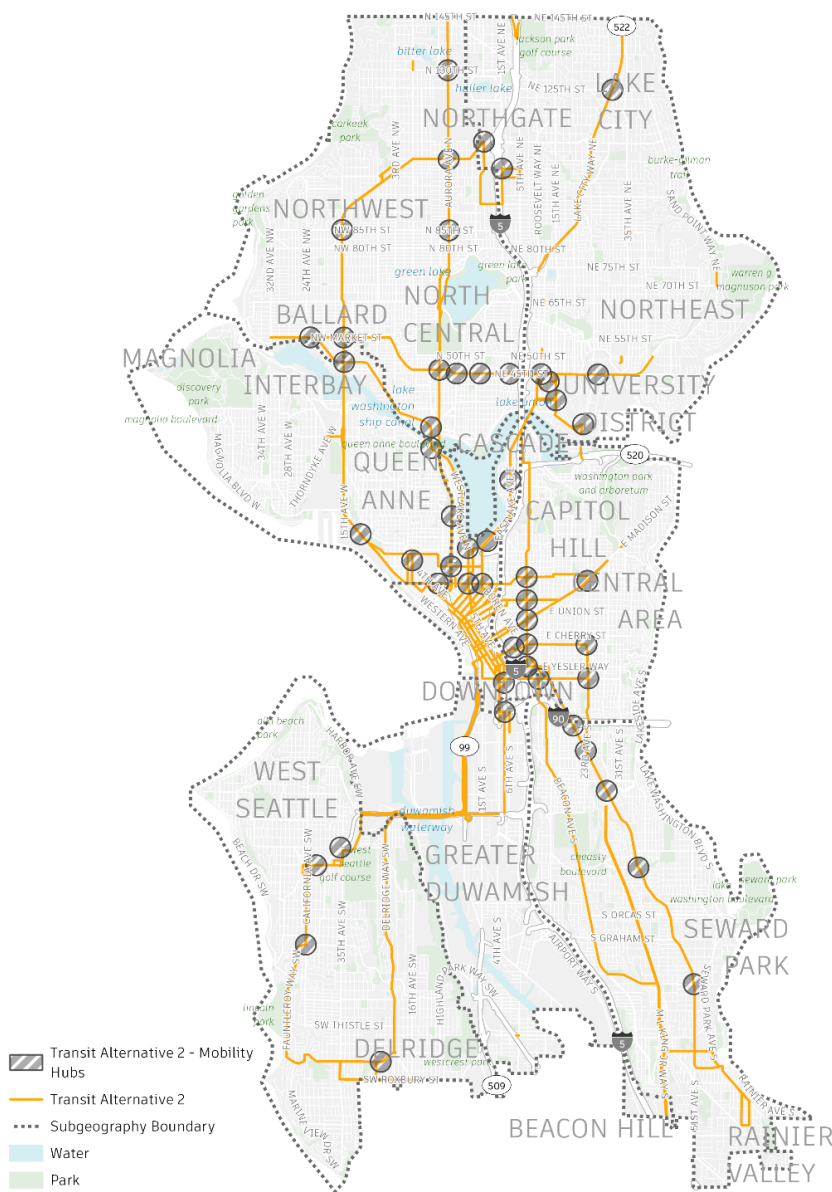
Transit Network  
(in linear miles of  
dedicated corridors)

Alternative 1 **Alternative 2**

38

+ 33

**Exhibit 2-13. Transit Corridors and Community & Mobility Hubs in Alternative 2**



Source: City of Seattle, 2022

## 2.4.14 Alternative 2 Freight Network

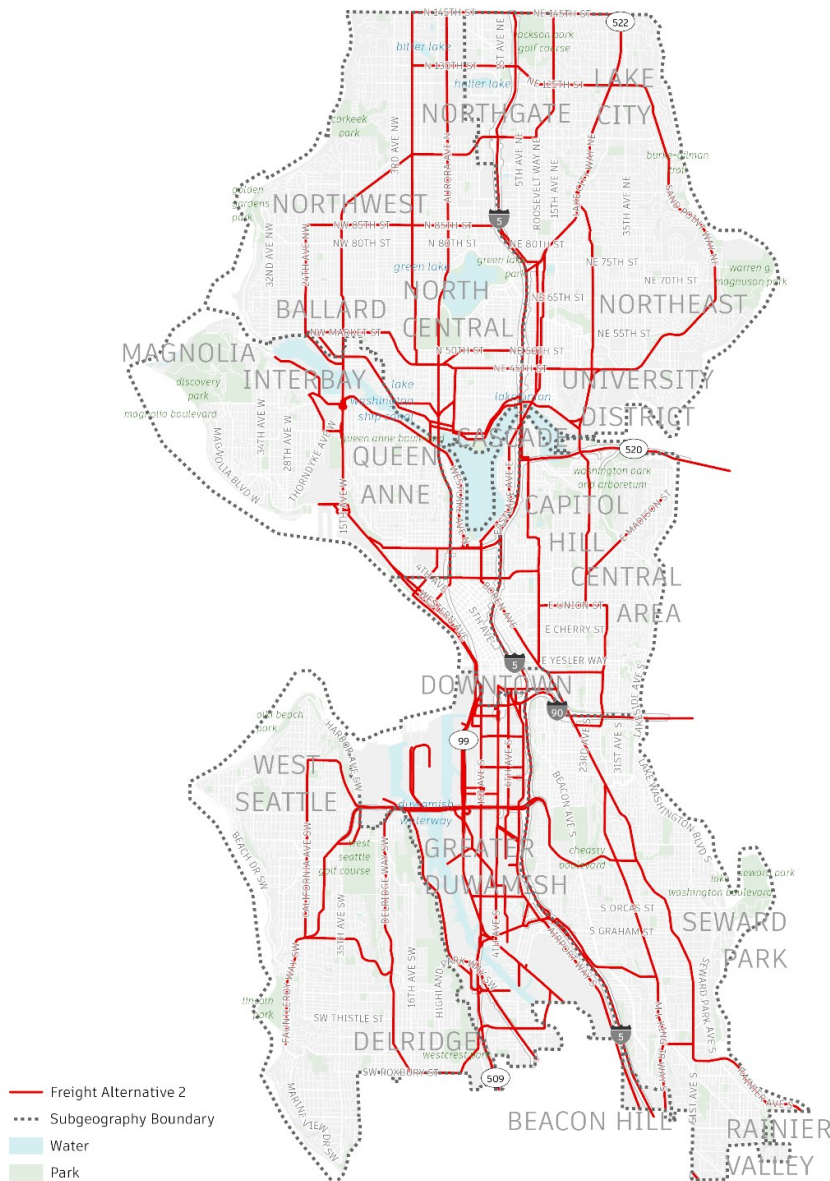
Alternative 2: Moderate Pace includes **218 linear miles** of truck streets designated in City of Seattle's the 2016 Freight Master Plan as shown in Exhibit 2-14.

Freight Network  
(in linear miles of  
truck streets)

Alternatives 1 & 2

218

**Exhibit 2-14. Designated Truck Streets in Alternative 2**



Source: City of Seattle, 2022

## 2.4.15 Alternative 3—Rapid Progress

Alternative 3: Rapid Progress envisions a future for Seattle’s transportation system with strong growth in and funding for new multimodal infrastructure in Seattle’s transportation system. The focus of this alternative is expanding pedestrian, bicycle, and transit connections. This alternative also includes a broad range of improvements to the public and pedestrian realm and additional dedicated space for goods movement through the city. In this alternative, the city fully implements overarching policies of the Seattle Transportation plan with a network of People Streets, electrification infrastructure, a wider range of community & mobility hubs, and implements additional mobility management strategies, in concert with the region.

## 2.4.16 Network and Policy Summary

### Network Assumptions

**General:** Existing transportation conditions and committed projects including ST3 and projects funded through the modal implementation plans, 18% of the overall fleet (including freight) is electric or plug in hybrid (best fit trendline of ZEV adoption from state registrations 2017 - 2023) with additional EV infrastructure.

**Pedestrian:** Sidewalks on all streets citywide, assumed improvements on all unimproved/unpaved trails and walkways.

**Bicycle:** Existing bicycle facilities citywide (excluding sharrows) and committed bicycle projects and bike facilities on all streets with proposed bike facilities in the bike vision network.

**PSPS:** Existing and committed stay healthy streets and additional pedestrian improvements along destination, strolling and event streets (all streets in the PSPS vision network).

**Transit:** Existing and committed dedicated transit lanes and RapidRide corridors and dedicated transit facilities on premium, high priority, and priority streets in the transit vision network (all streets in the transit vision network).

**Community & Mobility Hubs:** All community & mobility hubs included as part of the transit vision network.

**Freight:** Existing freight network and assumed dedicated freight and transit lanes on select freight and transit streets. These include major truck streets that are also priority transit corridors adjusted for feasibility and proximity to manufacturing/industrial centers.

## Policy Assumptions

Policy	Alternative 3 Implementation
<b>Transit System Improvements</b> <i>making connections to light rail, serving non-commute trips, serving underserved communities</i>	Much more frequent bus service connecting to light rail and increased off-peak service (more additional bus service hours).
<b>Network of People Streets</b> <i>creating space for other modes on city streets and discouraging general purpose traffic on certain corridors</i>	29 linear miles of stay healthy streets (limited traffic) 46 linear miles of destination streets 29 linear miles of strolling streets 2 linear miles of event streets
<b>Traffic operations to increase efficiency</b> <i>optimize operations</i>	Signal optimization for GP traffic and transit on all classified roadways, and improvements to reduce congestion at key intersections.
<b>Complete Streets</b> <i>reprioritizing street space for bikes, transit, sidewalk cafes</i>	More additional repurposed parking area and GP traffic lanes as part of: 546 linear miles of bike facilities. 105 linear miles of PSPS streets. 310 miles of dedicated transit corridors.
<b>Improvements at Transit Stops</b> <i>improve comfort and safety at transit stops, especially for riders waiting at night</i>	More safety improvements for transit stops along the entire transit system, particularly on high-ridership bus lines.
<b>Crosswalk Improvements</b> <i>prioritize safe crossings for people at arterials, highways, and water</i>	Crosswalk improvements focused on the safety and comfort of pedestrians along all classified roadways, including minor and collector arterials.
<b>Add mobility zones</b> <i>slow traffic in designated areas for emerging micromobility devices</i>	Traffic calmed zones at designated areas around 105 community & mobility hubs in the city of Seattle.
<b>Support electric vehicle adoption</b> <i>encourage electric vehicle charging infrastructure in public streets and new private development</i>	More EV charging infrastructure required in new development and additional EV infrastructure at 105 community & mobility hubs and 15% EV adoption.
<b>Mobility management strategies.</b> <i>implement additional mobility management strategies, in concert with the region</i>	Introduce additional mobility management strategies, in concert with the region.

### 2.4.17 Alternative 3 Pedestrian Network

Alternative 3: Rapid Progress includes **3,125 linear miles** of sidewalks, with **829 miles** of new sidewalks compared to Alternative 1 as shown in Exhibit 2-15. This includes new

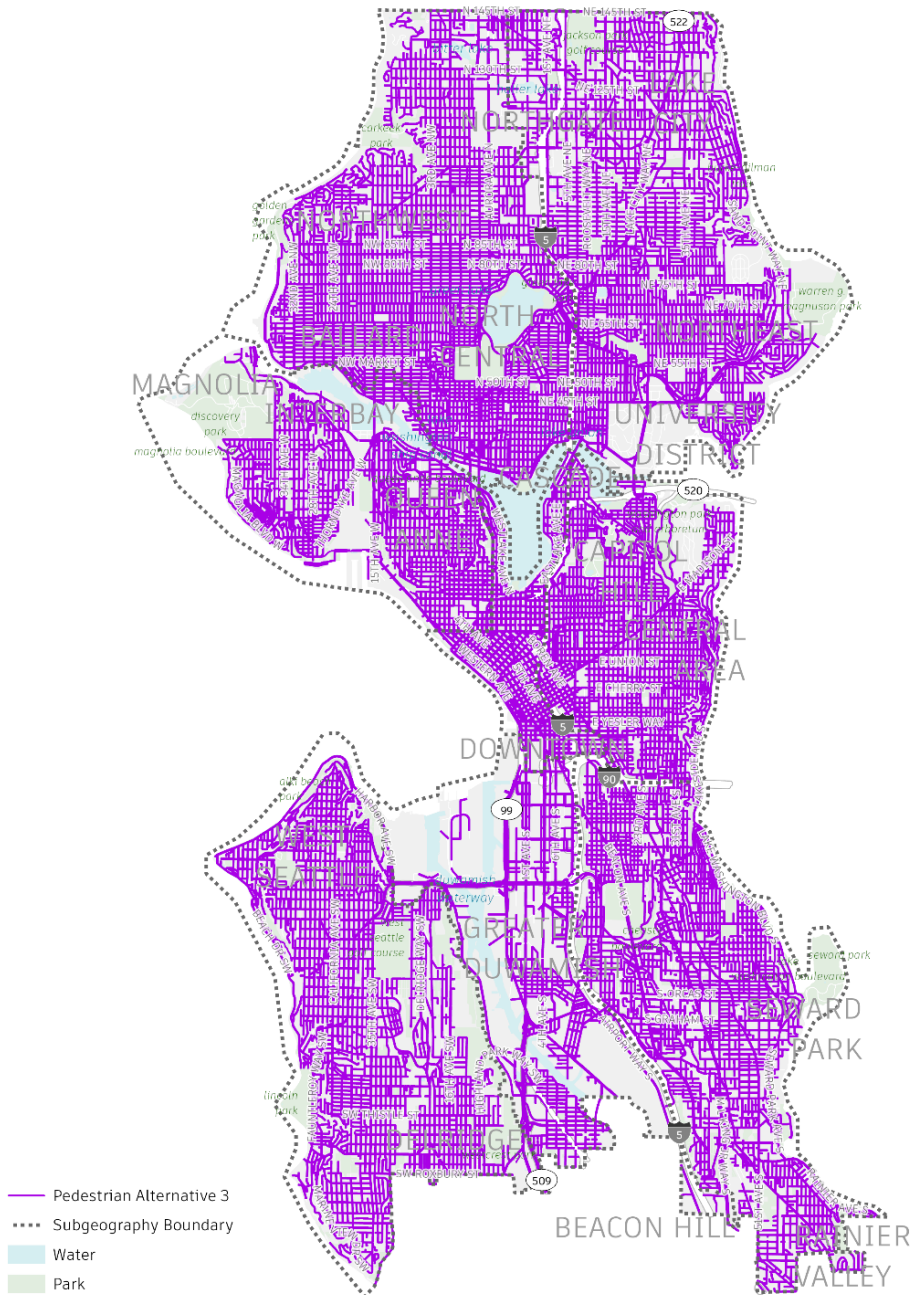
Pedestrian Network  
(in linear miles)

Alternative 1	Alternative 3
2,277	+ 829



sidewalks for all excess right-of-way designated as sidewalks in Seattle that are currently unimproved or gravel.

Exhibit 2-15. Alternative 3 Pedestrian Network



Source: City of Seattle, 2022



## 2.4.18 Alternative 3 Bike Network

Alternative 3: Rapid Progress includes **546 linear miles** of corridors with bike facilities as shown in Exhibit 2-16, with **285 miles** of new bike corridors compared to Alternative 1.

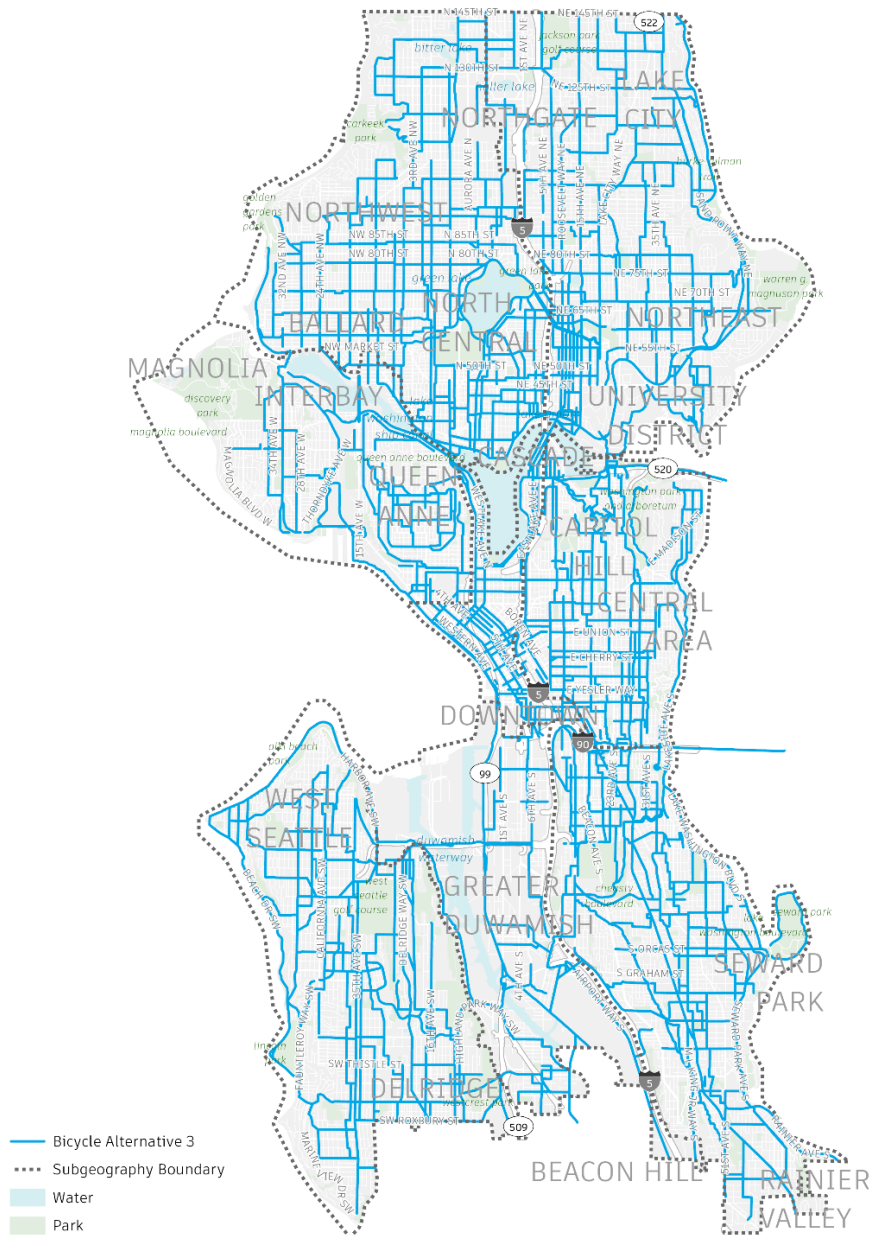
Bike Network  
(in linear miles)

Alternative 1 **Alternative 3**

161

+ 285

**Exhibit 2-16. Potential Bike Improvements in Alternative 3**



Source: City of Seattle, 2022

## 2.4.19 Alternative 3 PSPS Network

Alternative 3: Rapid Progress includes **1,384 linear miles** of corridors within the PSPS network, with **1,008 miles** of corridors with additional pedestrian realm improvements based on as shown in Exhibit 2-17.

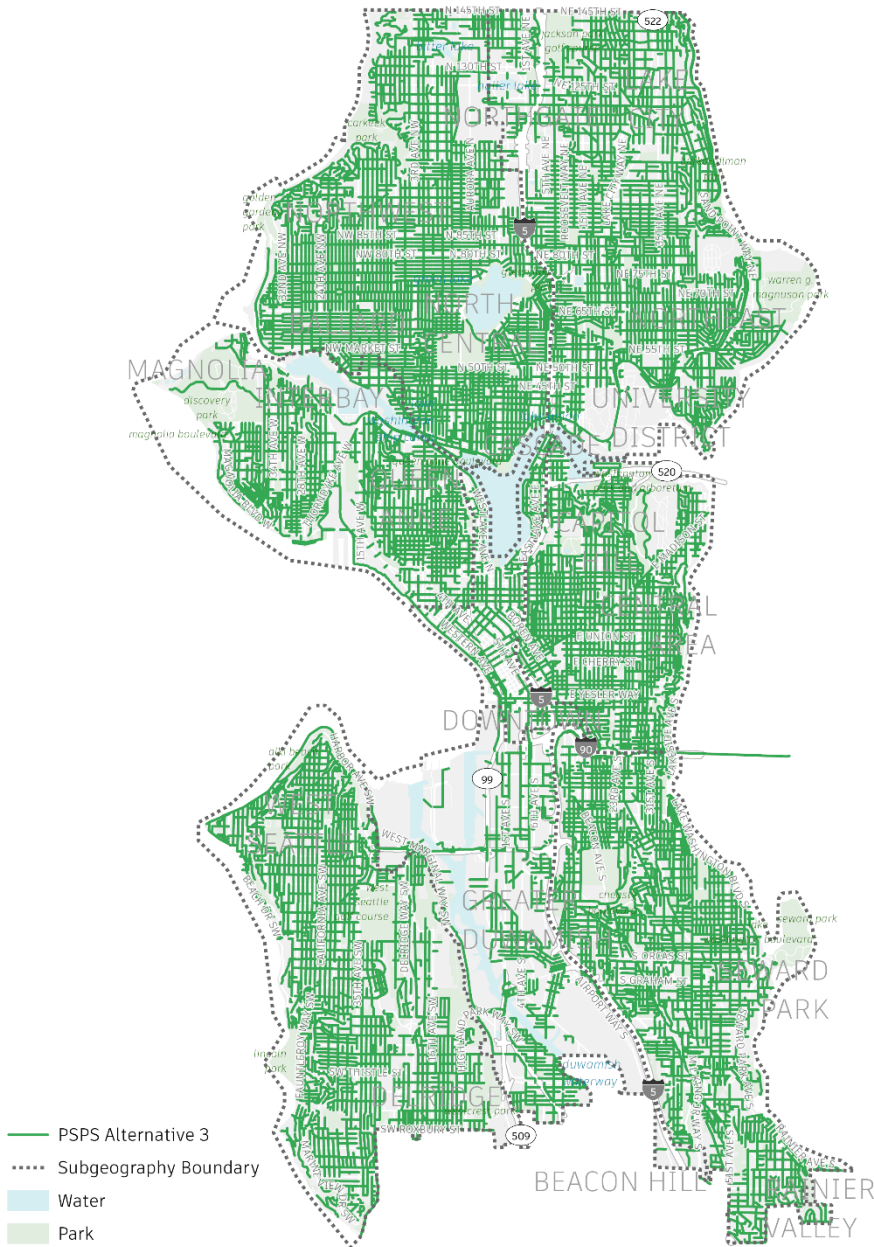
People Streets and  
Public Spaces  
(in linear miles)

Alternative 1 **Alternative 3**

29

+ 76

**Exhibit 2-17. Potential People Streets and Public Space Improvements in Alternative 3**



Source: City of Seattle, 2022

## 2.4.20 Alternative 3 Transit Network

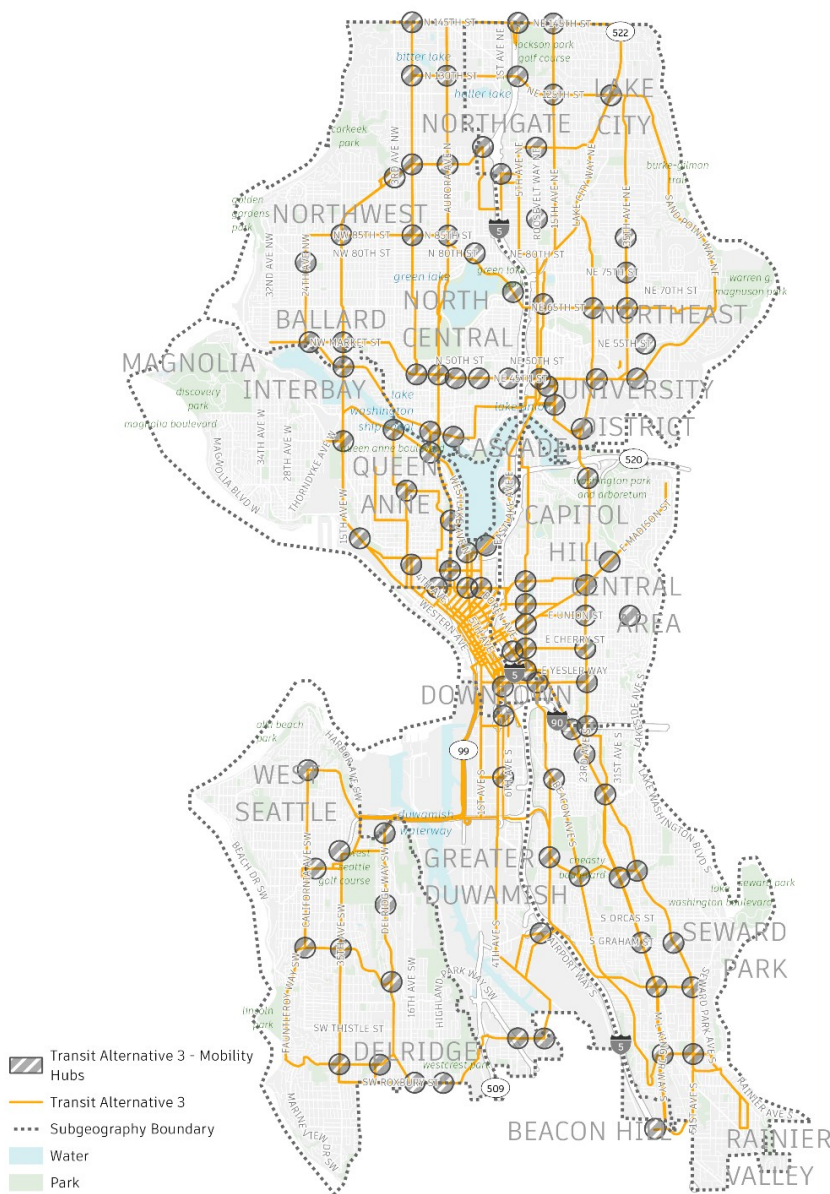
Alternative 3: Rapid Progress includes **161 linear miles** of dedicated transit corridors, **31** light rail stations, **75 linear miles** of RapidRide corridors, and **105** community & mobility hubs as shown in Exhibit 2-18. This includes **123 miles** of additional dedicated transit corridors compared to Alternative 1.

Transit Network  
(in linear miles of  
dedicated corridors)

Alternative 1 **Alternative 3**

38 + 123

**Exhibit 2-18. Transit Corridors and Community & Mobility Hubs in Alternative 3**



Source: City of Seattle, 2022

## 2.4.21 Alternative 3 Freight Network

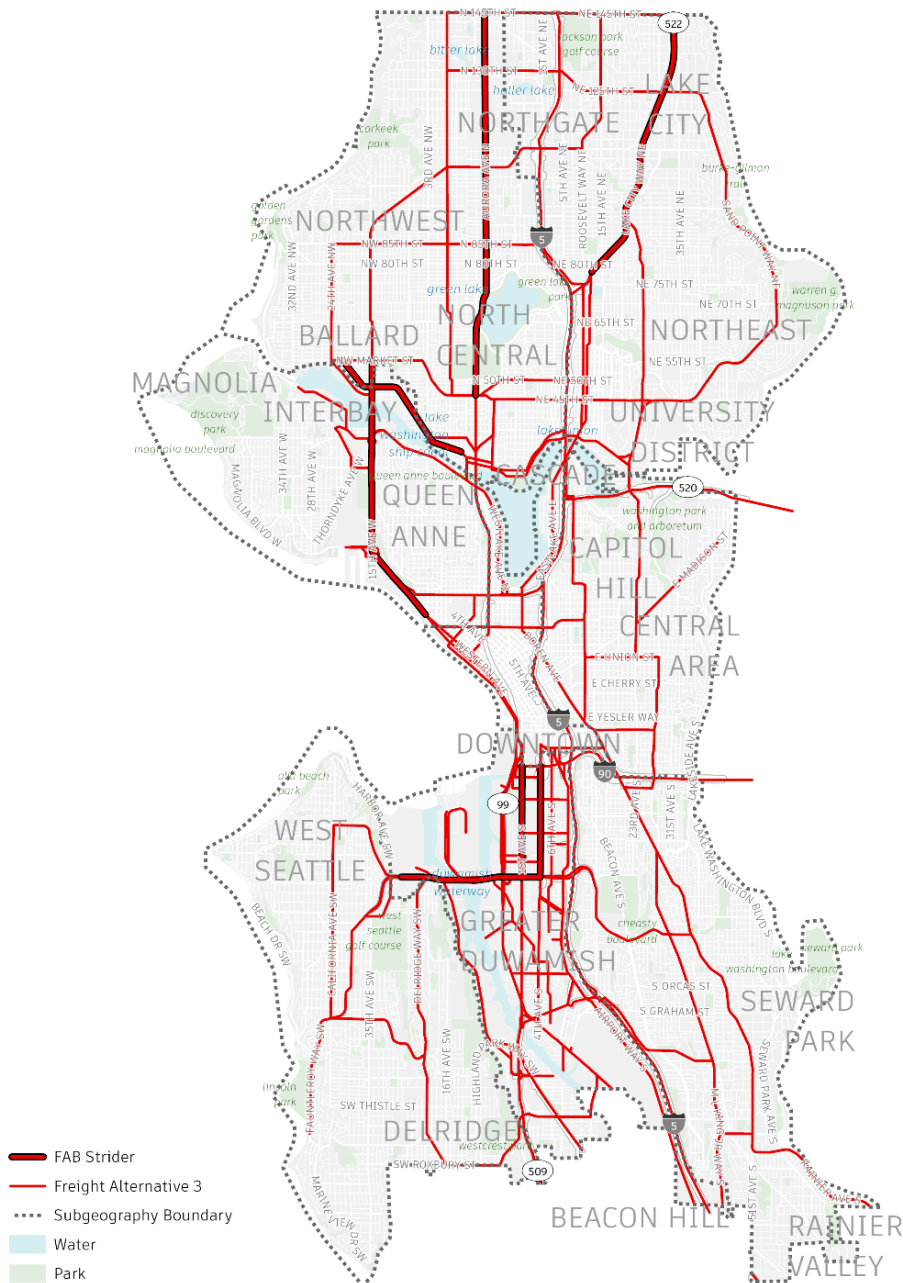
Alternative 3: Rapid Progress includes **218 linear miles** of truck streets from the City of Seattle’s 2016 Freight Master Plan, and **19 miles** of corridors with dedicated freight and transit lanes as shown in Exhibit 2-19.

Freight Network  
(in linear miles of  
truck streets)

Alternative 1 **Alternative 3**

218 + 19

**Exhibit 2-19. Freight Network in Alternative 3**



Source: City of Seattle, 2022



## 2.5 Comparison between Alternatives

### 2.5.1 Summary of Alternatives

Exhibit 2-20 below summarizes the policy concepts under each of the three alternatives studied in this EIS. Network changes are visualized in Exhibit 2-21. It is important to keep in mind that these are not project proposals when reviewing the alternatives. A legislative/funding proposal will be developed once the EIS process is complete which will likely be a hybrid of the alternatives described below and may include refinements to detailed aspects of the networks.

**Exhibit 2-20. Summary of Policy Concepts by Alternatives**

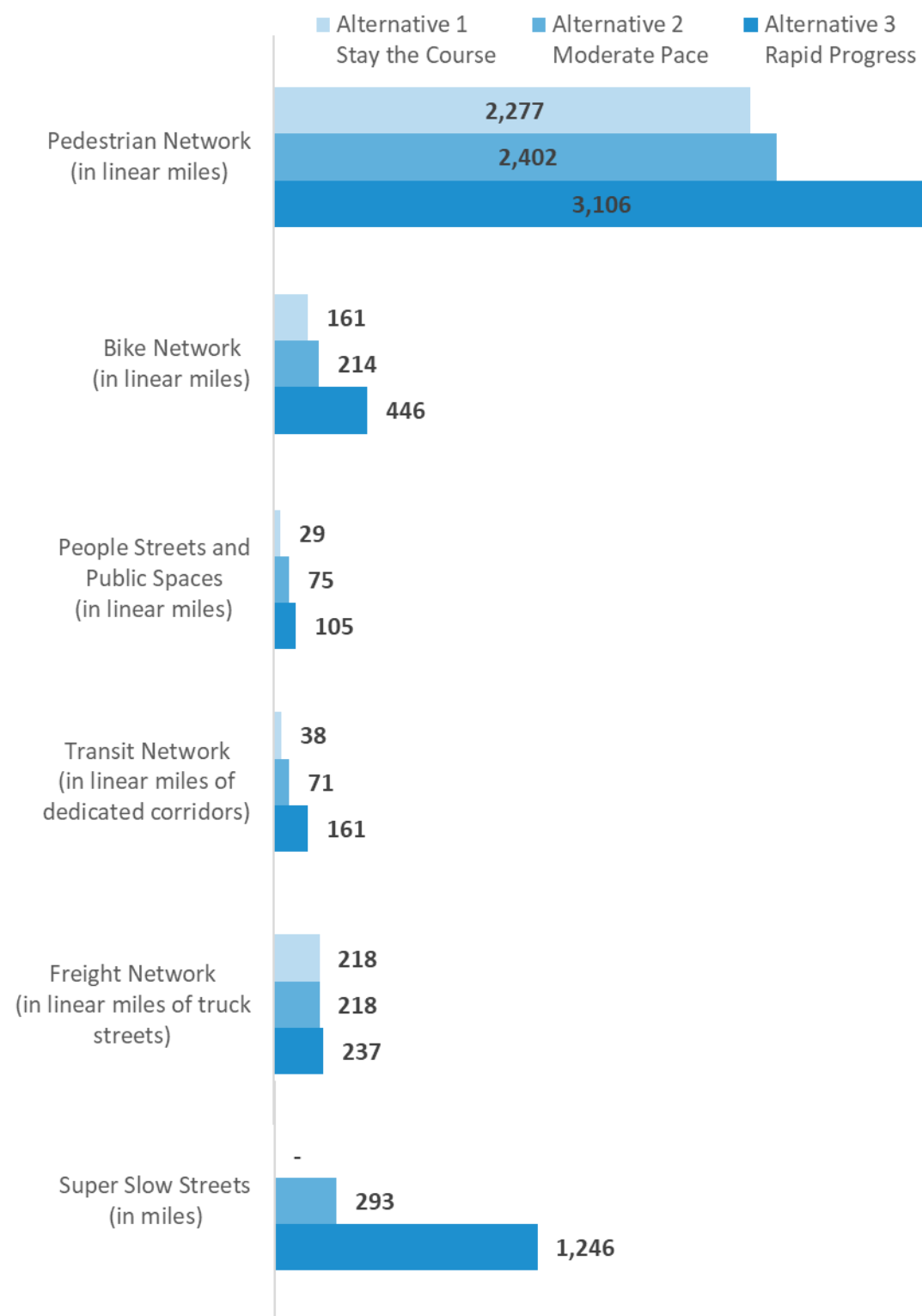
	Alternative 1: No Action	Alternative 2: Moderate Pace	Alternative 3: Rapid Progress
<b>Summary of Changes to Network by Mode</b>			
<b>Pedestrian</b> <i>linear miles of sidewalk</i>	2,277 linear miles	2,400 linear miles	3,125 linear miles
<b>Bike</b> <i>linear miles of corridors with bike facilities</i>	161 linear miles	214 linear miles	546 linear miles
<b>PSPS</b> <i>streets with additional pedestrian improvements</i>	29 linear miles	74 linear miles	105 linear miles
<b>Transit</b> <i>miles of dedicated transit corridor</i>	38 linear miles of dedicated transit corridors, 31 LRT stations, and 75 linear miles of RapidRide corridors.	71 linear miles of dedicated transit corridors, 31 LRT stations, and 75 linear miles of RapidRide corridors.	161 linear miles of dedicated transit corridors, 31 LRT stations, and 75 linear miles of RapidRide corridors.
<b>Freight</b> <i>linear miles of truck streets and corridors with dedicated lanes</i>	218 linear miles of truck streets	218 linear miles of truck streets	218 linear miles of truck streets of which 19 miles of dedicated freight and bus lanes
<b>Multimodal Improvements</b>			
<b>Transit System Improvements</b> <i>making connections to light rail, serving non-commute trips, serving underserved communities</i>	Limited increases in frequencies for bus routes connecting to light rails (limited additional bus service hours).	Somewhat more frequent bus service connecting to light rail connections and increase off-peak bus frequency (some additional bus service	Much more frequent bus service connecting to light rail and increased off-peak service (more additional bus service hours).

	Alternative 1: No Action	Alternative 2: Moderate Pace	Alternative 3: Rapid Progress
		hours).	
<b>Network of People Streets</b> <i>creating space for other modes on city streets and discouraging general purpose traffic on certain corridors</i>	No additional People Streets or Public Spaces on 29 linear miles of stay healthy streets.	29 linear miles of stay healthy streets (limited traffic) 46 linear miles of destination streets	29 linear miles of stay healthy streets (limited traffic) 46 linear miles of destination streets 29 linear miles of strolling streets 2 linear miles of event streets
<b>Complete Streets</b> <i>reprioritizing street space for bikes, transit, sidewalk cafes</i>	No repurposed parking or limited GP traffic outside of existing and funded improvement: 161 linear miles of bike facilities. 29 linear miles of PSPS streets. 38 miles of dedicated transit corridors.	Some additional repurposed parking areas and GP traffic lanes for as part of: 214 linear miles of bike facilities. 74 linear miles of PSPS streets. 71 miles of dedicated transit corridors.	More additional repurposed parking area and GP traffic lanes as part of: 546 linear miles of bike facilities. 105 linear miles of PSPS streets. 161 miles of dedicated transit corridors.
<b>Crosswalk Improvements</b> <i>prioritize safe crossings for people at arterials, highways, and water</i>	Limited crosswalk improvements focused on the safety and comfort of pedestrians at key intersections.	Crosswalk improvements focused on the safety and comfort of pedestrians along major arterial roadways including principal and county arterials.	Crosswalk improvements focused on the safety and comfort of pedestrians along all classified roadways, including minor and collector arterials.
<b>Community &amp; Mobility Hubs</b>	0 community & mobility hubs, with no associated improvements	52 community & mobility hubs with multimodal improvements.	105 community & mobility hubs with EV infrastructure and multimodal improvements
<b>Add mobility zones</b> <i>slow traffic in designated areas for emerging micromobility devices</i>	Very limited traffic calmed zones at designated areas.	Some traffic calmed zones at designated areas around 69 community & mobility hubs in the city of Seattle.	More traffic calmed zones at designated areas around 105 community & mobility hubs in the city of Seattle.



	Alternative 1: No Action	Alternative 2: Moderate Pace	Alternative 3: Rapid Progress
<b>Improvements at Transit Stops</b> <i>improve comfort and safety at transit stops, especially for riders waiting at night</i>	Limited safety improvements for transit stops in and around downtown.	Moderate safety improvements for transit stops near light rail stations and along RapidRide lines.	More safety improvements for transit stops along the entire transit system, particularly on high-ridership bus lines.
<b>Traffic Operations</b>			
<b>Traffic operations to increase efficiency</b> <i>optimize operations</i>	Signal optimization for transit and GP traffic at key intersections.	Signal optimization for GP traffic and transit on all major arterials and improvements to reduce congestion at key intersections.	Signal optimization for GP traffic and transit on all classified roadways, and improvements to reduce congestion at key intersections.
<b>Electrification</b>			
<b>Support electric vehicle adoption</b> <i>encourage electric vehicle charging infrastructure in public streets and new private development</i>	No new EV charging requirements for new development and limited EV infrastructure in public streets (assumed best-fit trendline for EV adoption).	No new EV charging requirements for new development and limited EV infrastructure in public streets (assumed best-fit trendline for EV adoption).	More EV charging infrastructure required in new development and additional EV infrastructure at 105 community & mobility hubs (assumed best-fit trendline for EV adoption +15%).
<b>Programs</b>			
<b>Mobility Management Strategies</b> <i>implement additional mobility management strategies, in concert with the region</i>	No additional mobility management strategies	No additional mobility management strategies.	Introduce additional mobility management strategies, in concert with the region.

**Exhibit 2-21. Summary of Network Changes by Mode for Alternatives**



## 2.5.2 Relationship to Land Use

The STP Update process provides a separate EIS from the Comprehensive Plan Update EIS to test multimodal transportation system changes. The STP considers how the level of investment in infrastructure for people walking, biking, and riding transit could improve transportation outcomes.

The No Action Network and the action alternatives use the One Seattle Comprehensive Plan Update Draft EIS Alternative 5.<sup>2</sup> In this way the STP EIS alternative networks are tested with a range of growth consistent with the One Seattle Comprehensive Plan Update.

## 2.6 Benefits & Disadvantages of Delaying the Proposed Action

Benefits of the proposed action include strengthened policies to make our transportation system more equitable, protect people traveling on our streets, foster a clean, sustainable transportation system, strategically link housing and mobility investments, create more low-cost travel options, continue recovery from the COVID-19 pandemic and reflect community priorities in our limited right-of-way.

Delaying the proposed action would limit the creation of a transportation system that includes restorative practices to address transportation-related inequities, centers safety, responds to climate change, provides reliable and affordable travel options that help people and good get where they want to go, reimagine our streets as inviting places to linger and play and improve transportation infrastructure. The disadvantages of delaying the proposed action may limit the nature and pace of potential investments in the transportation system.

Delaying the proposed action would continue present transportation system conditions. Delaying the proposed action would delay the update of the Transportation Plan. Integrating recommendations from Transportation Plan into the Comprehensive Plan or zoning and development standards may also be delayed.

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<sup>2</sup> See the One Seattle Comprehensive Plan Update EIS Scoping Report for a high-level overview of Alternative 5: <https://www.seattle.gov/opcd/one-seattle-plan/project-documents>.



## Chapter 3

# Environment, Impacts, & Mitigation Measures

This chapter describes the affected environment, potential impacts, and mitigation measures for the following topics:

- Section 3.1 Air Quality
- Section 3.2 Water Resources
- Section 3.3 Sea-Level Rise/Climate Change
- Section 3.4 Noise
- Section 3.5 Land Use
- Section 3.6 Transportation
- Section 3.7 Utilities

Following a description of current conditions (affected environment), the analysis compares and contrasts the alternatives and provides mitigation measures for identified impacts. It also summarizes whether there are significant unavoidable adverse impacts.

The analysis is broad, areawide, and comparative, considering the non-project proposals. (WAC 197-11-442) Where there is a potential for more than a moderate adverse impact on environmental quality (WAC 197-11-794), existing or potential mitigation measures are posed. Consistent with the non-project analysis, mitigation measures are policy, plan, regulation, or program activities that the City could undertake to limit impacts.

## Section 3.1

# Air Quality





This section assesses the potential air quality impacts associated with implementing the Seattle Transportation Plan alternatives under consideration. The air quality section describes regulatory standards for air quality and transportation-related emissions sources. It includes analysis of potentially sensitive land uses near high-traffic roadways (over 100,000 ADT) based on population and job growth through 2044. Impacts described in the following sections are programmatic evaluations based on the data and proposed improvements available at the time of analysis. For the purposes of this programmatic impact analysis, air quality is examined to determine whether:

- Consistent with Vision 2050, King County Countywide Planning Policies (CPPs) and Growth Management Act (GMA).
- The alternative would prevent or deter achieving the National Ambient Air Quality Standards (NAAQS) for criteria pollutants.

Using this methodology, the following analysis confirms that changes to the transportation networks under the studied alternatives do not prevent or deter from meeting the National Ambient Air Quality Standards (NAAQS) for criteria pollutants.

### 3.1.1 Affected Environment

#### Data & Methods

The project team collected data from the following sources to support analysis of existing air quality conditions and potential effects of the project alternatives:

- U.S. Environmental Protection Agency (EPA) Greenbook (EPA 2021)
- Puget Sound Clean Air Agency (PSCAA) and Ecology Air Monitoring Network
- 2016-2021 PSCAA Air Quality Data Summaries (PSCAA)

The analysis of potential impacts from the Seattle Transportation Plan in this section is a qualitative assessment based on efficiency indicators and performance metrics such as travel mode, access to transit, access to pedestrian network, access to jobs, personal vehicle and freight electrification.

#### Current Policy & Regulations

Air quality in the Puget Sound region including Seattle is regulated and enforced by federal, state, and local agencies including the Environmental Protection Agency (EPA), Washington State Department of Ecology (Ecology), and the Puget Sound Clean Air Agency (PSCAA). Each of these agencies has their own role in air quality regulation and monitoring.

##### U.S. Environmental Protection Agency

The Clean Air Act, established in 1970 and revised in 1977 and 1990, was created to protect human health and the environment from air pollutants. The Clean Air Act required the EPA to establish National Ambient Air Quality Standards (NAAQS) to limit common and widespread pollutants. The six criteria pollutants are: Carbon Monoxide (CO), Lead (Pb), Nitrogen Dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), Particle Pollution (PM), and Sulfur Dioxide (SO<sub>2</sub>). Particle pollution is differentiated based on the size of particulate matter and permissible

levels of both PM<sub>10</sub> (particles equal to or less than 10 microns in diameter) and PM<sub>2.5</sub> (particles that are less than or equal to 2.5 microns in diameter) have been established as part of the NAAQS.

These NAAQS are monitored according to primary and secondary standards—primary standards relate to the effect on sensitive populations such as children, the elderly, or those with respiratory or other health conditions and secondary standards relate to the public welfare, such as damage to crops, vegetation, and buildings. Standards are periodically reviewed and revised, with the most recent national standards listed in Exhibit 3-1 below.

**Exhibit 3-1. National Ambient Air Quality Standards**

Pollutant	Primary / Secondary	Averaging Time	Level	Measurement Criteria
Carbon Monoxide (CO)	Primary	8 Hours	9 ppm (10.31 mg/m <sup>3</sup> )	Not to be exceeded more than once per year
		1 Hour	35 ppm (40.08 mg/m <sup>3</sup> )	
Lead (Pb)	Primary and Secondary	Rolling 3-Month Average	0.15 µg/m <sup>3</sup>	Not to be exceeded
Nitrogen Dioxide (NO <sub>2</sub> )	Primary	1 Hour	100 ppb (188.10 µg/m <sup>3</sup> )	98 <sup>th</sup> percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Primary and Secondary	1 Year	53 ppb (99.69 µg/m <sup>3</sup> )	Annual mean
Ozone (O <sub>3</sub> )	Primary and Secondary	8 Hours	0.070 ppm	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
PM <sub>2.5</sub>	Primary	1 Year	12.0 µg/m <sup>3</sup>	Annual mean, averaged over 3 years
	Secondary	1 Year	15.0 µg/m <sup>3</sup>	Annual mean, averaged over 3 years
	Primary and Secondary	24 Hours	35 µg/m <sup>3</sup>	98 <sup>th</sup> percentile, averaged over 3 years
PM <sub>10</sub>	Primary and Secondary	24 Hours	150 µg/m <sup>3</sup>	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO <sub>2</sub> )	Primary	1 Hour	75 ppb (196.45 µg/m <sup>3</sup> )	99 <sup>th</sup> percentile of 1-hour daily maximum concentrations, averaged over 3 years

Pollutant	Primary / Secondary	Averaging Time	Level	Measurement Criteria
	Secondary	3 Hours	0.5 ppm (1309.63 µg/m <sup>3</sup> )	Not to be exceeded more than once per year

Source: EPA, 2022.

Note: The NAAQSs set limits on the level of the criteria pollutants in the air over specified time periods. These ambient air quality standards are designed to protect people that are most susceptible to respiratory distress, including children, the elderly, and people with compromised health or who engage in strenuous outdoor exercise. EPA designates areas that do not meet the NAAQS for one or more criteria as nonattainment areas. Areas that were once designated non-attainment areas but have since achieved the NAAQS are classified as maintenance areas, while areas that have air pollution levels below the NAAQS are classified as attainment areas. States must develop plans to reduce emissions in non-attainment areas to bring measurements of the criteria pollutants back into compliance with EPA standards.

The Clean Air Act also requires the EPA to regulate 188 different hazardous air pollutants (HAPs), also known as air toxics, from both mobile and stationary sources. HAPs are pollutants known or suspected to cause cancer or other serious health effects or have adverse environmental effects. EPA later identified 21 of these air toxics as mobile source air toxics (MSATs) and then extracted a subset of seven priority MSATs: benzene, formaldehyde, diesel particulate matter/diesel exhaust organic gases, acrolein, naphthalene, polycyclic organic matter and 1,3-butadiene. EPA enforces standards for controlling the emissions of HAPs from various sources within different industry groups, also known as source categories. Exposure to these pollutants in high concentrations for long durations increases the risk of cancer, damage to the immune system, neurological problems, reproductive, developmental, respiratory, and other serious health problems. The first phase of regulatory standards EPA develops for HAP sources are maximum achievable control technology (MACT) standards based on the level of emission control achieved by low-emitting sources in an industry. The second phase for controlling HAPs is a risk-based approach that occurs within eight years of the initial implementation of MACT standards. This residual risk review assesses the need for more health-protective standards.

### Washington State Department of Ecology

Washington Department of Ecology (Ecology) regulates over 430 toxic air pollutants from commercial and industrial sources in Washington state, prioritizing 21 of them due to the increased health risk and prevalence from common sources such as diesel emissions and wood smoke. Ecology is also responsible for monitoring statewide air quality and enforcing federal EPA standards through a State Implementation Plan (SIP), which includes Attainment SIPs (when an area doesn't meet NAAQS) and Maintenance SIPs (when an area must meet NAAQS for 20 years after a period of nonattainment). These SIPs also include specific state plans to address certain issues, such as the Regional Haze Plan, Smoke Management Program, and the Transportation Conformity Plan (TCP). The TCP ensures federal transportation funds support roadway and transit activities that align with SIPs for air quality. Attainment and Maintenance SIPs are also required to include enforceable limits on total pollution from all transportation sources, called "motor vehicle emissions budgets." These budgets put a cap on the total amount of transportation-related emissions that can be generated, including from projected future demand.

### **Puget Sound Clean Air Agency**

The Puget Sound Clean Air Agency (PSCAA) was formed in 1967 under the Washington Clean Air Act, having the authority to create regulations and permit station air pollutant sources and construction emissions within King, Kitsap, Pierce, and Snohomish Counties. PSCAA contributes to statewide SIPs and is currently updating their Strategic Plan that will cover the next 5 to 7 years, as the most recent plan was published in 2014. These Plans create goals and set standards to implement the long-term vision for air quality and climate within the region. PSCAA also operates 20 ambient air quality monitoring stations throughout its four-county jurisdiction, and while most standards are in-line with Ecology and the EPA, the PSCAA adopted a stricter health goal of 25  $\mu\text{g}/\text{m}^3$  for  $\text{PM}_{2.5}$  versus 35  $\mu\text{g}/\text{m}^3$  in a 24-hour period in 1999 after convening a “Particulate Matter Health Committee.”

### **Current Conditions**

Air quality is affected by pollutants from both natural and manmade sources. Vehicles and equipment that burn fossil fuels are typically among the largest contributors to transportation-related emissions. Vehicles traveling on roadways primarily contribute to four criteria pollutants: CO, PM,  $\text{NO}_2$ ,  $\text{O}_3$ , as well as ozone precursors known as volatile organic compounds (VOCs). State and federal standards regulate these pollutants along with the two other criteria pollutants:  $\text{SO}_2$  and lead. The Puget Sound region is currently in attainment for all six criteria pollutants ([Ecology, 2022](#)) meaning that levels for these pollutants are below the maximum threshold set by the EPA.

### **Pollutants of Concern**

The largest contributors of pollution related to transportation construction projects and changes to travel patterns are construction equipment and vehicles traveling on roadways. The main pollutants emitted from these sources are CO, PM, ozone precursors (VOC and  $\text{NO}_x$ ), greenhouse gases (GHGs), and HAPs. This section describes these pollutants and their effects on public health and the environment, with the exception of greenhouse gas emissions, which will be addressed in Section 3.3.

#### *Carbon Monoxide (CO)*

CO is an odorless, colorless, tasteless gas formed by the combustion of fuels containing carbon, with most CO emissions coming from motor vehicles, industrial activity, and wood burning. CO enters the bloodstream through the lungs and reduces the oxygen-carrying capacity of blood, affecting the function of organs and tissues. People with existing cardiovascular or respiratory issues may experience chest pains, nausea, fatigue, and dizziness when exposed to high levels of CO, though even healthy individuals may experience issues with alertness depending on the amount of exposure. As the most common source of CO emissions is motor vehicles, high concentrations are most present in urban areas, and it is the urban areas of Washington that have breached NAAQS in the past 30 years. The urban areas within Puget Sound and Vancouver, WA were on attainment maintenance plans for CO from 1996 to 2016, while Yakima and Spokane will remain on maintenance plans until the end of 2022 and mid 2025 respectively.

#### *Nitrogen Dioxide ( $\text{NO}_2$ )*

$\text{NO}_2$  is a red/brown reactive gas formed from the chemical reaction of nitrogen oxide (NO), hydroperoxyl radical ( $\text{HO}_2$ ), and alkylperoxy radical ( $\text{RO}_2$ ) in the atmosphere.  $\text{NO}_2$  when combined with other nitrogen oxides is known as  $\text{NO}_x$ , which when combined with volatile organic compounds (VOCs) in the atmosphere,

can form ozone. Vehicles such as automobiles, freight vehicles, and construction equipment are the most common sources of NO<sub>x</sub>, along with marine vessels and industrial boilers and processes. While Washington has not violated NAAQS for NO<sub>2</sub>, Ecology continues to measure NO<sub>x</sub> levels at three sites within Seattle, as NO<sub>x</sub> is a key contributor to ozone and fine particulate matter.

#### *General-level Ozone (O<sub>3</sub>)*

Ozone is a secondary air pollutant, produced in the atmosphere through a complex series of photochemical reactions involving VOCs (also sometimes referred to by some regulating agencies as reactive organic gases, or ROG), NO<sub>x</sub>, CO, and sunlight. These ozone precursors are created from combustion processes and the evaporation of solvents, paints, and fuels. Ozone levels are usually highest in the afternoon because of the intense sunlight and the time required for ozone to form in the atmosphere. Elevated concentrations of ground-level ozone can cause reduced lung function, respiratory irritation, and can aggravate asthma. Ozone has also been linked to immune system impairment. People should limit outdoor exertion if ozone levels are elevated, as even healthy individuals may experience respiratory issues on a high-ozone day. Ground-level ozone can also damage forests and agricultural crops, interfering with their ability to grow and produce food.

Currently, all of Washington State is in attainment for NAAQS for ozone, with a complete maintenance plan for the Central Puget Sound Region in 2016.

#### *Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>)*

PM is a class of air pollutants that consists of a mixture of extremely small particles and liquid droplets such as acids, organic chemicals, metals, and soil or dust particles. PM takes three main forms depending on density—PM<sub>10</sub> is considered “Coarse”, with a diameter of 10µm or less. “Fine” particulate matter is also known as PM<sub>2.5</sub>, due to its diameter being 2.5µm or less. Lastly there are “Ultrafine” particles with a diameter less than 0.1µm, though these are not factored into attainment designations. Particulate matter is a result of combustion, such as emissions from vehicles and industry, and from wood burning including wood stoves, fireplaces, and wildfires. High levels of particulate matter—especially PM<sub>2.5</sub>—can result in a multitude of health impacts, including an increase in hospital visits for cardiovascular and respiratory problems, especially for sensitive populations. Decreased visibility is also a major factor tied to increased levels of particulate matter.

Currently, all of Washington is meeting air quality standards for both fine (PM<sub>2.5</sub>) and coarse (PM<sub>10</sub>) particulate matter, with maintenance plans for most of the state being completed recently. Thurston County completed their maintenance plan for PM<sub>10</sub> in December 2020, while Kent, Puget Sound, and Tacoma completed their maintenance plans for PM<sub>10</sub> in May 2021. As of now, only Tacoma is completing a maintenance plan for PM<sub>2.5</sub> particles, with the end of their 20-year non-attainment being in March of 2035. Also, while there were extended periods of time when NAAQS were exceeded for particulate matter due to wildfires, the EPA allows data from days “influenced by exceptional events that are beyond the ability of air agencies to control” to be excluded for regulatory actions.

#### **Other Pollutants**

Historically, major sources of lead emissions have been from vehicles, equipment, and industrial sources, but after the removal of lead from gasoline, lead levels in the air fell by 98% between 1980 and 2014. Vehicle travel is no longer a major source of lead emissions, and lead emissions are not associated with changes to the transportation network or travel patterns from the Seattle Transportation Plan. SO<sub>2</sub> is produced by

burning fuels that contain sulfur such as coal, oil, and diesel, or processing metals that contain sulfur. Historically, Washington has maintained very low measured levels of SO<sub>2</sub> and stopped most monitoring of SO<sub>2</sub> levels in the air. After EPA adopted a new SO<sub>2</sub> standard in 2010, Ecology evaluated ambient SO<sub>2</sub> levels throughout Washington, finding that all counties met that standard—apart from one area in Whatcom County. (EPA, 2017). With the addition of new emission control technologies, SO<sub>2</sub> from gasoline, diesel, and transportation-related sources have fallen over the past few decades due to a reduction of sulfur content in gasoline and diesel by nearly 90%. Changes to the transportation system and travel patterns from the Seattle Transportation Plan are not associated with changes in SO<sub>2</sub> generation.

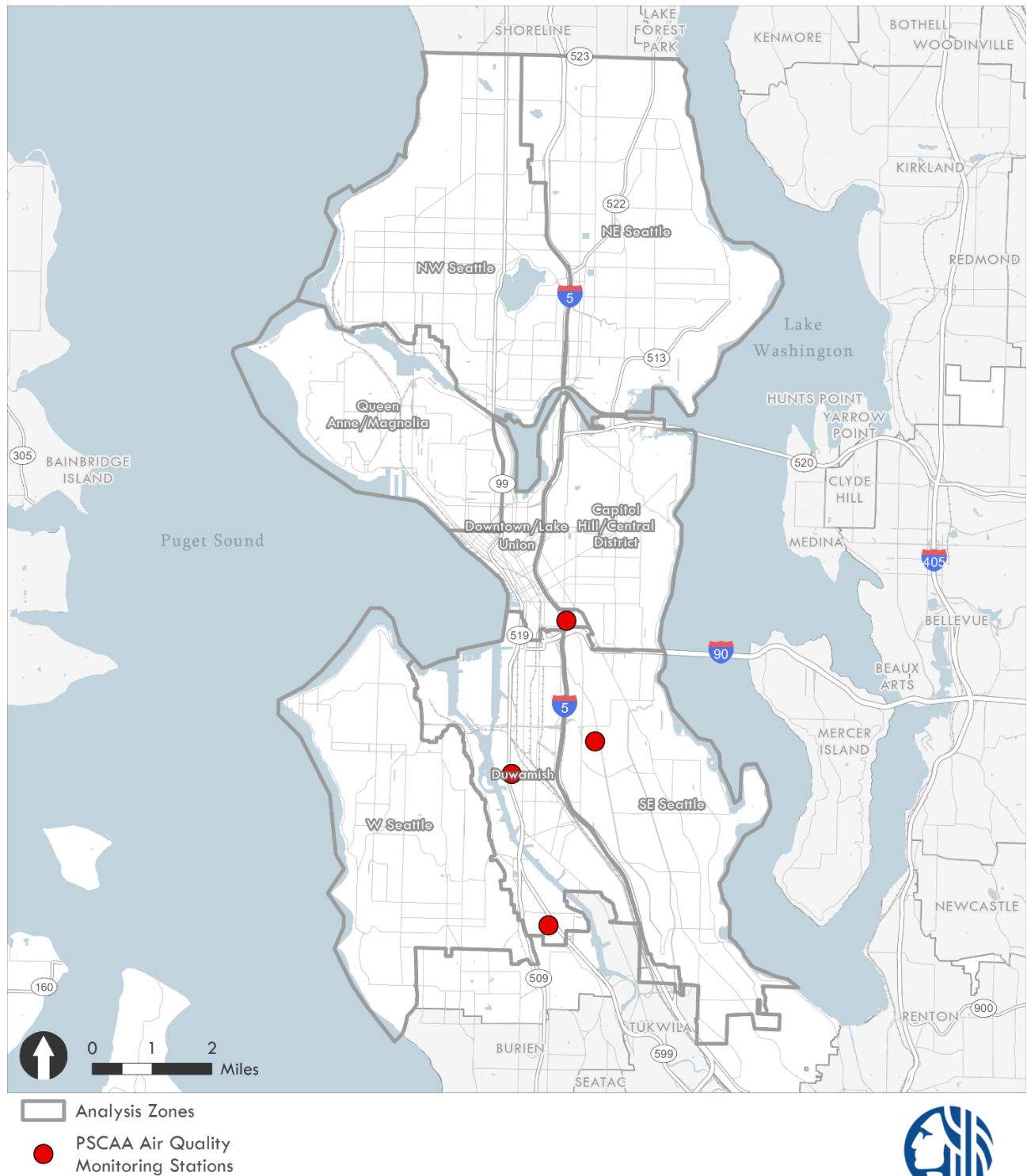
#### *Air Quality Information Sources, Monitoring and Trends*

Data from PSCAA, Ecology, and EPA monitoring stations shown in Exhibit 3-2 were used to compare criteria pollutant levels over the past three years to current NAAQS as summarized in Exhibit 3-3. This includes days with excessive wildfire smoke that were excluded from EPA determinations regarding attainment and nonattainment. Therefore, some data points may exceed the NAAQS, but this did not factor into attainment determinations for the State or the region.

Measured criteria pollutant levels decreased from 2019 to 2021 at all monitoring stations apart from Ozone at Beacon Hill, which did not change, and 24-hour averaging PM<sub>2.5</sub> at Beacon Hill, which increased, but remained below the NAAQS. Both CO and NO<sub>2</sub> levels were consistently higher at the 10<sup>th</sup> & Weller station in Subarea 4 than at the Beacon Hill station in Subarea 8. On average, measurements for PM<sub>2.5</sub> with 1-year averaging were highest at the South Park station in Subarea 7, while measurements for PM<sub>2.5</sub> with 24-hour averaging were highest at the 10<sup>th</sup> & Weller station in Subarea 4.



Exhibit 3-2. PSCAA Air Quality Monitoring Stations



Source: PSCAA, 2022.

Exhibit 3-3. Criteria Pollutant Levels in the City of Seattle 2019-2021

Pollutant	Station	Primary/ Secondary	Averaging Time	NAAQS	2019 Value	2020 Value	2021 Value
Carbon Monoxide (CO)	Beacon Hill (Subarea 8)	Primary	8 hours	9 ppm	0.80	1.70	0.60
			1 hour	35 ppm	1.17	1.79	0.77
Carbon Monoxide (CO)	10 <sup>th</sup> & Weller (Subarea 4)	Primary	8 hours	9 ppm	1.10	1.20	1.00
			1 hour	35 ppm	1.50	1.53	1.37
Nitrogen Dioxide (NO <sub>2</sub> )	Beacon Hill (Subarea 8)	Primary	1 hour	100 ppb	43.05	42.10	41.16
		Primary and Secondary	1 year	53 ppb	10.56	8.60	9.25
Nitrogen Dioxide (NO <sub>2</sub> )	10 <sup>th</sup> & Weller (Subarea 4)	Primary	1 hour	100 ppb	61.30	58.51	53.59
		Primary and Secondary	1 year	53 ppb	18.10	15.81	15.80
Ozone (O <sub>3</sub> )	Beacon Hill (Subarea 8)	Primary and Secondary	8 hours	0.07 ppm	0.05	0.05	0.05
PM <sub>2.5</sub>	Beacon Hill (Subarea 8)	Primary	1 year	12 µg/m <sup>3</sup>	6.57	6.50	5.70
		Secondary	1 year	15 µg/m <sup>3</sup>			
		Primary and Secondary	24 hours	35 µg/m <sup>3</sup>	25.80	34.43	26.00
PM <sub>2.5</sub>	10 <sup>th</sup> & Weller (Subarea 4)	Primary	1 year	12 µg/m <sup>3</sup>	N/A	8.70	7.77
		Secondary	1 year	15 µg/m <sup>3</sup>			
		Primary and Secondary	24 hours	35 µg/m <sup>3</sup>	N/A	37.50	30.57
PM <sub>2.5</sub>	Duwamish (Subarea 7)	Primary	1 year	12 µg/m <sup>3</sup>	8.73	8.9	8.37
		Secondary	1 year	15 µg/m <sup>3</sup>			
		Primary and Secondary	24 hours	35 µg/m <sup>3</sup>	31.83	35.60	27.57
PM <sub>2.5</sub>	South Park (Subarea 7)	Primary	1 year	12 µg/m <sup>3</sup>	9.13	8.80	8.10
		Secondary	1 year	15 µg/m <sup>3</sup>			
		Primary and Secondary	24 hours	35 µg/m <sup>3</sup>	36.73	26.40	16.93

Pollutant	Station	Primary/ Secondary	Averaging Time	NAAQS	2019 Value	2020 Value	2021 Value
PM <sub>10</sub>	Beacon Hill (Subarea 8)	Primary and Secondary	24 hours	150 µg/m <sup>3</sup>	N/A	58.67	32.33

Source: PSCAA, 2017-2022; EPA, 2021.

#### *Air Toxics*

Air toxic pollutant emissions are also of concern because of the projected growth in vehicle miles traveled. EPA has been able to reduce benzene, toluene, and other air toxics emissions from mobile sources by placing stringent standards on tailpipe emissions and requiring the use of reformulated gasoline. The Puget Sound Regional Council estimates that by 2050, the population of the Puget Sound region will grow by 38% (1.6 million people) to reach a population of 5.8 million people (PSRC 2021), with the highest population increase estimated to be in King County. Estimates such as this indicate that CO, PM<sub>2.5</sub> and ozone emissions will increase along with population, which could lead to future challenges meeting the NAAQS.

#### **Sources of Transportation Air Pollution in Seattle**

Equipment with heavy-duty fossil fuel burning engines, such as locomotives, large trucks, and construction equipment, are the main sources of transportation-related air pollution within Seattle, largely due to emissions produced by diesel motors. According to 2019-2020 AADT roadway data from WSDOT, the roads with the highest percentage of heavy truck traffic within Seattle are sections of I-5, SR-99, SR-519, and SR-522. The most affected area is Georgetown within the Duwamish Subarea of the City, with stretches of I-5, SR-99, and SR-519 running through the area. Maple Leaf in the NE Seattle Subarea of the City is also heavily affected, as both I-5 and SR-522 run through this area. The high volume of heavy truck traffic on I-5 also affects the neighborhoods within the SE Seattle, Capitol Hill/Central District, and NW Seattle Subareas. The main source of railway pollutants is from the freight trains that operate on the BNSF-owned tracks that intersect the Duwamish, Downtown/Lake Union, Queen Anne/Magnolia, and NW Seattle Subareas. Construction equipment pollution is more varied, as idling trucks and heavy equipment are only present and operating during an active construction project, therefore the impacts are citywide.

#### *Citywide*

Equipment with heavy-duty fossil fuel burning engines, such as locomotives, large trucks, and construction equipment, are the main sources of transportation-related air pollution within Seattle, largely due to emissions produced by diesel motors. According to 2019-2020 annual average daily traffic (AADT) roadway data from Washington State Department of Transportation (WSDOT), the roads with the highest percentage of heavy truck traffic within Seattle are sections of I-5, SR-99, SR-519, and SR-522. Construction equipment use is variable, intermittent, and geographically temporary, being more heavily associated with certain phases (such as earthmoving and grading) of active construction. However, when emissions are examined over a longer time frame, such as annually, impacts are fairly constant and ubiquitous on a citywide basis.

#### *Areas*

The most substantial sources of air pollution in each area of the City are described below.

NW Seattle (Area 1)

Northwest Seattle is heavily affected by on-road sources of air pollutants. I-5 generally runs north-south along the southeastern boundary of Area 1 and SR-99 runs north-south and transects Area 1. The main source of railway pollutants is from the freight trains that operate on the BNSF-owned tracks that run along the southern section of the eastern boundary of Area 1. Industrial uses are located along and adjacent to the southern boundary of the area.

NE Seattle (Area 2)

Northeast Seattle is heavily affected by on-road sources of air pollutants. I-5 runs along the southwestern boundary of and through the northwestern portion of Area 2. In addition, SR-522 runs through the northern portion of Area 2. The main source of railway pollutants is from the freight trains that operate on the BNSF-owned tracks that run along the western boundaries of Area 2.

Queen Anne/Magnolia (Area 3)

Queen Anne/Magnolia is heavily affected by on-road and rail sources of air pollutants. SR-99 runs along the eastern boundary of Area 3. The main source of railway pollutants is from the freight trains that operate on the BNSF-owned tracks that run through and along the southwestern boundary of Area 3. Other sources of air pollution include commercial cruises and other non-industrial operations at the Port of Seattle and industrial land uses.

Downtown/Lake Union (Area 4)

Downtown/Lake Union is heavily affected by on-road and rail sources of air pollutants. SR-99 runs through the area and I-5 runs along the eastern boundary. The main source of railway pollutants is from the freight trains that operate on the BNSF-owned tracks that run through Area 4. Another source of air pollution is commercial cruises and other non-industrial operations at the Port of Seattle. Industrial uses are located at the northwestern and southern portions of the Area.

Capitol Hill/Central District (Area 5)

Capitol Hill/Central District is heavily affected by on-road sources of air pollutants. I-5 runs along the western boundary, SR-520 runs along the northern boundary, and I-90 runs along the southern boundary of Area 5. The main source of railway pollutants is from the freight trains that operate on the BNSF-owned tracks that run through Area 5. Industrial uses are located at the southwestern corner of Area 5.

W Seattle (Area 6)

West Seattle is unaffected by on-road pollutants from roadways, but no major sources of air pollution are located within the Area. SR-509 runs along a relatively small segment of the southeastern boundary of the Area. Sources of railway pollutants are from freight trains that operate on the BNSF-owned tracks that run along a relatively small segment of the northeastern boundary of Area 6, adjacent to the industrial district operating along the southern portion of the Port of Seattle. The Area is bound to the east by Area 7, which consists primarily of industrial-zoned land.

#### Duwamish (Area 7)

Duwamish consists primarily of industrial land and is heavily affected by on-road, rail, maritime, and aviation sources of air pollutants. I-5 runs along the eastern boundary of and SR-509 runs through Area 7. Area 7 is heavily affected by rail operations from BNSF-owned tracks that run through the Area, which includes an intermodal facility and industrial district at the Port of Seattle. The King County International Airport is located in the southwestern portion of the Area, contributing to aviation-related pollutants.

#### SE Seattle (Area 8)

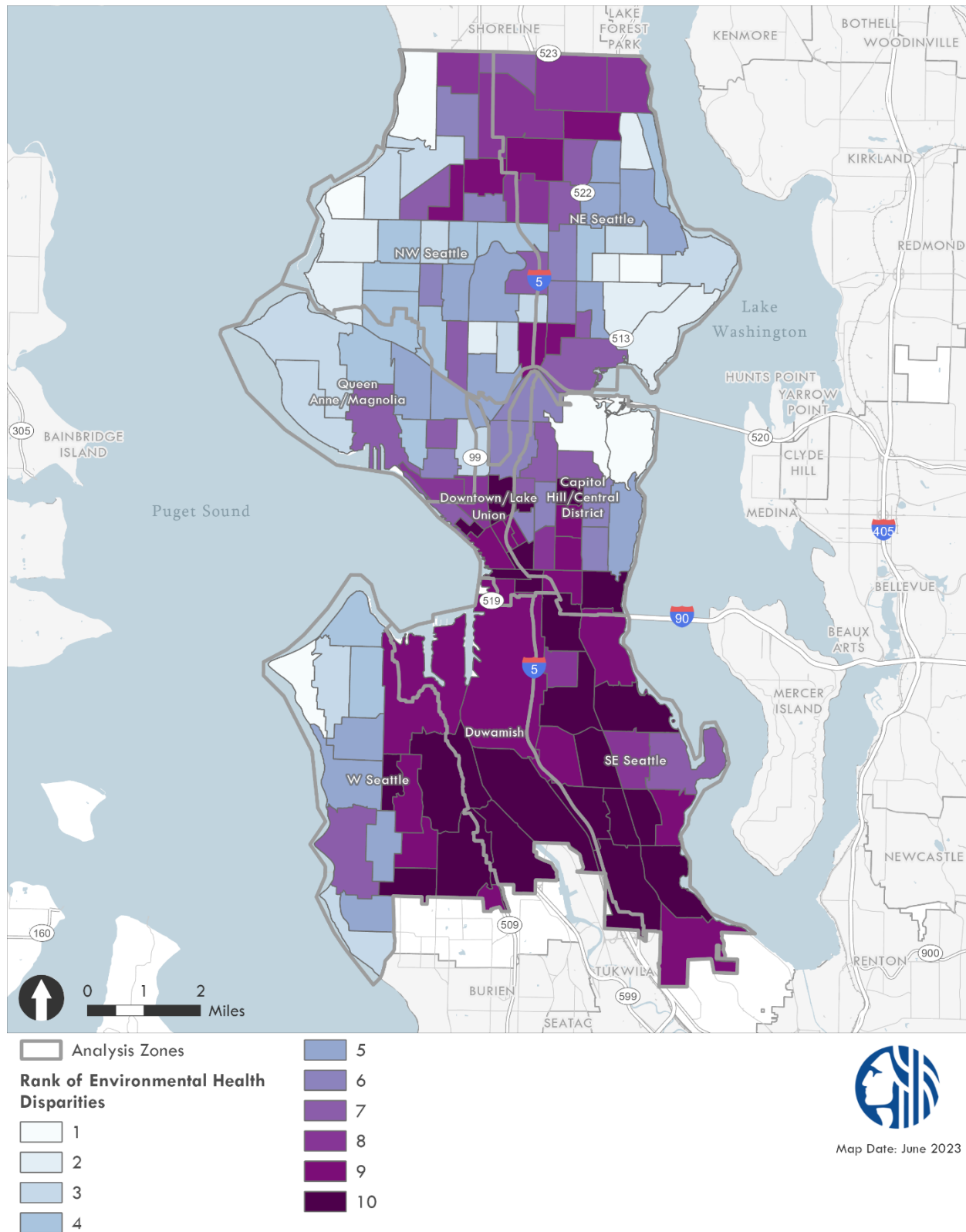
Southeast Seattle is heavily affected by on-road sources of air pollutants. I-5 runs along the western boundary and I-90 runs along the northern boundary of Area 5. The main source of railway pollutants is from the freight trains that operate on the BNSF-owned tracks that run along the western and northern boundaries of Area 8. Although not located within Area 8, the King County International Airport is located adjacent to Area 8 to the southwest and the Seattle Intermodal facility, which is source of railway pollutants, is located adjacent to the west of Area 8.

### **Sensitive Populations**

Sensitive populations are those who are the most at-risk of adverse effects from elevated levels of air pollution, whether due to age, previous or ongoing illnesses, socioeconomic status (SES), or other conditions such as pregnancy. According to EPA, these sensitive groups include people with heart and lung disease, older adults (those 65 years of age or older), children, people with diabetes, and people of lower SES (EPA, 2022). This also includes those experiencing breathing troubles, such as those who have/have had COVID-19, asthma, cystic fibrosis, or other respiratory ailments.

Sensitive land uses to air quality include residential areas, schools, daycare facilities, hospitals, and nursing and convalescent homes. Residential communities that border industrial areas may be at risk of increased impact from pollutants due to their proximity to both transportation and point sources of pollution. The Washington Environmental Health Disparities Map is used to locate areas with high environmental health risks posed to sensitive populations across the state. The map accounts for pollution measures and proximity to sources of pollution. The goal of the map is to provide insight on prioritization of public investments to buffer environmental health impacts on the state's communities, and so that everyone could benefit from clean and healthy air, water, and environments. The map was created with 19 indicators, and these indicators are divided into four themes: environmental exposures, environmental effects, sensitive populations, and socioeconomic factors. The combination of these indicators informs the environmental health disparities map by census tract, which shows communities experiencing a disproportionate share of environmental health burdens and that will need more assistance to reach equitable outcomes. The environmental health disparities data for the City of Seattle and its subareas is shown in Exhibit 3-4 below with 1 indicating census tracts with the lowest disparities and 10 indicating tracts with the highest disparities.

Exhibit 3-4. Washington Health Disparities Map



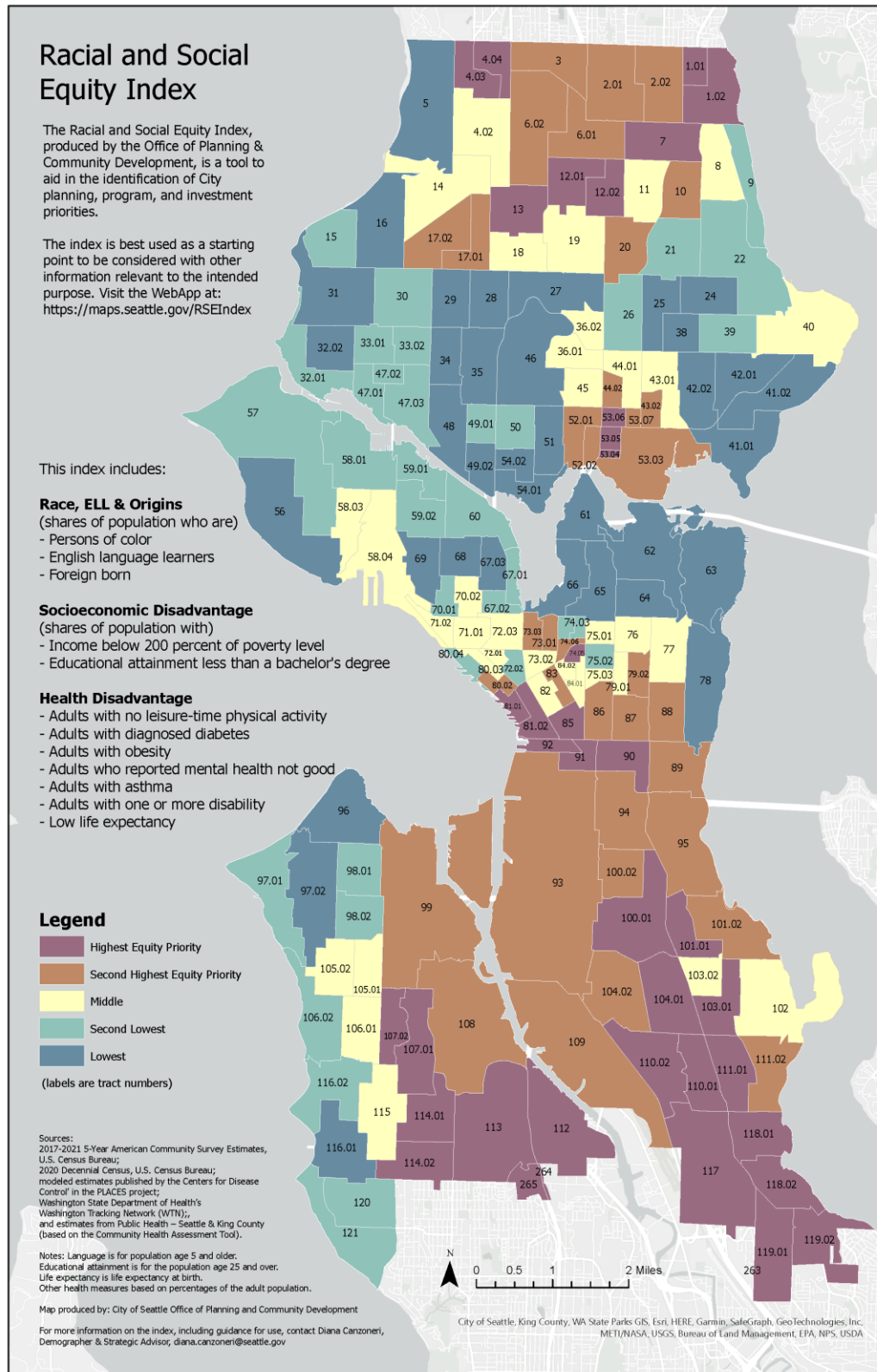
Source: Washington State Department of Health, 2022.



According to the Washington Department of Health, living in areas with more environmental hazards and population vulnerabilities is associated with a shorter lifespan, where population in census tracts with the lowest environmental health disparities (rank 1) on average lived 5.3 years longer than those in census tracts with the highest environmental health disparities (rank 10) (Washington Department of Health, n.d.). The map above indicates that Downtown/Lake Union, Capitol Hill/Central District, Duwamish, and SE Seattle rank the highest in the 8-10 range compared to the other subareas. The subareas that rank the lowest are NW Seattle and NE Seattle, which have tracts that rank in the 3 to 6 range.

This data closely aligns with the findings of SDOT's Racial and Social Index (shown in Exhibit 3-5) which combines information on race, ethnicity, and related demographics with data on socioeconomic and health disadvantages to identify where priority populations make up relatively large proportions of neighborhood residents.

Exhibit 3-5. Racial and Social Equity Index



Source: SDOT, 2023

### 3.1.2 Impacts

This section describes the potential impacts of each future alternative as they relate to the air quality thresholds of significance. The impacts of Alternatives 2 and 3 are measured against conditions expected under Alternative 1. The following were evaluated as thresholds of significance for air quality impacts:

The alternatives are expected to result in an impact to air quality if:

- **Policy Consistency:** The action would result in a change to land use patterns or development intensities that is inconsistent with GMA goals, the regional planning framework and local policy goals.
- **Criteria Pollutants:** The action would prevent or deter achieving the National Ambient Air Quality Standards (NAAQS) for criteria pollutants.

Thresholds of significance were evaluated for each STP alternative, with quantitative measures based on the existing and proposed transportation network.

### Impacts Common to All Alternatives

#### Construction-Related Emissions

Future improvements to the transportation system under any alternative would result in similar construction-related impacts. Most transportation improvement projects in the city would entail demolition and removal of existing pavement or sidewalks, grading and excavation to prepare for expanded roadways and/or bike lanes, and construction of sidewalks, curbs, and gutters. Emissions generated during construction activities would include exhaust emissions from heavy duty construction equipment, trucks used to haul construction materials to and from sites, worker vehicle emissions, fugitive dust emissions associated with earth-disturbing activities, and off-gassing of volatile organic gas (VOC) emissions from asphalt, paving, and striping activities. Embodied carbon, meaning the carbon emissions created during the creation of construction materials such as asphalt and concrete, would also be present in varying degrees depending on the production facility and type of material.

Fugitive dust emissions are typically generated during construction phases. Activities that generate dust include demolition, excavation, and equipment movement across unpaved construction sites. The PSCAA requires dust control measures (emissions control) be applied to construction projects through Article 9, Section 9.15. Of these measures, those applicable to fugitive dust include (1) use control equipment, enclosures or wet suppression techniques, (2) paving or otherwise covering unpaved surfaces as soon as possible, (3) treating construction sites with water or chemical stabilizers, reduce vehicle speeds and cleaning vehicle undercarriages before entering public roadways, and (4) covering or wetting truck loads or providing freeboard in truck loads. Because of these requirements, impacts related to construction dust are concluded to be less than significant.

Criteria air pollutants would be emitted during construction activities from demolition and construction equipment, much of it diesel-powered. Other emissions during construction would result from trucks used to haul construction materials to and from sites, and from vehicle emissions generated during worker travel to and from construction sites. Exhaust emissions from diesel off-road equipment represent a relatively small percentage of the overall emission inventory in King County: 0.6 percent of countywide CO, 7.1 percent of

countywide NO<sub>x</sub>, 0.97 percent of countywide PM<sub>10</sub>, 2.53 percent of countywide PM<sub>2.5</sub>, and 0.39 percent of countywide VOC (U.S. EPA, 2017). The primary emissions of concern (greater than 1 percent contribution) with regard to construction equipment are NO<sub>x</sub> and PM<sub>2.5</sub> (the latter a priority air toxic). NO<sub>x</sub> is primarily an air quality concern with respect to its role in (regional) ozone formation and the Puget Sound air shed has long been designated as an attainment area (meeting standards) with respect to ozone. Construction-related NO<sub>x</sub> emissions are not expected to generate significant adverse air quality impacts nor lead to violation of standards under any of the alternatives. The same conclusion is reached for diesel-related emissions of PM<sub>2.5</sub>, which could generate temporary localized adverse impacts within a few hundred feet of construction sites. A number of federal regulations require cleaner off-road equipment. Specifically, the U.S. EPA has set emissions standards for new off-road equipment engines, classified as Tier 1 through Tier 3. Tier 1 emission standard were phased in between 1996 and 2000, and Tier 4 interim and final emission standards for all new engines were phased in between 2008 and 2015. To meet Tier 4 emission standards, engine manufacturers are required to produce new engines with advanced emission-control technologies. The U.S. EPA estimates that by implementing the federal Tier 4 emission standards, NO<sub>x</sub> and PM emissions are reduced by more than 90 percent (U.S. EPA 2004). Consequently, it is anticipated that as the region-wide construction fleet converts to newer equipment the potential for health risks from off-road diesel equipment will be substantially reduced. Given the transient nature of construction-related emissions and regulatory improvements scheduled to be phased in, construction-related emissions associated with all alternatives would be considered only a minor adverse air quality impact.

### **Transportation-Related Emissions**

Regardless of the projects included proposed as part of each STP network alternative, transportation-related emissions are expected to be lower in 2044 when compared to existing conditions due to improvements in fuel economy. Federal programs are mandating improved fuel economy and reduced GHG emissions for passenger cars and light trucks. The National Highway Traffic and Safety Administration (NHTSA) is responsible for establishing vehicle standards and for revising existing standards. Compliance with Federal fuel economy standards is not determined for each individual vehicle model. Rather, compliance is determined based on each manufacturer's average fuel economy for the portion of their vehicles produced for sale in the United States. On March 31, 2022, the NHTSA finalized their Corporate Average Fuel Economy (café) standards for model years 2024 to 2026. The final rule requires an industry-wide fuel average of approximately 49 miles per gallon (mpg) for passenger cars and light trucks in model year 2026 by increasing fuel efficiency by 8 percent annually for model years 2024 and 2025 and 10 percent for model year 2026 (NHTSA, 2023). . The NHTSA estimates that final standards will reduce emissions of CO, VOC, NO<sub>x</sub>, and PM<sub>2.5</sub> emissions attributable to the light-duty on-road fleet dramatically between the years 2020 and 2050.

In 2022, the state of Washington implemented the 2035 fossil fuel vehicle sales ban. After 2035, car dealerships in Washington will no longer be allowed to sell new vehicles that run solely on gasoline or diesel. The ban aims to reduce greenhouse gas emissions and promote the adoption of electric vehicles (EVs) and other clean energy transportation options.

In addition to the vehicle sales ban, Washington also implemented a Clean Fuel standard. This standard requires fuel providers to reduce the carbon intensity of their transportation fuels over time. Carbon intensity refers to the amount of carbon dioxide and other greenhouse gases emitted per unit of energy

produced or consumed. The goal of the Clean Fuel standard is to encourage the use of cleaner, low-carbon alternative fuels, such as electricity, hydrogen, and biofuels, thereby reducing the overall carbon footprint of transportation in the state.

Both the fossil fuel vehicle sales ban and the Clean Fuel standard align with Washington's broader efforts to combat climate change, improve air quality, and transition to a more sustainable transportation sector. These policies promote the adoption of electric and other clean energy vehicles, reduce dependence on fossil fuels, and contribute to the overall decarbonization of transportation in the state.

Citywide vehicle miles traveled (VMT) are expected to increase with population growth through 2044 based on the range of alternatives presented in the City's Comprehensive Plan using the No Action network from STP Alternative 1. Transportation-related air pollutant emissions for STP Alternative 1 together with the growth assumptions in Seattle Comprehensive Plan Alternative 1 and Alternative 5 (Combined) are shown in Exhibit 3-6. Emissions shown account for tailpipe emissions and PM10 and PM2.5 emissions through tire and brake wear. Non-tailpipe emissions would not benefit from future improvements to vehicle fuel composition. STP Alternatives 2 and 3 use the assumptions from Comprehensive Plan Alternative 5 as the baseline VMT. Both alternatives include features that are likely to reduce VMT and criteria pollutant emissions below estimates for the No Action network with additional bicycle, pedestrian, and transit improvements.

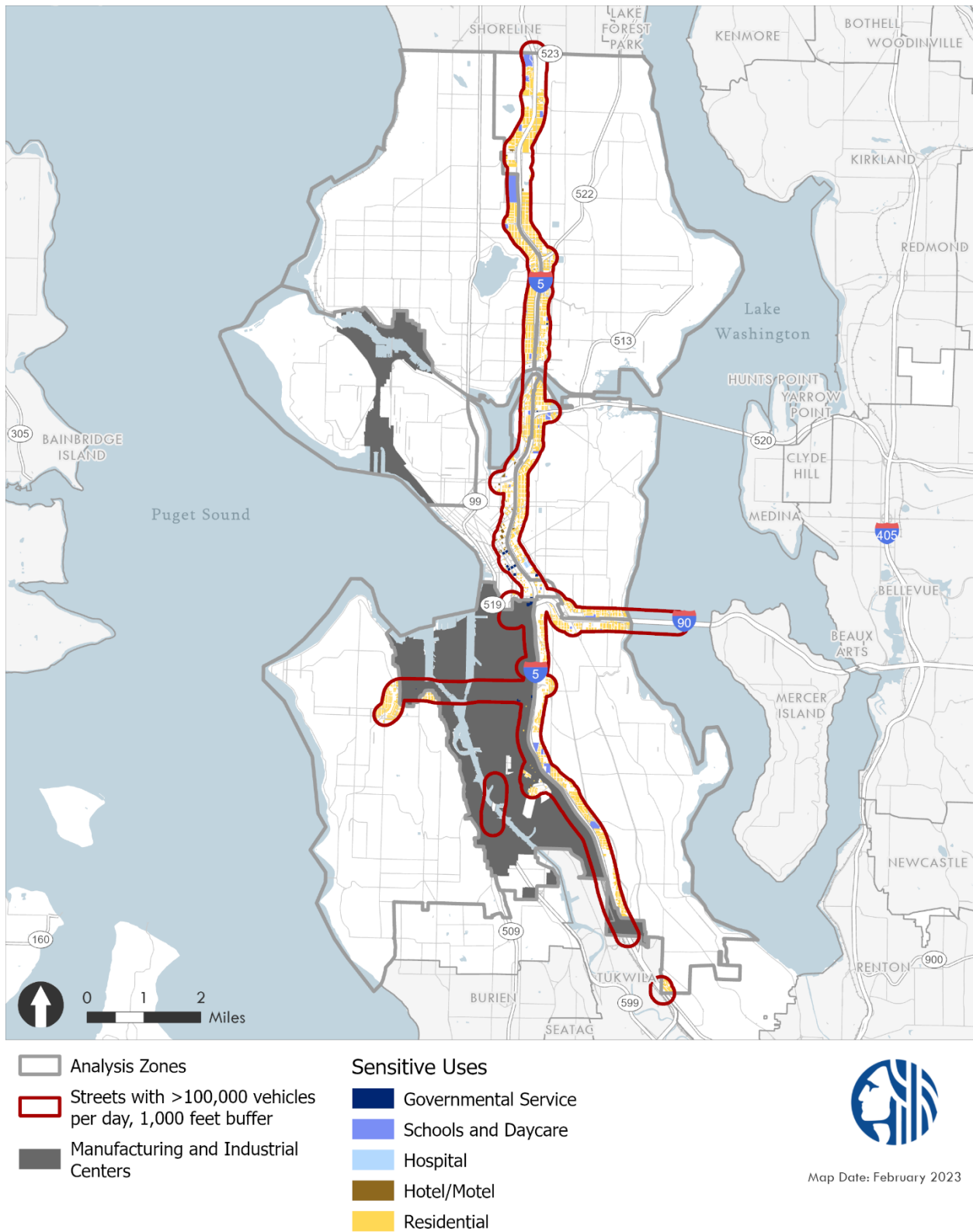
#### Exhibit 3-6. Transportation-Related Criteria Pollutant Emissions (MT/year)

	VOC	CO	NO <sub>x</sub>	PM10	PM2.5
Existing Conditions	313	1,990	129	4	4
STP Alternative 1 (Comprehensive Plan Alternative 1)	173	727	62	5	5
STP Alternatives 2 and 3 baseline (Comprehensive Plan Alternative 5)	184	773	66	6	5

Source: Kimley-Horn, 2023

In Alternatives 1, 2 and 3, the same four roadways through the City of Seattle are forecast to have average weekday traffic of 100,000 or more. These roadways are exclusively limited access highways and include I-5, I-90, the 1st Avenue S Bridge section of SR 99 and the West Seattle Bridge and connecting sections of the Spokane viaduct. Sensitive uses within 1,000 feet of these roadways are primarily along the west side of I-5 in south Seattle, and either side of I-5 in central and north Seattle and either side of I-90 through central Seattle. One of these roadways includes potential transit improvements as part of STP Alternatives 2 and 3, with potential for dedicated transit lanes on the Spokane Street viaduct between 1st Avenue and the West Seattle Bridge and other improvements to associated surface streets through 4th Avenue. These improvements are unlikely to require reconstruction or widening of the roadway and are in an area with primarily industrial uses and very few sensitive land uses nearby. Manufacturing and industrial centers contain primarily industrial and office uses, and thus have very few sensitive uses such as residences, schools, daycares and hospitals. Uses sensitive to air quality near these roadways are shown in Exhibit 3-7.

Exhibit 3-7. Sensitive Uses near Roadways with over 100,000 Average Weekday Traffic



Source: City of Seattle, 2022; King County, 2023



***Consistency with Vision 2050, Growth Management Act, and Countywide Planning Policies***

All alternatives are consistent with planning goals from the Growth Management Act (GMA) in RCW 36.70A.02 that relate to the health of the natural environment and related features in the built environment in RCW 36.70A.020. All STP alternatives are consistent with GMA goals to:

- protect the environment (RCW 36.70A.020 (10));
- encourage efficient multimodal transportation systems (RCW 36.70A.020(3)); and
- encourage development in urban areas where adequate public facilities and services exist/can be provided in an efficient manner (RCW 36.70A.020 (1)).

The PSRC General Assembly adopted VISION 2050 in October 2020. VISION 2050 provides a framework for how and where development occurs and how the region supports efforts to manage growth. All alternatives are consistent with Vision 2050's multicounty planning policies, including minimizing transportation impacts to improve air quality, especially near vulnerable populations and in areas disproportionately affected by air pollution (MPP-En-3, MPP-En-8, and MPP-En-22). All three STP alternatives also meet the intent of policy MPP-En-21 to reduce pollutants from transportation activities through cleaner fuels and increasing alternatives to driving alone, although Alternatives 2 and 3 are more supportive of this policy with more proposed pedestrian, bicycle, transit improvements and implementation of people streets and public spaces across Seattle.

Alternatives 1, 2 and 3 are also consistent with King County Countywide Planning Policies adopted in 2021 and ratified April 2022. All three STP alternatives are consistent CPPs to promote development and transportation patterns that minimize air pollution and GHG emissions (EN-28), limiting VMT and consumption of fossil fuels to support state, regional and local climate goals (EN-30), and expanding use of zero emission vehicles (T-34). Alternatives 2 and 3 have more features that support implementation of policies EN-28, EN-30, and T34 with more transit and multimodal improvements that can support compact development and encourage modes of travel other than driving and more electrification infrastructure.

***SDOT Transportation Equity Program***

In 2004, the City of Seattle established the Race and Social Justice Initiative (RSJI) to eliminate racial disparities and advance social justice through equitable policies, programs, and planning practices. The City's commitment to RSJI has led to the creation of several equity initiatives and programs over the years, including the SDOT Transportation Equity Program, established in 2017.

On November 28, 2017, Mayor Durkan issued an Executive Order affirming her commitment to RSJI, including transportation equity. On January 2, 2018, City Council unanimously adopted Resolution 31773, providing their support for transportation equity and directing SDOT to bring together a committee consisting of community members most impacted by transportation inequities, which led to the creation of SDOT's Transportation Equity Workgroup. SDOT's vision is that Seattle is a thriving, equitable community powered by dependable transportation, and the department's mission to deliver a transportation system that provides safe and affordable access to places and opportunities. SDOT recognizes equity as a key value and believes transportation must meet the needs of communities of color and those of all incomes, abilities,

and ages. SDOT's goal is to partner with communities to build a racially equitable and socially just transportation system.

SDOT's Transportation Equity Program provides department-wide policy and strategic advisement on equitable, safe, environmentally sustainable, accessible, and affordable transportation systems that support Black, Indigenous and People of Color (BIPOC) communities, low-income populations, people living with disabilities, and other communities historically and currently underinvested in by government. The program's principles center on building community trust through engagement and accountability, eliminating racial disparities, and mitigating the effects of displacement from transportation inequities.

Implementation of the transportation plan projects will be done in accordance with SDOT's equity program.

## Impacts of Alternative 1 No Action

The future of Seattle's transportation system with implementation of Alternative 1 includes no additional multi-modal or other transportation improvements beyond what has already been funded. This alternative focuses on optimizing existing conditions. Efficiency indicators and performance metrics are discussed below to provide a qualitative review of the effects of Alternative 1 implementation on air quality emissions.

### Vehicle Miles Traveled

Travel demand models include findings about projected VMT in future years for various classes of vehicles (e.g., cars, trucks, buses). The model generally assumes continuation of current economic and demographic trends, with minor shifts toward shorter trips and more trips made by modes other than automobile travel. As discussed below, improvements to the transportation network through implementation of Alternative 1 would contribute to reductions in VMT.

#### *Pedestrian Facilities*

A household activity survey conducted by the Puget Sound Regional Council (PSRC) in 2006 tested the effect of sidewalks on travel patterns and the relationship between sidewalk availability and VMT (SDOT & WSDOT, 2011). Results of the study provide evidence that sidewalk availability combined with land use mix was associated with reduced VMT. Alternative 1 includes 2,277 linear miles of pedestrian facilities on the existing sidewalk and trail system and reflects baseline future conditions, with no additional pedestrian infrastructure by 2044.

#### *Bicycle Improvements*

According to the NCST, bicycle infrastructure has the potential to reduce VMT by encouraging a shift from driving (National Center for Sustainable Transportation, 2017). The EPA estimates that bicycle paths/lanes/routes would provide less than 0.1 percent reductions in VMT (EPA, 2014). Alternative 1 includes existing and funded 161 linear miles of bicycle facilities. In comparison to present conditions, Alternative 1 would result in limited additional bicycle infrastructure.

### *Transit Improvements*

Transit has been identified as the most frequent and successful tool in reducing VMT (WSDOT, 2022). Transit improvements overall provide a VMT reduction of up to 2.6 percent (U.S. EPA 2014). Alternative 1 includes the 40 linear miles of existing and funded dedicated transit corridors, 31 existing and funded LRT stations, and 89 miles of existing and funded RapidRide corridors. The City would also implement limited increases in frequencies for bus routes connecting to light rail in partnership with local transit service providers. Therefore, transit service and connectivity even under Alternative 1: No Action would be improved by 2044.

### *Mobility Management Strategies*

Under Alternative 1, additional mobility management strategies would not be implemented. Therefore, there would be no change in VMT attributable to additional mobility management strategies under this alternative.

### *Land Use Mix and Compactness*

A mix of land uses together with more compact development around transit is associated with reduced VMT (WSDOT, 2023). Diversity in land uses combined with increased density within an urban area can lead to shorter trip distances and greater use of walking, as well as the reduced need for vehicle ownership. Access to a variety of trip purposes may induce additional trips; however, these trips are shorter and are more likely to be made by walking than trips in areas where mixed land uses are not available.

The basis of analysis for STP Alternative 1: No Action is comprehensive plan Alternative 1: No Action, in which fewer areas of the city would accommodate denser development with a mix of land uses. STP Alternative 1: No Action has a less extensive dedicated transit network (40 linear miles total) than both STP Alternative 2 and Alternative 3, and would be less supportive of compact, transit-oriented development.

## **Emissions**

Criteria pollutant emissions make up a large portion of criteria pollutant emissions. On-road mobile sources account for approximately half of the overall CO and NO<sub>x</sub> emissions within King County (U.S. EPA, 2017). Implementation of Alternative 1 corresponds with Alternative 1 of the Seattle Comprehensive Plan Update, which would result in a VMT of 22,213,000 for cars, 2,144,100 for trucks, and 77,150 for buses. As shown in Exhibit 3-6 above, transportation-related emissions associated with implementation of Seattle Comprehensive Plan Alternative 1 would result in lower emissions than under existing conditions. Improvements in fuel efficiency combined with reductions in VMT would contribute to reductions in criteria pollutant emissions.

## **Electric Vehicles**

Electric vehicles (EVs) do not create tailpipe emissions (U.S. EPA 2021). Replacement of gasoline- and diesel-fueled vehicles with EVs would reduce tailpipe emissions within the City of Seattle. However, fugitive dust emissions from brake wear and tire wear would remain the same. Implementation of the Seattle Transportation Plan does not directly affect the percentage of EVs within the City. A combination of charging infrastructure and incentives would encourage electric vehicles in private and public fleets (PSRC, 2020). One of the main barriers to EV adoption is the lack of off-street parking for charging (Seattle Office of Sustainability & Environment, 2014). Increased EV penetration would require an expansion of charging options for those without access to charging facilities in their home. Under Alternative 1, no new EV charging

infrastructure would be required for new development, but limited EV infrastructure would be provided in public streets. The rate EV adoption for this alternative is estimated to be 12% of all vehicles, comparable to 2021 EMFAC results for the state of California in model year 2044.

### Conclusion

No significant adverse impacts are identified with respect to criteria pollutant emissions. Improvements to the transportation network under Alternative 1 would result in the fewest emissions reduction features with respect to VMT and EV penetration when compared to other alternatives.

## Impacts of Alternative 2 Moderate Pace

The future of Seattle's transportation system with implementation of Alternative 2 envisions moderate growth in multimodal infrastructure with a moderated approach to expanding pedestrian, bicycle, and transit connections. Efficiency indicators and performance metrics are discussed below to provide a qualitative review of the effects of Alternative 2 implementation on air quality emissions associated with Comprehensive Plan land use in Alternative 5.

### Vehicle Miles Traveled

Implementation of Alternative 2 corresponds with Alternative 5 of the Seattle Comprehensive Plan Update, which would result in a VMT of 22,920,000 for cars, 2,202,100 for trucks, and 77,140 for buses. As shown in Exhibit 3-6 above, transportation-related emissions associated with implementation of Seattle Comprehensive Plan Alternative 5 would result in lower emissions than under existing conditions, and greater emissions than Comprehensive Plan Alternative 1. As discussed below, improvements to the transportation network through implementation of Alternative 2 would contribute to reductions in VMT.

#### *Pedestrian Facilities*

Alternative 2 includes the addition of 123 linear miles of pedestrian facilities such as sidewalks. Therefore, in comparison to Alternative 1, implementation of Alternative 2 would result in approximately 5.4 percent greater sidewalk coverage.

#### *Bicycle Improvements*

Alternative 2 includes the addition of 53 linear miles of bicycle facilities beyond what is existing or funded today. Therefore, implementation of Alternative 2 would result in approximately 33 percent more bicycle infrastructure than Alternative 1.

#### *Transit Improvements*

Alternative 2 includes the addition of 91 linear miles of dedicated transit corridors and includes the 31 existing and funded LRT stations, and 89 miles of existing and funded RapidRide corridors. As part of this alternative, the City would implement more frequent bus service connecting to light rail and increases in off-peak bus frequency in partnership with local transit service providers. A total of 52 community & mobility hubs where different modes of transportation come together at key community locations together with nearby multi-modal improvements would enhance connections at key transit hubs. In comparison to

Alternative 1: No Action, Alternative 2 would result in greater improvements to transit service and connectivity with 2.3 times the length in dedicated transit corridors and 52 more community & mobility hubs.

#### *Mobility Management Strategies*

Under Alternative 2, additional mobility management strategies would not be implemented. Therefore, there would be no change in VMT attributable to additional mobility management strategies under this alternative.

#### *Land Use Mix and Compactness*

A mix of land uses together with more compact development around transit is associated with reduced VMT (WSDOT, 2013). Diversity in land uses combined with increased density within an urban area can lead to shorter trip distances and greater use of walking, as well as the reduced need for vehicle ownership. Access to a variety of trip purposes may induce additional trips; however, these trips are shorter and are more likely to be made by walking than trips in areas where mixed land uses are not available.

The basis of analysis for STP Alternative 2: Moderate Pace is comprehensive plan Alternative 5: Combined, which would accommodate denser development with a mix of land uses across a larger area of the city. This alternative also includes a more comprehensive transit network, more dedicated transit right-of-way (131 linear miles in total) that is likely to support more compact and transit-oriented development even outside of the light rail station areas that are common to all alternatives.

### **Emissions**

As shown in Exhibit 3-6 above, transportation-related emissions associated with implementation of Seattle Comprehensive Plan Alternative 5 would result in lower emissions than under existing conditions, and greater emissions than Comprehensive Plan Alternative 1.

### **Electric Vehicles**

In Alternative 2, no new EV charging infrastructure would be required for new development, but limited EV infrastructure would be provided in public streets. The rate EV adoption for this alternative is assumed to be similar to Alternative 1 at 12% of all vehicles based on 2021 EMFAC results for model year 2044. Therefore, Alternative 2, similar to Alternative 1, would provide minimum reductions in emissions attributable to EV penetration.

### **Conclusion**

No significant adverse impacts are identified with respect to criteria pollutant emissions. Improvements to the transportation network under Alternative 2 would result in greater emissions reduction features than Alternative 1 with respect to VMT, but fewer emissions reduction features than Alternative 3 (discussed below).

## **Impacts of Alternative 3 Rapid Progress**

The future of Seattle's transportation system with implementation of Alternative 3 envisions a future for Seattle's transportation system with strong growth in funding for new multimodal infrastructure. The focus of this alternative is expanding pedestrian, bicycle, and transit connections with a shift toward dedicated

spaces for non-car users. Efficiency indicators and performance metrics are discussed below to provide a qualitative review of the effects of Alternative 3 implementation on air quality emissions.

### **Vehicle Miles Traveled**

Implementation of Alternative 3 corresponds with Alternative 5 of the Seattle Comprehensive Plan Update, which would result in a VMT of 22,920,000 for cars, 2,202,100 for trucks, and 77,140 for buses. As discussed below, improvements to the transportation network through implementation of Alternative 3 and assumptions of land use according to Comprehensive Plan Alternative 5 would contribute to the reductions in VMT.

#### *Pedestrian Facilities*

Alternative 3 includes the addition of 848 linear miles of pedestrian facilities such as sidewalks. Therefore, implementation of Alternative 3 would result in approximately 37% percent greater sidewalk coverage than Alternative 2 and 37 percent greater sidewalk availability than Alternative 1.

#### *Transit Improvements*

Alternative 3 includes the addition of 190 linear miles of dedicated transit corridors, along with 31 existing or funded LRT stations, and 89 miles of existing or funded RapidRide corridors. More frequent bus services connecting to light rail and increases in off-peak bus frequency with greater additional bus service hours would be implemented. Further, 105 community & mobility hubs with multimodal improvements would provide places of connectivity where different modes of transportation can come together at key community locations. Therefore, in comparison to Alternative 2, Alternative 3 would result in greater improvements to transit service and connectivity with 75.6 percent greater length in dedicated transit corridors, 53 more community mobility hubs, and more frequent bus service. Compared to Alternative 1, Alternative 3 would result in greater improvements to transit service and connectivity with 4.75 times the length in dedicated transit corridors, 105 more community & mobility hubs (compared to zero for Alternative 1), and more frequent bus service.

#### *Mobility Management Strategies*

Under Alternative 3, additional mobility management strategies are included as part of a regional solution. Alternative 3 could offer up to roughly 40 percent reductions in VMT attributable to additional mobility management strategies.

#### *Bicycle Improvements*

Alternative 3 includes the addition of 385 linear miles of bicycle facilities beyond what is existing or funded today. Therefore, implementation of Alternative 3 would result in approximately 1.5 times more bicycle infrastructure than Alternative 2 and 2.4 times more than Alternative 1.

#### *Land Use Mix and Compactness*

A mix of land uses together with more compact development around transit is associated with reduced VMT (WSDOT, 2013). Diversity in land uses combined with increased density within an urban area can lead to shorter trip distances and greater use of walking, as well as the reduced need for vehicle ownership. Access



to a variety of trip purposes may induce additional trips; however, these trips are shorter and are more likely to be made by walking than trips in areas where mixed land uses are not available.

The basis of analysis for STP Alternative 3: Rapid Progress is comprehensive plan Alternative 5: Combined, which would accommodate denser development with a mix of land uses across a larger area of the city. This alternative also includes the most comprehensive transit network of all STP alternatives and much more dedicated transit right-of-way (230 linear miles in total) that is likely to support more compact and transit-oriented development even outside of the light rail station areas that are common to all alternatives.

### **Emissions**

As shown in Exhibit 3-6 above, transportation-related emissions associated with implementation of Seattle Comprehensive Plan Alternative 5 would result in lower emissions than under existing conditions, and greater emissions than Comprehensive Plan Alternative 1.

### **Electric Vehicles**

Under Alternative 3, greater amounts of EV charging infrastructure would be required in new development, including at community mobility hubs to accommodate up to 15 percent more EV vehicles than projected EV vehicle percentage of the fleet in 2044 from the California Air Resources Board's (CARB) Emission Factor (EMFAC) model. Therefore, Alternative 3 would provide greater reductions in emissions attributable to EV penetration than Alternative 1 and Alternative 2.

### **Conclusion**

No significant adverse impacts are identified with respect to criteria pollutant emissions. Changes to the transportation network and city policy that would result in the greatest emissions reduction features with respect to VMT and electric vehicle adoption are greatest in Alternative 3, followed by Alternative 2, with the fewest emissions reduction features in Alternative 1.

## **3.1.3 Mitigation Measures**

Although mitigation strategies are not required as there are no anticipated significant adverse impacts to air quality for any STP alternative, there are various mitigation measures that could be implemented through the 2024 Comprehensive Plan update to address the exposure of residences in high-risk areas to air pollutants. For sensitive land uses in close proximity to highways or other high-traffic roadways, ventilation systems that are capable of filtering particulate pollutants from transportation sources could be integrated into HVAC systems to improve indoor quality. Ventilation systems with a higher Minimum Efficiency Reporting Value (MERV) are capable of removing finer particulate matter from indoor air. Specifically, EPA recommends higher efficiency filters with a MERV rating of 13 or higher for HVAC filtration (EPA, 2023). The 2016 American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) handbook for HVAC Systems and Equipment includes air cleaners with MERV ratings in the E-2 range (MERV 9 -12) for application in better residential and industrial air cleaning, which are effective for particulates in the 1.0 to 3.0 µm size range, while those in the E-1 range (MERV 13 – 16) control finer particulates (ASHRAE, 2016).

### 3.1.4 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts are identified with respect to criteria pollutant emissions. Improvements in the transportation network under all three alternatives would result in VMT reduction through the addition of multi-modal facilities and land use policy. In addition, implementation of the STP, regardless of alternative, would result in increases in EV charging infrastructure, supporting the transition to zero emission vehicles. Changes to the transportation network and city policy that would result in the greatest emissions reduction features with respect to VMT and electric vehicle adoption are greatest in Alternative 3, followed by Alternative 2, with the fewest emissions reduction features in Alternative 1.

## Section 3.2

# Water Resources



This section discusses major water resources in the study area, including:

- Longfellow, Puget, Thornton and Wolfe Creeks
- Elliott Bay
- Duwamish Waterway
- Ship Canal / Salmon Bay
- Lake Washington
- Groundwater

## 3.2.1 Affected Environment

### Data & Methods

Current conditions for water quality, and locations of water resources were based on GIS layers and existing reports related to water quality, stormwater/flow control management, and environmental impacts obtained from public agencies. Data from the following sources were compiled for a comprehensive inventory of all relevant water resources within the project limits.

The following GIS layers were collected and clipped to the predefined Seattle subareas to support the analysis of water quality conditions:

- King County
  - Combined Sewer Overflow (CSO) Outfall Locations (Updated 12/21/2018)
  - FEMA 100-Year Floodplain (Updated 4/14/2021)
  - FEMA 500-Year Floodplain (Updated 4/14/2021)
  - FEMA Floodways (Updated 4/14/2021)
- Seattle Public Utilities (King County GIS)
  - Capacity Constrained Drainage Systems (Updated 3/23/2022)
- US Fish and Wildlife Service
  - NWI Wetlands (Updated 5/1/2022)
- USGS
  - NHD Plus Dataset (Updated 7/6/2022)
- Washington Department of Ecology
  - Water Quality Assessment (Section 303(d) Category 5) (Updated 7/26/2016)
    - Approved by the EPA 8/26/2022

Publications from other public agencies were also used by the project team while inventorying water resources:

- Stormwater Manual (City of Seattle, July 2021)
- Supporting Information for 2018 Water Quality Assessment (WA Department of Ecology, August 2022)

- Chapter 173-201A WAC Water Quality Standards for Surface Waters of the State of Washington (Updated 3/22/2022)
- Water Quality Program Policy 1-11 (WA Department of Ecology, Updated July 2020)

## Current Policy & Regulations

### U.S. EPA and U.S. Army Corps of Engineers

The Clean Water Act, enacted in 1972, requires EPA to regulate the discharge of pollutants into water and to enforce water quality standards for surface waters. The Clean Water Act led to the creation of the EPA's National Pollutant Discharge Elimination System (NPDES), a digital database of all point sources where a permit has been obtained to discharge into navigable waters. While enforcement is mostly at the state level, EPA requires each state to incorporate inspections and reports into their compliance monitoring as part of the State's NPDES. In 2009, EPA created the Clean Water Act Action Plan to regulate non-point sources of water pollution, such as: animal feeding operations, sewer overflows, contaminated water from industrial facilities, construction sites, and runoff from urban streets.

Section 10 of the Rivers and Harbors Act, administered by the US Army Corps of Engineers (USACE), provides for permitting of any work in, over, or under navigable waters of the United States, or which affects the course, location, conditions, or capacity of such waters. Regulated activities include docks and piers, marinas, intake and outfall pipes, transmission lines, and dredging. The USACE also regulates the amount of dredge and fill materials allowed into waters and wetlands, as stated under Section 404 of the Clean Water Act.

### Washington Department of Ecology

Ecology provides several methods to rate water quality, with surface water quality standards listed in Chapter 173-201A of the Washington Administrative Code (WAC) and applied based on the use designation of each body of water. Fresh water designated uses and criteria are stated in WAC 173-201A-200, and marine water designated uses and criteria are stated in WAC 173-201A-210. Aquatic life use is rated as "Excellent" for Elliot Bay with no limitations on shellfish harvesting or primary contact recreation (such as swimming), while parts of Puget Sound adjacent to Seattle are rated even higher as "Extraordinary" and are also designated for shellfish harvesting and primary contact recreation. Aquatic life and recreational uses for the freshwater bodies are highest (core summer salmonid habitat and primary contact) for the Ship Canal/Lake Union, while the Duwamish River is rated for rearing/migration only (but is rated for primary contact). All freshwater bodies are designated for water supply uses with the exception of the Duwamish River.

To evaluate the quality of waterbodies within the state, the Washington Department of Ecology assigns waters a numeric value based on the categories recommended by EPA. These categories are determined based on the concentration of common pollutants and bacteria, low amounts of dissolved oxygen, "extreme value" pH levels, high temperature, elevated amounts of phosphorus and toxics, and above-average turbidity. These data samples are then evaluated and included in the bi-annual Water Quality Assessment submitted to EPA, with the most recent Assessment completed in 2018 and approved by the EPA in 2022.

All categories together represent the quality of waters statewide and are summarized in the "Integrated Report" in EPA guidance to meet Section 303(d) and 305(b) requirements. Only Category 5 waters are considered impaired and therefore eligible for Section 303(d).

- Category 1—Meets Tested Standards for Clean Water
  - Meet state water quality standards, though not necessarily free of all pollutants
- Category 2—Water of Concern
  - Some evidence of a water quality problem, but results are inconsistent
- Category 3—Insufficient Data
  - There are not enough data to evaluate water quality
- Category 4—Impaired Water that does not Require a Total Maximum Daily Load (TMDL)
  - Category 4a—Already has an EPA-approved TMDL implemented
  - Category 4b—Has another pollution control program in place
  - Category 4c—Impairment cannot be fixed through a TMDL, such as low water flow
- Category 5—Polluted Waters that Require a Water Improvement Project
  - There are data showing water quality standards have not been met for at least one pollutant category, and there is not a TMDL or other remediation plan in place

Groundwater quality is regulated by Ecology under the Water Quality Standards for Groundwaters of the State of Washington (Washington Administrative Code 173-200). These standards list the maximum concentrations of contaminants that are allowed in groundwater and prohibit further groundwater contamination.

### **City of Seattle**

Shoreline development is regulated at the local level by the Shoreline Master Program (SMP), which mandates that all shoreline modifications be constructed and managed to achieve no net loss of ecological functions. Shoreline setbacks in the SMP are based on the Ordinary High-Water Mark (OHWM) as defined by WAC 173-22-030. Ecology also provides regulatory oversight of shoreline development through the State Environmental Policy Act (WAC 197-11), which also uses the OHWM as a jurisdictional boundary.

All projects must meet minimum requirements as stated in Volume 1, Chapter 4 of the 2021 City of Seattle Stormwater Manual, with the requirements varying based on the project type. Most requirements are related to flow control, which is defined in the Manual as “controlling the discharge rate, flow duration, or both of drainage water from the site through means such as infiltration or detention.” Trail and sidewalk projects are not required to install flow control or water quality treatment best managements practices (BMPs). However, projects that add at least 2,000 square feet of new plus replaced hard surface or at least 7,000 square feet of land disturbing activity must adhere to the standards stated in the Seattle Municipal Code (SMC Section 22.805.040 and 22.805.070) for on-site stormwater management. “Roadway projects shall meet the minimum requirements for soil amendment (SMC, Section 22.805.060.A), on-site stormwater management (SMC, Section 22.805.020.F), flow control (SMC, Section 22.805.080) and water quality treatment (SMC, Section 22.805.090) when applicable. In addition to meeting a forested, pasture, or wetland protection standard, projects discharging to a capacity-constrained system will also be required to meet the peak control standard” (Seattle Stormwater Manual, 2021).

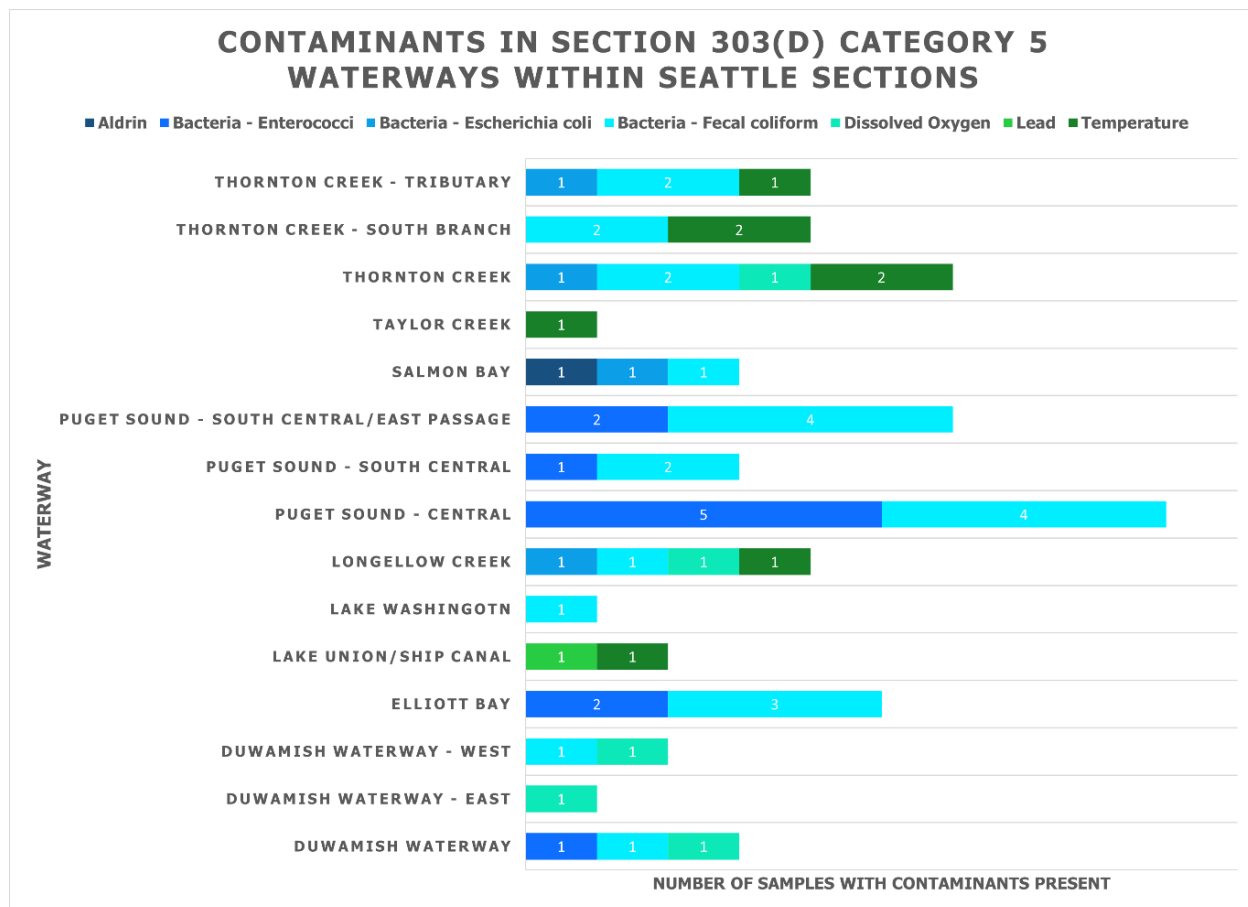


## Current Conditions

### Water Quality

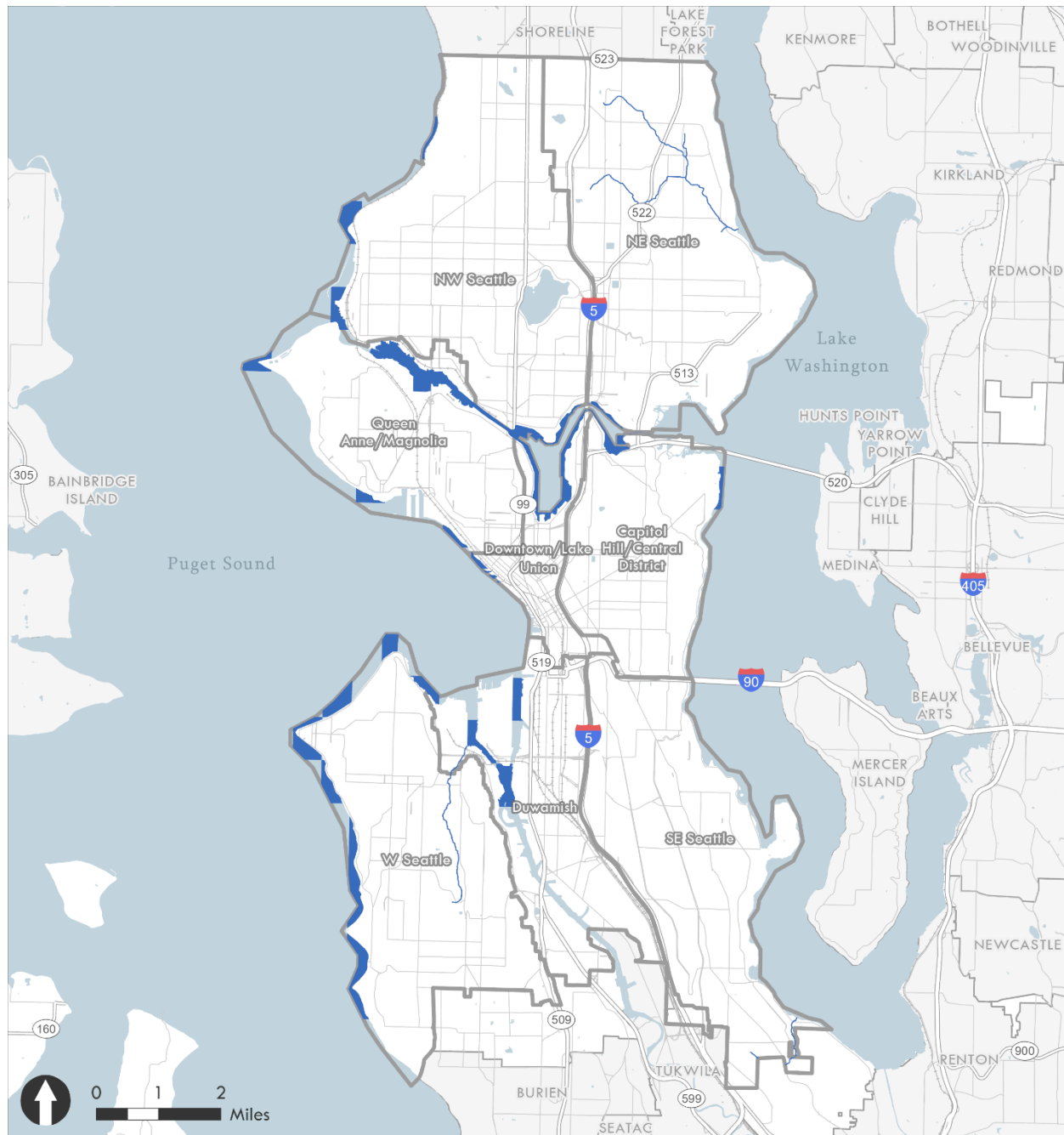
The City of Seattle is in two Water Resource Inventory Areas defined by Ecology—the Duwamish-Green watershed and the Cedar-Sammamish Watershed. There are 15 distinct category 5 waterbodies within the City of Seattle as defined by Ecology. When grouped by major waterbody, Puget Sound had the most water samples which exceeded water quality standards with a total 18 samples, followed by Thornton Creek with a total of 14 samples and Duwamish Waterway with 6. Taylor Creek and Lake Washington had the fewest samples, with the pollutants being abnormal temperature and dissolved oxygen respectively. Fecal coliform bacteria was the most common pollutant present in the category 5 waterbodies with 24 samples total, followed by enterococci bacteria with 11 samples, and 8 samples with high temperature readings. Aldrin and Lead had the least number of samples with 1 each. A map of Category 5 waterbodies in the City of Seattle is shown in Exhibit 3-8.

**Exhibit 3-8. Contaminants by Category 5 Waterbody**



Source: Washington State Department of Ecology, 2022

Exhibit 3-9. Category 5 Waterways in Seattle



- Analysis Zones
- Category 5 Waterways



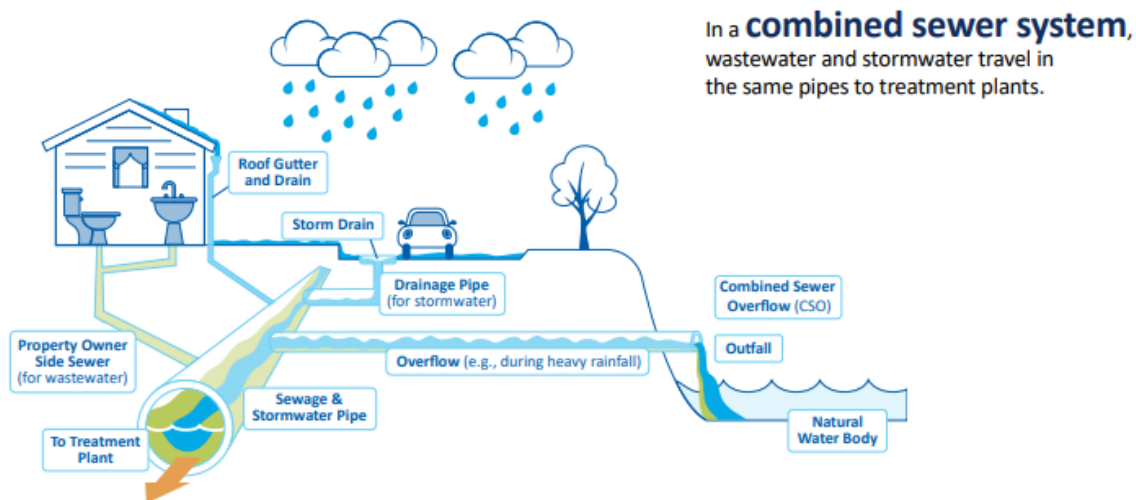
Map Date: April 2023

Source: Washington State Department of Ecology, 2022

## Infrastructure

The City of Seattle utilizes a comprehensive system of stormwater, sewer, and water infrastructure to minimize environmental impacts and ensure proper drainage and delivery of utilities. For sewer systems, Seattle Public Utilities defines three main types: combined sewer systems, separated sewer systems, and partially separated systems. Combined sewer systems have sewage and stormwater traveling in the same pipes to treatment plants. Separated systems have sewage travel to treatment plants in separated pipes, while stormwater is collected separately and travels to drainage outlets. Partially separated systems have most stormwater collected separately and directed to discrete outfall pipes, although some stormwater is still combined with sewage in pipes that travel to treatment plants.

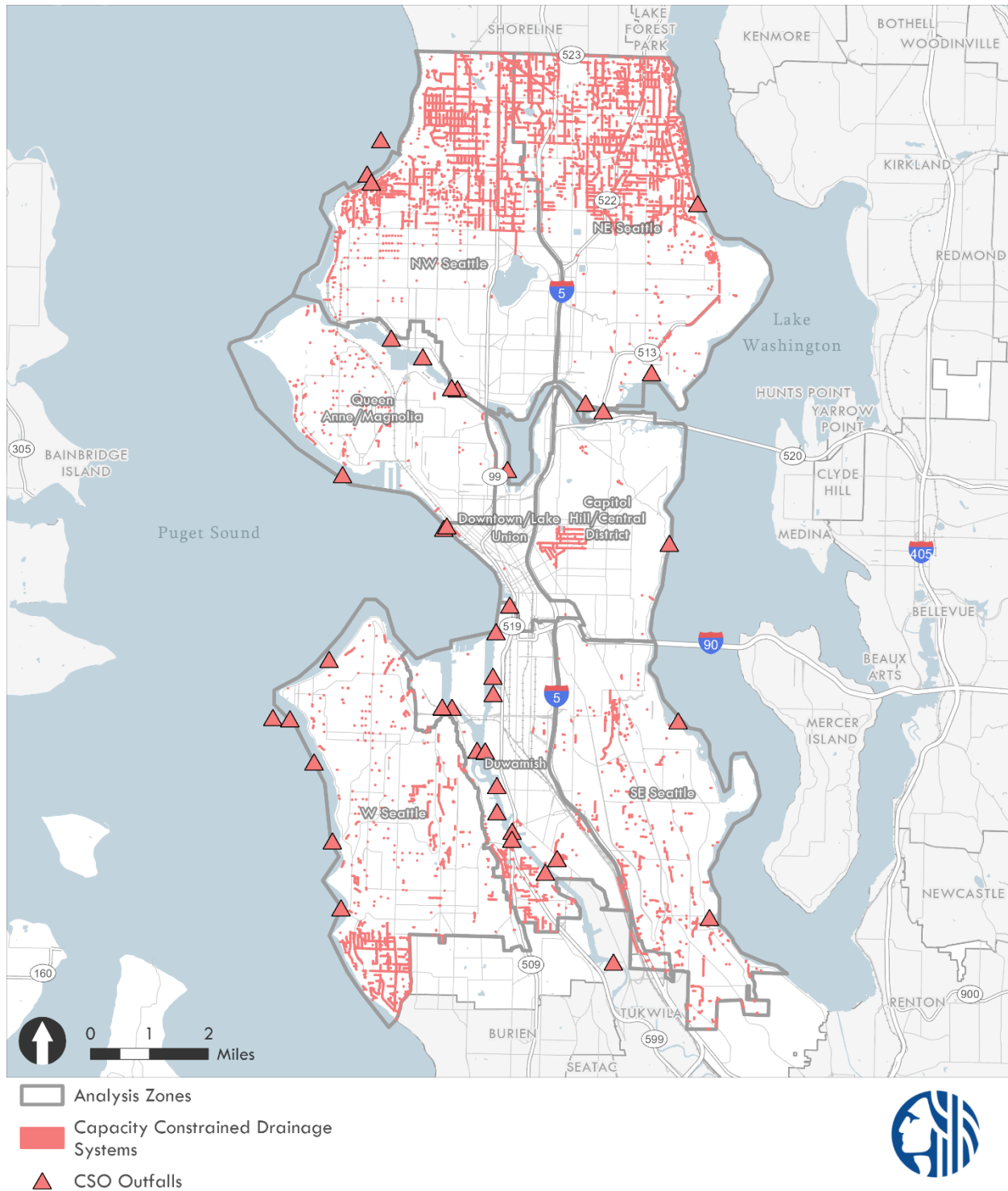
For both partially separated and combined sewer systems, there is a risk of sewage flowing into natural water bodies during heavy rains, as the pipes to treatment plants can overflow. The frequency of overflow is greater for combined systems, as more stormwater is present in pipes to treatment plants during heavy rainfall than in partially separated systems, meaning that a heavy rain has a greater chance of causing an overflow in a combined system versus a partially separated system.



Source: Seattle Public Utilities, 2023

The presence of combined sewer overflow (CSO) outfalls can also have a significant impact on water quality, especially when they are a part of a capacity-constrained system. A capacity-constrained system is defined by the Stormwater Code SMC 22.801.040 as “a drainage system or public combined sewer that the Director of SPU [Seattle Public Utilities] has determined to have inadequate capacity to carry drainage water.” As shown in Exhibit 3-10 and Exhibit 3-11, NE Seattle has the most capacity-constrained drainage, making up 40.6% of the capacity constrained system, while Downtown/Lake Union has the least amount, representing just 0.1% of the system.

Exhibit 3-10. Capacity Constrained Systems in the City of Seattle



Source: King County, 2018; Seattle Public Utilities, 2022.

**Exhibit 3-11. Capacity Constrained Systems and Outfalls in Seattle**

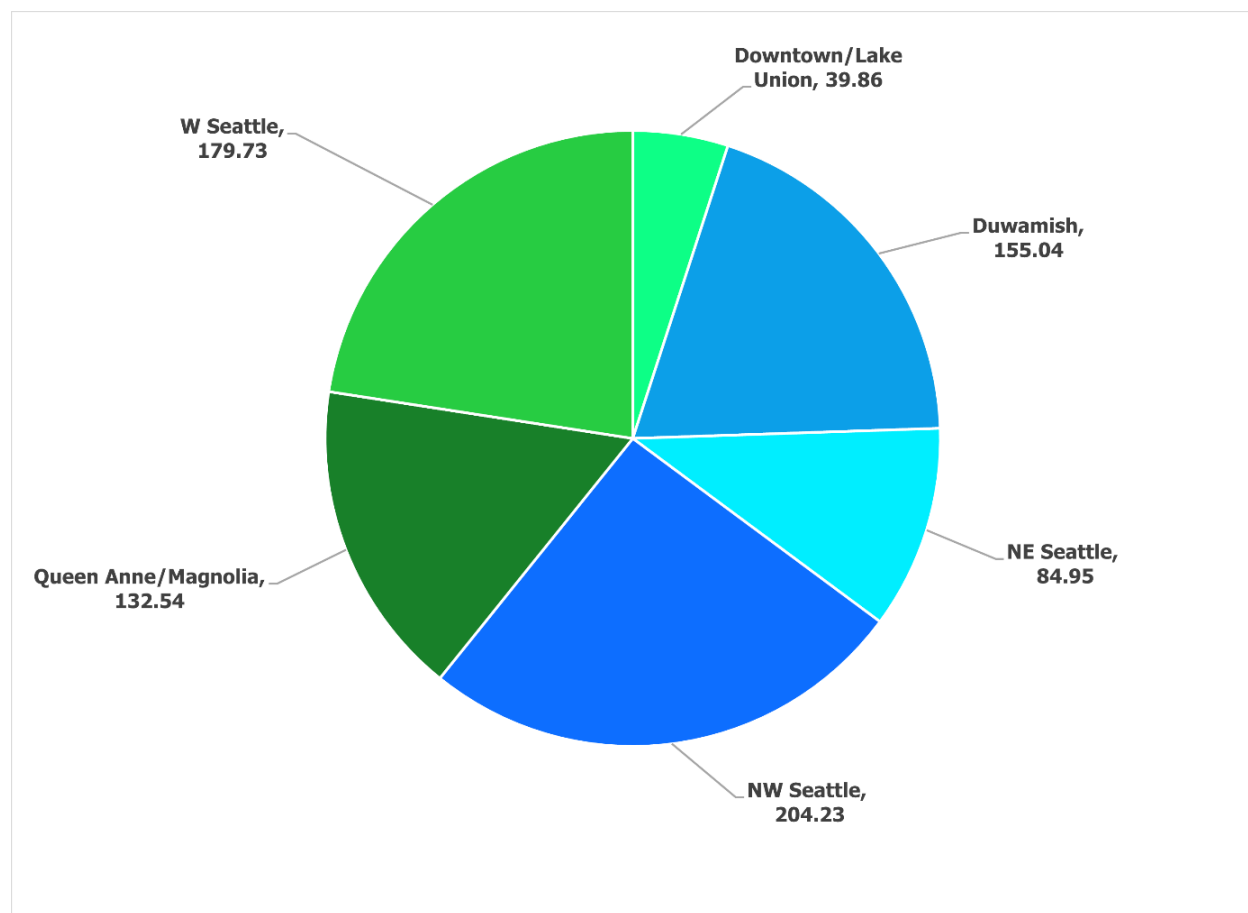
Study Subarea	Number of CSO Outfalls	Acres of Capacity Constrained Systems	Percent of Capacity Constrained System
Capitol Hill/Central District	1	37.5	2.5%
Downtown/Lake Union	2	1.0	0.1%
Duwamish	15	82.8	5.4%
NE Seattle	4	618.5	40.6%
NW Seattle	2	465.7	30.5%
Queen Anne/Magnolia	4	28.1	1.8%
SE Seattle	3	100.6	6.6%
W Seattle	5	190.1	12.5%
<b>Total</b>	<b>36</b>	<b>1,524.4</b>	<b>100.0%</b>

Source: King County, 2018; Seattle Public Utilities, 2022.

**Natural Resources**

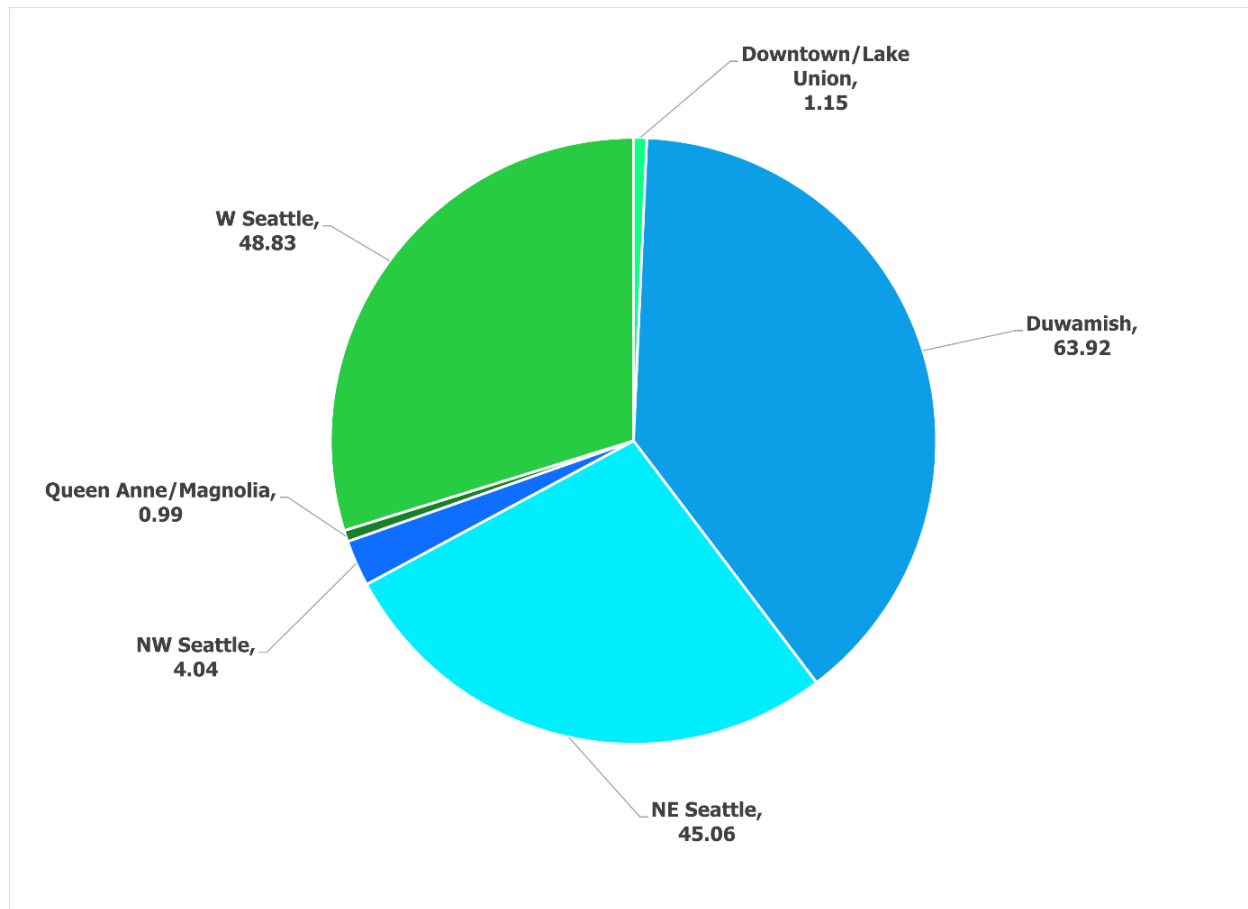
Each subarea also has varying amounts of wetlands and floodplains. According to FEMA data on floodprone areas within the City of Seattle, shown in Exhibit 3-12 and Exhibit 3-13, the subarea with the most total acres of inland floodplain is West Seattle with 179.73 acres of 100-year floodplain and 48.83 acres of 500-year floodplain. Capitol Hill/Central District and SE Seattle have no 100-year or 500-year floodplain areas.

**Exhibit 3-12. Acres of 100-year Floodplains in the City**



Source: FEMA, 2021.



**Exhibit 3-13. Acres of 500-Year Floodplains in Seattle by Subarea**

Source: Source: FEMA, 2021.

A natural way to control flooding is through wetlands, as they provide a repository for excess water and can limit the prevalence of flash floods and heavy erosion. Furthermore, wetlands provide both water quality and flood control benefits. They provide storage in urban areas during the rainy season and large storm events and serve as natural filtration systems for stormwater runoff. As shown in Exhibit 3-14, the Queen Anne/Magnolia Subarea of the city has the most acres of wetlands with approximately 1,142 acres, followed by 948 acres in West Seattle and 745 acres in Duwamish. When only looking at freshwater wetlands (located primarily inland), NE Seattle has the largest area with 159 acres, followed by Capitol Hill/Central District with 74 acres and West Seattle with 72 acres.

**Exhibit 3-14. Wetland Area (acres) and Type by Subarea in the City of Seattle**

Subarea	Wetland Type				Total per Subarea
	<i>Estuarine and Marine Deepwater</i>	<i>Estuarine and Marine Wetland</i>	<i>Freshwater Emergent Wetland</i>	<i>Freshwater Forested/Shrub Wetland</i>	
Capitol Hill/Central District	0ac	0ac	13.7ac	60.1ac	73.8ac
Downtown/Lake Union	63.9ac	0.9ac	0.4ac	0.1ac	65.3ac
Duwamish	693.6ac	34.1ac	8.9ac	8.1ac	744.7ac
NE Seattle	0ac	0ac	54.1ac	105.2ac	159.3ac
NW Seattle	384.5ac	41.9ac	5.3ac	53.4ac	485.0ac
Queen Anne/Magnolia	1,001.7ac	121.6ac	3.0ac	15.5ac	1,141.8ac
SE Seattle	0ac	0ac	9.9ac	29.7ac	39.7ac
W Seattle	750.0ac	125.4ac	8.0ac	64.3ac	947.7ac
Total by Type	2,893.7ac	323.9ac	103.2ac	336.5ac	3,657.3ac

Source: US Fish and Wildlife Service NWI Wetlands, 2022.

## 3.2.2 Impacts

Impacts described in the following sections are broad evaluations based upon the details available at the time of analysis; each transportation plan alternative will be subject to City of Seattle Stormwater Code and Manual and applicable Ecology standards and regulations. The City of Seattle defines pollution-generating impervious surfaces (PGIS) as roadways or parking lots and non-pollution generating impervious surfaces (NPGIS) as roofs or sidewalks.

Thresholds of significance utilized in this impact analysis include:

- **Pollution generating impervious surface (PGIS):** The alternative surpasses additional pollution generating impervious surface (PGIS) thresholds and would result in reduced surface water quality.
- **Groundwater Quality:** The alternative would degrade groundwater quality and reduce ground water quality below standards.

Using this methodology, the following analysis confirms that changes to the transportation networks under the studied alternatives do not result in significant impacts in terms of PGIS that would degrade surface or ground water quality.

## Impacts Common to All Alternatives

All three Alternatives include replacement of pollution generating impervious surfaces and addition of non-pollution generating impervious areas as defined by the City of Seattle. Non-pollution generating impervious surfaces such as sidewalks and roofs do not carry pollutants as rainwater runs over the surface; however, the

area will still need to be accounted for when sizing the overall treatment for the basin. When rainwater runs over impervious surfaces, such as roadways or parking lots, it carries pollutants into local waterways. Roadways and parking lots are typically paved with either asphalt, Portland Cement Concrete (PCC), or a combination of both (composite). As new roadways are constructed and replaced, PCC is generally the preferred surface type due to its longevity compared to asphalt, although it is typically less pervious than asphalt.

Without treatment, this runoff can degrade the quality of surface water and groundwater, particularly in urban and suburban areas, where most surfaces are impervious. These pollutants include emissions, particulates from tire, brake, and pavement wear, chemicals discharged by motor vehicles including motor oil, and heavy metals and other pollutants emitted as exhaust. Roadway construction and maintenance can also increase rates of runoff and lower groundwater recharge rates with more impervious surfaces. The addition of PGIS or NPGIS reduces the available land for groundwater recharge. More frequent flooding and higher peak flows result from the removal of these vegetated areas.

Vehicular traffic is a source of pollutants that can negatively impact waterways for all three Alternatives. Even with reductions in tailpipe emissions, cars produce heavy metals and hydrocarbons that find their way into waterbodies through roadway runoff. As brake pads wear down, copper and other metals in brake dust are deposited on roadways, where they are washed into streams and rivers. The Better Brakes Law requires manufacturers to reduce or eliminate several toxic chemicals from brake pads, and a major focus of the law is copper. Copper is highly toxic to fish and other aquatic species. In urban areas, brake pads account for up to half of the copper entering our waterways, with nearly 66 tons (60,000 kilograms) of copper a year entering Puget Sound from vehicle brake pads. To help alleviate impacts from these pollutants, pollution generating hard surfaces (roadways) can be replaced with non-pollution generating hard surfaces (sidewalks) and converted pervious surfaces (landscaped areas). Converted pervious surfaces provide more opportunity for infiltration and groundwater recharge, adding a level of pretreatment and reducing the runoff entering the City sewer systems.

## **Impacts of Alternative 1 No Action**

Alternative 1: No Action is not anticipated to have adverse impacts to water quality. This alternative does not include new or replaced PGIS or NPGIS other than what is currently funded or under construction. Depending on the specific design aspects of existing funded projects some benefits to water quality may occur under Alternative 1. No additional adverse impacts to water quality are anticipated in this alternative.

## **Impacts of Alternative 2 Moderate Pace**

Alternative 2: Moderate Pace includes the addition of approximately 180.1 acres new NPGIS, primarily because of sidewalk construction to fill gaps in urban centers and villages, and 248.7 acres of potential PGIS replacement for upgrades along transit corridors.

Without mitigation, this alternative will have an adverse impact on water quality and flow control. Additional impervious areas can increase runoff and impact sensitive wetlands or other surface waters directly or can result in additional runoff in areas where combined sewer is already capacity constrained (limited to South

Park). Basins that discharge directly to public combined sewer systems are not required to treat for water quality since they will be treated at the nearest treatment plant. For all other basins, water quality treatment will be required unless the total new plus replaced hard surface does not exceed 10,000 square feet.

Alternative 2 includes a significant amount of new sidewalk NPGIS in the northern portion of Seattle, with 36.2 new acres of NPGIS in NE Seattle and 42.4 new acres of NPGIS in NW Seattle where there are capacity constrained public drainage systems. This is a total of 78.6 acres of new NPGIS compared to Alternative 1 between NE and NW Seattle. Flow control will be required to mitigate the increases in peak flow. The thresholds for flow control vary depending on the receiving basin (creek basin, non-listed creek basin, wetland, small lake basin, capacity-constrained system).

Alternative 2 includes extensive transit improvements and potential for roadway reconstruction. In this alternative, an estimated 35.8 linear miles of roadway that currently have asphalt or composite surface may need to be reconstructed to accommodate dedicated transit lanes and more frequent transit service. NW Seattle has the most significant addition of roadway reconstruction PGIS, with the potential replacement of 75.4 acres of impervious roadway. This replaced hard surface exceeds the 10,000 square-foot threshold for PGIS replacement in the City of Seattle's Stormwater code, which would likely require water quality treatment and flow control mitigation. The potential extent of roadway reconstruction in Alternative 2 is shown in Exhibit 3-15.

**Exhibit 3-15. Potential Extent of Roadway Reconstruction in Alternative 2**



Source: Kimley-Horn, 2023

With 180.1 acres of potential new NPGIS primarily from construction of new sidewalks and 248.7 acres of potential PGIS replacement for improvements to transit citywide, Alternative 2 would have no significant adverse impacts on water quality beyond existing concerns. The improvements in Alternative 2 would have a moderate impact in terms of increased peak flow, but those impacts would be mitigated by flow control measures.

GMA planning goals related to the natural environment in RCW 36.70A.020(5) aim to “protect the environment and enhance the state’s quality of life, including water... quality, and the availability of water.” Vision 2050’s multicounty planning policies also aim to protect and improve water quality for all residents and reduce stormwater impacts from transportation projects (MPP-En-3, MPP-En-4, MPP-En-18, MPP-T-34). King County has similar countywide planning policies to minimize impacts to and protect water quality (EN-3) and protect critical areas (EN-7, EN-15). With treatment and flow control measures presently required to implement STP alternatives requirements under the City of Seattle’s stormwater code, as described in the sections to follow, this alternative would be consistent with GMA, Multicounty and Countywide goals and policies.

### **Impacts of Alternative 3 Rapid Progress**

Alternative 3: Rapid Progress includes the addition of approximately 1,217 acres of impervious sidewalk and approximately 340.6 acres of potential PGIS replacement along transit corridors. If unmitigated, additional NPGIS and replaced PGIS will have a negative impact on water quality and flow control. Additional impervious areas can increase runoff which can impact sensitive wetlands or other surface waters directly or can result in additional runoff where combined sewer is already capacity constrained (limited to South Park).

Basins that discharge directly to public combined sewer systems are not required to treat for water quality since they will be treated at the nearest treatment plant. For all other basins, water quality treatment will be required unless the total new plus replaced hard surface does not exceed 10,000 square feet or if the project is only sidewalk. Alternative 3 includes a significant amount of proposed sidewalk NPGIS in the northern portion of Seattle, with 327.7 acres of NPGIS in NE Seattle and 242.4 acres of new NPGIS in NW Seattle where there are capacity constrained combined sewer systems. Between both NE and NW Seattle, Alternative 3 includes 491.5 more acres of new NPGIS compared to Alternative 2 and 570.1 more acres of new NPGIS than Alternative 1. However, these capacity constrained systems in North Seattle are typically public drainage systems composed of ditches and culverts rather than defined stormwater systems. Flow control will be required to mitigate the increases in peak flow unless the project only involves sidewalk construction or replacement. The thresholds for flow control vary depending on the receiving basin (creek basin, non-listed creek basin, wetland, small lake basin, capacity-constrained system).



Exhibit 3-16. Potential Extent of Roadway Reconstruction in Alternative 3



Map Date: April 2023

Source: Kimley-Horn, 2023

Alternative 3 includes the most extensive transit improvements and the most potential roadway reconstruction. In this alternative, an estimated 52.7 linear miles of roadway that currently have asphalt or composite surface require reconstruction to accommodate dedicated transit lanes and more frequent transit service. These sections of roadway have an area of 340.6 acres citywide, which reflects the potential extent of replacement of existing PGIS based on improvements to the transit network in Alternative 3. This replaced hard surface exceeds the 10,000 square-foot threshold for PGIS replacement in the City of Seattle's Stormwater code, which would likely require water quality treatment and flow control mitigation.

With more than 1,200 acres of potential new NPGIS primarily from construction of new sidewalks and nearly 350 acres of potential PGIS replacement for improvements to transit citywide Alternative 3 would not have a significant impact on water quality. The improvements in Alternative 3 would have a moderate impact in terms of increased peak flow, but those impacts would be mitigated by flow control measures.

GMA planning goals related to the natural environment in RCW 36.70A.020(5) aim to “protect the environment and enhance the state’s quality of life, including water... quality, and the availability of water.” Vision 2050’s multicounty planning policies also aim to protect and improve water quality for all residents and reduce stormwater impacts from transportation projects (MPP-En-3, MPP-En-4, MPP-En-18, MPP-T-34). King County has similar countywide planning policies to minimize impacts to and protect water quality (EN-3) and protect critical areas (EN-7, EN-15). With treatment and flow control measures presently required to implement STP alternatives requirements under the City of Seattle’s stormwater code, as described in the sections to follow, this alternative would be consistent with GMA, Multicounty and Countywide goals and policies.

### 3.2.3 Mitigation Measures

#### Incorporated Plan Features

In Alternatives 2 and 3, better access will be provided to alternative modes of transportation. This will result in less vehicle traffic which in turn will provide a net benefit to water quality. Less vehicular traffic will lead to lower amounts of heavy metals and hydrocarbons in highway runoff. Additionally, pollution generating hard surfaces (roadways) will be replaced with non-pollution generating hard surfaces (sidewalks) and converted pervious surfaces (landscaped areas). Converted pervious surfaces will provide more opportunity for infiltration and groundwater recharge, adding a level of pretreatment plus reducing the runoff entering the City sewer and drainage systems.

#### Regulations and Commitments

The City of Seattle requires that both additional impervious surfaces and replaced impervious surfaces under certain thresholds be mitigated with water quality and flow control. The water quality mitigation measures can include oil control (ex. API Separator), phosphorous treatment (ex. Large Wetpond), enhanced treatment (ex. Bioretention), or at the minimum, removal of suspended solids/basic treatment (ex. Sand Filter). Flow control means controlling the discharge rate, flow duration, or both of drainage water from the site through

means such as infiltration or detention. Because of this requirement, impacts from both Alternatives 2 and 3 are anticipated to be fully mitigated due to the large quantity of impervious area being added or replaced.

## Other Potential Mitigation Measures

The City of Seattle could also provide additional water quality measures by including treatment beyond the requirements of the Washington Department of Ecology. In situations where the amount of proposed new or replaced impervious on individual projects does not trigger the requirement for treatment, the City of Seattle could implement water quality measures for treatment in areas that currently have none. The City could also seek opportunities to combine projects in the plan with opportunities to improve existing capacity constrained combined sewers (currently limited to South Park) for additional added benefit to water quality, where applicable. An approved landscape management plan (LMP) can be used as an alternative to the requirements to formally treat the runoff from pollution generating pervious surfaces subject to water quality treatment. Both retaining trees on the project site and planting new trees can achieve on-site stormwater management requirements and flow control credits. Improvements to the People Streets and Public Spaces network can potentially provide additional opportunities for stormwater treatment in areas where additional landscaping green spaces can be used to create an added benefit of less impervious surfaces along with new treatment opportunities for PGIS that remains. However, green stormwater infrastructure (GSI) such as specially designed landscaping requires regular maintenance to ensure runoff is being properly treated.

Pervious pavement is a potential mitigation measure to offset the added NPGIS. Pervious pavement systems would reduce the size of required flow control facilities. However, these systems require regular and substantial maintenance to function properly. Lack of proper maintenance can lead to the hardening of the pavement pores which in turn will cause stress and potentially flooding downstream.

### 3.2.4 Significant Unavoidable Adverse Impacts

Under all proposed alternatives, any transportation improvements involving construction of new infrastructure will require compliance with all applicable regulations to avoid, minimize, or mitigate any impacts to water resources. Development will need to meet stormwater requirements to protect surface and groundwater from increased flow or water quality impacts. Therefore, no significant unavoidable adverse impacts are anticipated on water resources under any of the proposed alternatives.

## Section 3.3

# Sea-Level Rise/Climate Change



This chapter assesses the potential impacts associated with implementing the alternatives for Seattle’s citywide transportation system in terms of sea-level rise and climate change. The sections to follow provide an overview of climate policy, scenarios for sea-level rise, and source of GHG emissions within the city of Seattle. This section evaluates potential sea-level rise and GHG emissions under each of the STP network alternatives.

Under the SEPA Rules (see WAC 197-11-330, WAC 197-11-440 and WAC 197-11-794), the evaluation of the significance of potential impacts considers whether there is a reasonable likelihood of more than a moderate adverse impact on environmental quality (WAC 197-11-794).

In many cases, regulatory thresholds are used to judge significance. If actions meet regulatory thresholds, then the determination is typically that the level of impact is unlikely to be significant. For the purposes of this programmatic impact analysis, sea-level rise and climate change is analyzed by examining:

- Consistency with Vision 2050, King County CPPs and GMA.
- Vulnerability of transportation infrastructure to five feet of sea-level rise.
- Prevention or deterrence of efforts to reduce emissions in comparison to local or regional goals or targets for GHG reductions.
- The alternative would cause a cumulative increase in GHG emissions compared to Alternative.

## 3.3.1 Affected Environment

### Data & Methods

#### Greenhouse Gas Emissions

The project team collected data from the following sources to support analysis of existing greenhouse gas (GHG) emissions conditions and potential effects of the project alternatives:

- 2020 Community Greenhouse Gas Emissions Inventory (Seattle 2022)
- Washington Department of Ecology (Ecology 2022)

#### Sea-Level Rise

The project team collected data from the following sources to support analysis of existing air quality conditions and potential effects of the project alternatives:

- Projected Sea-Level Rise for Washington State, University of Washington (2018)

### Current Policy & Regulations

#### Federal

The Clean Air Act, enacted in 1970, is the basis of most emissions-related regulations across the country, and has helped reduce GHGs from power plants, aircraft, and vehicles among other sources. EPA also enacts standards for vehicle fuel efficiency and emissions and, as of December 31, 2021, has set the strictest standards for passenger vehicles and light-duty trucks. From model year (MY) 2023 to 2026, the stringency

requirements were increased year-to-year, and the path forward from MY 2026 is set to continue that trend of tighter requirements. Fleetwide, MY 2026 vehicles are projected to produce 161 grams of CO<sub>2</sub> per mile, compared to 208 grams of CO<sub>2</sub> per mile as stated in the 2020 EPA regulations. Furthermore, MY 2026 vehicles will have a fleetwide fuel efficiency of 40 miles per gallon (MPG) compared to the 32 MPG required by 2020 regulations. EPA is also currently finalizing a Clean Trucks Plan to establish more stringent emissions standards on heavy-duty vehicles starting in MY 2027, specifically targeting NO<sub>x</sub> emissions from diesel-powered trucks. EPA also establishes emissions standards from other mobile sources of pollution such as aircraft, aligning with the International Civil Aviation Organization to reduce GHG emissions in commercial aviation and large business jets.

### **Washington State**

The State of Washington adopted the Climate Commitment Act (CCA) in 2021, which sets a statewide goal of a 95% reduction in carbon emissions by 2050 starting from a 1990 baseline year. One component of the CCA is a cap-and-invest program that caps the total emissions generated by the state and allows emitters to trade excess carbon emission budgets with one another. Emissions from gasoline, on-road diesel, and railroads are considered part of the 75% of “covered emissions” that would be incorporated into the cap-and-invest system. When these allowances are sold, the profits will be reinvested into projects that address air quality issues. The CCA directs Ecology to fully implement this cap-and-invest program by January 2023.

Washington State is also working to reduce mobile emissions through the 2020 Motor Vehicle Emissions Standards Law, which directs Washington to adopt vehicle emission standards set by the State of California—including the Zero-Emission vehicle (ZEV) standard, adopted in November 2021. This would require 100% of all new passenger cars, light-duty trucks, and medium-duty vehicles sold to be zero-emission starting in 2035. In 2021, Governor Inslee signed the Clean Fuel Standard, which requires fuel suppliers to gradually reduce the carbon intensity of transportation fuels (gasoline, diesel) to 20% below 2017 levels by 2038.

### **City of Seattle**

The City of Seattle was the first city in the United States to adopt a green building goal for all new municipal facilities, and in 2001 the City created a Leadership in Energy and Environmental Design (LEED) incentive program for new private projects. In 2011, the Seattle City Council adopted Resolution 31312, a long-term climate protection vision for Seattle with the goal of achieving net zero GHG emissions by 2050. With this goal, in 2013, the City adopted the Climate Action Plan (CAP) to outline goals for reducing GHG emissions and supporting City goals of building vibrant neighborhoods, driving economic prosperity, and furthering social equity. The plan identifies five main targets by 2030, based off the year 2008 including:

- 20% reduction in vehicle miles traveled (VMT);
- 75% reduction in GHG emissions per mile of Seattle vehicles;
- 10% reduction in commercial building energy use;
- 20% reduction in residential building energy use; and
- 25% reduction in combined commercial and residential building energy use.

Following the U.S.’s withdrawal from the Paris Climate Agreement in 2017, the City Council adopted Resolution 31757, directing the Office of Sustainability and Environment to identify additional actions necessary to limit global warming to an additional 1.5 degrees Celsius. Near-term priorities identified in the 2018 Climate Action Strategy are:



- Improving mobility through pricing;
- Passing of a new electric vehicle readiness ordinance;
- Create a map of optimal distribution of an EV charging infrastructure;
- Recommendation to convert 18,000 homes from heating oil to electric heat pump;
- Double existing budget allocation for reducing energy in municipal buildings with the goal of reducing energy use by 40%;
- Scale pay for performance efforts and pilot innovative utility program; and
- Provide programs and incentives to spur improved energy efficiency and reduced carbon emissions.

The City of Seattle also enacted the Green New Deal Resolution (Res 31895), with Mayor Jenny Durkan introducing the Green New Deal Executive Order (EO-2020-01) January 8, 2020. Together, the resolution and executive order direct all City departments to work together with the Green New Deal Oversight Board, the Environmental Justice Committee, and other key stakeholders to establish goals and actions that advance the vision of a climate-pollution free city. The Green New Deal Oversight Board, established through Ordinance 125926, consists of representatives passionate about advancing an equitable transition to a clean energy economy, and centering frontline communities and workers most impacted by climate change. The Green New Deal Oversight Board was entrusted with developing a workplan that:

- Establishes a definition of what constitutes a policy, program or project that advances a Green New Deal for Seattle;
- Provides proposals for the design of new policies, programs, and projects and for modifications to existing policies, programs and projects to the Mayor, City Council, and City departments to advance a Green New Deal for Seattle;
- Supports the planning and implementation of individual City Departmental actions, policies, programs, and practices, to make Seattle climate-pollution free by 2030;
- Provides recommendations on City budget priorities and priority City actions; and
- Coordinates efforts with City departments and existing committees, boards, and commissions.

To reduce greenhouse gas emissions in the transportation sector, the City of Seattle has adopted Executive Order 2018-02, which aims to have 100% of the City's fleet fossil-fuel free by 2030. This would mean rapid fleet electrification, biofuels, or renewable diesel/gasoline for the municipal fleet.

## Current Conditions

### Greenhouse Gas Emissions in Seattle

Climate change has various definitions that vary between regulatory authorities and the scientific community. Generally, climate change can be described as the changing of the Earth's climate or temperatures caused by natural fluctuations and anthropogenic activities (i.e., activities relating to, or resulting from the influence of human beings) that alter the composition of the global atmosphere. Global mean temperatures in the United States have warmed during the 20<sup>th</sup> century and continue to warm into the 21<sup>st</sup> century.

The accumulation of GHGs is a driving force in climate change. GHGs are gases that naturally trap heat by preventing the expulsion of solar radiation that hits the Earth, limiting the amount of radiation that is reflected back into space. This trapping of heat, known as the “greenhouse effect”, keeps the earth’s surface habitable. However, anthropogenic activities increase the concentrations of additional GHGs in the atmosphere, intensifying the natural greenhouse effect increasing global average temperatures, thus leading to climate change.

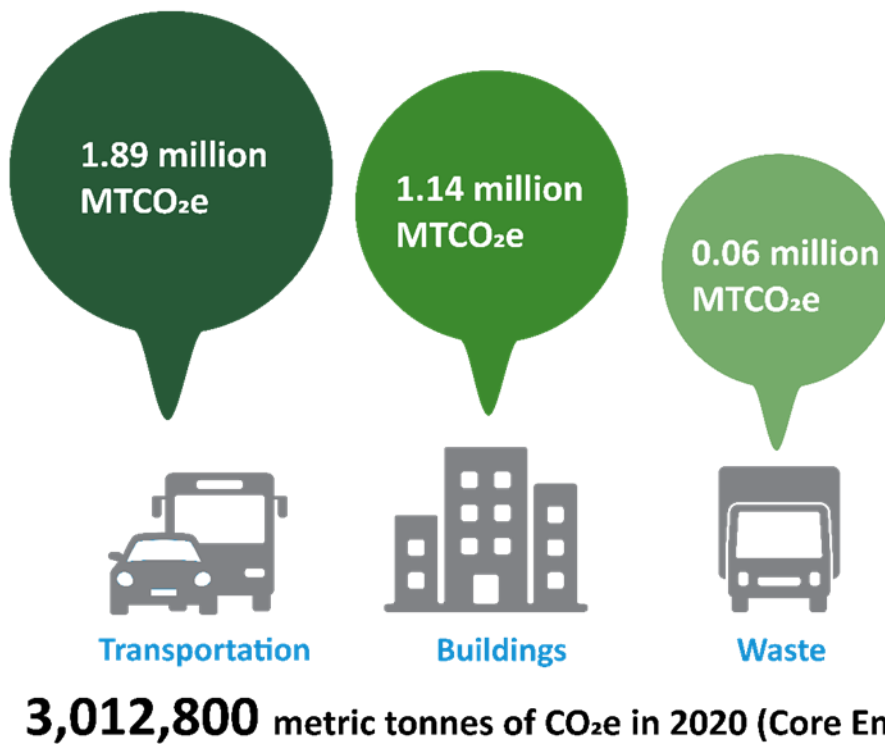
The principal GHGs of concern include carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), sulfur hexafluoride (SF<sub>6</sub>), perfluorocarbons (PFCs) and hydrofluorocarbons (HFCs). These GHGs have a long atmospheric lifespan (one year to several thousand years), and their potential to trap heat varies widely. Anthropogenic activities that release GHGs of concern include the combustion of fossil fuels for transportation, heating, and electricity generation. Other activities such as agricultural processes, industrial processes, waste decomposition, and deforestation all contribute to climate change.

The City of Seattle conducted a Community Greenhouse Gas Emissions Inventory study in 2020, which analyzed emissions data based on the national standards set forth by the International Council for Local Environmental Initiatives (ICLEI) – Local Governments for Sustainability. These standards make it easier for the City to compare its emissions with other cities and past inventories. GHGs were divided into core emissions and expanded emissions. Core emissions sources are those that the City can most directly and significantly impact; many of the City’s climate policies and programs are aimed at reducing core emissions. Core emissions include those from transportation, buildings, and waste sectors. Expanded emissions include all core emission sectors as well as additional sectors, subsectors, and categories. The additional category for expanded emissions includes industry-based emissions.

GHGs are measured by metric tonnes (MT) of carbon dioxide equivalents (CO<sub>2</sub>e). In 2020, a total of 3 million MTs of CO<sub>2</sub>e for core emissions were emitted in the city. For core emissions, the transportation sector had the highest amount of CO<sub>2</sub>e at 1.89 million MT (62%), followed by the buildings sector at 1.14 million MT and waste at 0.06 million MTs as shown in Exhibit 3-17 below. CO<sub>2</sub>e emissions in the transportation sector have decreased around 27.7% since 2008 – from 2.61 million mt in 2008 to 1.89 million mt. This decrease in emissions is due in part to improvements in vehicle efficiency standards, a decrease in vehicle miles traveled (VMT), and changes in travel patterns due to the COVID-19 pandemic in 2020.

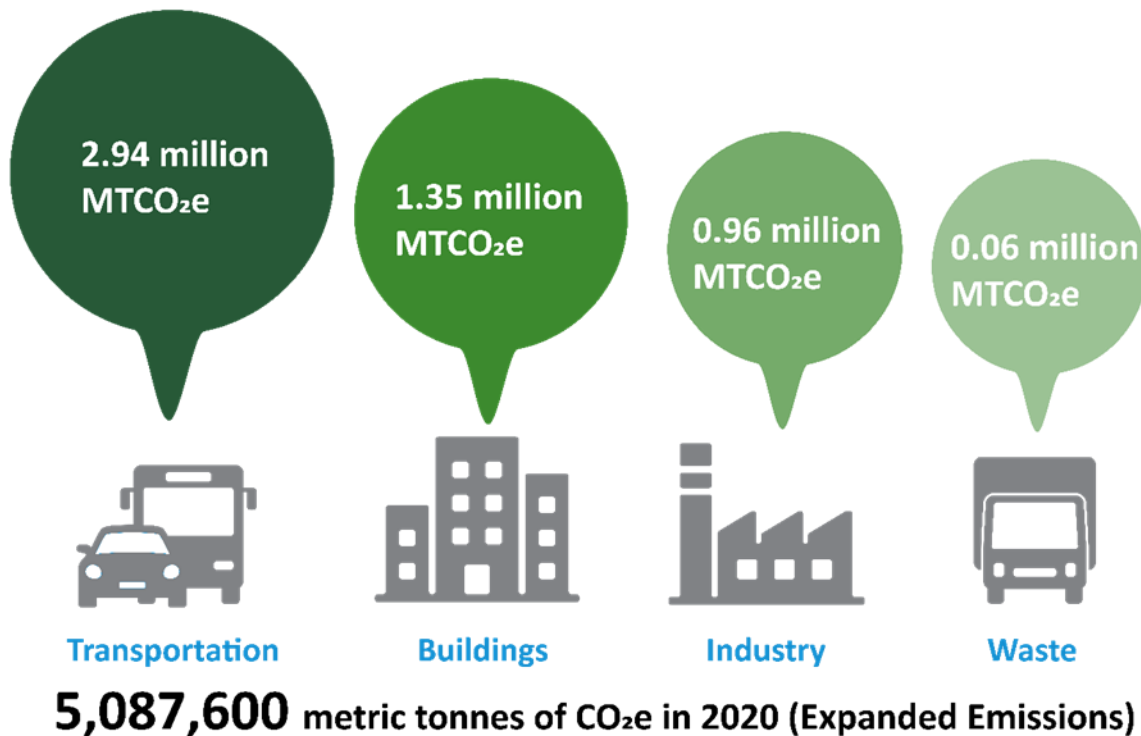
For core emissions in the transportation sector, emissions are classified by roadway vehicle type as passenger emissions and truck emissions. Passenger emissions accounted for majority of emissions in the transportation sector at 1.68 million mt of CO<sub>2</sub>e, whereas trucks emissions contributed only 207,000 mt of CO<sub>2</sub>e as shown in Exhibit 3-17 below. Passenger emissions consist of both single- and high-occupancy vehicles, motorcycles, light trucks, and buses. Truck emissions consists of commercial trucks including light-, medium-, and heavy-duty commercial trucks.

**Exhibit 3-17. Core GHG Emissions in the City of Seattle**



Source: City of Seattle Community Greenhouse Gas Emissions Inventory, 2020.

For expanded emissions, a total of 5 million MTs of CO<sub>2</sub>e was emitted in the city in 2020. The transportation sector had the highest amount of CO<sub>2</sub>e with 2.94 million mt (55%), followed by the buildings sector at 1.35 million mt, industry at 0.96 million mt, and waste at 0.06 million mt as shown in Exhibit 3-18 below.

**Exhibit 3-18. Expanded GHG Emissions in the City of Seattle**

Source: City of Seattle Community Greenhouse Gas Emissions Inventory, 2020.

Expanded emissions in the transportation sector are divided by air, marine, rail, passenger, and trucks. Passenger emissions still accounted for the majority of emissions in the transportation sector at 1.68 million MT of CO<sub>2</sub>e, while rail had the least amount at 27,000 mt of CO<sub>2</sub>e. Air transport and the industrial sector together comprised two of the largest sources of core and expanded emissions in 2020, approximately 844,000 mt of CO<sub>2</sub>e (15.9% of total) and 962,000 mt of CO<sub>2</sub>e (18.0% of total) respectively. Air transportation emissions have seen an uptick since 2008, due to increased economic activity and population growth.

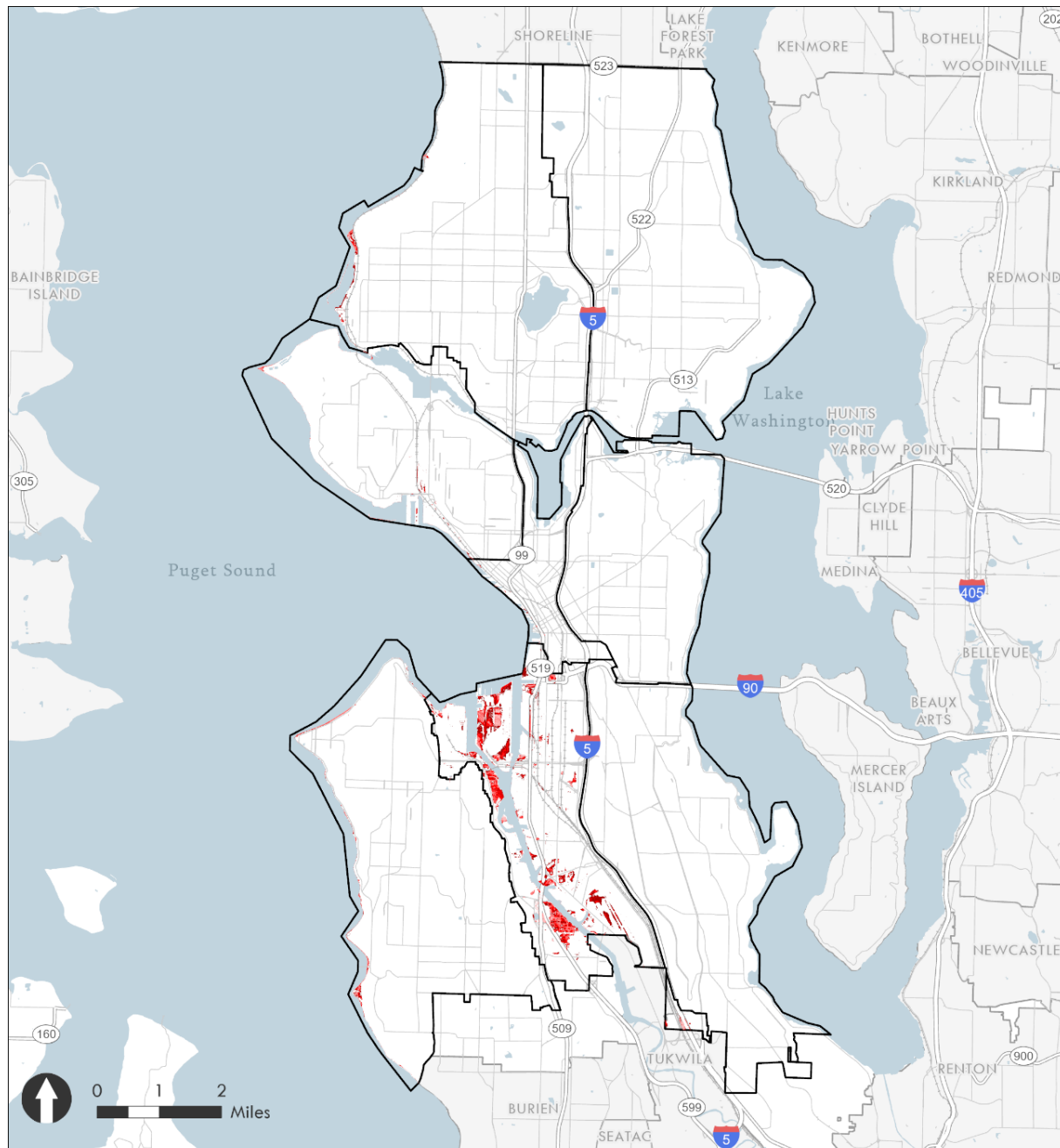
### Vulnerability to Sea Level Rise

Sea-level rise is an unavoidable consequence of a warming climate, primarily affecting low-lying areas along the shoreline. More severe storm surge, infrastructure and property damage, loss of near shore habitat, increased erosion, saltwater intrusion, and corrosion are all potential effects of rising seas levels. Sea level rise can also slow or block stormwater drainage into Puget Sound, leading to an increased flood risk inland, along with road closures and property damage.

The primary waterbodies in Seattle potentially affected by sea-level rise are Puget Sound and Elliott Bay. Puget Sound is a fjord-like estuary along the western shoreline of Seattle, and Elliott Bay is a partially enclosed embayment of Puget Sound bordered to the north, south and east by Seattle. Sea levels in Elliott Bay have been monitored by the National Oceanic and Atmospheric Administration since 1899 from gauge #9447130 at the Seattle Ferry Terminal. Sea levels at the gauge have historically risen at a rate of 0.68 feet in 100 years. However, a 2018 finding by the UW Climate Impacts Group estimates that sea level in the Puget

Sound has a 50% chance of rising by 0.8 – 0.9 feet by 2050 in the Duwamish- Green and Cedar-Sammamish Watersheds, and up to 1.9 – 5.2 feet by 2100 based on high-end and low-end estimates. This increase would apply to all tidally influenced water bodies, such as the Puget Sound, Elliott Bay, and the Duwamish River, although not the Ship Canal or Lake Union as they are above the Hiram M. Chittenden Locks. Sea level rise can also impact groundwater levels, causing flooding and damage to existing underground water, wastewater, sewer, and stormwater infrastructure. Exhibit 3-19 below shows the projected sea level rise in Seattle, showing four different projections (2 feet, 3 feet, 4 feet, 5 feet). MHHW in this map represents the Mean Higher High Water, which refers to today's average monthly high tide. Sea level in this map was measured as MHHW level of 9 feet on the North American Vertical Datum of 1988 (NAVD88). As an example, 2 feet of sea level rise here would equal 11 feet of NAVD88. Storm surge was not modeled as part of this study and was therefore not included in this analysis.

Exhibit 3-19. Projected Sea Level Rise in the City of Seattle



- Analysis Zones
- 2 ft Sea-Level Rise Above MHHW
- 3 ft Sea-Level Rise Above MHHW
- 4 ft Sea-Level Rise Above MHHW
- 5 ft Sea-Level Rise Above MHHW



Map Date: February 2023

Source: Seattle Public Utilities, 2018.



### 3.3.2 Impacts

This section describes the potential impacts of each future alternative as they relate to the thresholds of significance. The impacts of Alternatives 2 and 3 are measured against conditions expected under Alternative 1. The following were evaluated as thresholds of significance sea level rise/climate change impacts:

The alternatives are expected to result in an impact to air quality if:

- **Policy Consistency:** The action would result in a change to the transportation network that is inconsistent with GMA goals, the regional planning framework and local policy goals.
- **Vulnerability:** The action would increase the vulnerability of transportation infrastructure to sea-level rise.

Thresholds of significance were evaluated for each STP alternative, with quantitative measures based on the existing and proposed transportation network.

### Impacts Common to All Alternatives

#### Consistency with Vision 2050, King County CPPs and GMA Policies

All alternatives are consistent with the planning goals from the Growth Management Act (GMA) in RCW 36.70A.02 that relate to the health of the natural environment and related features in the built environment in RCW 36.70A.020. All STP alternatives are consistent with GMA goals to:

- protect the environment (RCW 36.70A.020 (10));
- encourage efficient multimodal transportation systems (RCW 36.70A.020(3));
- and encourage development in urban areas where adequate public facilities and services exist/can be provided in an efficient manner (RCW 36.70A.020 (1))

The PSRC General Assembly adopted VISION 2050 in October 2020. All three alternatives are consistent with Vision 2050's multicounty climate policies to reduce the impact of sea-level rise. All three alternatives are consistent with Vision 2050's multicounty climate policies to reduce greenhouse gases through alternative energy sources and prioritization of investments that support GHG reduction goals (CC-3 and CC-12). Compared to Alternative 1, Alternatives 2 and 3 would prioritize investments that would contribute to GHG reductions, with more features that would lower VMT. Alternative 3 would advance electrification through changes in policy and regulation than Alternatives 1 and 2. All three alternatives are consistent with Vision 2050 policies to reduce pollutants from transportation activities, with all alternatives reducing GHGs and criteria pollutants compared to present levels. Policy MPP-CC-10 addresses rising sea water by siting and planning for relocation of hazardous industries and essential public services away from the 500-year floodplain, but these alternatives do not propose essential public services in areas at risk of flooding or sea-level rise.

Alternatives 1, 2 and 3 are also consistent with King County Countywide Planning Policies adopted in 2021 and ratified April 2022. All three alternatives are consistent with CPPs to reduce GHG emissions (EN-28), limit VMT, support regional and local climate goals (EN-30), and expand use of zero emission vehicles (T-34). Compared to Alternative 1, Alternatives 2 and 3 would provide greater support for implementation of

policies EN-28, EN-30, and T34 with more transit and multimodal improvements that can support compact development and encourage modes of travel other than driving and more electrification infrastructure.

### Vulnerability of Transportation Infrastructure to Sea-Level Rise

Transportation infrastructure and paved public spaces in coastal and low-lying areas can be vulnerable to sea-level rise. Pavement and structures are identified by SDOT as two transportation asset classes most vulnerable to sea-level rise. According to WSDOT, potential impacts on highways, rail, and ferries due to sea-level rise includes weakened roadbed and bridge footings, damage to stormwater drainage and tide gates, saltwater corrosion of facilities, and detours around frequently flooded coastlines (Washington State Department of Transportation, 2022). Agencies including NOAA and the City of Seattle have developed tools to provide a screening level of the impacts of sea-level rise. Sea-level rise curves data paired with compound flooding and future storm surge simulations can help determine the critical elevation at which assets are vulnerable and at risk, though storm surge was not included in the impact analysis.

Seattle Public Utilities projects a range of two-to-five feet of sea-level rise by 2100, and this analysis uses the high end of that range to estimate the linear miles of transportation improvements vulnerable to sea-level rise in each of the future network alternatives. The total linear miles of bicycle, pedestrian, and transit infrastructure that are vulnerable to five feet of sea-level rise is shown in Exhibit 3-20.

#### Exhibit 3-20. Potential Transportation Improvements Vulnerable to Five Feet of Sea-Level Rise

	Alternative 1	Alternative 2	Alternative 3
Pedestrian Network	2.33 mi	2.36 mi	16.04 mi
Bike Network	1.5 mi	1.5 mi	2 mi
Transit Network	0.18 mi	0.25 mi	0.26 mi

Among all three alternatives, the difference in bike and transit improvements that would be vulnerable to sea-level rise is under one linear mile. A total of less than two linear miles of bike facilities and less than one half mile of transit improvements would be vulnerable to five feet of sea-level rise in all three alternatives. The relatively short sections of bike and transit corridors that would be vulnerable to five feet of sea-level rise represent less than 1% of these networks in each alternative and represent a moderate impact to the transportation network.

The only substantial difference in transportation infrastructure vulnerable to sea-level rise between alternatives is in pedestrian infrastructure, where Alternative 3 has nearly 14 more miles of potential sidewalk improvements that would be vulnerable to five feet of sea-level rise compared to Alternatives 1 and 2. Sidewalks vulnerable to sea-level rise comprise approximately 0.1% of the pedestrian network in Alternatives 1 and 2 and 0.5% of the pedestrian network in Alternative 3. These sections of the network that are vulnerable represent a moderate impact between all three alternatives. This is described further under the impacts of Alternative 3.

### **Construction-Related Greenhouse Gas Emissions**

Greenhouse gas emissions would be emitted during the construction of new and improvement of existing transportation infrastructure during regular construction activity, primarily from construction equipment, much of which would be diesel-powered. Other emissions during construction would result from trucks used to haul construction materials to and from sites, and from vehicle emissions generated during worker travel to and from construction sites. Industrial equipment operations (212,000 MTCO<sub>2</sub>e), which include the operation of construction equipment, represent approximately 7% of the emissions estimated in the citywide 2020 GHG emissions inventory (3,012,800 MTCO<sub>2</sub>e) (City of Seattle, 2020).

Construction-related GHG emissions from any transportation improvement project that may occur would be temporary and would not represent an ongoing burden to the City's inventory. However, cumulatively it can be assumed that varying levels of construction activities within the city would be ongoing under any of the Alternatives and hence, cumulative construction-related emissions would contribute to GHG emissions within the city.

The City's Climate Action Plan recognizes the relevance of construction-related GHG emissions and has included actions to be implemented by 2030 to address them. These include:

- Support new and expanded programs to reduce construction and demolition waste, such as creating grading standards for salvaged structural lumber so that it can be more readily reused;
- Expand source reduction efforts to City construction projects, and incorporate end-of-life management considerations into City procurement guidelines; and
- Phase-in bans on the following construction and demolition waste from job sites and private transfer stations: recyclable metal, cardboard, plastic film, carpet, clean gypsum, clean wood, and asphalt shingles.

Additionally, the West Coast Collaborative, a public-private partnership including EPA, equipment manufacturers, fleet owners, state and local governments and non-profit organizations leverages federal funds to reduce emissions from the highest polluting engines. With Ecology and privately owned construction companies, the Collaborative installed diesel oxidation catalysts on construction equipment and trucks, reducing carbon emissions by 121.4 tons annually (West Coast Collaborative, 2023).

Although construction-related emissions would not be negligible, because of the combination of regulatory improvements and parts of the Climate Action Plan that are underway, construction-related GHG emissions associated with all alternatives would be minor adverse climate impacts that would not prevent or deter efforts to reduce GHG emissions overall.

### **Transportation-Related Greenhouse Gas Emissions**

Although future growth would increase VMT, transportation-related emissions would be lower for all alternatives when compared to existing conditions due to improvements in fuel economy discussed above. The National Highway Traffic Safety Administration estimates that fuel economy standards will reduce GHG emissions by approximately 605 million MT of CO<sub>2</sub>, 730 thousand MT of CH<sub>4</sub>, and 17 thousand MT of N<sub>2</sub>O (NHTSA, 2022).

Transportation-related GHG emissions under existing conditions, Alternative 1 (based on Seattle Comprehensive Plan Alternative 1 [No Action]), and Alternatives 2 and 3 (based on Alternative 5 [Combined]) are shown in Exhibit 3-21. GHG emissions would be lower in both Alternatives 2 and 3 compared to Alternative 1, with Alternative 2 and 3 offering more VMT reduction factors than Alternative 1, including enhanced transit infrastructure and service, more safer and comfortable options for walking and biking, and increased densities near transit infrastructure associated with Comprehensive Plan Alternative 5 (which serves as the land use base for Alternatives 2 and 3). Transit vehicles are also anticipated to generate fewer GHG emissions than may be anticipated through GHG modeling with King County Metro’s Zero-Emission Transition Plan, though other transit providers and private shuttle operators may continue to operate non-zero-emission transit vehicles. The mode shift under Alternatives 2 and 3 would better support the City’s climate action goals of 20% VMT reduction from a 2008 baseline with more non-motorized and transit travel as well as a 75% reduction in GHGs per mile with a transition to more transit trips.

#### Exhibit 3-21. Road Transportation Emissions (MTCO<sub>2</sub>e)

	Existing	Alternative 1	Baseline for Alternatives 2 and 3
Cars	30,275	13,416	14,268
Trucks	705	8,184	8,692
Buses	89	7,809	8,286
<b>Total</b>	<b>31,070</b>	<b>29,408</b>	<b>31,246</b>

Source: Kimley-Horn, 2023

#### *Lighting for Streets and Transit Infrastructure*

Transportation improvements associated with all alternatives would involve improvements in street lighting, transit stop lighting, and traffic signals. GHG emissions from electrical use are generated when energy is generated by the non-renewable sources of an electrical supplier such as Seattle City Light. However, Seattle City Light is carbon neutral and, consistent with the City’s Climate Action Plan, no emissions related to electricity are assumed because Seattle City Light will maintain its commitment to carbon neutrality. GHG emissions from natural gas are direct emissions resulting from on-site combustion for heating and other purposes. Improvements to the transportation network would not require the use of natural gas for any alternatives.

#### *Solid Waste from Transportation Improvements*

Solid waste-related emissions are generated when the increased waste generated by new infrastructure is disposed in a landfill where it decomposes. Improvements to the transportation network under all alternatives may involve additional waste receptacles along the public right-of-way or public spaces. However, this would not result in long term increases in solid waste diverted to landfills. Impacts related to energy-generated GHGs would be considered a minor adverse impact.

## Impacts of Alternative 1: No Action

### Transportation Related Greenhouse Gas Emissions

The future of Seattle's transportation system with implementation of Alternative 1 includes no additional multi-modal or other transportation improvements beyond what has already been funded. This alternative focuses on optimizing existing conditions. Efficiency indicators and performance metrics are discussed in Section 3.1 to provide a qualitative review of the effects of Alternative 1 implementation on all emissions, including GHGs.

Travel demand modeling includes findings about projected VMT in future years for various classes of vehicles (e.g., cars, trucks, buses) based on anticipated growth included in the range of Comprehensive Plan alternatives. This generally assumes continuation of current economic and demographic trends, with minor shifts toward shorter trips and more trips made by modes other than automobile travel. According to the Washington State Department of Transportation, motorized transportation is the largest contributor of CO<sub>2</sub> emissions, accounting for approximately 47 percent of CO<sub>2</sub>e emissions statewide in the 2005 inventory.<sup>3</sup> Improvements in fuel efficiency combined with reductions in VMT would contribute to reductions in GHG emissions.

As discussed above in Section 3.1 Air Quality, implementation of Alternative 1 would result in improved transit service and some limited improvements to bicycle and pedestrian access, a number of transit improvements, and limited EV infrastructure. However, a less extensive dedicated transit network would be provided by Alternative 1 in comparison to Alternative 2 and Alternative 3, and Alternative 1 would be less supportive of compact, transit-oriented development.

Alternative 1 would have a moderate adverse impact in terms of GHG emissions but would not deter efforts to reduce emissions in comparison to local and regional goals. Improvements to the transportation network under Alternative 1 would result in the fewest emissions reduction features with respect to VMT and EV penetration when compared to other alternatives.

### Transportation Infrastructure Vulnerable to Sea-Level Rise

In Alternative 1, very limited sections of the transportation network would be vulnerable to sea-level rise based on the high end of sea-level rise projections from Seattle Public Utilities. This includes 2.3 miles of sidewalks and trails or 0.1% of the pedestrian network, 1.5 miles of bike corridors or just under 1% of the bike network, and 0.3 miles of transit corridors or 0.15% of the transit network. This constitutes a moderate impact to the network that is likely unavoidable because of global trends in sea-level rise, but can be mitigated as described in Section 3.3.3 Mitigation Measures.

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<sup>3</sup> Washington State Department of Transportation, Impacts of VMT Reduction Strategies on Selected Areas and Groups, December 2010. <https://www.wsdot.wa.gov/research/reports/fullreports/751.1.pdf>, accessed February 2023

## Impacts of Alternative 2: Moderate Pace

### Transportation Related Greenhouse Gas Emissions

As discussed above in Section 3.1, Air Quality, implementation of Alternative 2 would result in greater sidewalk availability, bicycle infrastructure, and improved transit service and connectivity in comparison to Alternative 1. Improvements to EV infrastructure would be similar to Alternative 1 by providing limited EV infrastructure in public streets following a best-fit trendline for EV adoption. In addition, STP Alternative 2 assumes implementation of Comprehensive Plan Alternative 5, which would combine the accommodation of denser development with a mix of land uses across a larger area of the city and more dedicated transit right-of-way (131 linear miles in total) than STP Alternative 1 that is likely to support compact and transit-oriented development.

No significant adverse impacts are identified with respect to GHG emissions. Improvements to the transportation network under Alternative 2 would result in greater emissions reduction features than Alternative 1 with respect to VMT, but fewer emissions reduction features than Alternative 3 (discussed below). This alternative is likely to result in a cumulative decrease in GHG emissions compared to Alternative 1 and would not deter or prevent emissions reductions based on local and regional targets.

### Transportation Infrastructure Vulnerable to Sea-Level Rise

In Alternative 2, very limited sections of the transportation network would be vulnerable to sea-level rise based on the high end of sea-level rise projections from Seattle Public Utilities. This includes 2.4 miles of sidewalks and trails or 0.1% of the pedestrian network, 1.5 miles of bicycle corridors or 0.7% of the bicycle network, and 0.25 miles of transit corridors or 0.15% of the transit network. This constitutes a moderate impact to the network that is likely unavoidable because of global trends in sea-level rise but can be mitigated as described in 3.3.3 Mitigation Measures.

## Impacts of Alternative 3: Rapid Progress

### Transportation Related Greenhouse Gas Emissions

Alternative 3 would result in greater sidewalk coverage and bicycle infrastructure, improved transit service and connectivity, and greater amounts of EV charging infrastructure in comparison to Alternative 1 and Alternative 2. Alternative 3 would also include the introduction of additional mobility management strategies. These emissions reduction factors are discussed in detail in Section 3.1 Air Quality. In addition, Alternative 3 assumes implementation of Comprehensive Plan Alternative 5, which would combine the accommodation of denser development with a mix of land uses across a larger area of the city with much more dedicated transit right-of-way (230 linear miles in total) that is likely to support compact and transit-oriented development.

No significant adverse impacts are identified with respect to GHG emissions. Improvements to the transportation network under Alternative 3 would result in greater emissions reduction features than Alternative 1 and Alternative 2 with more multimodal infrastructure that is likely to reduce VMT and more EV infrastructure to encourage greater EV penetration. This alternative is likely to result in a cumulative



decrease in GHG emissions compared to Alternative 1 and would not deter or prevent emissions reductions based on local and regional targets.

### **Transportation Infrastructure Vulnerable to Sea-Level Rise**

In Alternative 3, limited sections of the transportation network would be vulnerable to sea-level rise based on the high end of sea-level rise projections from Seattle Public Utilities. This includes 16 miles of sidewalks or 0.5% of the pedestrian network, 2 miles of bicycle corridors or 0.03% of the bike network, and 0.25 miles of transit corridors or 0.15% of the transit network. This constitutes a moderate impact to the network that is mostly unavoidable because of global trends in sea-level rise but can be mitigated as described in Section 3.3.3. Mitigation Measures.

In Alternative 3, where most sidewalk gaps in Seattle would be filled compared to Alternatives 1 and 2, a total of 16 miles of pedestrian facilities, or nearly 14 more linear miles of sidewalk would be at risk of five feet of sea-level rise by 2100. Those pedestrian facilities comprise approximately 0.5% of the pedestrian network, primarily in low lying coastal areas and along the Duwamish River in SODO, Harbor Island, South Park, and Georgetown, represents a moderate adverse impact.

## **3.3.3 Mitigation Measures**

### **Incorporated Plan Features**

The STP will include several strategies or “Key Moves” aimed at mitigating the effects of climate change and reducing GHG emissions. Those strategies are aimed at reducing vehicle trips through incentives, development regulation, and supporting TOD, along with localized neighborhood-based strategies that would be a part of all alternatives and would reduce the potential for future GHG emissions. Other policy features include a commitment to expanded green infrastructure that may help mitigate the effects for more frequent flooding and sea-level rise on transportation infrastructure.

### **Regulations & Commitments**

The City’s 2013 Climate Action Plan (CAP) and 2018 Climate Action Strategy offer goals and actions to protect the City from the effects of climate change. The CAP outlines key goals to reach through various strategies including those in the Climate Action Strategy, which the City is in the process of implementing since its adoption in 2018. In 2019, the City adopted an Electric Vehicle Readiness ordinance to encourage EV adoption, which was implemented through changes to the city’s land use code requiring EV-ready parking spaces as part of new development. The City of Seattle also has an explicit goal of a 100% fossil fuel free municipal fleet by 2030, adopted with Executive Order 2018-02 which would reduce the contribution of city-owned vehicles to overall GHG emissions.

### **Other Potential Mitigation Measures**

A number of mitigation strategies are incorporated in plan features to reduce VMT and emissions through improvements to the transportation system and also incentives to support mode shift and electrification. Seattle could also implement transportation demand management strategies to beyond the city’s current

Transportation Demand Management (TDM) policies to implement the state Commute Trip Reduction (CTR) law and the City's Commuter Benefit Ordinance. Additional TDM measures to reduce GHG emissions could include:

- Expanded commute trip reduction programs to include smaller employers or local residents.
- Expanded bike and scooter share programs throughout the city.
- More conveniently located bicycle parking at major destinations and transit stops.
- Expanded subsidized ORCA programs to incentivize transit use.

As the sea-level rises, the risk of flooding and erosion increases, which can damage transportation infrastructure. All Alternatives include transportation improvements that would be vulnerable to five feet of sea-level rise, but these make up a limited portion of each network. Potential mitigation measures include the following:

- Elevating infrastructure, which can include rebuilding roads on berms or constructing seawalls to protect critical infrastructure.
- Relocating infrastructure further inland.
- Improving drainage systems to handle increased volume.
- Planting coastal vegetation and salt marshes can help reduce erosion and protect against storm surges.

### **3.3.4 Significant Unavoidable Adverse Impacts**

No significant unavoidable adverse impacts are anticipated with respect to sea-level rise and GHG emissions for all Alternatives. Alternative 1 would likely result in a moderate impact to GHG emissions by 2044 but would not deter efforts to meet local or regional GHG goals. However, this alternative would not support the achievement of climate goals in terms of VMT reduction to the same degree as Alternatives 2 or 3. Changes to the transportation network and city policy that would result in the greatest emissions reduction features with respect to VMT and electric vehicle adoption are greatest with implementation of Alternative 3, followed by Alternative 2, with the fewest emissions reduction features with implementation of Alternative 1. All alternatives include small sections of the bike, pedestrian and transit networks that would be vulnerable to five feet of sea-level rise, a moderate but not significant impact, as these represent under 1% of the networks across all alternatives.

## Section 3.4

# Noise



This chapter assesses the potential noise impacts associated with implementing the alternatives for Seattle's citywide transportation system. The sections to follow provide an overview of noise and vibration and describe the methods used to analyze noise and vibration impacts and summarize noise sources and levels in Seattle. This analysis evaluates noise conditions and potential impacts throughout the city and along key high-traffic corridors, or those most likely to undergo reconstruction.

Under the SEPA Rules (see WAC 197-11-330, WAC 197-11-440 and WAC 197-11-794), the evaluation of the significance of potential impacts considers whether there is a reasonable likelihood of more than a moderate adverse impact on environmental quality (WAC 197-11-794).

In many cases, regulatory thresholds are used to judge significance. If actions meet regulatory thresholds, then the determination is typically that the level of impact is unlikely to be significant. For the purposes of this programmatic impact analysis, noise is analyzed by examining whether:

- The alternative would cause future traffic noise levels of 10 dBA or more above existing noise levels.
- After application of mitigation, the alternative fails to comply with SMC Maximum Allowable Sound Level for receivers.

Using this methodology, the following analysis found that, under the studied alternatives, noise volume changes are not anticipated to exceed 3dBA, the threshold at which the change would be perceptible.

## 3.4.1 Affected Environment

### Data and Methods

The project team used a range of data sources for this assessment of ambient, construction, and traffic noise listed below.

- Highway Construction Noise Handbook (FHWA 2006)
- Highway Traffic Noise: Analysis and Abatement Guidance (FHWA 2011)
- City of Seattle Municipal Code (SMC Chapter 25)
- State of Washington Administrative Code (Chapter 173-60 WAC)
- Port of Seattle Aircraft Noise Monitoring System (2022)

## Environmental Noise and Vibration Fundamentals

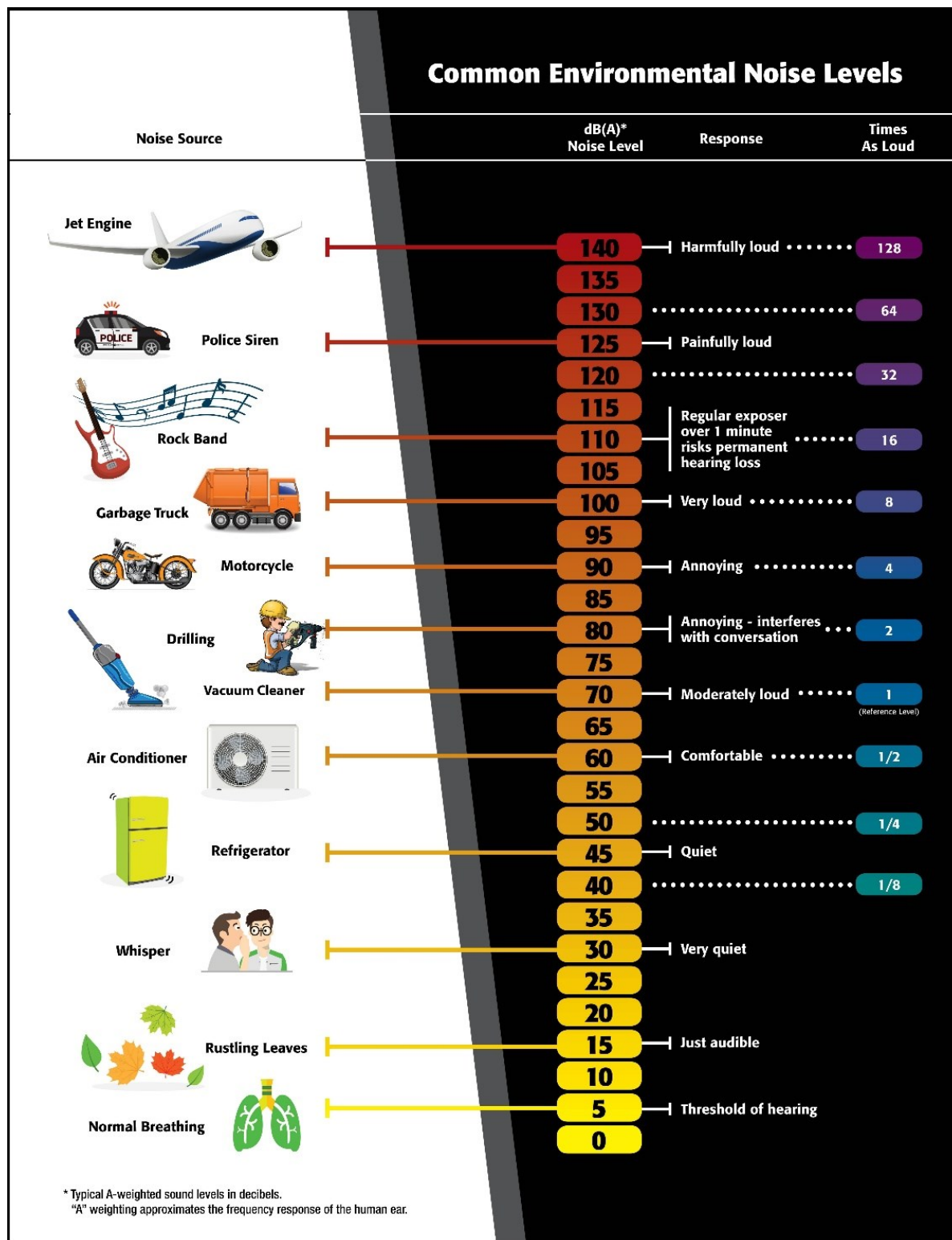
### Sound and Fundamental Noise

Acoustics is the science of sound. Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a medium (e.g., air) to a human (or animal) ear. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound and is expressed as cycles per second, or hertz (Hz).

Noise is defined as loud, unexpected, or unwanted sound. The fundamental acoustics model consists of a noise source, a receptor (or “receiver”), and the propagation path between the two. The loudness of the noise source, obstructions, or atmospheric factors affecting the propagation path determine the perceived sound level and noise characteristics at the receptor. Acoustics deal primarily with the propagation and control of sound. A typical noise environment consists of a base of steady background noise that is the sum of many distant and indistinguishable noise sources. The sound from individual local sources is superimposed on this background noise. These sources can vary from an occasional aircraft or train passing by to continuous noise from traffic on a major highway. Perceptions of sound and noise are highly subjective from person to person, with Exhibit 3-22. depicting typical noise levels.

Measuring sound directly in terms of pressure would require a large range of numbers. To avoid this, the decibel (dB) scale was devised. The dB scale uses the hearing threshold of 20 micropascals ( $\mu\text{Pa}$ ) as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The dB scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels correspond closely to human perception of relative loudness.

Exhibit 3-22. Typical Noise Levels



Source: Kimley-Horn and Associates, Inc., 2020



### Noise Descriptors

The dB scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Several rating scales have been developed to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise, as well as the time of day when the noise occurs. Most commonly, environmental sounds are described in terms of the equivalent noise level ( $L_{eq}$ ) that has the same acoustical energy as the summation of all the time-varying events. While  $L_{eq}$  represents the continuous sound pressure level over a given period, the day-night noise level ( $L_{dn}$ ) and Community Equivalent Noise Level (CNEL) are measures of energy average during a 24-hour period, with dB weighted sound levels from 7:00 p.m. to 7:00 a.m. Each is applicable to this analysis and defined in Exhibit 3-23..

#### Exhibit 3-23. Definitions of Acoustical Terms

Term	Definitions
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in $\mu\text{Pa}$ (or 20 micronewtons per square meter), where 1 pascal is the pressure resulting from a force of 1 newton exerted over an area of 1 square meter. The sound pressure level is expressed in dB as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 $\mu\text{Pa}$ ). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level (dBA)	The sound pressure level in dB as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level ( $L_{eq}$ )	The average acoustic energy content of noise for a stated period of time. Thus, the $L_{eq}$ of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
Maximum Noise Level ( $L_{max}$ ) Minimum Noise Level ( $L_{min}$ )	The maximum and minimum dBA during the measurement period.

Term	Definitions
Exceeded Noise Levels (L01, L10, L50, L90)	The dBA values that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day-Night Noise Level (Ldn)	A 24-hour average Leq with a 10 dBA weighting added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity at nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour Leq would result in a measurement of 66.4 dBA Ldn.
Community Noise Equivalent Level (CNEL)	A 24-hour average Leq with a 5 dBA weighting during the hours of 7:00 a.m. to 10:00 a.m. and a 10 dBA weighting added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour Leq would result in a measurement of 66.7 dBA CNEL.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends on its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018

Because sound levels can vary markedly over a short period of time, a method for describing either the sound's average character ( $L_{eq}$ ) or the variations' statistical behavior ( $L_{xx}$ ) must be utilized. The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The predicted models' accuracy depends on various factors, such as the distance between the noise receptor and the noise source, the character of the ground surface (e.g., hard or soft), and the presence or absence of structures (e.g., walls or buildings) or topography, and how well model inputs reflect these conditions.

### A-Weighted Decibels

The perceived loudness of sounds is dependent on many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable and can be approximated by dBA values. There is a strong correlation between dBA and the way the human ear perceives sound. For this reason, the dBA has become the standard tool of environmental noise assessment. All noise levels reported in this document are in terms of dBA, but are expressed as dB, unless otherwise noted.

### Addition of Decibels

The dB scale is logarithmic, not linear, and therefore sound levels cannot be added or subtracted through ordinary arithmetic. Two sound levels 10 dB apart differ in acoustic energy by a factor of 10 (Caltrans, 2013).

When the standard logarithmic dB is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound and twice as loud as a 60-dBA sound. When two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dBA higher than one source under the same conditions. Under the dB scale, three sources of equal loudness together would produce an increase of 5 dBA.

### **Sound Propagation and Attenuation**

Sound spreads (propagates) uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately 6 dB for each doubling of distance from a stationary or point source. Sound from a line source, such as a highway, propagates outward in a cylindrical pattern. Sound levels attenuate at a rate of approximately 3 dB for each doubling of distance from a line source, such as a roadway, depending on ground surface characteristics. No excess attenuation is assumed for hard surfaces like a parking lot or a body of water. Soft surfaces, such as soft dirt or grass, can absorb sound, so an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed. For line sources, an overall attenuation rate of 3 dB per doubling of distance is assumed in this report.

Noise levels may also be reduced by intervening structures; generally, a single row of buildings between the noise receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm can reduce noise levels by 5 to 15 dBA (FHWA, 2006). The way older homes were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows. The exterior-to-interior reduction of newer residential units is generally 30 dBA or more.

### **Human Response to Noise**

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels.

Noise environments and consequences of human activities are usually well represented by median noise levels during the day or night or over a 24-hour period. Environmental noise levels are generally considered low when the CNEL is below 60 dBA, moderate in the 60 to 70 dBA range, and high above 70 dBA (Cowan, 1994, and Harris, 1979). Examples of low daytime levels are isolated, natural settings with noise levels as low as 20 dBA and quiet, suburban, residential streets with noise levels around 40 dBA. Noise levels above 45 dBA at night can disrupt sleep. Examples of moderate-level noise environments are urban residential or semi-commercial areas (typically 55 to 60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with noisier urban residential or residential-commercial areas (60 to 75 dBA) or dense urban or industrial areas (65 to 80 dBA). Regarding increases in dBA, the following relationships should be noted (Caltrans, 2013 and 2017):

- Except in carefully controlled laboratory experiments, a 1-dBA change cannot be perceived by humans.
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference.
- A minimum 5-dBA change is required before any noticeable change in community response would be expected. A 5-dBA increase is typically considered substantial.
- A 10-dBA change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

## Effects of Noise on People

### Hearing Loss

While physical damage to the ear from an intense noise impulse is rare, a degradation of auditory acuity can occur even within a community noise environment. Hearing loss occurs mainly due to chronic exposure to excessive noise but may be due to a single event such as an explosion. Natural hearing loss associated with aging may also be accelerated from chronic exposure to loud noise. The Occupational Safety and Health Administration has a noise exposure standard that is set at the noise threshold where hearing loss may occur from long-term exposures. The maximum allowable level is 90 dBA averaged over 8 hours. If the noise is above 90 dBA, the allowable exposure time is correspondingly shorter (U.S. Department of Labor, 1974).

### Annoyance

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The  $L_{dn}$  as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. A noise level of about 55 dBA  $L_{dn}$  is the threshold at which a substantial percentage of people begin to report annoyance (FICON, 1992).

### **Ground borne Vibration**

Sources of ground borne vibrations include natural phenomena (earthquakes, volcanic eruptions, sea waves, landslides, etc.) or man-made causes (explosions, machinery, traffic, trains, construction equipment, etc.). Vibration sources may be continuous (e.g., factory machinery) or transient (e.g., explosions). Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One is the peak particle velocity (PPV); another is the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave and is expressed in terms of inches-per-second (in/sec). The RMS velocity is defined as the average of the squared amplitude of the signal and is expressed in terms of velocity decibels (VdB). The PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration.

Exhibit 3-24. displays the reactions of people and the effects on buildings produced by continuous vibration levels. The annoyance levels shown in the table should be interpreted with care since vibration may be found to be annoying at much lower levels than those listed, depending on the level of activity or the individual's sensitivity. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high noise environments, which are more prevalent where ground borne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

Ground vibration can be a concern in instances where buildings shake, and substantial rumblings occur. However, it is unusual for vibration from typical urban sources such as buses and heavy trucks to be perceptible. Common sources for ground borne vibration are planes, trains, and construction activities such as earthmoving which requires the use of heavy-duty earth moving equipment. For the purposes of this

analysis, a PPV descriptor with units of inches per second (in/sec) is used to evaluate construction-generated vibration for building damage and human complaints.

#### Exhibit 3-24. Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibrations

Maximum PPV (in/sec)	Vibration Annoyance Potential Criteria	Vibration Damage Potential Threshold Criteria	FTA Vibration Damage Criteria
0.008	--	Extremely fragile historic buildings, ruins, ancient monuments	--
0.01	Barely Perceptible	--	--
0.04	Distinctly Perceptible	--	--
0.1	Strongly Perceptible	Fragile buildings	--
0.12	--	--	Buildings extremely susceptible to vibration damage
0.2	--	--	Non-engineered timber and masonry buildings
0.25	--	Historic and some old buildings	--
0.3	--	Older residential structures	Engineered concrete and masonry (no plaster)
0.4	Severe	--	--
0.5	--	New residential structures, Modern industrial/commercial buildings	Reinforced-concrete, steel or timber (no plaster)

PPV = peak particle velocity; in/sec = inches per second; FTA = Federal Transit Administration

Source: California Department of Transportation, Transportation and Construction Vibration Guidance Manual, 2020 and Federal Transit Administration, Transit Noise and Vibration Assessment Manual, 2018.

## Current Policy & Regulations

### Federal Guidelines

The U.S. Department of Housing and Urban Development (HUD) has established federal noise abatement and control standards (24 CFR Part 51, Subpart B) for new construction. These standards are widely used to assess the significance of noise impacts in residential communities. According to HUD standards, sites where community noise exposure exceeds a day-night average sound level (L<sub>dn</sub>) of 65 dB (typically expressed as dBA for averages) are classified as noise-impacted, and interior noise levels within residences—typically 20 dB below exterior levels—should not exceed 45dB. Residential construction in noise-impacted areas require additional noise mitigation features for interior noise levels to meet the 45 dB standard.

In urban areas, noise from vehicles traveling on roads is a major source of noise, and changes in travel patterns and land use have the potential to affect traffic noise. Transportation facilities that receive federal funding (federal-aid projects) are subject to federal noise guidelines from the Federal Highway Administration (FHWA). FHWA also requires state departments of transportation such as the Washington

State Department of Transportation (WSDOT) to develop noise policies that will apply to projects within that state. WSDOT's 2020 Traffic Noise Policy and Procedures (WSDOT 2020) are consistent with the requirements of FHWA Code Federal Regulations 772 for roadway related traffic noise and are approved by FHWA for federal-aid projects in Washington.

FHWA guidelines require analysis of expected noise impacts and consideration of noise abatement by land use or Activity Category. FHWA applies different noise abatement criteria (NAC) to each Activity Category based on either exterior or interior noise levels. NAC of 67 dBA Activity Category B, which includes single- and multi-family residences, and Activity Category C, which includes places of worship, schools, recreation areas and other similar land uses. Exhibit 3-25 describes WSDOT's NAC by land use category. Activity Category E includes including, hotels, motels, offices, restaurants, bars, or other developed lands with a NAC of 72 dBA. FHWA determines whether a noise impact is expected to occur when predicted future traffic noise levels approach or exceed the established FHWA a particular Activity Category. The WSDOT definition of approach in this instance is within 1 dBA on the FWHA NAC, or 66 dBA for Activity Categories B and C or 71 dBA for Category E.

#### Exhibit 3-25. Noise Abatement Criteria by Land Use Category

Activity Category	Leq(h)*dBA	Description
A	57 (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (exterior)	Residential (single and multi-family units)
C	67 (exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings
D	52 (interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 (exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F. Includes undeveloped land permitted for these activities.
F	-	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G	-	Undeveloped lands that are not permitted

Source: WSDOT, 2020



### Washington State Noise Control Act of 1974

In 1974, the Washington State legislature authorized the establishment of regulations for the abatement and control of noise pollution considering social and economic impacts (Revised Code of Washington 70A.20). Regulations in Washington Administrative Code (WAC) 173-06-040 established maximum permissible noise levels for specific areas or environments called Environmental Designation for Noise Abatement (EDNA), which vary based on the land use of the noise source and the receiving property. Maximum permissible noise levels are measured in decibels generated by the source or project at the property line of adjacent land uses, rather than the combined project and background noise. Maximum Permissible Environmental Noise Levels apply to a variety of activities and facilities including residences, hospitals, commercial services, storage facilities, warehouses and distribution facilities, and industrial property. However, electrical substations, certain industrial installations, mobile noise sources, vehicles traveling in the public right of way, and warning devices (i.e., bells) are exempt. The state provisions have been adopted by most cities around the state, including the City of Seattle (SMC 25.08).

### Seattle Municipal Code 25.08 Noise Control

#### *Operational Noise Standards*

Chapter 25.08 of the Seattle Municipal Code (SMC) establishes exterior sound level limits for specified land use zones or “districts,” which vary depending on the district of sound source and the district of the receiving property. Between the hours of 10 p.m. and 7 a.m. during weekdays, and between the hours of 10 p.m. and 9 a.m. on weekends and legal holidays, the exterior sound level limits established by Section 25.08.410 are reduced by 10 dB(A) where the receiving property lies within a residential district of the City. The exterior sound limits based on noise source and receiving property in the City of Seattle Noise control ordinance are summarized in Exhibit 3-26.

#### Exhibit 3-26. Maximum Permissible Noise Level

District of Sound Source	EDNA Receiver of Noise (Maximum Allowable Sound Level in dBA Leq) District of Receiving Property		
	Residential	Commercial	Industrial
Class A Residential	55	57	60
Class B Commercial	57	60	65
Class C Industrial	60	65	70

Source: City of Seattle Noise Control Ordinance

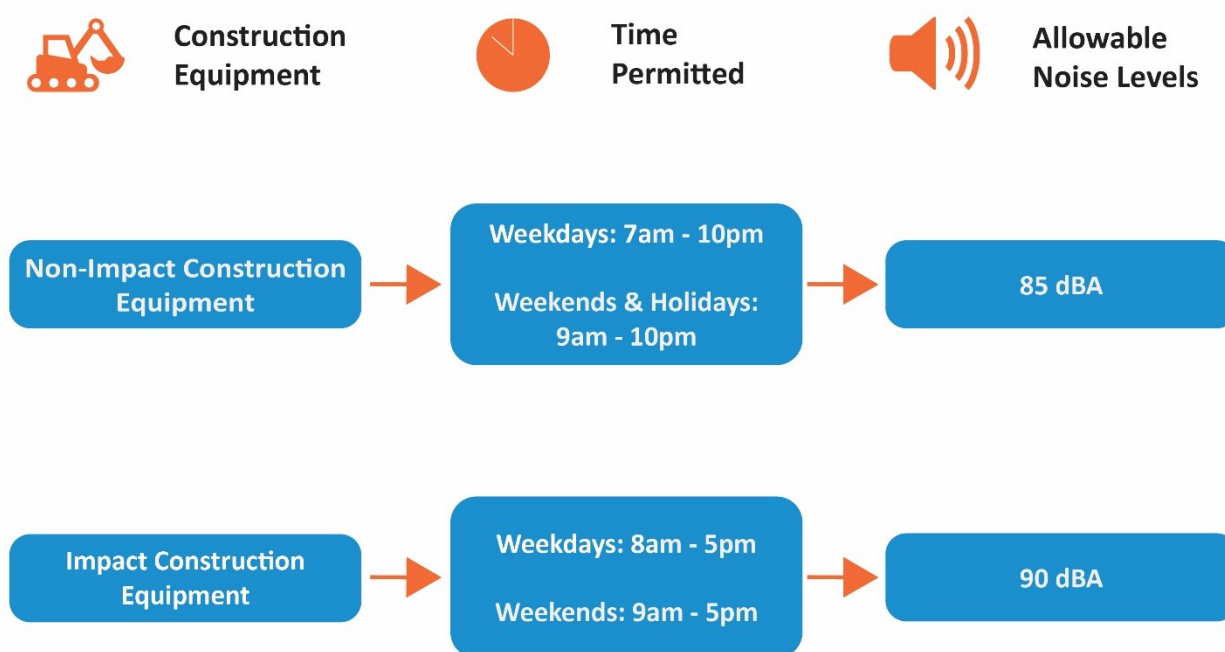
Between the hours of 10pm and 7am on weekdays and 10pm and 9am during weekends, the maximum limits for receivers within residential zones are to be reduced by 10 dBA. During a measurement interval,  $L_{max}$  may exceed the exterior sound level limits shown in subsection 25.08.410.A by no more than 15 dBA.

#### *Construction Noise Standards*

The City’s Noise Control code (shown in Exhibit 3-27) allows the exterior sound level limits to be exceeded by certain types of construction equipment operating in most commercial districts between 7am and 10pm on

weekdays and between 9am and 10pm on weekends and legal holidays (SMC 25.08.425). The types of equipment that would usually exceed the exterior sound level limit of 60 dBA are tractors, loaders, excavators, and cranes. This equipment may exceed the applicable standard by up to 25 dBA (an 85 dBA standard) when measured at a reference distance of 50 feet. Use of impact equipment—such as a pile driver—is restricted to between 8am and 5pm on weekdays and between 9am and 5pm on weekends and holidays. It is also restricted to 90 dBA continuously, 93 dBA for 30 minutes, 96 dBA for 15 minutes, and 99 dBA for 7½ minutes. Sound levels in excess of 99 dBA are prohibited unless authorized by variance obtained from the Administrator; and provided further that sound levels less than 90 dBA shall comply with subsection 25.08.425.A and B of the section during those hours not covered by subsection 25.08.425.C.

### Exhibit 3-27. Construction Noise Time Limits



Source: City of Seattle Noise Control Ordinance (SMC 2508.425)

## Current Conditions

### Noise Sources in Seattle

#### *Traffic Noise Sources*

Traffic noise exposure is comprised of several factors: the volume of vehicles per day, the speed of those vehicles, the number of those vehicles that are medium and heavy trucks, the distribution of those vehicles during daytime and nighttime hours, and the proximity of noise-sensitive receivers to the roadway. Existing traffic noise exposure is expected to be as low as 50 dB  $L_{dn}$  in the most isolated areas of the City, while receivers adjacent to interstate highways are likely to experience levels as high as 75 dB  $L_{dn}$  (U.S. Department

of Transportation 2022). Traffic noise assessment in this analysis is also inclusive of bus transit, as buses are an assumed percentage of overall roadway volumes used in the calculation of roadside noise levels. Exhibit 3-28 presents the distance to various noise contours for various roadways in the Seattle area. The values in Exhibit 3-28 do not take into consideration the presence of existing sound barriers, topographical conditions or roadway elevation, all of which can vary by location. The 65  $L_{dn}$  contour is important because it represents the exterior noise level which can be reduced to 45 dBA  $L_{dn}$  using standard construction techniques. An interior noise level of 45  $L_{dn}$  is the commonly accepted maximum recommended interior noise level for residential uses (U.S. EPA, 2016).

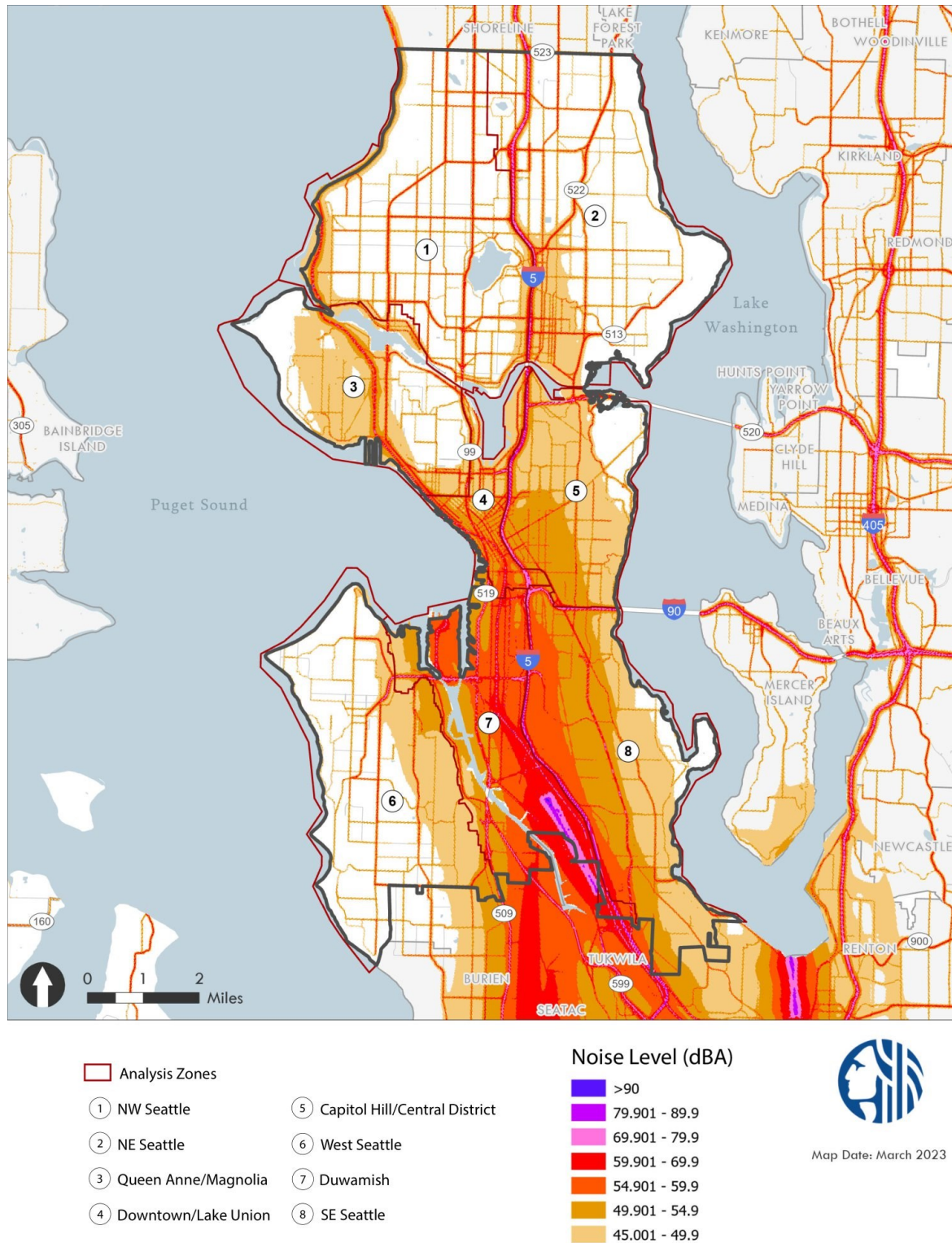
#### Exhibit 3-28. Existing Roadway Noise Levels

Roadway	Roadway Segment	Ldn at 150' from Roadway Center	Distance (feet) from Roadway Center to Noise Contours		
			65 dBA $L_{dn}$	60 dBA $L_{dn}$	55 dBA $L_{dn}$
Martin Luther King Jr Way S	Between S Jackson St and S Massachusetts St	58.4	33	105	332
	Between S Orcas St and S Graham St	59.7	-	139	440
Harbor Ave SW/Alki Ave SW	Between SW Admiral Way and California Way SW	57.5	-	83	264
Beacon Ave S	Between S Spokane St and S Columbian Way	54.8	-	46	144
34th Ave W	Between W Barrett St and W McGraw St	54.3	-	40	127
Roosevelt Way NE	Between NE Northgate Way and 80th St	56.7	-	70	220
Roosevelt Way NE	Between 5th Ave NE and 10th Ave NE	60.9	59	186	588

Source: Kimley Horn, 2023

According to the U.S. Department of Transportation National Transportation Noise Map, traffic noise levels along major highways and freeways in the City (e.g., I-5, I-405, I-90, and Highway 99) range from approximately 50 dBA  $L_{eq}$  to 75 dBA  $L_{eq}$  (U.S. Department of Transportation 2022). The National Transportation Noise Map is provided in Exhibit 3-29.

Exhibit 3-29. National Transportation Noise Map



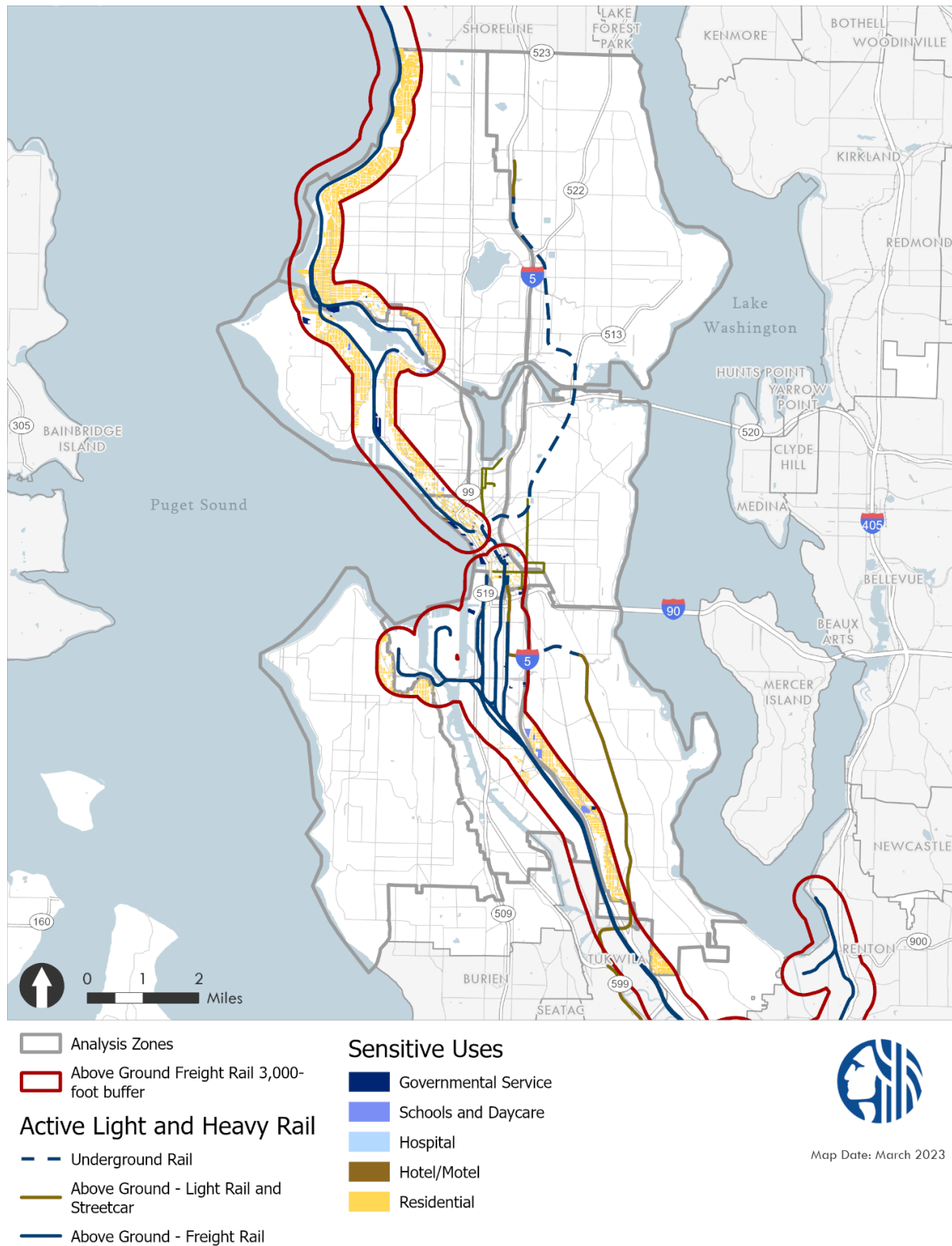
Source: U.S. Department of Transportation, 2022

*Rail Noise Sources*

Seattle is also affected by noise from freight and passenger rail operations. While rail operations generate significant noise levels in the immediate vicinity of railways, train operations are intermittent and area railways are widely dispersed. Sound Transit's light rail system operates frequently but thanks to electrification, lower speeds, and lighter loads, this results in overall lower noise levels. The contribution of rail noise to Seattle's ambient noise environment is relatively minor compared to other sources such as roadway traffic. However, areas near rail yards often experience higher noise levels due to the maintenance of rail vehicles, assembly of trains, and idling engines. Train operations can also be a source of significant ground-borne vibration near railroad tracks and yards. Vibration-sensitive receivers located within 100 feet of rail operations may be adversely affected by vibration exposure during train events (FTA 2006). Exhibit 3-30 shows active rail lines in the city of Seattle.



Exhibit 3-30. Active Rail Lines in Seattle



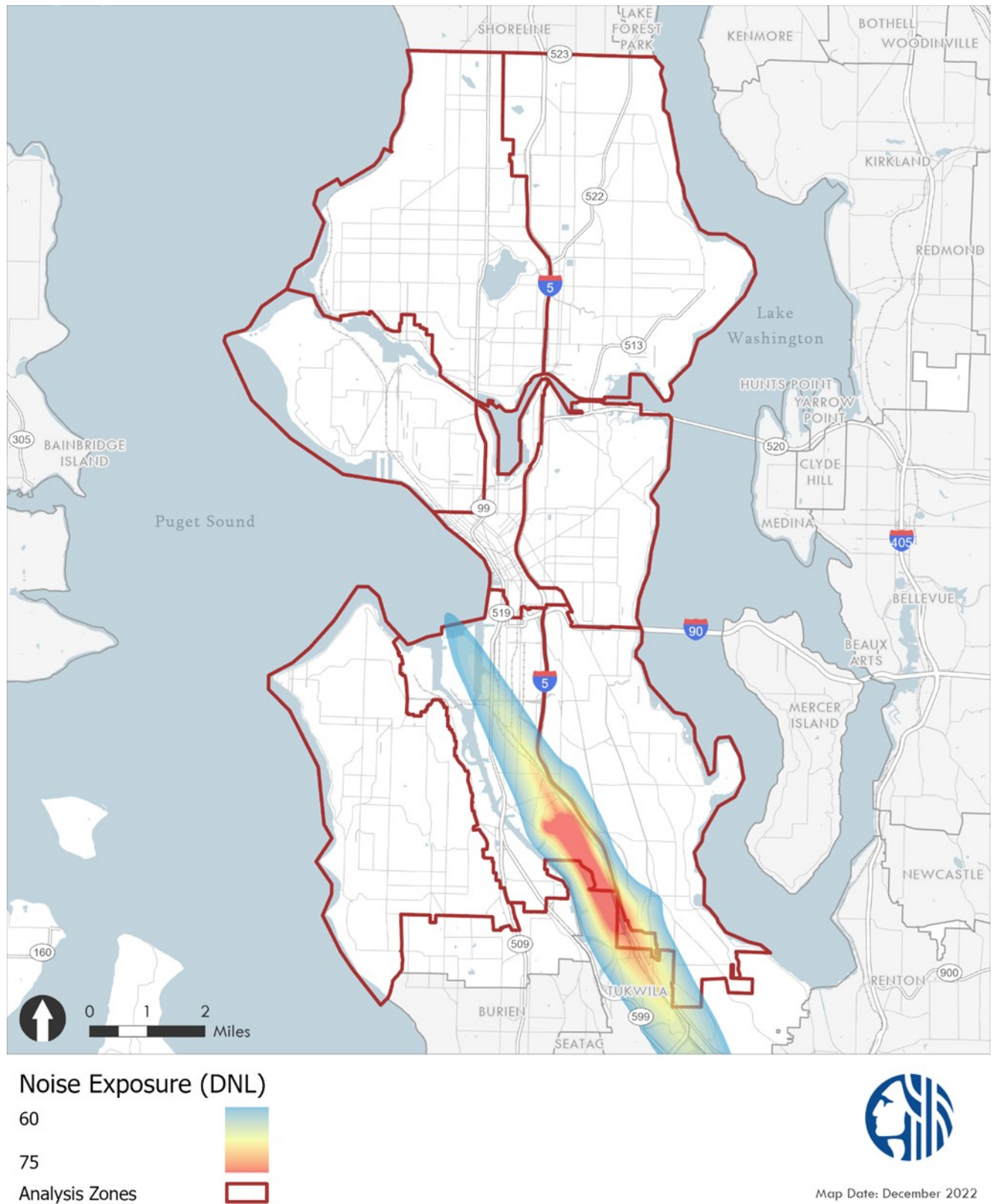
Source: WSDOT, 2022; Sound Transit, 2022.; Kimley-Horn, 2023



*Aircraft Noise Sources*

King County International Airport, also known as Boeing Field, generates approximately 500 aircraft operations a day. Aircraft originating from other airports such as Seattle-Tacoma International Airport frequently fly over Seattle. All these operations contribute to the overall ambient noise environment within the city. Similar to rail noise, the proximity of the receiver to the airport and aircraft flight path influences the noise exposure measurements. Other contributing factors include the type of aircraft operated, altitude of the aircraft, and atmospheric conditions. Atmospheric conditions may contribute to the direction of aircraft operations (flow) and affect aircraft noise propagation. The noise contours for Boeing Field are shown in Exhibit 3-31.

Exhibit 3-31. Boeing Field Noise Contours



Source: Port of Seattle, 2022; City of Seattle, 2022.

*Construction Noise Sources*

Construction activities related to new development and transportation improvements can create high noise levels of relatively short duration. Noise generated by construction equipment varies greatly depending on factors such as the operation performed, equipment type, model, age, and condition. Noise from heavy equipment diesel engine operations can dominate the noise environment surrounding construction sites. Other stationary equipment sources such as generators, pumps, and compressors can also contribute significantly. Operation of impact equipment such as pile drivers generally produce the highest noise levels and may also produce significant vibration in the vicinity. Maximum noise exposure from typical construction equipment operations is approximately 75–100 dB (Lmax at 50 feet), the highest noise production from heavy demolition and pile driving operations. Please refer to Exhibit 3-32 for typical construction noise levels.

**Exhibit 3-32. Typical Noise Levels from Construction/Demolition Equipment**

Construction Equipment	Typical Noise Level at 50 ft from Source
Air Compressor	80 dBA
Backhoe	80 dBA
Compactor	82 dBA
Concrete Mixer (Truck)	85 dBA
Concrete Pump (Truck)	82 dBA
Concrete Vibrator	76 dBA
Crane	83 - 88 dBA
Dozer	85 dBA
Generator	82 dBA
Grader	85 dBA
Jack Hammer	88 dBA
Loader	80 dBA
Paver	85 dBA
Pile Driver (Impact)	101 dBA
Pneumatic Tool	85 dBA
Pump	77 dBA
Shovel	82 dBA
Truck	84 dBA

Source: FTA Transit Noise and Vibration Impact Assessment Manual, 2018

Industry and Other Non-Transportation Noise Sources

A wide variety of industrial and other non-transportation noise sources are located in Seattle. These include manufacturing plants, marine shipping facilities, landfills, treatment plants (e.g., water), food packaging

plants and lumber mills, and other general industrial facilities. Noise generated by these sources varies widely and are often intermittent, but these noises can exceed 80 dBA close to the source for some activities (City of Seattle, 2022). Noise generated by these sources varies widely, but in many cases may be a significant contributor to a local noise environment.

### Noise Levels in Seattle

This section presents current noise levels in different portions of the city with the compilation of available noise data from publicly available documents and sources. The data for ambient noise in Seattle are primarily from the Port of Seattle’s Aircraft Noise Monitoring System.

Larger traffic volumes on local roadways and transit bus operations are largely responsible for this phenomenon. Urban areas with low roadway volumes can regularly experience typical ambient noise levels below 50 dBA, L50. Locations adjacent to freeways and highways can experience daytime ambient noise levels of 65–75 dBA, L50 (Caltrans 2009).

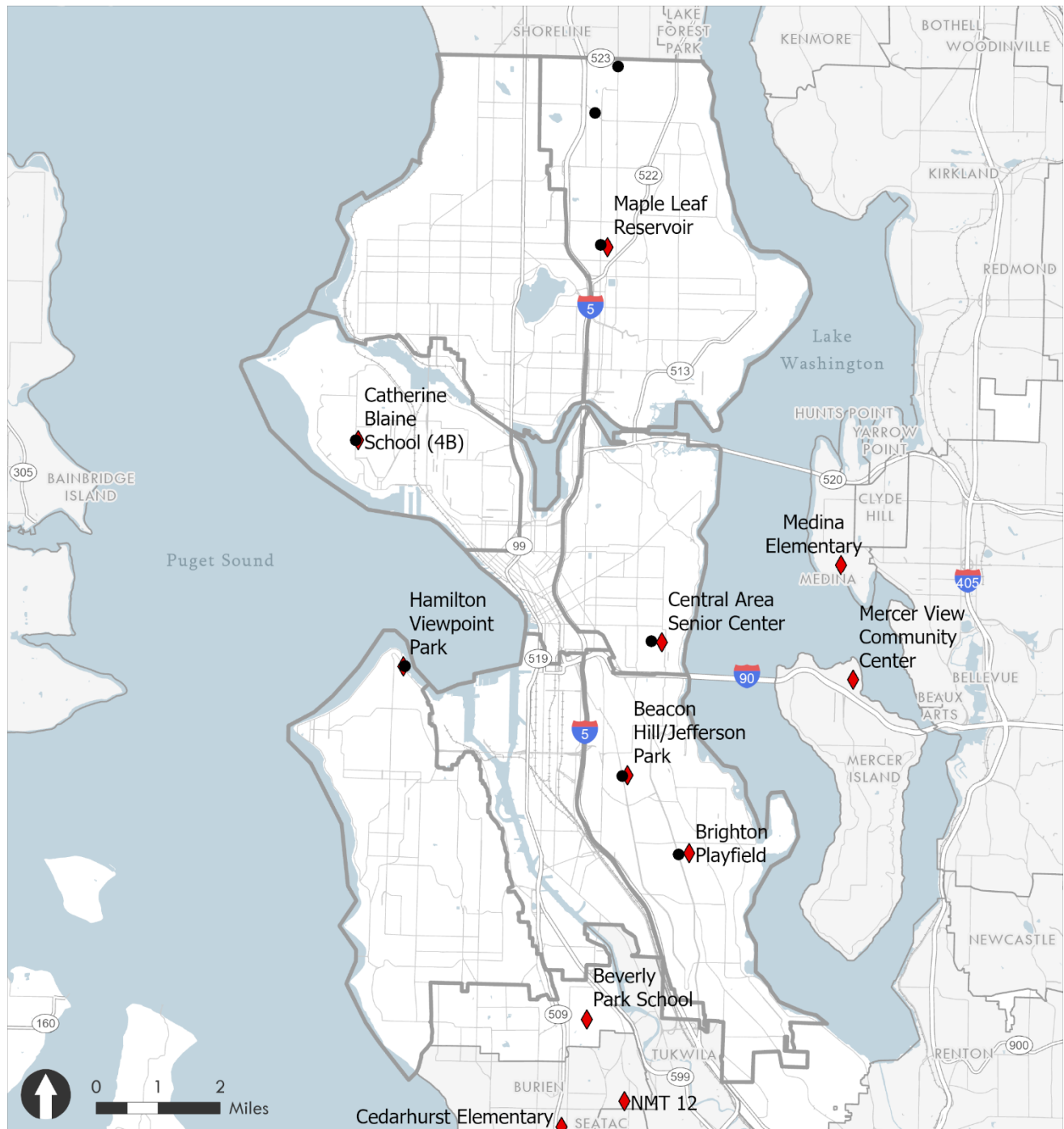
The most recent full year of noise data available from the Port of Seattle’s noise monitoring system within Seattle is shown in Exhibit 3-33. Noise levels across the City are comparable between most noise monitoring locations in the city. However, there are slightly higher noise levels at the Jefferson Park noise monitoring station, which may reflect an increase of nearly 80,000 take-offs and landings at Seattle-Tacoma International airport between 2020 and 2021, a recovery in air traffic from the COVID-19 pandemic. This noise monitor is directly beneath the flight path for Seattle-Tacoma International Airport, and the Beacon Hill neighborhood is more affected by aircraft noise than other areas within Seattle covered by the Port’s noise monitoring system.

**Exhibit 3-33. Average Annual Noise Level (most recent complete year) for Monitoring Locations in Seattle**

Measurement Location	Avg Annual Leq	Avg Annual Lmax
<i>Noise Monitoring Location</i>	<b>Leq</b>	<b>Lmax</b>
NMT3: Maple Leaf Reservoir (2020) NE Seattle	54.7	83.4
NMT4: Catherine Blain School (2020) Queen Anne/Magnolia	52.3	80.6
NMT6: Hamilton Viewpoint Park (2020) West Seattle	58.1	82.9
NMT7: Central Area Senior Center (2020) Capitol Hill/Central District	54.7	83.4
NMT9: Jefferson Park (2021) Southeast Seattle	62.0	88.1
NMT10: Brighton Playfield (2020) Southeast Seattle	54.7	85.7

Source: Port of Seattle, 2022

Exhibit 3-34. Noise Monitoring Locations



- Analysis Zones
- Traffic Noise Monitoring Locations
- SeaTac Noise Monitoring Locations



Map Date: February 2023

Source: Port of Seattle, 2022; Kimley-Horn, 2022

### **Sensitive Receptors**

Noise-sensitive land uses are generally defined as locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Noise-sensitive land uses typically include residences, hospitals, schools, transient lodging, libraries, and certain types of recreational uses. Noise-sensitive residential receivers are found throughout the city in every study area.

### **Northwest Seattle (Area 1)**

The predominant source of noise in the Northwest Seattle subarea is from transportation. The Sound Transit N line runs along the western edge of this area. The line operates locomotives, with anywhere from 2-7 passenger cars. This same railway also services BNSF freight locomotives and Amtrak passenger rail. The U.S. Department of Transportation National Transportation Noise Map (USDOT, 2016) illustrates that areas near the rail line are typically in the upper 50 dBA LA<sub>eq</sub> range for 24-hour noise levels. This is also true for the larger roadways in this area, most notably SR 99, 15<sup>th</sup> Ave NW, and Holman Rd NW. The biggest contributor to noise in this area is proximity to I-5, with 24-hour LA<sub>eq</sub> levels reaching over 70 dBA when in close proximity. For most areas outside major roadways, ambient noise levels are observed to be minimally affected by traffic noise. Industrial Marina areas are also present along the southern limit of the area near Lake Union and contribute to the existing noise environment.

### **Northeast Seattle (Area 2)**

The noise environment in the Northeast Seattle subarea is mainly comprised of roadway traffic and rail transit noise. A portion of the Sound Transit Link 1 Line traverses through the southernmost portion of this subarea in a northwest direction to Northgate, transitioning from a tunnel to an elevated track profile north of N 92<sup>nd</sup> St in Maple Leaf. This area also has notable roadway traffic noise, primarily from SR 522, SR 513, and I-5 along the western border of this subarea trending in a north-south direction. The University District and the uses associated with the University of Washington are also sources of noise from road traffic and a concentration of human activity and sporting events. Marina areas are also present along the southern limit of the area near Lake Union and contribute to the existing noise environment.

### **Queen Anne/Magnolia (Area 3)**

The same rail line that traverses Northwest Seattle (Sound Transit N Line) continues through the Queen Anne/Magnolia subarea, with Sound Transit Sounder Locomotives, Amtrak passenger rail and BNSF freight lines. Furthermore, the Balmer Yard in Interbay is an 80-acre rail yard with 41 parallel tracks. This industrial area that separates Queen Anne and Magnolia extends to the smith cove terminal, where cruise ships often dock. The National Transportation Noise Exposure Map shows that areas near the industrial sector experience noise levels up to 50 dBA for 24-hour LA<sub>eq</sub> levels. Significant sources of roadway traffic noise include the Magnolia Bridge, 15<sup>th</sup> Ave W, Elliot Ave W, and Nickerson St.

### **Downtown/Lake Union (Area 4)**

The Downtown/Lake Union subarea has the highest concentration of roadway traffic noise of all subareas, which is to be expected with high traffic volumes in densely developed urban areas. Noise travels farther and in various directions in this subarea due to the amount of sound reflective hard surfaces such as tall concrete



buildings and a majority of concrete groundcover. I-5 is the largest contributor to traffic noise in the Downtown/Lake Union area; however, Alaskan Way, Mercer St, and Aurora Ave/SR 99 are also significant road noise sources, reaching into the 60-70 dBA range for 24-hour  $LA_{eq}$  levels. The National Transportation Exposure Map (Seto & Huang, 2023) shows noise levels within this subarea ranging from 50 dBA  $LA_{eq}$  in the central Downtown areas up to approximately 80 dBA  $LA_{eq}$  near I-5.

### **Capitol Hill/Central District (Area 5)**

Interstate 5, Interstate 90, and State Route 520 are the major sources of noise in the Capitol Hill/Central District subarea. 23<sup>rd</sup> Ave, Boren Ave, Madison St, ML King Jr Way are also high-traffic roadways that are notable roadway noise sources. The Seattle Streetcar First Hill Line passes through this subarea, running north-south along Broadway. This area is primarily residential, with very few industrial sources of noise.

### **West Seattle (Area 6)**

The significant roadway noise sources in the West Seattle subarea are the West Seattle Bridge, California Ave SW, Fauntleroy Way SW, 35<sup>th</sup> Ave SW, Delridge Way SW, W Marginal Way and SW Roxbury St. The northern areas of this subarea are located close to Terminal 5 and Harbor Island, both parts of the Port of Seattle. In this industrial area is also the Nucor Steel, which along with the port, brings in additional freight train traffic.

### **Duwamish (Area 7)**

Boeing Field is located in the southeastern portion of the Duwamish subarea, and therefore this subarea has the highest levels of airplane noise. Areas near the airport experience noise levels in 75-80 dBA range, while the majority of the subarea is located within the 60-70 dBA noise level contour range. This area also contains two large rail yards, the Union Pacific Argo Yard and BNSF Stacy Yard. This area also contains a large portion of the Port of Seattle. These intermodal facilities run year-round every day. This subarea is predominantly comprised of industrial uses, with some residences located in the southern portion adjacent to the Boeing Field Airport and separated by the Duwamish waterway, which is roughly 500 feet in width. This area also includes the Sound Transit's Link OMF Central, which maintains the light rail trains that service Seattle. This area also has significant noise sources from Highway 99 and Highway 509, as well as the I-5 freeway.

### **Southeast Seattle (Area 8)**

The westernmost portion of the Southeast Seattle subarea is located within the 60-65 noise contour for Boeing Field, while the southwestern portion of this subarea is located within the 60-75 noise contour near the I-5 and Highway 90 interchange. The most notable roadway traffic noise sources are S Columbian Way, Martin Luther King Jr Way S and Rainer Ave S, as well as I-5 and I-90. The Sound Transit's Link Light Rail 1 line runs along Martin Luther King Jr Way S. The Beacon Hill Seattle Noise Project (Beacon Hill Seattle Noise Project, 2018) collected 24-hour noise measurements during the spring and summer of 2018 and observed areas with high levels. The sites with the highest noise readings were located near the three notable roadways mentioned above (S Columbian Way, Martin Luther King Jr Way S and Rainer Ave S).

### 3.4.2 Impacts

This section describes the potential impacts of each future alternative as they relate to the noise thresholds of significance. The impacts of Alternatives 2 and 3 are measured against conditions expected under Alternative 1. The following were evaluated as thresholds of significance for noise impacts:

The alternatives are expected to result in an impact to noise if:

- **Policy Consistency:** The action would result in a change to the transportation network that is inconsistent with GMA goals, the regional planning framework and local policy goals.
- **Noise:** The alternative would cause future traffic noise levels of 10 dBA or more above existing noise levels.

Thresholds of significance were evaluated for each STP alternative, with quantitative measures based on the existing and proposed transportation network.

### Impacts Common to All Alternatives

#### Construction Noise and Vibration Impacts

All three of the proposed alternatives include various improvements to the City's transportation network, including upgrades to pedestrian, bicycle, transit, and freight networks. Resultant construction activities associated with the expansion of transit, bicycle and pedestrian infrastructure and other transportation-related projects in Alternatives 1, 2 and 3 have the potential to temporarily affect nearby sensitive receivers such as existing residences, schools, day care centers, hospitals, and nursing homes. Temporary construction noise and vibrations in areas with proposed improvements in all Alternatives would occur primarily in urban areas where ambient noise and vibration levels are influenced by roadway traffic and other transportation sources. Noise and vibrations from construction under all alternatives would therefore be less noticeable to noise-sensitive receivers than if these activities were to occur in undeveloped areas of the City.

Section 25.08.425 of the Seattle Municipal Code establishes noise standards that limit construction activities to times when construction noise would have the least effect on adjacent land use. It also restricts the noise generated by different types of construction equipment. Transportation improvement projects under Alternatives 1, 2, and 3 would range from simple paint treatments to roadway reconstruction. Depending on the extent of construction activities involved and background ambient noise levels, localized construction-related noise effects could vary widely.

Construction activities for transportation projects with the highest potential for construction-related noise or vibration impacts are those that require pile driving or other similar invasive foundation work. These types of construction activities are generally associated with overcrossing structures or elevated railways as part of large-scale transportation construction projects.

The Seattle noise control ordinance restricts the use of impact equipment, such as pile drivers or jackhammers, to 8 a.m. to 5 p.m. on weekdays and 9 a.m. to 5 p.m. on weekends and holidays and limits their operation to a continuous noise level of 90 dBA and a maximum noise level of 99 dBA  $L_{max}$  when measured at a reference distance of 50 feet. Improvements to the multimodal network may require use of

impact equipment in urban centers and villages and along commercial corridors in all Alternatives. Construction noise impacts in excess of 90 dBA near funded and proposed pedestrian, bike, transit and people streets and public spaces have the potential for moderate adverse noise impacts. Mitigation is identified in the following sections to reduce this impact.

The City of Seattle does not enforce quantitative standards with regard to vibration. Construction-related vibration impacts from pile driving and other construction equipment are generally assessed in environmental review documents using the methodology of the Federal Transit Administration (FTA) which includes standards for structural damage as well as for human annoyance.

Pile driving can result in peak particle velocities (PPV) of up to 1.5 inches per second (in/ sec) at a distance of 25 feet (FTA 2018), but typically average about 0.644 PPV. The FTA utilizes a threshold of architectural damage for conventional sensitive structures of 0.3 in/sec PPV for new residential structures and modern commercial buildings and 0.2 in/sec PPV for historic and older buildings. Therefore, a potentially significant vibration impact related to structural damage could occur when pile driving is proposed within 50 feet of a historic building. Thus, mitigation is recommended to reduce potential construction vibration impacts related to pile driving.

Vibration levels can also result in interference or annoyance impacts for residences or other land uses where people sleep, such as hotels and hospitals. The FTA methodology for vibration annoyance is dependent on the frequency of the events. When vibration events occur more than 70 times per day, as is typically the case with pile driving, they are considered “frequent events.” Frequent events in excess of 72 VdB are considered to result in a significant vibration impact. However, the prohibited construction hours within the City’s Ordinance are sufficient to avoid sleep interference impacts during times that most people sleep.

### **Vehicle Miles Traveled & High Traffic Roadways**

Improvements to the multimodal network transportation have the potential to reduce VMT. As discussed in Section 3.1.2, none of the Alternatives are likely to result in any additional VMT per capita. The three factors that affect road noise are the volume of the traffic, speed, and the number of trucks in the flow of traffic (Center for Environmental Excellence, 2023). Generally, the traffic noise levels increase with heavier traffic volumes, higher vehicle speeds, and greater numbers of trucks. Vehicle noise is a combination of the noise produced by the engine, exhaust, and tires. Any reduction in vehicle miles traveled can then attribute to a reduction in noise levels. Therefore, transportation improvements that elicit a decrease in VMT will also reduce noise pollution.

In Alternatives 1, 2 and 3, the same four roadways through the City of Seattle are forecast to have average weekday traffic of 100,000 or more. These roadways are exclusively limited access highways and include I-5, I-90, the 1<sup>st</sup> Ave S Bridge section on SR 99, and the West Seattle Bridge and connecting sections of the Spokane viaduct. Sensitive uses within 1,000 feet of these roadways are primarily along the west side of I-5 in south Seattle, either side of I-5 in central and north Seattle and either side of I-90 through central Seattle. Manufacturing and industrial centers contain primarily industrial and office uses, and thus have very few sensitive uses such as residences, schools, daycares and hospitals.

Many of the proposed transit corridors and community & mobility hubs in Alternatives 2 and 3 are near major traffic noise sources such as highways and major arterials shown in Exhibit 3-29. Approximately 34% of community & mobility hubs in Alternative 2 and 27% of community & mobility hubs in Alternative 3 within 1,000 feet of the key roadways described above. The number of community & mobility hubs and linear miles of potential transit improvements in these alternatives is shown in Exhibit 3-35 below.

**Exhibit 3-35. Transit Alternative Improvements within 1,000 Feet of Roadways with Average Weekday Traffic of 100,000 or more.**

Alternative	Number of Community & Mobility Hubs	Miles of Transit Improvements
Alternative 1	0	15.7
Alternative 2	18	33.8
Alternative 3	28	50.5

Source: City of Seattle, 2022; King County, 2023

Potential noise impacts from community & mobility hubs in these areas would be minimal as traffic on these roadways is the primary noise source with relatively high noise levels. Thus, noise from community & mobility hubs and transit improvements within close proximity of these roadways would be minimal and have a very small contribution to increases in overall noise levels.

**Sidewalk Impacts**

Building new sidewalks to fill pedestrian gaps in Seattle would not contribute to any foreseeable increase in ambient noise levels. Noise from people talking attenuates rapidly with distance and are not expected to result in an increase in noise compared to adjacent roadway traffic noise.

**Bicycle Facility Impacts**

Due to the low noise outputs of bicycles, new or upgraded bicycle corridors do not have foreseeable adverse impact on noise levels. However, bike lanes and shared lanes are associated with higher levels of noise exposure for cyclists because of closer proximity to vehicle noise sources (Apparicio et al. 2016). The general consensus is cyclists are exposed to more noise than other road users. However, the roadway noise exposure duration for bicyclists is short and sporadic based on the volume of traffic on the adjacent roadway and would therefore not be sufficient intensity and/or duration to result in human health effects from noise pollution (Gelb & Apparicio, 2020).

**People Streets and Public Spaces Impacts**

Al three alternatives propose people streets and public space improvements, which could result in the conversion of existing roadway segments or areas to gathering spaces or pedestrian streets with fewer cars and lower traffic speeds. These areas could help reduce traffic-related noise levels up to 10 dBA, as cities with similar pedestrian-friendly spaces have found (Environmental International, 2021). Public spaces contemplated in the PSPS network are community prioritized places that invite people to gather, play and connect with each other and include destination streets, with a high density of shops, restaurants, cultural

centers and more. With higher pedestrian traffic and more designated spaces for gatherings, there may be an increase in noise levels related to events such as farmers markets or other community gatherings. However, these changes in noise levels are likely to be minimal, with lower noise levels in comparison to vehicular traffic.

### **Transit Impacts**

All alternatives would expand the dedicated transit corridors and RapidRide corridor network in the City. Newly constructed (or modified) dedicated transit lanes (bus or streetcar) could increase transit vehicle noise along transit corridors. As discussed above, a reduction in VMT per capita throughout the City is expected for all Alternatives, which could help offset any noise increases from additional bus/transit volumes. However, it is possible that dedicated transit lane projects could result in an increase in ambient noise levels at adjacent noise-sensitive land uses (e.g., residential) resulting in potential moderate noise impacts. Mitigation is identified in the following sections to reduce this impact.

Alternatives 1, 2 and 3 include all ST3 Sound Transit Link Light Rail Extensions, approved for funding by voters in 2016 and projects approved for funding as part of ST2 currently under construction. Stations in the Link system, particularly above-ground stations can result in an increase noise levels in the surrounding area. While these locations often have less of an impact on residential receptors due to being positioned in areas near existing major roadways or highways with existing high ambient noise levels, light rail train pass-bys, bus access/trips, vehicle parking, and community & mobility hubs at transit stations can result in increased ambient noise levels near noise-sensitive uses. Therefore, a moderate noise impact would result as a result of light rail and transit station projects associated with STP Alternatives 1 through 3. Mitigation is identified in the following sections to reduce this impact.

### **Freight Impacts**

Commercial freight trucks are inherently significant sources of noise along major roadways and highways within the City. In general, the major roadways and highways with high freight truck traffic volumes in the City are not developed with a high concentration of residences or other noise-sensitive uses. The Alternatives do not propose to expand the freight truck network or increase truck volumes within the City. In addition, citywide VMT per capita is anticipated to decline as a result of All Alternatives, which would result in traffic noise level reductions throughout the City. As a result, freight truck traffic is expected to result in a low-level noise impact with implementation of the Alternatives.

### **Electric Vehicles**

Concurrent with nationwide trends and federal incentives for electric vehicles (EVs), the fleet vehicle mix within the City is expected to see an increase in EVs with implementation of all three STP Alternatives. At low speeds (under 15 miles per hour) sound levels from electric cars are much lower since propulsion noise generated by the vehicle dominates over any aerodynamic and tire-pavement noise (Noel, 2021). Therefore, it is expected that traffic noise levels in low-speed areas within the City (e.g., residential streets, parking lots,) would reduce as the EV vehicle fleet mix share grows in the future. As a result, ambient noise levels in low traffic speed roadways could also diminish.

#### Consistency with Vision 2050, Growth Management Act, and Countywide Planning Policies

Vision 2050 incorporates a range of multicounty planning policies adopted under the GMA to address regionwide issues. These policies are a reference for counties and cities in the Central Puget Sound Region as they update countywide planning policies and comprehensive plans. Alternatives 1, 2 and 3 are all consistent with these policies and aim to reduce impacts to vulnerable populations, including those in areas disproportionately affected by transportation noise MPP-En-7 and MPP-En-8. None of the features of the alternatives are likely to have a significant effect on noise levels in those areas, as the largest transportation sources in those areas are highway and airport traffic.

All Alternatives are also consistent with King County's countywide planning policies 2021 and ratified April 2022 to prevent or mitigate the effect of pollutants, such as noise, that contribute to environmental health disparities (EN-25).

### **Impacts of Alternative 1: No Action**

Transit improvements and increased transit frequencies will lead to increases in noise levels. More frequent and reliable bus service along corridors with speed and reliability improvements will increase noise from transit vehicles along those corridors. The Washington Administrative Code (WAC 173-62-030) limits noise from heavy vehicles including buses to 80 dB at 50 feet away, which can impact receptors in close proximity (WAC 173-62-30).

Alternative 1: No Action includes existing and funded transit infrastructure with 38 miles of dedicated transit lanes, 31 light rail stations in the City of Seattle, and 75 linear miles of RapidRide corridors. This alternative includes a number of projects that are funded or under construction including the West Seattle and Ballard Link Extensions and RapidRide G and J lines but does not include any community & mobility hubs. Transit corridors currently in project development and construction that are included in this Alternative have the potential to increase noise levels along corridors where transit service is likely to be more frequent and reliable, with more transit vehicles traveling along these roadways throughout the day.

Alternative 1 would not include any roadway reconstruction other than what is currently funded and is not anticipated to have any significant construction noise impacts.

### **Impacts of Alternative 2: Moderate Pace**

Transit improvements and increased transit frequencies under Alternative 2: Moderate Pace will lead to increases in noise levels. More frequent and reliable bus service along corridors with speed and reliability improvements will increase noise from transit vehicles along those corridors. Alternative 2 includes 71 linear miles of dedicated transit corridors, 31 light rail stations, 75 linear miles of RapidRide corridors, and 52 community & mobility hubs. This includes 33 more miles of dedicated transit corridors compared to Alternative 1. Many of the proposed transit corridors and community & mobility hubs in Alternative 2 are near major traffic noise sources, such as highways and major arterials. In this Alternative, transit service would be more frequent and reliable on certain key transit corridors like N 105th St/Northgate Way, Beacon Ave S, Broadway, Denny Way, Harrison Street, Jefferson St, Lake City Way, and NW Market St/N 45<sup>th</sup> Street and has the potential to increase noise levels along those corridors. The dedicated transit corridors in



Alternative 2 are more concentrated in central and north Seattle, particularly in the Capitol Hill/Central District, NE Seattle and NW Seattle subareas.

Alternative 2 includes more transit improvements and would include more extensive roadway reconstruction, with more potential for temporary noise impacts during construction. In this alternative an estimated 35.8 linear miles of roadway that currently has asphalt or composite surface may need to be reconstructed for dedicated transit lanes and more frequent transit service. The potential for construction noise impacts would be limited to principal arterials, including Denny Way, Rainier Ave S, SR 99 and Lake City Way NE as shown in Exhibit 3-36. This alternative would result in some moderate adverse temporary noise impacts along these roadways, with construction noise that may require variances from the City's noise control ordinance. Mitigation is recommended to reduce potential construction noise impacts as a result of Alternative 2.

The City could also evaluate the effectiveness and feasibility of alternative pavement, asphalt, or roadway treatments to reduce tire propulsion noise for roadway segments that require full reconstruction. This is included as potential mitigation in Section 3.4.3.

Exhibit 3-36. Potential Extent of Roadway Reconstruction in Alternative 2



Map Date: June 2023

Source: Kimley-Horn, 2023

## Impacts of Alternative 3: Rapid Progress

Transit improvements and increased transit frequencies under Alternative 3 will lead to increases in noise levels. More frequent and reliable bus service along corridors with speed and reliability improvements will increase noise from transit vehicles along those corridors. Alternative 3: Rapid Progress includes 161 linear miles of dedicated transit corridors, 31 light rail stations, 75 linear miles of RapidRide corridors, and 105 community & mobility hubs. This includes 123 more miles of dedicated transit corridors compared to Alternative 1. Many of the proposed transit corridors and community & mobility hubs in Alternative 3 are near major traffic noise sources, such as highways and major arterials. In this Alternative, transit service would be more frequent and reliable across a much larger area of the City, which has the potential to increase noise levels along those 123 linear miles of roadway where transit improvements will increase transit traffic. These transit corridors are dispersed throughout each study subarea and include a number of east-west connections farther from central Seattle.

Alternative 3 includes transit improvements across a much larger area of the city and has the greatest potential extent of roadway reconstruction compared to other alternatives. As a result, Alternative 3 has more potential for temporary noise impacts during construction. In this alternative, an estimated 52.9 linear miles of roadway that currently has asphalt or composite surface may need to be reconstructed for dedicated transit lanes and more frequent transit service. More extensive roadway reconstruction in this alternative may result in some moderate adverse temporary noise impacts along various transit corridors throughout the city as shown in Exhibit 3-37, with construction noise that may require variances from the City's noise control ordinance. Mitigation is recommended to reduce potential construction noise impacts as a result of Alternative 3.

The City could also evaluate the effectiveness and feasibility of alternative pavement, asphalt, or roadway treatments, and compliance with WSDOT standard specifications for any interstate and state highways to reduce tire propulsion noise for roadway segments that require full reconstruction. This is included as potential mitigation in Section 3.4.3.

**Exhibit 3-37. Potential Extent of Roadway Reconstruction in Alternative 3**



Source: Kimley-Horn, 2023

### 3.4.3 Mitigation Measures

#### Incorporated Plan Features

The STP include the following features that relate to noise attenuation:

- Inclusion of circulation routes for non-motorized travel would reduce motorized traffic and associated noise.
- Incentivizing the use of transit would reduce overall traffic volumes and associated noise.
- Expanded sidewalks and people spaces would create greater separation between sensitive uses and vehicular traffic and decrease exterior noise levels.

#### Regulations & Commitments

City noise regulations establish exterior sound level limits for various land use zones with the limits varying depending on the source zone and the receiving zone. These limits are intended to result in acceptably low interior noise levels for residences and other sensitive noise receptors. City noise regulations also address construction noise, limiting the times during the day when construction noise, both impact and non-impact, can exceed exterior noise limits.

Transportation noise emanating from mobile vehicles and rail/transit sources are governed by FHWA, FTA, and WSDOT and employ maximum noise level limits for combustion engines and tire noise for various vehicle/engine types. In addition, federal agencies (e.g., FHWA) and WSDOT also mandate transportation noise thresholds and methodologies to evaluate and provide abatement for traffic noise impacts for established land uses.

#### Other Potential Mitigation Measures

##### Measures to Reduce Construction-Related Noise and Vibration Impacts

To reduce potential moderate adverse noise impacts from impact pile driving activities adjacent to noise-sensitive land uses (closer than 50 feet) or moderate adverse vibration impacts to historic structures, the City could consider adoption of a policy recommending the Seattle Noise Ordinance be updated to require best practices for noise control, including “quiet” pile-driving technology (such as pre-drilling of piles, use of sonic or vibratory drivers instead of impact pile drivers, where feasible); and using temporary sound walls or cushion blocks to dampen impact noise from pile driving).

##### Measures to Reduce Transit-Related Noise Impacts

To reduce potential moderate adverse noise impacts from new transit facilities, the City could require individual transit projects to prepare a Noise Study to evaluate and mitigate noise impacts to adjacent noise-sensitive uses. The detailed noise analyses would evaluate whether individual projects would expose noise-sensitive receivers to long-term operational noise levels in exceedance of Washington State and/or SMC standards or result in a substantial noise increase compared to ambient conditions. Potential abatement measures to reduce noise impacts at noise-sensitive uses may include, but are not limited to, the

construction of sound walls, berms, and providing upgraded windows at residences to ensure interior noise levels do not exceed the 45  $L_{dn}$  interior noise standard.

### **Measures for Roadway Reconstruction Projects**

To reduce potential moderate adverse traffic noise impacts from projects that require full roadway reconstruction, the City could recommend the use of noise-reducing paving materials such as rubberized asphalt or “quiet pavement” to reduce road noise. These treatments are not included in WSDOT’s surface paving and treatment manual and may not be a viable mitigation strategy for surface streets under WSDOT jurisdiction including SR 99, SR 522, and SR 513.

## **3.4.4 Significant Unavoidable Adverse Impacts**

Under the studied alternatives, increased could result in increased traffic volumes, though the resulting noise increases are not anticipated to exceed 3 dBA, the threshold of change that is perceptible. The location of noise sensitive receivers like residential uses near industrial or traffic noise sources could occur under all alternatives, particularly alternatives 2 and 3. Implementation of residential noise mitigation described in the preceding subsection should adequately reduce noise experienced by noise sensitive receivers. With the application of mitigation measures described above, no significant unavoidable adverse noise impacts would occur under any of the alternatives.



## Section 3.5

# Land Use Patterns



This section describes the potential impacts of each future alternative as they relate to the land use thresholds of significance. The impacts of Alternatives 2 and 3 are measured against conditions expected under Alternative 1. The Comprehensive Plan's Alternative 5 land use patterns and growth is used as the basis for the land use analysis. The following were evaluated as thresholds of significance for land use impacts:

The alternatives are expected to result in a land use impact if:

- **Policy Consistency:** The action would result in a change to land use patterns or development intensities that is inconsistent with GMA goals, the regional planning framework and local policy goals.
- **Compatibility with current and future land use:** The action would result in a change to the land use pattern that is incompatible with the amount or pattern of anticipated growth.
- **Displacement:** The extent which this action would increase the risk for displacement.
- **Access to community assets:** The action would result in a change to the land use pattern that limits access to community gathering spaces.

Land use impacts of the alternatives are considered significant if:

- There is an acute/severe adverse impact within one of the impact categories defined above.
- There are cumulative land use impacts in multiple categories within one of the defined subareas.

Mitigation measures and a summary of any significant unavoidable adverse impacts are included following the impacts analysis.

### 3.5.1 Affected Environment

This section begins with a discussion of the historical context of planning and land use decisions in Seattle. This is followed by a summary of the existing land use plan and policy framework—including policies and regulations—and the resulting general development patterns citywide and by analysis area. The summary addresses land use patterns and development character in Seattle and provides a baseline for analyzing the impacts of the alternative networks.

#### Primary & Secondary Study Areas

- The primary study area includes all of the City of Seattle.
- Secondary study areas include eight EIS Analysis Areas.

#### Data & Methods

The Land Use Section uses an inventory of existing land uses based on parcel level GIS data provided by the City of Seattle. State, regional, and local land use policies were also reviewed and evaluated.

## Overview of Historical Planning & Transportation Decisions

This section addresses early settlement, land uses, and associated transportation systems. This history sets the stage for today's mobility strengths and challenges in Seattle. Historical patterns of use on the lands and waterways that are today part of the City of Seattle help explain the existing conditions for where people live, work, and play. It also sets the stage for the areas best served by today's transportation grids. It draws from work completed by OPCD on the Seattle Industrial Lands EIS.

Prior to the presence of White settlers in the region the study area was inhabited extensively by Coast Salish peoples for thousands of years. Before European contact, the region was one of the most populated centers in North America. The Indians of the Eastern Puget Sound lived in relatively small, autonomous villages and spoke variations of the Lushootseed (*txʷəłšucid*, *dxʷləšucid*), one of the Coast Salish languages. Many tribes were affiliated through intermarriage, political agreement, trade, and material culture. Indigenous people lived in permanent villages of longhouses or winter houses, and traditionally left their winter residences in the spring, summer, and early fall in family canoes to travel to temporary camps at fishing, hunting, and gathering grounds. At the time of the first White settlements around 1850, natives were living in more than 90 longhouses, in at least 17 villages, in modern-day Seattle.

Waterways were central to the cultures and livelihoods of native people. Duwamish "Duwamish" is the Anglo-Europeanized word which meant "people of the inside", *dxʷdəwʔabš*, referencing the interior waters of the Duwamish, Black and Cedar rivers. The Suquamish take their name from the Lushootseed phrase for "people of the clear salt water", and the people living around Lake Washington were collectively known as *hah-choo-AHBSH* or *hah-chu-AHBSH* or *Xacuabš*, People of *HAH-choo* or *Xachu*, "People of a Large Lake" or "Lake People".

### Early Alterations to Seattle's Lands & Waterways

Physical alteration of the land and waterways by white settlers is important context for a discussion of land use today. Most present-day manufacturing and industrial centers are along the Duwamish River's historic meandering flood plain, Elliott Bay, Lake Union, and Salmon Bay. Prior to the Lake Washington ship canal and other alterations, the land and waterways looked much different. In the location of present-day Lake Union there were a series of separate lakes that natives transited with over-land portages. The Lushootseed name for present day Lake Union was *tenas Chuck* or *XáXu7cHoo* ("small great-amount-of-water"), present day Lake Washington was called *hyas Chuck* or *Xacuabš* ("great-amount-of-water"), and the present-day area of the Montlake Cut was called "Carry a Canoe".

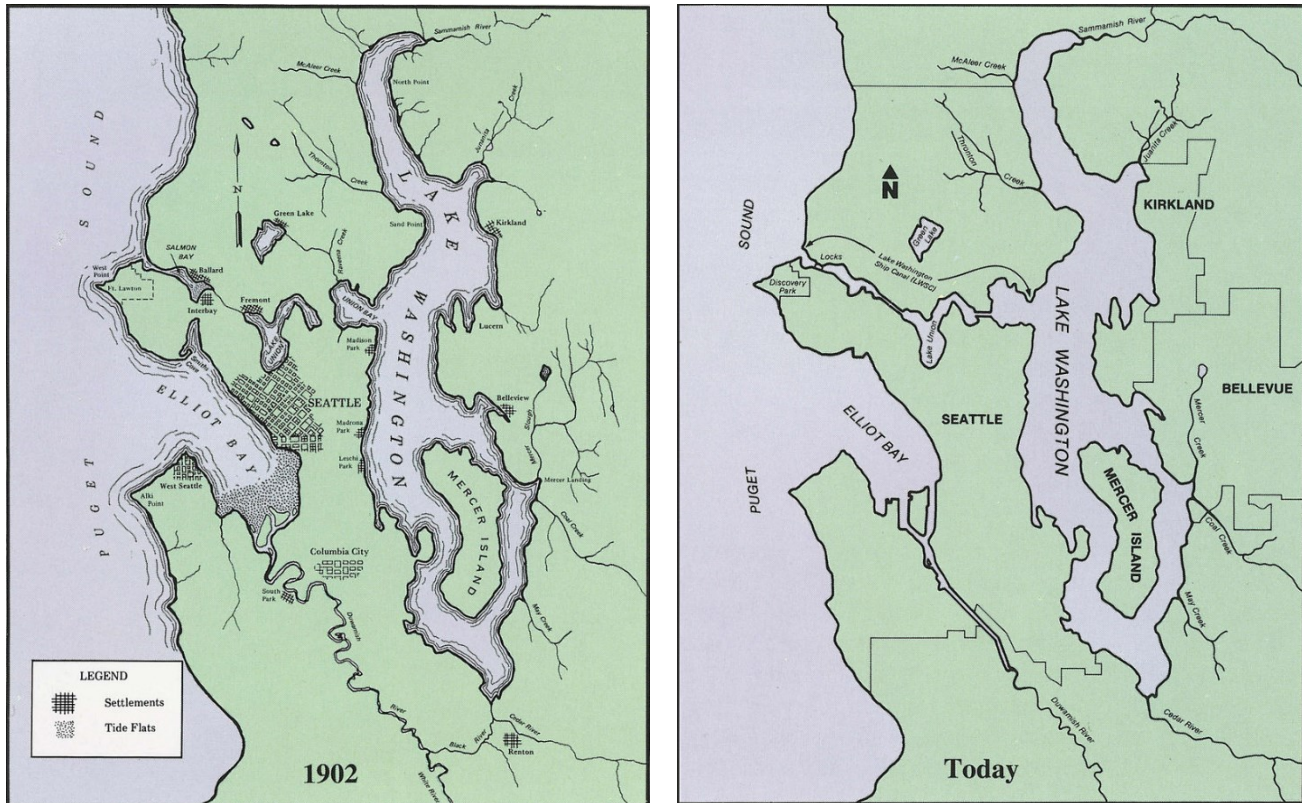
This section incorporates evaluation written by City staff from the 2022 [Seattle Industrial and Maritime Strategy Final EIS](#).

Additional context was added here to expand the discussion citywide beyond industrial and maritime areas.

Construction of a system of locks and cut waterways connecting east to west began in 1911 and culminated in 1916 (see Exhibit 3-38.). Waters were connected from Lake Washington's Union Bay to Lake Union, to Salmon Bay through a series of locks to Shilshole Bay. As a result, the waters of Lake Washington were partially drained, lowering the level of that lake by 8.8 ft and drying up more than 1,000 acres of wetlands. Changes to river flows at the south end of Lake Washington resulted from construction of the ship canal and locks. Prior to the alterations, Lake Washington emptied from its south end into the Black River (which no

longer exists). The Black River is connected to the Duwamish River, which outlets as it does today to Elliott Bay. The Cedar River, which had previously flowed into the Black River in Renton, was diverted in 1912 directly into the south end of Lake Washington to reduce flooding in Renton. In 1916, when Lake Washington's level dropped, the remaining portion of the Black River dried up. Several indigenous villages were located near the confluence of the Black and Duwamish rivers and the area was long used as a place of refuge. When the Black River vanished, natives were displaced from the area.

### Exhibit 3-38. Seattle's Shoreline Over Time



Source: Burke Museum, The Waterlines Project.

The Great Seattle Fire of 1889 prompted a vigorous period of rebuilding with more substantial, and fire-resistant materials like brick and stone. In an effort to create more buildable land for the expanding city, Seattle's city engineers began to regrade large chunks of land with hydraulic hoses. The runoff was funneled west into Elliott Bay and the Duwamish wetlands to make most of today's SODO industrial district. The Denny Hill regrade was the single largest effort in reshaping Seattle's landscape, taking place between 1897 and 1930. Denny Hill originally topped out at about 220 feet in elevation, about half the height of hills such as Queen Anne, Capitol, and Magnolia; by the time regrading ended, the hill's high point had been lowered by more than 100 feet to create the mostly flat land now known as the Denny Regrade (Exhibit 3-39). Runoff and sediment from the Denny Regrade were primarily funneled west into Elliott Bay with some transported to the area around Pine and Olive Streets (creating the smoothed out, relatively gentle slope that now ascends past the Paramount Theater to Capitol Hill).



**Exhibit 3-39. Denny Regrade Before and After, 1907-1909**



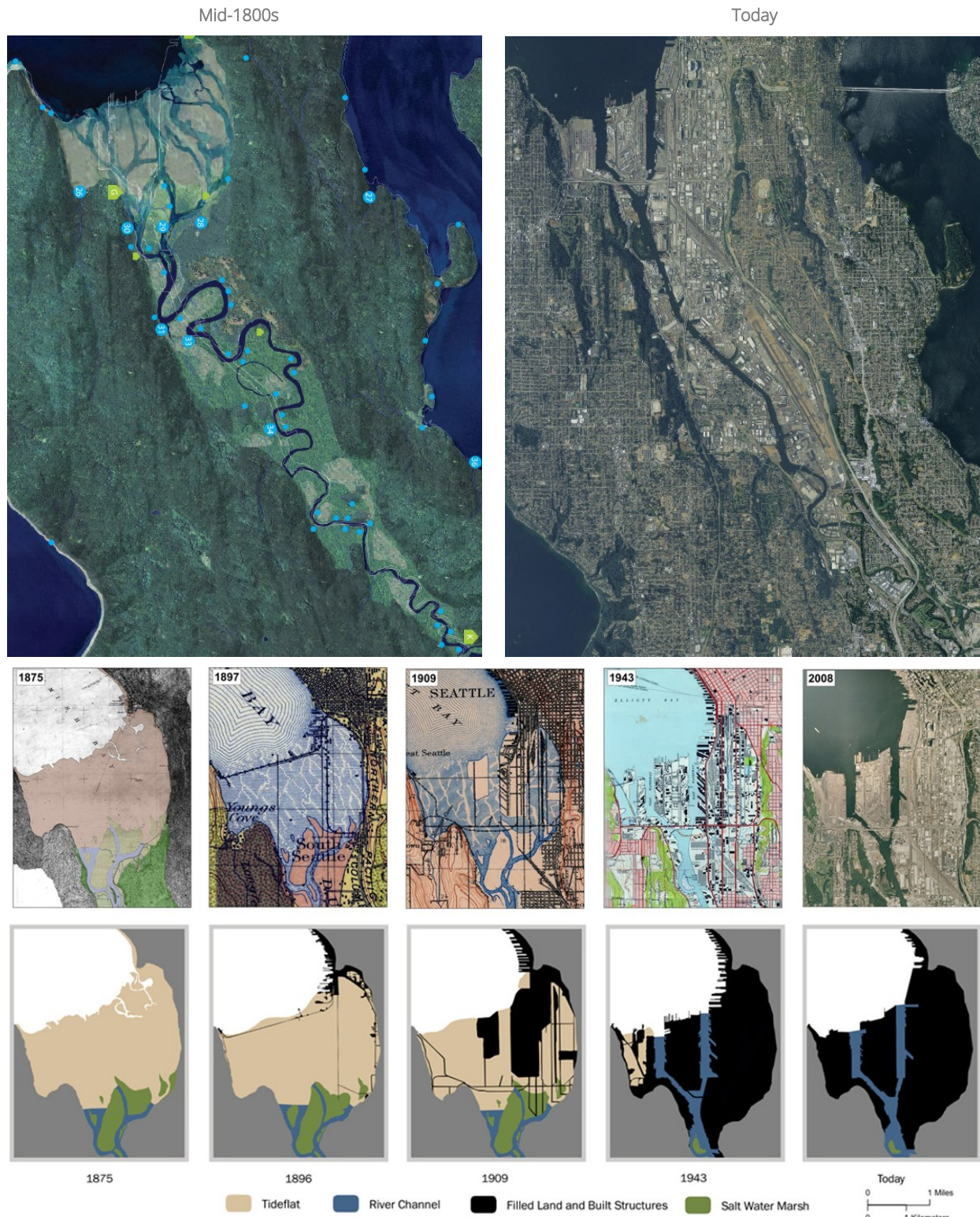
Note: Regrade before and after, 2nd Avenue looking north from Pine Street, Seattle, 1907-1909

Sources: Courtesy Washington State Historical Society (1994.1.1.42) via [HistoryLink.org Essay 21204](https://www.historylink.org/essay/21204).

During the first decades of the 20<sup>th</sup> century, hundreds of acres of tide flats were also filled in to create dry land as depicted below in Exhibit 3-40.



**Exhibit 3-40. The Transformation of the Duwamish Estuary and River**



Source: Burke Museum, [The Waterlines Project](#), 2009.



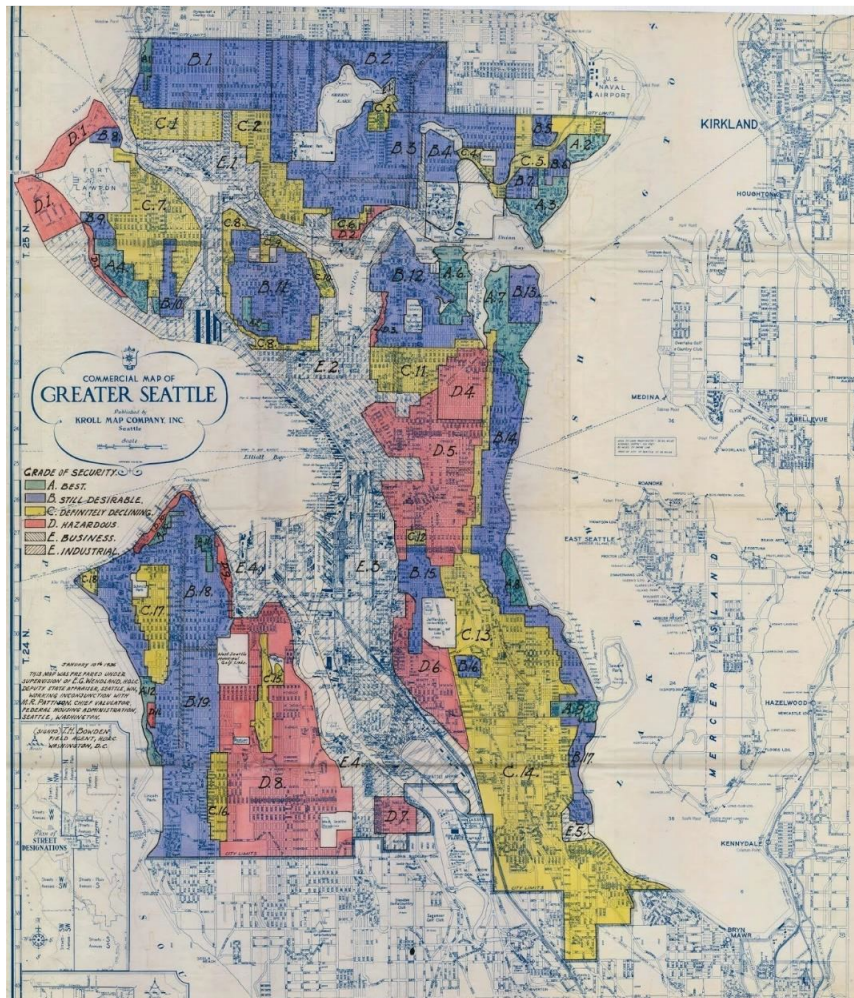
### **Racially Restrictive Covenants & Zoning Laws**

Racially restrictive covenants came into popular use in Seattle after 1920. Covenants were used by property owners, subdivision developers, or realtors to bar the sale or rental of property to specified racial or ethnic groups. Property deeds in predominantly White neighborhoods or desirable areas of new housing development often explicitly stated that no Asian, Black, and Indian people shall be permitted to occupy the property. Seattle residential areas with restrictive covenants include but are not limited to Victory Heights, Queen Anne, Capitol Hill, Blue Ridge, and Hawthorne Hills. Such neighborhoods are located away from the city's industrial areas. By excluding all but White households from covenant-restricted residential areas eligible locations for homes for Black, Asian, and Indigenous households were more likely to be in close proximity to industrial areas, such as Delridge, South Park, and South Beacon Hill (Honig 2021; University of Washington 2020).

In the late 1930s the practice of redlining was used to discriminate against racial minorities as the federal Home Owners' Loan Corporation (HOLC) evaluated mortgage risks in cities across the country. It rated neighborhoods as "best," "still desirable," "definitely declining," and "hazardous" (Exhibit 3-41). Neighborhoods with concentrations of Black, Asian, and Indian households were deemed financially risky and were marked in red so that mortgage lenders were discouraged from financing property there. Seattle's first zoning ordinances were introduced in 1923 with a major update in 1956. Multi-family residential districts were located at the edges of rail lines, industrial districts, and manufacturing districts as part of the 1956 update and caused environmental justice harms. These land use decisions were racially motivated and caused harm to non-White households.

Racially restrictive covenants, redlining, and exclusionary zoning decisions led to the concentration of people of color into certain neighborhoods within Seattle. Many of these neighborhoods were then carved apart by the development of major transportation corridors such as I-5 and I-90, fracturing social networks and disturbing air quality and noise levels for these communities. This history has created generational impacts on wealth building, access to opportunity, and land use patterns in Seattle. The STP recognizes the racial inequity reinforced by public policy across Seattle's history and hopes to actively promote racial justice by reducing harmful environmental impacts of the transportation grid and offering access and opportunity via mobility and connectivity to those who have experienced past harm.

## Exhibit 3-41. Commercial Map of Greater Seattle With "Grade Of Security" Designations, 1936



Source: Honig, 2021 (HistoryLink Essay No. 21296).

### Regional Transportation Corridors

Major transportation corridors constructed during the 20<sup>th</sup> century also fundamentally changed Seattle's land use patterns and the neighborhoods bisected by them. These included the Pacific Highway built in the 1920s (later renamed US 99 and then SR 99 after construction of I-5), the George Washington Memorial Bridge (the Aurora Bridge) completed in 1932, the elevated Alaskan Way completed in 1936 and subsequent double-deck Alaskan Way Viaduct built in three phases from 1949 through 1959, and the Seattle Freeway (now I-5) constructed in the 1960s.

When the viaduct opened in 1953, it offered the first route around Seattle's congested central business district. The expressway relieved traffic on city streets, eased the movement of through traffic, and improved connections between growing southwest Seattle neighborhoods and downtown. Despite its utility, the viaduct was long viewed as a physical and visual barrier between downtown and the city's waterfront. Various groups and individuals argued and planned for its demise over several decades but the lack of a viable alternative for handling the tens of thousands of daily users stymied their efforts. The 2001 Nisqually

earthquake significantly damaged the viaduct's joints and foundations and furthered the discussion. After a decade of studying, planning, and public discussion, the idea for a deep-bore tunnel garnered enough support to move forward. The southern end of the viaduct was demolished in October 2011 and tunnel boring took place from 2013-2017. The viaduct closed to traffic in January 2019, the new tunnel opened in February, and the remaining span of the viaduct was demolished later that year. New development along the waterfront in downtown Seattle—including a park promenade—are scheduled to be completed in 2025.

The Seattle Freeway, now known as I-5, also altered the landscape of Seattle's neighborhoods when it was constructed in the 1960s. Due to unique geographical and topographical constraints, the freeway's route was ultimately drawn directly through the center of the city, breaking east to avoid Green Lake and then bending west around Beacon Hill before continuing south (see Exhibit 3-42). Communities within or adjacent to the future construction path were sliced in half and severely impacted by the resulting displacement while communities on the western and eastern shores of the city remained intact. For example, eight square blocks of land demolished in the heart of the Chinese International District left the district divided and with an unpleasant edge condition for future redevelopment to contend with. In all, 20.5 miles of the route—or about 4,500 parcels of land (most of which were improved with homes, apartment buildings, or businesses)—were cleared for the construction.

Seattle's Freeway Revolt—one of a number of such uprisings across the U.S. in the 1960s and 70s—halted two other major freeways in the city and significantly downsized a third. Along with I-5, the City's Comprehensive Plan called for a parallel freeway on the Lake Washington side (the RH Thomson Expressway) that would have run from the Duwamish neighborhood in the south to Bothell in the north, and the Bay Freeway that would have connected Seattle Center to I-5 with a highway via a massive viaduct that cut through South Lake Union (see Exhibit 3-42). If built as planned, the RH Thompson Expressway would have cut through the heart of the largely Black Central District Neighborhood, demolished as many as 3,000 homes, and displaced up to 8,000 people. The planned 14-lane interchange with I-90 alone (via an open trench on Mount Baker Ridge) would have displaced an estimated 4,000 residents and many businesses (as opposed to the existing tunnels that currently connect I-90 to I-5). A diverse consortium of activists faced the Seattle City Council and Highway Department head-on to stop both of the planned freeways, which were eventually removed from the City's Comprehensive Plan in the 1970s and struck down by public referendum.



### Exhibit 3-42. I-5 Construction Through Seattle and the Planned Seattle Freeway System



Top left: Construction of I-5, 1964; Courtesy of the [Seattle Municipal Archives](#).  
 Bottom left: Apartment building being moved due to I-5 construction, 1960; [HistoryLink Essay 4168](#) via MOHAI (1986.5.4007).  
 Right: City of Seattle 1956 Comprehensive Plan; Seattle Public Libraries Special Collection.

## Current Policy & Regulatory Frameworks

Identification of land use impacts requires consideration of the policy framework regulating land use in Seattle. The policy framework flows from the State of Washington Growth Management Act, the Puget Sound Regional Council's (PSRC's) Multi-County Planning Policies (MPPs), King County's County-Wide Planning Policies (CPPs), the City Comprehensive Plan (Seattle 2035), and implementation actions including development standards in the Seattle Municipal Code (SMC) and the City's Shoreline Master Program.

Several other regulatory measures affect land use including localized overlay districts and community agreements.

## State and Regional Framework

### Washington State Growth Management Act

The Washington State Growth Management Act (GMA), adopted in 1990, is a body of planning regulations that establishes requirements for Counties and localities to plan for future growth.

- GMA requires local governments to manage growth by (among other things) preparing comprehensive plans and implementing them through capital investments and development regulations (zoning).
- The Washington State Department of Commerce, the Puget Sound Regional Council, and a Governor-appointed Hearings Board oversee whether local governments are in compliance.
- Local comprehensive plans must provide land use capacity to accommodate growth that is projected for 20 years.
- Cities in King County must demonstrate sufficient zoned capacity for housing and employment growth.

Consistent with the GMA, the City of Seattle prepares updates to its Comprehensive Plan to accommodate new 20-year growth projections every eight ten years and has an annual process to amend the plan between major updates. Seattle most recently completed a major update, Seattle 2035, in 2015 and is preparing for a major update in 2024 that will extend the planning horizon to the year 2044.

The GMA establishes planning requirements and procedures including mandating elements of the Comprehensive Plan that the City must address (discussed below).

### PSRC's VISION 2050

The Puget Sound Regional Council (PSRC) is composed of nearly 100 members, including the four counties, cities and towns, ports, state and local transportation agencies, and Tribal governments within the region. PSRC develops policies and coordinates decisions about regional growth, transportation and economic development planning within King, Pierce, Snohomish, and Kitsap counties. Vision 2050 envisions a safe, affordable, and efficient transportation system that connects people and goods to where they need to go, promotes economic and environmental vitality, and supports the Regional Growth Strategy.

The GMA requires multi-county planning policies (MPPs) and cities and counties planning under GMA must develop Comprehensive Plan policies consistent with the MPPs. (See Exhibit 3-43) MPPs for King, Pierce, Snohomish, and Kitsap are adopted by PSRC in a long-range plan called VISION 2050, the region's plan for growth. By 2050, the region's population is expected to reach 5.8 million people. See Exhibit 3-43.

### Exhibit 3-43. VISION 2050 Goals and Policies

#### Goal or Policy

**Environment Goal:** The region cares for the natural environment by protecting and restoring natural systems, conserving habitat, improving water quality, and reducing air pollutants. The health of all residents and the economy is connected to the health of the environment. Planning at all levels considers the impacts of land use, development, and transportation on the ecosystem.

Goal or Policy

**MPP-En-3** Maintain and, where possible, improve air and water quality, soils, and natural systems to ensure the health and well-being of people, animals, and plants. Reduce the impacts of transportation on air and water quality and climate change.

**MPP-En-7** Reduce and mitigate noise and light pollution caused by transportation, industries, public facilities, and other sources.

**MPP-En-15** Provide parks, trails, and open space within walking distance of urban residents. Prioritize historically underserved communities for open space improvements and investments.

**MPP-En-21** Continue efforts to reduce pollutants from transportation activities, including through the use of cleaner fuels and vehicles and increasing alternatives to driving alone, as well as design and land use.

**Climate Change Goal:** The region substantially reduces emissions of greenhouse gases that contribute to climate change in accordance with the goals of the Puget Sound Clean Air Agency (50% below 1990 levels by 2030 and 80% below 1990 levels by 2050) and prepares for climate change impacts.

**MPP-CC-3** Reduce greenhouse gases by expanding the use of conservation and alternative energy sources, electrifying the transportation system, and reducing vehicle miles traveled by increasing alternatives to driving alone.

**MPP-CC-12** Prioritize transportation investments that support achievement of regional greenhouse gas emissions reduction goals, such as by reducing vehicle miles traveled.

**MPP-DP-12** Design transportation projects and other infrastructure to achieve community development objectives and improve communities.

**MPP-DP-15** Design communities to provide safe and welcoming environments for walking and bicycling.

**MPP-DP-25** Support the development of centers within all jurisdictions, including high-capacity transit station areas and countywide and local centers.

**Transportation Goal:** The region has a sustainable, equitable, affordable, safe, and efficient multimodal transportation system, with specific emphasis on an integrated regional transit network that supports the Regional Growth Strategy and promotes vitality of the economy, environment, and health.

**MPP-T-1** Maintain and operate transportation systems to provide safe, efficient, and reliable movement of people, goods, and services.

**MPP-T-4** Improve the safety of the transportation system and, in the long term, achieve the state's goal of zero deaths and serious injuries.

**MPP-T-9** Implement transportation programs and projects that provide access to opportunities while preventing or mitigating negative impacts to people of color, people with low incomes, and people with special transportation needs.

**MPP-T-11** Design, construct, and operate a safe and convenient transportation system for all users while accommodating the movement of freight and goods, using best practices and context sensitive design strategies.

**MPP-T-12** Emphasize transportation investments that provide and encourage alternatives to single-occupancy vehicle travel and increase travel options, especially to and within centers and along corridors connecting centers.

**MPP-T-16** Improve local street patterns including their design and how they are used for walking, bicycling, and transit use to enhance communities, connectivity, and physical activity.

**MPP-T-17** Promote and incorporate bicycle and pedestrian travel as important modes of transportation by providing facilities and navigable connections.

Source: Puget Sound Regional Council, BERK, 2023

2021 King County Countywide Planning Policies

Within the GMA framework, each county collaborates with its cities to adopt Countywide Planning Policies (CPPs) and develop local growth targets that set expectations for local comprehensive plans. In July of 2021 the GMPC approved new CPPs and were adopted and ratified by the King County Council. The updated policies are consistent with PSRC's newly adopted VISION 2050. See Exhibit 3-44.



### Exhibit 3-44. King County Countywide Planning Policies

#### Goal or Policy

**EN-22** Provide parks, trails, and open space within walking distance of urban residents. Prioritize historically underserved communities for open space improvements and investments.

**EN-30** Promote energy efficiency, conservation methods, sustainable energy sources, electrifying the transportation system, and limiting vehicle miles traveled to reduce air pollution, greenhouse gas emissions, and consumption of fossil fuels to support state, regional, and local climate change goals.

**Development Patterns Overarching Goal:** Growth in King County occurs in a compact, centers-focused pattern that uses land and infrastructure efficiently, connects people to opportunity, and protects Rural and Natural Resource Lands.

**DP-2** Prioritize housing and employment growth in cities and centers within the Urban Growth Area, where residents and workers have higher access to opportunity and high-capacity transit. Promote a pattern of compact development within the Urban Growth Area that includes housing at a range of urban densities, commercial and industrial development, and other urban facilities, including medical, governmental, institutional, and educational uses and schools, and parks and open space. The Urban Growth Area will include a mix of uses that are convenient to and support public transportation to reduce reliance on single-occupancy vehicle travel for most daily activities.

**DP-45** Adopt flexible design standards, parking requirements, incentives, or guidelines that foster green building, multimodal transportation, and infill development that enhances the existing or desired urban character of a neighborhood/community. Ensure adequate code enforcement so that flexible regulations are appropriately implemented.

**Housing Overarching Goal:** Provide a full range of affordable, accessible, healthy, and safe housing choices to every resident in King County. All jurisdictions work to: preserve, improve, and expand their housing stock; promote fair and equitable access to housing for all people; and take actions that eliminate race-, place-, ability-, and income-based housing disparities.

**H-16:** Expand the supply and range of housing types, including affordable units, at densities sufficient to maximize the benefits of transit investments throughout the county.

**Transportation Overarching Goal:** The region is well served by an integrated, multimodal transportation system that supports the regional vision for growth, efficiently moves people and goods, and is environmentally and functionally sustainable over the long term.

**T-4:** Reduce the need for new roadway capacity improvements through investments in transportation system management and operations, pricing programs, and transportation demand management strategies that improve the efficiency of and access to the current system.

**T-5** Prioritize transportation investments that provide and encourage alternatives to single occupancy vehicle travel and increase travel options, particularly to and within centers and along corridors connecting centers.

**T-14** Promote the mobility of people and goods through a multimodal transportation system based on regional priorities consistent with VISION 2050 and local comprehensive plans.

**T-18:** Develop and implement freight mobility strategies that strengthen, preserve, and protect King County's role as a major regional freight distribution hub, an international trade gateway, and a manufacturing area while minimizing negative impacts on the community.

**T-28** Promote road and transit facility design that includes well-defined, safe, and appealing spaces for pedestrians and bicyclists.

Source: King County, BERK, 2023

### Existing City of Seattle Framework

#### 2015 Comprehensive Plan

Seattle's Comprehensive Plan establishes land use policies for Seattle. The Plan sets out Seattle's growth management strategy. Seattle 2035 includes a land use element and shoreline areas element that each establish land use goals and policies. Other elements that guide the City's investments and activities include transportation, economic development, and environment elements.

### *Comprehensive Plan Growth Strategy*

The Comprehensive Plan includes the city’s overall plan for accommodating housing and job growth over a 20-year planning horizon. Under GMA the plan must demonstrate the City’s ability to accommodate forecasted jobs and housing. The plan includes a growth strategy for where jobs and housing will be located in the city and seeks to describe how decisions about the location of growth should interact with the natural and built environments. Seattle’s growth strategy, the urban village strategy, aims to concentrate most of the city’s future growth in urban centers and villages, which are compact neighborhoods that offer a mix of housing, employment, and services. This strategy can make public services more convenient and efficient, reduce traffic congestion and greenhouse gas emissions, and limit reliance on cars. The strategy takes the unique character of Seattle’s neighborhoods into account when planning for future growth, with four different types of areas playing distinct roles: urban centers, hub urban villages, residential urban villages, and manufacturing/industrial centers.

The following tables (Exhibit 3-45 and Exhibit 3-46) summarize the goals and policies of the Land Use and Transportation elements of the adopted Comprehensive Plan that are most relevant to STP. As mandated by State Law, Seattle’s Comprehensive Plan is currently being updated. The City will adopt a new Comprehensive Plan with a refreshed growth strategy in 2024. The City has released five alternatives for its growth strategy as part of the Comprehensive Plan update process. The STP considers the development patterns envisioned in Comprehensive Plan Alternative 5 for its analysis of land use compatibility.

### *Comprehensive Plan Land Use Element*

#### **Exhibit 3-45. Seattle Comprehensive Plan Goals and Policies, Land Use Element**

Goal or Policy
<b>Goal LU G6</b> Regulate off-street parking to address parking demand in ways that reduce reliance on automobiles, improve public health and safety, reduce greenhouse gas emissions, lower construction costs to reduce the cost of housing and increase affordable housing, create attractive and walkable environments, and promote economic development throughout the city.
<b>LU 6.1</b> Establish parking requirements where appropriate for both single-occupant vehicles and their alternatives at levels that further this Plan’s goal to increase the use of public transit, carpools, walking, and bicycles as alternatives to the use of single-occupant vehicles.
<b>LU 6.3</b> Rely on market forces to determine the amount of parking provided in areas of the city that are well-served by transit, such as urban centers and urban villages.
<b>LU 6.4</b> Consider setting parking maximums in urban centers and urban villages, where high levels of pedestrian, bicycle, and transit accessibility make many trips possible without a car.
<b>LU 6.5</b> Establish bicycle parking requirements to encourage bicycle ownership and use.
<b>LU 6.9</b> Require parking in areas with limited transit access and set the requirements to discourage underused parking facilities, even if occasional spillover parking could result.
<b>LU 6.10</b> Allow transportation management programs in commercial and multifamily residential areas with access to frequent transit to include measures such as cooperative parking, shared parking, shared vehicles, restricted access, carpools, van pools, or transit pass subsidies.
<b>Goal LU G8</b> Allow a variety of housing types and densities that is suitable for a broad array of households and income levels, and that promotes walking and transit use near employment concentrations, residential services, and amenities.
<b>LU 8.10</b> Designate lowrise multifamily zones in places where low-scale buildings can provide a gradual transition between

Goal or Policy

neighborhood residential zones and more intensive multifamily or commercial areas.

**LU 8.13** Use highrise multifamily zoning designations only in urban centers, where the mix of activities offers convenient access to regional transit and to a full range of residential services and amenities, as well as to jobs.

**LU 9.2** Encourage the development of compact, concentrated commercial/mixed-use areas, in urban centers and urban villages, where pedestrians can easily access transit and a variety of businesses.

**LU 9.6** Encourage housing in mixed-use developments in pedestrian-oriented commercial/mixed-use areas to provide additional opportunities for residents to live in neighborhoods where they can walk to transit, services, and employment.

**LU 9.17** Use a development pattern, mix of uses, and intensity of activity generally oriented to pedestrian and transit use in pedestrian-oriented commercial/mixed-use zones to achieve:

- a compatible blend of commercial and residential uses.
- strong, healthy business districts that reinforce a sense of place while providing essential goods, services, and livelihoods for Seattleites, especially residents who are within walking distance of these places.
- mixes of commercial activity that are compatible with development in adjacent areas.
- residential development that is both appealing to residents and compatible with the desired commercial function of the area.
- an active, attractive, accessible, walkable pedestrian environment with continuous commercial street frontages.

Source: City of Seattle, 2023

*Comprehensive Plan Transportation Element*

**Exhibit 3-46. Seattle Comprehensive Plan Goals and Policies, Transportation Element**

Goal or Policy

**GOAL 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 1.1** Provide safe and reliable transportation facilities and services to promote and accommodate the growth this Plan anticipates in urban centers, urban villages, and manufacturing/industrial centers.

**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 1.3** Design transportation infrastructure in urban centers and villages to support compact, accessible, and walkable neighborhoods for all ages and abilities.

**T 1.4** Design transportation facilities to be compatible with planned land uses and consider the planned scale and character of the surrounding neighborhood.

**GOAL 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 2.5** Prioritize mobility needs in the street travelway based on safety concerns and then on the recommended networks and facilities identified in the respective modal plans.

**T 2.7** Assign space in the flex zone to support nearby land uses, provide support for modal plan priorities, and accommodate multiple functions.

**GOAL TG 3** Meet people's mobility needs by providing equitable access to, and encouraging use of, multiple transportation options.

**T 3.1** Develop and maintain high-quality, affordable, and connected bicycle, pedestrian, and transit facilities.

Goal or Policy

**T 4.4** Manage the transportation system to support modes that reduce the use of fossil fuels and promote the use of alternative fuels.

**GOAL TG 5** Improve mobility and access for the movement of goods and services to enhance and promote economic opportunity throughout the city.

Source: City of Seattle, 2023

*Future Land Use Designations & Zoning*

The City of Seattle’s Future Land Use Map (FLUM) is part of the Comprehensive Plan and expresses graphically the 20-year vision of preferred land use patterns to guide development within the city. Four land use area types implement the urban village strategy—urban centers, hub urban villages, residential urban villages, and manufacturing/industrial centers (MICs). Four other land use types—neighborhood residential areas, multi-family residential areas, commercial/mixed-use areas, and industrial areas—are meant to suggest specific uses outside of the urban villages. The FLUM also designates major institutions, cemeteries, and city-owned open space.

The future land use designations are implemented by a corresponding range of zoning districts and development regulations established in [Title 23 of the Seattle Municipal Code](#) (SMC). There may be different levels of zoning within each land use area that provide more detail about what can be built. Zoning overlays also exist in certain locations, such as around major institution overlay districts and in master planned communities. Exhibit 3-47. summarizes future land use designations and corresponding implementing zones. Neighborhood density designations are important inputs for STP’s assumptions related to future residential patterns that drive priority-setting for road improvements, transit service, and network connectivity.

**Exhibit 3-47. Future Land Use Designations and Typical Implementing Zones**

Future Land Use Designation	Typical Implementing Zones <sup>1</sup>
<b>Urban Centers</b> Urban Centers are the densest Seattle neighborhoods. They act as both regional centers and local neighborhoods that offer a diverse mix of uses, housing, and employment opportunities.	<ul style="list-style-type: none"><li>▪ Downtown (DH1, DH2, DMC, DMR, DOC1, DOC2, and DRC)</li><li>▪ Pike Market Mixed (PMM), Pioneer Square Mixed (PSM), and International District Mixed and Residential (IDM and IDR)</li><li>▪ Seattle Mixed (SM)</li><li>▪ Lowrise, Midrise, and Highrise Multifamily (LR3, MR, and HR)</li><li>▪ Neighborhood Commercial (NC2, and NC3)</li><li>▪ Commercial (C1 and C2)</li></ul>
<b>Hub Urban Villages</b> Hub villages are communities that offer a balance of housing and employment but are generally less dense than urban centers. These areas provide a mix of goods, services, and employment for their residents and surrounding neighborhoods.	<ul style="list-style-type: none"><li>▪ Residential Small Lot (RSL)</li><li>▪ Lowrise Multifamily (LR1, LR2, and LR3)</li><li>▪ Midrise Multifamily (MR)</li><li>▪ Neighborhood Commercial (NC1, NC2, and NC3)</li><li>▪ Commercial (C1 and C2)</li></ul>

Future Land Use Designation	Typical Implementing Zones <sup>1</sup>
<p><b>Residential Urban Villages</b></p> <p>Residential villages are areas of residential development, generally at lower densities than urban centers or hub urban villages. While they are also sources of goods and services for residents and surrounding communities, for the most part they do not offer many employment opportunities.</p>	<ul style="list-style-type: none"> <li>▪ Residential Small Lot (RSL)</li> <li>▪ Lowrise Multifamily (LR1, LR2, and LR3)</li> <li>▪ Midrise Multifamily (MR)</li> <li>▪ Neighborhood Commercial (NC1, NC2, and NC3)</li> </ul>
<p><b>Manufacturing Industrial Centers (MICs)</b></p> <p>Manufacturing Industrial Centers are home to the city's thriving industrial businesses. Like urban centers, they are important regional resources for retaining and attracting jobs and for maintaining a diversified economy. Most of the city's shipping, manufacturing, and freight-distribution activities take place in the city's two manufacturing/industrial centers.</p>	<ul style="list-style-type: none"> <li>▪ Industrial (IG1, IG2, IB, and IC)<sup>2</sup></li> </ul>
<p><b>Neighborhood Residential Areas</b></p> <p>Neighborhood residential areas provide opportunities for detached single-family and other compatible housing options that have low height, bulk, and scale in order to serve a broad array of households and incomes and to maintain an intensity of development that is appropriate for areas with limited access to services, infrastructure constraints, fragile environmental conditions, or that are otherwise not conducive to more intensive development.</p>	<ul style="list-style-type: none"> <li>▪ Neighborhood Residential (NR1, NR2, and NR3)</li> </ul>
<p><b>Multi-Family Residential Areas</b></p> <p>The city's multi-family areas contain a variety of housing types. You might find duplexes or townhouses, walk-up apartments, or highrise towers. Overall, these areas offer more choices for people with different living styles and a wider range of incomes than single-family zones.</p>	<ul style="list-style-type: none"> <li>▪ Lowrise Multifamily (LR1, LR2, and LR3)</li> <li>▪ Midrise Multifamily (MR)</li> </ul>
<p><b>Commercial / Mixed Use Areas</b></p> <p>Commercial/mixed-use areas are places meant to provide jobs and services. Most of these areas also allow housing.</p>	<ul style="list-style-type: none"> <li>▪ Neighborhood Commercial (NC1, NC2, and NC3)</li> <li>▪ Commercial (C1 and C2)</li> </ul>
<p><b>Industrial Areas</b></p> <p>In limited industrial areas outside the two MICs, City zoning rules allow industrial activity such as manufacturing, warehousing, and shipping of goods through waterways, railways, and highways.</p>	<ul style="list-style-type: none"> <li>▪ Industrial (IG1, IG2, IB, and IC)<sup>2</sup></li> </ul>
<p><b>Major Institutions</b></p>	<ul style="list-style-type: none"> <li>▪ Major Institution Overlay District. Underlying zoning varies depending on the surrounding community.</li> </ul>

Future Land Use Designation	Typical Implementing Zones <sup>1</sup>
Cemetery	<ul style="list-style-type: none"> <li>▪ Neighborhood Residential (NR2 and NR3)</li> <li>▪ Lowrise Multifamily (LR3)</li> </ul>
City-Owned Open Space	<ul style="list-style-type: none"> <li>▪ Neighborhood Residential (NR1, NR2, and NR3)</li> </ul>

<sup>1</sup> See "Major Land Use Policy Changes Currently Under Consideration" for a discussion of the future of industry zones under consideration as part of the Industrial and Maritime Strategy. The future of industry land use concepts would be implemented in the MICs and targeted industrial areas outside the MICs.

Sources: [City of Seattle Future Land Use Map](#), 2022; BERK, 2022.

#### *Major Land Use Policy Changes Currently Under Consideration*

The City of Seattle is currently in the process of updating the existing Comprehensive Plan in coordination with the creation of the STP. As part of this work, the City is conducting an EIS for the Comprehensive Plan Update which evaluates five alternatives that vary the amount and distribution for future growth in housing and jobs. Seattle is expected to experience significant housing and employment growth under all alternatives considered in the Comprehensive Plan. Activity levels would increase across the City with new residents, businesses, and employees. The primary differences between the alternatives considered in the Comprehensive Plan lie in the distribution and intensity of growth across the City and the projected land use patterns. The actual pace and distribution of future growth would be influenced in part by the implementation of comprehensive plan policies, related regulations and actions, and by decisions made by individual property owners and developers.

As part of the update, there will be changes to place names and the introduction of two place types, as shown in Exhibit 3-48.

#### **Exhibit 3-48. Place Type Names from Seattle Comprehensive Plan**

Alternative 1 No Action (Seattle 2035) Place Type Names	Place Type Name in EIS Scoping Documents 2022	Alternatives 2,3,4, and 5 Place Type Names in Comp Plan Draft EIS
Urban Center	Urban Center	Regional Center
Hub Urban Villages	Urban Village	Urban Center
Residential Urban Villages		
<i>(new place type)</i>	Neighborhood Anchor	Neighborhood Center
<i>(new place type)</i>	Corridors	Corridors
Neighborhood Residential	Neighborhood Residential	Urban Neighborhood
Manufacturing & Industrial Center	Manufacturing & Industrial Center	Manufacturing & Industrial Center

Source: Seattle Comprehensive Plan Update (Draft), 2023

In general, all alternatives would focus the majority of future growth into urban centers and villages currently characterized by higher densities, more compact building forms, and a more diverse mix of uses than other



areas of the city. There would be 80,000 new housing units distributed under the No Action Alternative based on past growth and Comprehensive Plan targets, resulting in growth primarily in existing urban centers and villages. An additional 20,000 or 40,000 housing units added under the Action Alternatives would be accommodated within new place types or expanded urban center and village boundaries located throughout the city depending on the alternative. All alternatives assume the same overall growth in jobs with a little over half of job growth in Downtown/South Lake Union (Area 4) and about 9% in the Duwamish Manufacturing Center (Area 7) under the no action alternative. The distribution of jobs and housing under Alternative 5 would be a combination of the other alternatives after accounting for expanded urban village boundaries and potential changes to place type designations. For this EIS land use chapter, the Comprehensive Plan Alternative 5 is considered as the land use scenario for all three network Alternatives.

The City plans to expand some existing urban centers and villages, redesignate Ballard as a regional center and add 130th as an urban village. It is also considering two additional place types—neighborhood centers and corridors—as well as broad changes to neighborhood residential areas – as part of the 2024 Comprehensive Plan Update. Neighborhood Centers are places with a wide range of housing and businesses that primarily serve the local community. These areas resemble urban villages, but with a smaller size and lower intensity of allowed development. Corridors are areas near frequent transit that allow a wide range of housing types ranging from duplexes, triplexes, and fourplexes to 5-story buildings closer to transit, including in areas currently zoned exclusively for detached homes. Corridors also include areas already zoned for multifamily and commercial use. Changes throughout Neighborhood Residential zones would allow flexibility for new forms of detached, attached, and stacked housing in areas currently zoned predominantly for detached homes.

As a result of these growth distributions, Seattle’s land use pattern—broadly defined—would continue to emphasize:

- Growth leading to a denser and more continuous pattern of intensive land uses in the city’s geographic center (Downtown plus the surrounding neighborhood districts including Uptown, South Lake Union, Capitol Hill, and First Hill).
- Business and port-related activity and employment growth within two central Port and industrial-use centers (Greater Duwamish MIC and BINMIC). All alternatives studied in this EIS include changes proposed as part of the [Industrial and Maritime Strategy Final EIS](#).
- Growth in a wide range of other mixed-use urban villages such as Fremont, Columbia City and West Seattle Junction distributed through the various sectors of the city, including urban villages located along major transportation corridors (such as Aurora Avenue, Lake City Way, MLK Jr Way, Rainier Avenue, and California Avenue) that radiate through the various geographic sectors and industrial-use centers.

#### Transportation Plans & Strategies

Seattle has worked to establish policies and strategies that are responsive to the needs of the community. Many of these policies and strategies specific to geographies, methods of travel, and initiatives are found in past planning documents. Existing City goals and policies are established in the following plans/documents.

- Age Friendly Action Plan (2018)
- Asset Management Status & Condition Report (2015)
- Bicycle Master Plan (2014)
- Climate Action Plan (2013)
- Commute Trip Reduction Strategic Plan (2019-2023)
- Complete Streets Ordinance (2007)
- Emerging Technology and Mobility Options Operating in City Right-of-Way (2019)
- Freight Master Plan (2016)
- Imagine Greater Downtown (2019)
- Move Seattle Strategic Plan (2015)
- Move the Needle Performance Report (2019)
- New Mobility Playbook (2017)
- Pedestrian Lighting Citywide Plan (2012)
- Pedestrian Master Plan (2017)
- Seattle Resilience Roadmap (2019)
- Seattle Trails Upgrade Plan (2017)
- STBD 2018 Annual Report (2018)
- Transit Master Plan (2012, amended 2016)
- Transportation Electrification Blueprint (2020)
- Transportation Equity Framework (2022)
- Trees and Sidewalks Operations Plan (2015)
- Vision Zero Action Plan (2015)

Exhibit 3-49 shows the relationship between these plans and the goals of the transportation element.

#### Exhibit 3-49 Plans and Alignment with Comprehensive Plan

Plan	Relationship to Transportation Element Goals
Age Friendly Action Plan (2018)	<b>T 1.3</b> Design transportation infrastructure in urban centers and villages to support compact, accessible, and walkable neighborhoods for all ages and abilities.
Asset Management Status & Condition Report (2015)	<b>Goal TG 8</b> Maintain and renew existing transportation assets to ensure the long-term viability of investments, reduce ongoing costs, and promote safe conditions.
Bicycle Master Plan (2014)	<b>T 7.9</b> Work with neighboring jurisdictions and King County to integrate the city's bicycle network, developed as part of the Bicycle Master Plan, with regional bicycle facilities.
Climate Action Plan (2013)	<b>T 1.7</b> Recognize the connection between transportation choices and climate change and work to reduce vehicular emissions.
Commute Trip Reduction Strategic Plan (2019-2023)	<b>T 4.3</b> 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
Complete Streets Ordinance (2007)	<b>T 6.9</b> Use complete street principles, traffic-calming, and neighborhood traffic control strategies to promote safe neighborhood streets by discouraging cut-through traffic.
Emerging Technology and Mobility Options Operating in City Right-of-Way (2019)	<b>T 2.1</b> Devote space in the street right-of-way to accommodate multiple functions of mobility, access for

Plan	Relationship to Transportation Element Goals
	commerce and people, activation, landscaping, and storage of vehicles
Freight Master Plan (2016)	<b>T 8.6</b> Designate a heavy haul network for truck freight to provide efficient freight operations to key port terminals and intermodal freight facilities
Move the Needle Performance Report (2019)	<b>Goal TG 9</b> Use LOS standards as a gauge to assess the performance of the transportation system.
New Mobility Playbook (2017)	<b>T 9.2</b> Provide a menu of transportation-demand management tools for future development to meet non-drive-alone mode share targets, provision of transit passes, carpool benefits, and improvements to pedestrian and bicycle facilities.
Pedestrian Lighting Citywide Plan (2012)	<b>T 3.11</b> Develop and maintain bicycle and pedestrian facilities, including public stairways, that enhance the predictability and safety of all users of the street and that connect to a wide range of key destinations throughout the city
Pedestrian Master Plan (2017)	<b>T 3.1</b> Develop and maintain high-quality, affordable, and connected bicycle, pedestrian, and transit facilities.
Seattle Resilience Roadmap (2019)	<b>T 4.2</b> Enhance the public street tree canopy and landscaping in the street right-of-way
Seattle Trails Upgrade Plan (2017)	<b>Goal TG 6</b> Provide and maintain a safe transportation system that protects all travelers, particularly the most vulnerable users.
STBD 2018 Annual Report (2018)	<b>Goal TG 10</b> Ensure that transportation funding is sufficient to operate, maintain, and improve the transportation system that supports the City's transportation, land use, economic, environmental, equity, and other goals
Transit Master Plan (2012, amended 2016)	<b>T 2.2</b> 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.
Transportation Electrification Blueprint (2020)	<b>T 4.5</b> Encourage the use of electric-powered vehicles and the provision and expansion of electric-vehicle charging stations.
Transportation Equity Framework (2022)	<b>T 8.2</b> Operate the transportation system in a way that balances the following priorities: safety, mobility, accessibility, social equity, placemaking, infrastructure preservation, and resident satisfaction
Trees and Sidewalks Operations Plan (2015)	<b>T 4.2</b> Enhance the public street tree canopy and landscaping in the street right-of-way.

Source: BERK, 2022.

*Street Concept Plans*

The City's Street Concept Plans solidify a vision for street(s) included and can tie that vision back to other planning and design documents that the neighborhood or City may have developed. Concept Plans are also useful as a vehicle for discussion between a permit proponent and the City about appropriate streetscape elements given the adjacent land use and the street's operational characteristics. There are currently 16 adopted Street Concept Plans and 5 draft plans that will be adopted following agency review and completion of a formal public comment and review period. See Exhibit 3-50.

**Exhibit 3-50. Adopted and Draft Street Concept Plans by EIS Analysis Area**

Title	Streets Included	EIS Analysis Area(s)
<b>Adopted Plans</b>		
The Street Element of the Ballard Municipal Center Plan	20 <sup>th</sup> and 22 <sup>nd</sup> Aves NW; NW Market Street; NW 56 <sup>th</sup> -58 <sup>th</sup> Sts	(1) NW Seattle
Roosevelt Neighborhood Streetscape Concept Plan	Roosevelt Residential Urban Village streets, including NE 66 <sup>th</sup> St, Brooklyn Ave NE, and 14 <sup>th</sup> Ave NE	(2) NE Seattle
University District Alley Activation	Alley corridor between NE 41 <sup>st</sup> St; NE 45 <sup>th</sup> St between University Way and 15 <sup>th</sup> Ave NE	(2) NE Seattle
University District Green Streets	Brooklyn Ave NE; NE 43 <sup>rd</sup> ; NE 42 <sup>nd</sup> St	(2) NE Seattle
Queen Anne Avenue North Streetscape Concept plan	Queen Anne Ave North from W McGraw to W Galer	(3) Queen Anne/Magnolia
Thomas Green Street Concept Plan (See also: <i>Thomas Street Draft Concept Plan</i> )	Thomas Street and West Thomas St between Eastlake Ave and the W Thomas St overpass	(3) Queen Anne/Magnolia (4) Downtown/Lake Union
Denny Way Streetscape Concept Plan	Denny Way from Melrose Ave to Elliott Ave	(4) Downtown /Lake Union
Maynard + Lane Green Streets Streetscape Concept Lane	Maynard Ave South; South Lane St	(4) Downtown /Lake Union
Pike/Pine Streetscape concept plan	Pike and Pine Sts between 1 <sup>st</sup> and 4 <sup>th</sup> Aves	(4) Downtown /Lake Union
Pontius Ave N	Pontius between John St and Republican St	(4) Downtown /Lake Union
South Lake Union Street Concept Plans	8 <sup>th</sup> Avenue North between Denny Park and Republican St; Republican St, Harrison St, Thomas St, and John St between Dexter Ave and 8 <sup>th</sup> Ave N	(4) Downtown /Lake Union
Terry Avenue N Street Design Guidelines	Terry Ave N between Denny Way and Mercer St	(4) Downtown /Lake Union
Westlake & 7th Streetscape Concept Plan	Westlake and 7 <sup>th</sup> Ave	(4) Downtown /Lake Union

Title	Streets Included	EIS Analysis Area(s)
10th & 11th Avenue Street Concept Plan	10 <sup>th</sup> and 11 <sup>th</sup> Avenue linking Pike and Pine Sts	(5) Capitola Hill/Central District
First Hill Public Realm Action Plan	University St; 8 <sup>th</sup> Ave; Terrace St; Terry Ave	(5) Capitola Hill/Central District
West Seattle Concept Plan	Fauntleroy Ave SW; SW Alaska; 40 <sup>th</sup> Ave SW	(6) W Seattle
<b>Draft Plans</b>		
Lake to Bay Concept Plan	Terry Ave N from Lake Union Park to Thomas St; Thomas St from Terry Ave N to Broad St; Broad St from Thomas St to Alaskan Way; Alaskan Way from Broad St to the Central Waterfront (Pier 62/63)	(3) Queen Anne/Magnolia (4) Downtown /Lake Union
Thomas St Draft Concept Plan	Thomas St between 5 <sup>th</sup> Ave N and Dexter Ave N	(3) Queen Anne/Magnolia (4) Downtown /Lake Union
Bell St Concept Plan	Bell St between 1 <sup>st</sup> Ave and Denny Way	(4) Downtown /Lake Union
Little Saigon Draft Concept Plan	S King St, S Jackson St, and S Weller St between I-5 and Rainier Ave; 10 <sup>th</sup> Ave S between Yesler Hillclimb and S Weller St	(4) Downtown /Lake Union
Pioneer Square Draft Concept Plan	1 <sup>st</sup> Ave/1 <sup>st</sup> Ave S from Columbia St to Railroad Way S; 2 <sup>nd</sup> Ave S from 2 <sup>nd</sup> Ave Ext S to S King St; 2 <sup>nd</sup> Ave Ext S from Cherry St to 4 <sup>th</sup> Ave S; Yesler Way from Alaskan Way S to 5 <sup>th</sup> Ave S	(4) Downtown /Lake Union

Note: Map of adopted street concept plans is available online at <https://streetsillustrated.seattle.gov/urban-design/street-concept-plans/list-of-approved-street-concept-plans/>.

Sources: City of Seattle, 2022; BERK, 2022.

### Displacement Risk

Displacement refers to a process where households, businesses, and cultural communities must relocate involuntarily. Several kinds of displacement are occurring presently in Seattle. Physical displacement results from eviction, acquisition, rehabilitation, or demolition of the property that a household or business occupies; it can also occur when covenants on rent- and income-restricted housing expire. Economic displacement occurs when residents or businesses can no longer afford rising rents or the costs of property owners, like taxes. Cultural displacement occurs when residents are compelled to move because the people and institutions that comprise and reflect their cultural community have left or are leaving the area. A form of exclusionary displacement also occurs in Seattle when households struggle to grow in place or afford to live in and access certain neighborhoods due to a lack of affordable housing options.

Not all households are equally vulnerable to displacement pressure, and the factors that contribute to displacement risk are not equitably distributed throughout the city. In 2016, the City developed a Displacement Risk Index to identify where displacement of people of color, low-income people, renters, and other vulnerable populations may be more likely. The Displacement Risk Index provides a longer-term view

of displacement risk based on neighborhood characteristics like the presence of vulnerable populations, rent and market factors, and infrastructure and amenities that tend to increase real estate demand.

## Current Conditions

### Citywide

#### Existing Land Use Patterns

Seattle's transportation system is heavily influenced by the city's growth strategy, which focuses on urban centers, urban villages, and manufacturing/industrial centers.

The City of Seattle encompasses approximately 83.83 square miles (53,651 acres). Excluding water bodies and public rights-of-way, the city contains approximately 39,802 acres of land. The largest land-use category is single-family residential, which makes up about 48% of existing land uses. Parks and open space/cemeteries account for about 14%; and major institutions, public facilities, and utilities account for about 11% of existing land uses. Multi-family and commercial/mixed-use comprise 9% and 8%, respectively, while industrial and vacant land each use 5% of total existing uses in Seattle. See Exhibit 3-51.

**Exhibit 3-51. Current Land Use—Acres Citywide and by EIS Analysis Area**

Current Use Category	EIS Analysis Area								Citywide
	1	2	3	4	5	6	7	8	
Commercial / Mixed-Use	653 ac. (9.1%)	537 ac. (6.6%)	536 ac. (13.1%)	642 ac. (62.1%)	260 ac. (7.8%)	214 ac. (3.3%)	296 ac. (7.3%)	222 ac. (3.9%)	<b>3,360 ac. (8.4%)</b>
Industrial	107 ac. (1.5%)	33 ac. (0.4%)	203 ac. (5.0%)	35 ac. (3.4%)	15 ac. (0.4%)	22 ac. (0.3%)	1,513 ac. (37.3%)	78 ac. (1.4%)	<b>2,007 ac. (5.0%)</b>
Multi-Family	842 ac. (11.8%)	570 ac. (7.0%)	389 ac. (9.5%)	154 ac. (14.9%)	615 ac. (18.4%)	482 ac. (7.5%)	37 ac. (0.9%)	394 ac. (7.0%)	<b>3,483 ac. (8.7%)</b>
Single Family	4,099 ac. (57.3%)	4,736 ac. (58.6%)	1,440 ac. (35.3%)	33 ac. (3.2%)	1,515 ac. (45.5%)	3,788 ac. (59.1%)	148 ac. (3.7%)	3,247 ac. (57.4%)	<b>19,005 ac. (47.7%)</b>
Major Institution & Public Facilities / Utilities	338 ac. (4.7%)	1,025 ac. (12.7%)	500 ac. (12.3%)	89 ac. (8.6%)	217 ac. (6.5%)	298 ac. (4.6%)	1,436 ac. (35.4%)	335 ac. (5.9%)	<b>4,240 ac. (10.7%)</b>
Parks / Open Space / Cemeteries	765 ac. (10.7%)	1,016 ac. (12.6%)	827 ac. (20.3%)	42 ac. (4.1%)	604 ac. (18.1%)	1,206 ac. (18.8%)	51 ac. (1.2%)	960 ac. (17.0%)	<b>5,471 ac. (13.7%)</b>
Vacant	324 ac. (4.5%)	145 ac. (1.8%)	172 ac. (4.2%)	36 ac. (3.5%)	88 ac. (2.6%)	368 ac. (5.7%)	559 ac. (13.8%)	401 ac. (7.1%)	<b>2,094 ac. (5.3%)</b>
Easement / Unclassified	22 ac. (0.3%)	25 ac. (0.3%)	8 ac. (0.2%)	3 ac. (0.3%)	17 ac. (0.5%)	32 ac. (0.5%)	16 ac. (0.4%)	19 ac. (0.3%)	<b>143 ac. (0.4%)</b>
<b>Total Acres &amp; Percent of Citywide Total</b>	<b>7,151 ac. (18%)</b>	<b>8,087 ac. (20%)</b>	<b>4,075 ac. (10%)</b>	<b>1,033 ac. (3%)</b>	<b>3,332 ac. (8%)</b>	<b>6,411 ac. (16%)</b>	<b>4,056 ac. (10%)</b>	<b>5,656 ac. (14%)</b>	<b>39,802 ac. (100%)</b>

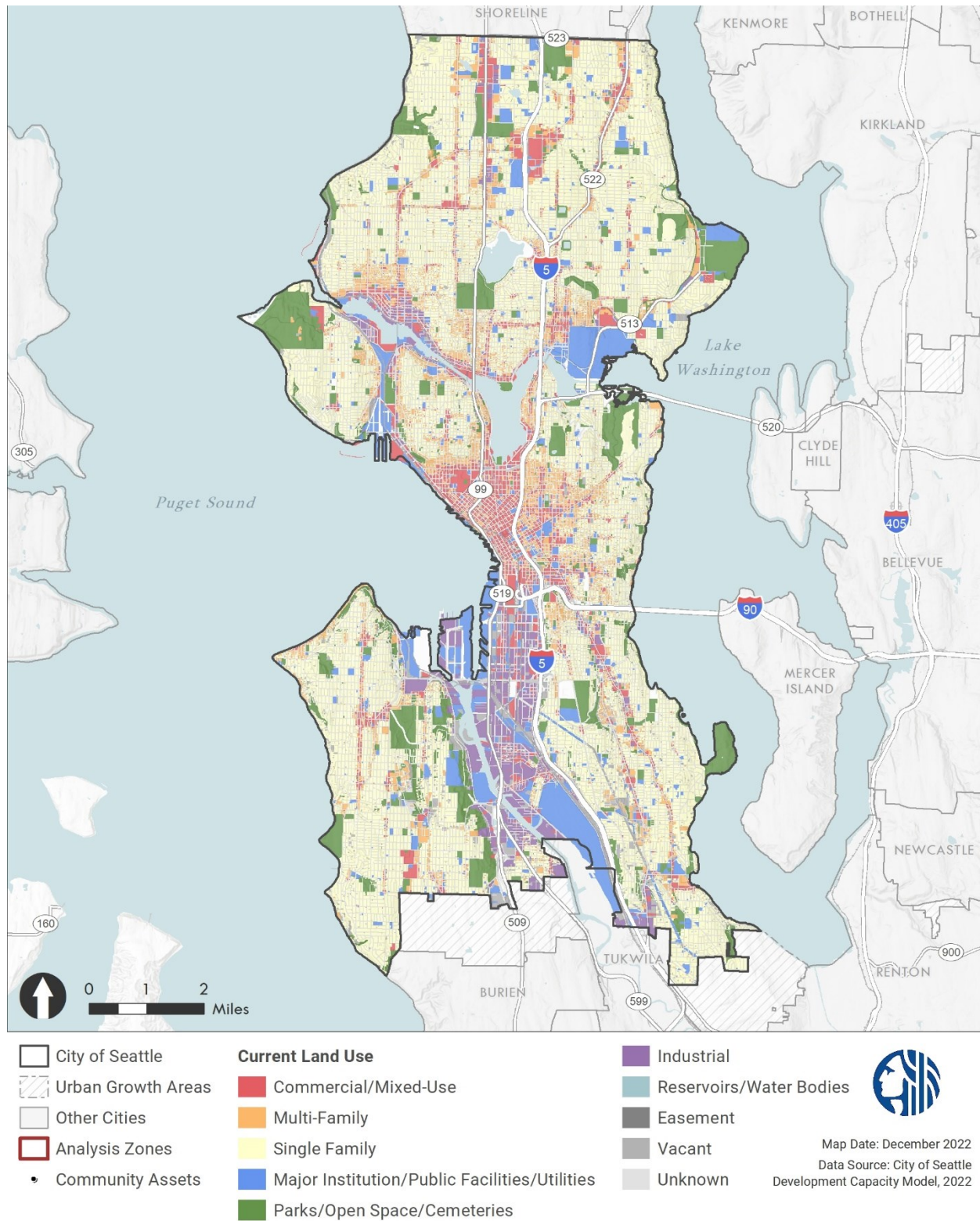
Sources: City of Seattle, 2022; BERK, 2022.



The Exhibit 3-52 map shows the existing land use distribution across the city. The highest concentrations of commercial, mixed-use, and multi-family development are in the four urban centers that constitute the area sometimes called the “center city” (Downtown, First/Capitol Hill, South Lake Union, and Uptown). Housing in these areas might be built as a stand-alone structure or along with commercial space. Mixed-use areas or projects contain residential and commercial uses and often have offices or stores on the ground floor with housing above. Other urban centers, urban villages, and smaller nodes around the city also contain varying levels of commercial, mixed-use, and multi-family development. Outside of the urban centers and villages, concentrations of commercial, mixed-use, and multi-family development generally follow main arterials such as Holman Rd NW/15<sup>th</sup> Ave NW/15<sup>th</sup> Ave W, SR 99, Greenwood/Phinney Ave N, 15<sup>th</sup> Ave NE, Lake City Way NE, Sand Point Way NE, Westlake Ave N, E Madison St, Alki Ave SW, California Ave SW, Delridge Way SW, MLK Jr Way S, and Rainier Ave S.

Single-family residential neighborhoods make up the remaining areas, along with parks, open space, and major institutional uses. Industrial development is concentrated in the Greater Duwamish MIC in south central Seattle and in the BINMIC northwest of Downtown.

Exhibit 3-52 Citywide Current Land Use

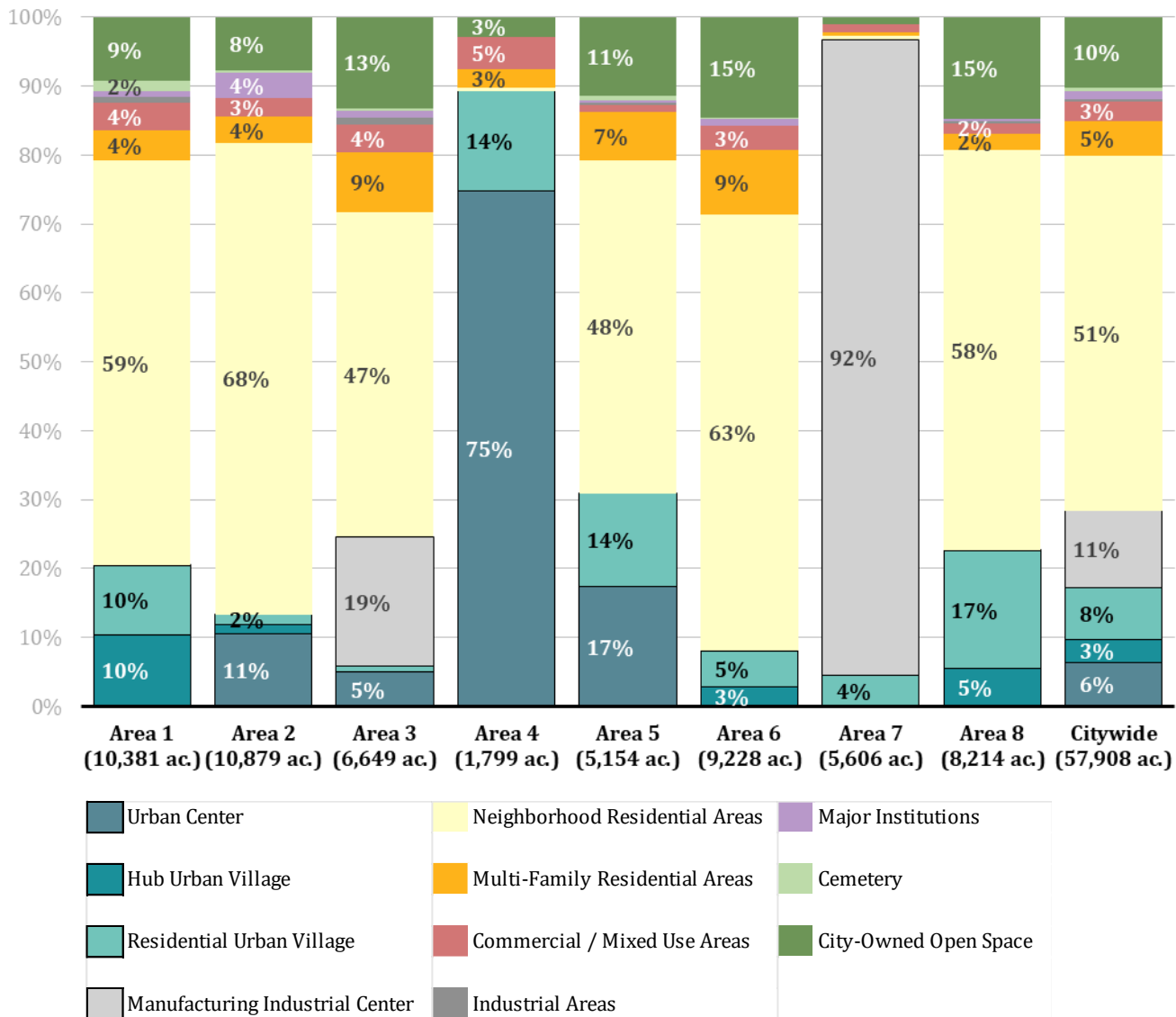


Sources: City of Seattle, 2022; BERK, 2022.

#### Future Land Use & Zoning Designations

The City of Seattle's Future Land Use Map (FLUM) is part of the Comprehensive Plan and expresses graphically the 20-year vision of preferred land use patterns to guide development within the city. Four land use area types implement the urban village strategy—urban centers, hub urban villages, residential urban villages, and manufacturing/industrial centers (MICs). Four other land use types—neighborhood residential areas, multi-family residential areas, commercial/mixed-use areas, and industrial areas—are meant to suggest specific uses outside of the urban villages. The FLUM also designates major institutions, cemeteries, and city-owned open space. The future land use designations are implemented by a corresponding range of zoning districts and development regulations established in [Title 23 of the Seattle Municipal Code](#) (SMC).

The largest future land use designation category in the city is neighborhood residential, accounting for 52% of the city (excluding rights-of-way and water bodies). Another one-quarter of the city is designated as a center or an urban village (28%) with 6% in urban centers, 3% in hub urban villages, 8% in residential urban villages, and 11% in MICs. Of the remaining quarter, land designated as city-owned open space accounts for 10% of the city, multi-family residential designations account for 5%, commercial/mixed-use designations account for 3%, major institution designations account for 1%, and land designated as cemeteries or industrial areas outside the MICs account for less than 1% each. See Exhibit 3-53.

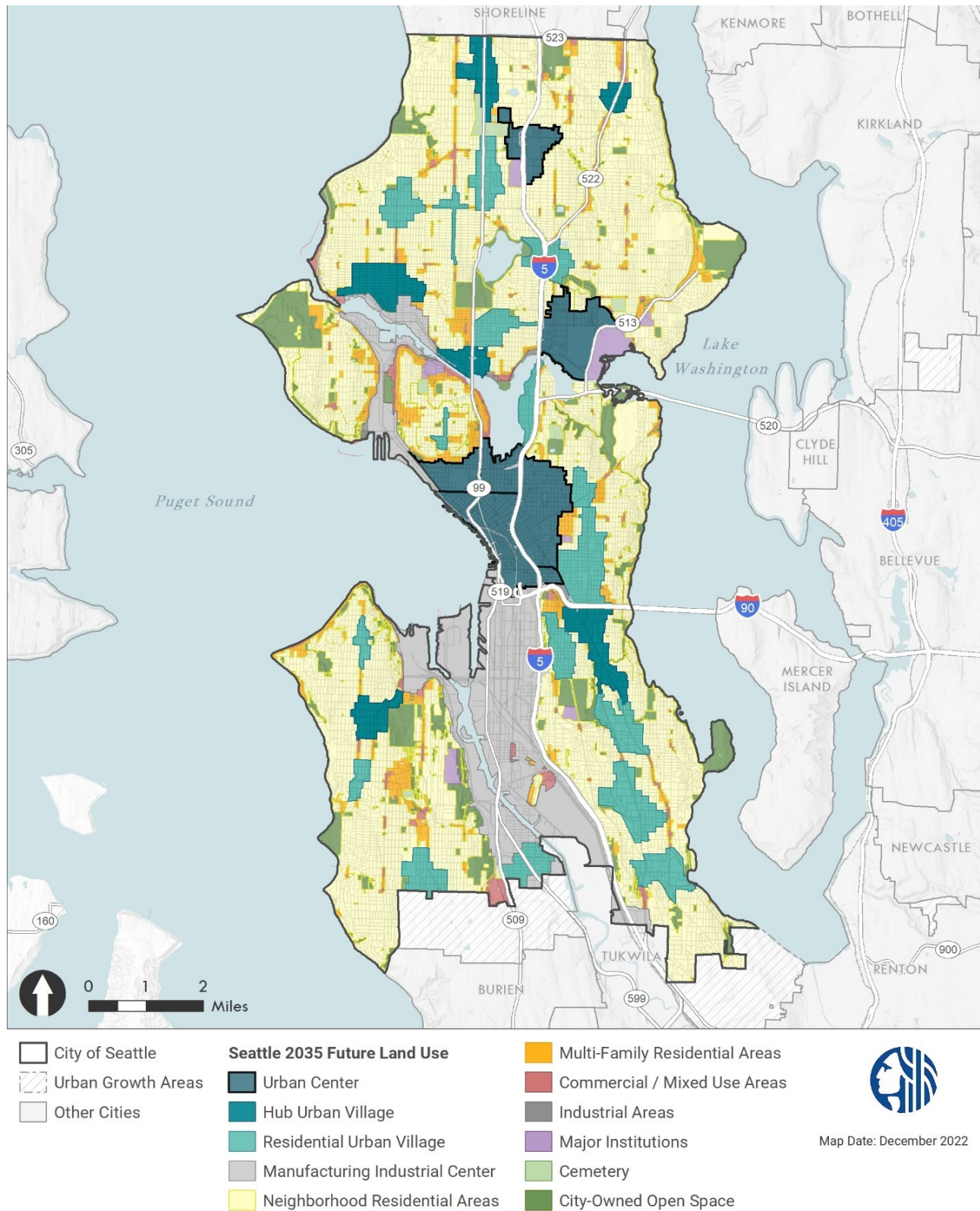
**Exhibit 3-53. Future Land Use Designations—Acres Citywide and by EIS Analysis Area**

Sources: City of Seattle, 2022; BERK, 2022.

Adopted aggregate Future Land Use designations in Seattle are mapped in Exhibit 3-54. Between the centers and villages, commercial, mixed-use, and multi-family designations generally follow main arterials such as Holman Rd NW/15<sup>th</sup> Ave NW/15<sup>th</sup> Ave W, SR 99, Greenwood/Phinney Ave N, 15<sup>th</sup> Ave NE, Lake City Way NE, Sand Point Way NE, Westlake Ave N, E Madison St, Alki Ave SW, California Ave SW, Delridge Way SW, MLK Jr Way S, and Rainier Ave S. Neighborhood residential areas fill the areas in between, along with city-owned open space and major institutions. This is consistent with existing land use patterns. Industrial designations outside the MICs are typically adjacent to the MICs or other major roadways (e.g., the north shore of Lake Union, near Smith Cove, and near the I-5/I-90 interchange).



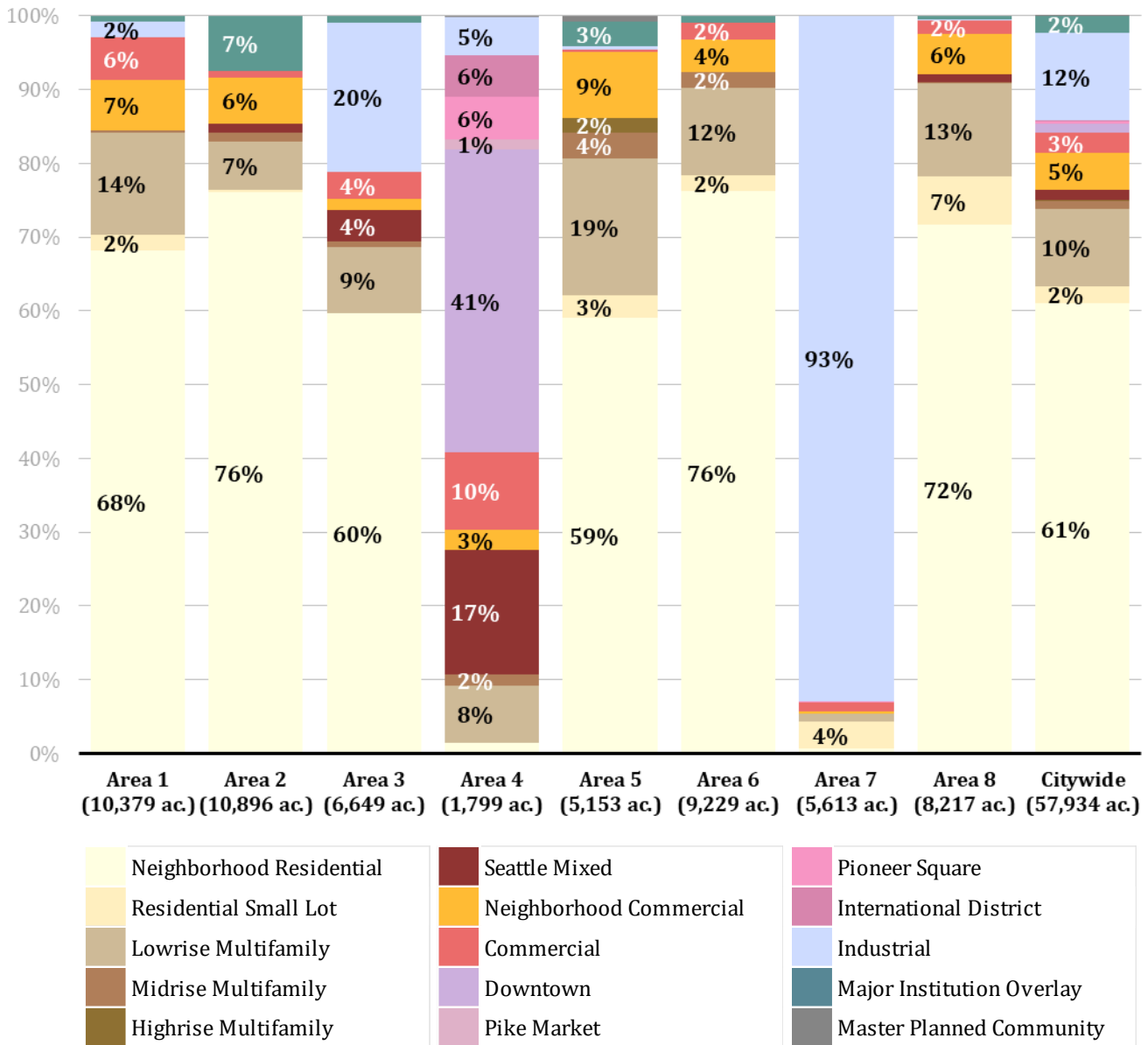
**Exhibit 3-54. Citywide Future Land Use Designations – 2035 Comp Plan**



Sources: City of Seattle, 2022; BERK, 2022.

About three-quarters of the city is zoned for residential development, with 61% zoned neighborhood residential (61%), 2% zoned residential small lot, and 12% zoned multifamily. About 12% is zoned industrial, 5% is zoned neighborhood commercial, and 3% is zoned commercial. The remaining zones account for about 5% of land in the city. See Exhibit 3-55.

**Exhibit 3-55. Generalized Zoning—Acres Citywide and by EIS Analysis Area**



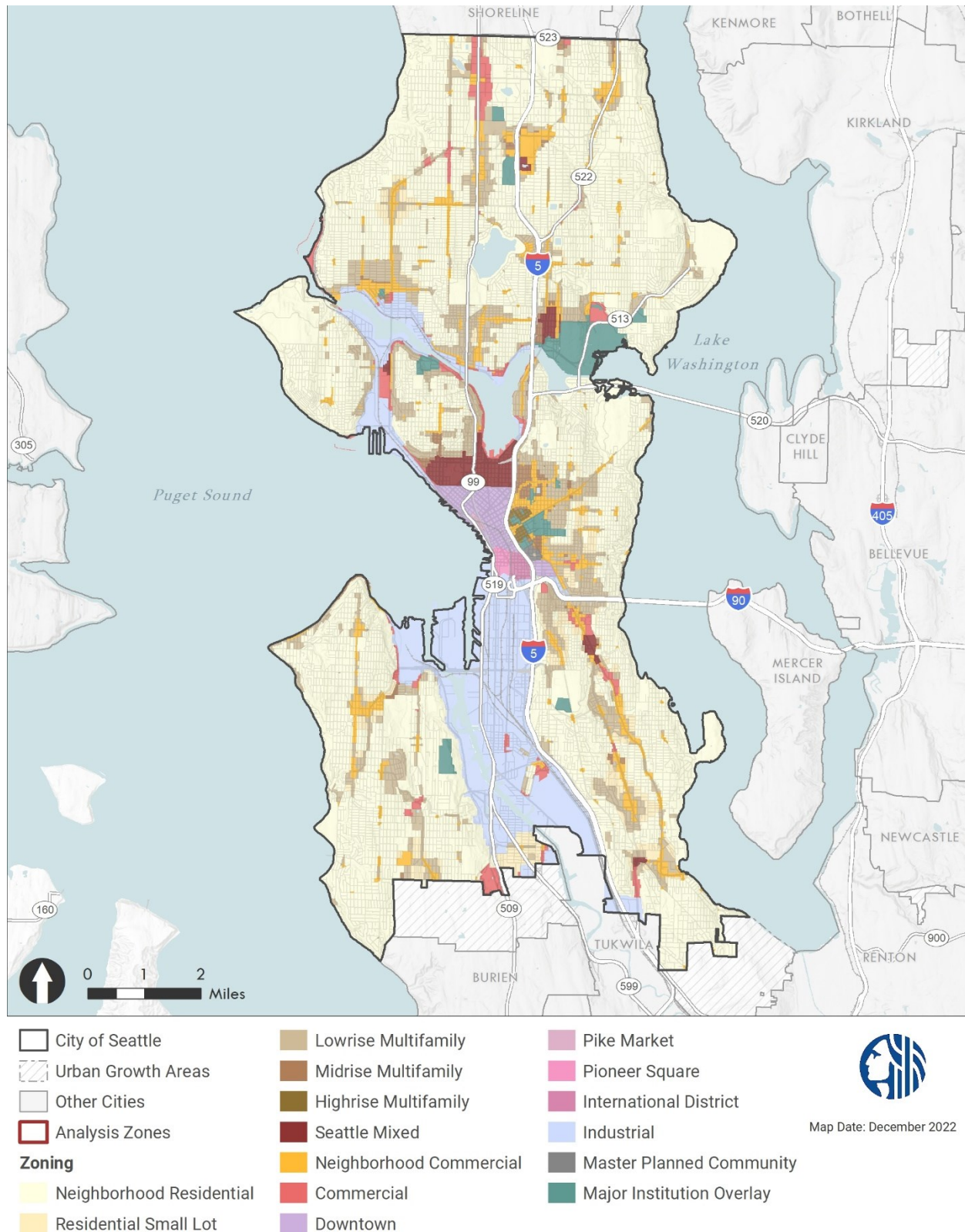
Sources: City of Seattle, 2022; BERK, 2022.



Generalized zoning in Seattle is shown in Exhibit 3-56. Most of the areas designated and zoned for commercial/mixed-use or multi-family residential uses are located in urban centers or villages. The general commercial zones tend to be found on major arterials and are typically more auto-oriented. Neighborhood Commercial and Mixed zones use development standards that produce more walkable environments and are better for higher-density housing development. Commercial and multifamily zoning outside urban centers or villages tends to be concentrated around major arterials. Industrial zoning is concentrated in the two MICs. City zoning rules in these areas allow industrial activity such as manufacturing, warehousing, and shipping of goods through waterways, railways, and highways.

Most areas outside urban center, urban village, and MIC boundaries are zoned for neighborhood residential use. Neighborhood Residential zones cover much of the city. While these areas are thought of as residential neighborhoods, they include a variety of uses beyond housing. For instance, most of the public parkland is found in these zones, as are many of the public schools, cemeteries, and fire stations. In most of these areas, houses are usually not very tall and typically have yards and open space around them. Much of the land in these areas has been built to the densities allowed under current zoning rules.

Exhibit 3-56. Citywide Generalized Zoning



Sources: City of Seattle, 2022; BERK, 2022.

### Shorelines & Critical Areas

Designated shorelines and critical areas overlay the primary future land use designations and zoning regulations. The Shoreline District encompasses 7,447 acres in the study area citywide and is regulated through zoning and shoreline environment designations. A little less than two-thirds of the shorelines citywide are within a conservancy shoreline environment (61%) and a little more than one-third are within an urban shoreline environment (39%). About 25% of shorelines are designated Conservancy Recreation (CR), 22% are designated Conservancy Preservation (CP), and 10% are designated Conservancy Management (CM). These are typically located in waterways and on shorelines bordering neighborhood residential areas and city-owned open space. The other conservancy shoreline environments are concentrated in waterways such as Green Lake, Lake Union, the Lake Washington Ship Canal, and Smith Cove. About 19% of shorelines are designated Urban Industrial (UI), primarily within the Greater Duwamish MIC and BINMIC. Urban Residential accounts for another 10% of shorelines and is mostly located on the inland 200 feet of neighborhood residential areas. The other urban shoreline environments are concentrated around the Downtown waterfront and on the borders of Lake Union and the Lake Washington Ship Canal.

Exhibit 3-57 below summarizes the acreage of each designation citywide and within each EIS Analysis Area. See also the Shorelines Areas Element (from Seattle 2035) section for more detail about the SMP and the purpose of each environment designation.

Critical areas designations include geologic hazard areas (landslide-prone, liquefaction-prone, peat-settlement-prone, seismic hazard, steep slope erosion hazard, and/or volcanic areas), flood-prone areas, wetlands, fish and wildlife habitat conservation areas, and abandoned landfills.

Exhibit 3-58 below summarizes the goals and policies relevant to transportation on the shoreline from the Seattle Comprehensive Plan. The two identified goals are to provide transportation that supports and enhances use of and access to shorelines, and to remove any transportation facilities that are disruptive to the shoreline. Policies emphasize both the commercial/industrial and public access uses as the most important functions of shoreline areas. Policies include discouraging vehicle parking on waterfront lots and connecting ferry service to other modes of public transportation.

**Exhibit 3-57. Shoreline Environment Designations—Acres Citywide and by EIS Analysis Area**

Shoreline Designation	EIS Analysis Area								Citywide
	1	2	3	4	5	6	7	8	
Conservancy Management	339 ac. (32.4%)	80 ac. (10.5%)	168 ac. (9.5%)	5 ac. (1.2%)	61 ac. (11.9%)	44 ac. (4.0%)	1 ac. (0.1%)	57 ac. (8.4%)	754 ac. (10.1%)
Conservancy Navigation	82 ac. (7.9%)	3 ac. (0.4%)	140 ac. (7.9%)	3 ac. (0.9%)	2 ac. (0.4%)	0.2 ac. (0.0%)	0.2 ac. (0.0%)	2 ac. (0.4%)	234 ac. (3.1%)
Conservancy Preservation	150 ac. (14.3%)	199 ac. (26.1%)	615 ac. (34.7%)	—	160 ac. (31.2%)	337 ac. (30.6%)	58 ac. (4.9%)	112 ac. (16.5%)	1,632 ac. (21.9%)
Conservancy Recreation	132 ac. (12.7%)	293 ac. (38.5%)	336 ac. (19.0%)	6 ac. (1.5%)	164 ac. (31.9%)	548 ac. (49.7%)	12 ac. (1.0%)	402 ac. (59.3%)	1,894 ac. (25.4%)

### Ch.3 Environment, Impacts, & Mitigation Measures ▪ Land Use Patterns

Shoreline Designation	EIS Analysis Area								Citywide
	1	2	3	4	5	6	7	8	
Conservancy Waterway	13 ac. (1.3%)	1 ac. (0.1%)	—	22 ac. (5.7%)	—	—	—	—	36 ac. (0.5%)
Urban Commercial	182 ac. (17.4%)	32 ac. (4.1%)	—	160 ac. (41.0%)	3 ac. (0.6%)	11 ac. (1.0%)	—	8 ac. (1.1%)	395 ac. (5.3%)
Urban General	20 ac. (1.9%)	—	21 ac. (1.2%)	0.3 ac. (0.1%)	—	—	4 ac. (0.3%)	—	44 ac. (0.6%)
Urban Harborfront	—	—	—	130 ac. (33.3%)	—	—	—	—	130 ac. (1.7%)
Urban Industrial	2 ac. (0.2%)	—	309 ac. (17.4%)	0.2 ac. (0.1%)	—	0.1 ac. (0.0%)	1,110 ac. (93.7%)	—	1,421 ac. (19.1%)
Urban Maritime	56 ac. (5.3%)	3 ac. (0.4%)	97 ac. (5.5%)	35 ac. (9.0%)	—	—	—	—	191 ac. (2.6%)
Urban Residential	70 ac. (6.7%)	151 ac. (19.8%)	86 ac. (4.8%)	28 ac. (7.3%)	123 ac. (23.9%)	162 ac. (14.7%)	—	97 ac. (14.3%)	716 ac. (9.6%)
<b>Total Acres &amp; Percent of Citywide Total</b>	<b>1,045 ac. (14%)</b>	<b>761 ac. (10%)</b>	<b>1,772 ac. (24%)</b>	<b>390 ac. (5%)</b>	<b>513 ac. (7%)</b>	<b>1,102 ac. (15%)</b>	<b>1,185 ac. (16%)</b>	<b>678 ac. (9%)</b>	<b>7,447 ac. (100%)</b>

Sources: City of Seattle, 2022; BERK, 2022.

#### Exhibit 3-58. Seattle Comprehensive Plan Goals and Policies, Transportation in Shoreline Areas

##### Goal or Policy

**GOAL SA G8 Provide a transportation network that supports and enhances use of and access to the shorelines.**

**GOAL SA G9 Relocate or demolish transportation facilities that are functionally or aesthetically disruptive to the shoreline, such as the aerial portion of the Alaskan Way Viaduct on the Central Waterfront between King Street and Union Street.**

SA P11 Encourage the transport of materials and cargo in the shoreline district via modes having the least environmental impact.

SA P12 Encourage large vessels (cruise ships and cargo-container ships) to connect to dockside electrical facilities or use other energy alternatives while in port in order to reduce engine idling and exhaust emissions.

SA P13 Discourage, and reduce over time, vehicle parking on waterfront lots in the shoreline district.

SA P14 Encourage the maintenance and future development of intermodal commuter ferry services to complement other public transportation systems, from both intracity locations and elsewhere in the region.

SA P15 Provide public transportation convenient to the shoreline.

SA P16

1. Locate streets, highways, freeways, and railroads away from the shoreline in order to maximize the area of waterfront lots. Discourage streets, highways, freeways, and railroads not needed for access to shoreline lots in the shoreline district. A replacement for the State Route 99 Viaduct with a tunnel and/or a surface roadway may be located in the shoreline district because it represents a critical link in the transportation network.

2. To facilitate expeditious construction in an environmentally and fiscally responsible manner, standards for major state and regional transportation projects should be considered that will allow flexibility in construction staging, utility relocation, and construction-related mitigation and uses, provided that the projects result in no net loss of ecological function.

3. Prohibit aerial transportation structures over thirty-five feet high, such as bridges and viaducts, on the Central Waterfront in the shoreline environments between King Street and Union Street, except for aerial pedestrian walkways associated with Colman Dock, in order to facilitate the revitalization of Downtown's waterfront, provide opportunities for public access to the Central Waterfront shoreline, and preserve views of Elliott Bay and the land forms beyond.

**Goal or Policy**

SA P17 The primary purpose of waterways in Lake Union and Portage Bay is to facilitate navigation and commerce by providing waterborne access to adjacent properties, access to the land for the loading and unloading of watercraft, and temporary moorage. Waterways are also important for providing public access from dry land to the water.

SA P18 Public access shall be the preferred use for vacated rights-of-way. Public rights-of way may be used or developed for uses other than public access, provided that such uses are determined by the City to be in the public interest, and that public access of substantial quality and at least comparable to that available in the right-of-way is provided.

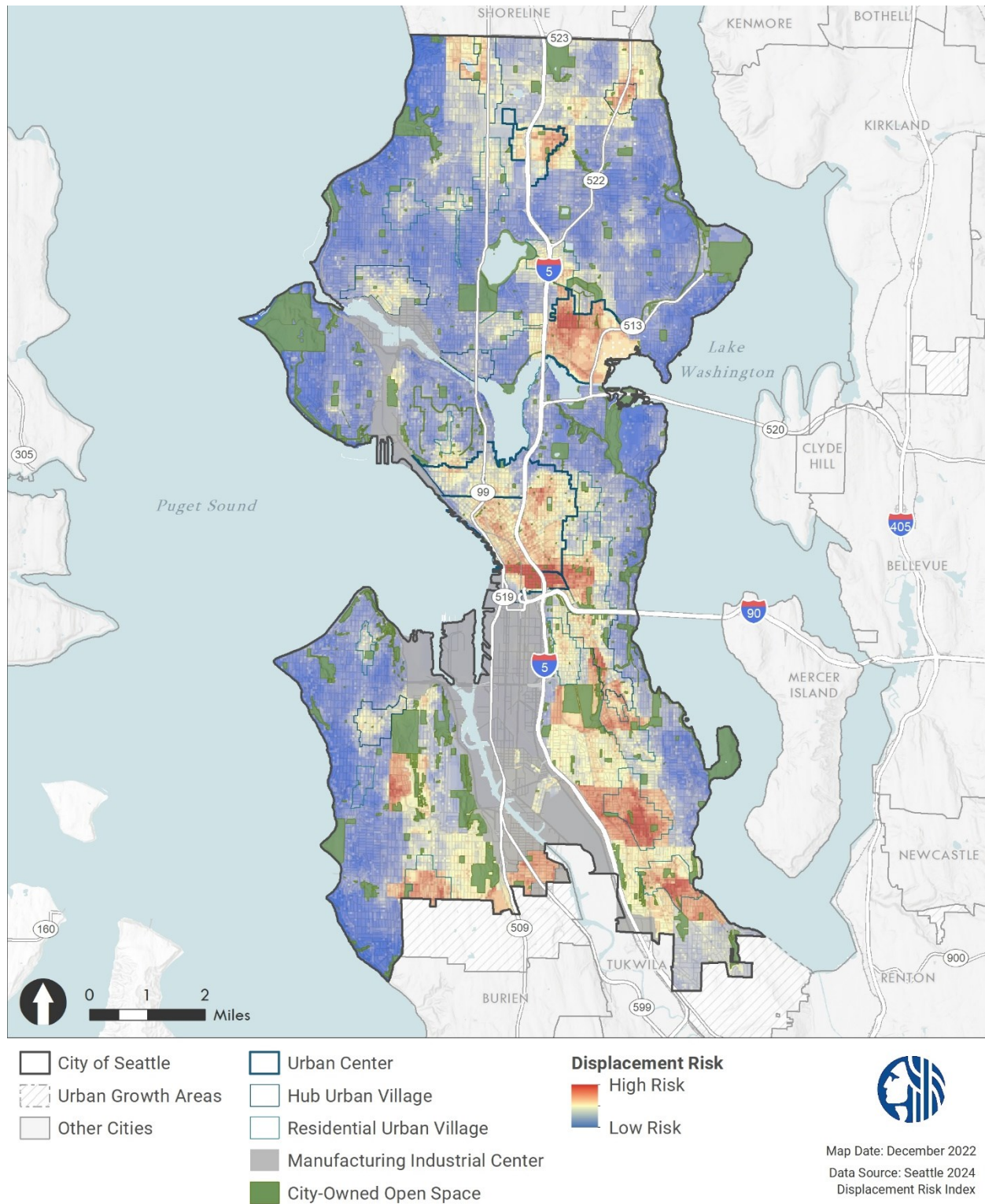
Source: Seattle 2035 Comprehensive Plan

**Displacement Risk**

Based on the Displacement Risk Index, neighborhoods with the highest displacement risk in Seattle include the Chinatown–International District, Central District, Rainier Valley, Rainier Beach, South Park, High Point, and the University District. Urban centers and villages tend to have higher displacement risk than areas outside urban centers and villages primarily due to their relatively large share of rental housing, higher prevalence of low-income households, and the presence of infrastructure (like transit), neighborhood essentials, and services that can result in higher rental prices and the demolition or rehabilitation of existing buildings. This is particularly true for urban villages in southeast Seattle. Conversely, many neighborhoods north of downtown have low displacement risk, including areas that include transportation corridors, like Eastlake, Ballard, and Roosevelt. Citywide displacement risk is shown in Exhibit 3-59.



**Exhibit 3-59. Citywide Displacement Risk**



Sources: City of Seattle, 2022; BERK, 2022.



### Community Assets

Community assets include a wide range of options for accessibility/disability assistance, including emergency shelters, residential treatment centers, and assisted living facilities. Community centers, senior centers, and places of worship also offer assistance to those in need. Educational opportunities are available at elementary, middle, and high schools, as well as colleges and other schools. Farmers markets, grocery stores, food banks, and WIC vendors provide access to healthy food options. Healthcare services are provided through hospitals, qualified health centers, and nursing homes. Transportation options are also available through Orca Fare outlets and enrollment centers. Shopping centers and work source sites are also available in the City.

Community assets are important destinations for network planning. Where possible, these locations should be safely connected by all modes of transportation so that community members can access the resources they need regardless of how they travel. The full list of community assets is as follows:

- Accessibility/Disability Assistance
- Apprenticeship Program
- Assisted Living Facility
- College
- Community Center
- Election Drop-Box
- Elementary School
- Emergency Shelter
- Farmers Market
- Fed Qualified Health Center
- Food Bank
- FQHC/Tribal
- Grocery Store
- Hospital
- Library
- Middle or High School
- Nursing Homes
- ORCA Fare Outlet
- Orca Lift Enrollment Center
- Other Schools
- Place of Worship
- Residential Treatment Center
- Senior Center
- Shopping Center
- WIC Vendor
- WIC clinic
- Work Source Site

## Secondary Study Area

### NW Seattle (Analysis Zone 1)

The NW Seattle Analysis Area includes the portion of Seattle that is west of I-5 and north of the Lake Washington Ship Canal. It includes approximately 7,151 acres of buildable lands, or 18% of the buildable lands citywide, and includes three hub urban villages and five residential urban villages.

Most commercial, mixed-use, and lowrise multi-family future land use and zoning designations are concentrated in the urban villages with commercial designations generally adjacent to major arterials and lowrise multi-family designations on the edges of the urban village boundaries. Outside of the urban villages, commercial, mixed-use, and multi-family future land use and zoning designations generally follow major arterials including SR 99, Greenwood/Phinney Ave N, and 15<sup>th</sup> Ave NW/Holman Rd NW. A small portion of the land along the north shore of Lake Union is designated and zoned industrial. Major parks and open space in the area include Woodland Park Zoo, Green Lake Park, Golden Gardens, Carkeek Park, and Gas Works. North Seattle College is also located adjacent to I-5 in the central eastern portion of the analysis area.

Neighborhood Residential future land use and zoning designations fill in the intervening areas. See Exhibit 3-54, Exhibit 3-55, Exhibit 3-57, and Exhibit 3-61.

The NW Seattle Analysis Area includes 1,045 acres of designated shorelines. A little over two-thirds are within a conservancy shoreline environment, including Conservancy Management (32%) in Green Lake and a combination of Conservancy Preservation (14%) and Recreation (13%) on Puget Sound from Golden Gardens north to the city limit. Another 29% are designated Urban Commercial (near Shilshole Bay), Urban Maritime (along the north shore of Lake Union), and Urban Residential (inland along Puget Sound north of Golden Gardens). See Exhibit 3-57 and Exhibit 3-62.

The largest existing land use category is single family residential, which comprises about 57% of existing uses (versus 48% citywide). A slightly higher percentage of land uses are also multi-family residential (12% versus 9% citywide). Existing commercial, mixed-use, and multi-family uses as well as community assets are primarily within the urban village boundaries, with the densest concentrations in the Ballard, Bitter Lake, and Fremont hub urban villages. Commercial uses in Bitter Lake are typically larger-scale big-box retailers while those in Ballard and Fremont are smaller scale. Additional concentrations of commercial, mixed-use, and multi-family uses run adjacent to major roadways between the urban villages and along the Lake Washington Ship Canal and Shilshole Bay. Most industrial uses in the Analysis Area are near the Lake Washington Ship Canal in Ballard and along the north shore of Lake Union or on SR 99 in the Bitter Lake and Aurora-Licton Springs urban villages. The BNSF railway also runs along Puget Sound throughout the Analysis Area. See Exhibit 3-63.

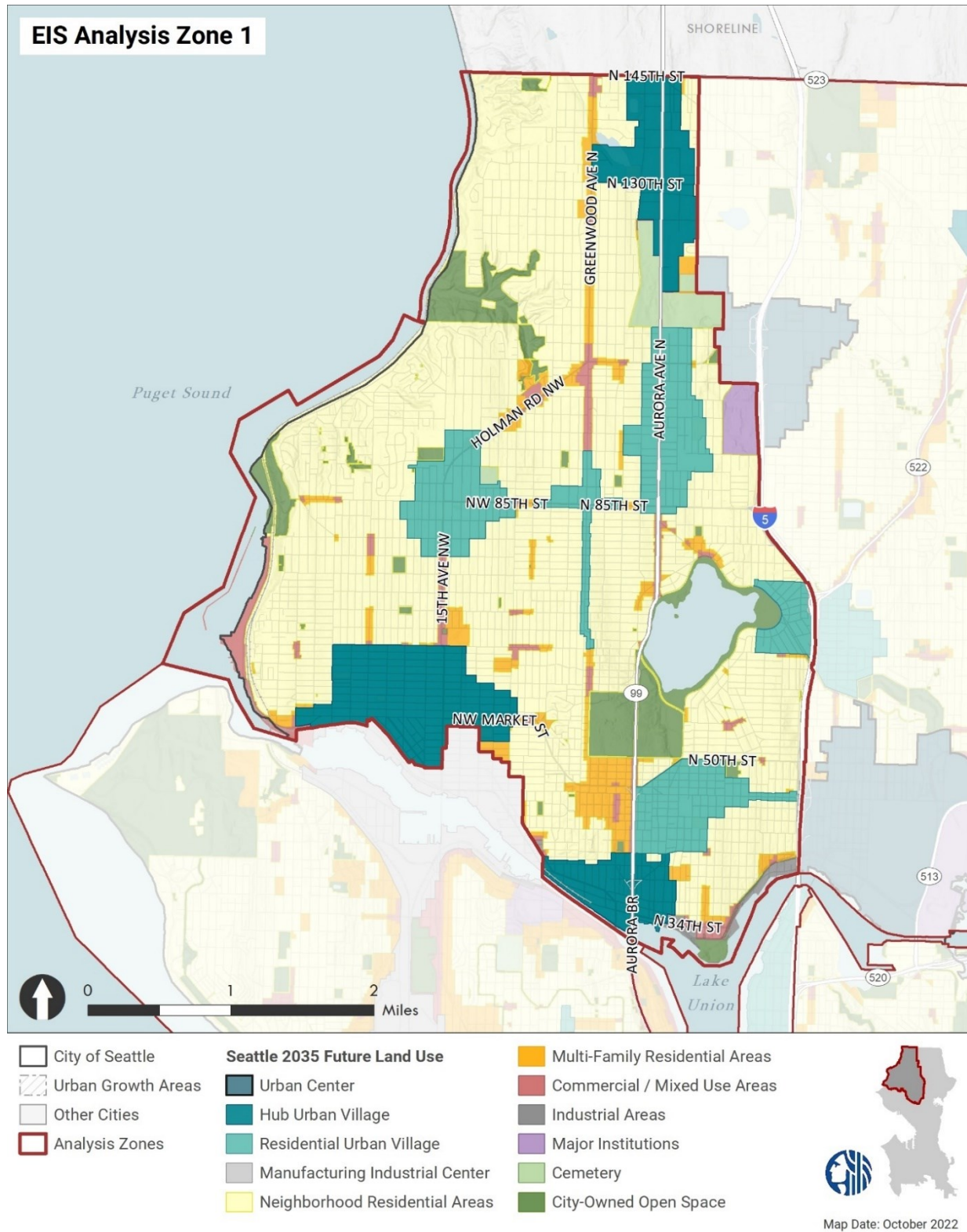
Most of the NW Seattle Analysis Area is at low risk of displacement. Displacement risk is higher within the urban village boundaries with the exception of some areas near I-5 and around Bitter Lake between N 130<sup>th</sup> St and N 145<sup>th</sup> St. See Exhibit 3-64.

The only street concept plan in the NW Seattle Analysis Area is the Street Element of the Ballard Municipal Center Plan. This plan applies to 20<sup>th</sup> and 22<sup>nd</sup> Avenues NW, NW Market St, and NW 56<sup>th</sup> – 58<sup>th</sup> Streets. The

street improvement design standards encourage maximum use of the public street right-of-way by implementing a consistent, unique, and safer pedestrian-friendly street scape design throughout the plan area. There are no subarea plans for this Analysis Area.

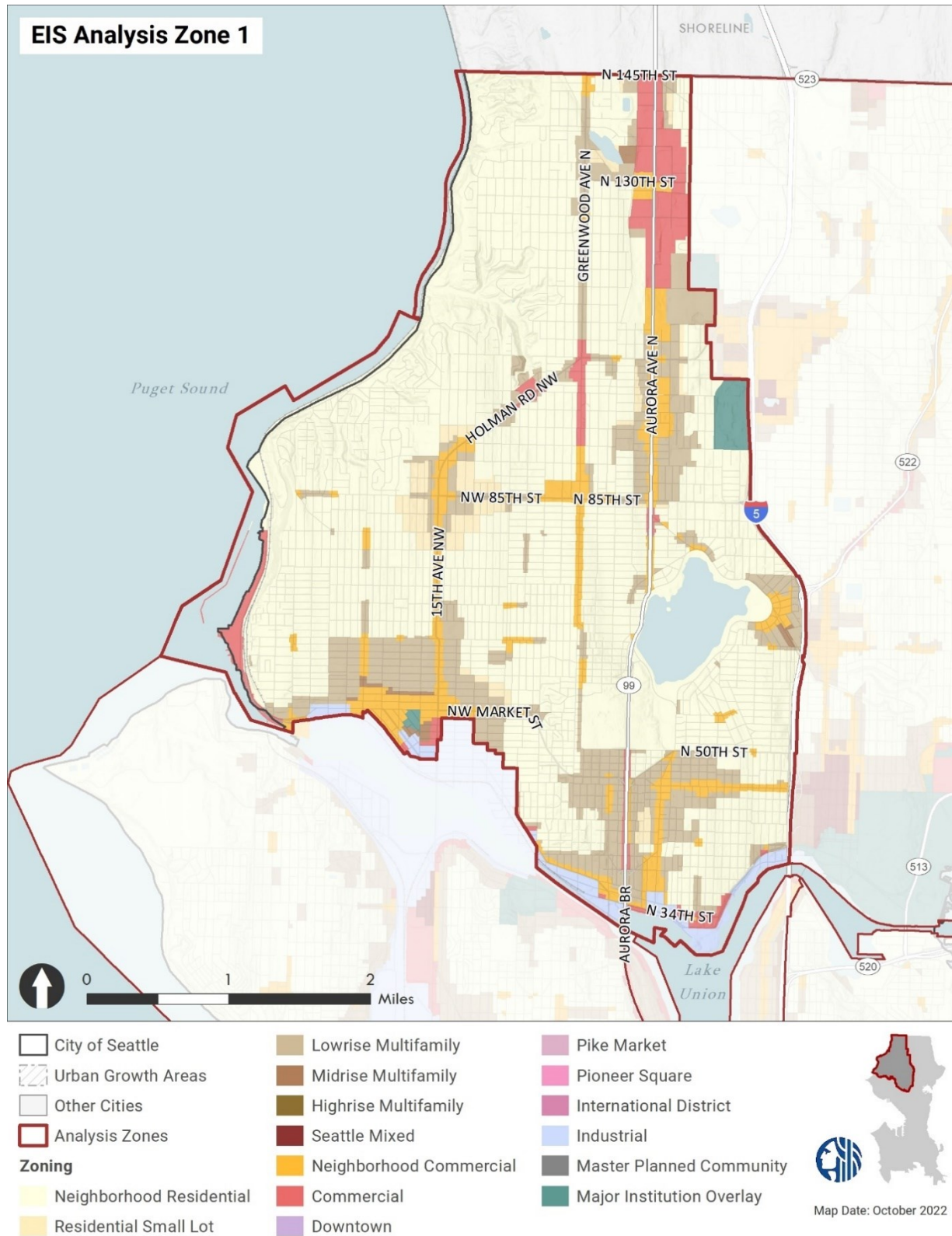
There are seven neighborhood plans within the NW Seattle Analysis Area. These are enabled by the Seattle 2035 Vision to have dense urban villages where there is enhanced access to transit and amenities. The neighborhood plans in this analysis area include Aurora-Licton, Broadview / Bitter Lake/ Haller Lake, Crown Hill / Ballard, Fremont, Green Lake, Greenwood / Phinney Ridge, and Wallingford. These neighborhood plans include specific goals relating to land use, transportation, human services, utilities, community building, parks and open space, and community character.

Exhibit 3-60. NW Seattle Analysis Area—Future Land Use Designations



Source: City of Seattle, 2022; BERK, 2022.

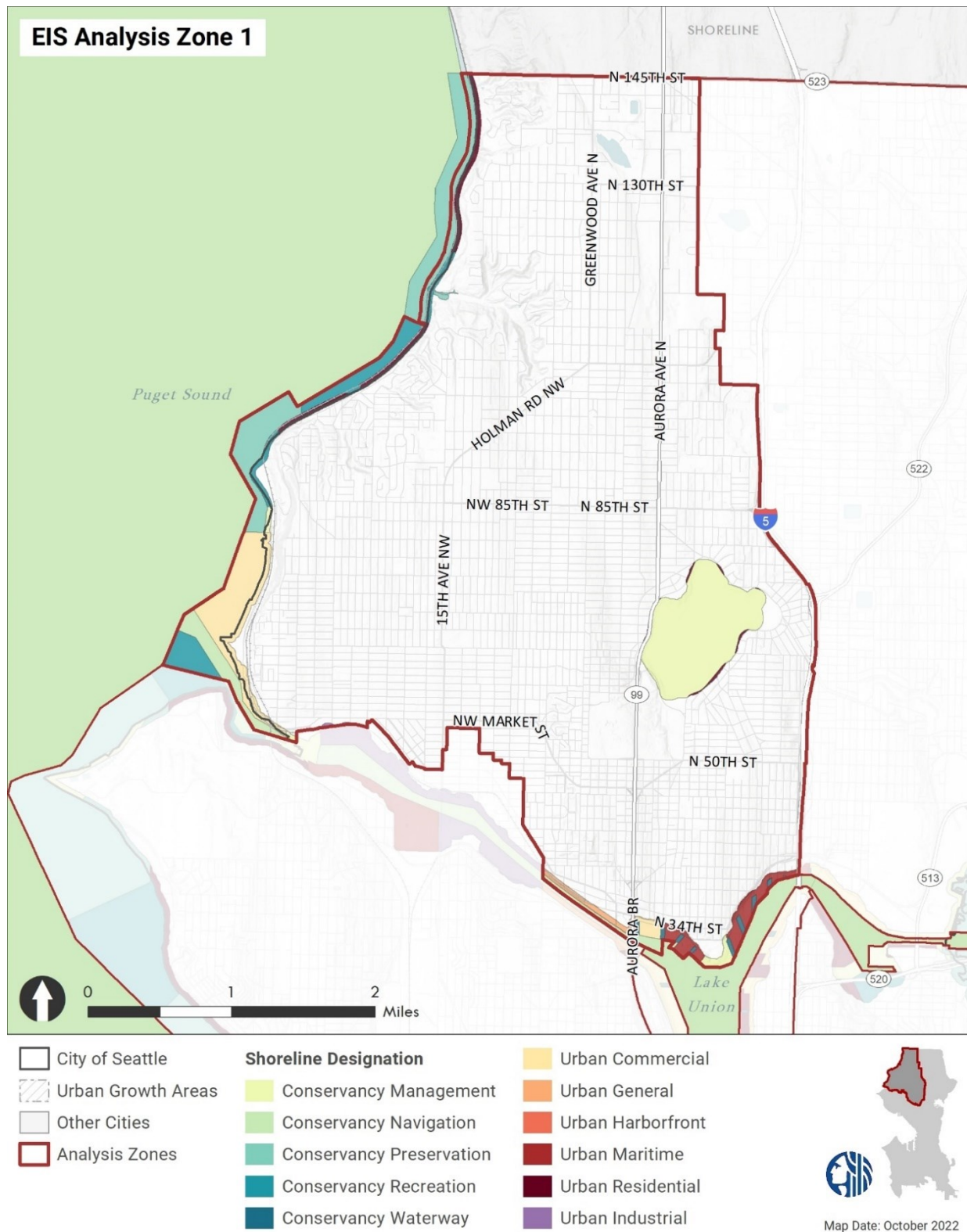
Exhibit 3-61. NW Seattle Analysis Area—Zoning



Source: City of Seattle, 2022; BERK, 2022.



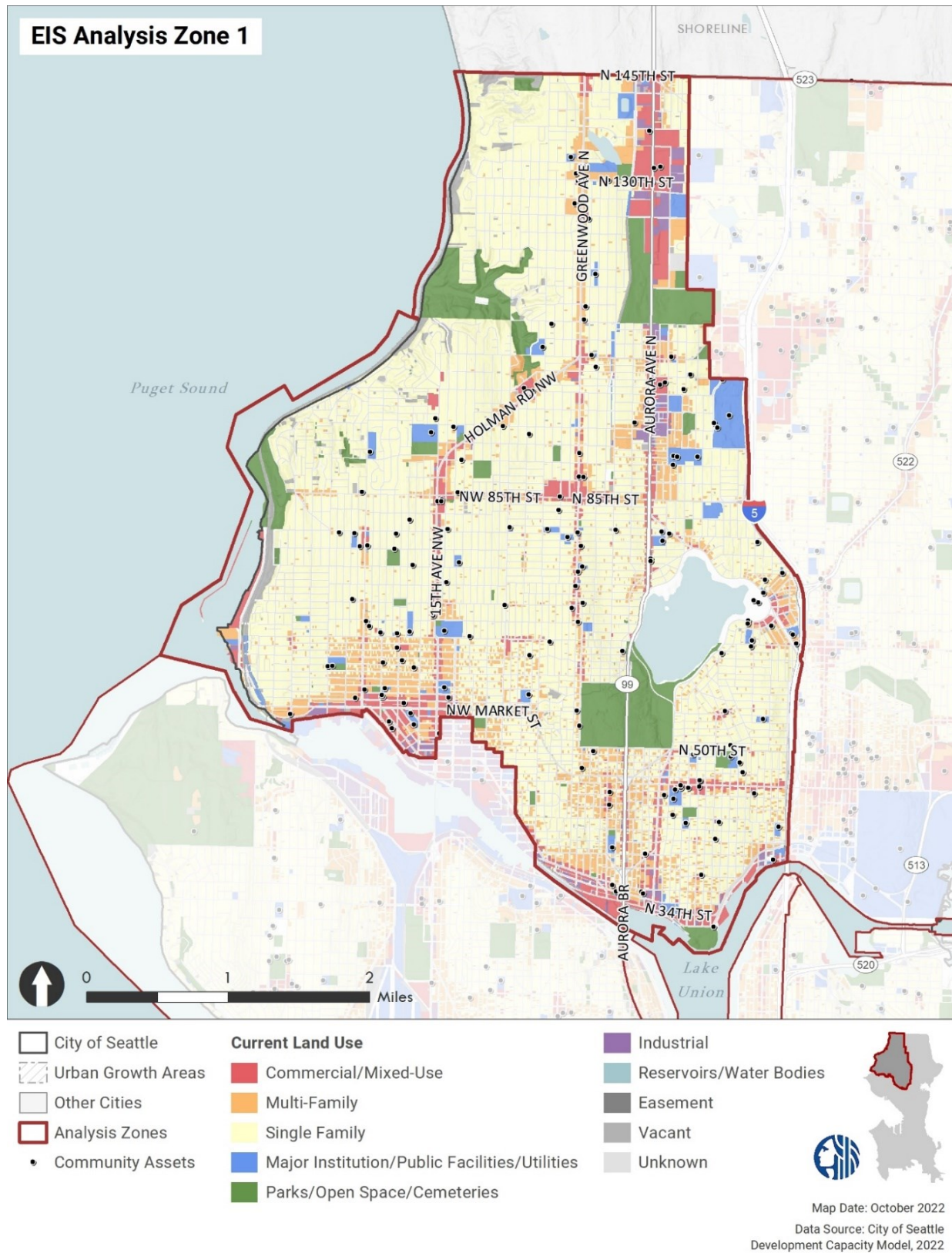
Exhibit 3-62. NW Seattle Analysis Area—Shoreline Designations



Source: City of Seattle, 2022; BERK, 2022.

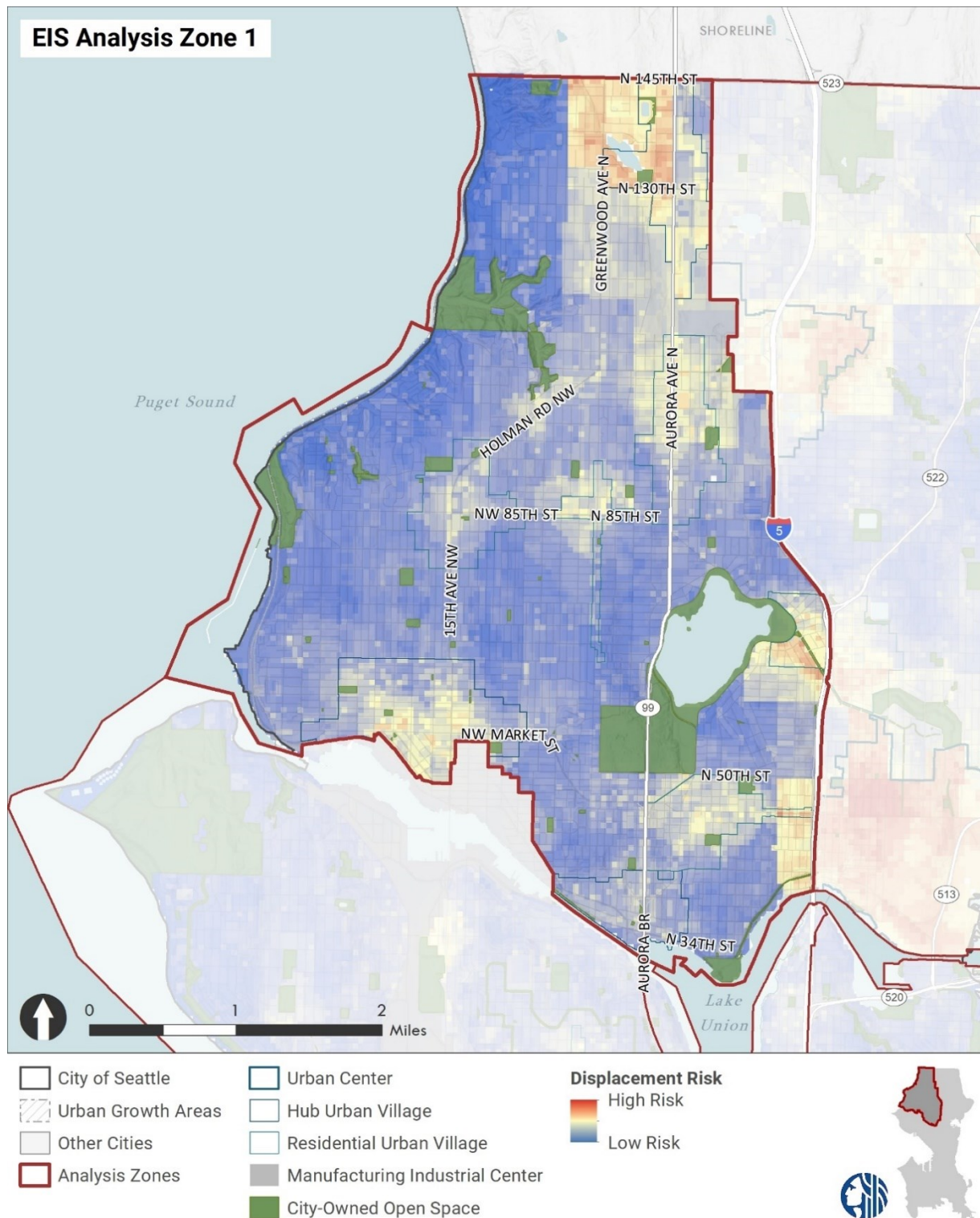


Exhibit 3-63. NW Seattle Analysis Area—Current Land Use



Source: City of Seattle, 2022; BERK, 2022.

Exhibit 3-64. NW Seattle Analysis Area—Displacement Risk



Source: City of Seattle, 2022; BERK, 2022.

NE Seattle (Analysis Zone 2)

The NE Seattle Analysis Area includes the portion of Seattle east of Interstate 5, south of NE 145<sup>th</sup> Street (Seattle's northern most boundary), and north of Portage Bay and the Montlake Cut. It includes approximately 8,087 acres of buildable land, or 20% of the buildable lands city wide. Additionally, the NE Seattle Analysis Area includes the Northgate and University District Urban Centers, the Lake City Hub Urban Village, and the Roosevelt Residential Urban Village. See Exhibit 3-67 and Exhibit 3-68.

A majority of the commercial, mixed-use, and multi-family future land use and zoning designations are concentrated in the Urban Villages with commercial and multifamily designations adjacent to major arterials running between Urban Village boundaries. Outside of the urban villages, commercial, mixed-use, and multi-family future land use and zoning designations generally follow Sandpoint Way NE, Lake City Way NE, Roosevelt Way NE, and 15<sup>th</sup> Ave E which are all principal arterial streets as well as 35<sup>th</sup> Ave NE which carries a minor arterial designation. Major parks and open space in the area include Cowen and Magnuson Parks, the Calvary Cemetery, Sand Point County Club, and Jackson Park Golf Course. The University of Washington is located within a major institution overlay, which is a key regulatory feature of this subarea. Neighborhood Residential future land use and zoning designations fill in the intervening areas. See Exhibit 3-47 and Exhibit 3-65.

The NE Seattle Analysis Area includes 761 acres of designated shorelines, or 10% of the designated shorelines citywide. Nearly 75% are within a conservancy shoreline environment, including Conservancy Management (11%) on the northern shoreline of Magnuson Park, Conservancy Preservation (26%) across the extent of Union Bay just SW of Laurelhurst neighborhood, and Conservancy Recreation (39%) on the eastern and southern shoreline of Magnuson Park. Another 19% is designated as Urban Residential extending north from Magnuson Park to the NE 145<sup>th</sup> St and south of Magnuson Park to the western most boundary of Laurelhurst. See Exhibit 3-46 and Exhibit 3-67.

The largest existing land use category is single family residential, which accounts for 59% of the land (versus 48% citywide). Major institutions and public facilities account for 13% of the existing land uses due to the presence of the University of Washington and the National Oceanic and Atmospheric Administration Western Regional Center. Parks, open space, and cemeteries account for an additional 13% due to the presence of Cowen and Magnuson Parks, the Calvary Cemetery, Sand Point County Club, and Jackson Park Golf Course. The share of industrial land uses is lower in the NE Seattle Analysis Area (.4%) compared to 5% citywide. Existing commercial, mixed-use, and multi-family uses, as well as a majority of the community assets, are located within the existing Urban Center/Urban Village boundaries. Commercial and mixed uses found in the Roosevelt and Lake City Urban Villages are typically vertically dense apartment buildings with ground floor commercial around a main commercial corridor that supports essential neighborhood amenities. In comparison, the University District and Northgate Urban Centers have denser, and more intensive land uses which are often at a greater scale than is found in Urban Villages. Outside of the Urban Center/Urban Village boundaries, commercial and multifamily development is concentrated along the extents of Sandpoint Way NE, Lake City Way NE, Roosevelt Way NE, and 15<sup>th</sup> Ave E which are all principal arterial streets as well as 35<sup>th</sup> Ave NE, which carries a minor arterial designation. See Exhibit 3-53 and Exhibit 3-68.



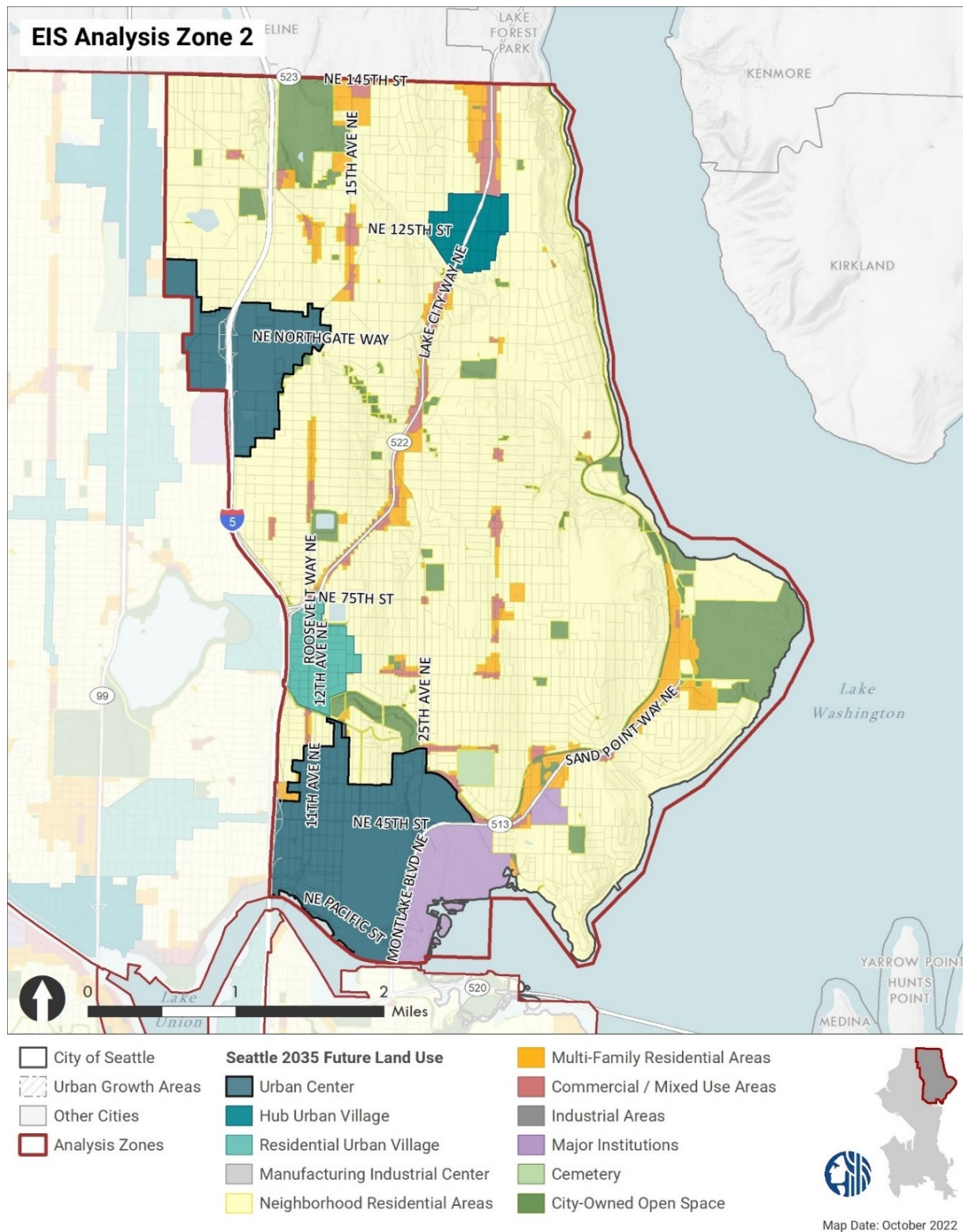
Outside of the existing Urban Center/Urban Village boundaries where displacement risk is highest within the analysis area, displacement risk is low to moderate. Because of the existing growth strategies that concentrate commercial/mixed-use development and multifamily development in relatively small, geographically confined, boundaries the market pressures are felt at an accelerated rate. The spatially constrained nature of the residential density strategy plans for morphological shifts that may have demographic impacts. Displacement risk is the highest within the University District Urban Center. See Exhibit 3-69.

There are three approved Street Concept Plans in the NE Seattle Analysis Area including: the Roosevelt Neighborhood Streetscape Concept Plan, University District Alley Activation Plan, and the University Districts Green Streets Plan. The Roosevelt Neighborhood Streetscape Concept Plan was enabled by Joint Director's Rule DPD8-2013/SDOT04-2013 effective as of November of 2013. This concept plan was adopted in anticipation of the Roosevelt Light Rail Station and the accompanying upzone to guide right-of-way improvements provided by private development. In order to support and improve the character of the streets, the concept plan proposes cohesive urban design treatments that enhance the public realm and create a safer and more predictable condition for all modes of transportation. The University District Alley Plan was enabled by Joint Director's Rule DPD 7-2015/SDOT 05-2015 effective as of August of 2015. The University District Alley Activation Plan focuses on the three-alley corridor between University Way and 15th Ave NE, south of NE 45th St and north of NE 41<sup>st</sup> St. The Street Design Concept Plan's goals include promoting an active, inclusive, pedestrian-focused alley environment; continuing vehicular access from the alley; and showcasing environmentally friendly design approaches.

The last plan in the NE Seattle Analysis Area is the University Districts Green Streets Plan which was enabled by Joint Director's Rule DPD 13-2015/SDOT 06-2015 effective as of August of 2015. The Street Design Concept Plan recommends enhanced landscaping and pedestrian safety improvements on the designated green streets. Additional enhanced aesthetic and traffic calming measures are recommended on those portions of Brooklyn Ave NE and NE 43rd St that are immediately outside the future light rail station, including a curbless landscaped street on Brooklyn Ave NE and significantly improved sidewalks and landscaping in the heart of the U District. See Exhibit 3-50.

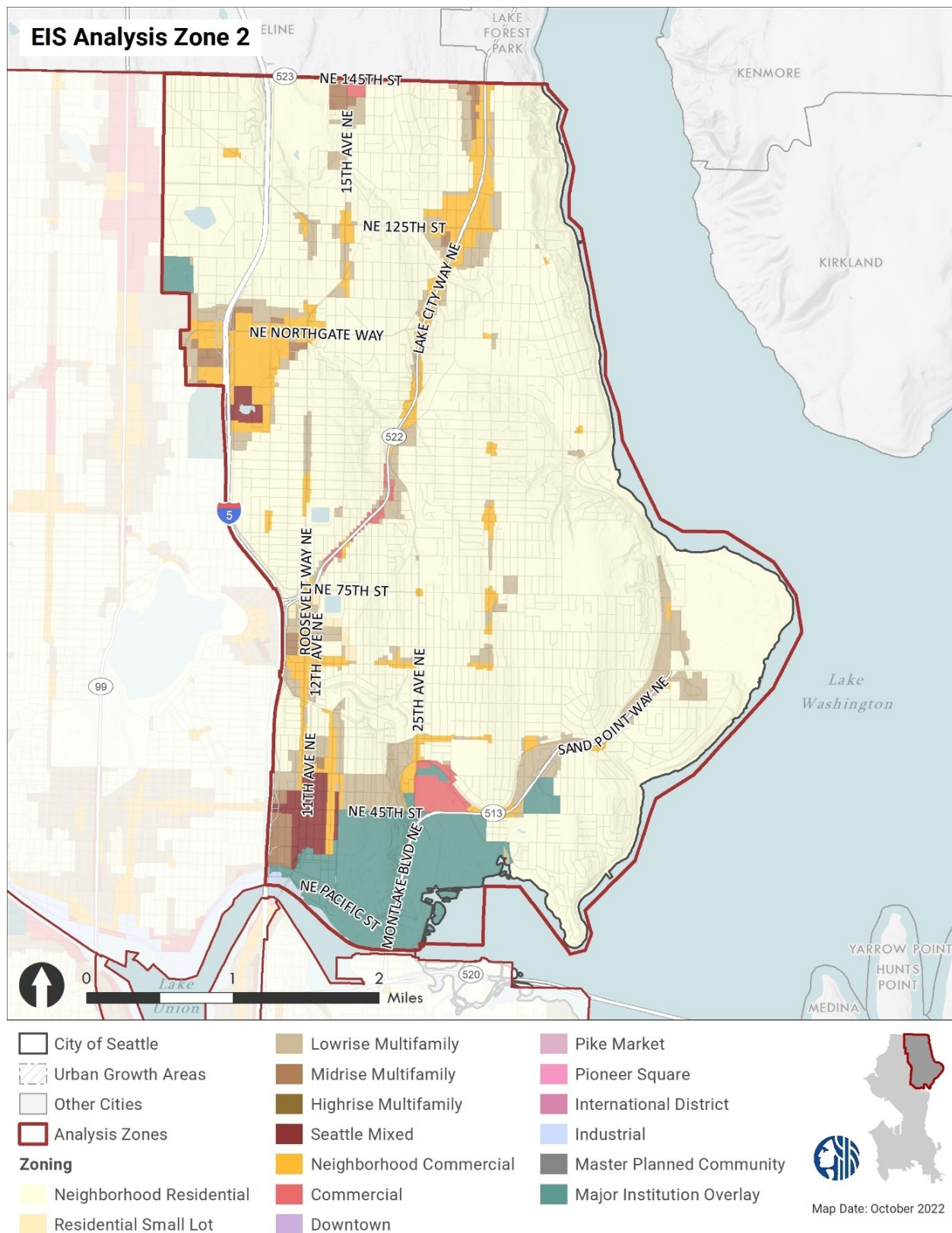
Additionally, there are four neighborhood plans within the NE Seattle Analysis Area. These are enabled by the Seattle 2035 Vision to have dense urban villages where there is enhanced access to transit and amenities. The neighborhood plans in this analysis area include North Neighborhoods (Lake City), Northgate, Roosevelt, and the University Community. These neighborhood plans include specific goals relating to land use, transportation, human services, utilities, community building, parks and open space, and community character.

Exhibit 3-65. NE Seattle Analysis Area—Future Land Use Designations



Source: City of Seattle, 2022; BERK, 2022.

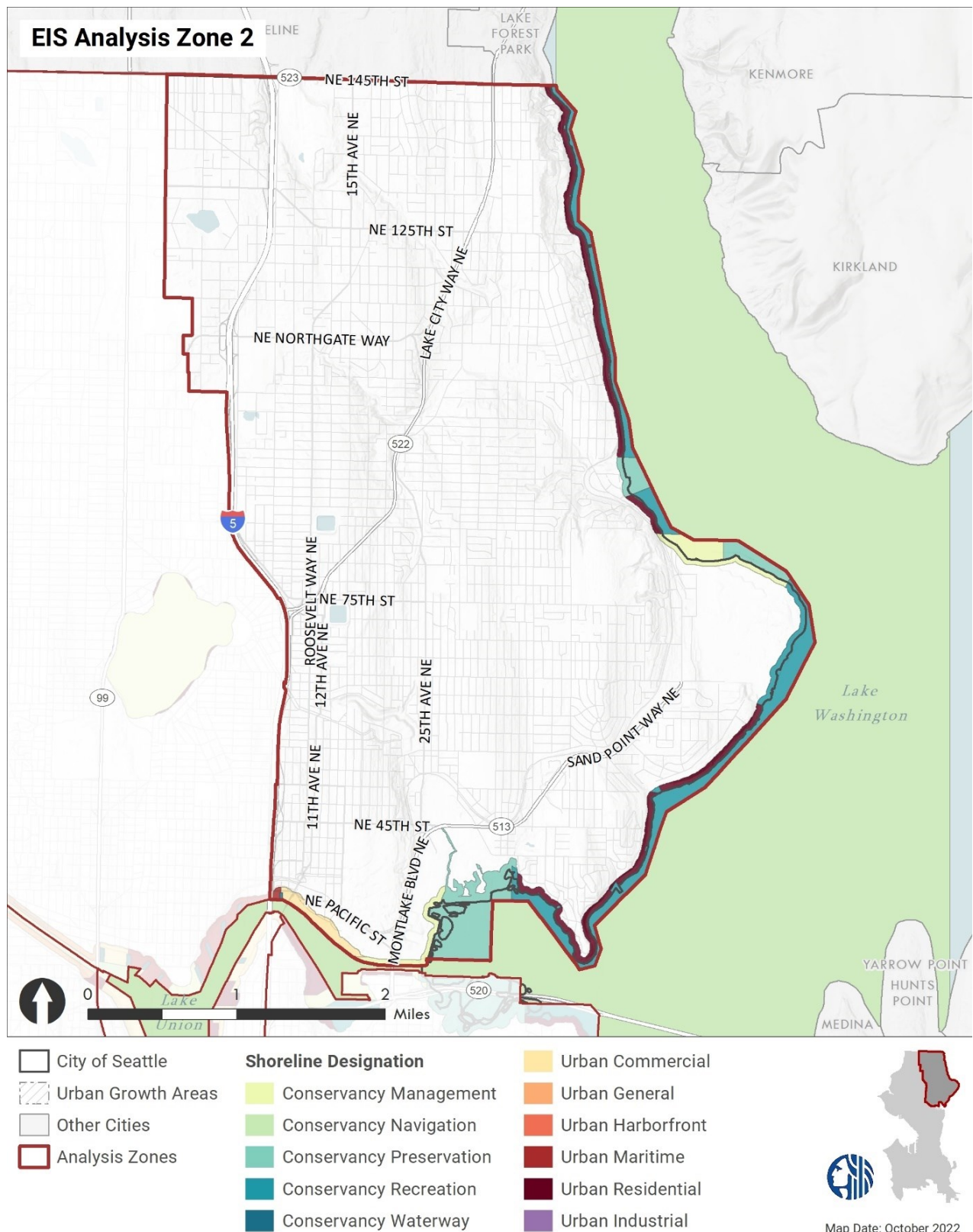
Exhibit 3-66. NE Seattle Analysis Area—Zoning



Source: City of Seattle, 2022; BERK, 2022.

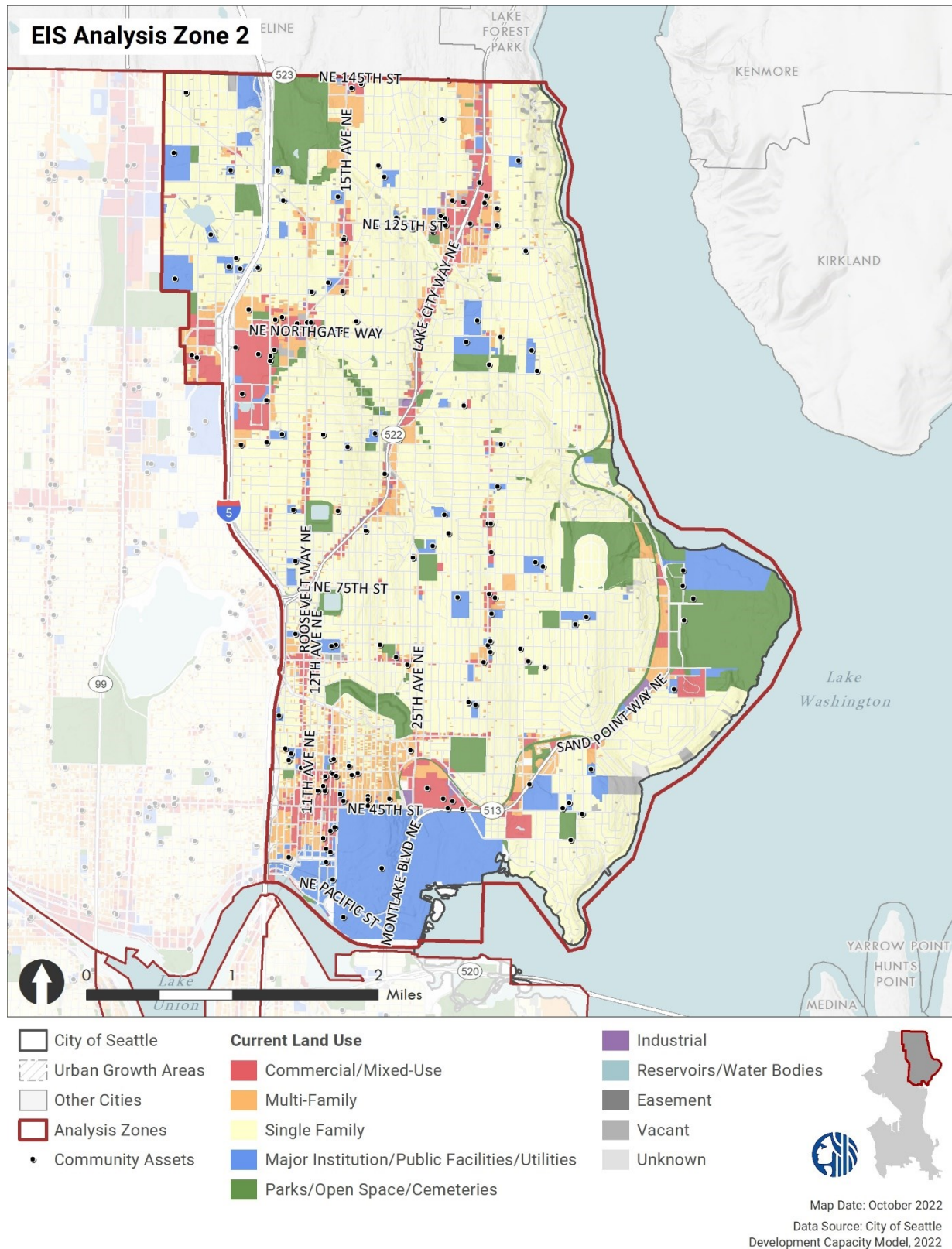


Exhibit 3-67. NE Seattle Analysis Area—Shoreline Designations



Source: City of Seattle, 2022; BERK, 2022.

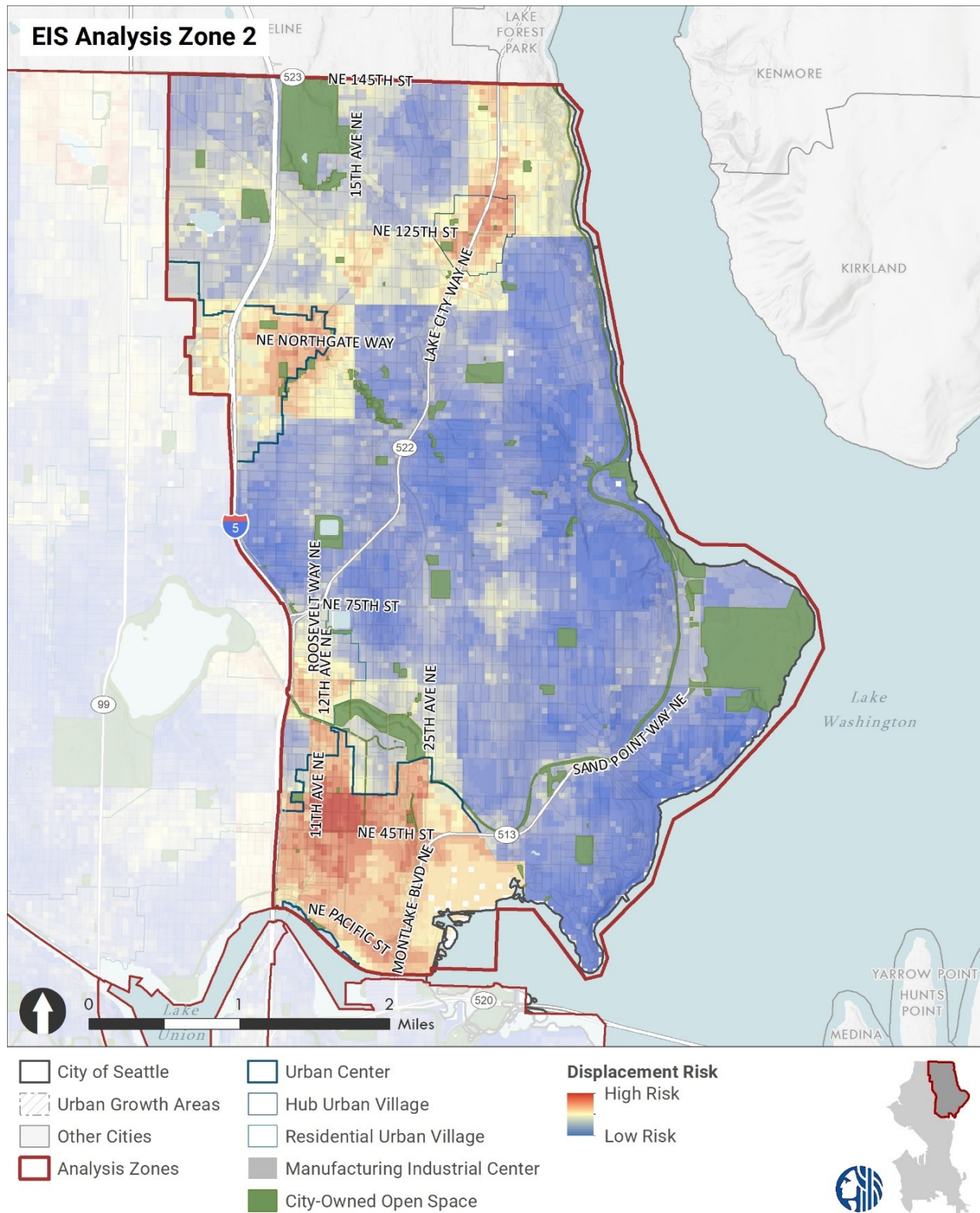
Exhibit 3-68. NE Seattle Analysis Area—Current Land Use



Source: City of Seattle, 2022; BERK, 2022.



Exhibit 3-69. NE Seattle Analysis Area—Displacement Risk



Source: City of Seattle, 2022; BERK, 2022.

Queen Anne/Magnolia (Analysis Zone 3)

The Queen Anne/Magnolia Seattle Analysis Area includes the portion of Seattle that is west of State Route 99, north of Denny Way, and south of the Lake Washington Ship Canal except for the lands included in the Ballard Interbay Industrial Manufacturing Center (BINMIC). It includes approximately 4,075 acres of buildable lands, or 10% of the buildable lands citywide including the Uptown Urban Center and the Upper Queen Anne Residential Urban Village. See Exhibit 3-51 and Exhibit 3-71.

Topography plays a role in future land use designations within this analysis area. The crest of the Magnolia and Queen Anne neighborhoods support commercial/mixed uses and multi-family residential uses along a primary commercial corridor. Magnolia's commercial and mixed-use core is centered at the intersection of 32<sup>nd</sup> Ave W and W McGraw St, streets that both carry a collector arterial designation. The Upper Queen Anne commercial core is organized along Queen Anne Ave N, a minor arterial street whereas the Uptown neighborhood is organized along Mercer St, a principal arterial. Multi-family residential uses are located at the foot of both hills, buffering the neighborhood residential areas from the industrial uses in the BINMIC. See Exhibit 3-47 and Exhibit 3-70.

The Queen Anne/Magnolia Seattle Analysis Area includes 1,772 acres of designated shorelines, or 24% of the shoreline citywide. Nearly three quarters of the shoreline is within a conservancy shoreline environment, including Conservancy Management (9.5%) east of the Ballard Locks and on both sides of the Smith Cove Waterway, Conservancy Navigation (7.9%) along the Lake Washington Ship Canal, and a mix of Conservancy Preservation (34.7%) and Conservancy Recreation (19%) following the shoreline along the Magnolia neighborhood. Another 17.4% are designated Urban Industrial on the north shore of the Lake Washington Ship Canal and surrounding Smith Cove Waterway and 5.5% designated as Urban Maritime (near Fisherman's Terminal). See Exhibit 3-57 and Exhibit 3-72.

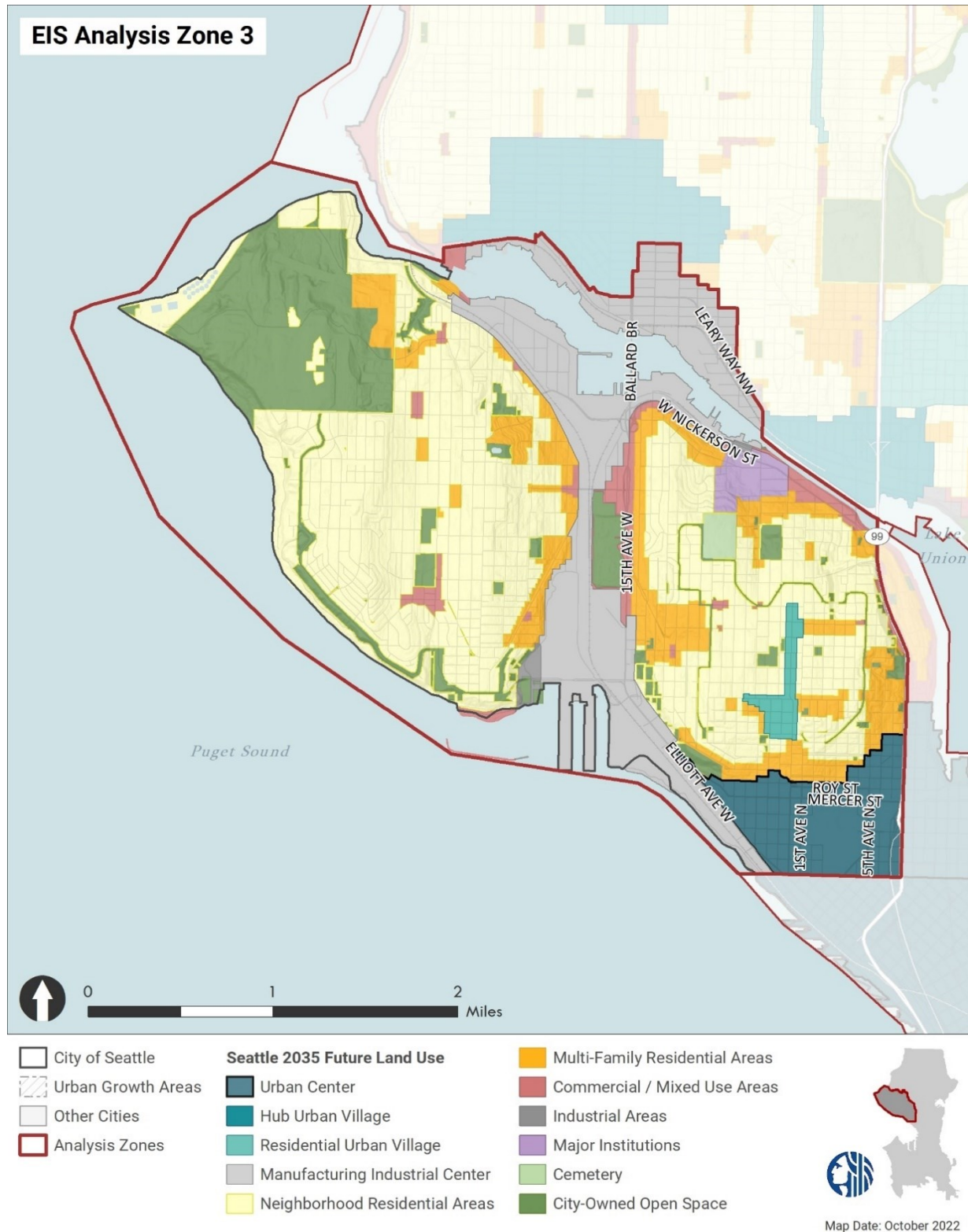
The largest existing land use category is single family residential which accounts for 35.3% of existing uses versus 47.7% citywide. Major institutions, public facilities, and utilities account for 12% of the existing land uses primarily due to the presence of the BINMIC and Seattle Pacific University. A higher share of commercial/mixed land uses is present in the study area (13%) compared to the 8% citywide. The commercial and mixed uses are centered in the Uptown Urban Center and the Upper Queen Anne Residential Urban Village with a smaller portion allocated in the Magnolia Village along the W McGraw St commercial corridor. The mixed-use context in the Urban Center/Urban Village is typified by four to five story residential buildings with ground floor retail and organized around a liner commercial corridor. Parks, open space, and cemeteries account for 20% of the land uses in the Queen Anne/Magnolia Seattle Analysis Area. The largest uses in this category include Discovery Park, Interbay Athletic Complex, Mt. Pleasant Cemetery, and neighborhood parks including David Rodgers, Smith Cove, and Ella Bailey Parks. See Exhibit 3-51 and Exhibit 3-73.

Displacement risk is low in the Queen Anne/Magnolia Seattle Analysis Area largely due to the lack of planned growth in Magnolia. It is highest in the edge of the Uptown Urban Center where there is a large band of multifamily housing buffering the single-family residential housing from the commercial/mixed use core. Development pressure and housing scarcity may lead to increased land acquisition resulting in an increased risk of displacement. See Exhibit 3-74.

There are two approved Street Concept Plans in the Queen Anne/Magnolia Seattle Analysis Area including: the Queen Anne Ave North Streetscape Concept Plan, and the Thomas Green Street Concept Plan. The Queen Anne Ave North Streetscape Concept Plan was enabled by Joint Director's Rule DPD 11-2009 / SDOT 7-2009 effective as of January of 2010. This streetscape concept plan provides conceptual design information for the six blocks of Queen Anne Avenue North from West McGraw Street to W Galer St in an effort to create a cohesive public as development occurs. The Thomas Green Street Concept Plan was enabled by Joint Director's Rule DPD9-2013 / SDOT03-2013 effective as of November of 2013. The streetscape concept plan provides greater predictability for stakeholders when making investments in City rights-of-way along the Thomas Street corridor. The concept plan identifies preferred public realm interventions to support and enhance the character of the street. See Exhibit 3-50.

There are two neighborhood plans within the Queen Anne/Magnolia Analysis Area. These are enabled by the Seattle 2035 Vision to have dense urban villages where there is enhanced access to transit and amenities. The neighborhood plans in this analysis area include the BINMIC, and Queen Anne (Uptown). These neighborhood plans include specific goals relating to land use, transportation, human services, utilities, community building, parks and open space, and community character.

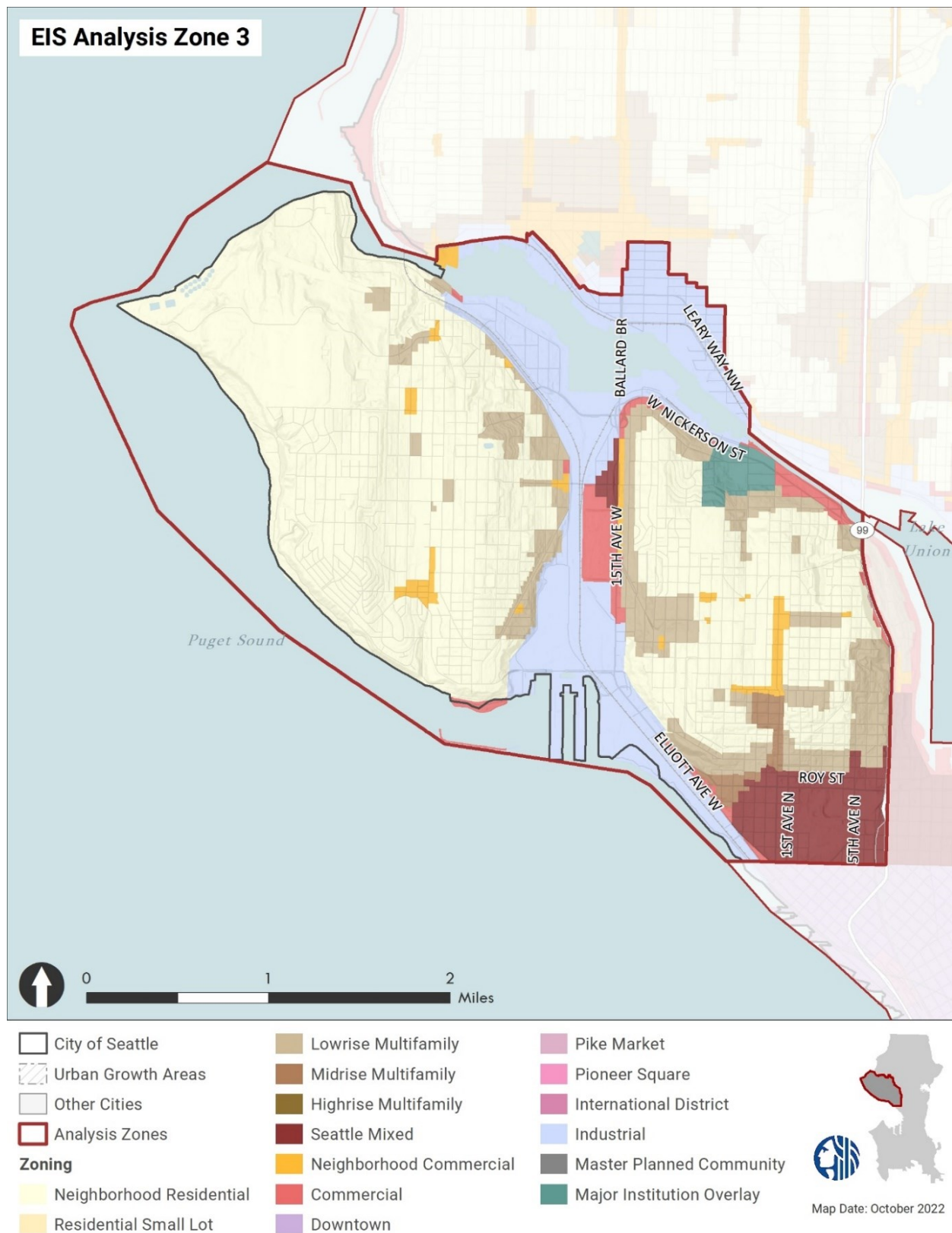
Exhibit 3-70. Queen Anne/Magnolia Analysis Area—Future Land Use Designations



Source: City of Seattle, 2022; BERK, 2022.

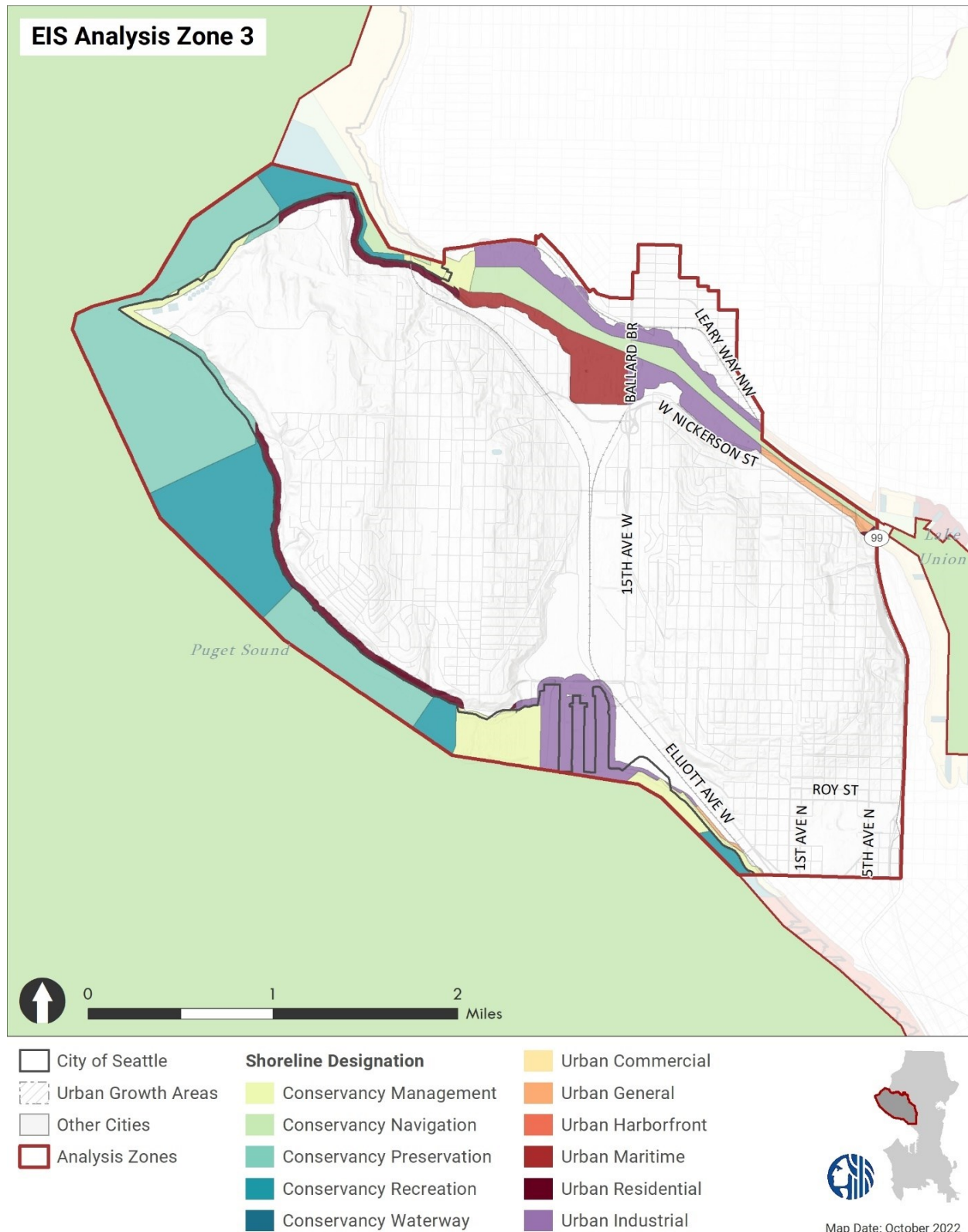


Exhibit 3-71. Queen Anne/Magnolia Analysis Area—Zoning



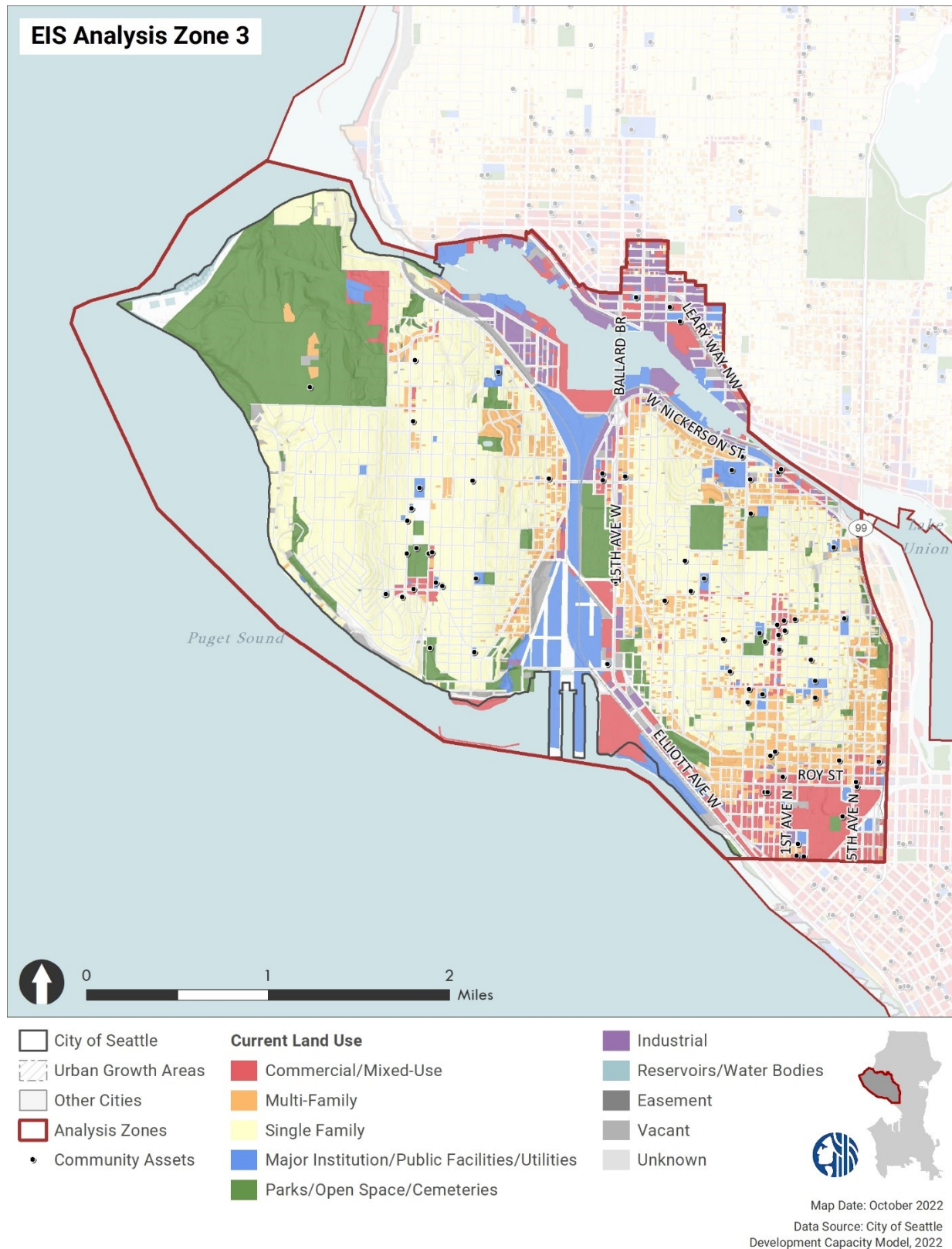
Source: City of Seattle, 2022; BERK, 2022.

Exhibit 3-72. Queen Anne/Magnolia Analysis Area—Shoreline Designations



Source: City of Seattle, 2022; BERK, 2022.

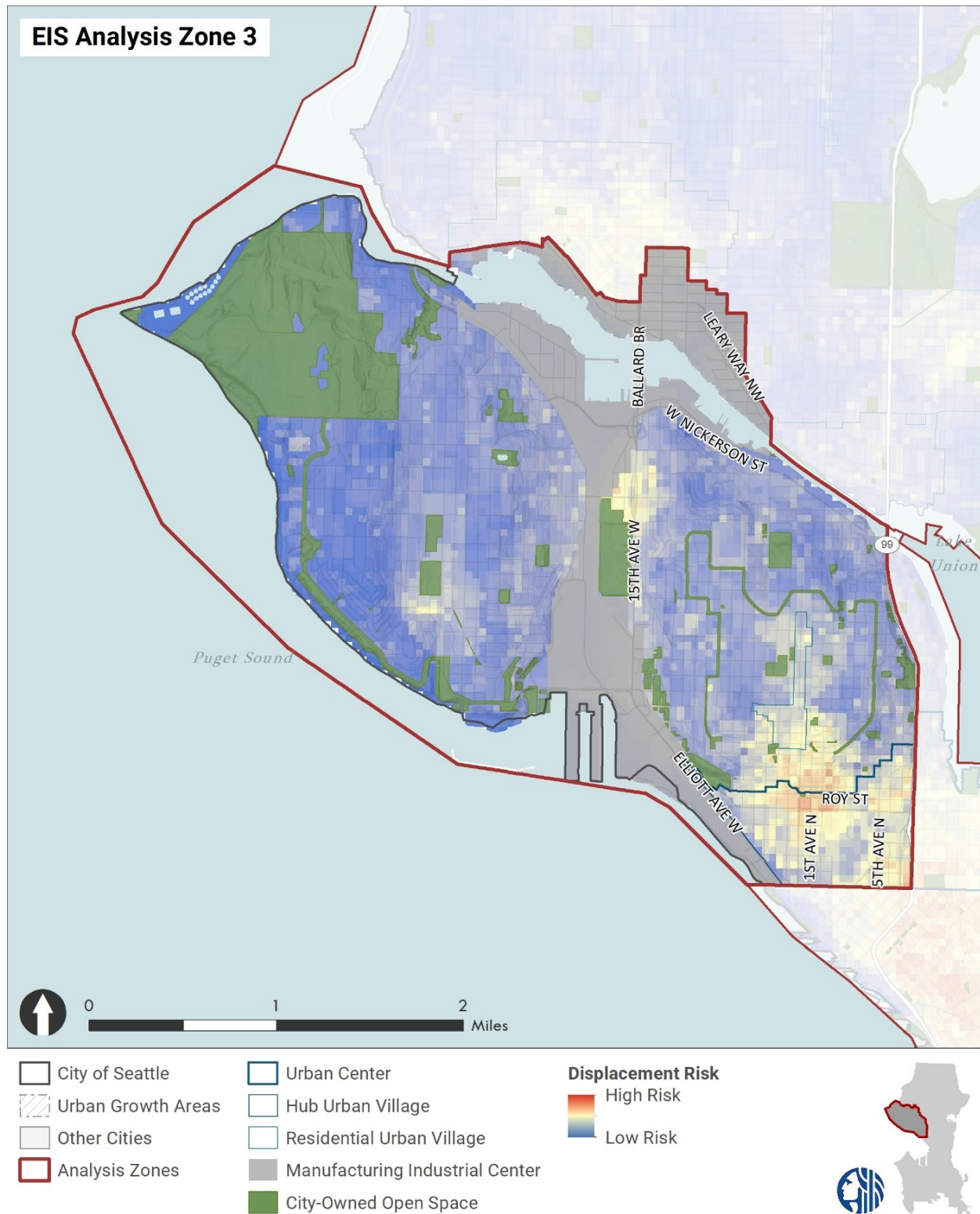
Exhibit 3-73. Queen Anne/Magnolia Analysis Area—Current Land Use



Source: City of Seattle, 2022; BERK, 2022.



Exhibit 3-74. Queen Anne/Magnolia Analysis Area—Displacement Risk



Source: City of Seattle, 2022; BERK, 2022.

Downtown/Lake Union (Analysis Zone 4)

The Downtown/Lake Union Analysis Area includes the portion of Seattle east of State Route 99, west of Interstate 5, and north of Interstate 90. The study area is also bounded by its shoreline fronting Elliott Bay and Lake Union. It includes approximately 1,033 acres of buildable lands, or 3% of the buildable lands city wide including the Downtown and South Lake Union Urban Centers, and the Eastlake Residential Urban Village. See Exhibit 3-51 and Exhibit 3-78.

The future land use map for the Downtown/Lake Union Analysis Area shows four distinct land uses. The Downtown Urban Center, South Lake Union Urban Centers, and Eastlake Residential Urban Village account for nearly 90% of planned uses. Denny Way, a principal arterial street, separates the Downtown Urban Center from the South Lake Union Urban Center. The remaining commercial/mixed use, and multifamily uses are located east of Aurora Ave N and north of Galer street in the Westlake neighborhood. Commercial uses are concentrated along Westlake Ave N and Aurora Ave N, both principal arterial streets, with multifamily residential future land use and zoning designations filling in the intervening areas. See Exhibit 3-47 and Exhibit 3-75.

The Downtown/Lake Union Analysis Area includes 390 acres of designated shorelines representing a 5% share citywide. Less than 10% of the existing shoreline is within a conservancy shoreline environment. A majority of the shoreline is designated Urban Commercial (41%) lining a majority of Lake Union from the Aurora Bridge to Lake Union Drydocks, followed by Urban Harborfront (33%) fronting Elliott Bay, Urban Marine (9%) in the southeastern corner of Lake Union, and Urban Residential (7%) on the eastside of Lake Union. See Exhibit 3-57 and Exhibit 3-77.

The largest existing land use category is commercial/mixed use which accounts for 62.1% of existing uses versus 8.4% citywide. Downtown and South Lake Union make up the commercial and financial center of Seattle and houses its densest and tallest commercial and mixed-use buildings. The commercial and mixed uses are centered in the Downtown and South Lake Union Urban Centers with a smaller portion of multifamily uses centered in the Belltown and Eastlake neighborhoods. The Eastlake Residential Urban Village has a main commercial corridor along Eastlake Ave E, which is buffered by multifamily and single family uses. Major institutions, public facilities, and utilities account for 8.6% of the existing land uses in the study area. These uses include the Seattle City Light Denny Substation, King County Courthouse, Administration, and Detention facilities, and the Washington State Convention Center. Parks, open space, and cemeteries account for only 4% of the land uses in the Downtown/Lake Union Analysis Area compared to 13.7% citywide. The largest uses in this category include Lake Union Park, Denny Park, Cascade Playground, and part of the newly rehabilitated waterfront along Elliot Bay. See Exhibit 3-51 and Exhibit 3-78.

Displacement risk is relatively high in the Downtown/Lake Union Analysis Area. The communities in Eastlake and Westlake are at lower risk of displacement, but still show low to moderate risk due to the proximity to Downtown. The Pioneer Square, Chinatown International District, and Little Saigon neighborhoods are at high risk of displacement. Some of the key factors that contribute to this high displacement risk rating is the underdeveloped urban form as compared to its zoned capacity, a higher concentration of communities of color, and low household incomes. See Exhibit 3-79.

There are seven approved Street Concept Plans in the Downtown/Lake Union Analysis Area including: the Pontius Ave N Street Design Concept Plan, the Maynard Avenue South and South Lane Street Streetscape Concept Plan, Pike and Pine Streetscape Concept Plan, Westlake and 7<sup>th</sup> Streetscape concept Plan, Terry Ave N Street Design Guidelines, South Lake Union Street Concept Plan, and the Denny Way Streetscape Concept Plan. See Exhibit 3-50.

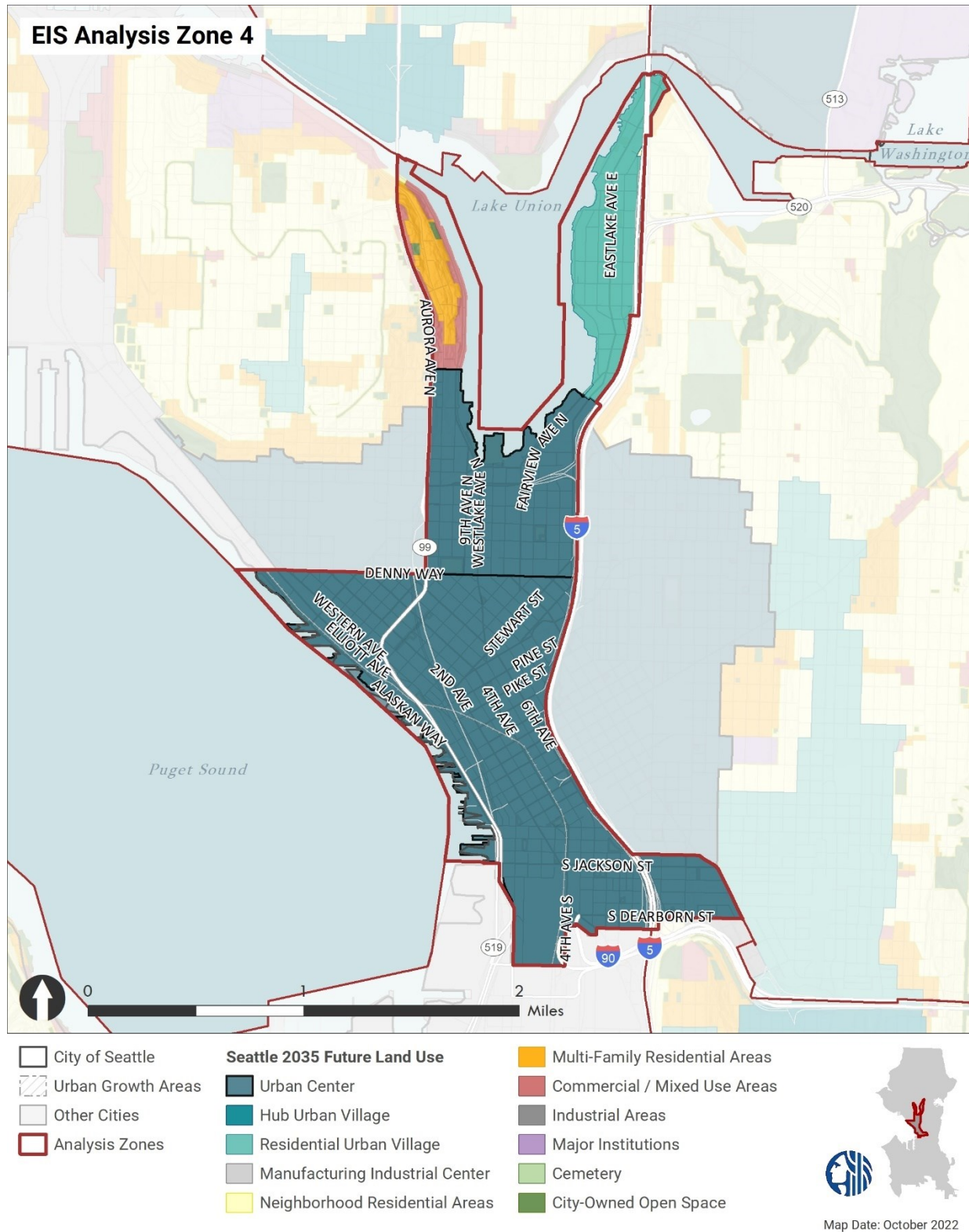
- The Pontius Ave N Street Design Concept Plan was enabled by Joint Director's Rule DPD 9-2015 / SDOT 02-2015 effective as of August of 2015. The Pontius Ave N Street Design Concept Plan focuses on Pontius Ave N between Republican St and John St. Recommendations in the plan include pedestrian realm enhancements including street lighting and street trees along the Cascade Playground and increasing the visibility of the intersection of John Street and Pontius Avenue. Paving materials from the Denny Substation public space are recommended to be continued through the John St and Pontius Ave N intersection to establish a visual connection between the neighborhood and new substation public space.
- The Maynard Avenue South and South Lane Street Streetscape Concept Plan was enabled by Joint Director's Rule DPD 12-2010 / SDOT 4-2010 effective as of September of 2010. This streetscape concept plan provides greater predictability for stakeholders when making investments in the City rights-of-way on Maynard Ave S and S Lane St. The principal objectives of this plan is to enhance the livability and augment existing open spaces by investing in the public realm.
- The Pike and Pine Streetscape Concept Plan was enabled by Joint Director's Rule SDOT DR 03-08 / DPD DR 20-2008 / SPU DR 06-2008 / SCL DR 01 effective as of May of 2009. The Conceptual Design Plan provides greater predictability for stakeholders when making investments in City rights-of-way. The conceptual design establishes a consistent design framework and identifies preferred interventions, balancing the needs of pedestrians, motorists and services in the Pike & Pine Corridor from First to Fourth Avenues.
- The Westlake and 7<sup>th</sup> Streetscape Concept Plan was enabled by Joint Director's Rule DPD 4-2013 / SDOT 01-2013 effective as of May of 2013. The Westlake and 7<sup>th</sup> Streetscape Concept Plan outlines ideal urban design treatments and establishes a uniform design framework to support and improve the corridor's pedestrian-oriented character.
- The Terry Ave N Street Design Guidelines enabled by SDOT DR 2002-04 / DPD DR 15-2002 effective as of June of 2005. As South Lake Union grows, the Terry Avenue North Street Design Guidelines act as a catalyst to promote high caliber public and private investment. The Design Guidelines define aspects that balance the needs of drivers, pedestrians, and services while establishing a coherent design framework.
- The South Lake Union Street Concept Plan was enabled by Joint Director's Rule DPD7-2013 / SDOT05-2013 effective as of November of 2013. The South Lake Union Streetscape Concept Plans have as one of their objectives to assist in identifying the suitable design interventions, roadway configuration, and facilities that will enable the neighborhood street network to operate as a functional hierarchy. The concept designs aid in defining the extent and character of such possible improvements, and newly codified zoning restrictions also contain incentives for private developments to contribute to streetscape improvements.
- The Denny Way Streetscape Concept Plan was enabled by Joint Director's Rule DPD10-2013 / SDOT02-2013 effective as of November of 2013. Denny Way has served as a northern edge of downtown and is often regarded as a substantial boundary between the Belltown, Uptown, South Lake Union and Denny



Triangle neighborhoods. The concept plan establishes a consistent design framework and identifies preferred urban design treatments and public realm interventions, balancing the multimodal needs of transit users along the Denny Way corridor.

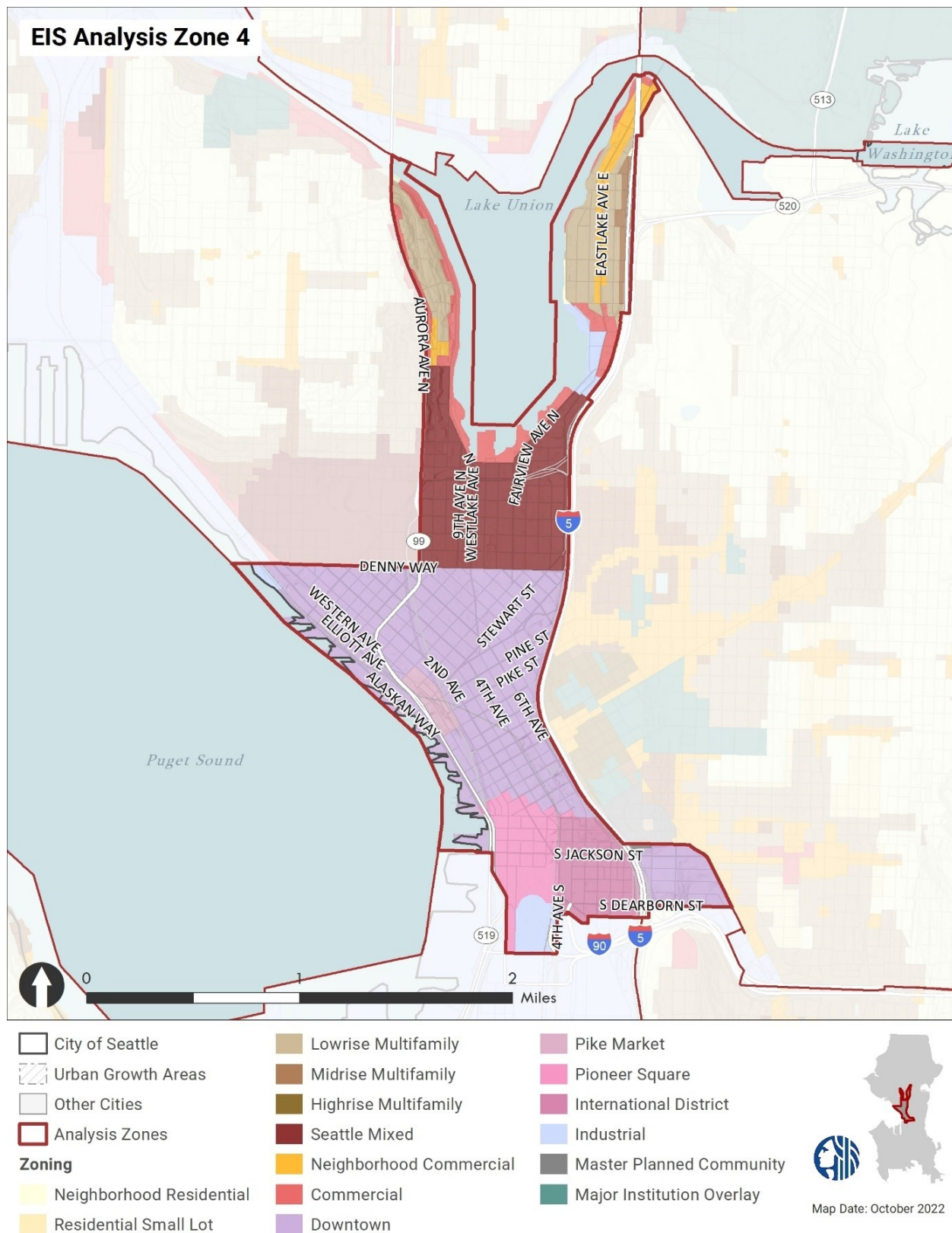
There are three neighborhood plans within the Downtown/Lake Union Analysis Area. These are enabled by the Seattle 2035 Vision to have dense urban villages where there is enhanced access to transit and amenities. The neighborhood plans in this analysis area include Downtown, Eastlake, and South Lake Union. These neighborhood plans include specific goals relating to land use, transportation, human services, utilities, community building, parks and open space, and community character.

Exhibit 3-75. Downtown/Lake Union Analysis Area—Future Land Use Designations



Source: City of Seattle, 2022; BERK, 2022.

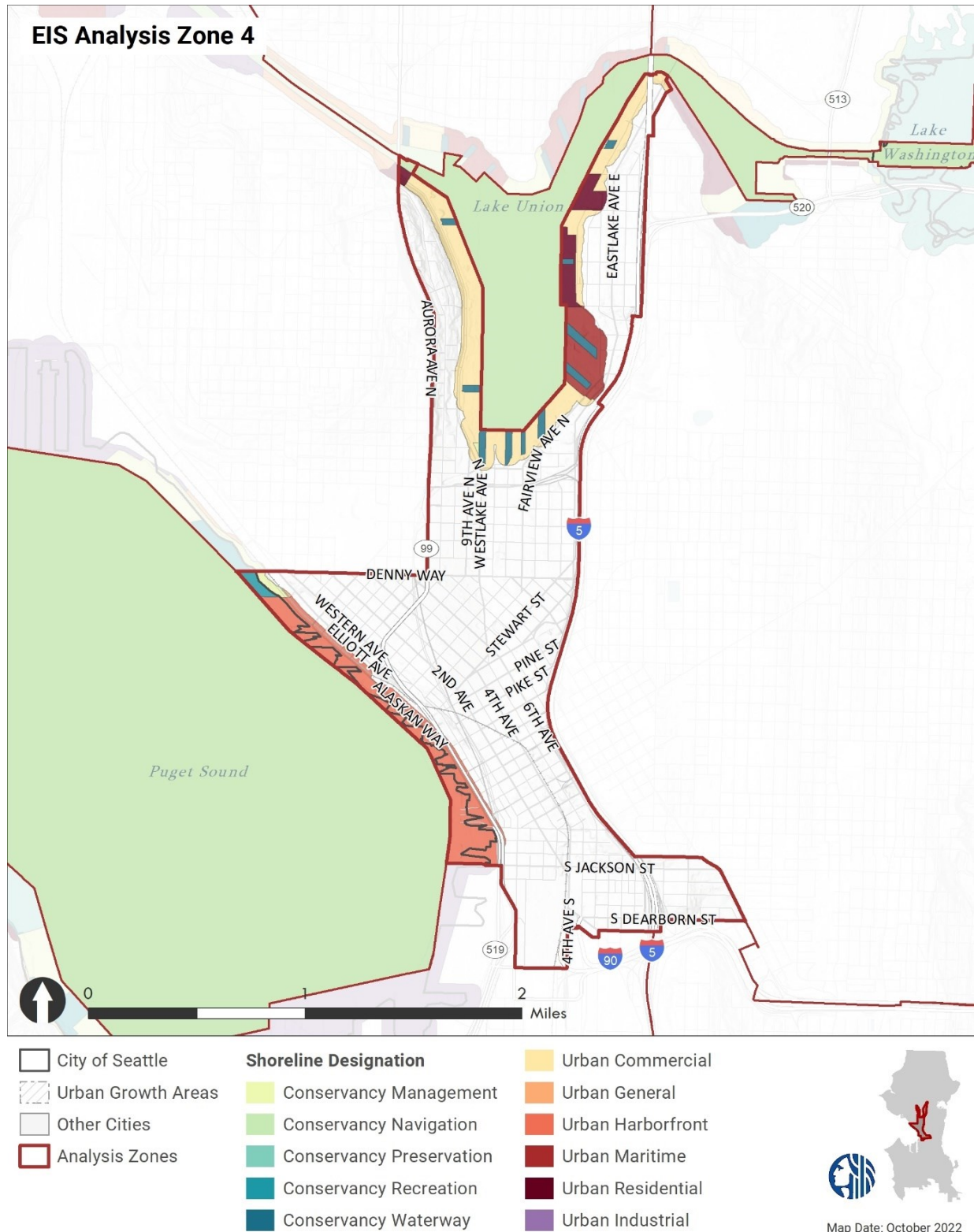
Exhibit 3-76. Downtown/Lake Union Analysis Area—Zoning



Source: City of Seattle, 2022; BERK, 2022.

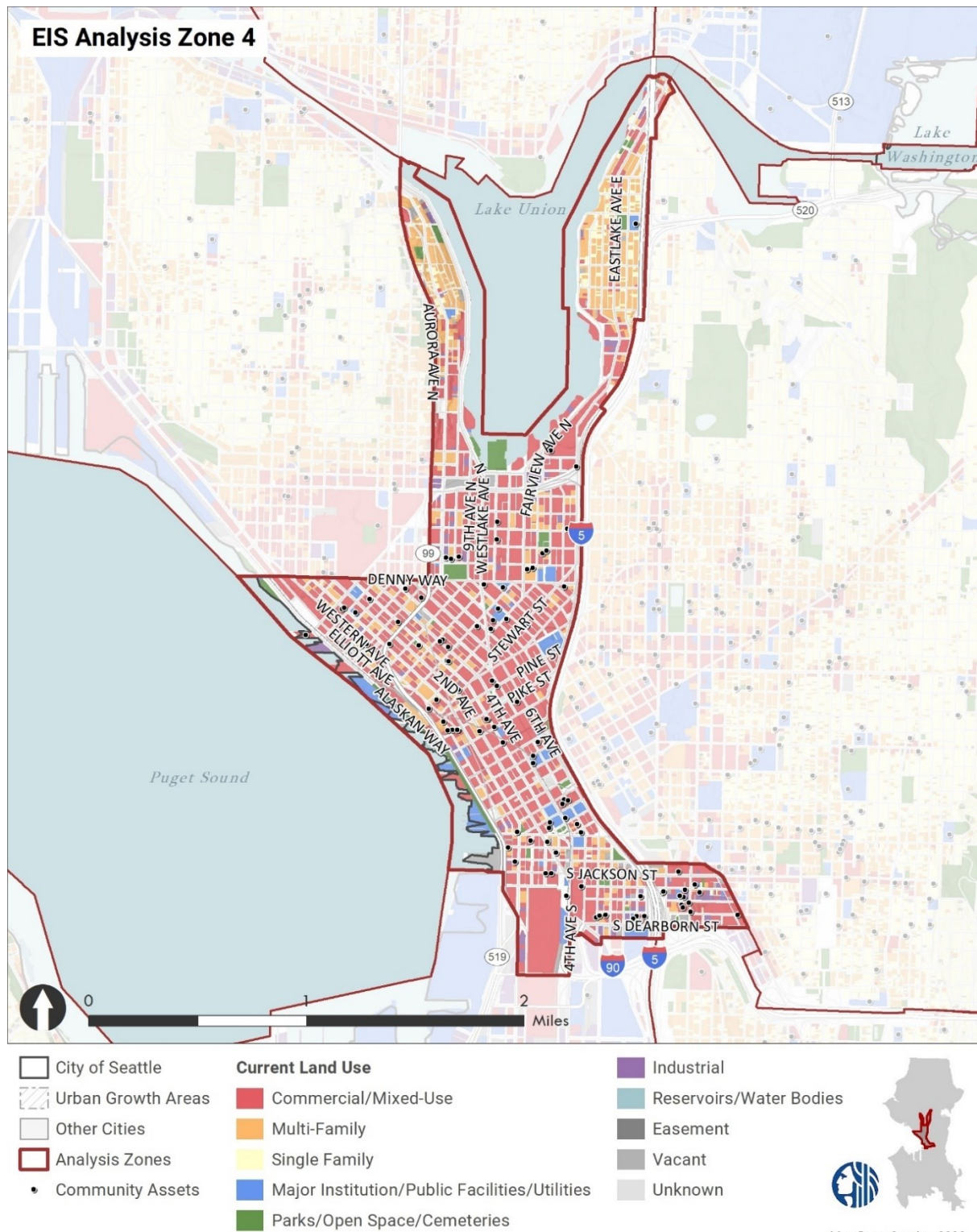


Exhibit 3-77. Downtown/Lake Union Analysis Area—Shoreline Designations



Source: City of Seattle, 2022; BERK, 2022.

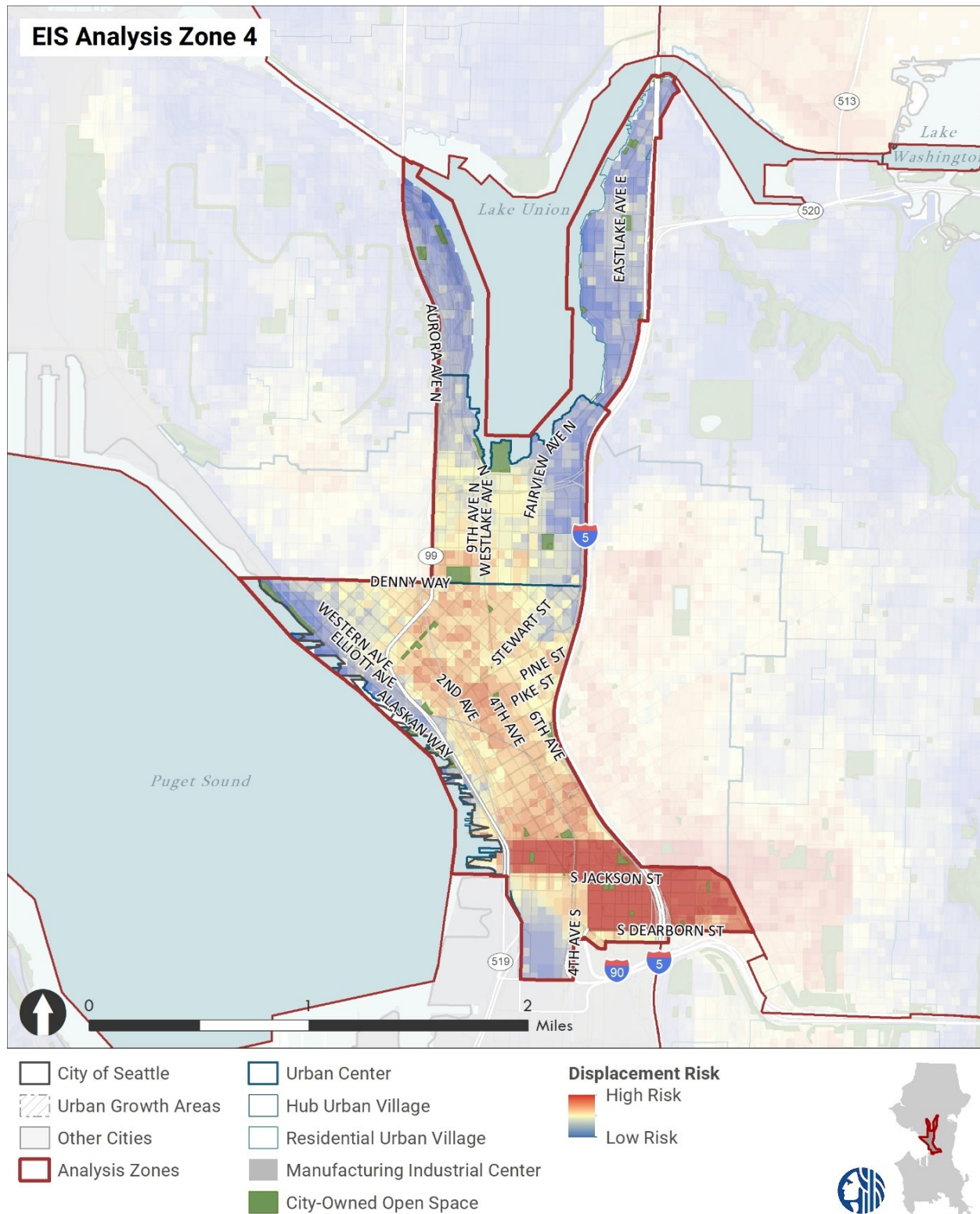
Exhibit 3-78. Downtown/Lake Union Analysis Area—Current Land Use



Source: City of Seattle, 2022; BERK, 2022.



Exhibit 3-79. Downtown/Lake Union Analysis Area—Displacement Risk



Source: City of Seattle, 2022; BERK, 2022.



Capitol Hill/Central District (Analysis Zone 5)

The Capitol Hill/Central District Analysis Area includes the portion of Seattle east of Interstate 5, north of Interstate 90, and south of the Montlake Cut. The study area is also bounded by its shoreline fronting Portage Bay and Lake Washington. It includes approximately 3,332 acres of buildable lands, or 8% of the buildable lands city wide including the First Hill/Capitol Hill Urban Center, and the 23<sup>rd</sup> & Union-Jackson and Madison-Miller Residential Urban Villages. See Exhibit 3-51 and Exhibit 3-83.

The Urban Center and Urban Village designations indicate where growth is to be concentrated in the future land use map. The First Hill/Capitol Hill Urban Center, and the 23<sup>rd</sup> & Union-Jackson and Madison-Miller Residential Urban Villages are oriented along E Madison Street running diagonally southwest to northeast and 23<sup>rd</sup> Ave E running north-south through the analysis area. Outside of the Urban Center/Urban Village boundaries, future multifamily residential and commercial/mixed uses are planned along these principal arterial streets. There is a small major institutions pocket between the First Hill/Capitol Hill Urban Center and the 23<sup>rd</sup> and Union-Jackson Residential Urban Village where Seattle University is located. Neighborhood residential future land use designations fill in the intervening areas. See Exhibit 3-47 and Exhibit 3-80.

The Capitol Hill/Central District Analysis Area includes 513 acres of designated shorelines representing a 7% share citywide. Nearly three quarters of the shoreline is within a conservancy shoreline environment, including Conservancy Management (11.9%) within the inner harbor of Portage Bay, Conservancy Preservation (31.2%) where Foster Island meets Union Bay, and Conservancy Recreation (31.9%) along the eastern frontage of the study area along Lake Washington. Another 23.9% are designated Urban Residential predominantly along the shoreline of Lake Washington. See Exhibit 3-57 and Exhibit 3-82.

The largest existing land use category is single family residential which accounts for 45.5% of existing uses versus 47.7% citywide. The commercial and mixed uses are centered in the First Hill/Capitol Hill Urban Center, and the 23<sup>rd</sup> & Union-Jackson and Madison-Miller Residential Urban Villages. This neighborhood has an 18.4% share of multi-family residential which is more than double of the proportion city wide (8.7%). Major institutions, public facilities, and utilities account for 6.5% of the existing land uses in the study area. These uses include Seattle University, Seattle Central College, Garfield Highschool, Bailey Gatzert Elementary, Thurgood Marshall Elementary, and the King County Juvenile Detention Center. Parks, open space, and cemeteries account for 18.1% of the land uses in the Capitol Hill/Central District Analysis Area compared to 13.7% citywide. The largest uses in this category include the Washington Park Arboretum, Volunteer Park, Cal Anderson Park, Frink Park, and Powell Barnett Park. See Exhibit 3-51 and Exhibit 3-83.

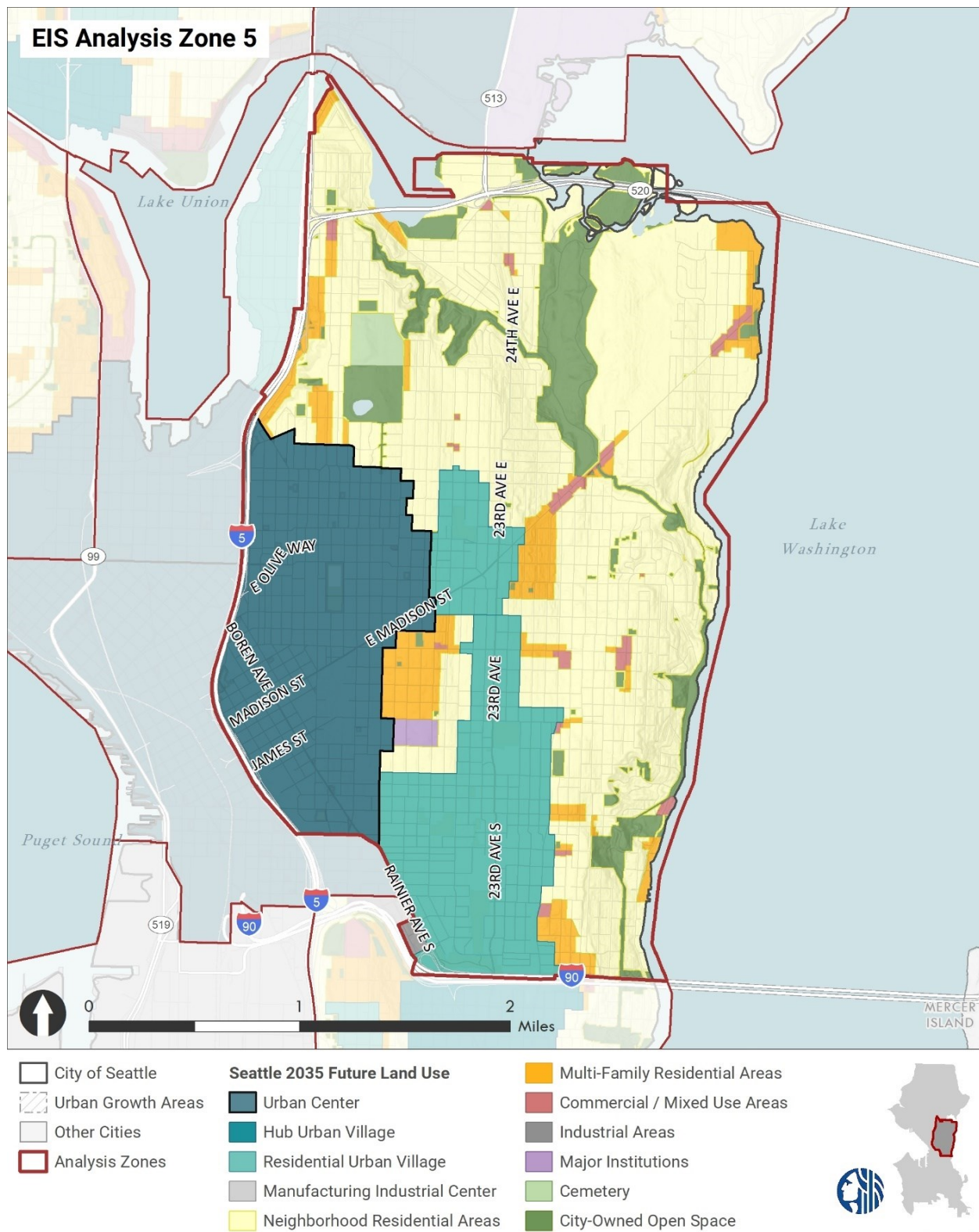
Displacement risk is moderate to high in the First Hill/Capitol Hill Urban Center, and the 23<sup>rd</sup> & Union-Jackson and Madison-Miller Residential Urban Villages. The communities in Madison Park and Madrona are at lower risk of displacement, but still show a low to moderate risk due to the proximity to the urban center boundary. Some of the key factors that contribute to this high displacement risk rating is the underdeveloped urban form as compared to its zoned capacity, a higher concentration of communities of color, and a history of redlining and housing segregation. See Exhibit 3-84.

There are two approved Street Concept Plans in the Capitol Hill/Central District Analysis Area including the First Hill Public Realm Action Plan and the 10<sup>th</sup> & 11<sup>th</sup> Avenue Street Concept Plan. The First Hill Public Realm

Action Plan was enabled by Joint Director's Rule DPD 10-2015 / SDOT03-2015 effective as of August of 2015. This street concept plan includes strategies to expand the public space network for pedestrians, an integrated network of sidewalks, green streets, parks, and rest areas. The 10th & 11th Avenue Street Concept Plan was enabled by Joint Director's Rule DPD11-2013 / SDOT06-2013 effective as of November of 2013. This plan included specific recommendations relevant to the 10th and 11th Avenue corridor including adding curb bulbs to reduce pedestrian crossing distances, turning 10th and 11th Avenues into designated neighborhood green streets, improving pedestrian access across East Pine between the core area and Cal Anderson Park, and providing pedestrian scaled lighting. See Exhibit 3-50.

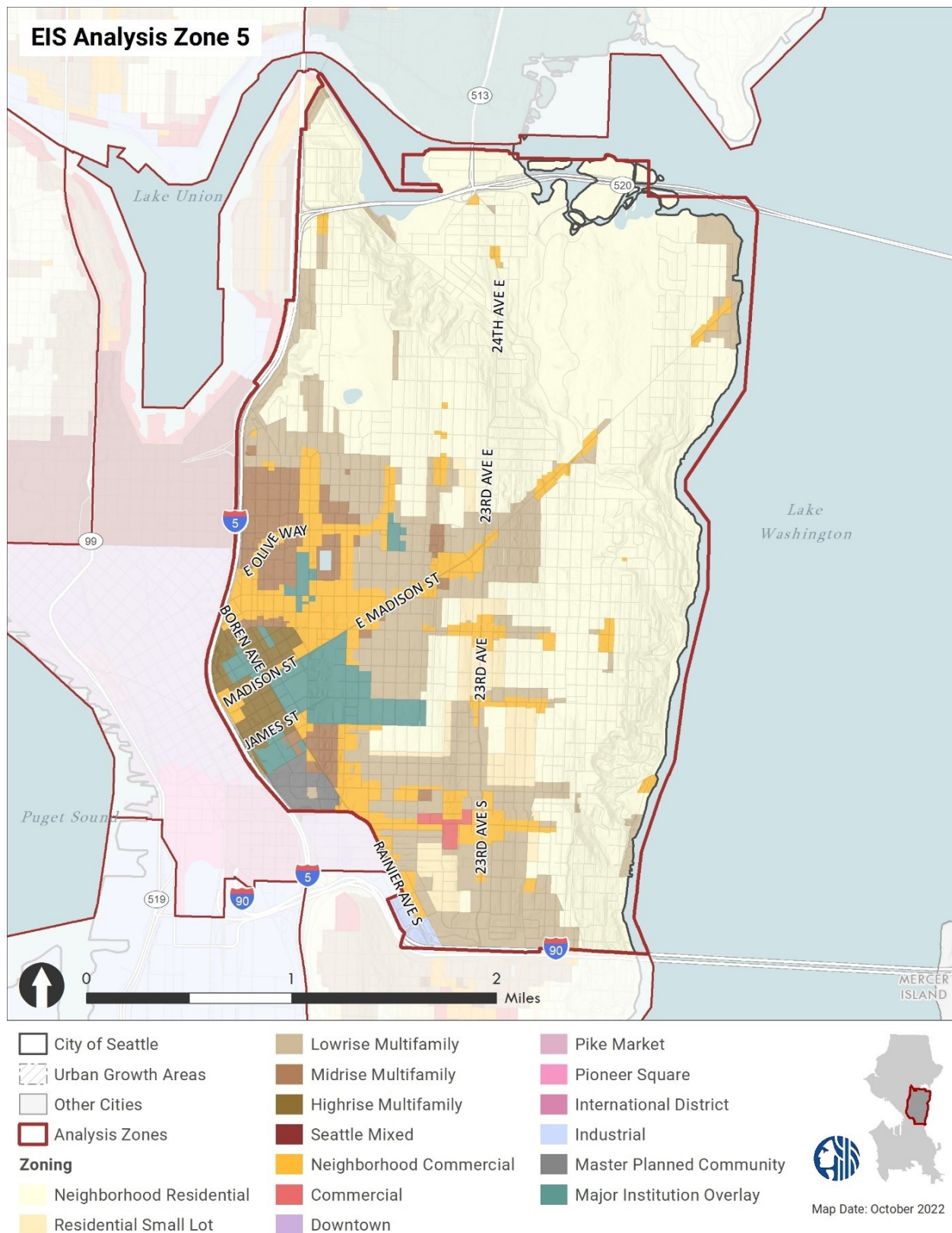
There are four neighborhood plans within the Capitol Hill / Central District Analysis Area. These are enabled by the Seattle 2035 Vision to have dense urban villages where there is enhanced access to transit and amenities. The neighborhood plans in this analysis area include Capitol Hill, Central Area, First Hill, and Pike/Pine. These neighborhood plans include specific goals relating to land use, transportation, human services, utilities, community building, parks and open space, and community character.

**Exhibit 3-80. Capitol Hill/Central District Analysis Area—Future Land Use Designations**



Source: City of Seattle, 2022; BERK, 2022.

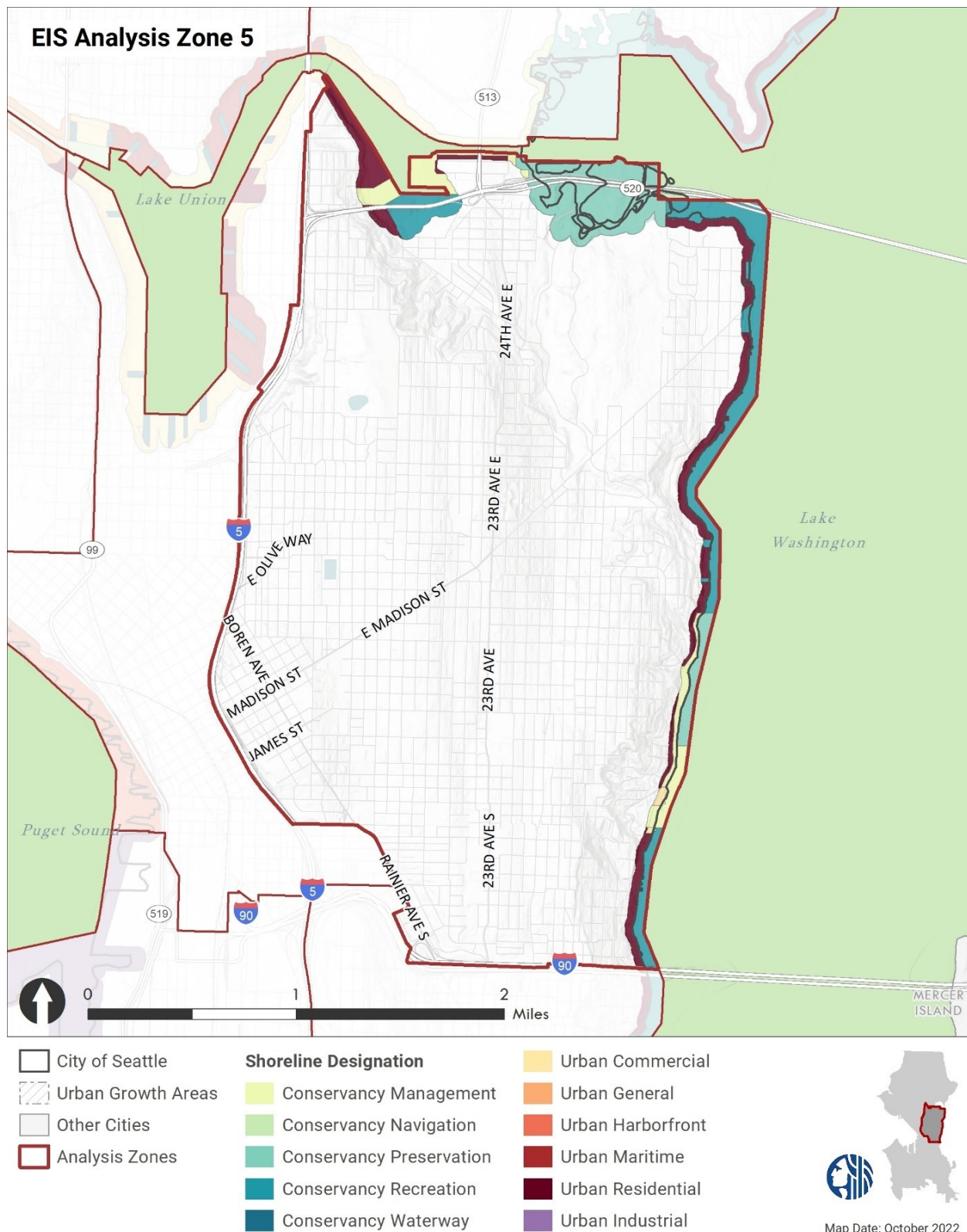
**Exhibit 3-81. Capitol Hill/Central District Analysis Area—Zoning**



Source: City of Seattle, 2022; BERK, 2022.

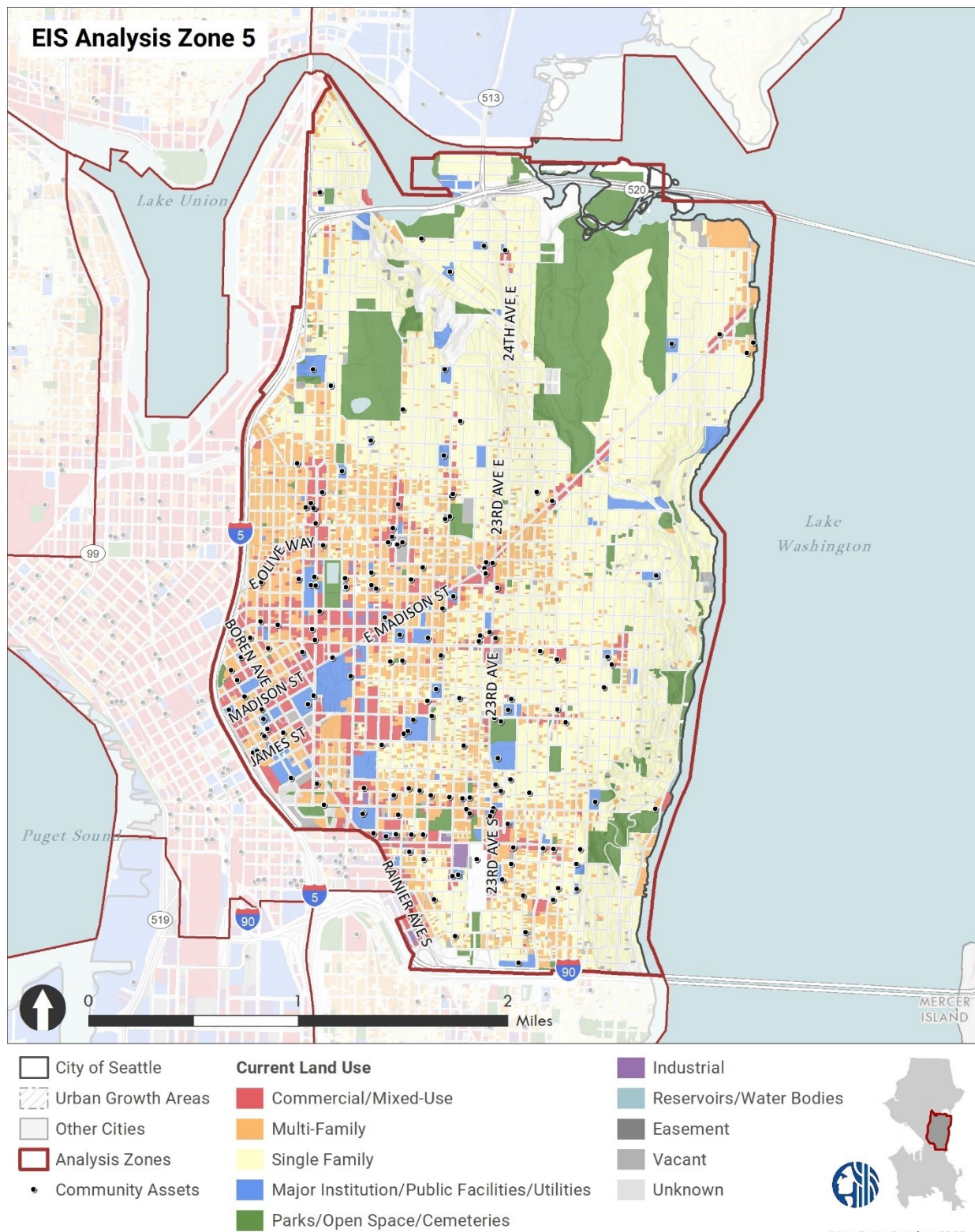


**Exhibit 3-82. Capitol Hill/Central District Analysis Area—Shoreline Designations**



Source: City of Seattle, 2022; BERK, 2022.

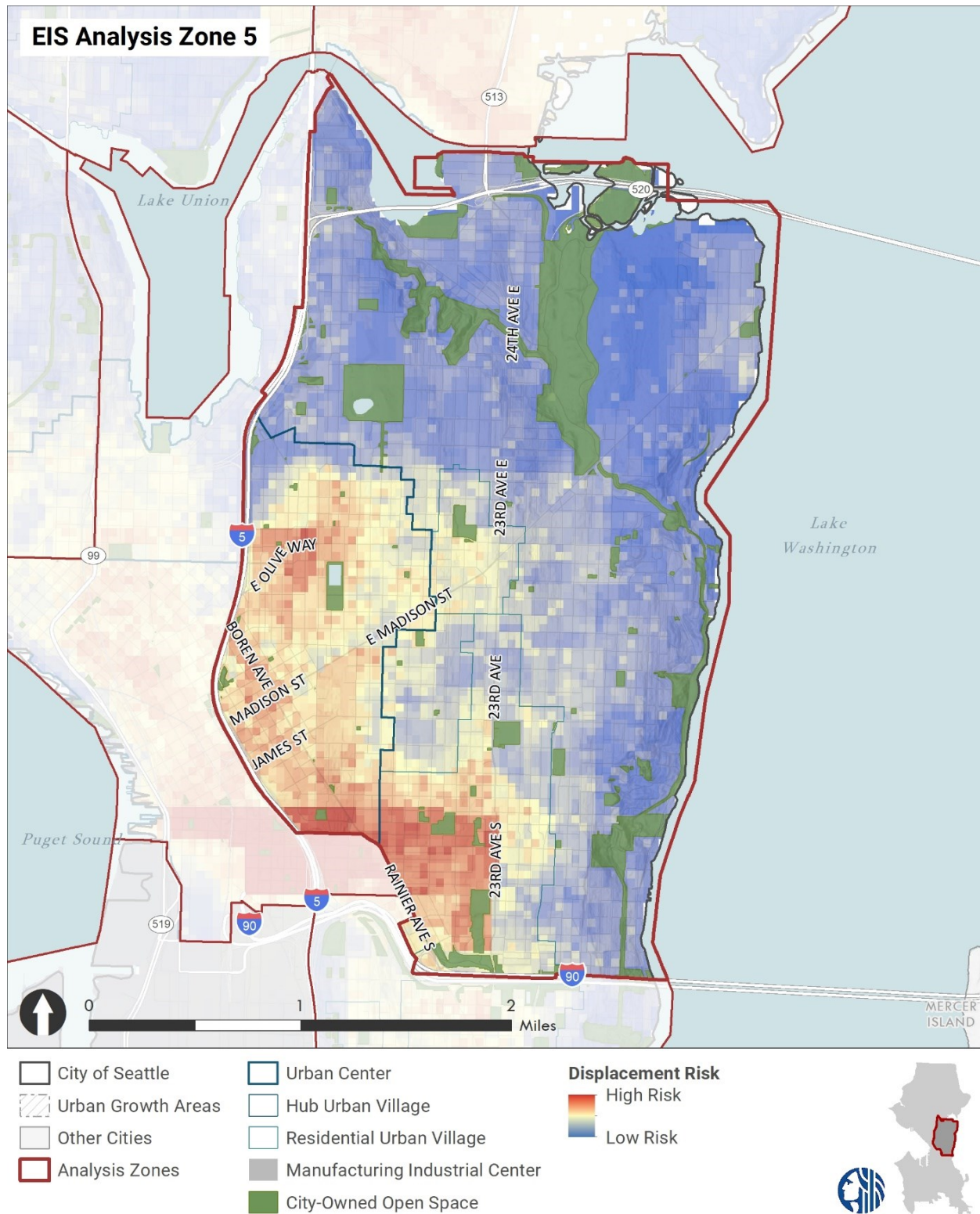
**Exhibit 3-83. Capitol Hill/Central District Analysis Area—Current Land Use**



Source: City of Seattle, 2022; BERK, 2022.



**Exhibit 3-84. Capitol Hill/Central District Analysis Area—Displacement Risk**



Source: City of Seattle, 2022; BERK, 2022.

W Seattle (Analysis Zone 6)

The W Seattle Analysis Area includes the portion of Seattle west of the Duwamish Waterway and State Route 509, north of SW Roxbury St, and is bounded by the Puget Sound at its western and northern extents. It includes approximately 6,411 acres of buildable land, or 16% of the buildable lands city wide. Additionally, the W Seattle Analysis Area includes the Westwood-Highland Park, Morgan Junction, and Admiral Residential Urban Villages as well as the West Seattle Junction Hub Urban Village. See Exhibit 3-51 and Exhibit 3-88.

Only 8% of the W Seattle Analysis Area has a future land use designation of either Residential or Hub Urban Village distributed between the Westwood-Highland Park, Morgan Junction, and Admiral Residential Urban Villages, and the West Seattle Junction Hub Urban Village. Outside of the Urban Villages, commercial, mixed-use, and multi-family future land use and zoning designations generally follow California Ave SW and Alki Ave SW (minor arterial streets), and Delridge Way SW and Fauntleroy Way SW (principal arterial streets). Neighborhood Residential future land use and zoning designations fill in the intervening areas accounting for 63% of future designated land uses. See Exhibit 3-53 and Exhibit 3-85.

The W Seattle Analysis Area includes 1,102 acres of designated shorelines, or 15% of the designated shorelines citywide. Nearly 85% are within a conservancy shoreline environment, including Conservancy Management (4%) on the northeastern shoreline fronting Elliott Bay, Conservancy Preservation (30.6%) on the northern edge of Alki Beach and surrounding Lincoln Park, and Conservancy Recreation (49.7%) on a majority of the eastern shoreline fronting the Puget Sound. Another 14.7% is designated as Urban Residential infilling between the public lands of Lincoln Park and Alki Beach. See Exhibit 3-57 and Exhibit 3-87.

The largest existing land use category is single family residential, which accounts for 59% of the land (versus 48% citywide). Major institutions and public facilities only account for 4.6% of the existing land uses versus the 10.7% share citywide. The largest uses in this category are educational institutions including the South Seattle College, Pathfinder K-8 School, Denny International Middle School, Madison Middle School and west Seattle Highschool. Parks, open space, and cemeteries account for an additional 18% due to the presence of the West Duwamish Greenbelt, West Seattle Golf Course, and Lincoln, Schmitz Preserve, and Fauntleroy Parks. The share of industrial land uses is lower in the W Seattle Analysis Area (.3%) compared to 5% citywide and is attributed to a public storage facility on the southern border of Seattle. Existing commercial, mixed-use, and multi-family uses, as well as a majority of the community assets, are located within the existing Urban Village boundaries oriented along California Ave SW. Commercial and mixed uses found within the Urban Village boundaries are typically medium density apartment buildings with ground floor commercial around a main commercial corridor that supports essential neighborhood amenities. California Ave SW still maintains a majority of its historic urban fabric supporting single story retail uses whereas the Westwood-Highland Park Residential Urban Village is comprised of newer, master planned big box development. Outside of the Urban Village boundaries, multifamily development is concentrated around the Alki Beach and Highpoint neighborhoods. See Exhibit 3-51 and Exhibit 3-88.

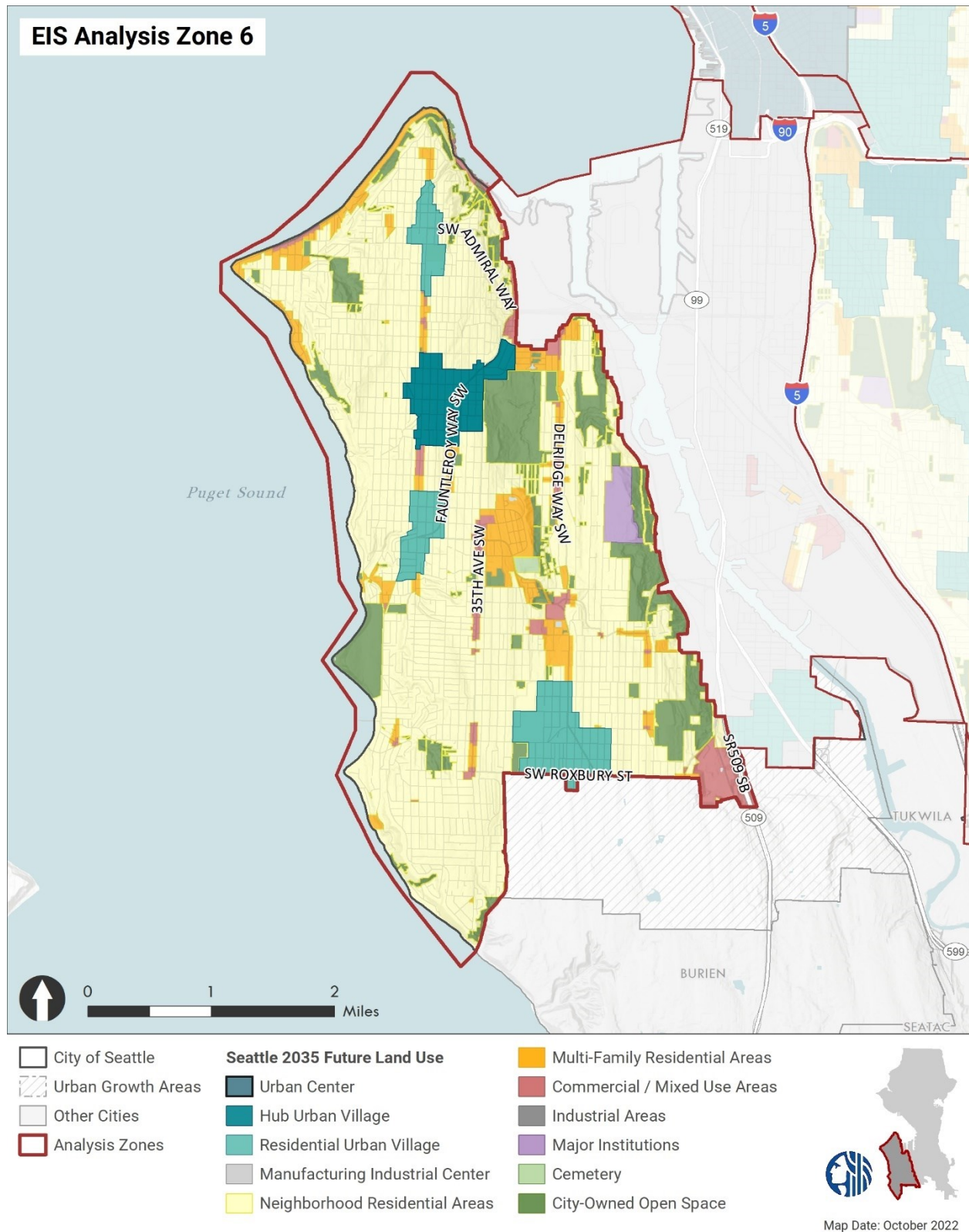
Displacement risk is low in a majority of the W Seattle Analysis Area. Displacement risk is highest in the Westwood-Highland Park Residential Urban Village and the Highpoint neighborhood. Highpoint is outside of an Urban Village boundary but is the largest contiguous neighborhood in the W Seattle Analysis Area that supports multifamily housing. Because of the existing growth strategies that concentrate commercial/mixed-

use development and multifamily development in relatively small, geographically confined, boundaries the market pressures are felt at an accelerated rate. See Exhibit 3-89.

The only street concept plan in the W Seattle Analysis Area is the West Seattle Triangle Streetscape Concept Plan. This plan was enabled by Joint Director's Rule DPD2-2012 / SDOT4-2012 effective as of February of 2012. The plan is focused on the triangle formed by Fauntleroy Ave SW, SW Alaska and 40th Ave SW, placing on establishing a framework that supports multi-modal transit, enhanced design guidelines for private development along the street frontages to enhance the pedestrian experience, and additional greening in the right-of-way. See Exhibit 3-50.

There are five neighborhood plans within the W Seattle Analysis Area. These are enabled by the Seattle 2035 Vision to have dense urban villages where there is enhanced access to transit and amenities. The neighborhood plans in this analysis area include Admiral, Delridge, Morgan Junction, West Seattle Junction, Westwood/Highland Park. These neighborhood plans include specific goals relating to land use, transportation, human services, utilities, community building, parks and open space, and community character.

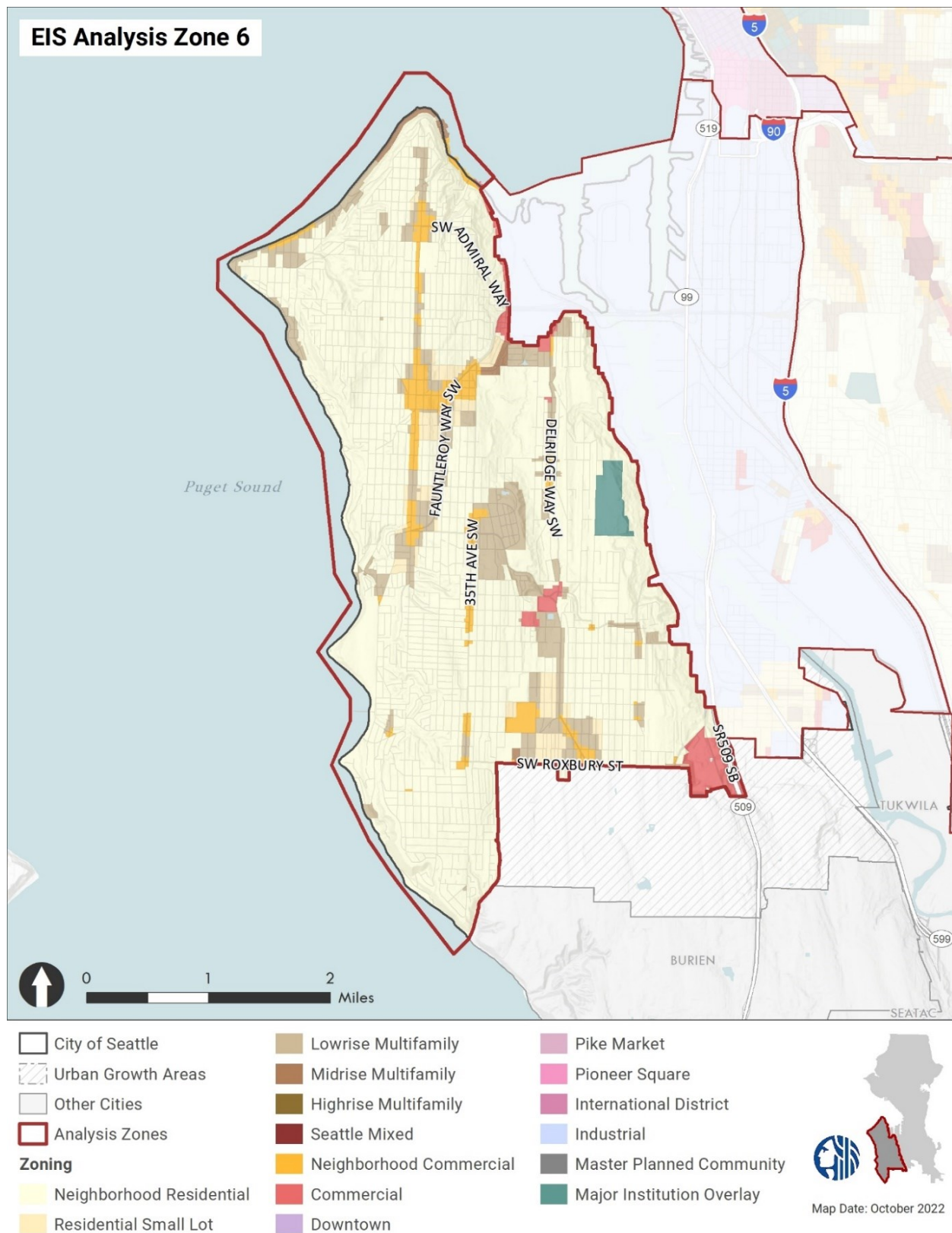
Exhibit 3-85. W Seattle Analysis Area—Future Land Use Designations



Source: City of Seattle, 2022; BERK, 2022.



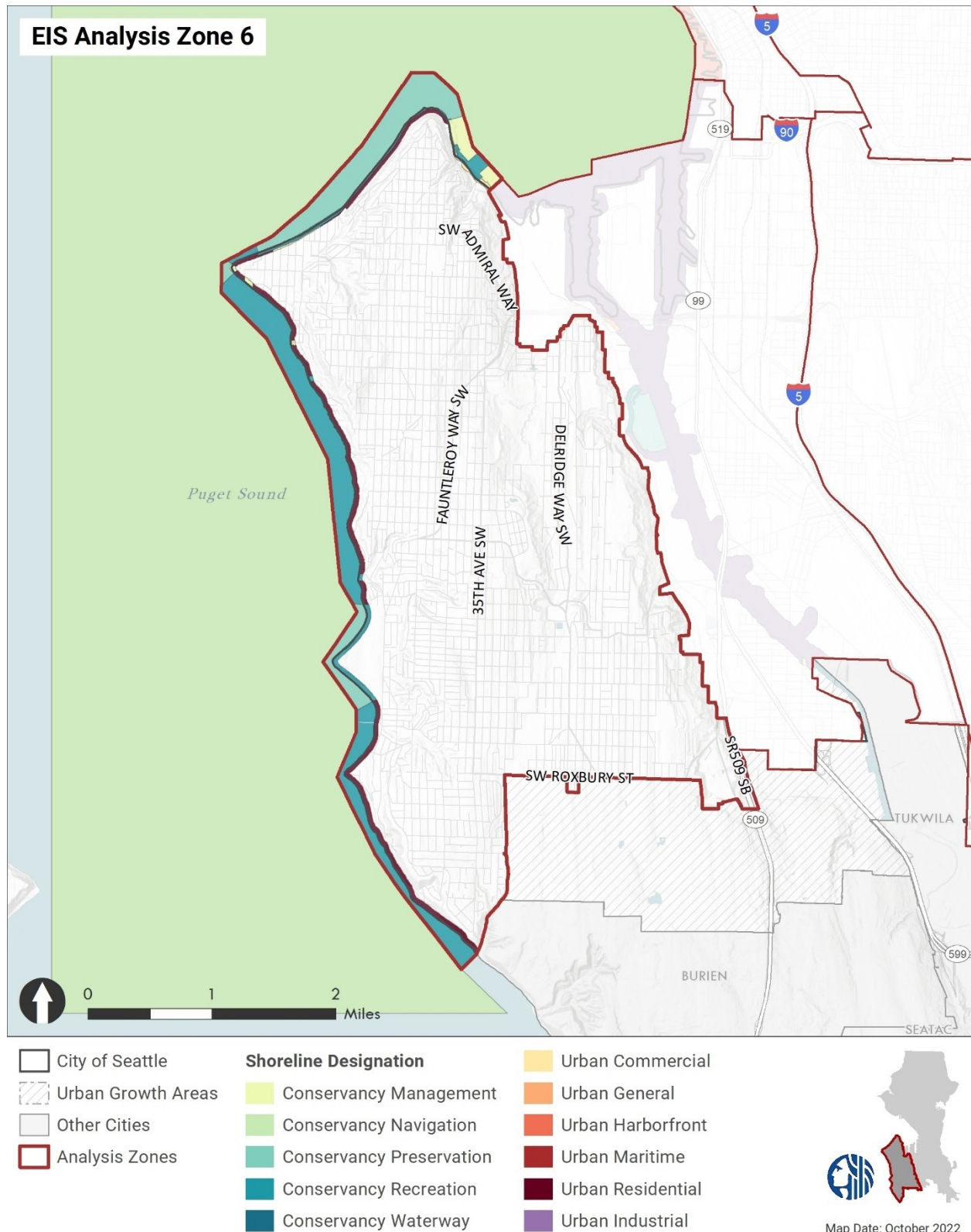
Exhibit 3-86. W Seattle Analysis Area—Zoning



Source: City of Seattle, 2022; BERK, 2022.

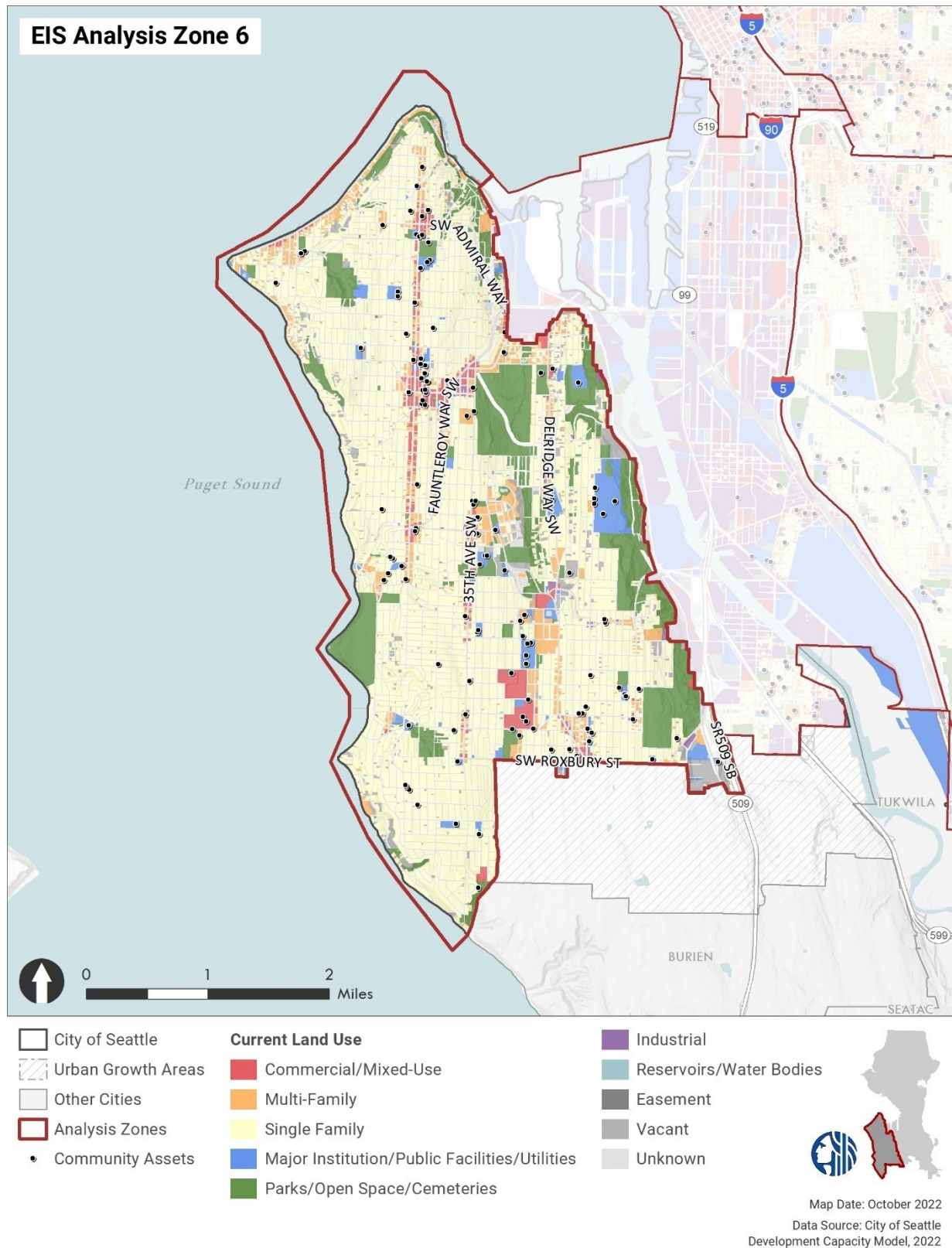


Exhibit 3-87. W Seattle Analysis Area—Shoreline Designations



Source: City of Seattle, 2022; BERK, 2022.

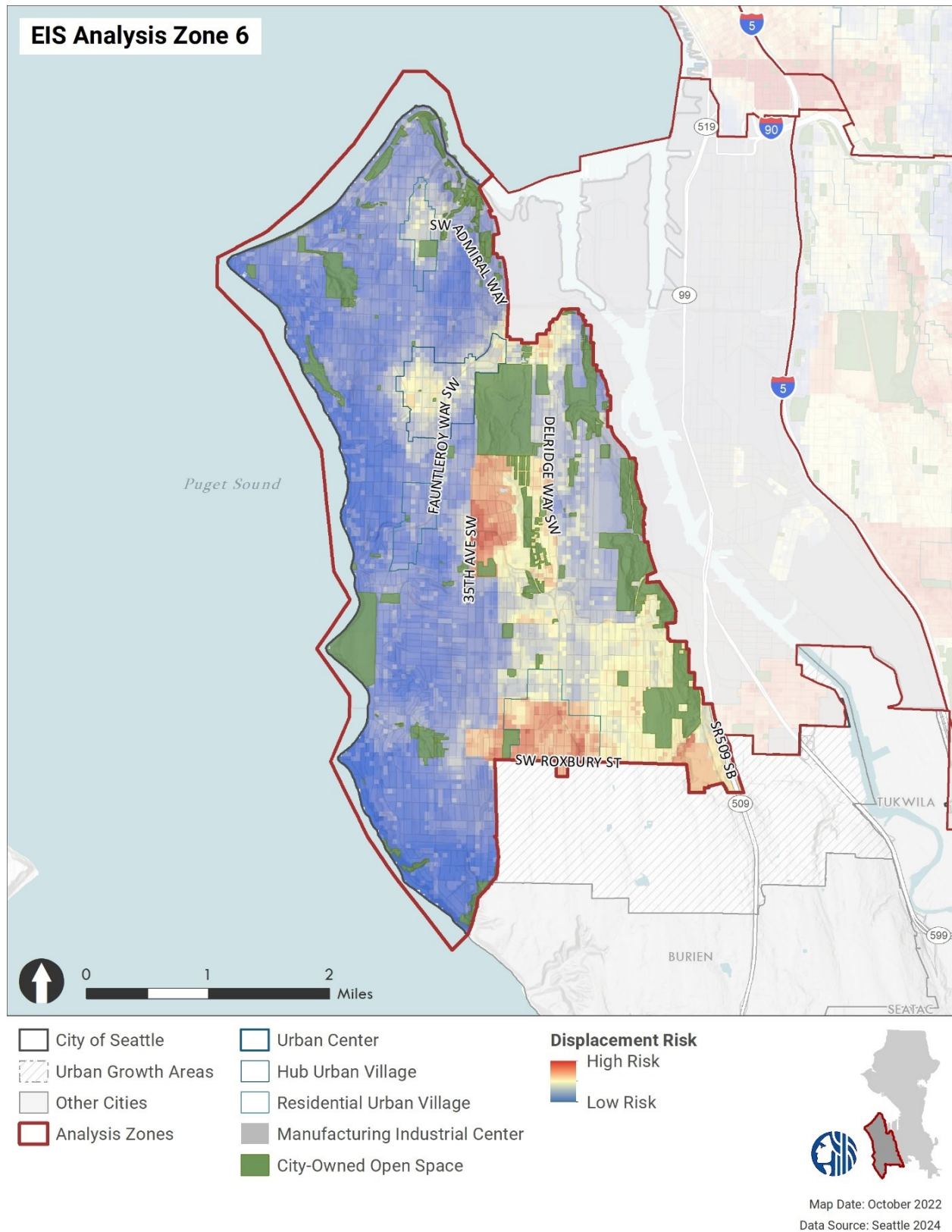
Exhibit 3-88. W Seattle Analysis Area—Current Land Use



Source: City of Seattle, 2022; BERK, 2022.



Exhibit 3-89. W Seattle Analysis Area—Displacement Risk



Source: City of Seattle, 2022; BERK, 2022.

Duwamish (Analysis Zone 7)

The Duwamish Analysis Area includes the portion of Seattle bordering the Duwamish Waterway west of Interstate 5, east of W Marginal Way SW, sharing its northern boundary with Elliott Bay. It includes approximately 4,056 acres of buildable land, or 10% of the buildable lands city wide. Additionally, the Duwamish Analysis Area includes the South Park Residential Urban Village and the Greater Duwamish Manufacturing Industrial Center. See Exhibit 3-51 and Exhibit 3-93.

Nearly 93% of the Duwamish Analysis Area has a future land use designation as a manufacturing industrial center. The remainder is allocated towards the South Park Urban Village at the southeastern corner of the analysis area, and the residential/commercial mix around the Van Asselt neighborhood in Georgetown. See Exhibit 3-53 and Exhibit 3-90.

The Duwamish Analysis Area includes 1,185 acres of designated shorelines, or 16% of the designated shorelines citywide. Nearly 95% are within the Urban Industrial designation, surrounding Harbor Island and spanning both side of the shoreline along the Duwamish Waterway. The remainder of the shoreline is within the Conservancy Preservation designation on the western shoreline adjacent to Kellogg Island. See Exhibit 3-57 and Exhibit 3-92.

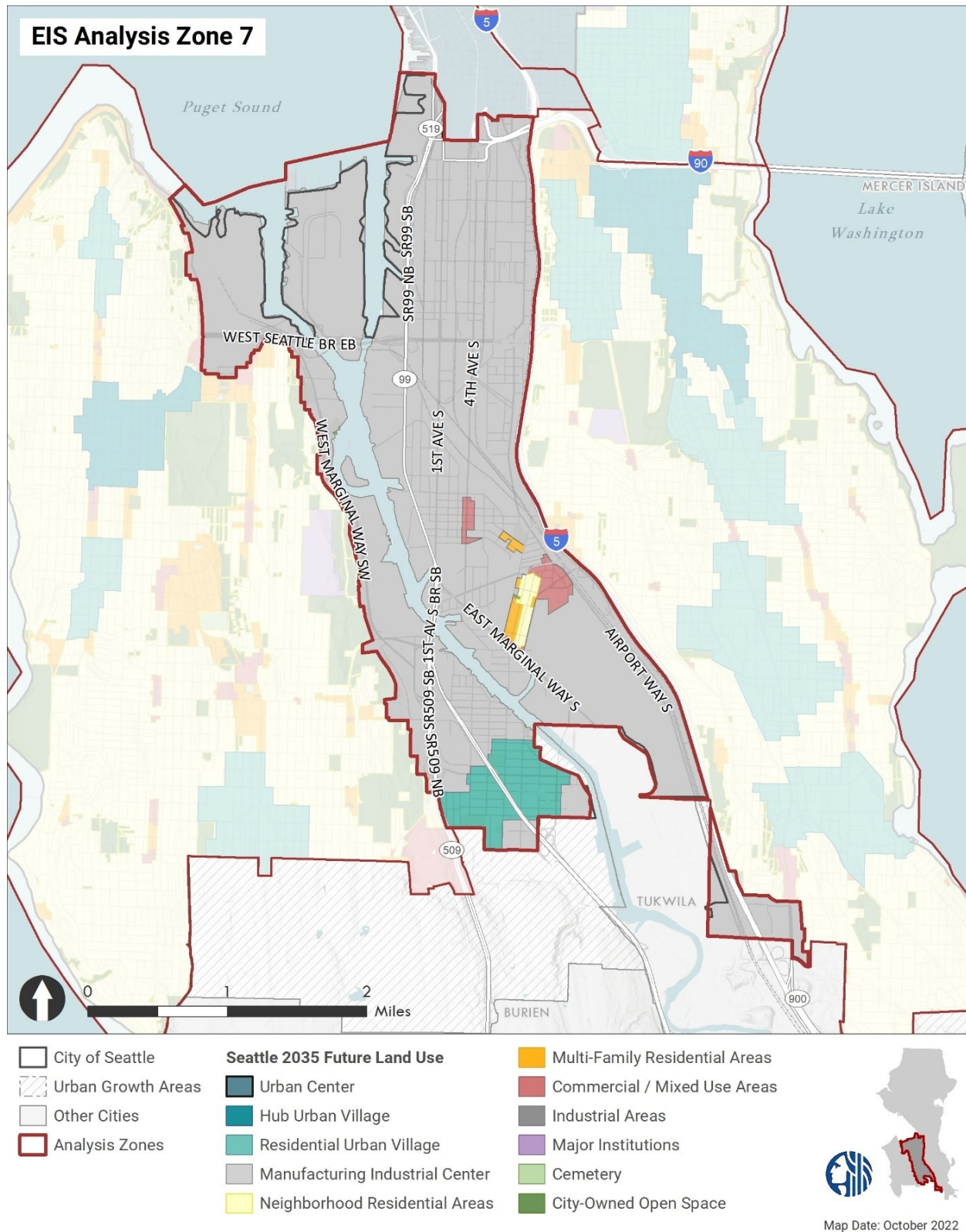
The largest existing land use category within the Duwamish Analysis Area is industrial, which accounts for 37.3% of the land (versus 5% citywide). The Analysis Area contains the entirety of the Greater Duwamish Manufacturing Industrial Center and supports the Port of Seattle's primary marine shipping area. Major institutions and public facilities account for an additional 35.4% of the existing land uses due to the presence of the Port of Seattle, King County International Airport, and Sound Transit properties. Parks, open space, and cemeteries account for only 1% of existing land uses, primarily attributed to the Georgetown and South Park Playfields as well as Marra-Desimone Park. This is the lowest allocation of parks, open space, and cemetery uses across the eight analysis areas. Single family and multifamily uses account for a 5% share of the existing land use, centered exclusively within the South Park Residential Urban Village and the Van Asselt neighborhood. Vacant land accounts for nearly 14% of the land use as compared to 5 % citywide. This can be attributed to unbuildable land adjacent to railway corridors running throughout the analysis area and parcels paved for staging and storage uses including the First Study Bus Yard. Existing commercial and mixed-uses account for 7.3% of existing land uses and are located through the analysis area due to industrial zoning that supports specific commercial uses. Commercial and mixed uses found in the South Park Residential Urban Village follow a more traditional pattern, being spatially organized along a principal arterial street (14<sup>th</sup> Ave S) supporting at grade commercial uses. In comparison the commercial and mixed uses located throughout the Manufacturing Industrial Center are not organized by any spatial logic and support a variety of more intense and less pedestrian friendly uses including auto dealerships and wholesale retailers. See Exhibit 3-51 and Exhibit 3-93.

Displacement risk is moderate to high within the South Park Residential Urban Village. This is due in large part to the fact that this is the largest concentration of residential zoning in the analysis area. With that comes increased development pressure to withing the Urban Village boundary. Outside of the Urban Village boundary, displacement risk is moderate in the Van Asselt neighborhood and immeasurable within the Manufacturing Industrial Center. See Exhibit 3-94.

There are no approved street concept plans in the Duwamish Analysis Area, but there are three neighborhood plans within the Duwamish Analysis Area. These are enabled by the Seattle 2035 Vision to have dense urban villages where there is enhanced access to transit and amenities. The neighborhood plans in this analysis area include Georgetown, Greater Duwamish MIC, and South Park. These neighborhood plans include specific goals relating to land use, transportation, human services, utilities, community building, parks and open space, and community character. See Exhibit 3-50.

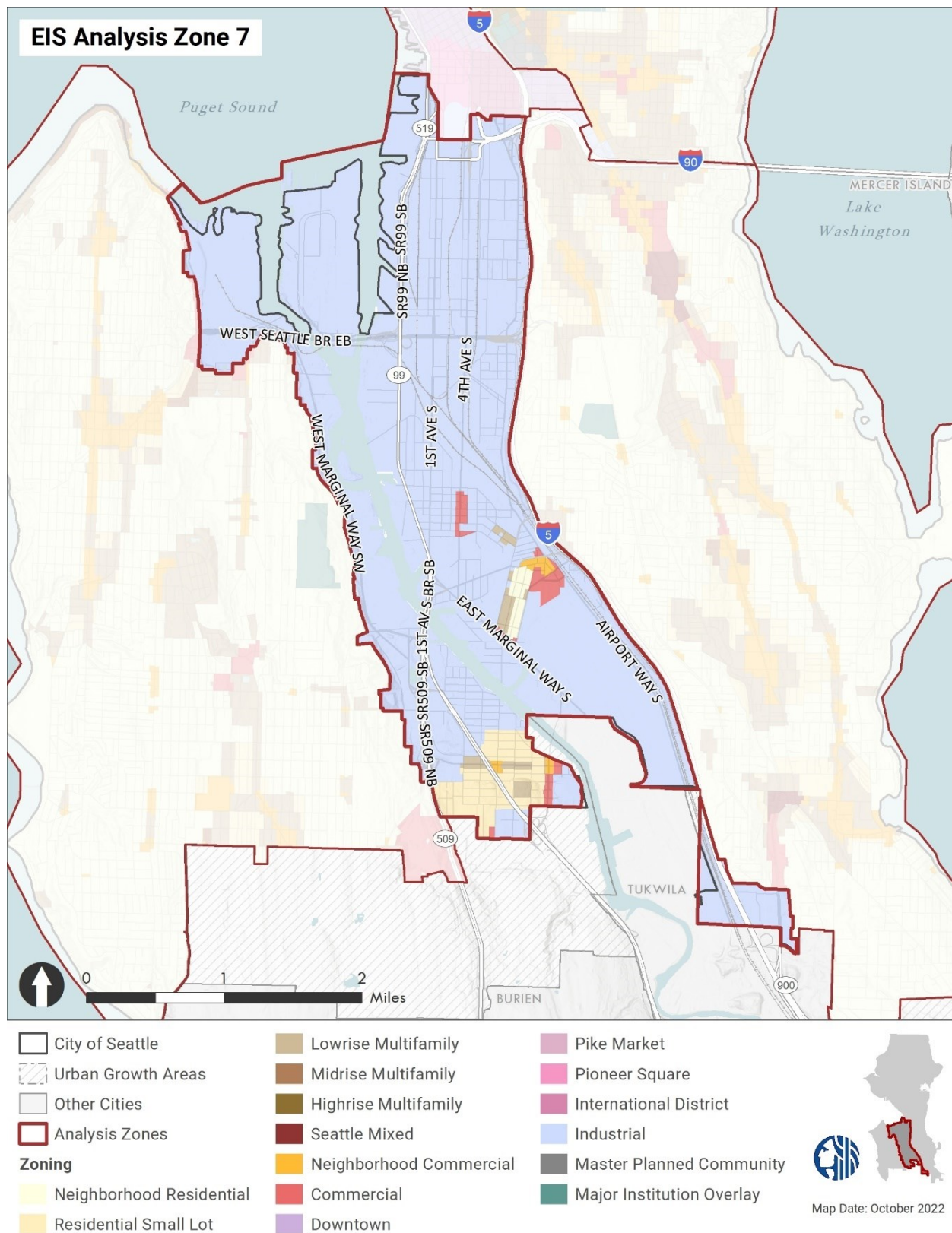


Exhibit 3-90. Duwamish Analysis Area—Future Land Use Designations



Source: City of Seattle, 2022; BERK, 2022.

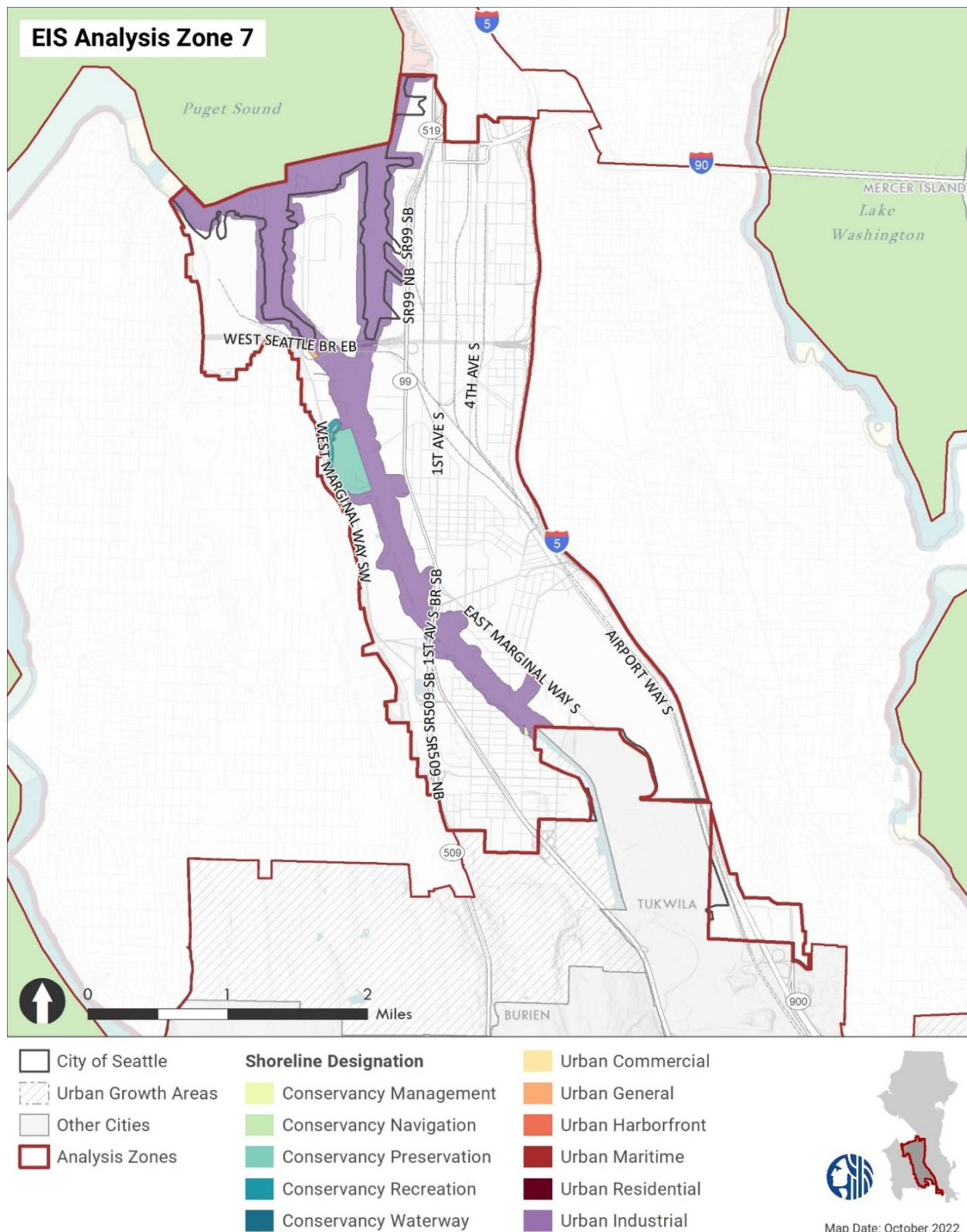
Exhibit 3-91. Duwamish Analysis Area—Zoning



Source: City of Seattle, 2022; BERK, 2022.

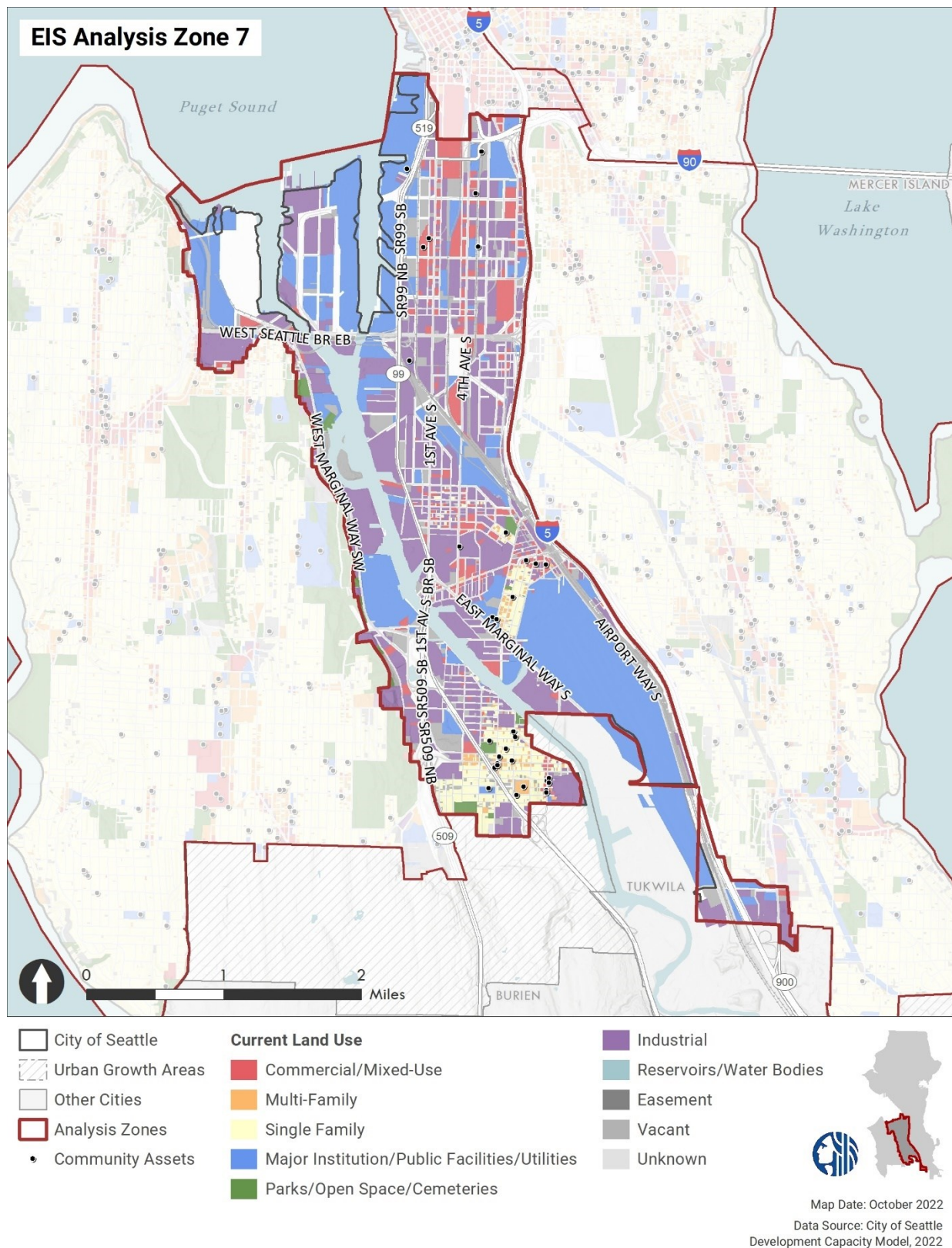


Exhibit 3-92. Duwamish Analysis Area—Shoreline Designations



Source: City of Seattle, 2022; BERK, 2022.

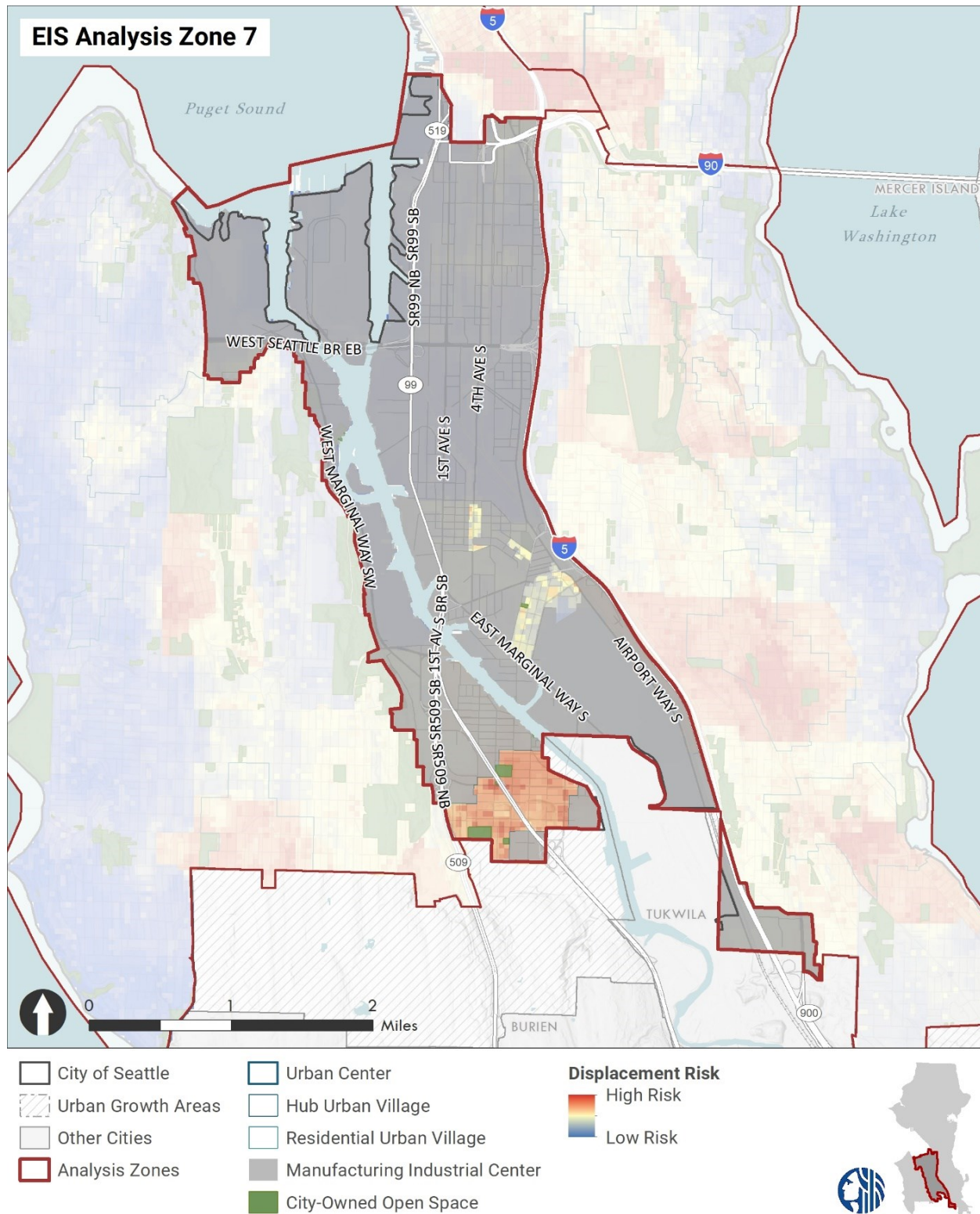
Exhibit 3-93. Duwamish Analysis Area—Current Land Use



Source: City of Seattle, 2022; BERK, 2022.



Exhibit 3-94. Duwamish Analysis Area—Displacement Risk



Source: City of Seattle, 2022; BERK, 2022.



SE Seattle (Analysis Zone 8)

The SE Seattle Analysis Area includes the portion of Seattle east of Interstate 5, south of Interstate 90, and shares its eastern frontage with Lake Washington. It includes approximately 5,656 acres of buildable land, or 14% of the buildable lands city wide. Additionally, the SE Seattle Analysis Area includes the Mt Baker Hub Urban Village, and the North Beacon Hill, Columbia City, Othello, and Rainier Beach Residential Urban Villages. See Exhibit 3-51 and Exhibit 3-98.

Nearly 25% of the SE Seattle Analysis Area has a future land use designation of either Residential or Hub Urban Village including the Mt Baker Hub Urban Village, and the North Beacon Hill, Columbia City, Othello, and Rainier Beach Residential Urban Village. Outside of these Urban Village boundaries, a majority of the commercial, mixed-use, and multi-family future land use and zoning designations are concentrated adjacent to major arterials running between Urban Village boundaries. Outside of the urban villages, commercial, mixed-use, and multi-family future land use and zoning designations generally follow Beacon Ave S, a minor arterial street, and Rainier Ave S, and MLK Jr Way S, both principal arterial streets. Neighborhood Residential future land use and zoning designations fill in the intervening areas. See Exhibit 3-53 and Exhibit 3-95.

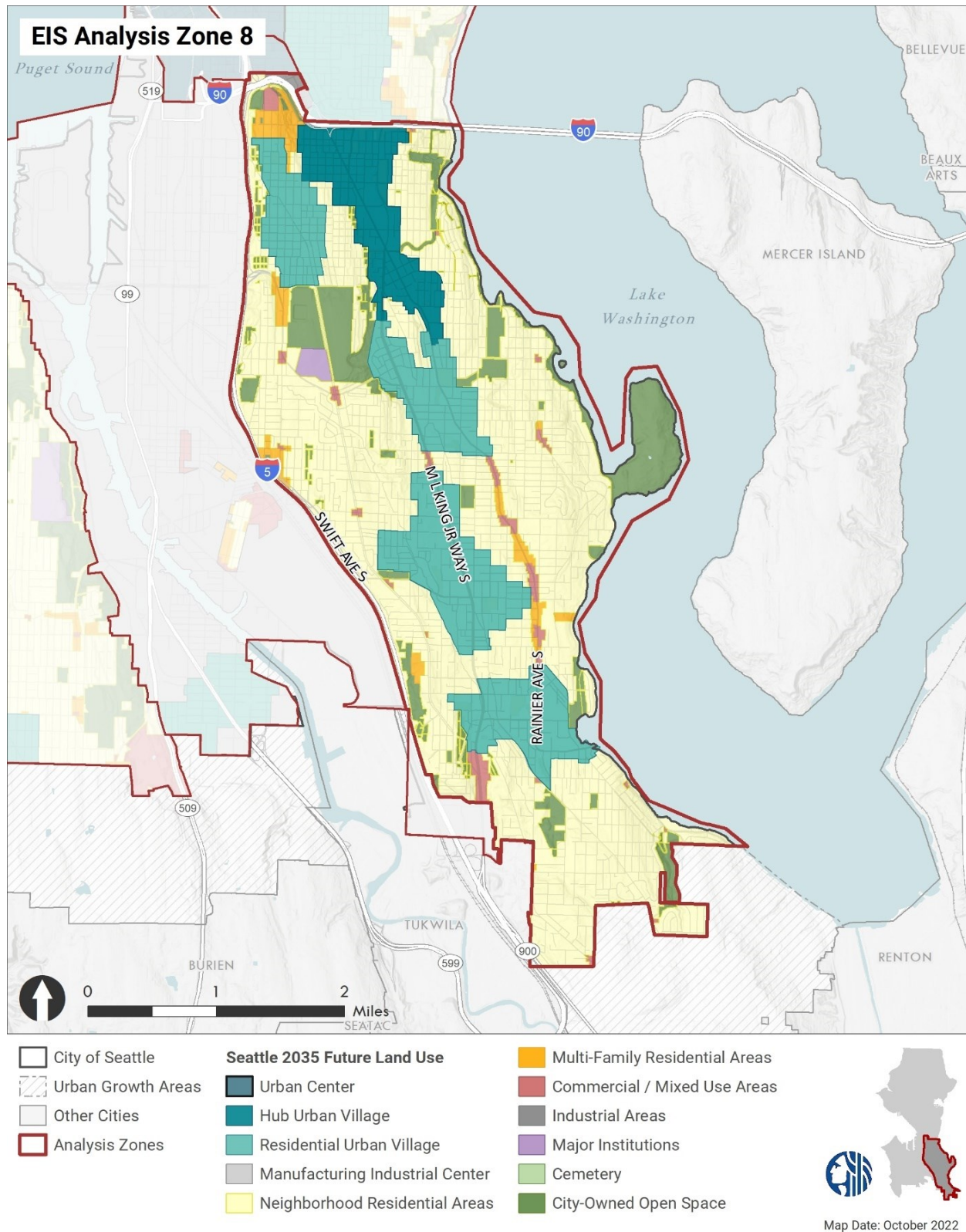
The SE Seattle Analysis Area includes 678 acres of designated shorelines, or 9% of the designated shorelines citywide. Nearly 85% are within a conservancy shoreline environment, including Conservancy Management (8.4%) around the Stan Sayres Boat Launch, Lakewood Marina, and Parkshore Arena, Conservancy Preservation (16.5%) surrounding Seward Park, and Conservancy Recreation (59.3%) spanning the remainder of the shoreline. Another 14.3% is designated as Urban Residential covering the lakefront properties south of I-90 and north of Coleman Beach, and lakefront properties between Seward Park and the southern extent of the City of Seattle. See Exhibit 3-57 and Exhibit 3-97.

The largest existing land use category is single family residential, which accounts for 57% of the land (versus 48% citywide). Major institutions and public facilities account for 6% of the existing land uses due to the presence of the Veterans Administration Campus and Hospital, the high voltage power easement running NW to SE diagonally through the analysis area, and the public schools including Emerson Elementary, Kimball Elementary, Mercer Middle School, Rainier Beach Highschool, Cleveland Highschool, and Franklin Highschool. Parks, open space, and cemeteries account for an additional 17% due to the presence of large urban parks including Seward Park, Jefferson Park and the Jefferson Park Golf Course, the Cheasty Greenbelt, and Kubota Garden. The share of vacant land uses is higher in the SE Seattle Analysis Area (7%) compared to 5% citywide which can be attributed in large part to the high voltage power easement running through the analysis area as well as unused lands adjacent to the Sound Transit Light Rail line. Existing commercial, mixed-use, and multi-family uses, as well as a majority of the community assets, are located within the existing Urban Village boundaries. See Exhibit 3-51 and Exhibit 3-98.

Displacement risk is highly volatile within the SE Seattle Analysis Area. The residential communities adjacent to Lake Washington have a low risk of displacement whereas communities in the Othello and Rainier Beach Urban Villages have a high risk of displacement. The Mt Baker Hub Urban Village, and the North Beacon Hill, Columbia City Residential Urban Villages has a mix of moderate to high displacement risk, with moderate displacement risk prevailing outside of the Urban Village boundaries from Beacon Hill to Rainier Beach west of Rainier Ave S. See Exhibit 3-99.

There are no approved street concept plans in the SE Seattle Analysis Area, but there are five neighborhood plans within the SE Seattle Analysis Area. These are enabled by the Seattle 2035 Vision to have dense urban villages where there is enhanced access to transit and amenities. The neighborhood plans in this analysis area include Columbia City, North Beacon Hill, North Rainier, Othello, and Rainier Beach. These neighborhood plans include specific goals relating to land use, transportation, human services, utilities, community building, parks and open space, and community character. See Exhibit 3-50.

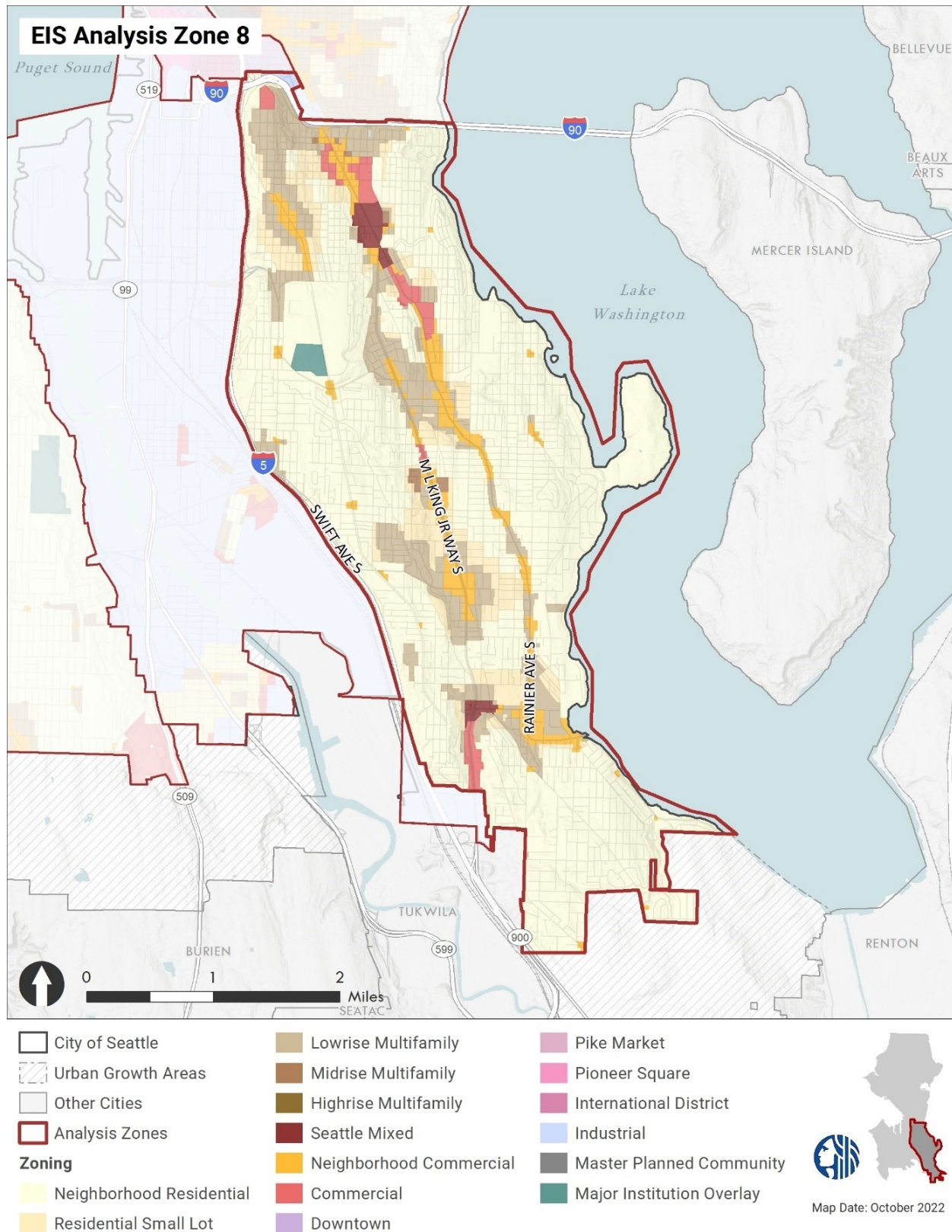
Exhibit 3-95. SE Seattle Analysis Area—Future Land Use Designations



Source: City of Seattle, 2022; BERK, 2022.

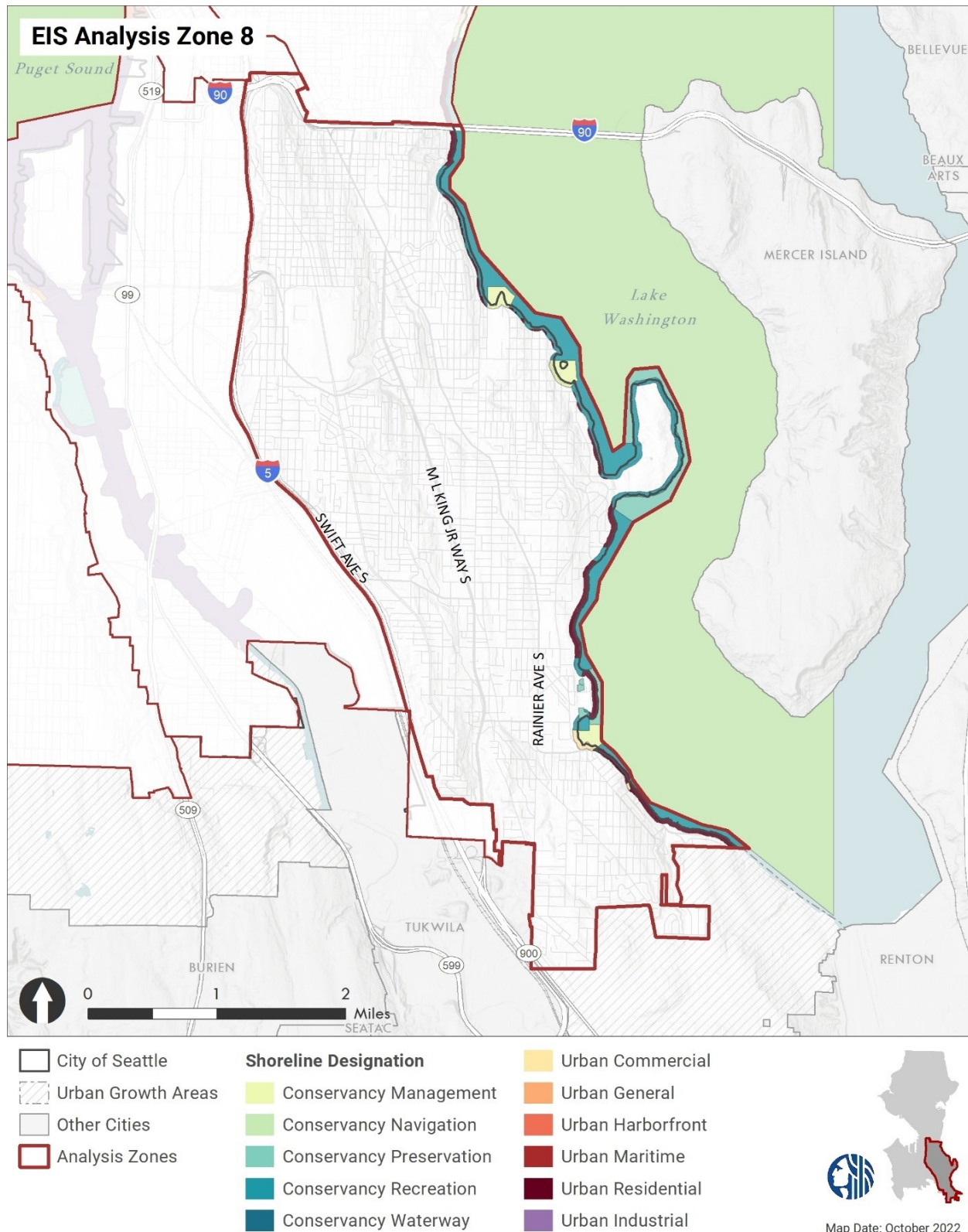


Exhibit 3-96. SE Seattle Analysis Area—Zoning



Source: City of Seattle, 2022; BERK, 2022.

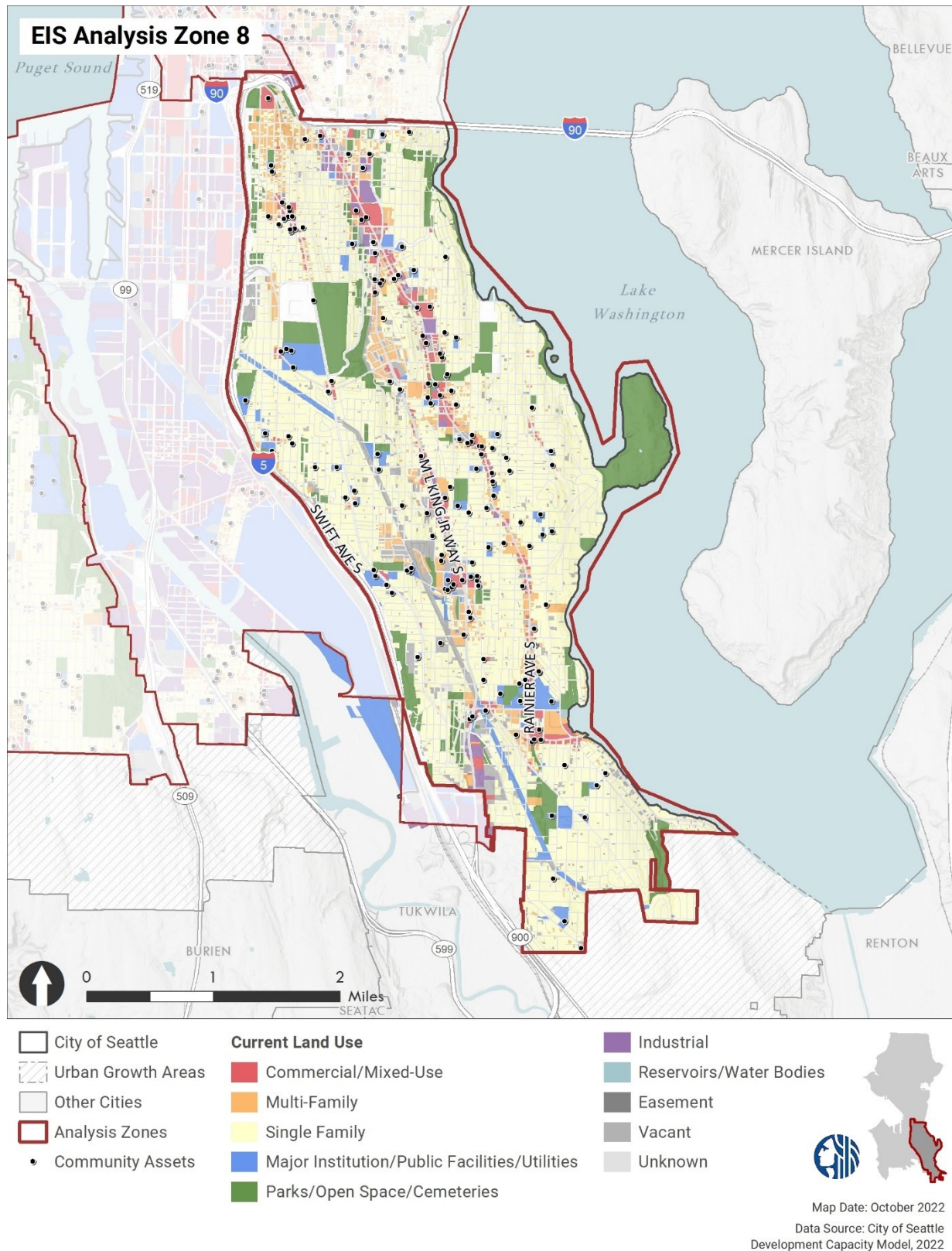
Exhibit 3-97. SE Seattle Analysis Area—Shoreline Designations



Source: City of Seattle, 2022; BERK, 2022.

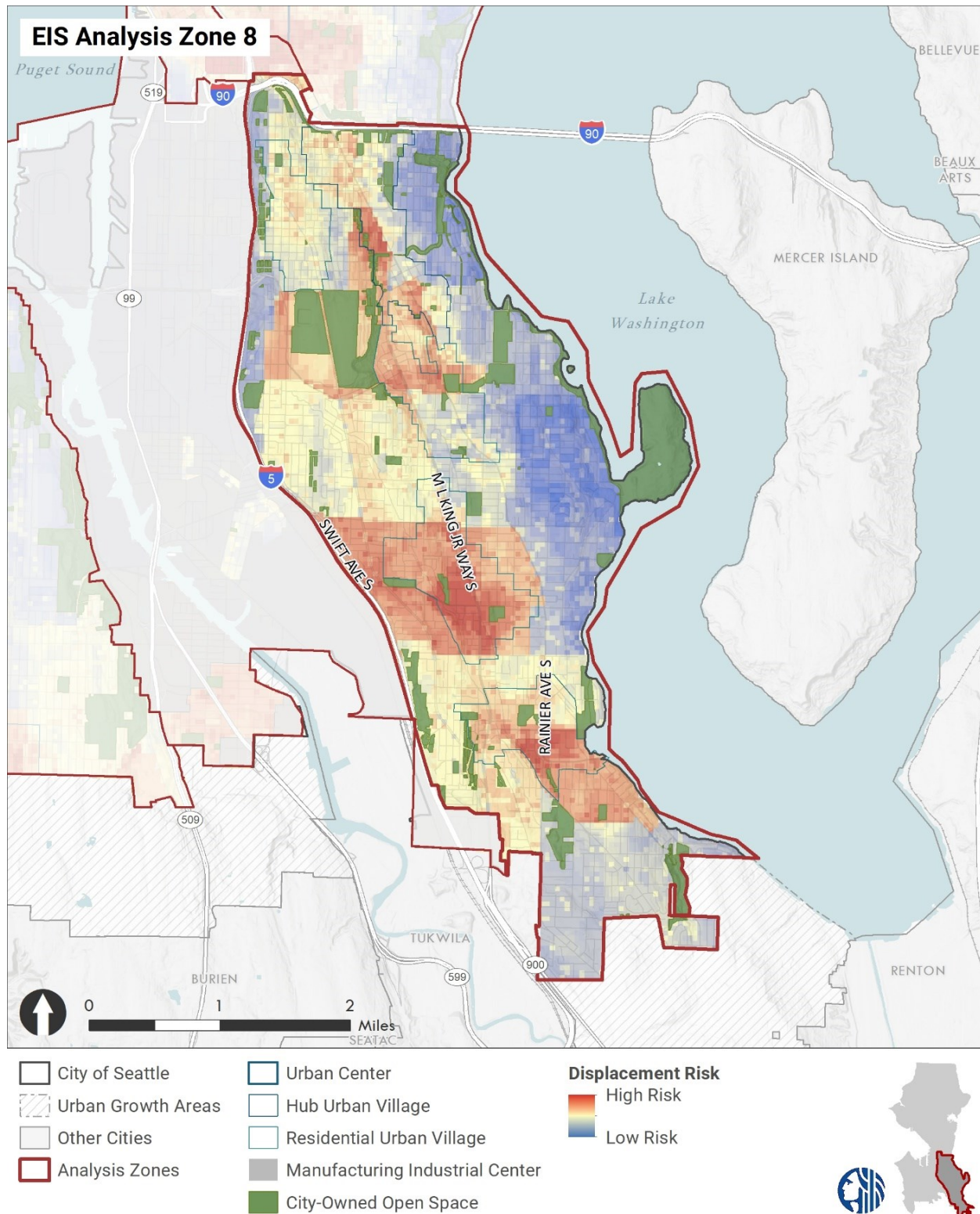


Exhibit 3-98. SE Seattle Analysis Area—Current Land Use



Source: City of Seattle, 2022; BERK, 2022.

Exhibit 3-99. SE Seattle Analysis Area—Displacement Risk



Source: City of Seattle, 2022; BERK, 2022.



### 3.5.2 Impacts

This section describes the potential impacts of each future alternative as they relate to the land use thresholds of significance. The impacts of Alternatives 2 and 3 are measured against conditions expected under Alternative 1. The Comprehensive Plan's Alternative 5 land use patterns and growth is used as the basis for the land use analysis. The following were evaluated as thresholds of significance for land use impacts.

The alternatives are expected to result in a land use impact if:

- **Policy Consistency:** The action would result in a change to land use patterns or development intensities that is inconsistent with GMA goals, the regional planning framework and local policy goals.
- **Compatibility with current and future land use:** The action would result in a change to the land use pattern that is incompatible with the amount or pattern of anticipated growth.
- **Displacement:** The extent to which the action would increase the risk for displacement.
- **Access to community assets:** The action would result in a change to the land use pattern that limits access to community gathering spaces.

Thresholds of significance were evaluated for each STP alternative, with quantitative measures based on the existing and proposed transportation network.

Land use impacts of the alternatives are considered significant if:

- There is an acute/severe adverse impact within one of the impact categories defined above.
- There are cumulative land use impacts in multiple categories within one of the defined subareas.

## Impacts Common to All Alternatives

### Citywide Impacts

Alternative 1 ("No Action") maintains the current status quo, with no significant changes to any mode of transportation. SDOT is continually planning and implementing improvements to active transportation facilities. This Alternative assumes that the City will continue to implement existing commitments and funded project under this Alternative, though the pace of improvements will vary over time depending on funding availability. Sound Transit's light rail extensions to Ballard and West Seattle are planned to be complete by 2044, providing frequent, high-capacity service to more neighborhoods in Seattle. The Link extensions would construct stations in ten new locations and reconstruct or expand upon existing facilities at several other station areas. These projects will include investments to the pedestrian and bicycle connections to the station areas. Planned pedestrian and bicycle improvements as well as improved infrastructure as new development projects are subject to city standards for frontage improvements is likely to result in improved infrastructure under the No Action Alternative.

Alternative 2 ("Moderate Pace") represents a moderate level of progress, with improvements to pedestrian, bike, PSPS, transit, and freight infrastructure, including an additional 123 linear miles of sidewalk, 53 linear

miles of bike facilities, 45 linear miles of additional pedestrian improvements, and 33 linear miles of dedicated transit corridor.

Alternative 3 ("Rapid Progress") represents a more ambitious level of progress, with even greater improvements to all modes of transportation, including the following additions over Alternative 1: 848 linear miles of sidewalk, 385 linear miles of bike facilities, 76 linear miles of additional pedestrian improvements, and 123 linear miles of dedicated transit corridor, including 19 miles of dedicated freight and bus lanes. Overall, Alternative 3 represents the most comprehensive and transformative approach to improving the city's transportation network. See Exhibit 3-100.

**Exhibit 3-100. Transportation Modes by Alternative, by EIS Zone (lengths in miles)**

	EIS Study Area 1	EIS Study Area 2	EIS Study Area 3	EIS Study Area 4	EIS Study Area 5	EIS Study Area 6	EIS Study Area 7	EIS Study Area 8	Total
Alternative 1 Bike Network	25.22	31.73	11.87	14.76	18.18	19.58	11.46	26.22	<b>159.02</b>
Alternative 2 Bike Network	26.20	43.16	15.01	22.40	18.95	28.86	21.22	34.19	<b>209.99</b>
Alternative 3 Bike Network	101.55	102.71	43.40	31.44	63.59	78.05	33.52	86.44	<b>540.71</b>
Alternative 1 Freight Network	32.45	30.74	16.17	15.74	18.29	17.76	56.58	23.83	<b>211.56</b>
Alternative 2 Freight Network	32.45	30.74	16.17	15.74	18.29	17.76	56.58	23.83	<b>211.56</b>
Alternative 3 Freight Network	38.87	34.38	20.42	15.74	18.29	17.85	61.20	23.83	<b>230.58</b>
Alternative 1 Pedestrian Network	476.04	351.77	252.91	113.12	306.84	344.81	85.04	340.75	<b>2271.28</b>
Alternative 2 Pedestrian Network	504.80	377.11	256.21	121.43	311.77	360.98	88.59	373.67	<b>2394.55</b>
Alternative 3 Pedestrian Network	641.47	577.52	305.67	123.49	338.27	465.00	197.76	466.97	<b>3116.15</b>
Alternative 1 PSPS	7.57	2.39	0.00	0.24	2.49	5.58	1.98	8.28	<b>28.83</b>
Alternative 2 PSPS	89.87	35.69	25.37	28.30	65.63	45.58	9.64	75.33	<b>375.41</b>
Alternative 3 PSPS	300.99	259.05	135.95	39.53	155.58	210.47	64.53	216.96	<b>1,381.90</b>
Alternative 1 Transit Network	10.84	4.52	7.08	15.57	3.83	11.21	10.83	16.46	<b>80.34</b>
Alternative 2	27.30	14.47	16.55	32.49	15.94	21.40	14.74	27.39	<b>170.28</b>

	EIS Study Area 1	EIS Study Area 2	EIS Study Area 3	EIS Study Area 4	EIS Study Area 5	EIS Study Area 6	EIS Study Area 7	EIS Study Area 8	Total
Transit Network									
Alternative 3 Transit Network	40.25	42.16	22.85	42.76	24.03	30.41	25.68	41.74	<b>269.88</b>

Source: City of Seattle 2023, BERK 2023

### Growth Management Act

All alternatives are consistent with the planning goals of the Growth Management Act. While none of the STP alternatives are inconsistent with GMA planning goals, the action alternatives are more supportive of a comprehensive multimodal transportation system, with a more complete bicycle, transit, and pedestrian network. Vision 2050 incorporates a range of multicounty planning policies adopted under the GMA to address regionwide issues. These policies are a reference for counties and cities in the Central Puget Sound Region as they update countywide planning policies and comprehensive plans. The features of all STP alternatives are consistent with the Comprehensive Plan policies, although the alternatives differ in how supportive they are of specific policies. No impacts to policy consistency are anticipated.

### Regional and Local Policy Consistency

The City of Seattle is designated as a Metropolitan City in PSRC’s VISION 2050, meaning it “has convenient access to high-capacity transit and serves as a civic, cultural, and economic hub” as well as being a regional growth center serving “as a focal point for accommodating both population and employment growth”. The table below identifies pertinent land use goals and policies and quantifies how well the three Alternatives would address them within the framework of the Seattle Transportation Plan. All alternatives are consistent with Vision 2050 goals. Action alternatives would more optimally meet goals for improving environmental conditions (e.g., tree canopy), and supporting transit. See Exhibit 3-101.

#### Exhibit 3-101. Alternatives Consistency with VISION 2050 Goals and Policies

Goal or Policy	No Action	Alt. 2	Alt. 3	Notes
<b>Environment Goal:</b> The region cares for the natural environment by protecting and restoring natural systems, conserving habitat, improving water quality, and reducing air pollutants. The health of all residents and the economy is connected to the health of the environment. Planning at all levels considers the impacts of land use, development, and transportation on the ecosystem.	✓	✓+	✓+	Action alternatives would improve streetscapes and encourage non-motorized modes of transportation. This could help reduce air pollutants.



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Goal or Policy	No Action	Alt. 2	Alt. 3	Notes
<b>MPP-En-3</b> Maintain and, where possible, improve air and water quality, soils, and natural systems to ensure the health and well-being of people, animals, and plants. Reduce the impacts of transportation on air and water quality and climate change.	✓	✓+	✓+	Action alternatives propose community & mobility hubs with EV infrastructure and multimodal improvements. This could support GHG reduction and climate change mitigation.
<b>MPP-En-7</b> Reduce and mitigate noise and light pollution caused by transportation, industries, public facilities, and other sources.	✓	✓+	✓+	Action alternatives propose a network of People Streets. These changes would result in a reduction in noise pollution.
<b>MPP-En-15</b> Provide parks, trails, and open space within walking distance of urban residents. Prioritize historically underserved communities for open space improvements and investments.	✓	✓+	✓+	All alternatives will prioritize pedestrian, bicycle, and transit infrastructure, resulting in a more accessible public right-of-way.
<b>MPP-En-21</b> Continue efforts to reduce pollutants from transportation activities, including through the use of cleaner fuels and vehicles and increasing alternatives to driving alone, as well as design and land use.	✓	✓+	✓+	All alternatives will prioritize pedestrian, bicycle, and transit infrastructure, with the action alternatives adding community & mobility hubs with EV infrastructure and multimodal improvements. This could reduce pollutants and rely on cleaner fuels.
<b>Climate Change Goal:</b> The region substantially reduces emissions of greenhouse gases that contribute to climate change in accordance with the goals of the Puget Sound Clean Air Agency (50% below 1990 levels by 2030 and 80% below 1990 levels by 2050) and prepares for climate change impacts.	✓	✓+	✓+	Action alternatives dramatically increase the miles of pedestrian, bicycle, and transit infrastructure resulting in the reduction of emissions and greenhouse gases.
<b>MPP-CC-3</b> Reduce greenhouse gases by expanding the use of conservation and alternative energy sources, electrifying the transportation system, and reducing vehicle miles traveled by increasing alternatives to driving alone.	✓	✓+	✓+	Action alternatives support EV adoption to encourage EV charging infrastructure in public streets and new private development.
<b>MPP-CC-12</b> Prioritize transportation investments	✓	✓	✓+	Action alternative 3 proposes implementing additional

### Ch.3 Environment, Impacts, & Mitigation Measures ▪ Land Use Patterns

Goal or Policy	No Action	Alt. 2	Alt. 3	Notes
that support achievement of regional greenhouse gas emissions reduction goals, such as by reducing vehicle miles traveled.				mobility management strategies, in concert with the region.
<b>MPP-DP-12</b> Design transportation projects and other infrastructure to achieve community development objectives and improve communities.	✓	✓+	✓+	All alternatives improve the transportation network in the City of Seattle, making it a more connected and vibrant city.
<b>MPP-DP-15</b> Design communities to provide safe and welcoming environments for walking and bicycling.	✓	✓+	✓+	All alternatives will prioritize pedestrian, bicycle, and transit infrastructure, resulting in a more accessible public right-of-way.
<b>MPP-DP-25</b> Support the development of centers within all jurisdictions, including high-capacity transit station areas and countywide and local centers.	✓	✓+	✓+	Action alternatives propose transit system improvements, including more frequent bus service connecting to light rail and increased off-peak service.
<b>Transportation Goal:</b> The region has a sustainable, equitable, affordable, safe, and efficient multimodal transportation system, with specific emphasis on an integrated regional transit network that supports the Regional Growth Strategy and promotes vitality of the economy, environment, and health.	✓	✓+	✓+	All alternatives are designed to provide a sustainable, equitable, affordable, safe, and efficient multimodal transportation system.
<b>MPP-T-1</b> Maintain and operate transportation systems to provide safe, efficient, and reliable movement of people, goods, and services.	✓	✓+	✓+	Action alternatives would enhance traffic operations to increase efficiency and optimize transit operations.
<b>MPP-T-4</b> Improve the safety of the transportation system and, in the long term, achieve the state's goal of zero deaths and serious injuries.	✓	✓+	✓+	Action alternatives propose crosswalk improvements prioritize safe crossings for people at arterials, highways, and water.
<b>MPP-T-9</b> Implement transportation programs and projects that provide access to opportunities while preventing or mitigating negative impacts to people of color, people with low incomes, and people with special transportation needs.	✓	✓+	✓+	Action alternatives propose much more frequent bus service connecting to light rail and increased off-peak service (more additional bus service hours).

Goal or Policy	No Action	Alt. 2	Alt. 3	Notes
<b>MPP-T-11</b> Design, construct, and operate a safe and convenient transportation system for all users while accommodating the movement of freight and goods, using best practices and context sensitive design strategies.	✓	✓+	✓+	Action alternatives would designate alternative routes for cars that make direct routes for people walking, biking, and rolling car-free.
<b>MPP-T-12</b> Emphasize transportation investments that provide and encourage alternatives to single-occupancy vehicle travel and increase travel options, especially to and within centers and along corridors connecting centers.	✓	✓+	✓+	Action alternatives provide Complete Streets, reprioritizing street space for bikes, transit, sidewalk cafes.
<b>MPP-T-16</b> Improve local street patterns including their design and how they are used for walking, bicycling, and transit use to enhance communities, connectivity, and physical activity.	✓	✓+	✓+	Action alternatives designate alternative routes for cars that make direct routes for people walking, biking, and rolling car-free.
<b>MPP-T-17</b> Promote and incorporate bicycle and pedestrian travel as important modes of transportation by providing facilities and navigable connections.	✓	✓	✓+	All alternatives would increase the bicycle and pedestrian network, although Alternative 3 would dramatically increase these facilities to create navigable connections.

Source: Puget Sound Regional Council, BERK, 2023

Legend: ✓- = partially meets ✓ = meets ✓+ = optimally meets

In accordance with RCW 36.70A.210, which mandates that a county's legislative authority adopt countywide planning policies in collaboration with cities situated in the county, the 2021 King County Countywide Planning Policies (CPPs) create a shared and consistent framework for growth management planning for all jurisdictions in King County. The framework that the CPPs build is used to develop the comprehensive plan for King County as well as the comprehensive plans for the cities and municipalities that make up King County. The CPPs carry out VISION 2050, the region's growth strategy. Selected Countywide Planning Policies that can influence planning for the Seattle Transportation Plan are identified in Exhibit 3-102.

### Exhibit 3-102. Alternatives Consistency with the King County Countywide Planning Policies

Goal or Policy	No Action	Alt. 2	Alt. 3	Notes
<b>EN-22</b> Provide parks, trails, and open space within walking distance of urban residents. Prioritize historically	✓	✓+	✓+	Action alternatives propose transit system improvements, making connections to light rail,

### Ch.3 Environment, Impacts, & Mitigation Measures ▪ Land Use Patterns

Goal or Policy	No Action	Alt. 2	Alt. 3	Notes
underserved communities for open space improvements and investments.				serving non-commute trips, serving underserved communities.
<b>EN-30</b> Promote energy efficiency, conservation methods, sustainable energy sources, electrifying the transportation system, and limiting vehicle miles traveled to reduce air pollution, greenhouse gas emissions, and consumption of fossil fuels to support state, regional, and local climate change goals.	✓	✓+	✓+	Action alternatives dramatically increase the miles of pedestrian, bicycle, and transit infrastructure resulting in the reduction of emissions and greenhouse gases.
<b>Development Patterns Overarching Goal:</b> Growth in King County occurs in a compact, centers-focused pattern that uses land and infrastructure efficiently, connects people to opportunity, and protects Rural and Natural Resource Lands.	✓	✓+	✓+	All alternatives improve the transportation network in the City of Seattle, making it a more connected and vibrant city.
<b>DP-2</b> Prioritize housing and employment growth in cities and centers within the Urban Growth Area, where residents and workers have higher access to opportunity and high-capacity transit. Promote a pattern of compact development within the Urban Growth Area that includes housing at a range of urban densities, commercial and industrial development, and other urban facilities, including medical, governmental, institutional, and educational uses and schools, and parks and open space. The Urban Growth Area will include a mix of uses that are convenient to and support public transportation to reduce reliance on single-occupancy vehicle travel for most daily activities.	✓	✓	✓+	All alternatives will prioritize pedestrian, bicycle, and transit infrastructure, resulting in a more accessible public right-of-way.
<b>DP-45</b> Adopt flexible design standards, parking requirements, incentives, or guidelines that foster green building, multimodal transportation, and infill development that enhances the existing or desired urban character of a neighborhood/community. Ensure adequate code enforcement so that flexible regulations are appropriately implemented.	✓	✓+	✓+	All alternatives plan for and implement a multimodal transportation network.
<b>Transportation Overarching Goal:</b> The region is well served by an integrated, multimodal transportation system that supports the regional vision for growth, efficiently moves people and goods, and is environmentally and functionally sustainable over the long term.	✓	✓+	✓+	Action alternatives propose Complete Streets, such as bikes, transit, pedestrians, and public space uses.

Goal or Policy	No Action	Alt. 2	Alt. 3	Notes
<b>T-5</b> Prioritize transportation investments that provide and encourage alternatives to single occupancy vehicle travel and increase travel options, particularly to and within centers and along corridors connecting centers.	✓	✓+	✓+	Action alternatives emphasize multi modal transit investments.
<b>T-14</b> Promote the mobility of people and goods through a multimodal transportation system based on regional priorities consistent with VISION 2050 and local comprehensive plans.	✓	✓+	✓+	All alternatives have been assessed based on the VISION 2050 priorities. See Exhibit 3-102.
<b>T-28</b> Promote road and transit facility design that includes well-defined, safe, and appealing spaces for pedestrians and bicyclists.	✓	✓	✓+	All alternatives will prioritize pedestrian, bicycle, and transit infrastructure, resulting in a more accessible public right-of-way.

Source: King County, BERK, 2023

Legend: ✓- = partially meets ✓ = meets ✓+ = optimally meets

The Action Alternatives propose alternative lengths in miles of pedestrian, bike, transit, and freight networks compared to the No Action Alternative. **No policy inconsistency is identified across the three alternatives including the No Action alternative. No impacts are anticipated.** See Exhibit 3-103.

#### Exhibit 3-103. Alternatives Consistency with Seattle Comprehensive Plan Policies

Goal or Policy	No Action	Alt. 2	Alt. 3	Notes
<b>GS 1.7</b> Promote levels of density, mixed-uses, and transit improvements in urban centers and villages that will support walking, biking, and use of public transportation.	✓	✓+	✓+	Action alternatives prioritize Complete Streets, prioritizing street space for bikes, transit, sidewalk cafes.
<b>GOAL TG 1</b> Ensure that transportation decisions, strategies, and investments support the City's overall growth strategy and are coordinated with this Plan's land use goals.	✓	✓	✓+	All alternatives improve the transportation network in the City of Seattle, making it a more connected and vibrant city.
<b>T 1.1</b> Provide safe and reliable transportation facilities and services to promote and accommodate the growth this Plan anticipates in urban centers, urban villages, and manufacturing/industrial centers.	✓	✓	✓	All alternatives are designed to provide a sustainable, equitable, affordable, safe, and efficient multimodal transportation system.
<b>T 1.2</b> 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	✓	✓	✓+	Action alternatives propose transit system improvements, including more frequent bus service connecting to light rail and increased off-peak service.



### Ch.3 Environment, Impacts, & Mitigation Measures ▪ Land Use Patterns

Goal or Policy	No Action	Alt. 2	Alt. 3	Notes
communities.				
<b>T 1.3</b> Design transportation infrastructure in urban centers and villages to support compact, accessible, and walkable neighborhoods for all ages and abilities.	✓	✓+	✓+	Action alternatives would designate alternative routes for cars that make direct routes for people walking, biking, and rolling car-free.
<b>T 1.4</b> Design transportation facilities to be compatible with planned land uses and consider the planned scale and character of the surrounding neighborhood.	✓	✓+	✓+	Action alternatives provide Complete Streets, prioritizing street space for bikes, transit, sidewalk cafes.
<b>GOAL TG 2</b> 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.	✓	✓+	✓+	Action alternatives propose crosswalk improvements prioritize safe crossings for people at arterials, highways, and water.
<b>T 2.2</b> 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.	✓	✓+	✓+	Action alternatives designate alternative routes for cars that make direct routes for people walking, biking, and rolling car-free.
<b>T 2.5</b> Prioritize mobility needs in the street travelway based on safety concerns and then on the recommended networks and facilities identified in the respective modal plans.	✓	✓	✓+	All alternatives will prioritize pedestrian, bicycle, and transit infrastructure, with the action alternatives adding community & mobility hubs with EV infrastructure and multimodal improvements.
<b>T 2.7</b> Assign space in the flex zone to support nearby land uses, provide support for modal plan priorities, and accommodate multiple functions.	✓	✓+	✓+	Action alternatives provide Complete Streets, such as bikes, transit, pedestrians, and public space uses.
<b>GOAL TG 3</b> Meet people's mobility needs by providing equitable access to, and encouraging use of, multiple transportation options.	✓	✓	✓+	Action alternatives propose transit system improvements, making connections to light rail, serving non-commute trips, serving underserved communities.
<b>T 3.1</b> Develop and maintain high-quality, affordable, and connected bicycle, pedestrian, and transit facilities.	✓	✓+	✓+	All alternatives will prioritize pedestrian, bicycle, and transit infrastructure, resulting in a more accessible public right-of-way.
<b>T 4.4</b> Manage the transportation system to support modes that reduce the use of fossil fuels and promote the use of alternative fuels.	✓	✓	✓+	Action alternatives dramatically increase the miles of pedestrian, bicycle, and transit infrastructure resulting in the reduction of emissions and greenhouse gases.
<b>GOAL TG 5</b> Improve mobility and access	✓	✓	✓+	Action alternative 3 proposes

Goal or Policy	No Action	Alt. 2	Alt. 3	Notes
for the movement of goods and services to enhance and promote economic opportunity throughout the city.				implementing additional mobility management strategies, in concert with the region.

Source: City of Seattle, BERK, 2023

Legend: ✓- = partially meets ✓ = meets

✓+ = optimally meets

### Compatibility with Current and Future Land Use

See sections on impacts of each Alternative.

### Displacement

Neighborhoods undergo continuous changes driven by the movement of people and private and public capital. These changes can be visible, such as the arrival of newcomers, new buildings, and businesses, or they can be less apparent, involving property transfers that happen much before new residents move in. The process of neighborhood change can be slow, discontinuous, and difficult to predict. Change can take decades to unfold or happen in a matter of years.

The planning and construction of transportation infrastructure further complicate the dynamics of neighborhood change. Investors speculate on properties in advance, residents move in or may be displaced, and construction may disrupt the neighborhood, leading to the potential displacement of some households and businesses. Over the longer term, the new availability of transportation infrastructure can make neighborhoods more accessible and desirable, resulting in increased property values. As the neighborhood adapts to the new infrastructure and further development takes place, the pace of change can accelerate. Displacement may only be recognized at this point or may not occur at all.

Various factors, both internal and external, contribute to displacement in neighborhoods. These include demographic characteristics (such as race and ethnicity), housing characteristics (such as a high concentration of renter housing), economic factors (such as a strong job or housing market), and features of the built environment (such as distinct urban forms and amenities). Transportation investments can also have an impact on neighborhood change if they significantly change the perceived value of a neighborhood resulting in higher housing costs or additional demolition or rehabilitation of existing homes.

Quantitative models attempting to explain or predict displacement often overlook the non-linear and discontinuous nature of neighborhood change. By focusing on individual neighborhoods or aggregates within a city or region, these models may miss the influence of local and regional contexts. Additionally, the impacts of certain factors may differ from one place to another, and housing markets operate on a regional level. Specific impacts depend on the location of neighborhoods within the region and their unique local contexts. Some neighborhoods may never transform. Change in some neighborhoods may stall or reverse itself.

The role of transportation infrastructure within this process, its role in reshaping neighborhoods and who lives in them, is not fully understood. Large-scale land use changes such as those anticipated in the City's Comprehensive Plan land use scenarios have more potential to increase displacement than smaller-scale

transportation improvements alone. Given that land use changes under the Comprehensive Plan are not yet final, and the uncertainty associated with displacement based on transportation investments, it would be speculative at this time to identify impacts related to displacement.

The STP Alternatives involve projects spread across the City meaning that differential impacts on specific neighborhood areas small. The Alternatives, to varying degrees, support an integrated transit network such that individual improvements would tend to improve transportation throughout the network. The individual transportation improvement projects that are proposed are generally incremental as opposed to major investments like new light rail stations and would tend to provide connections to allow more people to use existing transit investments. **No significant adverse impacts are identified for any of the STP Alternatives related to displacement.**

The analysis in the subarea impacts section identifies areas that have higher or lower potential for displacement based on the Displacement Risk index developed by the City and described planned investments in transportation.

### Access to community assets

See sections on impacts of each Alternative.

## Impacts of Alternative 1: No Action

Alternative 1: No Action includes existing and funded bicycle, pedestrian and transit infrastructure, with some projects currently under construction. Alternative 1 would implement limited capital improvements to the bicycle, pedestrian, transit and freight networks beyond what is funded today. This includes no additional sidewalk miles, and funded bicycle projects and dedicated transit lanes, with no new community & mobility hubs. There are 2,271 miles of sidewalk, 159 miles of corridors with bike facilities, 80 miles of transit corridors, 211 miles of freight corridors, and 31 light rail stations among the infrastructure that is already in place and has been financed.

### Citywide Impacts

The network assumptions include existing transportation conditions and committed projects, 12% of the fleet being electric or plug-in hybrid, and no additional EV infrastructure. Existing pedestrian sidewalks and bicycle facilities (excluding sharrows) are assumed citywide, along with committed bicycle projects and stay healthy streets for PSPS. The transit system assumes existing and committed dedicated transit lanes, on-street light rail, and RapidRide corridors, but no community & mobility hubs. The existing freight network is also included, and there are no additional People Streets assumed. See Exhibit 3-104.

### Exhibit 3-104. Alternative 1 Transportation Network

	EIS Study Area 1	EIS Study Area 2	EIS Study Area 3	EIS Study Area 4	EIS Study Area 5	EIS Study Area 6	EIS Study Area 7	EIS Study Area 8	Total
Alternative 1 Bike Network	25.22	31.73	11.87	14.76	18.18	19.58	11.46	26.22	<b>159.02</b>
Alternative 1	32.45	30.74	16.17	15.74	18.29	17.76	56.58	23.83	<b>211.56</b>

Freight Network

Alternative 1 Pedestrian Network	476.04	351.77	252.91	113.12	306.84	344.81	85.04	340.75	<b>2271.28</b>
Alternative 1 PSPS	7.57	2.39	0.00	0.24	2.49	5.58	1.98	8.28	<b>28.53</b>
Alternative 1 Transit Network	10.84	4.52	7.08	15.57	3.83	11.21	10.83	16.46	<b>80.34</b>

Transportation Modes by Alternative, by EIS Zone (lengths in miles)

Sources: City of Seattle, 2022; Kimley-Horn, 2023.

## Regional and Local Policy Consistency

See Impacts Common to All Section

## Compatibility with Current and Future Land Use

The Action Alternatives are evaluated for compatibility with future land use assumptions using the Seattle Comprehensive Plan EIS Alternative 5, see Exhibit 3-105.

Comprehensive Plan EIS Alternative 5 aims to increase the supply and diversity of housing in Seattle by incorporating strategies from Comprehensive Plan EIS Alternatives 2, 3, and 4, along with other key land use changes. Alternative 5 would build upon existing urban centers and villages designated in the current Seattle 2035 Plan and make the following changes:

- Redesignate Ballard as a Regional Center (referred to as an Urban Center in Seattle 2035)
- Designate a new Urban Center (referred to as Urban Villages in Seattle 2035) at the NE 130th St light rail station
- Expand the boundaries of several existing Regional and Urban centers
- Add a new place type called Neighborhood Centers that would allow more housing around neighborhood-serving clusters of shops and services with access to transit
- Add a new place type called Corridors that would allow more housing within a short walk of transit and amenities
- Allow a greater amount and diversity of housing in Neighborhood Residential zones, including middle housing types like fourplexes, sixplexes, and stacked flats

### Implementation of Middle Housing (HB 1110)

In 2023, the Washington State Legislature passed E2SHB 1110, which requires the City to allow 4 and 6 dwelling units per lot in a middle housing form. 6 dwelling units per lot are tied to the proximity to rail and frequent transit routes. The City must adopt updated zoning legislation by June 30, 2025. Existing City planning documents do not currently reflect the updated density requirements.

Comprehensive Plan EIS Alternative 5 assumes growth of 120,000 housing units (40,000 more than the No Action Alternative). 80,000 units would be located in a similar distribution to alternative 1, with the additional 40,000 distributed based on a combination of Alternatives 2, 3, and 4. Alternative 5 also assumes growth of 158,000 new jobs over the same period. The goals guiding the development of a revised growth

strategy for the next 20 years include addressing the past underproduction of housing, relieving market pressure contributing to rising housing costs and displacement and promoting a greater range of rental and ownership housing in all neighborhoods. The new growth strategy concepts are also intended to support complete communities where a broad range of people can live and access their daily needs via a short walk, bike, or transit trip.

Most new growth would still be focused within areas currently designated as urban centers and villages which are characterized by higher densities, more compact building forms, and a more diverse mix of uses than other areas of the city. Housing growth within the urban centers and village, however, would be higher under Alternative 5 than the other alternatives.

As a result of these growth distributions, Seattle's land use pattern—broadly defined—would continue to emphasize:

- Growth leading to a denser and more continuous pattern of intensive land uses in the city's geographic center (Downtown plus the surrounding neighborhood districts including Uptown, South Lake Union, Capitol Hill, and First Hill).
- Business and port-related activity and employment growth within two central Port and industrial-use centers (Greater Duwamish MIC and BINMIC). All alternatives studied in this EIS include changes proposed as part of the [Industrial and Maritime Strategy Final EIS](#) (see the Major Land Use Policy Changes Currently Under Consideration).
- Growth in a wide range of other mixed-use urban villages such as Fremont, Columbia City and West Seattle Junction distributed through the various sectors of the city, including urban villages located along major transportation corridors (such as Aurora Ave N, Lake City Way NE, MLK Jr Way, Rainier Ave S, and California Ave SW) that radiate through the various geographic sectors and industrial-use centers.

Overall, Alternative 5 distributes more growth to a greater number of locations than any other alternative contemplated in the Comprehensive Plan. This is likely to result in a denser land use pattern citywide with focused growth in the urban centers and villages and smaller mixed-use nodes in the new neighborhood anchors and along corridors with frequent transit.

The No Action Alternative has the potential for an adverse impact on land use compatibility since it is not likely to fully support the future land use anticipated as part of the Comprehensive Plan Alternative 5. No adverse impacts are anticipated for the Action Alternatives.

Alternative 1: No Action accommodates pedestrian, bicycle, freight, and transit connections within urban village/urban center boundaries and along primary corridors. Compared to the action alternatives, Alternative 1 would provide less progress toward implementing the land use pattern envisioned in Comprehensive Plan Alternative 5, especially outside urban village/urban center regional center boundaries. The growth in households under the Comprehensive Plan Alternative 5 is likely to increase demand in all areas of the city, including those areas that currently lack sidewalks or other transportation infrastructure. Given this, a higher potential for significant adverse impact is anticipated under the STP No Action Alternative.



## Displacement

See section on Impacts Common to All Alternatives.

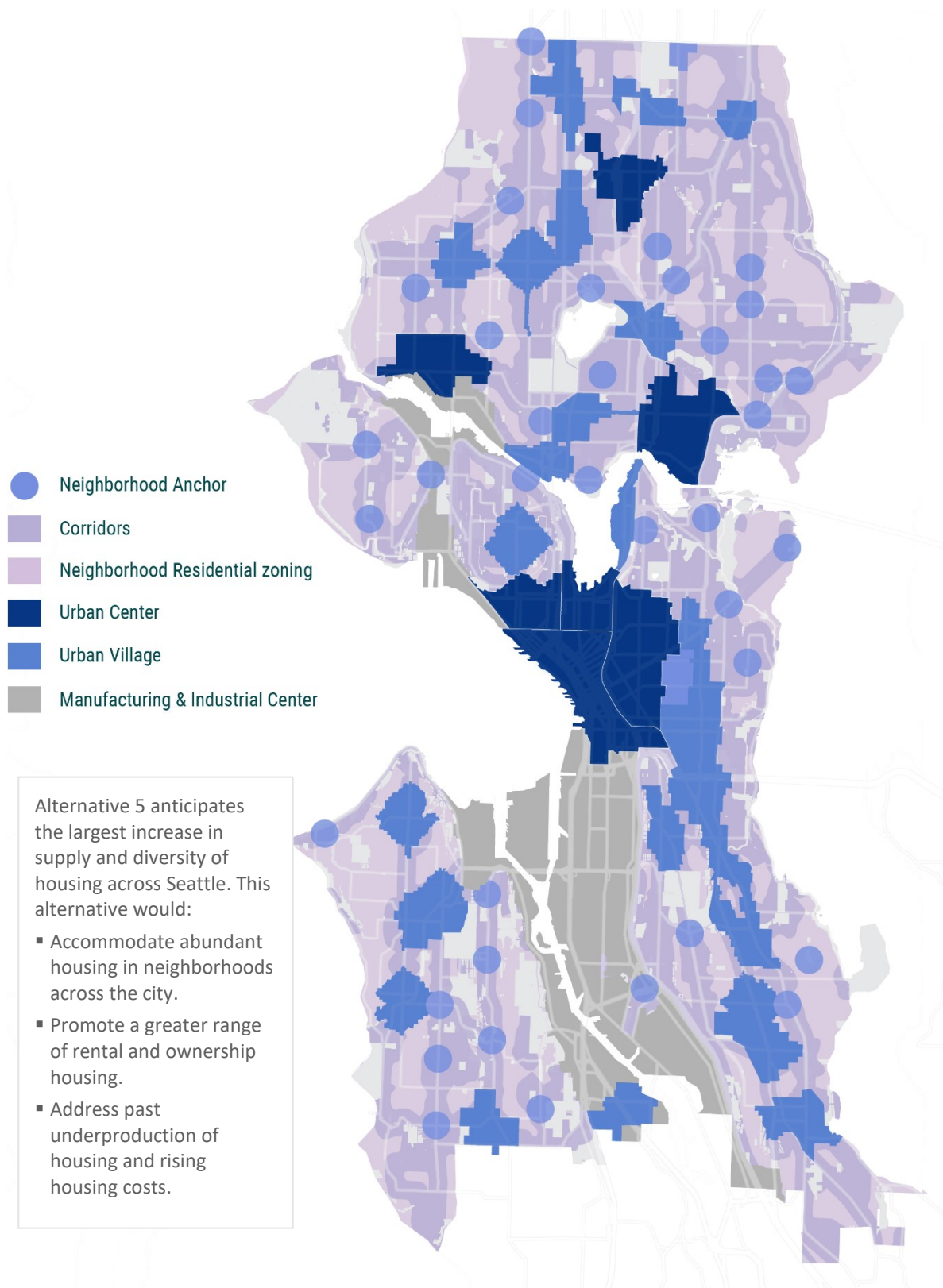
### Access to community assets

Seattle's existing pedestrian network is most complete in and around its urban centers and hub urban villages, including Downtown, South Lake Union, Capitol Hill, Uptown, University District, Northgate, Lake City, Fremont, Ballard, and North Rainier. These areas tend to have uninterrupted sidewalks with frequent pedestrian infrastructure including curb ramps, crosswalks, staircases, and pedestrian bridges.

Areas of the city that lack connected networks are primarily north of NE/NW 85th St, Arbor Heights and the Delridge neighborhood in West Seattle, in industrial areas in the Duwamish and Ballard-Interbay MICs, and South Beacon Hill.

Alternative 1: No Action does not introduce changes in the transportation network to increase access to community assets in Seattle. The improvements are limited, such as some additional bus service hours, and 29 linear miles of Stay Healthy Streets with car-lite streets. There are no new EV charging requirements for new development and limited EV infrastructure in public streets. There are no new sidewalk improvements. Alternative 1 provides limited access to community assets outside of major transit corridors, and beyond urban village/urban center boundaries resulting in a potential for adverse impact in the access to community assets.

Exhibit 3-105. Seattle Comprehensive Plan Alternative 5: Combined



Source: City of Seattle, 2023.

## Secondary Study Areas Impacts

Analysis on the secondary study areas can be found in [Appendix C](#).

## Impacts of Alternative 2: Moderate Pace

Alternative 2: Moderate Pace includes moderate and targeted multimodal infrastructure for the future of Seattle’s transportation system. Alternative 2 includes 2,394 miles of sidewalks to bridge gaps in the existing pedestrian network, 210 miles of corridors with bicycle improvements, 170 miles of transit corridors, 211 miles of freight network, and 375 miles of thePSPS network. This alternative would also improve key transit corridors with 33 additional miles of dedicated transit corridors and 52 community & mobility hubs throughout the city.

### Citywide Impacts

The network assumptions include the existing transportation conditions, committed projects, and 12% of the overall fleet being electric or plug-in hybrid, with no additional EV infrastructure. For the pedestrian network, existing sidewalks citywide will be used, and sidewalks will be added to destination streets from the PSPS network where none exist. The bicycle network will use existing bicycle facilities citywide (excluding sharrows) and committed bicycle projects, and bike facilities on portions of the vision network segments that are principal and county arterials. The PSPS network will use existing and committed stay healthy streets and additional pedestrian improvements on destination streets. The transit network will use existing and committed dedicated transit lanes, light rail, RapidRide corridors, and dedicated transit facilities on premium transit corridors in the vision network. Mobility hubs will be located on principal transit corridors and within urban centers or villages. The freight network will use the existing freight network. The Alternative 2 transportation network is shown in Exhibit 3-106 below, represented in miles.

**Exhibit 3-106 Alternative 2 Transportation Network**

	EIS Study Area 1	EIS Study Area 2	EIS Study Area 3	EIS Study Area 4	EIS Study Area 5	EIS Study Area 6	EIS Study Area 7	EIS Study Area 8	Total
Alternative 2 Bike Network	26.20	43.16	15.01	22.40	18.95	28.86	21.22	34.19	<b>209.99</b>
Alternative 2 Freight Network	32.45	30.74	16.17	15.74	18.29	17.76	56.58	23.83	<b>211.56</b>
Alternative 2 Pedestrian Network	504.80	377.11	256.21	121.43	311.77	360.98	88.59	373.67	<b>2394.55</b>
Alternative 2 PSPS	89.87	35.69	25.37	28.30	65.63	45.58	9.64	75.33	<b>375.41</b>
Alternative 2 Transit Network	27.30	14.47	16.55	32.49	15.94	21.40	14.74	27.39	<b>170.28</b>

Transportation Modes by Alternative, by EIS Zone (lengths in miles)

Sources: City of Seattle, 2022; Kimley-Horn, 2023.

### **Regional and Local Policy Consistency**

See Impacts Common to All Alternatives section.

### **Compatibility with Current and Future Land Use**

Alternative 2 includes improvements that increase access to transportation in areas of the city beyond frequent transit corridors and outside of urban village/urban center boundaries. Alternative 2 proposes additional People Streets and community & mobility hubs that are compatible with the corridor and neighborhood anchors shown in Exhibit 3-105. These alternatives propose a transit network that enhances multimodal connections throughout the City while supporting primary/high volume transit capacity along corridors and within urban village/urban center boundaries. Alternative 2 is more likely to support the land use patterns envisioned in Alternative 5 of the Comprehensive Plan than the No Action Alternative. No significant adverse impacts are anticipated.

### **Displacement**

See section on Impacts Common to All Alternatives

### **Access to Community Assets**

Alternative 2 introduces more improvements to increase access to community assets in Seattle. It includes more linear miles of sidewalks, corridors with bike facilities, and streets with additional pedestrian improvements. Sidewalk improvements are anticipated in urban centers, urban villages, and neighborhood anchors that currently lack sidewalks. The transit system improvements are also more frequent, with more dedicated transit corridors, light rail stations, and RapidRide corridors. There are also more crosswalk improvements and moderate safety improvements for transit stops near light rail stations and along RapidRide lines facilitating multimodal transportation connections. Additionally, there are 52 community & mobility hubs providing transit connections to areas of the city with both commercial and residential uses. These improvements increase access to community assets in areas of the city beyond frequent transit corridors and outside of urban village/urban center boundaries. No adverse impacts to access to community assets are anticipated.

### **Secondary Study Areas Impacts**

Analysis on the secondary subarea impacts can be found in [Appendix C](#).

## **Impacts of Alternative 3: Rapid Progress**

Alternative 3: Rapid Progress includes the most investment in pedestrian, bike, transit, freight and PSPS improvements across the City of Seattle. This alternative includes 3,116 miles of sidewalks to bridge gaps in the existing pedestrian network, 540 miles of corridors with bicycle improvements, 270 miles of transit corridors, 230 miles of freight network, and 1,397 miles of PSPS network. This alternative would also improve key transit corridors with 33 additional miles of dedicated transit corridors and 52 community & mobility hubs throughout the City. Alternative 3 also includes the greatest investment in transit connections and would include 123 additional miles of dedicated transit corridors and 106 community & mobility hubs.

### Citywide Impacts

These assumptions outline the existing and anticipated transportation conditions for different modes of transportation in the city under Alternative 3. For electric vehicles, 18% of the overall fleet is assumed to be electric or plug-in hybrid, with additional EV infrastructure. For pedestrians, sidewalks are assumed on all streets citywide, and improvements are assumed on unimproved streets. For bicycles, existing facilities and committed projects are assumed, with bike facilities on all streets proposed in the bike vision network. For PSPS (Pedestrian, Strolling, and Event Streets), existing and committed stay healthy streets are assumed, along with additional pedestrian improvements along destination streets. For transit, existing and committed dedicated transit lanes and RapidRide corridors are assumed, along with dedicated transit facilities on priority streets in the transit vision network. All community & mobility hubs included in the transit vision network are also assumed. For freight, the existing network is assumed, along with dedicated freight and transit lanes on select streets, including major truck streets that are also priority transit corridors.

Alternative 3 plans for rapid progress, increasing the miles of bicycle network by 240% over Alternative 1, increasing the miles of freight network by 9% over Alternative 1, increasing the miles of pedestrian network by 37% over Alternative 1, increasing the miles of PSPS (streets with additional pedestrian improvements) by 470% over Alternative 1, and increasing miles of transit network by 236% over Alternative 1. The Alternative 3 transportation network is shown in Exhibit 3-107 below, represented in miles.

**Exhibit 3-107 Alternative 3 Transportation Network**

	EIS Study Area 1	EIS Study Area 2	EIS Study Area 3	EIS Study Area 4	EIS Study Area 5	EIS Study Area 6	EIS Study Area 7	EIS Study Area 8	Total
Alternative 3 Bike Network	101.55	102.71	43.40	31.44	63.59	78.05	33.52	86.44	<b>540.71</b>
Alternative 3 Freight Network	38.87	34.38	20.42	15.74	18.29	17.85	61.20	23.83	<b>230.58</b>
Alternative 3 Pedestrian Network	641.47	577.52	305.67	123.49	338.27	465.00	197.76	466.97	<b>3116.15</b>
Alternative 3 PSPS	299.83	259.05	135.95	39.53	155.58	210.47	64.53	216.96	<b>1,381.90</b>
Alternative 3 Transit Network	40.25	42.16	22.85	42.76	24.03	30.41	25.68	41.74	<b>269.88</b>

Transportation Modes by Alternative, by EIS Zone (lengths in miles)  
Sources: City of Seattle, 2022; Kimley-Horn, 2023.

### Regional and Local Policy Consistency

See Impacts Common to All Alternatives section.



### **Compatibility with Current and Future Land Use**

Similar to Alternative 2, Alternatives 3 include improvements that increase access to transportation in areas of the city beyond frequent transit corridors and outside of urban village/urban center boundaries.

Alternative 3 proposes additional People Streets and community & mobility hubs that are compatible with the corridor and neighborhood anchors shown in Exhibit 3-105. This alternative proposes a transit network that enhances multimodal connections throughout the City while supporting primary/high volume transit capacity along corridors and within urban village/urban center boundaries. Alternative 3 is more likely to support the land use patterns envisioned in Alternative 5 of the Comprehensive Plan than the No Action Alternative. No significant adverse impacts are anticipated.

### **Displacement**

See section on Impacts Common to All Alternatives

### **Access to Community Assets**

Alternative 3 introduces the most improvements to increase access to community assets in Seattle. It includes the most linear miles of sidewalks, corridors with bike facilities, and streets with additional pedestrian improvements. Sidewalk improvements are anticipated in areas that currently lack sidewalks. Transit system improvements are also the most frequent, with the most dedicated transit corridors, light rail stations, and RapidRide corridors. There are also the most crosswalk improvements, and more safety improvements for transit stops along the entire transit system, particularly on high-ridership bus lines. Furthermore, this alternative introduces more EV charging infrastructure required in new development and additional EV infrastructure in public streets. These improvements create the most access to community assets in areas of the city beyond frequent transit corridors and outside of urban village/urban center boundaries. No adverse impacts to access to community assets are anticipated.

### **Secondary Study Area Impacts**

Analysis on the secondary study areas can be found in [Appendix C](#).

## **3.5.3 Summary of Impacts**

Exhibit 3-108 represents a summary of the impact thresholds for three alternatives: Alternative 1: No Action, Alternative 2: Moderate Pace, and Alternative 3: Rapid Progress. Each alternative is evaluated based on four criteria: policy consistency, land use compatibility, displacement, and access to community assets.

Alternative 1 has the potential to result in significant adverse impacts with respect to land use compatibility and access to community assets. These impacts are primarily due to the lower level of transportation improvements to support future land use growth compared to Alternatives 2 and 3. No other potential significant adverse land use impacts are identified for any of the alternatives.

Exhibit 3-108. Summary of Land Use Impacts by Alternative

Impact Threshold	Alternative 1	Alternative 2	Alternative 3
<b>POLICY CONSISTENCY</b>	▼	▼	▼
<b>LAND USE COMPATIBILITY</b>	▲	▼	▼
<b>DISPLACEMENT</b>	▼	▼	▼
<b>ACCESS TO COMMUNITY ASSETS</b>	▲	▼	▼

Notes: Land use impacts are considered either No potential for significant adverse impact (▼), or Potential for significant adverse impact (▲).

Sources: BERK, 2023.

## 3.5.4 Mitigation Measures

### Incorporated Plan Features

Many of the potential land use impacts are mitigated by incorporated plan features that are a part of the proposal.

- No alternative would directly affect land use patterns or the ability of the City to meet its growth targets.
- All alternatives maintain the vision, goals, and policies of the Comprehensive Plan.

### Regulations & Commitments

Some of the potential land use impacts are mitigated by the presence of existing regulatory commitments that would apply with or without the proposal.

#### Commute Trip Reduction program

Seattle's CTR program is a partnership between the State, City, the local Transportation Management Association, and Seattle employers. The business-oriented program provides education, events, communications, and data insights to support commuters, employers, and the environment through transportation choices. The program has seen substantial decreases in driving alone, and currently over two-thirds of CTR affected commuters choose transit, walking, carpooling, bicycling, or telecommuting.

### Other Potential Mitigation Measures

Potential significant land use impacts identified for Alternative 1 could be mitigated through adoption of one of the action alternatives, or through amendment of Alternative 1 to ensure that transportation improvements more adequately serve planned growth.

### Anti-Displacement

Although no significant adverse impacts to displacement risk are identified, measures that could be taken to continue to reduce the risk of future displacement include the following:

- Work closely with affected BIPOC and low-income communities to better understand community-specific displacement pressures and goals around anti-displacement. Listen to and advance community-driven solutions by disproportionately impacted groups.
- Invest in creation and preservation of affordable housing in areas where transportation improvements could increase market pressures, ideally ahead of or alongside those improvements.
- Invest in community-owned and community-driven development by communities that are at high risk of displacement.
- Build capacity within affected communities to use anti-displacement resources and ensure the City is prepared to support where needed through technical assistance.
- Stabilize vulnerable tenants and community-serving entities through direct funding support and technical assistance toward affected communities to help them stay in place in the face of market pressures.
- Supplement knowledge shared by affected communities with data that tracks high displacement risk areas and the outcomes of policy actions.
- Seattle's City Code contains regulations that help to address potential displacement. These include:
  - Seattle's Tenant Relocation Assistance Ordinance.
  - Notice of Intent to Sell Ordinance.
  - Rental registration and Inspection Ordination

### 3.5.5 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts are anticipated.

## Section 3.6

# Transportation



This chapter presents a multimodal transportation evaluation of the potential impacts of implementing the range of alternatives under consideration. The chapter presents existing transportation conditions within the study area and future transportation conditions under three alternatives: Alternative 1 No Action and two Action Alternatives reflecting varying increases in multimodal investments in Seattle's transportation system by 2044. Significant transportation impacts and potential mitigation strategies are identified for the Alternatives based on the policies and recommendations established in local plans. To evaluate potential impacts to the transportation system, this chapter evaluated the following:

- Consistency with state, regional and county policies.
- Potential increases in the number of people walking or biking based on access to non-motorized infrastructure.
- Increases in VMT per capita.
- The number of existing and future jobs and housing units with access to pedestrian, bicycle and transit infrastructure.
- The extent of mobility priority for transit and freight.

More specific thresholds are described in Section 3.6.2.

## 3.6.1 Affected Environment

### Primary & Secondary Study Areas

The description of existing transportation networks in this section is primarily at the secondary study area or subarea scale. The primary study area (citywide) scale is used principally to summarize existing policies, plans and regulations.

### Data & Methods

Data on the existing and funded transportation network within the City of Seattle were obtained from the following sources:

- Seattle Department of Transportation
- Sound Transit
- King County Metro



## Current Policy & Regulations

The following policies and regulations are key elements that are shaping the future of transportation and urban development in Washington State, particularly in the Puget Sound region. Together, these initiatives play a vital role in creating livable, sustainable, equitable, and connected communities throughout Washington State.

### Washington State

#### *Washington State Growth Management Act*

The Washington State Growth Management Act (GMA), adopted in 1990, is a body of planning regulations that establishes requirements for Counties and localities to plan for future growth. GMA requires local governments to manage growth by (among other things) preparing comprehensive plans and implementing them through capital investments and development regulations (zoning).

Consistent with the GMA, the City of Seattle prepares updates to its Comprehensive Plan to accommodate new 20-year growth projections every eight years and has an annual process to amend the plan between major updates. Seattle most recently completed a major update, Seattle 2035, in 2015 and is preparing for a major update in 2024 that will extend the planning horizon to the year 2044.

The GMA establishes planning requirements and procedures including mandating elements of the Comprehensive Plan that the City must address (discussed below)

#### *Complete Streets Policy*

Washington State Department of Transportation (WSDOT) has a Complete Streets policy, which was passed by the Washington State Legislature in 2022 under Senate Bill 5974 as part of the Move Ahead Washington package. The Complete Streets requirement added to RCW 47.24.060 directs WSDOT to incorporate the principles of complete streets into WSDOT facilities and improve the safety, mobility, and accessibility of state highways for all users. This directive affects all state transportation projects beginning the design phase on or after July 1, 2022 over \$500,000 in value.

### Central Puget Sound Region

#### *PSRC's VISION 2050*

The Puget Sound Regional Council (PSRC) is composed of nearly 100 members, including the four counties, cities and towns, ports, state and local transportation agencies, and Tribal governments within the region. PSRC develops policies and coordinates decisions about regional growth, transportation and economic development planning within King, Pierce, Snohomish, and Kitsap counties. The PSRC *Vision 2050* plan is the Puget Sound's long-term plan for growth and includes actions that local governments could take to support this vision. The plan has two main policies, namely 'Regional Growth Strategy' and 'Multicounty Planning Policies'. 'Regional Growth Strategy' is a strategy to focus growth near high-capacity transit areas and inside designated urban growth areas. 'Multicounty Planning Policies' provide a common framework for

countywide planning policies and local plans, which helps jurisdictions with decision-making and updates towards their own comprehensive plans to accommodate future growth. The *Vision 2050* plan also informs a subplan by PSRC called *Regional Transportation Plan (RTP)*, which is a long-range transportation plan for the central Puget Sound region. This plan is adopted every four years and determines investments and policies needed to create a safe and efficient transportation system for the region. This plan builds on the transportation element within the *Vision 2050* plan using data-based strategies.

#### *Sound Transit 3 Plan*

*Sound Transit 3 (ST3)* is a plan for high-capacity transit improvements for Central Puget Sound Region, with future service throughout the regional shown in Exhibit 3-109. This plan is consistent with Puget Sound Regional Council (PSRC)'s established regional land use and transportation plans in Vision 2040 and Regional Transportation Plan. The ST3 Plan, approved for funding by voters in the Sound Transit District in 2016, includes the expansion of link light rail, bus rapid transit, and commuter rail. Projects in the plan include the West Seattle and Ballard Link Extensions, which proposes an additional downtown tunnel with thirteen new stations in Seattle along a new light rail alignment. ST3 also includes two infill stations within Seattle at South Graham St and NE 130<sup>th</sup> St. Shown in Exhibit 3-109, the Systemwide connections in the ST3 Plan would expand light rail throughout the region north to Everett and south to Tacoma Dome, and east to Downtown Redmond along with expanded Sounder commuter rail and Tacoma Link (T-Line) service.

Exhibit 3-109. Sound Transit Future Service Map Under ST3



Source: Sound Transit, 2022.

## **King County**

### 2021 King County Countywide Planning Policies

2021 King County Countywide Planning Policies has a transportation subsection, which consists of goals and policies that build on PSRC's *Vision 2050* Plan. The overall goal is for the county to be "well served by an integrated, multimodal transportation system that supports the regional vision for growth, efficiently moves people and goods, and is environmentally and functionally sustainable over the long term" (King County, 2022). All transportation policies outlined in this plan are divided into three sections: 'Supporting Growth', 'Mobility' and 'System Operations'. The policies under 'Supporting Growth' aim to ensure consistency between local and regional transportation system developments and PSRC *Vision 2050*'s 'Regional Growth Strategy' framework as outlined in sections above. Next, the policies under 'Mobility' aim to create a well-integrated, multimodal transportation system that moves people and goods efficiently and effectively within and beyond the county. Lastly, the policies under 'System Operations' aim to create a transportation system that "protects public investments, promote equitable access, provide mobility, promote public health and safety, and achieve optimum efficiency" (King County, 2022).

### Metro Connects

King County Metro's *Metro Connects* Plan, adopted in 2017, is a long-range service and capital plan to for bus service to all of King County. The plan responds to critical challenges facing the region, including historic inequities, displacement risk, a worsening climate crisis, integration of a wide range of mobility services, and new sustainable funding sources. Metro Connects is also essential to delivering a system that advances Metro's mission, vision, and policy goals, as described in Metro's Strategic Plan for Transportation. The policy goals are outlined as below in Exhibit 3-110.

Exhibit 3-110. Metro Connects Alignment with Strategic Plan Goals



Source: King County Metro, 2017

## City of Seattle

### Move Seattle

In 2015 Seattle passed the Levy to Move Seattle, a nine-year (2016-2024), \$930 million levy developed by the Seattle Department of Transportation to enhance citywide multimodal travel in three main categories: Safe Routes, Maintenance and Repair, and Congestion Relief. Safe Routes focuses on safety for pedestrians and bicyclists through programs such as Vision Zero, Neighborhood Street Fund, and pedestrian or bicycle infrastructure improvements. Maintenance and Repair focuses primarily on repairing/replacing roadway infrastructure on bridges and arterial roadways. Lastly, Congestion Relief encompasses all modes of transportation to enhance safety and comfort for all users. Following the passing of the Levy, a workplan titled Move Seattle was published in 2018 and updated annually since 2020, which combines the goals of the 2009 pedestrian, 2012 transit, 2014 bicycle, and 2015 freight master plans to select a variety of projects to be covered by the levy.

### Pedestrian Master Plan

The City of Seattle's Pedestrian Master Plan is a 20-year blueprint to achieve the vision of Seattle as the most walkable and accessible city in the nation, by focusing on the safety, vibrancy, equity, and health of the city. The plan aims to improve mobility conditions for all who use the city's sidewalks, walkways, and crossings. This plan builds on an existing foundation of city goals and policies in various plans, including: the Seattle Comprehensive Plan, Move Seattle, the Bicycle Master Plan, the Transit Master Plan, the Freight Master Plan, Vision Zero, Climate Action Plan, Complete Streets Policy, and the Right-of-Way Improvements Manual.



#### Bicycle Master Plan

The City of Seattle's Bicycle Master Plan is a 20-year blueprint adopted in 2013. The vision of this plan is for people of all ages and abilities in Seattle to be able to comfortably ride a bicycle as an integral part of daily life. This vision is supported by five goals: ridership, safety, connectivity, equity, and livability – which set the basis for the plan's performance measures and help to prioritize the projects that should be built first. The plan includes a Bicycle Network Map, which lists the recommendations for locations and facility types of bicycle improvements throughout the city. Additionally, the plan recognizes that upgrades of existing bicycle facilities are needed and recommends a prioritization process. Other elements in the plan include a review of end-of-trip facilities such as bicycle parking accommodations; education and enforcement programs; coordination with other agencies; and funding or cost inventories for bicycle facilities at a planning level.

#### Transit Master Plan

The City of Seattle's Transit Master Plan is a 20-year plan adopted in 2012 and amended in 2016. The plan recommends strategies, projects, and policies that will make Seattle a more affordable, cleaner, vital, equitable, and enjoyable place to live and do business; the plan aims to meet Seattle's transit needs through 2030. Based on an extensive market analysis, capital investment priorities needed to establish a transit network were identified and preferred transit modes for high priority corridors in close coordination with other modal needs were evaluated and recommended in the plan. The plan is also a framework for a transportation system where mobility and access are provided equally and affordably to all residents. There are six major initiatives identified as near-term priorities in the plan:

- Continue Implementation of Bus Rapid Transit Network and Priority Bus Corridors
- Develop Center City Transit to Support Downtown Growth and Vitality
- Plan, Fund, and Build Priority High-Capacity Transit Projects
- Enhance Walk-Bike-Ride Access where Needs are Greatest
- Improve Transit Information and System Usability
- Pursue Funding to Enhance Transit Service and Facilities

#### Freight Master Plan

City of Seattle's Freight Master Plan is a 10-year strategic vision that was published in 2016. The vision of the plan is to ensure goods are moving to, from, and within Seattle in an efficient, predictable, safe, and sustained manner to maintain the economic health and vibrancy of the city. To achieve this, the plan aims to design Seattle's roadway network to effectively connect people and products to marketplaces; in consideration with regional and international destinations through road, railroad, waterways and air. The vision of this plan is supported by six main goals that articulate what the plan seeks to achieve over time to meet the vision; and sets the basis for the plan's strategies, actions, performance measures and prioritization framework. These goals are: economy, safety, mobility, state of good repair, equity and environment. The plan included public input, freight stakeholders, and coordination with City staff and other agencies. Freight data was reviewed, and tools such as geographic information systems (GIS) and a field analysis of the existing transportation network were used to identify freight facilities, determine needs, and identify potential solutions.

#### 2035 Comprehensive Plan

Seattle's 2015 Comprehensive Plan includes a framework for right-of-way allocation of how decisions are made with regard to using street space. The policies establish 6 essential functions of the street in the public right-of-way:

- Mobility (moving people and goods)
- Access for people (e.g., bus stops and short-term passenger vehicle parking)
- Access for commerce (e.g., loading spaces for trucks)
- Activation (e.g., parklets)
- Greening (e.g., street trees, green stormwater infrastructure)
- Storage (long-term storage of vehicles)

The policies state that in making right-of-way decisions, it should accommodate as many of these functions as possible and look to the modal master plans to identify specific needs and priorities on individual streets and corridors.

#### Vision Zero

In 2015, Seattle Department of Transportation adopted a Vision Zero policy, which is a goal of eliminating traffic deaths and serious injuries on Seattle streets by 2030. It uses a data-driven approach to increase safety on roadways and provides targeted funding for education and enforcement.

#### Complete Streets

The City of Seattle passed Resolution 30915 in 2007, which incorporates Complete Streets principles into future transportation plans and roadway design. That resolution was followed by the City's Complete Streets Ordinance (Ordinance 122386) in May 2007 that defined Complete Streets and ordered SDOT to incorporate these principles into all future plans. Design standards for Complete Streets were later specified in the SDOT Right-of-Way Manual *Seattle Streets Illustrated*, which gives exact roadway and pedestrian infrastructure design parameters for improvements.

#### Right-of-Way Improvements Manual

The City's Right-of-Way Improvements Manual (ROWIM) provides design guidance to property owners, developers, architects, landscape architects, and engineers involved with the design, permitting, and construction of improvements to Seattle's rights of-way. This manual outlines procedures and design criteria, which attempts to address the access and mobility needs of everyone who uses the right-of-way.

#### Intelligent Transportation Systems (ITS) Strategic Plan

The City of Seattle's 2010 Intelligent Transportation Systems (ITS) Strategic Plan is a 10-year plan for implementing ITS across the city. ITS uses communications technology and automated traffic systems, to enhance mobility for all modes by increasing the efficiency and safety of the transportation infrastructure. The goals of the strategic plan are to preserve and maintain existing ITS infrastructure, to maximize the value of this existing infrastructure, and expand ITS to provide more coverage and benefits to travelers.

#### Transportation Capital Improvement Program

The City of Seattle's 2022-2027 Proposed Capital Improvement Program is a six-year financial plan for capital investments and strategies to fund those investments, including \$1.6 billion of investments in Seattle transportation system. Transportation projects funded through the CIP include maintenance including paving and resurfacing and implementation of the city's modal plans through improvements that advance those plans.

#### Neighborhood and Subarea Transportation Planning

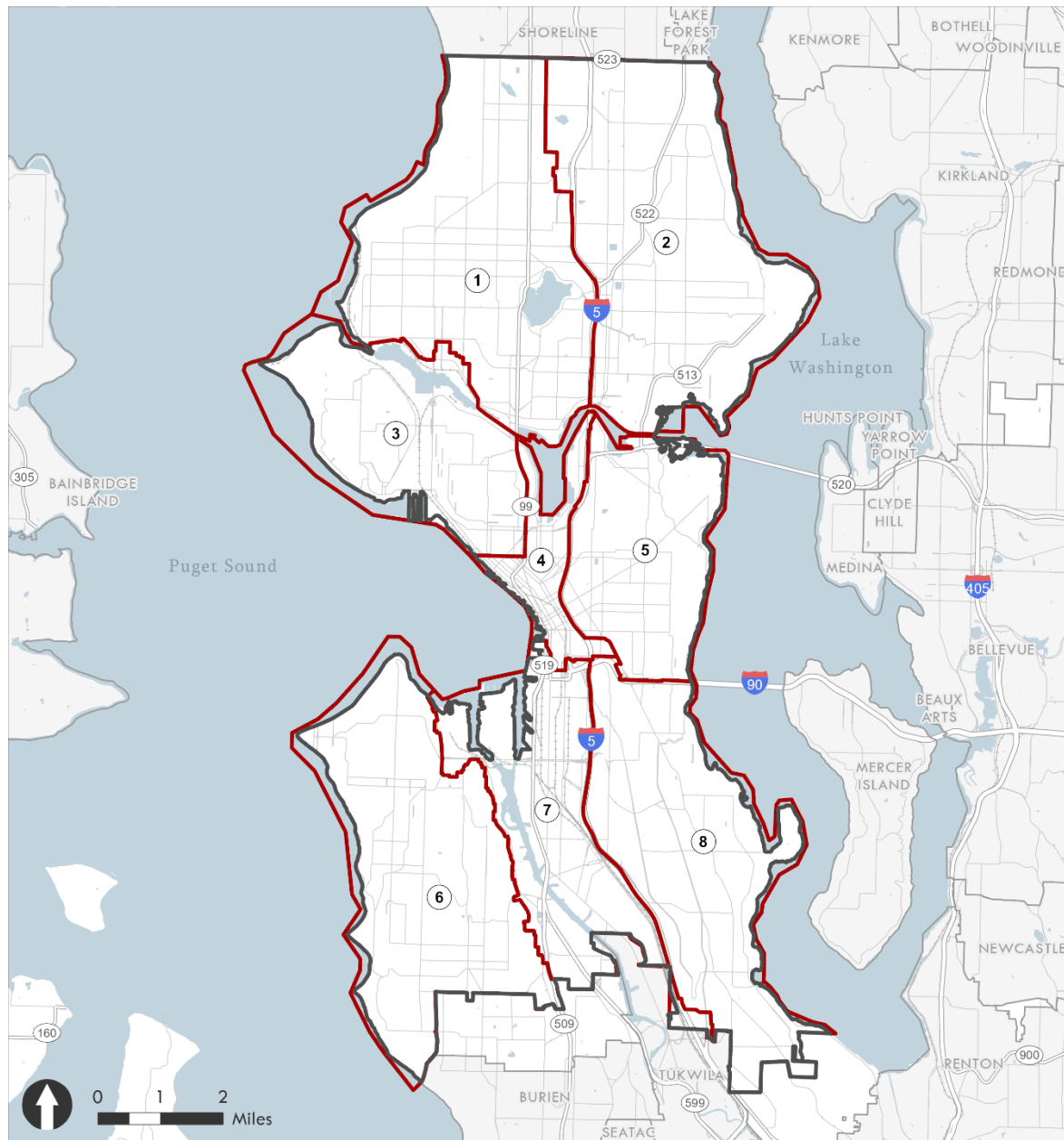
Seattle works with communities to plan for transportation in specific neighborhoods and subareas, including more local priorities, safety improvements and street design concepts. Some recent neighborhood level transportation planning efforts are included below.

- One Center City
- Georgetown Mobility Study
- Judkins Park Station Access Study
- Beacon Hill Station Access and Mobility Study
- North Downtown Mobility Study
- Imagine Greater Downtown
- Ballard-Interbay Regional Transportation System

### **Current Conditions**

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

Exhibit 3-111. Subareas



- City of Seattle
- Other Cities
- Analysis Zones

- |                       |                                 |
|-----------------------|---------------------------------|
| ① NW Seattle          | ⑤ Capitol Hill/Central District |
| ② NE Seattle          | ⑥ W Seattle                     |
| ③ Queen Anne/Magnolia | ⑦ Duwamish                      |
| ④ Downtown/Lake Union | ⑧ SE Seattle                    |



Map Date: April 2023

Washington State Department of Transportation, 2023

### **Citywide Pedestrian and Bicycle Network**

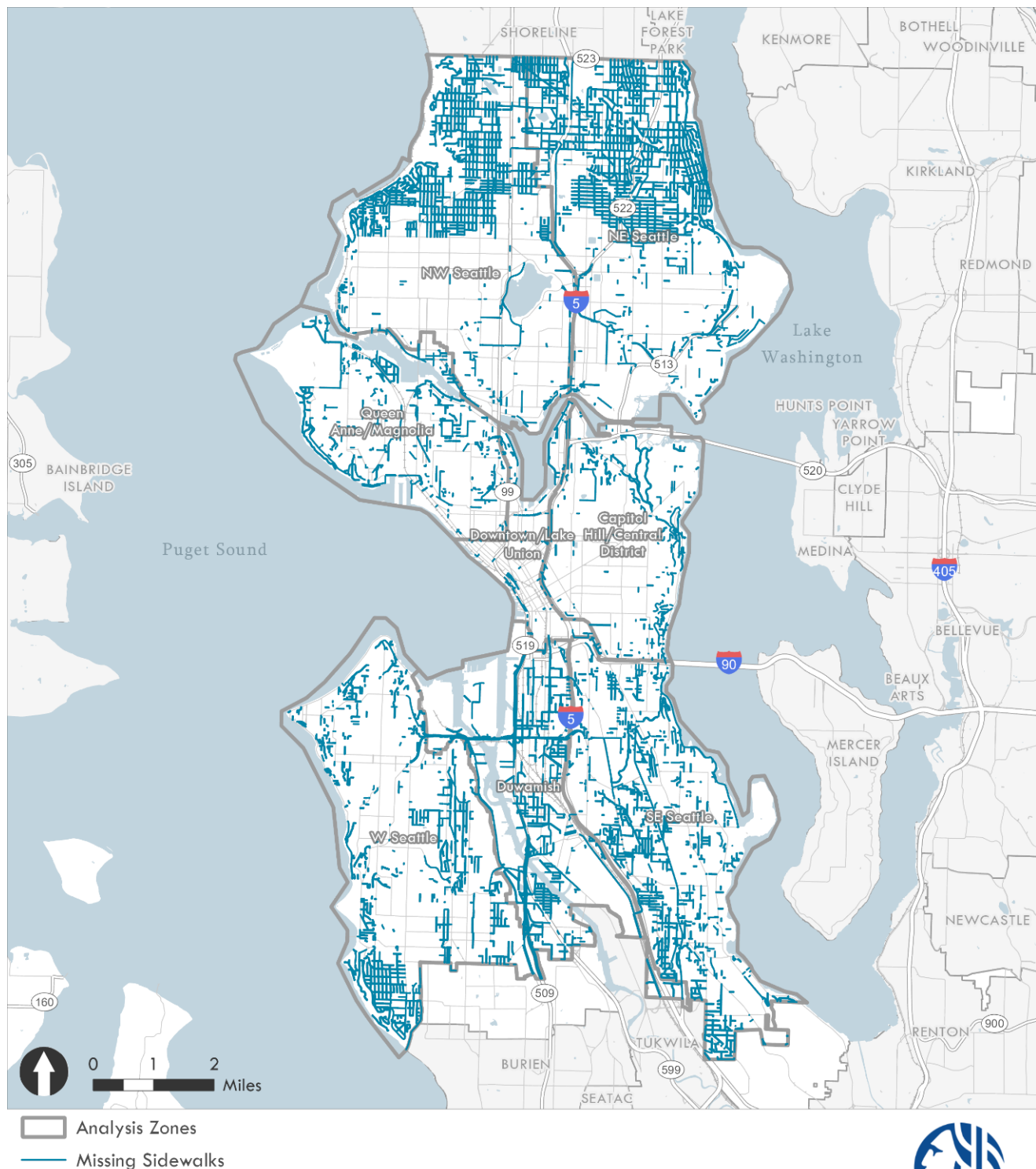
Seattle's existing pedestrian and bicycle system strives to be comprehensive and accommodating, including approximately 502 public stairways, 2,300 miles of sidewalks and medians, 48 miles of multi-use trails, and nearly 315 miles of bicycle facilities.

Still, there are large gaps in the pedestrian network, with almost 843 miles of missing sidewalk concentrated north of N 85<sup>th</sup> Street and in south Seattle. The NW and NE Seattle subareas show the most sidewalk gaps, while the Downtown/Lake Union, Capitol Hill/Central District, and Queen Anne/Magnolia subareas have the most sidewalk coverage. W Seattle, SE Seattle and Duwamish also have substantial sidewalk gaps, but those gaps tend to be more dispersed, and in the case of Duwamish, concentrated in industrial areas. Missing sidewalks in the pedestrian network are shown in Exhibit 3-112.

Bike infrastructure is more concentrated in the Downtown/Lake Union and Capitol Hill/Central District study areas with fewer bike connections farther from the center city and in the Queen Anne/Magnolia study area (see Exhibit 3-113). While there are bike facilities throughout the city, these facilities do not always connect and there are gaps in the existing network. About 200 miles of the existing citywide bicycle network are considered AAA or comfortable for all ages and abilities. This distinction is given to bicycle infrastructure that provides an enhanced experience to users, providing physical barriers and distance between bicycles and vehicle traffic to enhance the sense of and actual safety of bicyclists. AAA features include- Protected Bike Lanes (PBLs), Neighborhood Greenways, and Off-Street Multiuse Trails. These categories of bikeways provide separation between vehicles and bicycles, enhancing safety and usability for children, the elderly, and all other users. AAA bike facilities throughout the City of Seattle are shown in Exhibit 3-114.



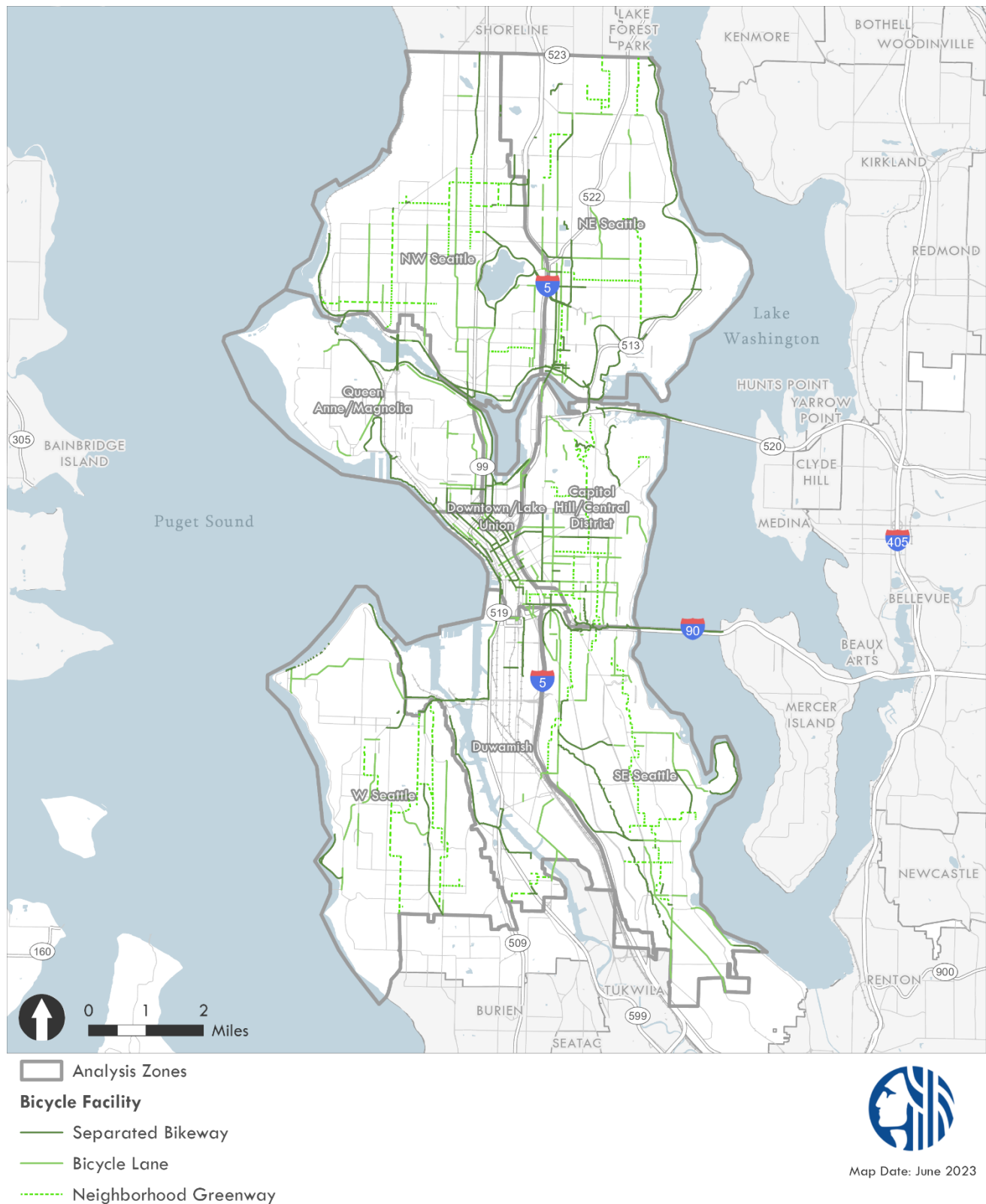
Exhibit 3-112. Existing Citywide Pedestrian Gaps



Map Date: April 2023

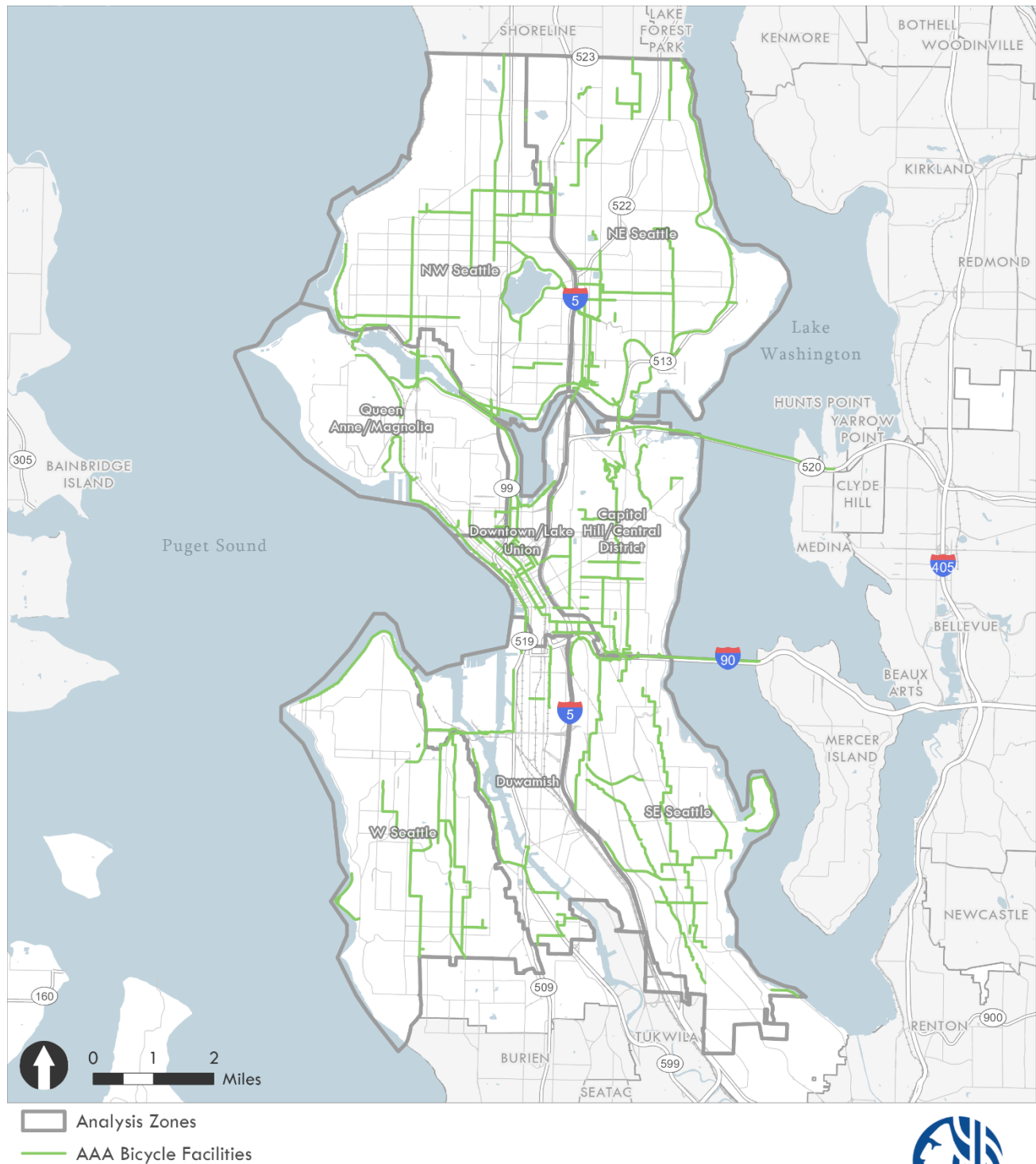
Source: Seattle Department of Transportation, 2023

Exhibit 3-113. Existing Citywide Bicycle Facilities



Source: Seattle Department of Transportation, 2022.

Exhibit 3-114. Existing Citywide AAA Bike Facilities



Map Date: April 2023

Source: Seattle Department of Transportation, 2022

### **Citywide Transit Network**

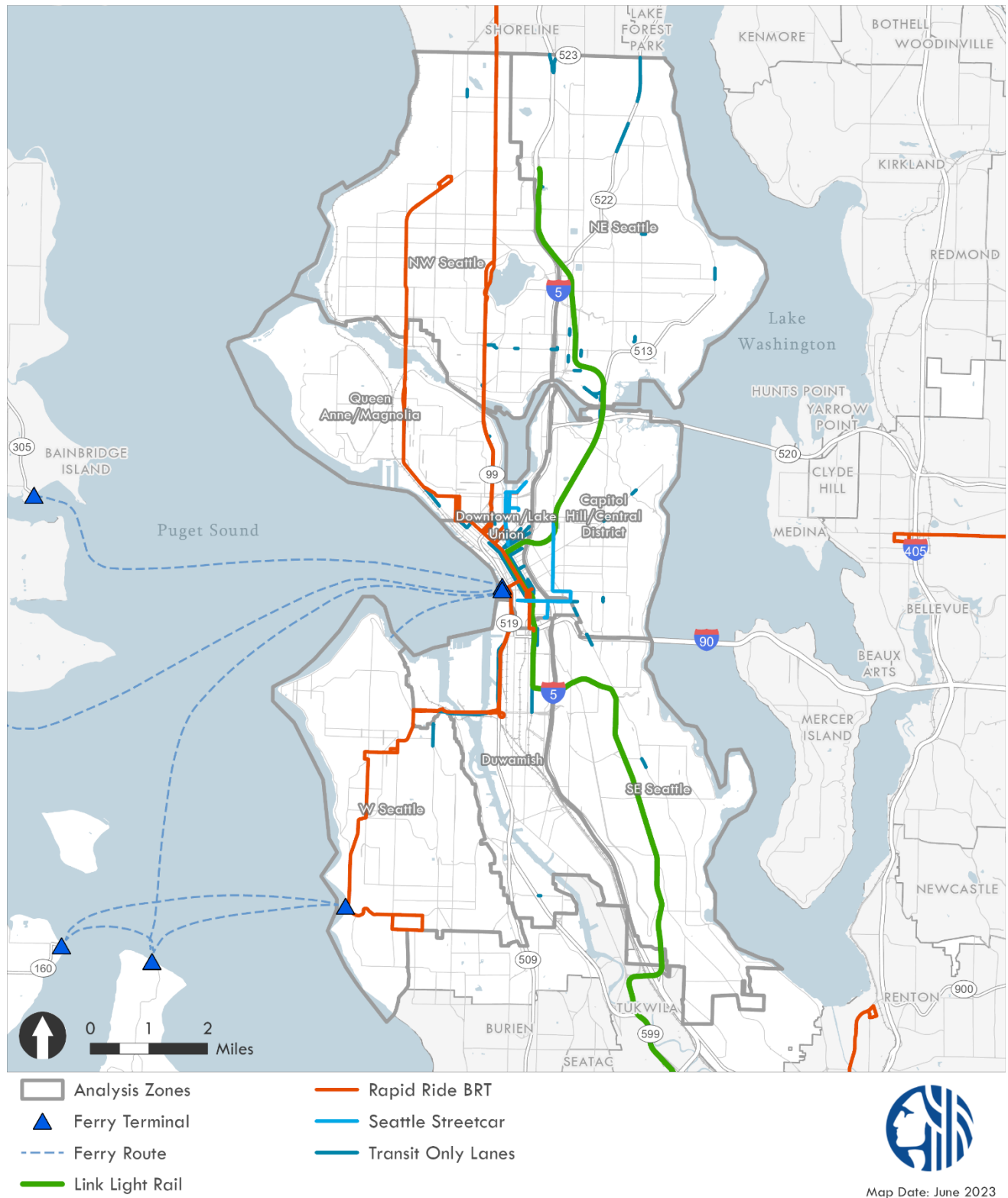
Public transit service in the City of Seattle is provided by King County Metro, Sound Transit, Community Transit and the City of Seattle, with ferry service operated by Kitsap Transit and Washington State Ferries. King County Metro (Metro) operates bus service and a number of ferry and rideshare services that serve the City of Seattle. Metro's bus service in Seattle includes three RapidRide routes with more frequent and reliable service that connect downtown to West Seattle (the C Line), Ballard (the D Line), and Shoreline along the SR 99 corridor (the E Line). Several other RapidRide corridors through Seattle are in development or beginning service including the G Line serving the Madison Avenue corridor, the H Line serving the Delridge Way corridor, and the J Line to the U District along the Eastlake Ave corridor. Portions of these lines include improved transit lanes or other speed and reliability improvements, and Metro is actively working with the City of Seattle to improve speed and reliability along other high-ridership lines including Route 7 and Route 40. There are 38 linear miles of improved transit corridors in the City of Seattle, primarily along bus corridors included RapidRide lines and other routes with speed and reliability improvements, this figure also includes dedicated lanes for center-running light rail along Martin Luther King Jr Way.

Sound Transit's Link light rail serves the Seattle area with the existing 1 Line, an approximately 25-mile rail corridor with service from Angle Lake, south of Seattle Tacoma International Airport through southeast Seattle connecting to downtown, and then north to Northgate station, which serves as a hub for riders in the north of the city.

Sound Transit plans to expand this light rail network over the next several years, with service north to Lynnwood, south to Federal Way and east to Bellevue and Redmond all expected to open by 2025. This will include the NE 130<sup>th</sup> Street Station and 148<sup>th</sup> Street Station in north Seattle and the Judkins Park Station in Central Seattle. Further extensions as part of the ST3 Plan approved for funding by voters in 2016 will bring Link Light Rail service to farther north to Everett, south to Tacoma and east to downtown Redmond. The West Seattle and Ballard Link extensions will expand service within the City of Seattle, with service to West Seattle expected to open in 2032 and service to Ballard expected to open in 2037.

The City of Seattle also maintains the monorail connecting Westlake to the Seattle Center, and two streetcar lines: the South Lake Union Streetcar and the First Hill Streetcar. These two routes are planned to connect via the Center City Connector route, which is currently planned to run north-south through downtown Seattle along 1<sup>st</sup> Avenue.

Exhibit 3-115. Existing Citywide Transit Facilities



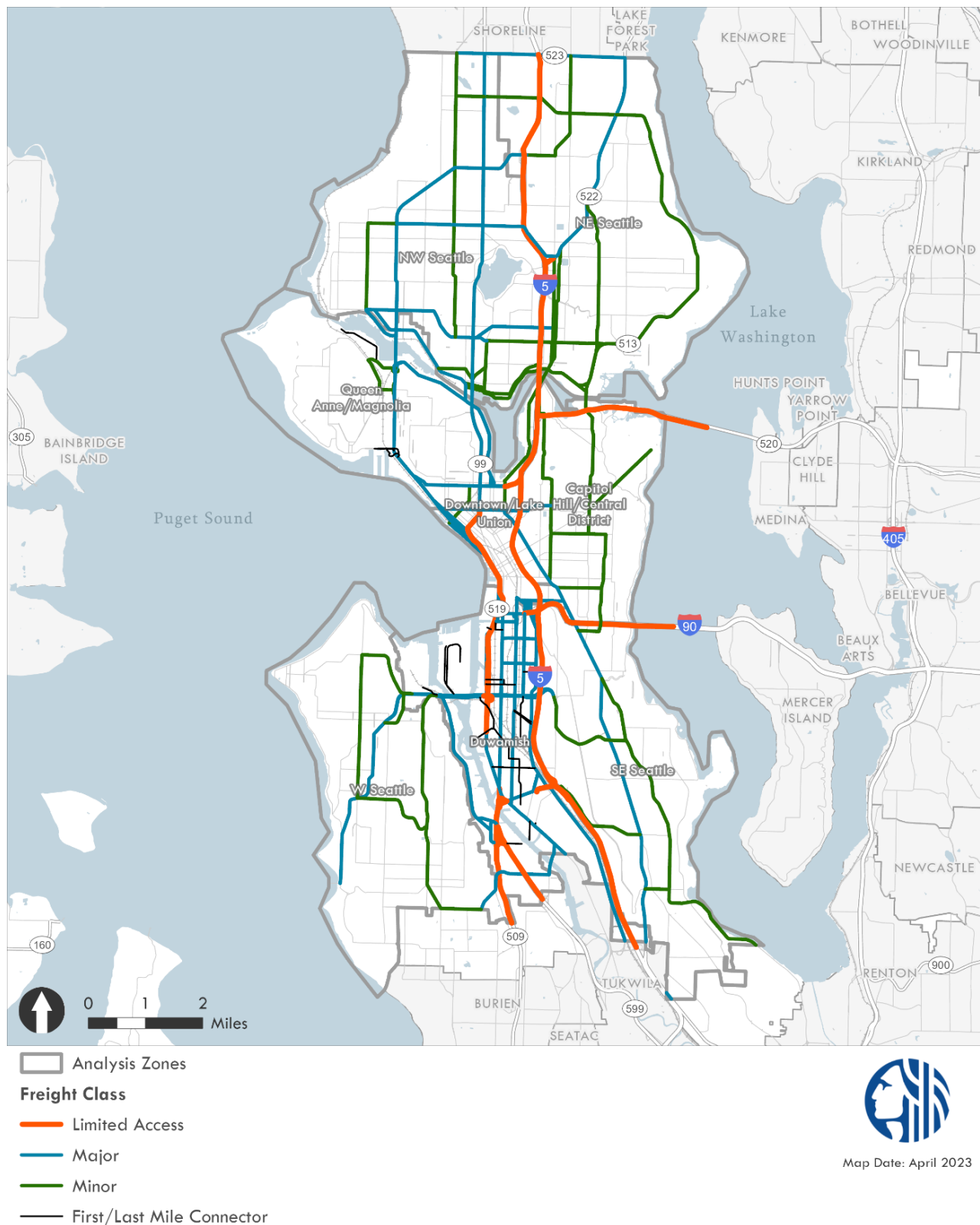
Source: City of Seattle, King County Metro, Sound Transit, 2022



### **Citywide Freight Network**

Seattle has adopted street designations for good movements include major truck streets that carry heavy freight traffic and connect to the City's port facilities and industrial areas. The freight network is composed primarily of interstate and state highways and major corridors that connect to key destinations for freight and intermodal facilities where freight is moved between trains, trucks, and ships. The freight network is shown in Exhibit 3-116. These freight routes connect all study areas in the city. Major truck routes make up a particularly large share of the streets in the Duwamish Subarea, which is home to the Port of Seattle and the regionally designated Duwamish Manufacturing/Industrial Center.

Exhibit 3-116. Existing Citywide Freight Network

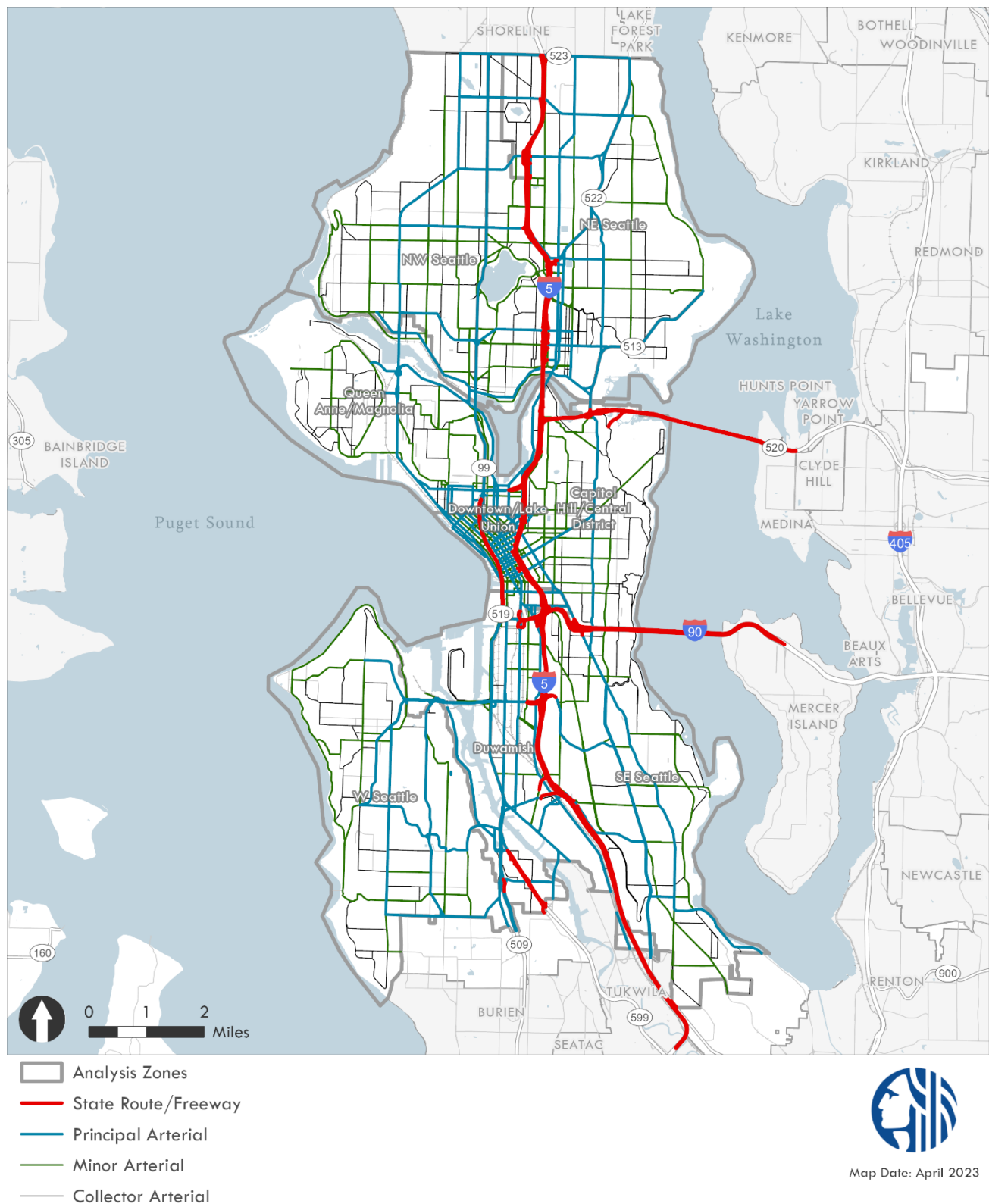


Source: Seattle Department of Transportation, 2022

### **Citywide Roadway Network**

The City roadway network used for analysis purposes comprises the arterial network: interstate highways, major state routes, and principal, minor and collector arterials. Two interstate highways run through Seattle: I-5 running the length of the city north to south, and I-90 connecting central Seattle to the east. There are a number of major state routes in Seattle under WSDOT jurisdiction, including SR 99—another major north-south connection west of I-5—SR 509 connecting areas to the southwest, SR 520 that connects I-5 to the east side of Lake Washington, SR 513 connecting SR 520 and Sand Point, SR 519 connecting the waterfront to I-90, SR 522 which connects I-5 to I-405 through Lake City, and SR 900 which connects the south of Seattle to the east. Of the arterial routes, there are approximately 108 miles of State Routes/Freeways, 186 miles of Principal Arterials, 178 miles of Minor Arterials, and 140 miles of Collector Arterials within the City of Seattle. Arterial roadways and their classifications are shown in Exhibit 3-117.

Exhibit 3-117. Existing Citywide Arterials



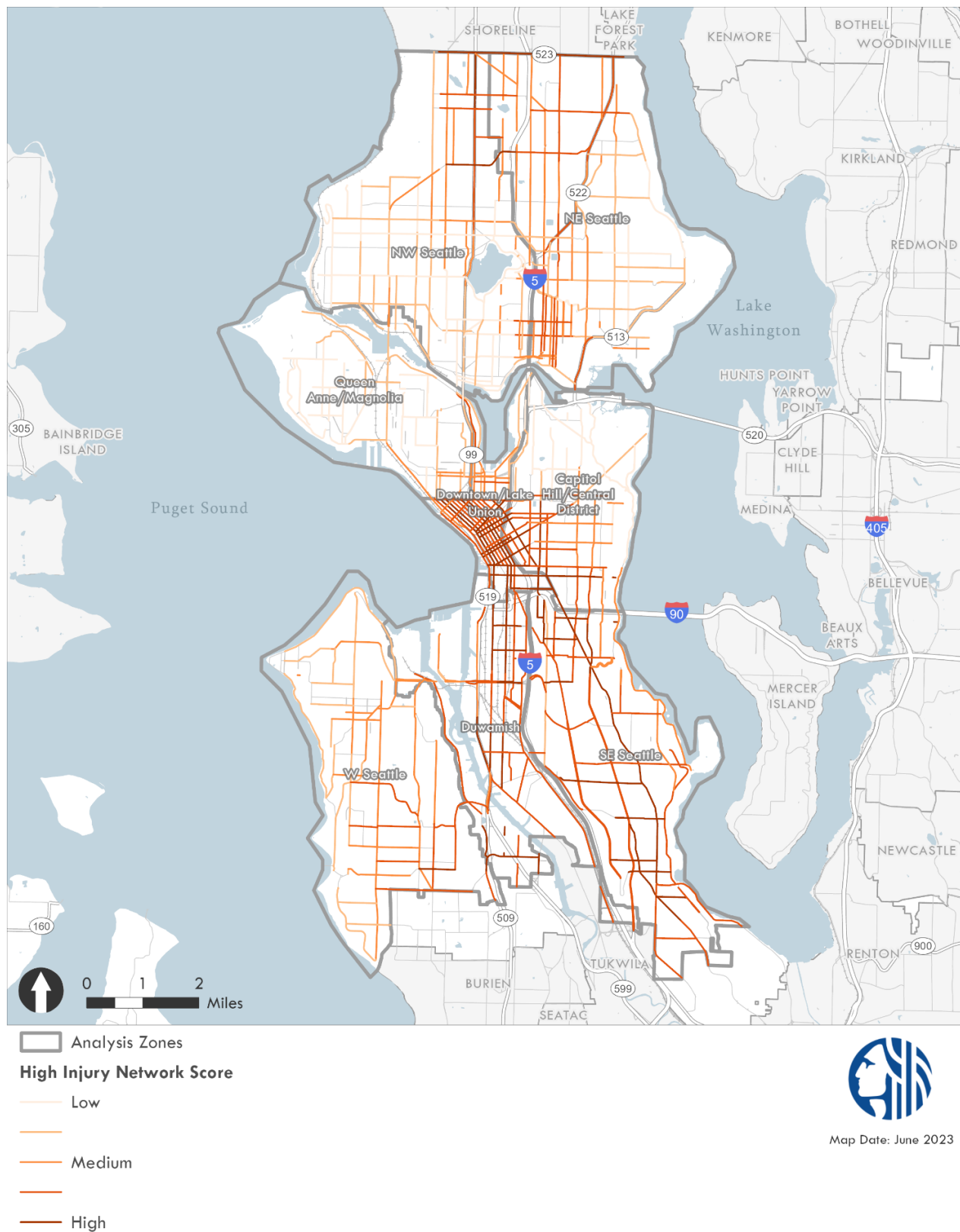
Source: City of Seattle, 2022

### **Citywide Safety and High Injury Network**

The High Injury Network (HIN) shown in Exhibit 3-118 and developed by the Seattle Department of Transportation, is a network created by weighing equity and collision density variables, to form a score showing where the worst crashes have occurred across the city. This score was created to inform Seattle's Vision Zero program, and the higher the score, the higher the collision density. Overall, there are disparities between north versus south and central Seattle. In the central and south end of Seattle, the SE Seattle subarea has the highest average HIN score at 49.1, followed by the Downtown/Lake Union subarea at 48.5, the Duwamish subarea at 47.8 and lastly the Capitol Hill/Central District subarea at 39.8. This is in contrast with the subareas located in the north end of Seattle, where the NE subarea has an average score of 33.3, followed by Queen Anne/Magnolia subarea at 26, and the NW subarea at 25.8.



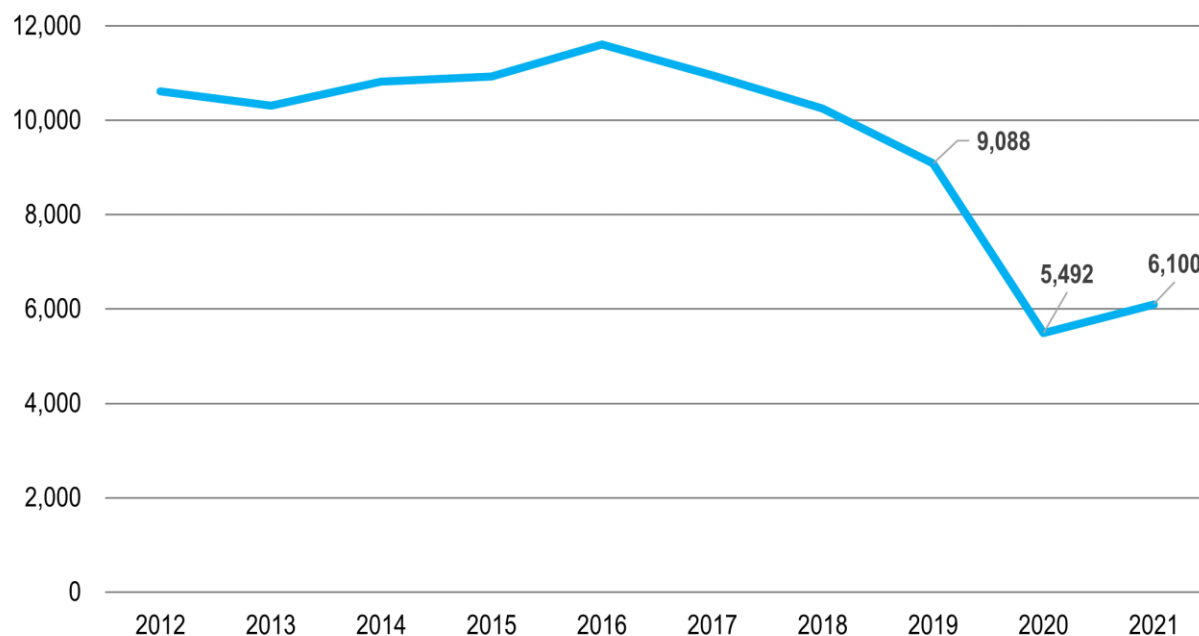
Exhibit 3-118. Existing Citywide High Injury Network



Source: Seattle Department of Transportation, 2022

The City of Seattle recently finalized and updated collision and traffic data, which is explained more in-depth in the *2022 Traffic Report*. When looking at all police-reported collisions in Seattle for the most recent ten years of data, the number of collisions stayed relatively consistent from 2012 to 2015, ranging from 10,614 collisions in 2012 to 10,930 in 2016. Collisions then steadily declined from 2016 to 2020, going from a peak of 11,603 collisions in 2016 to a low of 5,492 collisions in 2020. However, collisions then increased by 608 to 6,100 in 2021, as shown in Exhibit 3-119.

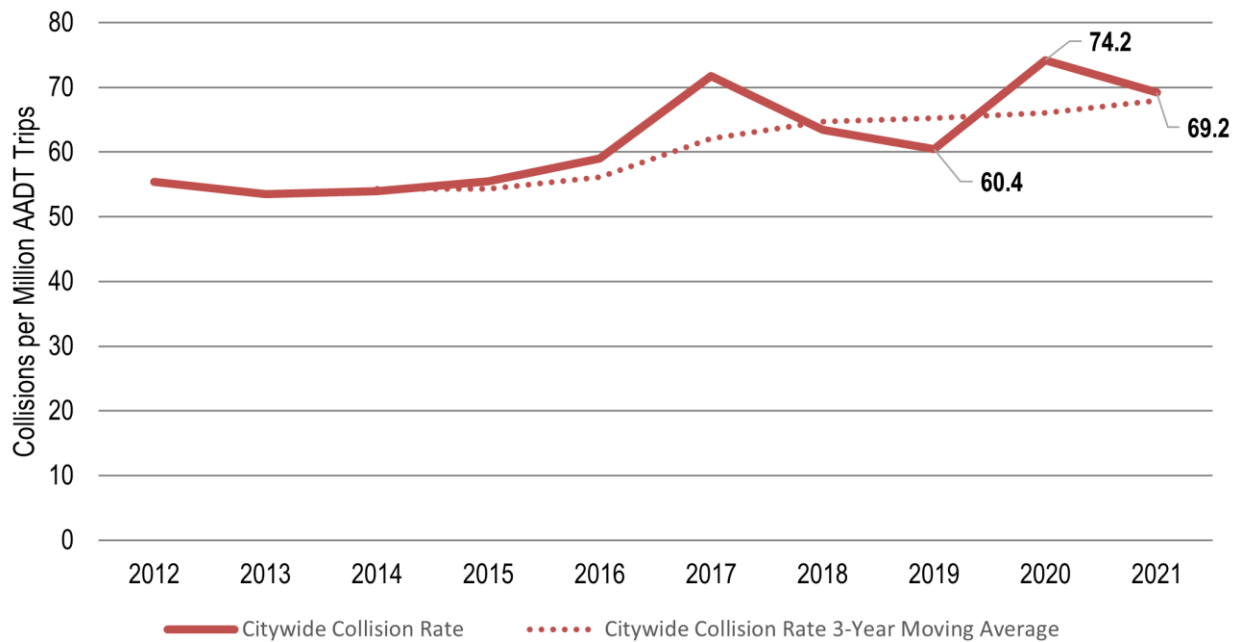
**Exhibit 3-119. Police-Reported Citywide Collisions 2012-2021**



Source: Seattle Department of Transportation, 2022 Traffic Report, 2023.

Although the number of collisions in 2021 was higher than in 2020, this is still a 32% decrease compared to the total number of collisions reported by police in 2019. Furthermore, due in part to the COVID-19 pandemic, crashes and Average Annual Daily Trips (AADT) were at their lowest in 2020, which skews the trend seen over the past five years. The total number of collisions had already been steadily declining since 2016, likely due in part to safety improvements installed by SDOT with the launch of the Vision Zero program in 2015. Therefore, while the number of collisions in 2021 is higher than in 2020, the 2021 numbers still follow the previous trend of declining crashes and match more closely to the previous rate of declination.

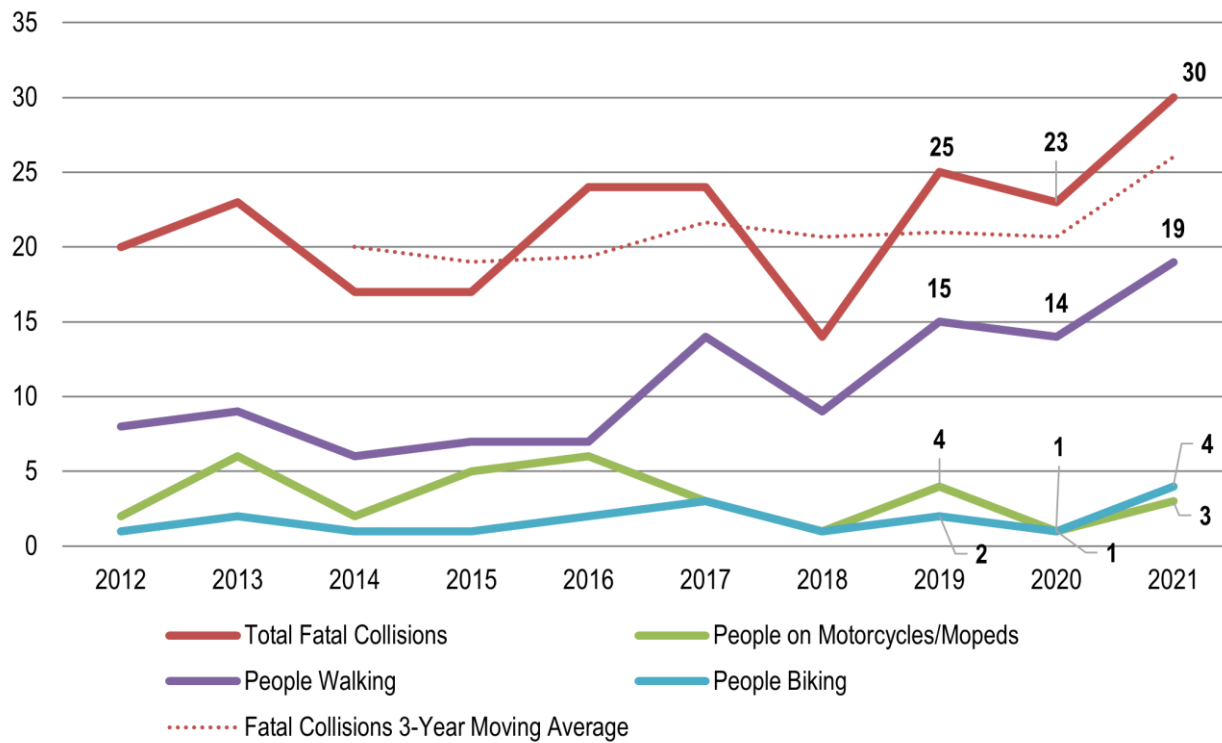
Exhibit 3-120. Police Reported Collisions per Million AADT Trips 2012-2021



Source: Seattle Department of Transportation, 2022 Traffic Report, 2023.

As the number of collisions began steadily declining from 2016, AADT has also been declining since 2014, going from a peak AADT of 200,624,075 in 2014 to 88,183,215 in 2021. AADT has been decreasing much more quickly than the number of collisions, resulting in an overall increase in the rate of collisions as shown in Exhibit 3-120. Although the number of collisions and AADT was at its lowest in the last ten years in 2020, the collision rate was at its highest at the same time. Compared to 2019, the collision rate increased by 14.6% for 2021, with the 3-year moving average reflecting a steady increase in the collision rate.

Exhibit 3-121. Fatal Police Reported Collisions by Mode 2012-2021



Source: Seattle Department of Transportation, 2022 Traffic Report, 2023.

Although total collisions have decreased overall since 2016, total fatal collisions have increased overall from 2012 to 2021 as shown in Exhibit 3-121. The total number of fatal collisions and fatal collisions involving pedestrians, motorcyclists, and bicyclists was at its lowest in 2018, before peaking in 2021. The decline in fatal collisions in 2020 can be explained in part by the COVID-19 Pandemic, however, the moving average of fatal collisions continues to trend upwards. Furthermore, it is shown that people walking make up the majority of fatal collisions, as pedestrians are the most vulnerable users of city streets and have the least amount of protection when involved in a crash.

### **Citywide Parking Areas**

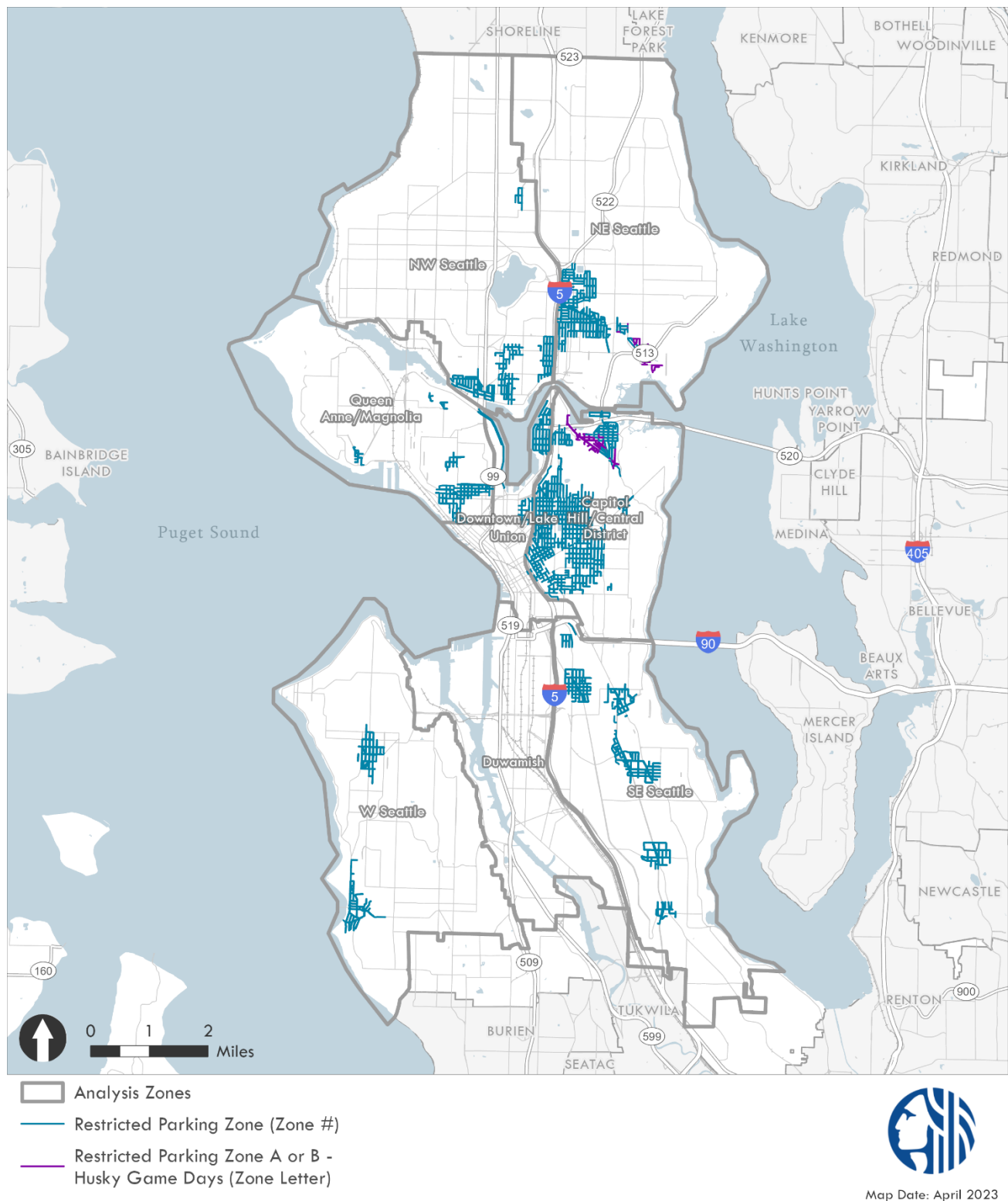
The City of Seattle designated restricted parking zones (RPZs) to enforce time restrictions on parking generally near Residential Urban Villages. RPZs are typically requested by neighborhood residents in areas that have parking demand near residential areas with major employers or destinations nearby. The RPZ program allows residents to apply for parking permits within the RPZ with more reliable long-term parking access. There are 34 RPZs in the City of Seattle, with two additional RPZs that come into effect during game days that the University of Washington's Husky Stadium. RPZs in Seattle are shown in Exhibit 3-122.

The City of Seattle has paid on-street parking in busier areas primarily around the center city, with most paid parking in the Downtown/Lake Union study area, and some other paid parking areas in neighboring sections of Queen Anne/Magnolia and Capitol Hill/Central District. Outside of central Seattle, paid parking areas are limited to business areas of Ballard, the University District, and Columbia City. Parking rates vary between \$0.50 and \$2.00 per hour throughout these areas. Paid parking in the City of Seattle and typical daytime rates are shown in Exhibit 3-123.

Seattle uses a dynamic pricing program to manage on-street parking occupancy, with semi-annual adjustments in paid parking rates to fit the target occupancy range of 70% - 85% occupancy. SDOT uses paid parking transaction data together with historical occupancy rates and data collection to adjust rates, time limits and paid hours of operation.

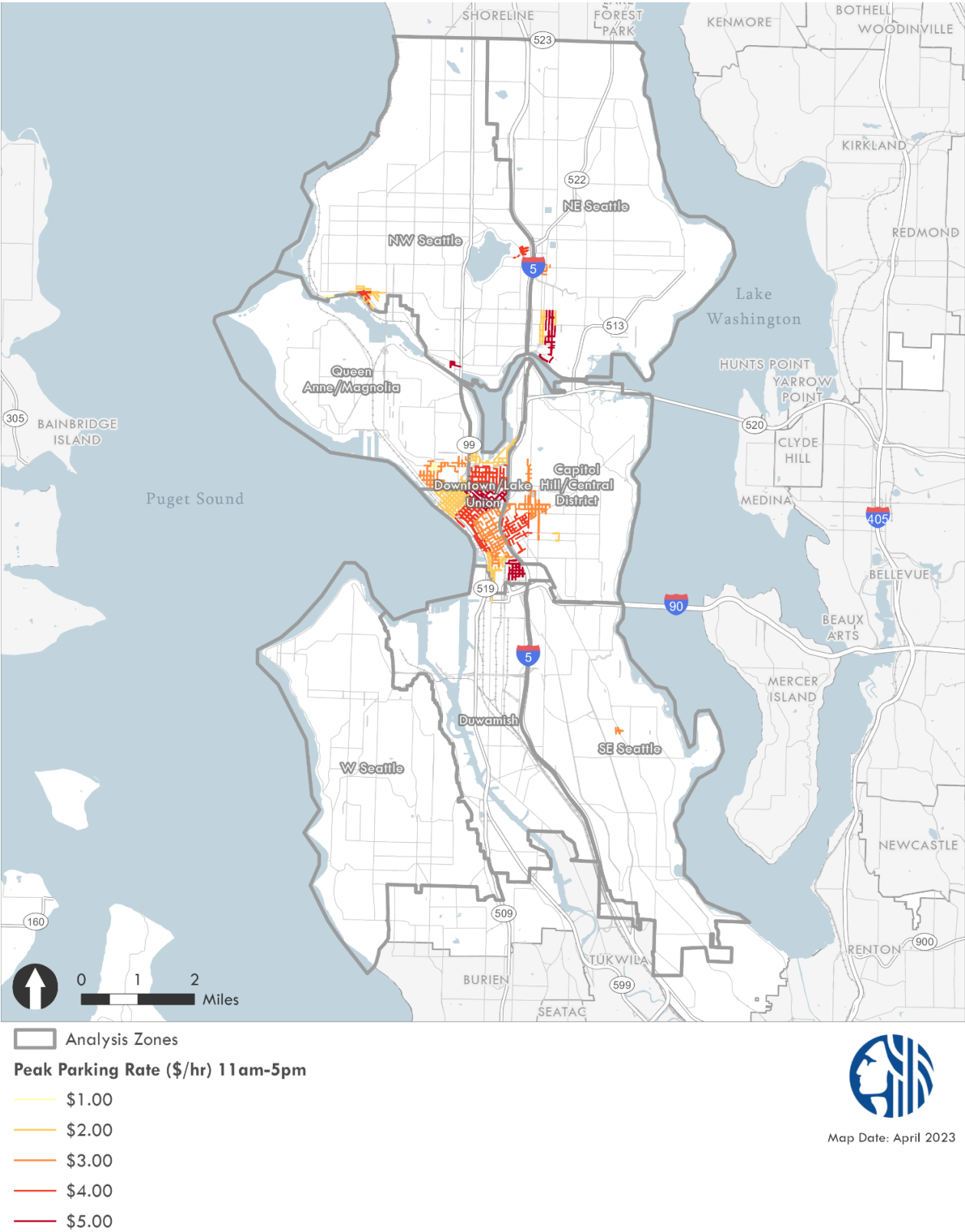


Exhibit 3-122. Restricted Parking Zones (RPZs) in Seattle



Source: City of Seattle, 2022

Exhibit 3-123. Paid Parking Areas in Seattle



Source: City of Seattle, 2022

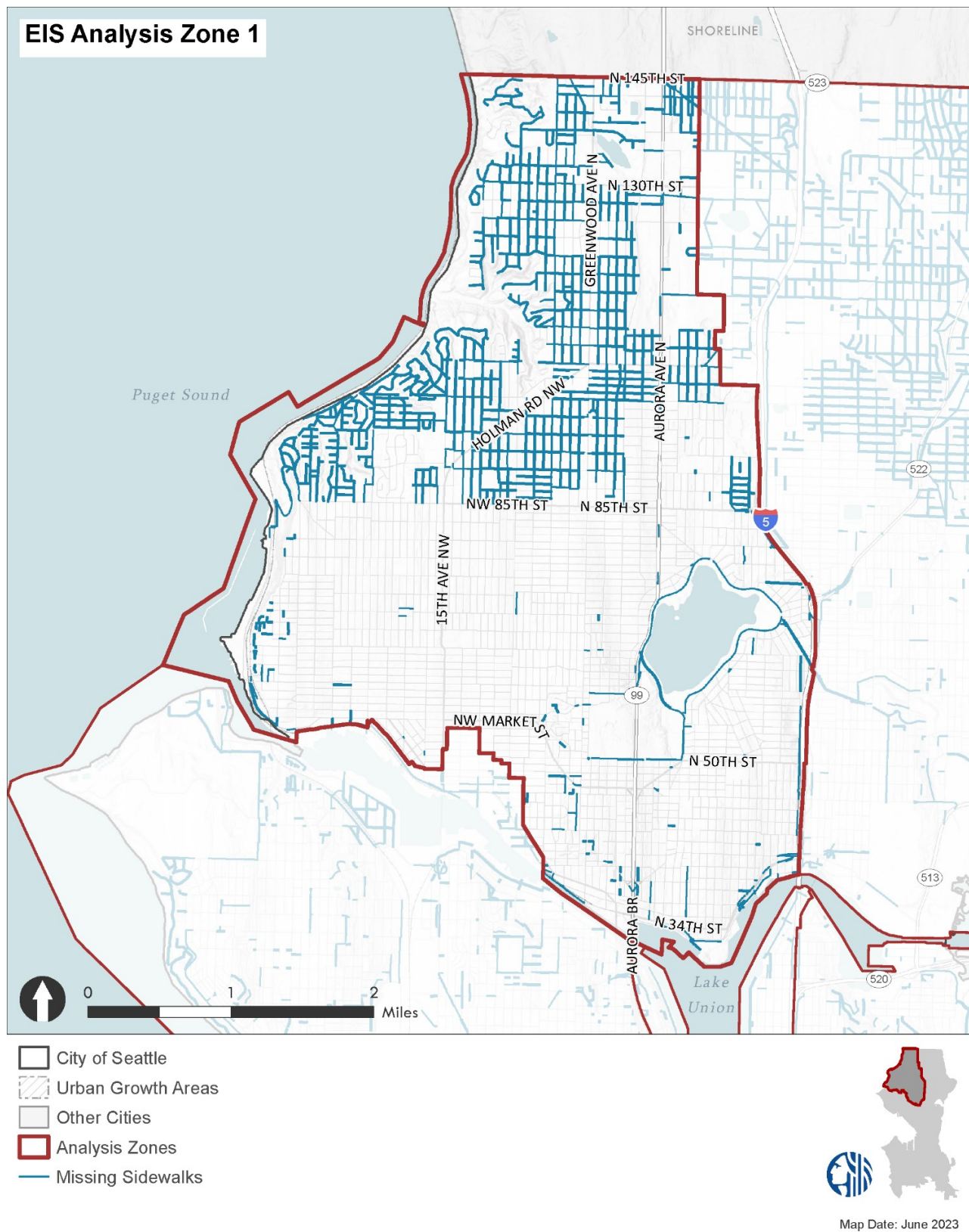
## Northwest Seattle

### Pedestrian and Bicycle Infrastructure

The Northwest Seattle subarea has approximately 642 linear miles of sidewalk and has a larger number of residential streets with no sidewalks, particularly north of N and NW 85<sup>th</sup> Street as shown in Exhibit 3-124. High priority areas called out in the 2009 Pedestrian Master Plan (PMP) were designated based on pedestrian demand, equity and corridor function are concentrated around urban villages or along key transit corridors, with the highest priority streets designated as Tier 1. These streets are concentrated around Aurora/Licton Springs Ballard, Bitter Lake, Crown Hill, Green Lake and east of I-5 near Northgate. There are approximately 46.5 linear miles of bike facilities in the Northwest Subarea, these include multi-use trails, protected or buffered bike lanes, painted bike lanes, greenways and sharrows.

The Northwest subarea shown in Exhibit 3-125 has 5.1 linear miles of multi-use trails, primarily along sections of Burke Gilman Trail and the Interurban Trail. This subarea has a total of 6.4 miles of buffered or protected bike lanes, including major bike facilities around Green Lake and on connecting streets such as NE Ravenna Blvd and Green Lake Drive, along College Way N and connecting crossings on I-5 including Northgate Way NE 92<sup>nd</sup> Street and connecting to the Interurban Trail along Linden Ave N. Neighborhood Greenways comprise 11.4 linear miles of the bike facilities in the Northwest Subarea running longer distances and connecting the bike network in this area. These are mostly along lower traffic, narrower streets with some traffic calming improvements and include greenways on NW 50<sup>th</sup> St, 17<sup>th</sup> Ave NW, N and NW 92<sup>nd</sup> St, 1<sup>st</sup> Ave W, Fremont Ave N, N 100<sup>th</sup> St, Ashworth Ave N, N 43<sup>rd</sup> and 44<sup>th</sup> Streets and N 110<sup>th</sup> and 107<sup>th</sup> Streets. Painted bike lanes make up 23.6 linear miles of the existing bike network in the Northwest Subarea, primarily along north-south streets and include painted bike lanes on major streets like Phinney Ave N, Greenwood Ave N, N Fremont Ave and Stone Way N.

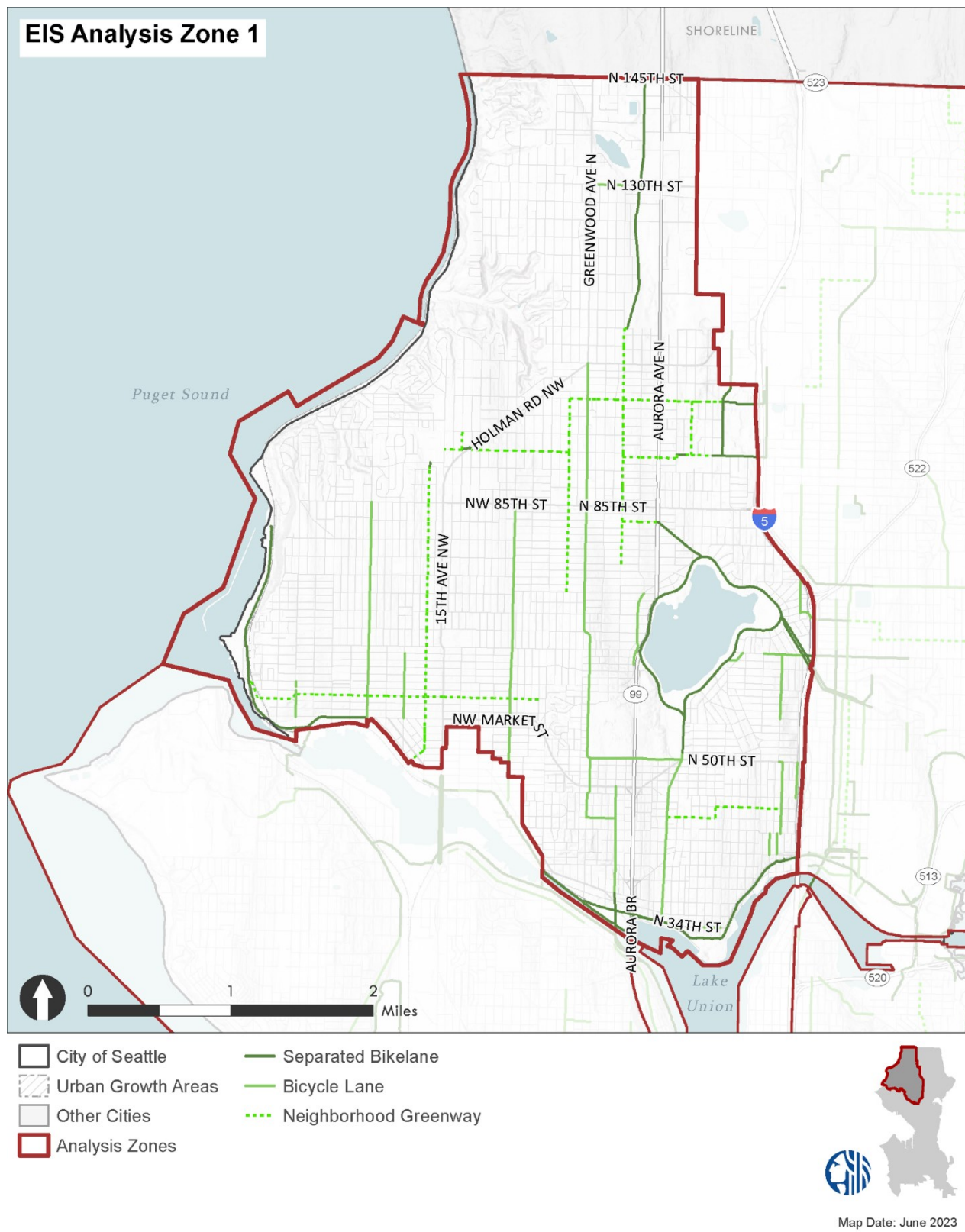
Exhibit 3-124. Sidewalk Gaps in Northwest Seattle



Source: Seattle Department of Transportation, 2022



Exhibit 3-125. Bicycle Facilities in Northwest Seattle



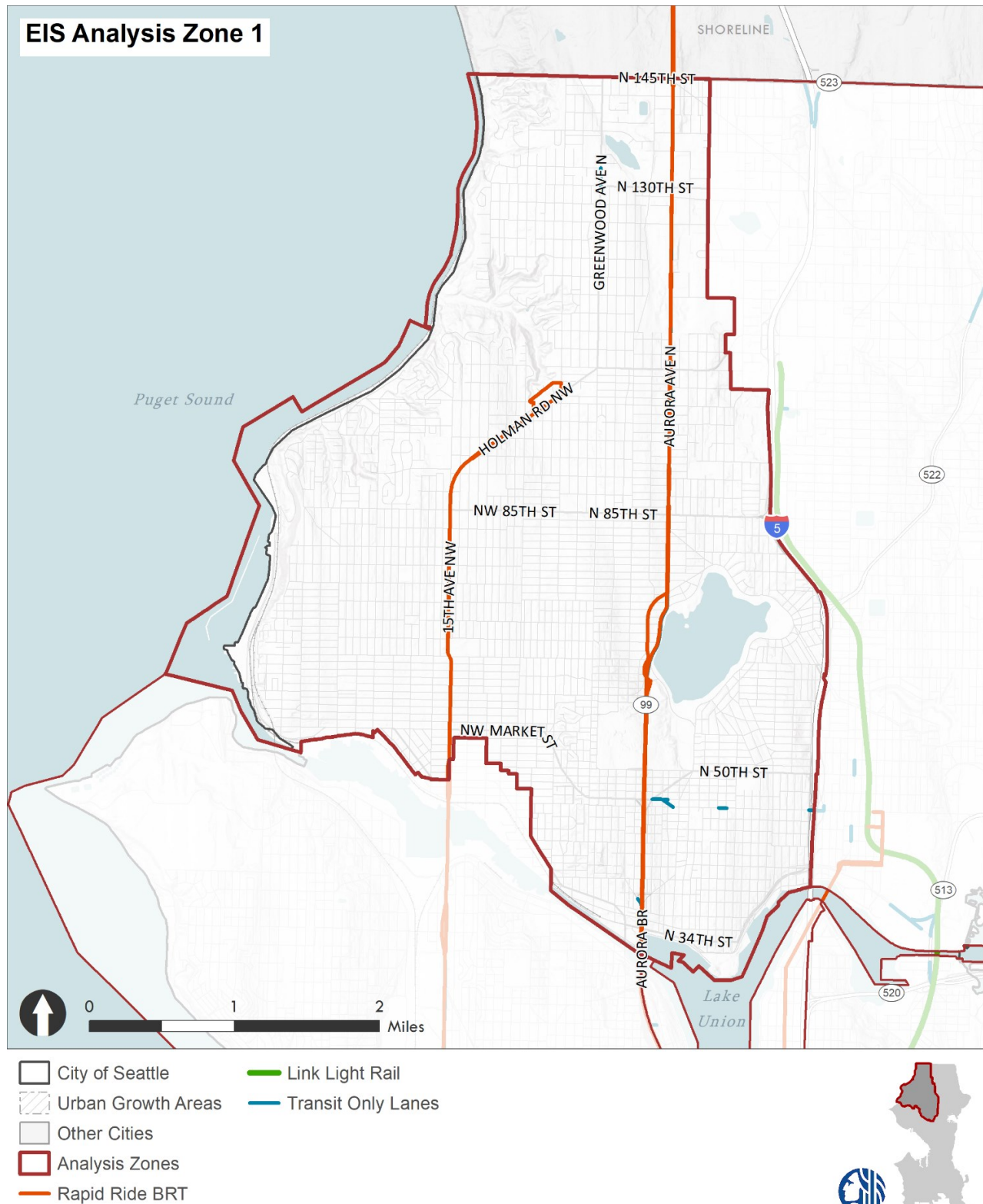
Source: Seattle Department of Transportation, 2022



### **Transit Facilities**

Transit facilities are shown in Exhibit 3-126. Transit facilities in the Northwest Subarea include both bus and rail transit, but the subarea is currently only served by bus transit. There are 6.5 miles of dedicated transit lanes in this subarea, with the longest running north-south on SR 99. A total of 30 King County Metro bus routes and Sound Transit Express bus routes 510, 522 and 586 serve this subarea. The Sounder North line runs through this subarea on a 5.35-mile rail corridor along the waterfront but does not serve this subarea of Seattle.

Exhibit 3-126. Transit Facilities in Northwest Seattle

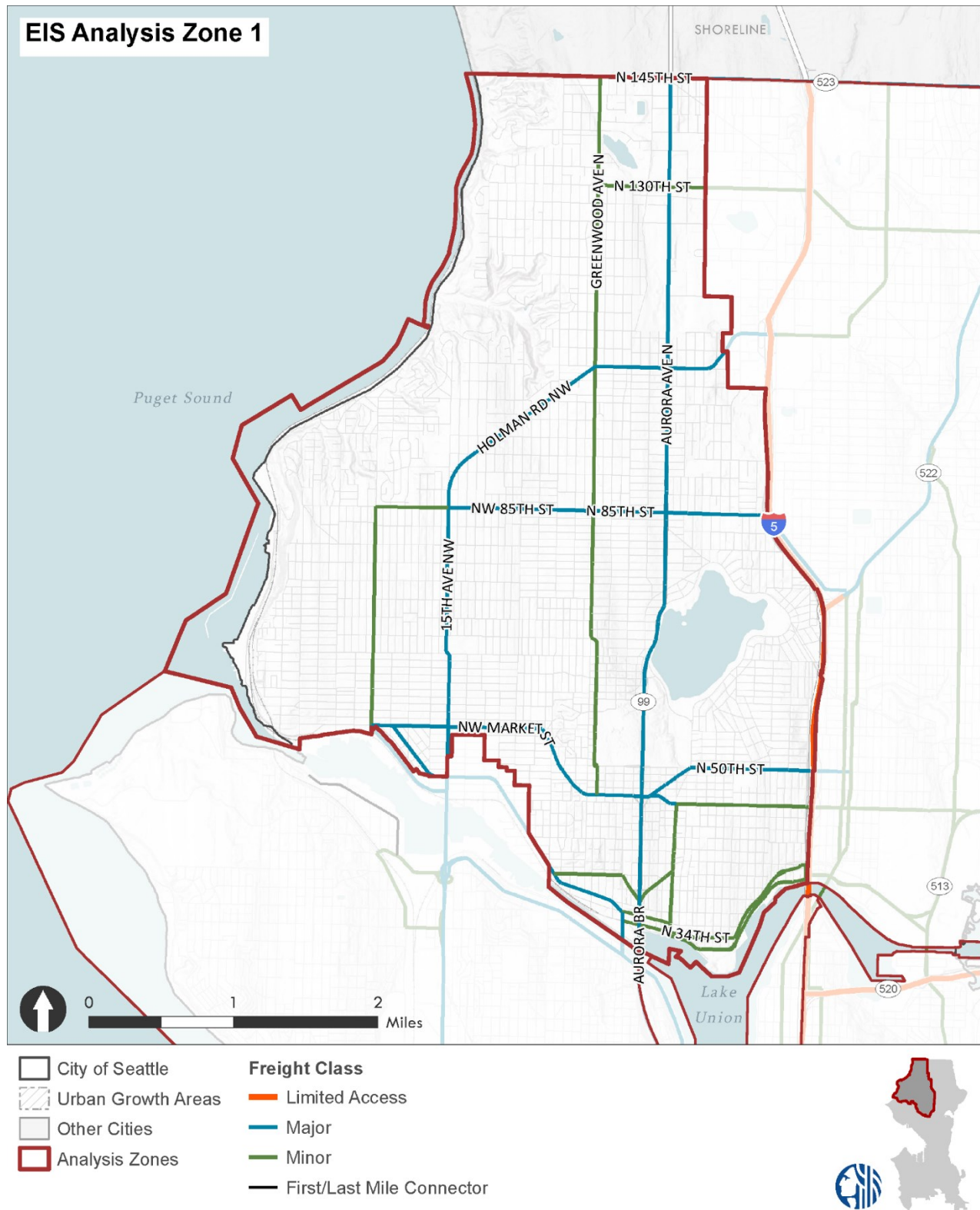


Source: Seattle Department of Transportation, 2022

### **Freight**

Truck streets intended to support goods movement are designated along 45 different streets in this subarea as shown in Exhibit 3-127. Major truck streets in this subarea include NW Market St, N 50<sup>th</sup> Street, NW 105<sup>th</sup> St, N Northgate Way, and NW 85<sup>th</sup> and N 145<sup>th</sup> Streets, which provide east-west connections and provide access to I-5 from the west. Aurora Ave N, and 15<sup>th</sup> Ave NW are the only major north-south truck routes through this subarea. Minor truck routes run along a number of commercial corridors in this subarea including Phinney Ave N, Greenwood Ave N, 24<sup>th</sup> Ave NW, and N 130<sup>th</sup> St.

Exhibit 3-127. Freight Routes in Northwest Seattle



Source: Seattle Department of Transportation, 2022

## Northeast Seattle

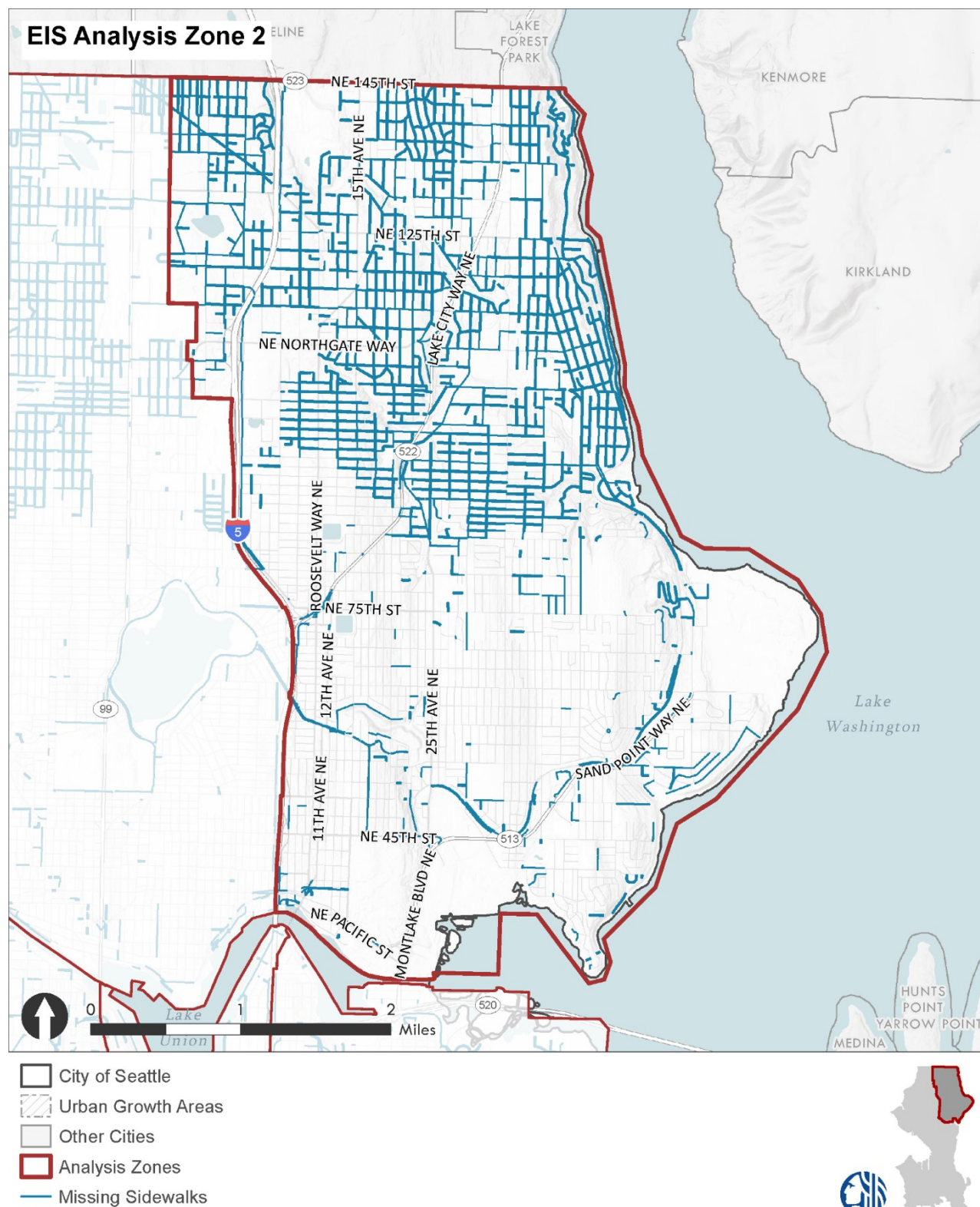
### Pedestrian and Bicycle Infrastructure

There are approximately 578 miles of existing sidewalks in the Northeast Seattle subarea, and this subarea has more residential streets with no sidewalks, particularly north of NE 85<sup>th</sup> Street as shown in Exhibit 3-128. High priority areas in the 2009 PMP were designated based on pedestrian demand, equity and corridor function are concentrated around urban villages or along key transit corridors, with the highest priority streets designated as Tier 1 streets. These streets are concentrated around Lake City Way NE, Sand Point Way NE and in the University District.

There are approximately 47.2 linear miles of bike facilities in the Northeast Subarea as shown in Exhibit 3-129. These include multi-use trails, protected or buffered bike lanes, painted bike lanes, greenways and sharrows. The Northeast subarea has 10.2 linear miles of multi-use trail, primarily along the Burke-Gilman Trail which runs from I-5 through the University of Washington before continuing north along Lake Washington. This subarea has a total of 7.5 miles of buffered or protected bike lanes, including major north-south connection on Roosevelt Way NE and 15<sup>th</sup> Avenue NE and east-west connections on NE 65<sup>th</sup> Street and NE Ravenna Boulevard. Neighborhood Greenways comprise 9.1 linear miles of the bike facilities in the Northeast Seattle mostly along narrow, lower traffic, streets with some traffic calming improvements and including 12<sup>th</sup> Ave NE, 39<sup>th</sup> Ave NE and NE 68<sup>th</sup> St; and a few streets towards further north such as 8<sup>th</sup> Ave NE, 27<sup>th</sup> Ave NE and 37<sup>th</sup> Ave NE. Painted bike lanes make up 20.4 linear miles of the existing bike network in the Northeast Subarea, primarily along north-south streets and include painted bike lanes on major streets like 11<sup>th</sup> Ave NE, Ravenna Ave NE, and 35<sup>th</sup> Ave NE.



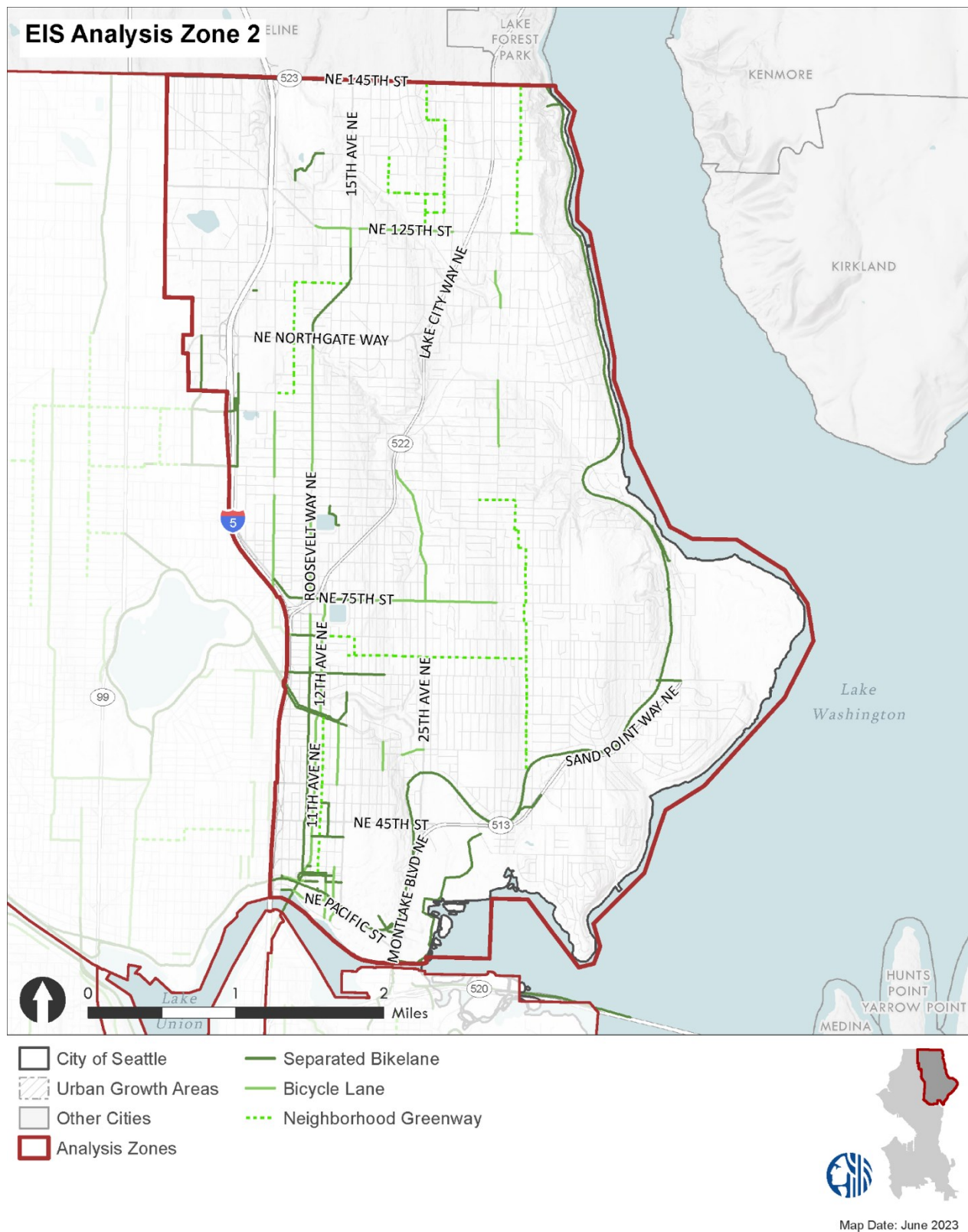
### Exhibit 3-128. Sidewalk Gaps in Northeast Seattle



Map Date: June 2023

Source: Seattle Department of Transportation, 2022

Exhibit 3-129. Bicycle Facilities in Northeast Seattle



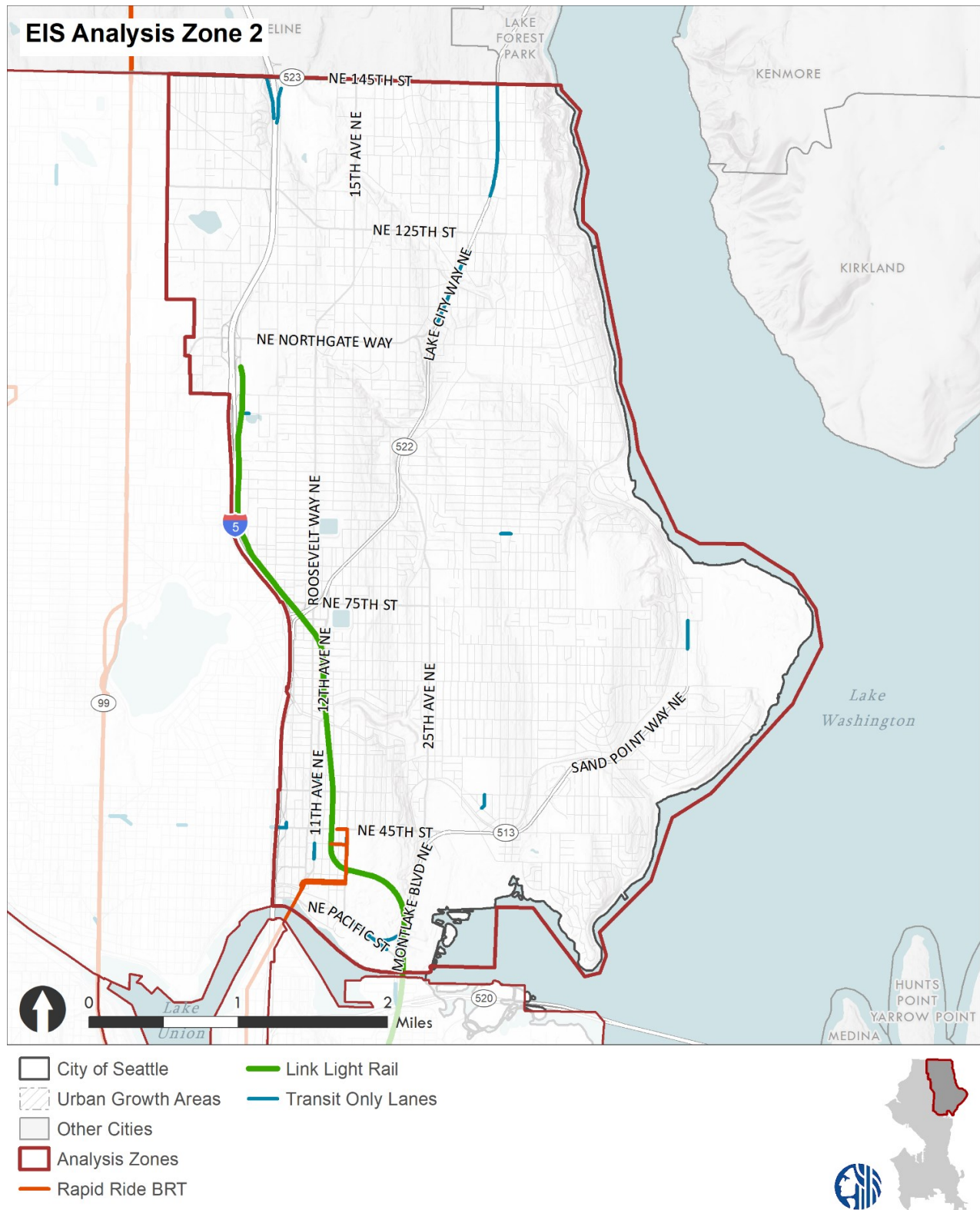
Source: Seattle Department of Transportation, 2022

### **Transit Facilities**

Transit facilities are shown in Exhibit 3-130. Transit facilities in the Northeast Seattle subarea include bus and rail. There are a total of approximately 3.4 miles of existing dedicated transit lanes, including portions of streets around University of Washington area and on Lake City Way NE. This subarea is served by a total of 44 King County Metro bus routes and eight Sound Transit Express bus routes. This subarea is also served by Sound Transit's Link Light Rail, with four stations on the 1 Line including: University of Washington, U District, Roosevelt, and Northgate stations.



Exhibit 3-130. Transit Facilities in Northeast Seattle



Source: Seattle Department of Transportation, 2022

### **Freight**

Designated truck streets intended to support goods movement through the Northeast Subarea run on 24 different streets and I-5, a limited access highway, as shown in Exhibit 3-131. Major truck streets in this subarea are more limited and include Lake City Way NE, N 145<sup>th</sup> St and Banner Way NE. Minor truck streets run along other commercial corridors in this subarea including Sand Point Way NE, 25<sup>th</sup> Ave NE, and 11th Ave NE and Roosevelt Way NE, a one-way couplet.



Exhibit 3-131. Freight Routes in Northeast Seattle



Source: Seattle Department of Transportation, 2022

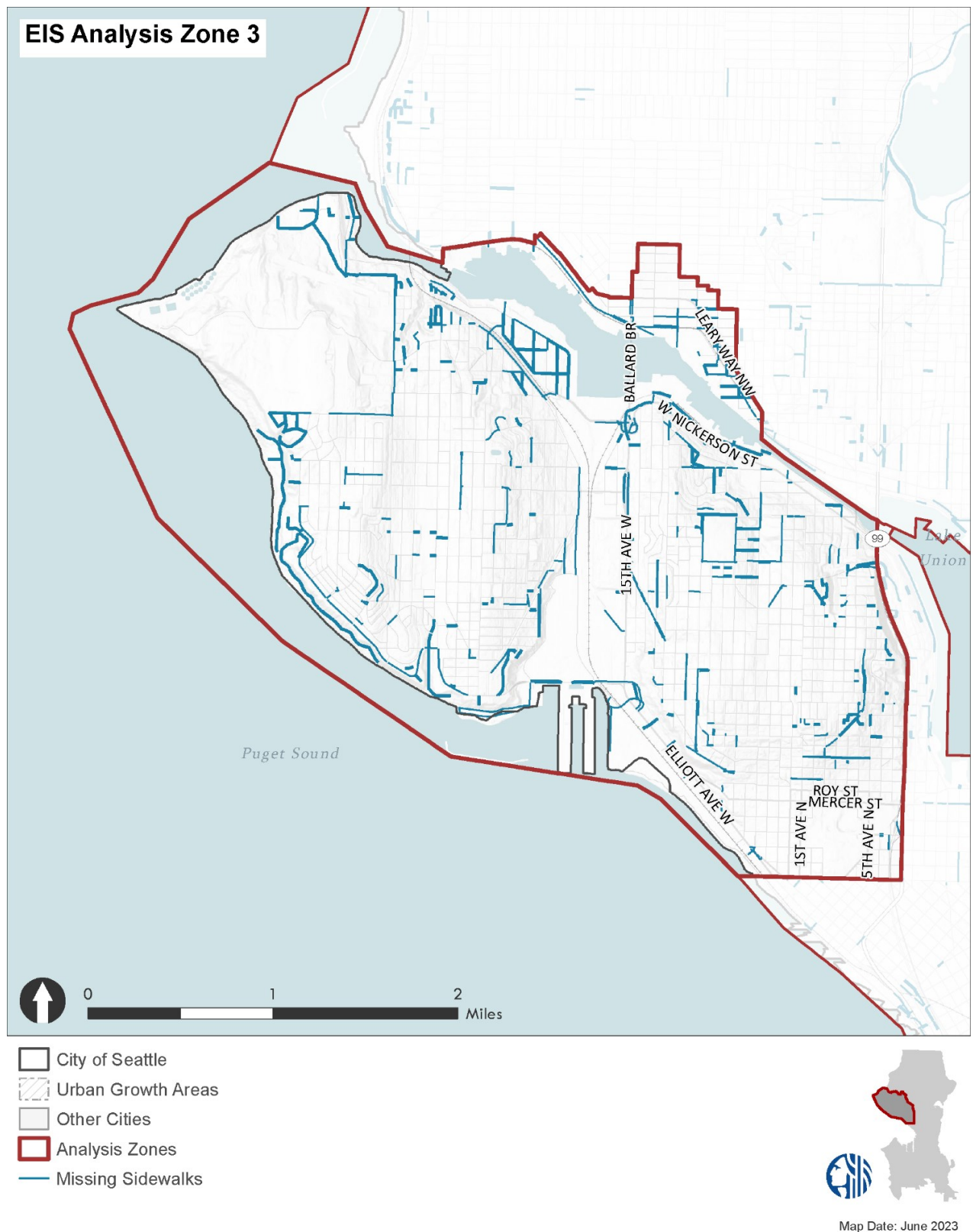
## Queen Anne/Magnolia

### Pedestrian and Bicycle Infrastructure

There are a total of approximately 306 linear miles of sidewalks in the Queen Anne/Magnolia subarea. There are fewer sidewalk gaps in this area than the subareas on the northern and southern ends of the city, but there are still some gaps in the sidewalk network, particularly around 15<sup>th</sup> Ave W, as shown in Exhibit 3-132. High priority areas in the 2009 PMP were designated based on pedestrian demand, equity and corridor function are concentrated around urban villages or along key transit corridors, with the highest priority streets designated as Tier 1. These streets are concentrated near 15<sup>th</sup> Ave W, Elliott Ave W, Aurora Ave N and W Nickerson St.

There are approximately 24.5 linear miles of bike facilities in the Queen Anne/Magnolia Subarea, as shown in shown in Exhibit 3-133; these include multi-use trails, protected or buffered bike lanes, painted bike lanes, and sharrows. The Queen Anne/Magnolia Subarea has no neighborhood greenways. The Queen Anne/Magnolia subarea has 5.9 linear miles of multiuse trail, primarily on sections of Ship Canal Trail and Elliott Bay Trail. This subarea has a total of 2.5 miles of buffered or protected bike lanes, mostly on Gilman Ave W with parts on Queen Anne Ave N. Painted bike lanes make up 16.1 linear miles of the existing bike network in the Queen Anne/Magnolia Subarea, primarily along the Magnolia Blvd W/Gilman Ave W/Thorndyke Ave W loop that connects to Discovery Park.

Exhibit 3-132. Sidewalk Gaps in Queen Anne/Magnolia



Source: Seattle Department of Transportation, 2022

Exhibit 3-133. Bicycle Facilities in Queen Anne/Magnolia



Source: Seattle Department of Transportation, 2022

### **Transit Facilities**

Transit facilities are shown in Exhibit 3-134. Transit facilities in the Queen Anne/Magnolia subarea include bus and rail facilities, but the subarea is currently only served by bus routes. Existing transit lanes and RapidRide in this subarea totaled 3.42 linear miles along Elliott Ave W and 15<sup>th</sup> Ave W. There are a total of 22 King County Metro bus routes that serve this subarea. The Sounder North commuter rail line that runs along a 4.13-mile section of track through this subarea but does not serve the subarea with any stations.



Exhibit 3-134. Transit Facilities in Queen Anne/Magnolia



Source: Seattle Department of Transportation, 2022

### **Freight**

Designated truck streets intended to support goods movement through the Queen Anne/Magnolia Subarea run on approximately 27 different streets as shown in Exhibit 3-135. Major truck streets in this subarea are more limited and include Aurora Ave N, Elliott Ave N and 15<sup>th</sup> Ave W, Westlake Ave N, Nickerson St and Mercer St, all located east of Interbay. Minor truck streets in this area are very limited, with W Emerson P, Gilman Ave W, and W Dravus St connecting to the Fisherman's Terminal area from 15<sup>th</sup> Ave W and 5<sup>th</sup> Ave and Broad St connecting to downtown and Alaskan Way.

Exhibit 3-135. Freight Routes in Queen Anne/Magnolia



Source: Seattle Department of Transportation, 2022

## **Downtown/Lake Union**

### **Pedestrian and Bicycle Infrastructure**

There are approximately 124 linear miles of existing sidewalks in the Downtown/Lake Union subarea of Seattle and the sidewalk network in the subarea is relatively complete with few gaps as shown in Citywide Pedestrian and Bicycle Network and Exhibit 3-136. Seattle's existing pedestrian and bicycle system strives to be comprehensive and accommodating, including approximately 502 public stairways, 2,300 miles of sidewalks and medians, 48 miles of multi-use trails, and nearly 315 miles of bicycle facilities.

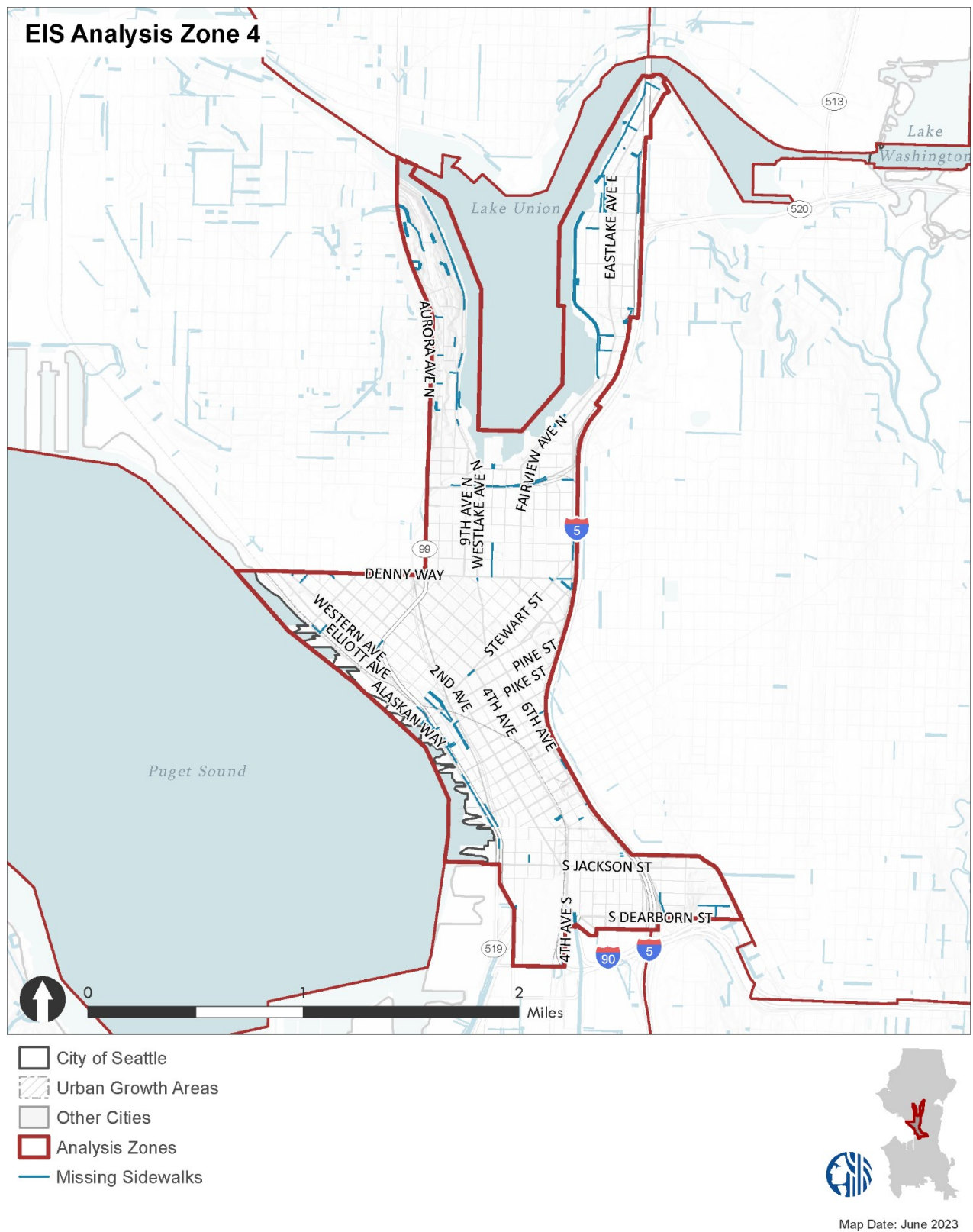
Still, there are large gaps in the pedestrian network, with almost 843 miles of missing sidewalk concentrated north of N 85th Street and in south Seattle. The NW and NE Seattle subareas show the most sidewalk gaps, while the Downtown/Lake Union, Capitol Hill/Central District, and Queen Anne/Magnolia subareas have the most sidewalk coverage. W Seattle, SE Seattle and Duwamish also have substantial sidewalk gaps, but those gaps tend to be more dispersed, and in the case of Duwamish, concentrated in industrial areas. Missing sidewalks in the pedestrian network are shown in Exhibit 3-112.

Bike infrastructure is more concentrated in the Downtown/Lake Union and Capitol Hill/Central District study areas with fewer bike connections farther from the center city and in the Queen Anne/Magnolia study area (see Exhibit 3.6 5). While there are bike facilities throughout the city, these facilities do not always connect and there are gaps in the existing network. About 200 miles of the existing citywide bicycle network are considered AAA or comfortable for all ages and abilities. This distinction is given to bicycle infrastructure that provides an enhanced experience to users, providing physical barriers and distance between bicycles and vehicle traffic to enhance the sense of and actual safety of bicyclists. AAA features include- Protected Bike Lanes (PBLs), Neighborhood Greenways, and Off-Street Multiuse Trails. These categories of bikeways provide separation between vehicles and bicycles, enhancing safety and usability for children, the elderly, and all other users. AAA bike facilities throughout the City of Seattle are shown in Exhibit 3.6 6. High priority areas in the 2009 PMP were designated based on pedestrian demand, equity and corridor function are concentrated around urban villages or along key transit corridors, with the highest priority streets designated as Tier 1 streets. These streets are concentrated along Westlake Ave, near Denny Way, along the waterfront and along the western side of I-5.

There are approximately 25.6 linear miles of bike facilities in the Downtown/Lake Union Subarea, as shown in shown in Exhibit 3-137; these include multi-use trails, protected or buffered bike lanes, painted bike lanes, greenways and sharrows. The Downtown/Lake Union subarea has 0.4 linear miles of multiuse trail, primarily along sections of Elliott Bay Trail and Lenora Street Pedestrian Bridge respectively. This subarea has a total of 11.3 miles of buffered or protected bike lanes, mostly clustered on the core streets of downtown Seattle such as Alaskan Way, Western Ave, 2<sup>nd</sup> Ave and 4<sup>th</sup> Ave. Neighborhood Greenways comprise 1 linear mile of the bike facilities in the Downtown/Lake Union Subarea mostly along narrow, lower traffic streets with some traffic calming improvements including Bell St, S King S and Maynard Ave S. The Downtown/Lake Union subarea has an extensive network of 12.9 linear miles of painted bike lanes which covers streets in all directions of the Subarea.



Exhibit 3-136. Sidewalk Gaps in Downtown/Lake Union



Source: Seattle Department of Transportation, 2022



Exhibit 3-137. Bicycle Facilities in Downtown/Lake Union

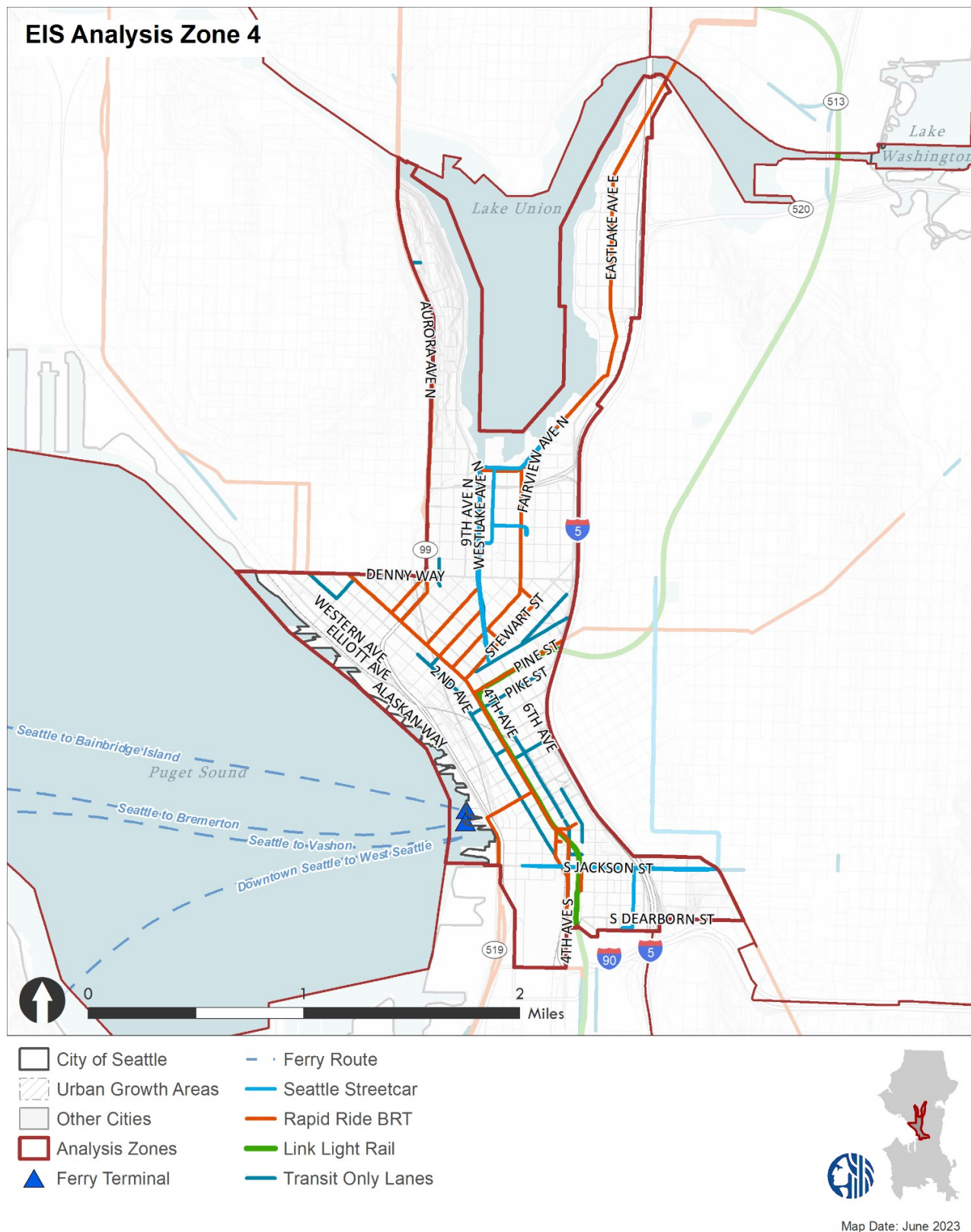


Source: Seattle Department of Transportation, 2022

### **Transit Facilities**

Transit facilities are shown in Exhibit 3-138. Transit facilities in the Downtown/Lake Union subarea include bus and rail facilities. There are approximately 8 miles of dedicated transit lanes in this subarea, located along downtown streets such as 2<sup>nd</sup> Ave, 3<sup>rd</sup> Ave and 4<sup>th</sup> Ave. Approximately 82 King County Metro bus routes serve this subarea, along with 11 Sound Transit Express bus routes. Community Transit routes also serve this subarea of Seattle at the southern end of the Snohomish County agency's community bus routes. The Sounder commuter rail runs through this Subarea, along a total of 2.5 miles of heavy rail track, with the North and South Sounder lines terminating at King Street Station. Link Light Rail also serves the Downtown/Lake Union subarea, with four stations: International District/Chinatown, Pioneer Square, University Street, and Westlake. Both the South Lake Union and First Hill streetcar lines serve this subarea with stations on the north side of downtown into South Lake Union, and along S Jackson Street in the Pioneer Square and Chinatown/International District. While not considered in the alternatives analysis, there are also multiple ferry routes that run out of the downtown ferry terminal. There are two routes operated by Washington State Ferries to Bainbridge Island and Bremerton, two routes operated by King County to West Seattle and Vashon Island, and three routes operated by Kitsap County to Southworth, Bremerton, and Kingston.

Exhibit 3-138. Transit Facilities in Downtown/Lake Union

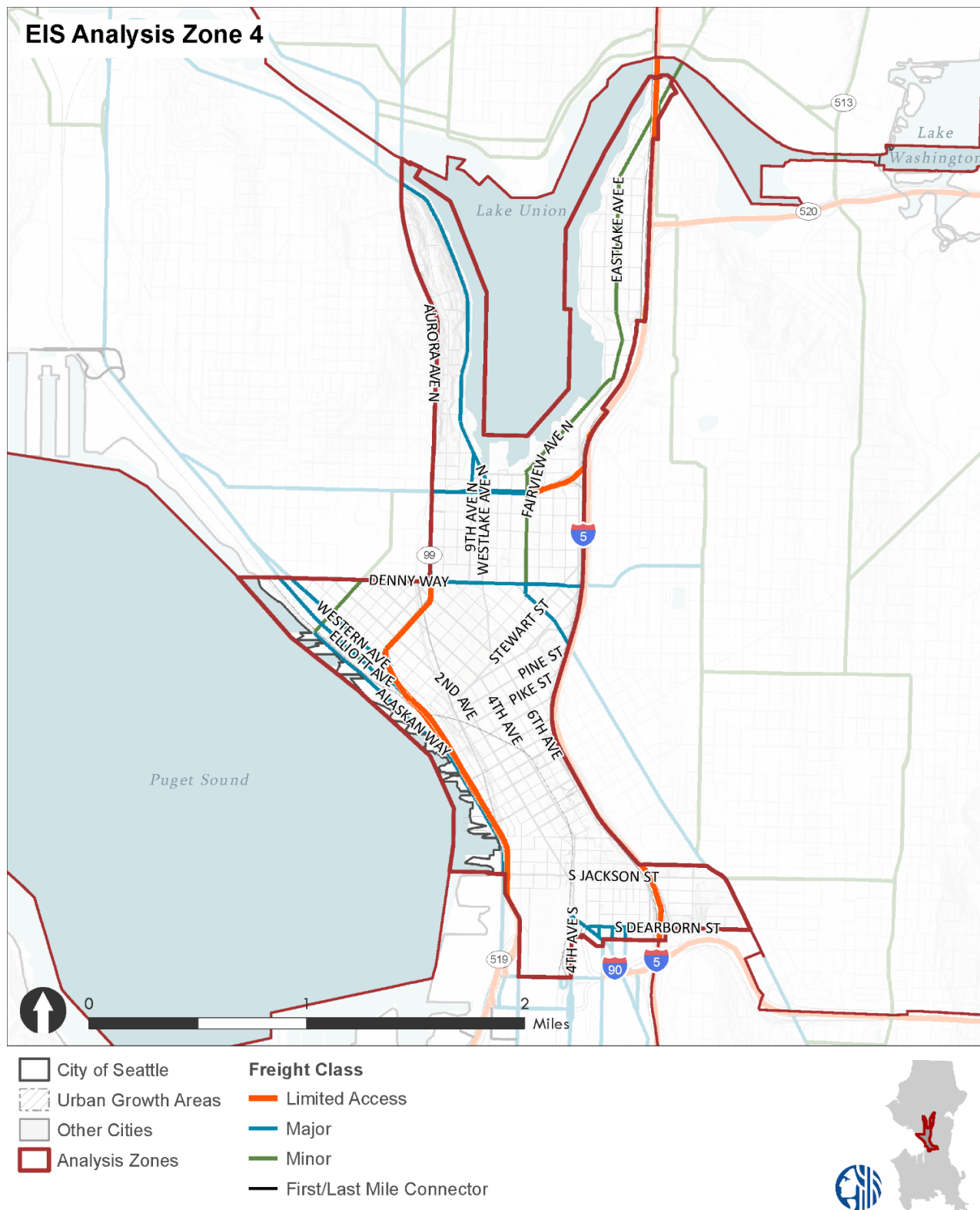


Source: Seattle Department of Transportation, 2022

### **Freight**

Designated freight routes are shown in Exhibit 3-139. Designated truck streets intended to support freight and goods movement through the Downtown/Lake Union subarea run on 24 regular streets as well as highways including I-5 and SR-99. Major truck streets in the Downtown/Lake Union subarea include Alaskan Way, portions of Western Avenue and 1<sup>st</sup> Avenue, Denny Way, Westlake Avenue and Mercer Street. Minor truck streets in this subarea include Eastlake Avenue E and Fairview Avenue N, and Broad Street.

Exhibit 3-139. Freight Routes in Downtown/Lake Union



Source: Seattle Department of Transportation, 2022



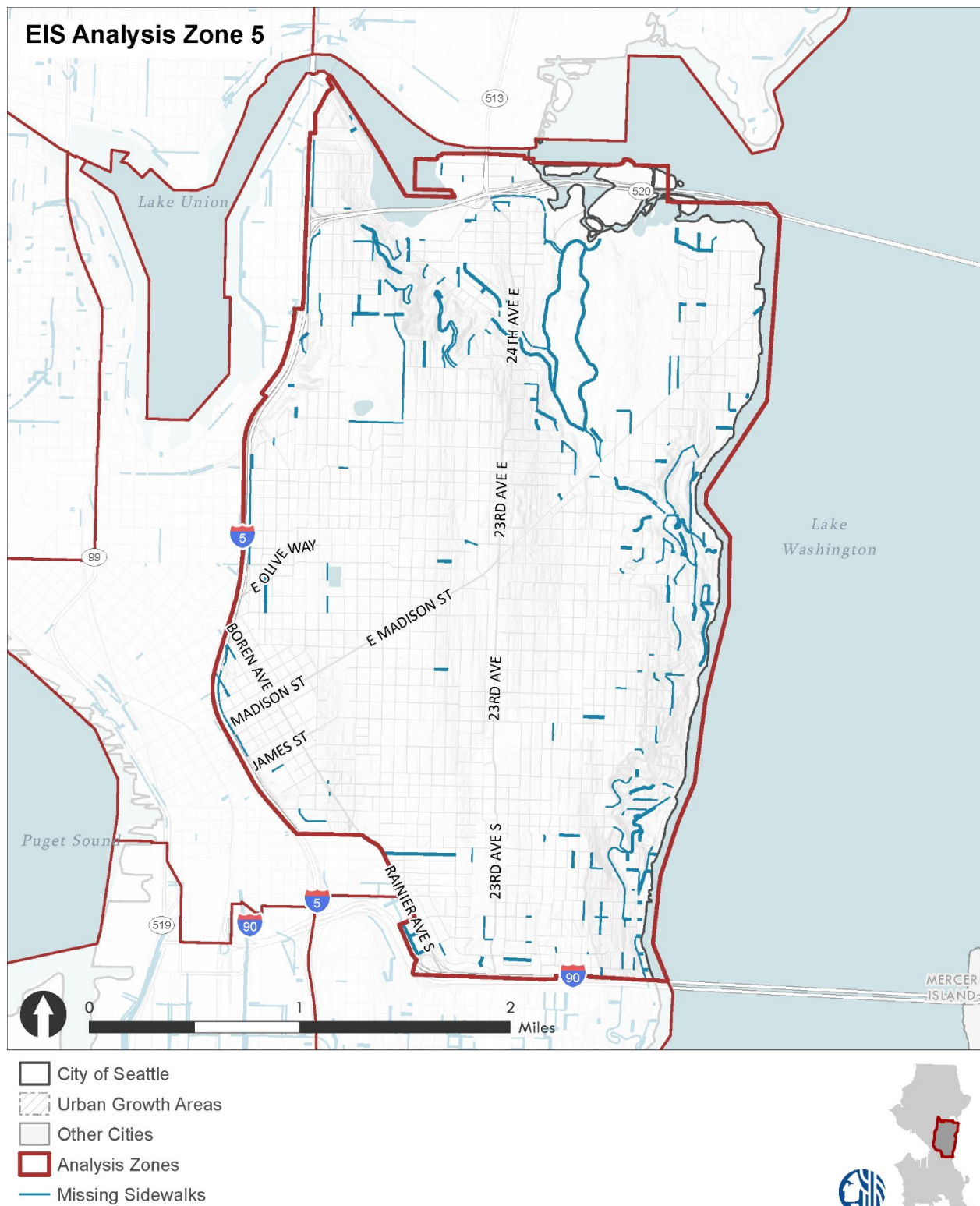
## Capitol Hill/Central District

### Pedestrian and Bicycle Infrastructure

There are approximately 338 linear miles of sidewalks in the Capitol Hill/Central District subarea of Seattle and the sidewalk network in this area is relatively complete with few gaps in the pedestrian network, as shown in Exhibit 3-140. High priority areas in the 2009 Pedestrian Master Plan (PMP) were designated based on pedestrian demand, equity and corridor function are concentrated around urban villages or along key transit corridors, with the highest priority streets designated as Tier 1 streets. These streets are concentrated in First Hill closer to I-5; in Montlake near 24<sup>th</sup> Ave; and along I-5 in Capitol Hill.

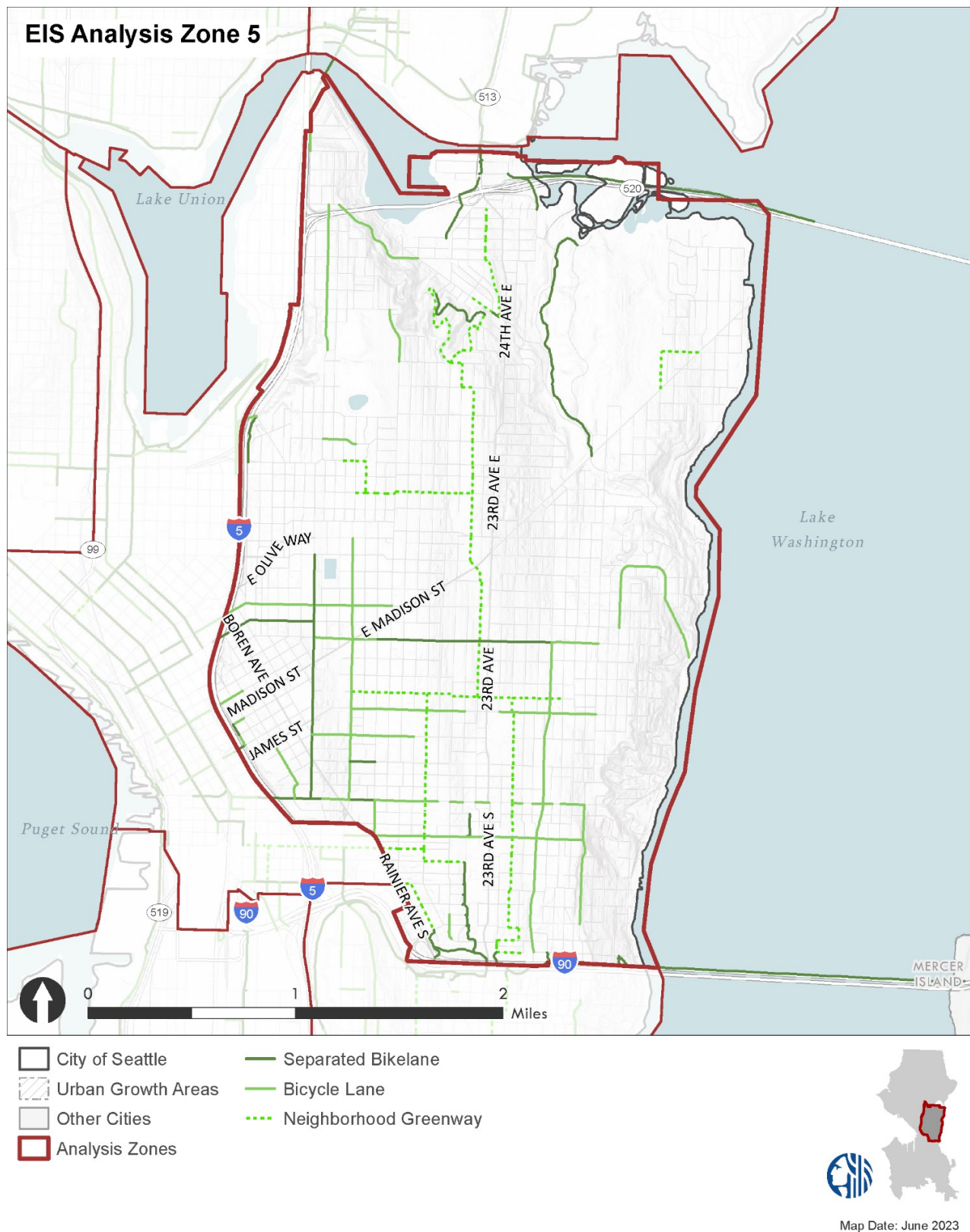
There are approximately 43 miles of existing bike facilities in the Capitol Hill/Central District subarea, these include multi-use trails, protected or buffered bike lanes, painted bike lanes, greenways and sharrows, as shown in Exhibit 3-141. The Capitol Hill/Central District subarea has 2.8 linear miles of multiuse trail, primarily along sections of the SR-520 Trail and Mountains to Sound Trail. This subarea has a total of 2.9 miles of buffered or protected bike lanes, mostly clustered on main streets such as Broadway and E Union Street. Neighborhood Greenways comprise 8.7 linear miles of the bike facilities in the Capitol Hill/Central District Subarea running longer distances and connecting the bike network in this area. These are mostly along lower traffic, narrower streets with some traffic calming improvements and include greenways mostly on 21<sup>st</sup> Ave E and 25<sup>th</sup> Ave E that connect to Interlaken Park in the north and I-90 to the south. Painted bike lanes make up 28.6 linear miles of the existing bike network in the Capitol Hill/Central District Subarea, primarily in the core areas of the Capitol Hill neighborhood such as Broadway, E Aloha St, E Republican St, E Pine St and E Union St.

Exhibit 3-140. Sidewalk Gaps in Capitol Hill/Central District



Source: Seattle Department of Transportation, 2022

Exhibit 3-141. Bicycle Facilities in Capitol Hill/Central District



Source: Seattle Department of Transportation, 2022

### **Transit Facilities**

Transit facilities are shown in Exhibit 3-142. Transit facilities in the Capitol Hill/Central District subarea include both bus and rail facilities. There are approximately 0.9 miles of dedicated transit lanes, primarily along Broadway, E Madison St and 24<sup>th</sup> Ave E. Dedicated transit lanes along Madison Street are currently under construction as part of the RapidRide G Line project. There are 51 different King County Metro bus routes that serve this subarea as well as one Link Light Rail station at Capitol Hill along the 1 Line. A second Link station at Judkins Park is currently under construction as part of the East Link extension to Bellevue and Redmond. This subarea is also served by the First Hill Streetcar, with stations along S Jackson St and Broadway.



Exhibit 3-142. Transit Facilities in Capitol Hill/Central District



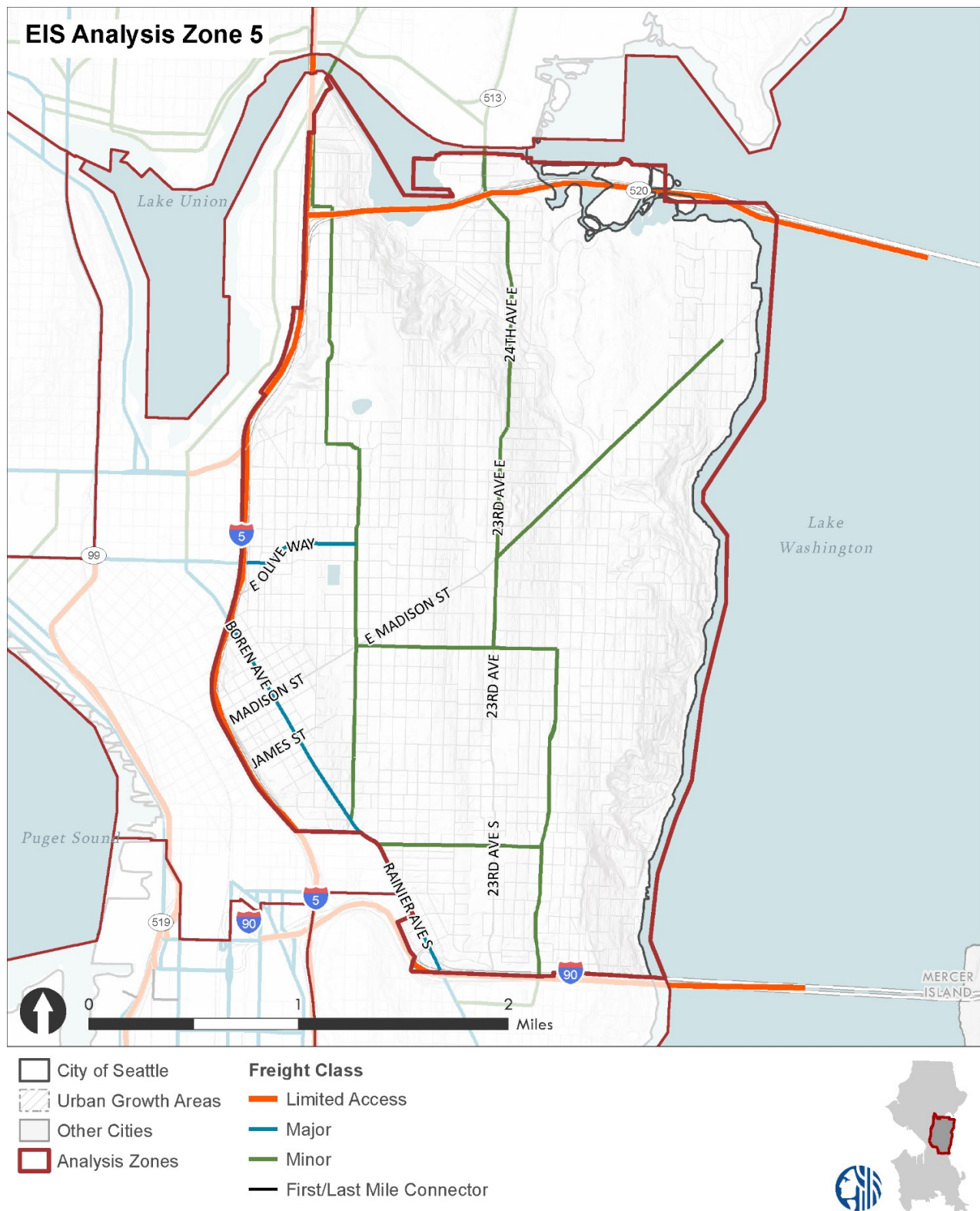
Source: Seattle Department of Transportation, 2022



### **Freight**

Designated freight routes are shown in Exhibit 3-143. Designated truck streets intended to support freight and goods movement through downtown run on 19 surface streets, as well as I-5, a limited access highway. Major truck streets in this subarea are limited to a few arterials including Boren Ave and Denny Way. Minor truck streets run along other commercial corridors in this subarea including Broadway, E Union St, S Jackson St, ML King Jr Way connecting to I-90 and 24<sup>th</sup> and 23<sup>rd</sup> Ave connecting to SR 520.

Exhibit 3-143. Freight Routes in Capitol Hill/Central District



Source: Seattle Department of Transportation, 2022

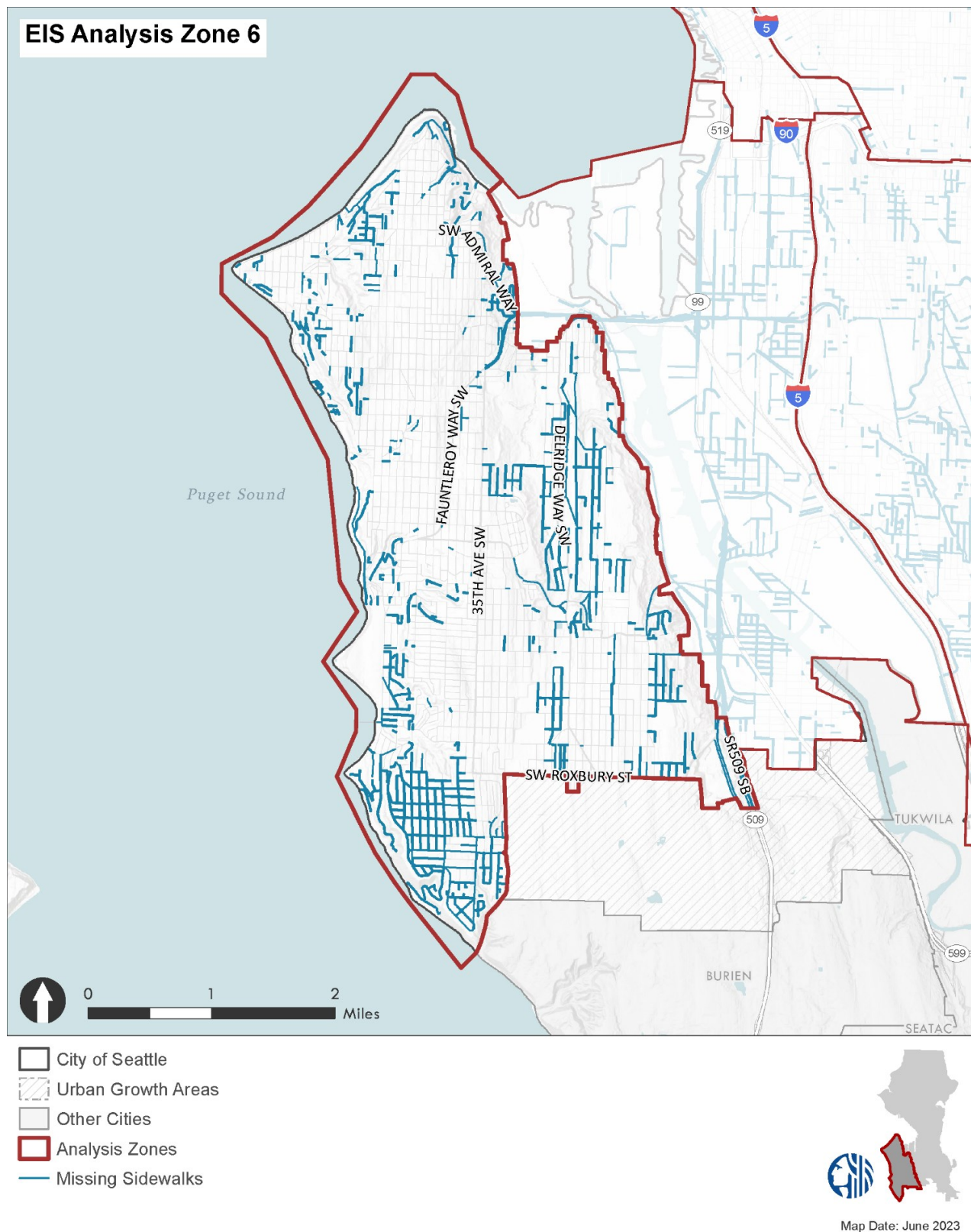
## West Seattle

### Pedestrian and Bicycle Infrastructure

There are approximately 465 linear miles of sidewalks in the West Seattle subarea of Seattle, with more gaps in the pedestrian network farther south and on streets connecting to Delridge Way and Fauntleroy Way, as shown in Exhibit 3-144. High priority areas in the 2009 PMP were designated based on pedestrian demand, equity and corridor function. These areas are concentrated around urban villages or along key transit corridors, with the highest priority streets designated as Tier 1 streets. These streets are located in pockets in South Delridge, Fauntleroy, and along Morgan St SW and 21<sup>st</sup> Ave SW.

There are approximately 39.6 linear miles of bike facilities in the West Seattle subarea, as shown in Exhibit 3-145; these include multi-use trails, protected or buffered bike lanes, painted bike lanes, greenways and sharrows. The West Seattle subarea has 3 linear miles of multiuse trail, primarily along sections of the Alki Trail. This subarea has a total of 1 mile of buffered or protected bike lanes, primarily on SW Avalon Way. Neighborhood Greenways comprise 11.1 linear miles of the bike facilities in the West Seattle Subarea running longer distances and connecting the bike network in this area. These are mostly along narrow, lower traffic streets with some traffic calming improvements including 21<sup>st</sup> Ave SW and 34<sup>th</sup> Ave SW which connects to SW Roxbury St in the White Center neighborhood to the south and the West Seattle Bridge to the north. Painted bike lanes make up 24.5 linear miles of the existing bike network in the West Seattle Subarea, primarily in the core areas of the West Seattle neighborhood such as California Ave SW, Fauntleroy Way SW, Delridge Way SW; and a loop around the coast of the neighborhood on Alki Ave SW to Beach Dr SW.

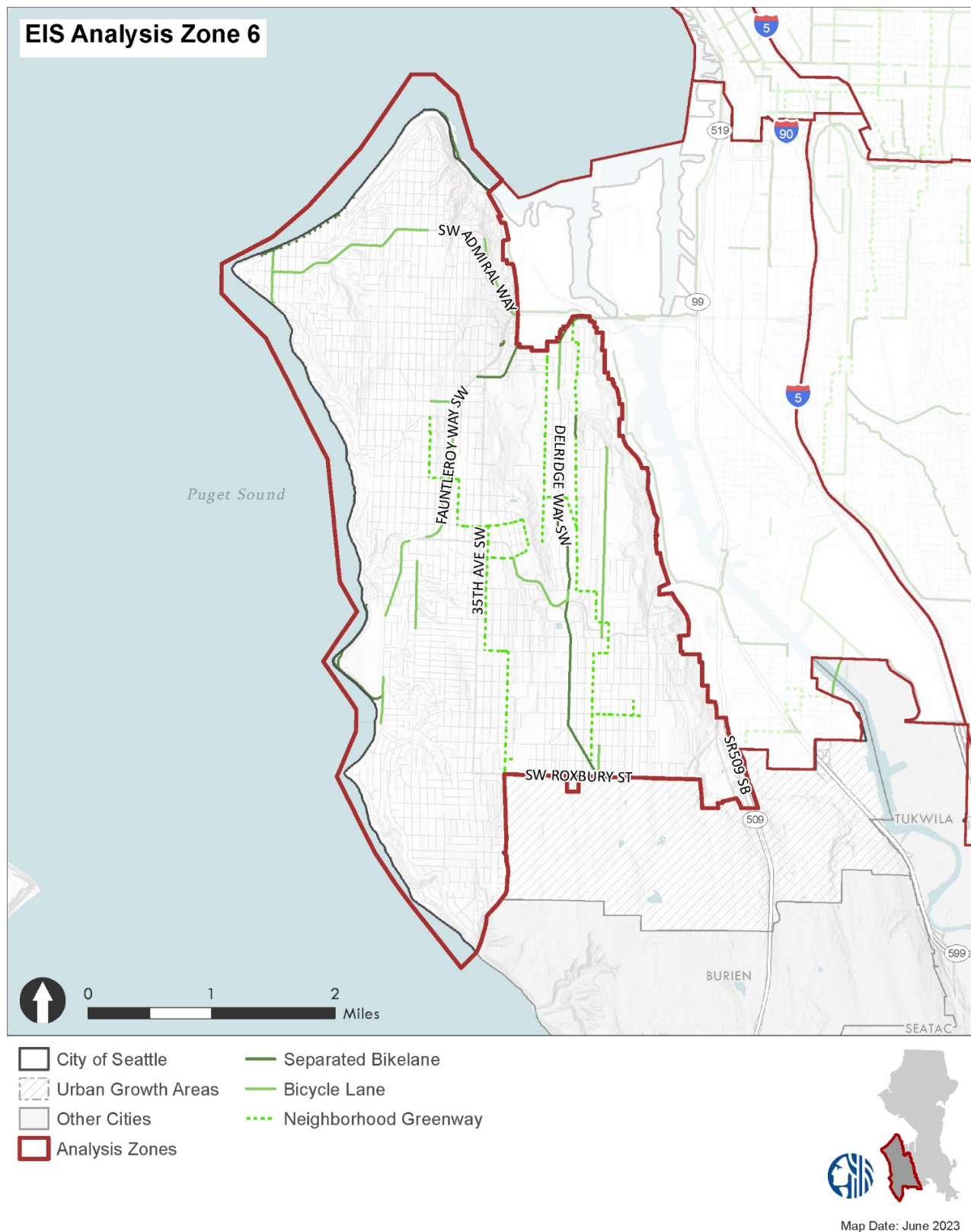
Exhibit 3-144. Sidewalk Gaps in West Seattle



Source: Seattle Department of Transportation, 2022



Exhibit 3-145. Bicycle Facilities in West Seattle



Source: Seattle Department of Transportation, 2022

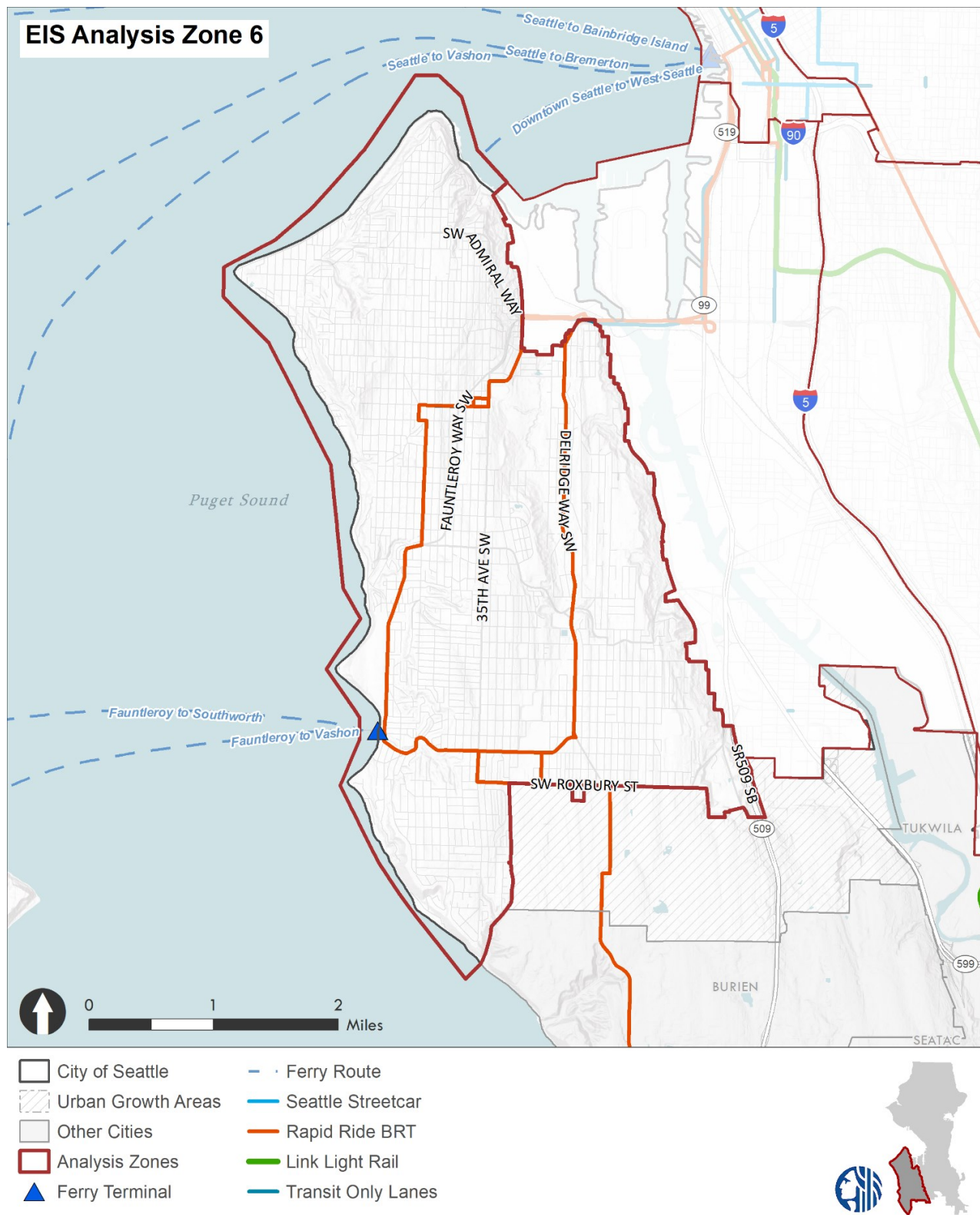


### **Transit Facilities**

Transit facilities are shown in Exhibit 3-146. There are major gaps in the central part of West Seattle, especially for east to west connections. For instance, SW Charlestown St, SW Alaska St, and SW Graham St are lacking or have only fragmented facilities. There are also gaps near the White Center/Arbor Heights areas. There are a total of 3 miles of multi-use trails in this section, with the Alki Trail comprising most of that mileage.

Transit facilities in the West Seattle subarea of Seattle consists entirely of bus transit. There are approximately 1.2 miles of existing dedicated transit facilities in west Seattle, primarily along Delridge Way SW and SW Alaska Street. There are a total of 18 King County Metro bus routes in this section and one Sound Transit Express bus route – Route 560.

Exhibit 3-146. Transit Facilities in West Seattle

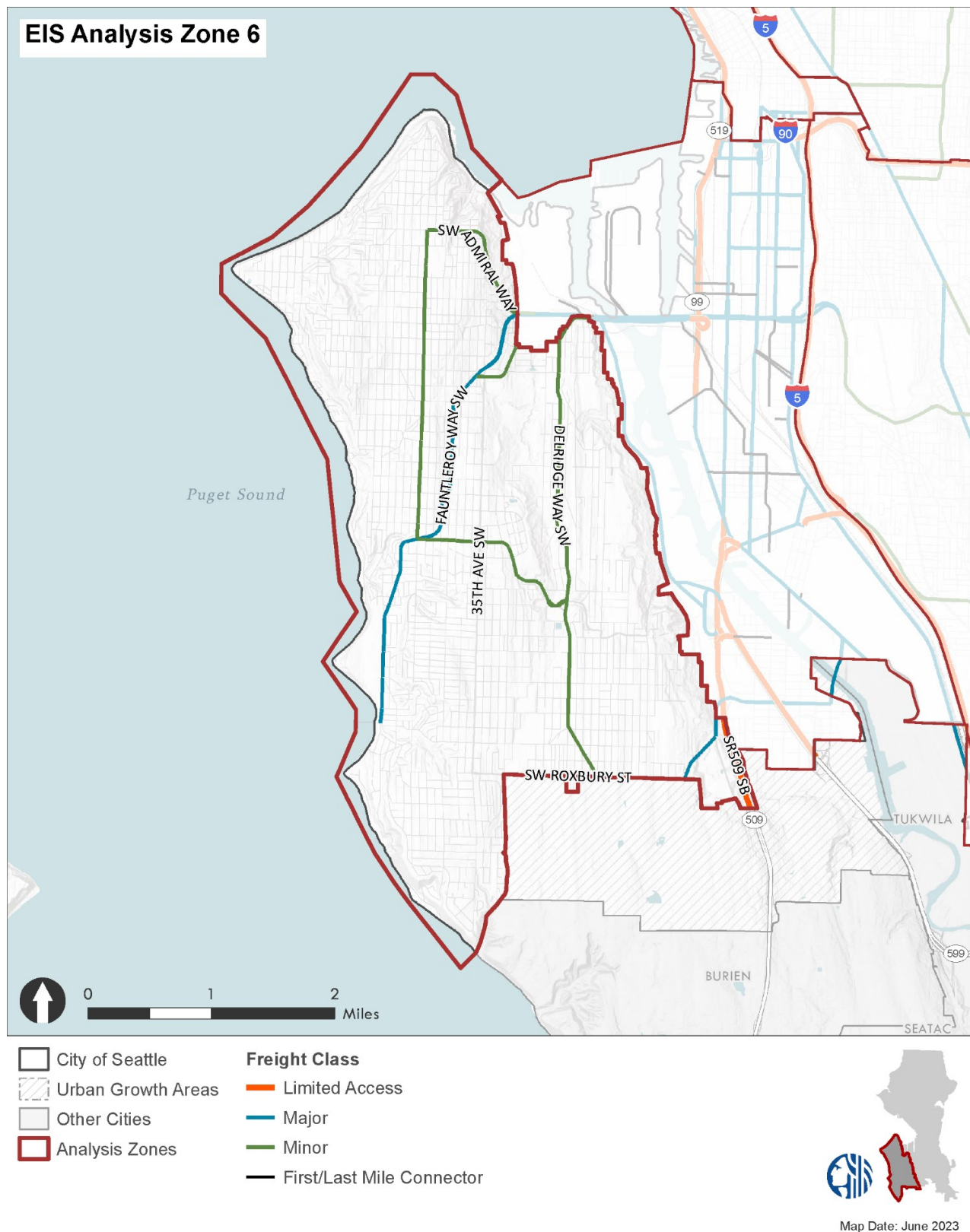


Source: Seattle Department of Transportation, 2022

### **Freight**

Designated freight routes are shown in Exhibit 3-147. Designated truck streets intended to support freight and goods movement through West Seattle run on 11 streets, as well as a limited access on sections of SR-509. Major truck streets in this subarea are limited to the Fauntleroy Way SW corridor. Minor truck streets run along other commercial corridors in this subarea including California Ave SW, Delridge Way SW, and Sylvan Way SW.

Exhibit 3-147. Freight Routes in West Seattle



Source: Seattle Department of Transportation, 2022

## Duwamish

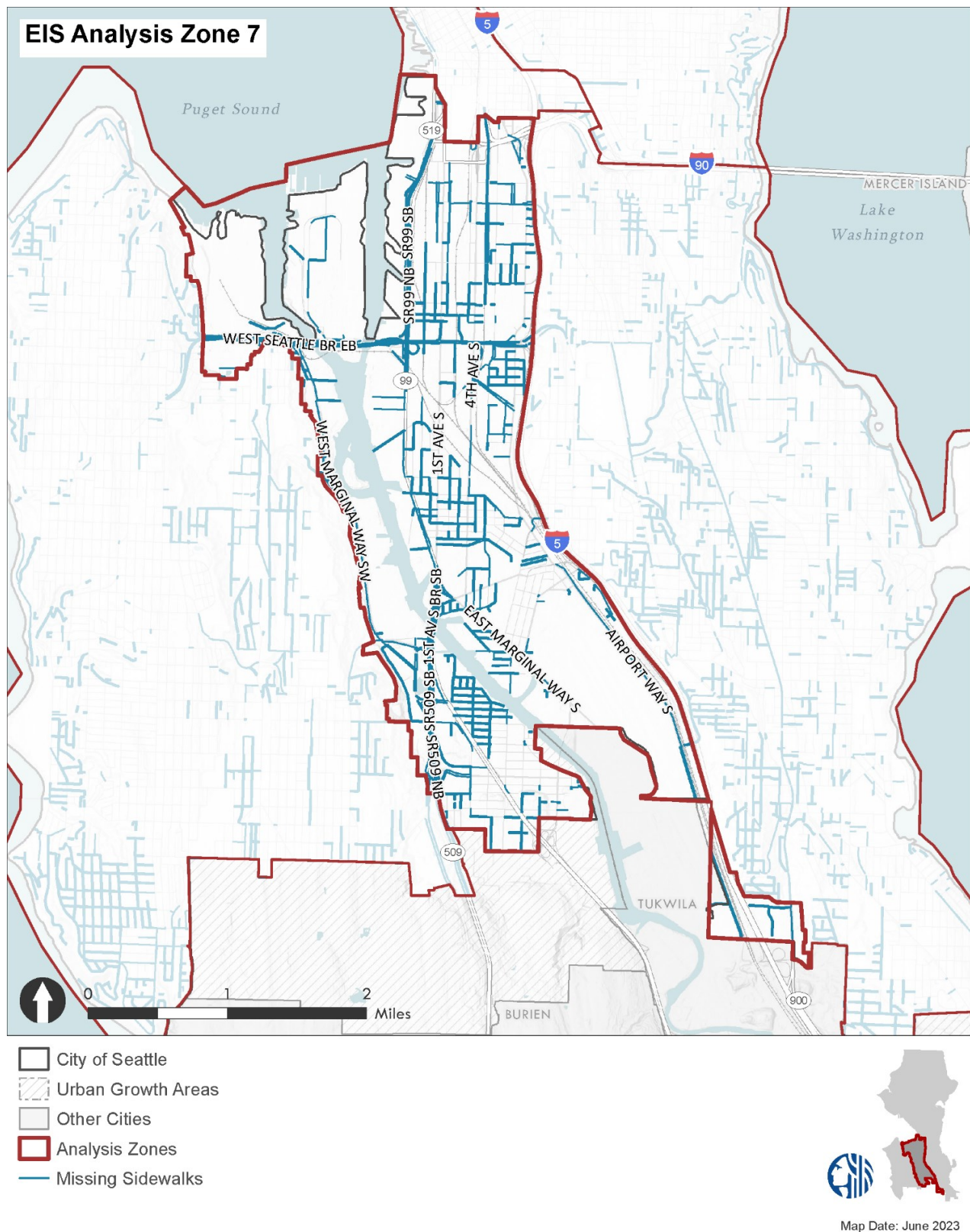
### Pedestrian and Bicycle Infrastructure

Gaps in the sidewalk network are shown in Exhibit 3-148. There are approximately 198 linear miles of existing sidewalks in the Duwamish subarea of Seattle and the sidewalk network in this area is somewhat fragmented with regular gaps. High priority areas in the 2009 PMP were designated based on pedestrian demand, equity, and corridor function. These areas are concentrated around urban villages or along key transit corridors, with the highest priority streets designated as Tier 1 streets. These streets are concentrated around the Georgetown area and on the northern end of the subarea between SODO Station and T-Mobile Park.

Bicycle facilities in the Duwamish subarea are shown in Exhibit 3-149. There are approximately 21.1 linear miles of bike facilities in the Duwamish subarea; these include multi-use trails, protected or buffered bike lanes, painted bike lanes, greenways and sharrows. The Duwamish subarea has 8.1 linear miles of multiuse trail, primarily along sections of Duwamish River Trail, Alki Trail, Delridge Connector Trail, Portside Trail, SODO Trail, and West Seattle Bridge Trail. This subarea has a total of 0.5 miles of buffered or protected bike lanes, primarily on SW Avalon Way. Neighborhood Greenways comprise 1.36 linear miles of the bike facilities in the Duwamish Subarea running longer distances and connecting the bike network in this area. These are mostly along narrow, lower traffic streets with some traffic calming improvements including S Henderson St, S Sullivan St, and 10<sup>th</sup> Ave S. Painted bike lanes make up 11.14 linear miles of the existing bike network in the Duwamish Subarea, primarily on 1st Ave S and E Marginal Way S, with a few other minor ones that provide fragmented east to west connections.

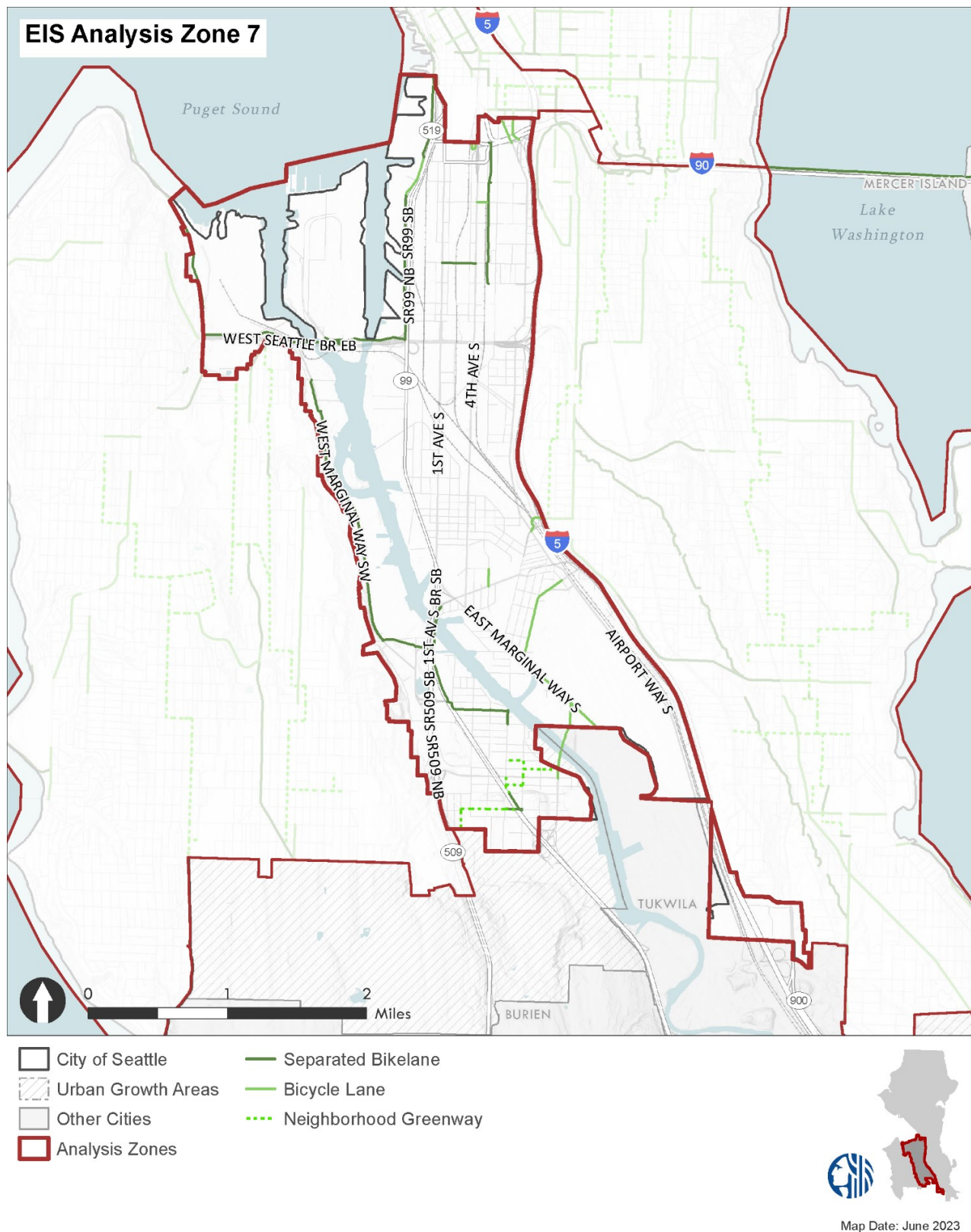


Exhibit 3-148. Sidewalk Gaps in Duwamish



Source: Seattle Department of Transportation, 2022

Exhibit 3-149. Bicycle Facilities in Duwamish



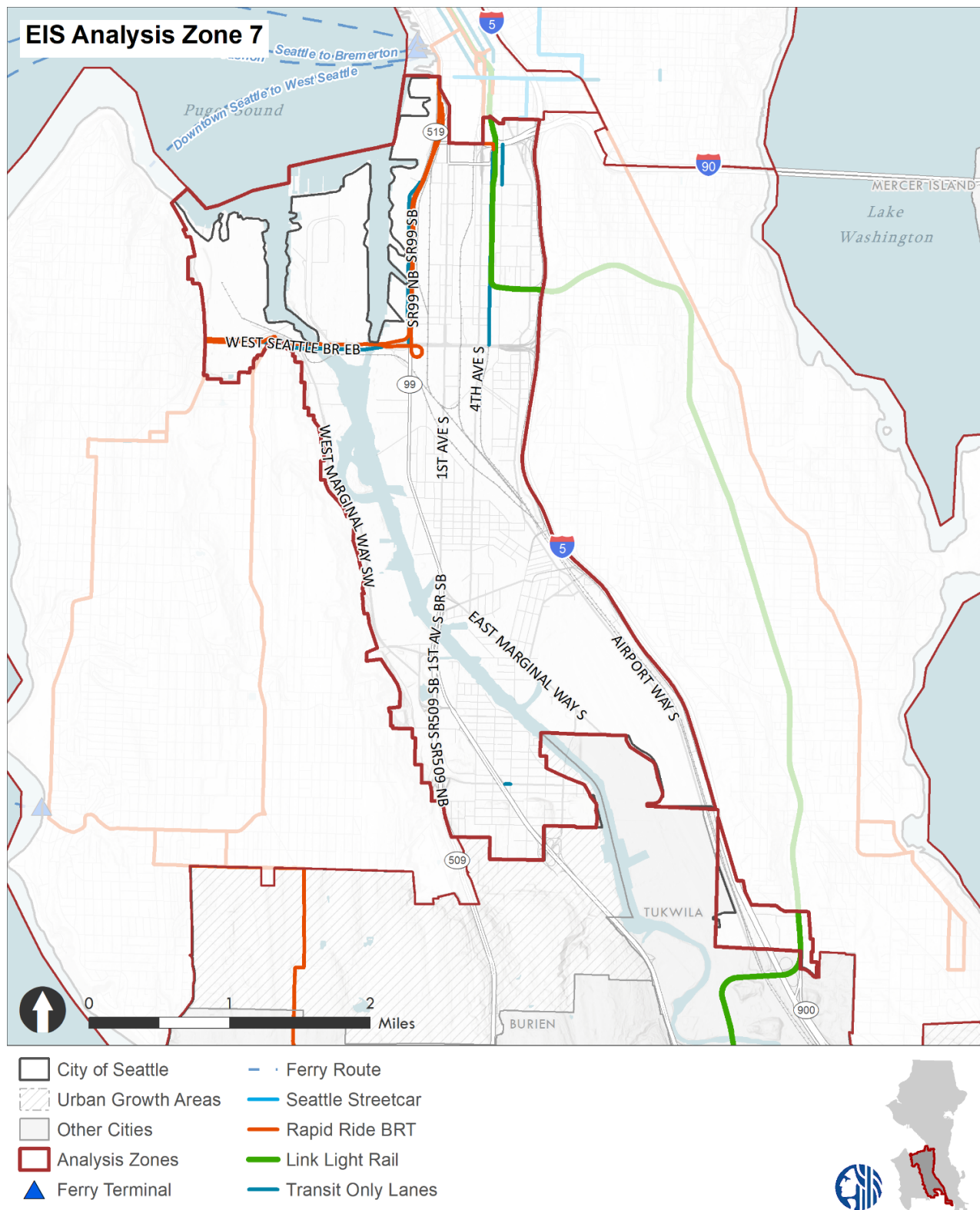
Source: Seattle Department of Transportation, 2022

### **Transit Facilities**

Transit facilities in the Duwamish subarea include bus and rail facilities as shown in Exhibit 3-150. There are approximately 3.8 linear miles of dedicated transit facilities in this subarea including the Spokane St Viaduct and West Seattle High Bridge, E Marginal Way S, and near Link light rail stations. A total of 38 King County Metro bus routes serve the Duwamish subarea, along with five Sound Transit Express bus routes. The Sounder train route runs through this subarea, along 6 miles of heavy rail track but does not serve the subarea with any stations. There are two Link light rail stations that serve this subarea, Stadium and SODO stations, both of which are on the 1-line.



Exhibit 3-150. Transit Facilities in Duwamish



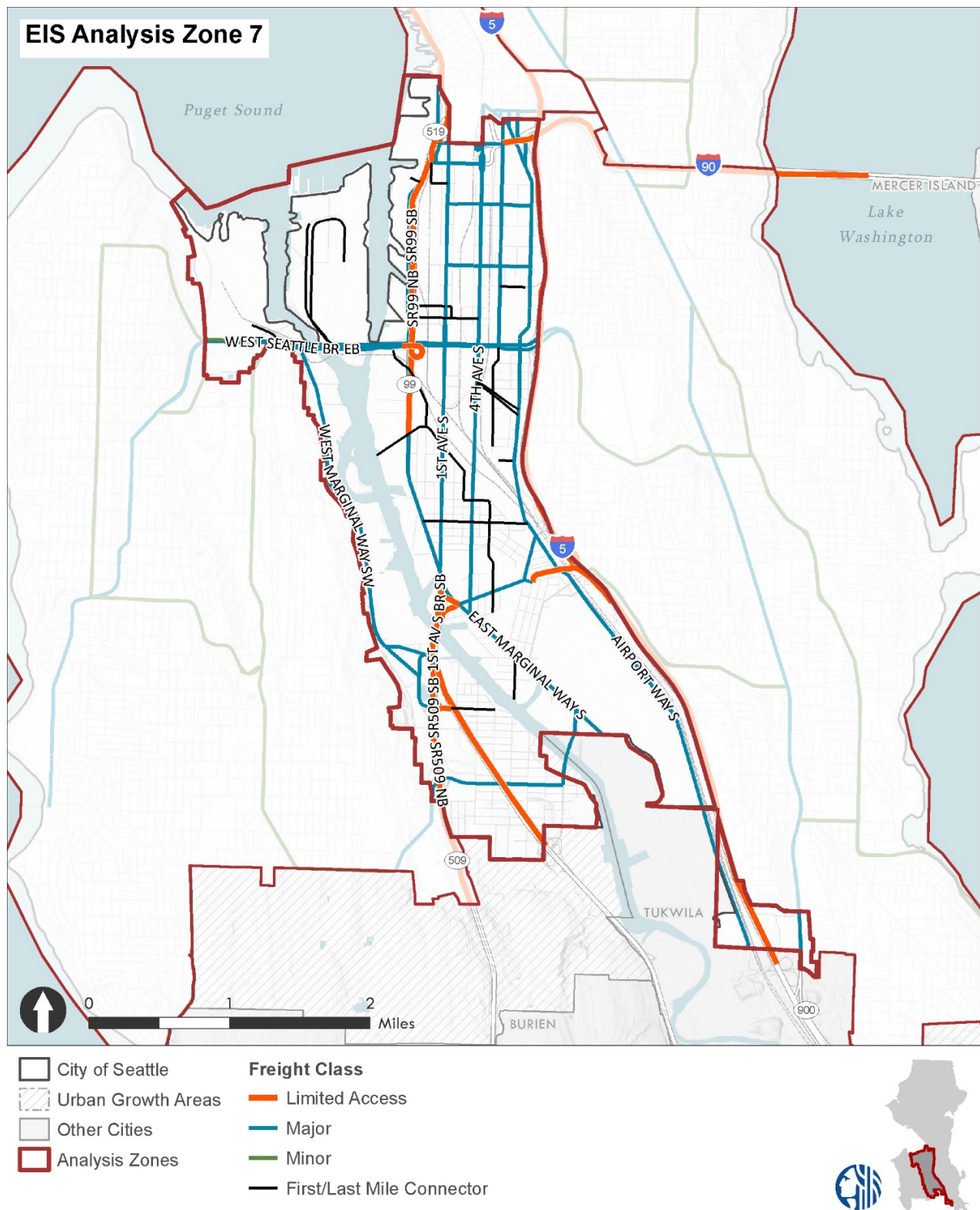
Source: Seattle Department of Transportation, 2022

### **Freight**

Designated truck streets intended to support freight and goods movement through the Duwamish subarea run on 44 streets and on I-5 and SR 509, both limited access highways, as shown in Exhibit 3-151. Major truck streets in this subarea form an extensive network along north-south streets like 1<sup>st</sup> Ave S, 4<sup>th</sup> Ave S, 6<sup>th</sup> Ave S, Airport Way and E Marginal Way S and east-west roadways like S Spokane St, S Holgate St and S Michigan St. There are no minor truck streets in this subarea, but there are a number of first/last mile connectors through the subarea.



Exhibit 3-151. Freight Routes in Duwamish



Source: Seattle Department of Transportation, 2022

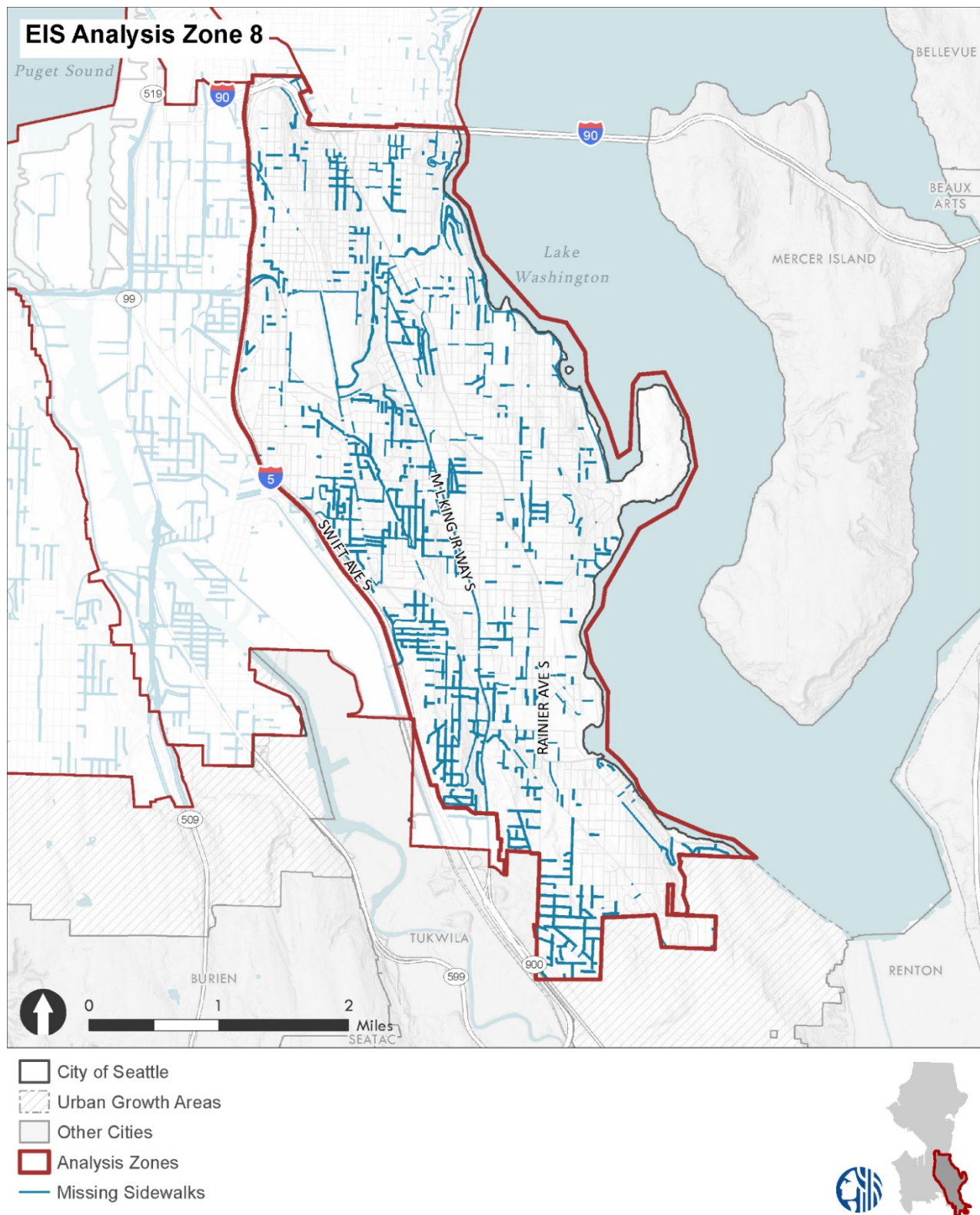
## Southeast Seattle

### Pedestrian and Bicycle Infrastructure

There are approximately 467 miles of existing sidewalks in the Southeast Seattle subarea and there are more gaps in the pedestrian network in this subarea than in other subareas, shown in Exhibit 3-152. There are gaps in the pedestrian network, particularly farther south in the Rainier Beach area and on minor streets near Rainier Ave S and ML King Jr Way S. High priority areas in the 2009 PMP were designated based on pedestrian demand, equity and corridor function are concentrated around urban villages or along key transit corridors, with the highest priority streets designated as Tier 1 streets. These streets are more evenly distributed through this subarea as there are more regular gaps in sidewalks along transit corridors in Southeast Seattle. Tier 1 streets are generally closer to major transit corridors such as Beacon Ave S, Rainier Ave S, and ML King Jr Way S.

There are approximately 51.7 linear miles of bike facilities in the Southeast Seattle subarea, as shown in Exhibit 3-153; these include multi-use trails, protected or buffered bike lanes, painted bike lanes, greenways and sharrows. The Southeast Seattle subarea has 8.7 linear miles of multi-use trail, primarily along sections of Chief Sealth Trail and Mountains to Sound Trail. This subarea has a total of 4 miles of buffered or protected bike lanes, primarily on S Columbian Way, S Myrtle Pl, and Wilson Ave S. Neighborhood Greenways comprise 11.3 linear miles of the bike facilities in the Duwamish Subarea running longer distances and connecting the bike network in this area. These are mostly along narrow, lower traffic streets with some traffic calming improvements and include greenways mostly north to south between 30<sup>th</sup> Ave S to 50<sup>th</sup> Ave S; west to east between 37<sup>th</sup> Ave S to 57<sup>th</sup> Ave S; as well as between 12<sup>th</sup> Ave S to 18<sup>th</sup> Ave S. Painted bike lanes make up 27.7 linear miles of the existing bike network in the Southeast Seattle Subarea, primarily on major streets like Beacon Ave S and Renton Ave S.

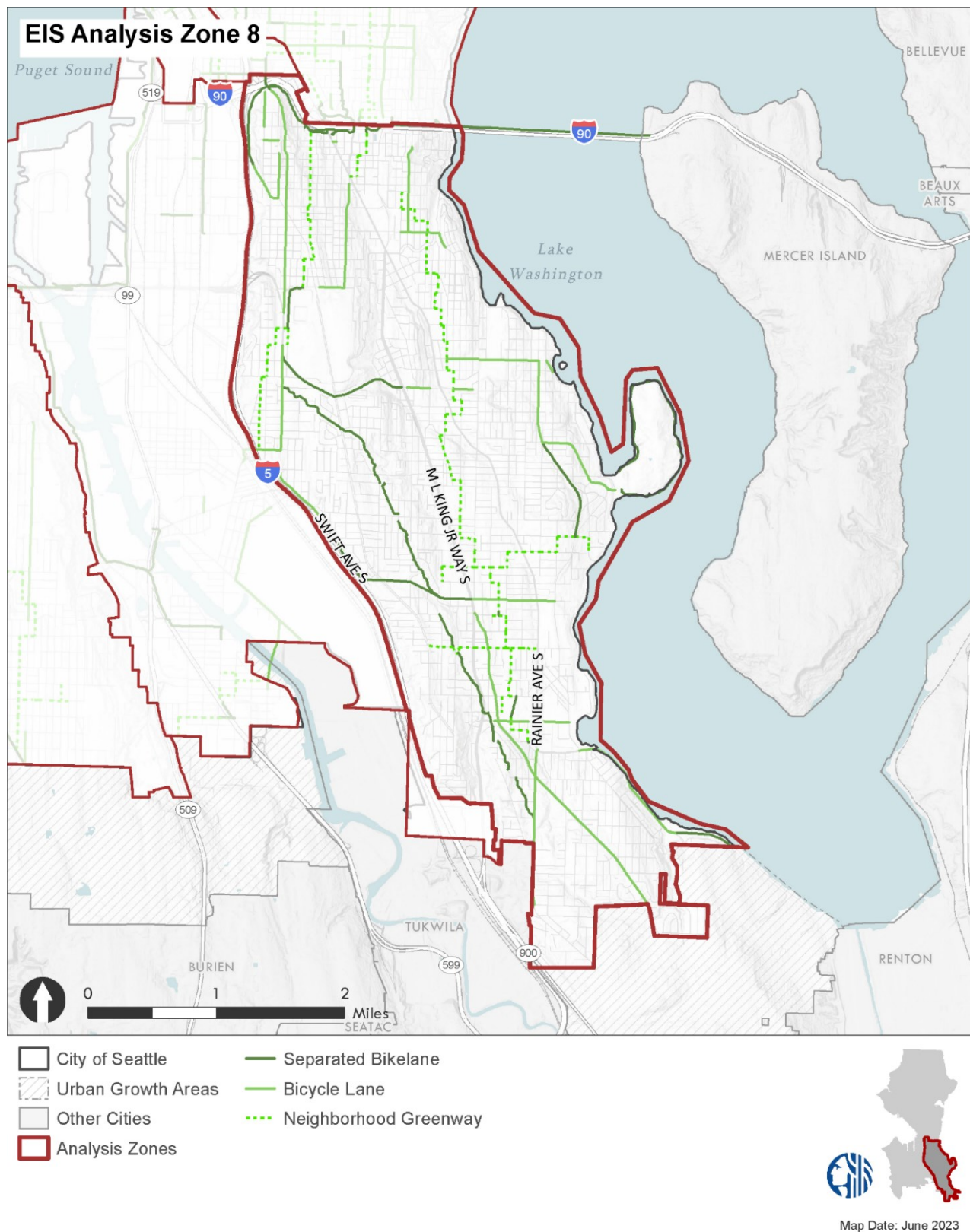
Exhibit 3-152. Sidewalk Gaps in Southeast Seattle



Source: Seattle Department of Transportation, 2022



Exhibit 3-153. Bicycle Facilities in Southeast Seattle



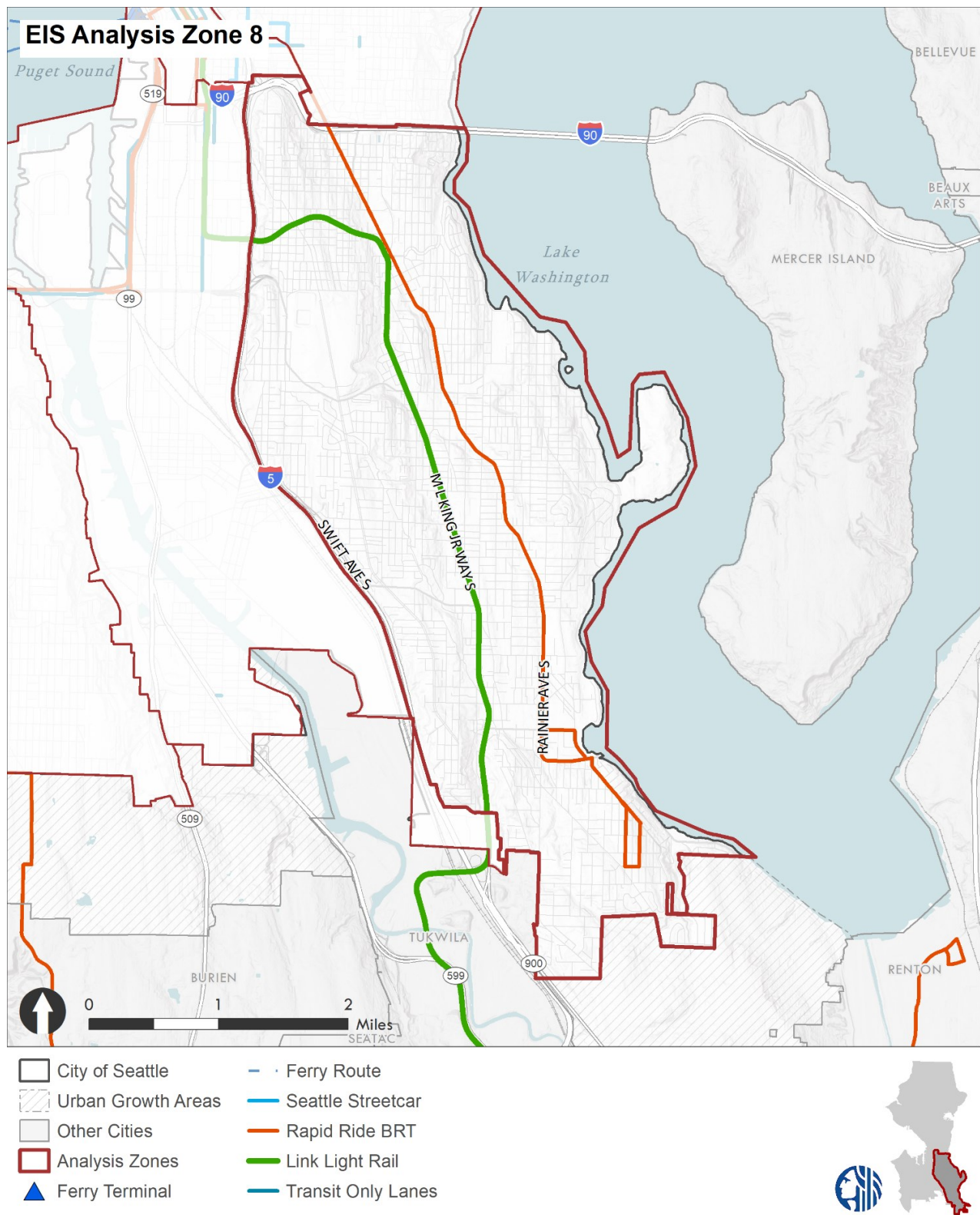
Source: Seattle Department of Transportation, 2022

### **Transit Facilities**

Transit facilities in the Southeast subarea include bus and rail facilities as shown in Exhibit 3-154. There are 0.3 linear miles of transit only lanes, located on Rainier Ave S. A total of 32 King County Metro bus routes serve this subarea. There are five Sound Transit Link light rail stations in this subarea: Beacon Hill, Mount Baker, Columbia City, Othello, and Rainier Beach, all of which are part of the 1-Line, which runs at-grade along ML King Jr Way S.



Exhibit 3-154. Transit Facilities in Southeast Seattle

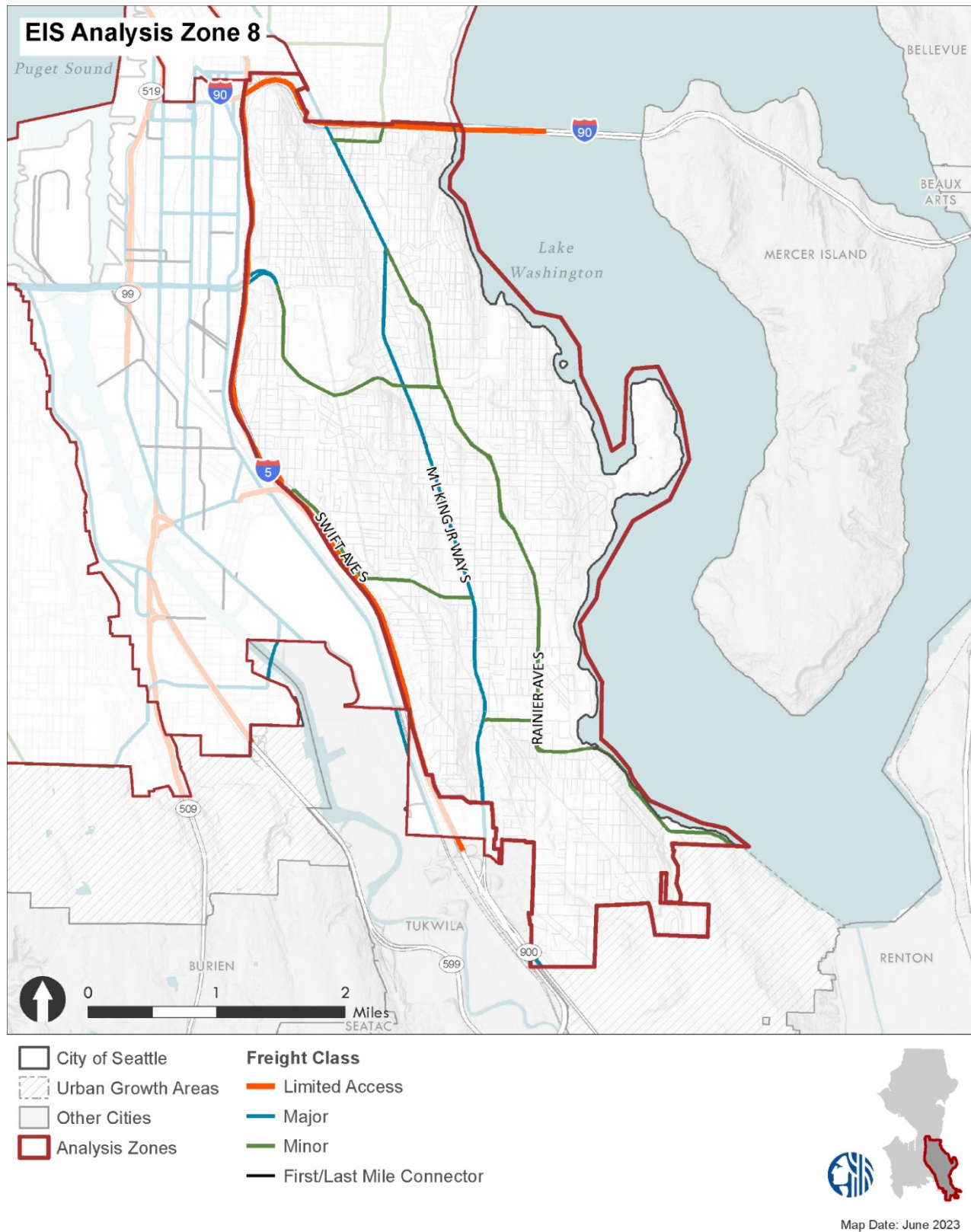


Source: Seattle Department of Transportation, 2022

### **Freight**

Designated truck streets intended to support freight and goods movement through Southeast Seattle run on 11 streets and on I-5, a limited access highway, as shown in Exhibit 3-155. One major truck corridor runs on a diagonal through the Southeast subarea along Rainier Ave S and continuing to the southern edge of Seattle along ML King Jr Way. Minor truck streets run along other commercial corridors in this subarea including Rainier Ave S and S Othello St and along Columbian Way, a major east-west connection to I-5 and neighborhoods to the west.

Exhibit 3-155. Freight Routes in Southeast Seattle



Source: Seattle Department of Transportation, 2022

### 3.6.2 Impacts

This section describes the potential impacts of each alternative as they relate to the transportation thresholds of significance. The impacts of Alternatives 2 and 3 are measured against conditions expected under Alternative 1. Transportation impacts are generally focused on access to jobs and housing within varying distances of the transportation network, using the 2044 job and housing targets from Land Use Alternative 5 to estimate the number of housing units and jobs accessible from the network. As the job and housing targets cover the entire city, impacts were taken from the citywide scale and applied proportionally to each alternative for each mode of transportation using the affected area of each STP Alternative. Therefore, the number of housing unit and jobs encompassed by each STP Alternative are not exact, as the precise location of new housing and jobs (such as future apartment or office buildings) are unknown.

The following were evaluated as thresholds of significance for transportation impacts:

- **Consistency** with Vision 2050, King County Countywide Planning Policies, and Growth Management Areas.
- The degree to which each alternative would result in an **increase in VMT per capita**.
- The amount of **future job or housing growth that is more than 300 feet from the future sidewalk network**.
- The amount of **future job or housing growth that is more than a quarter-mile from the future bicycle network**.
- The amount of **future job or housing growth that is more than a half-mile outside of community & mobility hubs and light rail stations or is more than a quarter-mile outside of improved transit lanes and RapidRide lines**.
- The extent of mobility priority for transit and freight.

Thresholds of significance were evaluated for each STP alternative, with quantitative measures based on land use alternatives under consideration for the City's 2024 Comprehensive Plan update. Alternative 1: No Action was evaluated together with comprehensive plan Alternative 1: No Action as well as Comprehensive Plan Alternative 5: Combined, while Alternative 2: Moderate Pace and Alternative 3: Rapid Progress were evaluated together with comprehensive plan Alternative 5: Combined.

### Impacts Common to All Alternatives

#### Comparison between Alternatives

Alternatives 1, 2 and 3 include various levels of investment in bicycle, pedestrian and transit facilities and would be accessible to different numbers of housing units and jobs citywide. The proximity of jobs and housing units in these growth alternatives to elements of the pedestrian, bike and transit network in Alternative 1, 2, and 3 is shown in Exhibit 3-156. Comparison of the reach of those networks can be seen in Exhibit 3-157, Exhibit 3-158, and Exhibit 3-159.

**Exhibit 3-156. Comparison of Existing (2020) and Future Jobs and Housing Units (2024-2044) with Access to Pedestrian, Bike, and Transit Networks between Alternatives - Citywide**

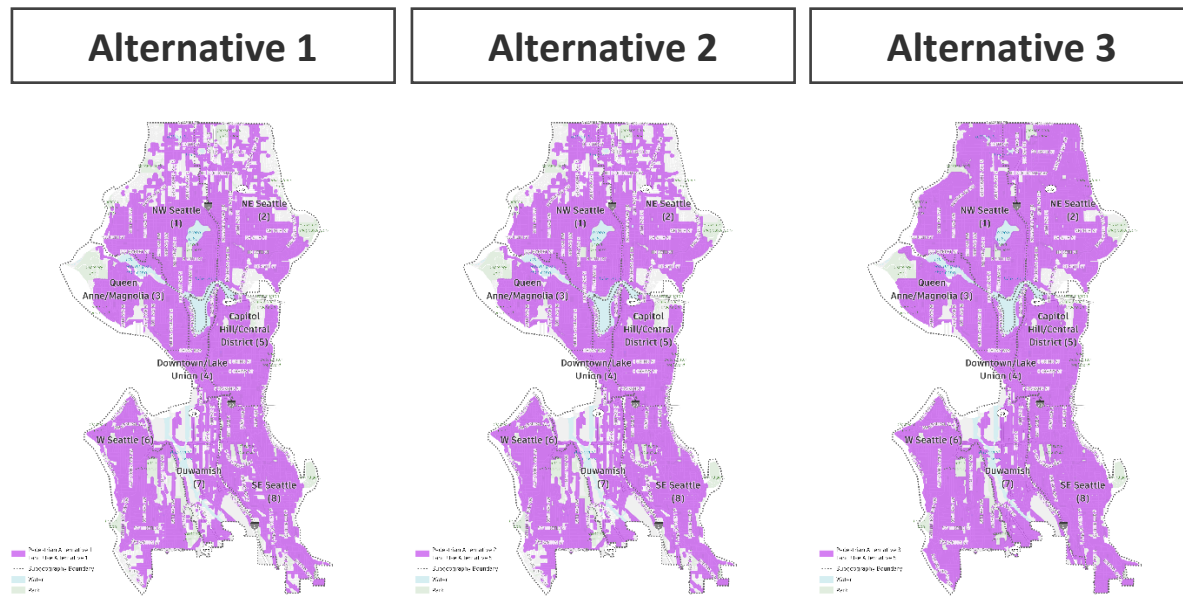
	Housing Unit and Job Estimates	Alternative 1: No Action (with No Action Comprehensive Plan Land Use)	Alternative 1: No Action (with Comprehensive Plan Land Use Alternative 5)	Alternative 2: Moderate Pace (with Comprehensive Plan Land Use Alternative 5)	Alternative 3: Rapid Progress (with Comprehensive Plan Land Use Alternative 5)
<b>Pedestrian Network</b> (Within 300-feet of sidewalks)	Housing unit growth through 2024-2044	74,154 housing units	108,827 housing units	110,933 housing units	114,229 housing units
	Job growth through 2024-2044	142,282 jobs	142,635 jobs	143,806 jobs	147,391 jobs
	Existing housing units	318,142 housing units	318,142 housing units	321,680 housing units	338,620 housing units
	Existing jobs	572,358 jobs	572,358 jobs	573,292 jobs	590,931 jobs
<b>Bicycle Network</b> (Within ¼ mile of bicycle facilities)	Housing unit growth 2024- 2044	68,697 housing units	94,316 housing units	102,239 housing units	118,138 housing units
	Job growth 2024-2044	140,414 jobs	139,970 jobs	148,027 jobs	156,008 jobs
	Existing housing units	259,811 housing units	259,811 housing units	278,328 housing units	347,961 housing units
	Existing jobs	540,537 jobs	540,537 jobs	572,029 jobs	613,542 jobs
<b>Transit Network</b> (Within ¼ mile of improved transit corridors or within a ½ mile of light rail stations and community & mobility hubs)	Housing unit growth 2024- 2044	58,611 housing units	73,681 housing units	87,387 housing units	106,668 housing units
	Job growth 2024-2044	125,644 jobs	124,195 jobs	133,583 jobs	146,092 jobs
	Existing housing units	190,635 housing units	190,635 housing units	233,984 housing units	302,384 housing units
	Existing jobs	434,422 jobs	434,422 jobs	532,178 jobs	590,710 jobs

Source: Kimley-Horn, 2023

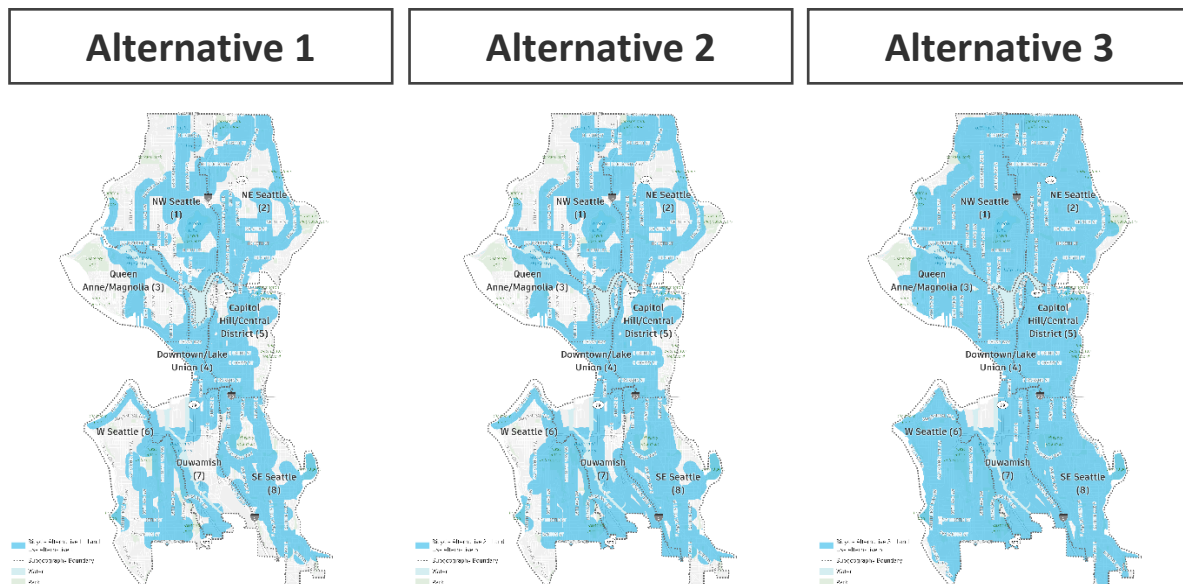
Note: Existing jobs and housing unit numbers are based on 2020 ACS 5-Year Estimates. 2024-2044 growth estimates for jobs and housing are based on the City of Seattle comprehensive plan.



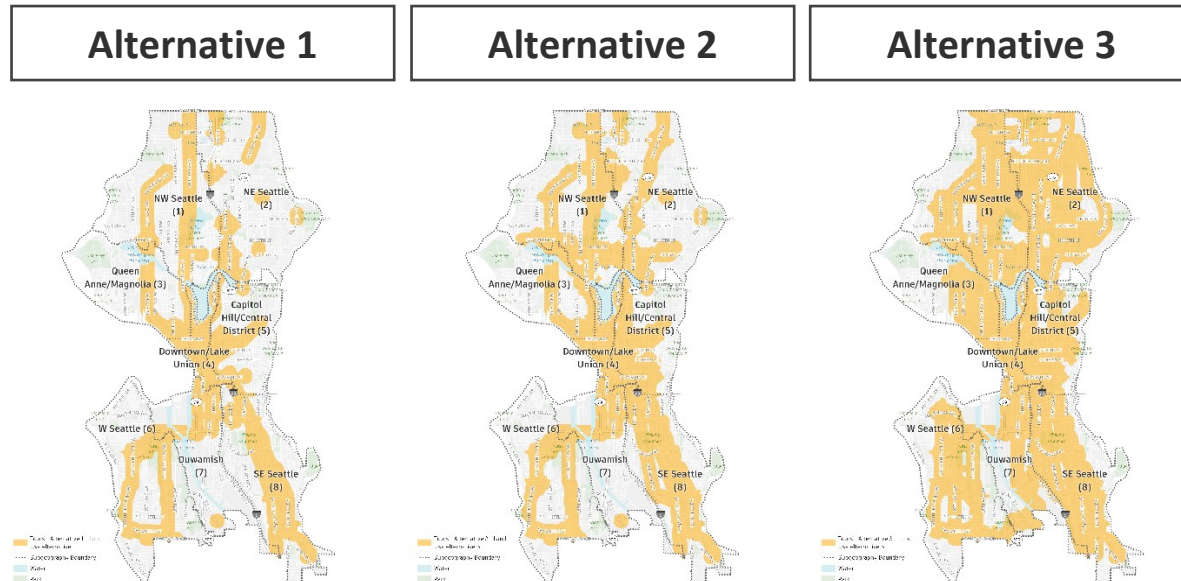
**Exhibit 3-157. Areas within 300 feet of Sidewalks in Alternatives 1, 2, and 3**



**Exhibit 3-158. Areas within ¼ mile of Bike Facilities in Alternatives 1, 2, and 3**



**Exhibit 3-159. Areas within ¼ mile of Improved Transit Corridors or ½ mile of Light Rail Stations & Community & Mobility Hubs in Alternatives 1, 2, and 3**



### Consistency with Vision 2050, Growth Management Act, and Countywide Planning Policies

All alternatives are consistent with the planning goals of the Growth Management Act (GMA), including RCW 36.70A.020 to “[e]ncourage efficient multimodal transportation systems that are based on regional priorities.” While none of the STP alternatives are inconsistent with GMA planning goals, Alternative 2 and Alternative 3 are more supportive of a comprehensive multimodal transportation system than the No Action Alternative. These alternatives have a more complete network of bicycle and pedestrian facilities and contain more improvements to the transit system.

Vision 2050 incorporates a range of multicounty planning policies adopted under the GMA to address regionwide issues. These policies are a reference for counties and cities in the Central Puget Sound Region as they update countywide planning policies and comprehensive plans. Vision 2050’s multicounty planning policies include 22 policies for the regional transportation plan that further the goal of a sustainable, equitable, affordable, safe, and efficient multimodal transportation system for the region. The features of all STP alternatives are consistent with most of these policies, though the alternatives differ in how supportive they are of specific policies.

**Alternative 1: No Action** includes improvements to safety and operations reflected in policy, also including active transportation and transit improvements that are currently funded and respect these objectives. However, Alternative 1 does not place the same emphasis on alternatives to driving (MPP-T-12, MPP-T-13 and MPP-T-17) or supporting compact development around transit (MPP-T-15 and MPP-T-16).

**Alternative 2: Moderate Pace** includes stronger policy language and more potential improvements to the pedestrian, bicycle, and transit network to advance implementation of these regional policies within the City of Seattle. Alternatives 1 and 2 do not preclude alternative transportation financing methods (MPP-T-6), but

do not include implementation of mobility management strategies, in concert with the region, as in **Alternative 3: Rapid Progress**. Both alternatives 1 and 2 support transition to zero-emission vehicles and electrification infrastructure (MPP-T-33, MPP-T-34), though not as extensively as Alternative 3.

**Alternative 3** includes the most features that support PSRC's multi-county planning policies, including electrification, zero emission vehicle goals and financing, and places the greatest focus on modes other than driving.

King County's countywide planning policies for transportation fall under three categories: supporting growth, mobility, and system operations. Those that are most relevant to the Seattle Transportation Plan further the County's goals related to the regional growth strategy and multimodal transportation. These policies generally align with those included in PSRC's multi-county planning policies, and all STP alternatives are consistent with King County's countywide planning policies. Alternatives 2 and 3 include more improvements to the pedestrian, bike and transit network and are more supportive of policies that emphasize alternatives to driving alone (T-5, T-7, T-10). Of the 3 STP alternatives, Alternative 3 includes policies that most closely reflect the County's policy to advocate for new funding methods (T-13), with implementation of additional mobility management strategies, in concert with the region.

### **Changes in VMT per Capita**

None of the Alternatives are likely to result in any additional VMT per capita from the forecast VMT in the comprehensive plan alternatives. Alternative 1 of the Seattle Comprehensive Plan Update would result in a VMT of 22,213,000 for cars, 2,144,100 for trucks, and 77,150 for buses, while Alternative 5 of the Seattle Comprehensive Plan Update would result in a VMT of 22,920,000 for cars, 2,202,100 for trucks, and 77,140 for buses.

While the two comprehensive plan alternatives used for analysis do not include specific population forecasts, there are substantial differences in citywide housing growth between the comprehensive plan Alternative 1 and Alternative 5. Alternative 1 would add 80,000 homes, primarily in urban centers and villages throughout the city over 20 years between 2024 and 2044, while Alternative 5 would add 120,000 homes over the same period, with 40,000 additional homes in other areas.

Combined with the VMT reduction factors in STP Alternative 2 and 3, the STP action alternatives are unlikely to raise VMT per capita, and more likely to reduce VMT per capita citywide. In fact, Alternatives 2 and 3 have more emissions reduction factors than Alternative 1, with the most sidewalk availability, bicycle infrastructure and transit improvements under Alternative 3, followed by Alternative 2. Recent studies have found that sidewalk coverage together with land use is associated with reduced VMT (SDOT & WSDOT, 2011), bicycle infrastructure has potential to support modest VMT reductions (National Center for Sustainable Transportation, 2017; U.S. EPA, 2014), and transit improvements have also been shown to be an effective tool in reducing VMT (WSDOT, 2022; U.S. EPA, 2014). The expanded multimodal network in Alternatives 2 and 3 is likely to result in lower overall VMT and VMT per capita compared to Alternative 1 or the baseline VMT in Comprehensive Plan Alternative 5. None of the STP alternatives would have an adverse impact on VMT per capita, but Alternative 1 would support the least reduction in VMT per capita across the citywide network.

**Jobs/Housing Access to future sidewalk network**

See impacts on each alternative below.

**Jobs/Housing Access to future bicycle network**

See impacts on each alternative below.

**Jobs/Housing Access to future transit network**

See impacts on each alternative below.

**Extent of mobility priority for transit and freight**

See impacts on each alternative below.

**Impacts of Alternative 1: No Action**

Alternative 1: No Action includes existing and funded bicycle, pedestrian, and transit infrastructure, with some projects currently under construction. Alternative 1 would implement limited capital improvements to the bicycle, pedestrian, transit, and freight networks beyond what is funded today. This includes no additional sidewalk miles, only funded bicycle projects and transit projects, and no new community & mobility hubs. Existing and funded infrastructure includes 2,277 miles of sidewalk, 161 miles of corridors with bike facilities, 38 miles of dedicated transit corridors, 75 miles of RapidRide corridors and 31 light rail stations.

**Citywide Impacts**

Analysis of future citywide and subarea jobs and housing units for Alternative 1 is based on the 2024 Comprehensive Plan update Alternative 5. Existing jobs and housing units citywide and per subarea were determined using 2020 ACS 5-Year estimates. Access to different pedestrian, bicycle, and transit infrastructure is defined by proximity, with future and existing jobs and population estimated within 300 feet of sidewalks, within ¼ mile of bike corridors, and within ¼ mile of transit corridors or ½ mile of light rail stations and community & mobility hubs. The number of existing and future jobs and housing units with access to the pedestrian bike and transit network in Alternative 1 is shown in Exhibit 3-160 below.

**Exhibit 3-160. Future (2024-2044) and Existing (2020) Jobs and Housing Units with Access to the Pedestrian, Bike, and Transit Networks in Alternative 1**

	Existing Housing Units	Existing Jobs	Housing Unit Growth 2024-2044	Job Growth 2024-2044
<b>Pedestrian Network</b> (Within 300-feet of sidewalks)	318,142 housing units	572,358 jobs	108,827 housing units	142,635 jobs
<b>Bicycle Network</b> (Within ¼ mile of bicycle facilities)	259,811 housing units	540,537 jobs	94,316 housing units	139,970 jobs
<b>Transit Network</b> (Within ¼ mile of dedicated	190,635 housing units	434,422 jobs	73,681 housing units	124,195 jobs

	Existing Housing Units	Existing Jobs	Housing Unit Growth 2024-2044	Job Growth 2024-2044
transit corridors or within a ½ mile of light rail stations and community & mobility hubs)				
<b>Citywide (Land Use Alternative 5)</b>	391,394 housing units	720,173 jobs	120,000 housing units	158,000 jobs

Source: Kimley-Horn, 2023

Note: Existing jobs and housing unit numbers are based on 2020 ACS 5-Year Estimates. 2024-2044 growth estimates for jobs and housing are based on the City of Seattle comprehensive plan.

Alternative 1 does not propose substantial capital improvements to the city’s transportation network aside from what is currently planned and programmed today. According to 2020 Census estimates, the areas within 300 feet of sidewalks include an estimated 572,358 existing jobs and 318,142 existing housing units, 934 fewer jobs and 3,538 fewer housing units than Alternative 2, and 18,573 fewer jobs and 20,478 fewer housing units than Alternative 3. In Alternative 1, the areas within 300 feet of sidewalks are expected to see growth of 142,645 jobs and 108,827 housing between 2024-2044, which is 1,171 fewer jobs and 2,106 fewer housing units than Alternative 2, and 4,756 fewer jobs and 5,402 fewer housing units than Alternative 3. Citywide, an estimated 9% of growth in housing units and just under 10% of job growth would not have easy access to pedestrian facilities in STP Alternative 1. Compared to Alternatives 2 and 3, STP Alternative 1 has more future job and housing growth from 2024-2044 more than 300-feet from the STP Alternative 1 sidewalk network. This results in the potential for significant adverse impacts. Although a larger proportion of the housing growth is within 300-feet of the sidewalk, a significant amount of housing is more than 300-feet of the sidewalk.

The number of jobs and housing units with access to bike facilities differs between STP alternatives, with 540,537 existing jobs and 259,811 existing housing units estimated within ¼ mile of bike facilities under Alternative 1, 31,492 fewer jobs and 18,517 fewer housing units than Alternative 2, and 73,005 fewer jobs and 88,150 fewer housing units than Alternative 3. Areas within ¼ mile of bicycle infrastructure are expected to see growth of 139,970 jobs and 94,316 housing units between 2024 and 2044 in this alternative. This amounts to 8,057 fewer jobs and 7,923 fewer housing units than Alternative 2, and 16,308 fewer jobs and 23,822 fewer housing units than Alternative 3 over the same period. Citywide, 21% of estimated growth in housing units and 11% of job growth would not have easy access to bicycle facilities in STP Alternative 1. This results in the potential for significant adverse impacts, as a relatively (compared to STP Alternatives 2 and 3) larger proportion of future housing growth from 2024-2044 is more than a quarter-mile from the STP Alternative 1 bicycle network.

The number of future and existing housing units and jobs with access to transit corridors in each alternative were also estimated using Census data and projected growth in the comprehensive plan alternatives. As Alternative 1 does not contain any community & mobility hubs, only areas within ¼ mile of transit corridors or ½ mile of existing and funded light rail stations were analyzed for Alternative 1, whereas Alternatives 2

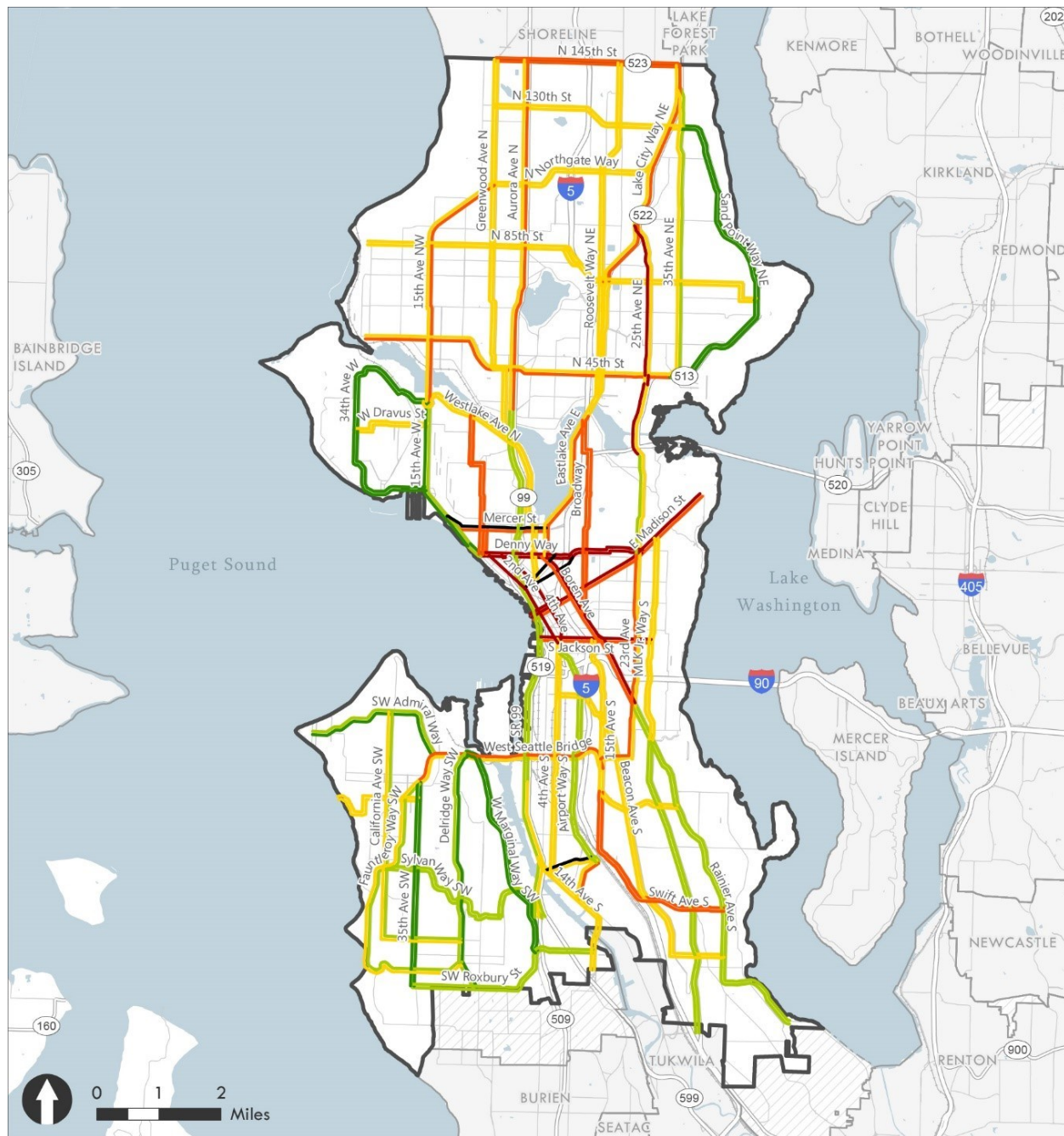


and 3 include areas within ¼ mile of improved transit corridors or within a ½ mile of light rail stations and community & mobility hubs.

Areas with access to the transit network include 434,422 existing jobs and 190,635 existing housing units, which is 97,756 fewer jobs and 43,349 fewer housing units than Alternative 2, and 156,288 fewer jobs and 111,749 fewer housing units than Alternative 3. In Alternative 1, areas within ¼ mile of improved transit corridors or within a ½ mile of light rail stations and community & mobility hubs are expected to see growth of 124,195 jobs and 73,681 housing units by 2044, which is 9,388 fewer jobs and 13,706 fewer housing units than Alternative 2 and 22,897 fewer job and 32,987 fewer housing units than Alternative 3. Citywide, 39% of estimated growth in housing units and 21% of job growth would not have easy access to transit facilities in STP Alternative 1. Given the number of future job and housing unit growth from 2024-2044 more than a half-mile from community & mobility hubs and light rail or within a quarter-mile of improved transit lanes and RapidRide lines on the STP Alternative 1 transit network, there is potential for significant adverse impacts for transit access for jobs and housing.

Alternative 1 does not include roadways with potential reprioritization of space in the right-of-way based on the Complete Streets Policy. Based on modeling for the Comprehensive Plan, some roadways have been identified as capacity constrained using the STP No Action Alternative and the Comprehensive Plan Land Use Scenario 5. See Exhibit 3-161

**Exhibit 3-161. Capacity Constrained Roadways Based on Comprehensive Plan Alternative 5 and STP No Action Alternative**



- Level of Service
- A
  - B
  - C
  - D
  - E
  - F
- City of Seattle
- Other Cities
- Urban Growth Areas



Map Date: February 2023

Source: Fehr and Peers, 2023

### Subarea Impacts

Analysis on the subareas can be found in [Appendix D](#).

## Impacts of Alternative 2: Moderate Pace

Alternative 2: Moderate Pace includes moderate and targeted new multimodal infrastructure for the future of Seattle's transportation system. Alternative 2 includes 123 additional miles of sidewalks to bridge gaps in the pedestrian network primarily in urban centers and villages and 53 additional miles of corridors with bicycle improvements compared to Alternative 1. This alternative would also improve key transit corridors with 33 additional miles of improved transit corridors and a total of 52 community & mobility hubs throughout the City.

### Citywide Impacts

Analysis of citywide and subarea jobs and housing units for STP Alternative 2 are based on the 2024 Comprehensive Plan update Alternative 5: Combined. Existing jobs and housing units citywide and per subarea were determined using 2020 ACS 5-Year estimates. Access to different pedestrian, bicycle and transit infrastructure is defined by proximity, with current and future jobs and population estimated within 300 feet of sidewalks, within ¼ mile of bike corridors and within ¼ mile of transit corridors or ½ mile of light rail stations and community & mobility hubs. The number of jobs with access to the pedestrian bike and transit network in Alternative 2 is shown in Exhibit 3-162 below.

**Exhibit 3-162. Future Jobs and Housing Units with Access to the Pedestrian Bike and Transit Networks in Alternative 2 – Citywide**

	Existing Housing Units	Existing Jobs	Housing Unit Growth 2024-2044	Job Growth 2024-2044
<b>Pedestrian Network</b> (Within 300-feet of sidewalks)	321,680 housing units	573,292 jobs	110,933 housing units	143,806 jobs
<b>Bicycle Network</b> (Within ¼ mile of bicycle facilities)	278,328 housing units	572,029 jobs	102,239 housing units	148,027 jobs
<b>Transit Network</b> (Within ¼ mile of improved transit corridors or within a ½ mile of light rail stations and community & mobility hubs)	233,984 housing units	532,178 jobs	87,387 housing units	133,583 jobs
<b>Citywide</b>	391,394 housing units	720,173 jobs	120,000 housing units	158,000 jobs

Source: Kimley-Horn, 2023

Note: Existing jobs and housing unit numbers are based on 2020 ACS 5-Year Estimates. 2024-2044 growth estimates for jobs and housing are based on the City of Seattle comprehensive plan.

According to 2020 Census estimates, the areas within 300 feet of sidewalks and pathways in Alternative 2 include 573,292 existing jobs and 321,680 existing housing units, 934 more jobs and 3,538 more housing units than Alternative 1, and 17,639 fewer jobs and 16,940 fewer housing units than Alternative 3. In Alternative 2, the areas within 300 feet of sidewalks are expected to see growth of 143,806 jobs and 110,933 housing units between 2024 and 2044, 1,523 more jobs and 36,779 more housing units than Alternative 1, and 3,586 fewer jobs and 3,296 fewer housing units than Alternative 3. Citywide, 8% of estimated growth in housing units and 9% of job growth would not have easy access to pedestrian facilities in STP Alternative 2. Potential limitations in the pedestrian network's ability to connect new growth in Alternative 2 does not have the potential for significant adverse impact and is comparable to other alternatives.

The number of housing units and jobs with access to bike facilities differs between STP alternatives, with a total of 572,029 existing jobs and 278,328 existing housing units within ¼ mile of bicycle facilities in Alternative 2, 31,492 more jobs and 18,517 more housing units than Alternative 1, and 41,513 fewer jobs and 69,633 fewer housing units than Alternative 3. Areas within ¼ mile of bicycle infrastructure are expected to see growth of 148,027 jobs and 102,239 housing units between 2024 and 2044. This amounts to 7,613 more jobs and 33,543 more housing units than Alternative 1, and 15,594 fewer jobs and 15,898 fewer housing units than Alternative 3 over that same period. Citywide, 15% of estimated growth in housing units and 6% of job growth would not have easy access to bicycle facilities in STP Alternative 2. Access to jobs would not have the potential for significant adverse impacts, as a minimal amount of future job growth from 2024-2044 is more than a quarter-mile from the STP Alternative 2 bicycle network. This represents less impacts than STP Alternative 1 but more impacts than STP Alternative 3, as the potential for impact varies depending on the amount of bicycle infrastructure.

The number of future and existing housing units and jobs with access to transit corridors in each alternative were also estimated using Census data and projected growth in the comprehensive plan alternatives. In Alternative 2 there are an estimated 532,178 existing jobs and 233,984 existing housing units within ¼ mile of improved transit corridors or within a ½ mile of light rail stations and community & mobility hubs, 97,756 more jobs and 43,349 more housing units than Alternative 1, and 58,532 fewer jobs and 68,400 fewer housing units than Alternative 3. In Alternative 2, areas within ¼ mile of improved transit corridors or within a ½ mile of light rail stations and community & mobility hubs are expected to see growth of 133,583 jobs and 87,387 housing units by 2044, 7,939 more jobs and 28,776 more housing units than Alternative 1, and 12,509 fewer jobs and 19,301 fewer housing units than Alternative 3. Citywide, 27% of estimated growth in housing units and 16% of job growth would not have easy access to transit facilities in STP Alternative 2. As a relatively small amount of future housing unit growth from 2024-2044 is more than a half-mile from community & mobility hubs and light rail or within a quarter-mile of improved transit lanes and RapidRide lines on the STP Alternative 2 transit network, there is no potential for significant adverse impacts for access to jobs or housing.

Roadways where reprioritization of modes would inform how space is allocated in the public right-of-way are anticipated to be in Alternatives 2 and 3. New investments in dedicated transit lanes are likely to require the most space in the right-of-way, and therefore priority transit streets are where most lane miles are anticipated to be reprioritized for multimodal improvements. Locations of reprioritization areas are expected

to be on priority transit streets with four or more lanes for two-way streets or three or more lanes for one-way streets. See Exhibit 3-163.

**Exhibit 3-163. Corridors Evaluated for Transit Priority Lanes in Alternative 2**

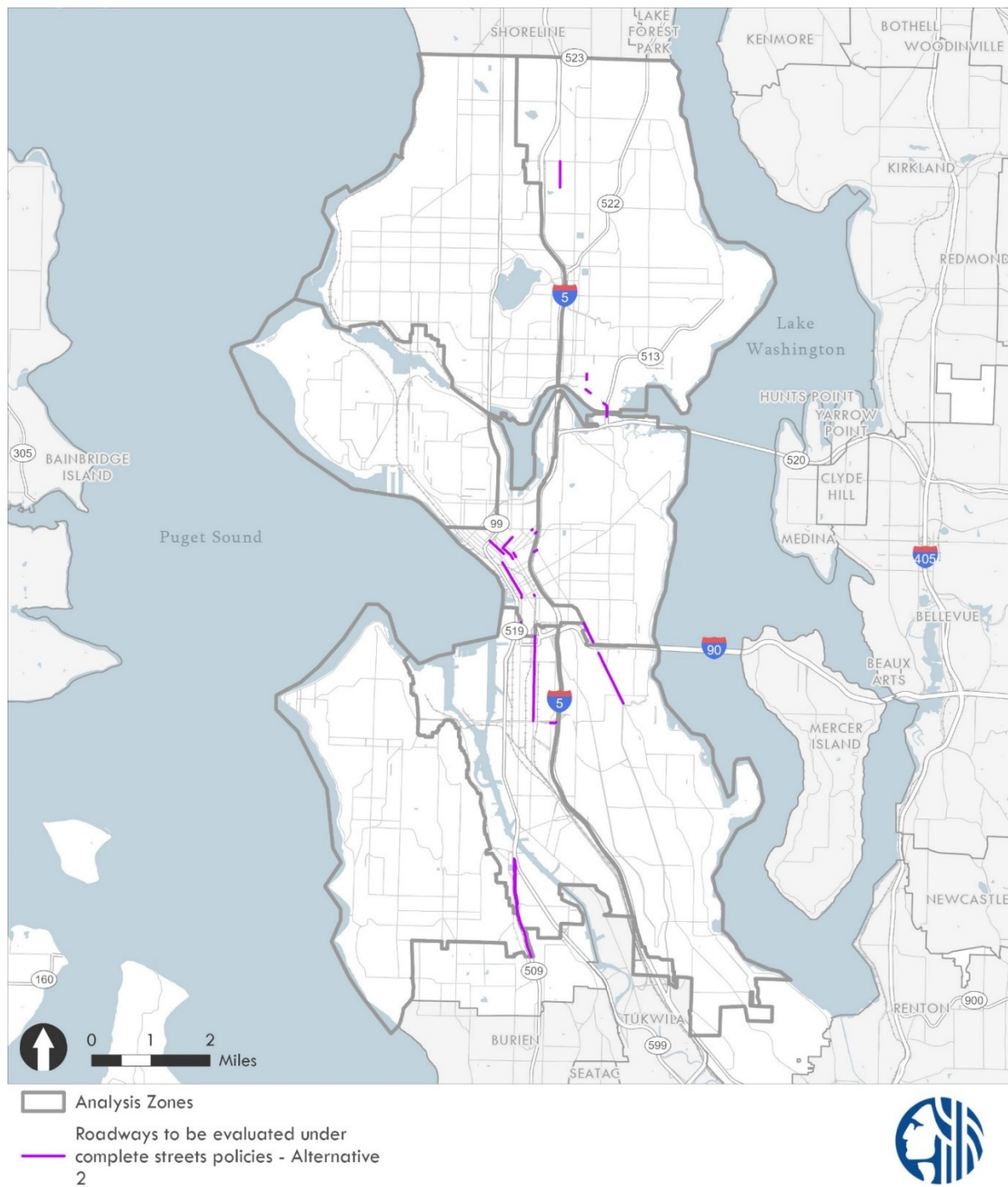
Analysis Zone	Extent of Transit Priority Lanes Subject to Complete Streets
NW Seattle (Area 1)	0 lane miles
NE Seattle (Area 2)	0.88 lane miles
Queen Anne/Magnolia (Area 3)	0 lane miles
Downtown/Lake Union (Area 4)	2.17 lane miles
Capitol Hill/Central District (Area 5)	0.55 lane miles
W Seattle (Area 6)	0.54 lane miles
Duwamish (Area 7)	5 lane miles
SE Seattle (Area 8)	1.27 lane miles
<b>Total</b>	<b>10.41 lane miles</b>

Source: Kimley-Horn, 2023

Citywide, there are a total of 10.4 lane miles on city roadways where transit lanes would be considered as part of Alternative 2, as shown in Exhibit 3-164. Streets that would potentially have reprioritization are concentrated in the Downtown/Lake Union, Duwamish, and SE Seattle subareas, with approximately half located in the Duwamish Subarea. Based on modeling for the Comprehensive Plan, some roadways have been identified as capacity constrained using the STP No Action Alternative and the Comprehensive Plan Land Use Scenario 5. See Exhibit 3-161 There may be additional roadways that are capacity constrained based on the STP Alternative 2 and 3 networks and the Comprehensive Plan Land Use Scenario 5. Reprioritization to align with Complete Streets under Alternative 2 is likely to increase mobility throughput of people and goods. No significant adverse impacts to mobility throughput for people and goods are anticipated. As required, the City would prepare additional analysis and consider public input before implementing specific transportation projects.



Exhibit 3-164. Corridors Evaluated for Transit Priority Lanes in Alternative 2



Source: Kimley-Horn, 2023

### Subarea Impacts

Analysis on the subareas can be found in [Appendix D](#).

## Impacts of Alternative 3: Rapid Progress

Alternative 3: Rapid Progress includes the most investment in pedestrian, bike, transit, freight and PSPS improvements across the City of Seattle. This alternative would implement 848 additional miles of sidewalks and 385 miles of corridors with bike facilities compared with Alternative 1 and the most extensive bicycle and pedestrian improvements on any alternatives. Alternative 3 also includes the greatest investment in transit connections and would include 123 additional miles of improved transit corridors and a total of 106 community & mobility hubs.

### Citywide Impacts

Analysis of citywide and subarea jobs and housing units for STP Alternative 3 are based on the 2024 Comprehensive Plan update Alternative 5: Combined. Existing jobs and housing units citywide and per subarea were determined using 2020 ACS 5-Year estimates. Access to different pedestrian, bicycle and transit infrastructure is defined by proximity, with future jobs and population estimated within 300 feet of sidewalks, within ¼ mile of bike corridors and within ¼ mile of transit corridors or ½ mile of light rail stations and community & mobility hubs. The number of jobs with access to the pedestrian bike and transit network in Alternative 3 is shown in Exhibit 3-165 below.

**Exhibit 3-165. Future Jobs and Housing Units with Access to the Pedestrian Bike and Transit Networks in Alternative 3 - Citywide**

	Existing Housing Units	Existing Jobs	Housing Unit Growth 2024-2044	Job Growth 2024-2044
<b>Pedestrian Network</b> (Within 300-feet of sidewalks)	338,620 housing units	590,931 jobs	114,229 housing units	147,391 jobs
<b>Bicycle Network</b> (Within ¼ mile of bicycle facilities)	347,961 housing units	613,542 jobs	118,138 housing units	156,008 jobs
<b>Transit Network</b> (Within ¼ mile of improved transit corridors or within a ½ mile of light rail stations and community & mobility hubs)	302,384 housing units	590,710 jobs	106,688 housing units	146,092 jobs
<b>Citywide</b>	391,394 housing units	720,173 jobs	120,000 housing units	158,000 jobs

Source: Kimley-Horn, 2023

Note: Existing jobs and housing unit numbers are based on 2020 ACS 5-Year Estimates. 2024-2044 growth estimates for jobs and housing are based on the City of Seattle comprehensive plan.

According to 2020 Census estimates, areas within 300 feet of sidewalks and pathways in Alternative 3 include 590,931 existing jobs and 338,620 existing housing units, 18,573 more jobs and 20,478 more housing units than Alternative 1, and 17,639 more jobs and 16,940 more housing units than Alternative 2. In Alternative 3, the areas within 300 feet of sidewalks are expected to see growth of 147,391 jobs and 114,229 housing units between 2024 and 2044, 5,109 more jobs and 40,075 more housing units than Alternative 1, and 3,586 more jobs and 3,296 more housing units than Alternative 2. Citywide, 5% of estimated growth in housing units and 7% of job growth would not have easy access to pedestrian facilities in STP Alternative 3. Potential limitations in the pedestrian network's ability to connect new growth in Alternative 3 is not anticipated to have the potential for significant adverse impact and is comparable to other alternatives.

The number of housing units and jobs with access to bike facilities differs between STP alternatives, with a total of 613,524 existing jobs and 348,961 existing housing units within ¼ mile of bicycle facilities in Alternative 3, 73,005 more jobs and 88,150 more housing units than Alternative 1, and 41,513 more jobs and 69,633 more housing units than Alternative 2. Areas within ¼ mile of bicycle infrastructure are expected to see growth of 156,008 jobs and 118,138 housing units between 2024 and 2044. This amounts to 15,594 more jobs and 49,441 more housing units than Alternative 1, and 15,594 more jobs and 15,898 more housing units than Alternative 3 over that same period. Citywide, 2% of estimated growth in housing units and 1% of job growth would not have easy access to bicycle facilities in STP Alternative 3. No potential for significant adverse impacts is anticipated for access to housing units or jobs. Alternative 3 has the least potential for significant adverse impact compared to STP Alternatives 1 and 2.

The number of future and existing housing units and jobs with access to transit corridors in each alternative were also estimated using Census data and projected growth in the comprehensive plan alternatives. In Alternative 3 there are an estimated 590,710 existing jobs and 302,384 existing housing units within ¼ mile of improved transit corridors or within a ½ mile of light rail stations and community & mobility hubs, 156,288 more jobs and 111,749 more housing units than Alternative 1, and 58,532 more jobs and 68,400 more housing units than Alternative 3. In Alternative 3, areas within ¼ mile of improved transit corridors or within a ½ mile of light rail stations and community & mobility hubs are expected to see growth of 146,092 jobs and 106,688 housing units in by 2044, 20,488 more jobs and 48,077 more housing units than Alternative 1, and 12,509 more jobs and 19,301 more housing units than Alternative 2. Citywide, 11% of estimated growth in housing units and 8% of job growth would not have easy access to transit facilities in STP Alternative 3. No potential for significant adverse impacts is anticipated.

Roadways where reprioritization of modes would inform how space is allocated in the public right-of-way are anticipated to be in Alternatives 2 and 3. New investments in dedicated transit or freight and bus (FAB) lanes are likely to require the most space in the right-of-way, and therefore priority transit streets include the most lane miles where reprioritization for multimodal improvements are anticipated to be needed. Locations of reprioritization areas are expected to be on priority transit streets with four or more lanes for two-way streets or three or more lanes for one-way streets. See Exhibit 3-166.

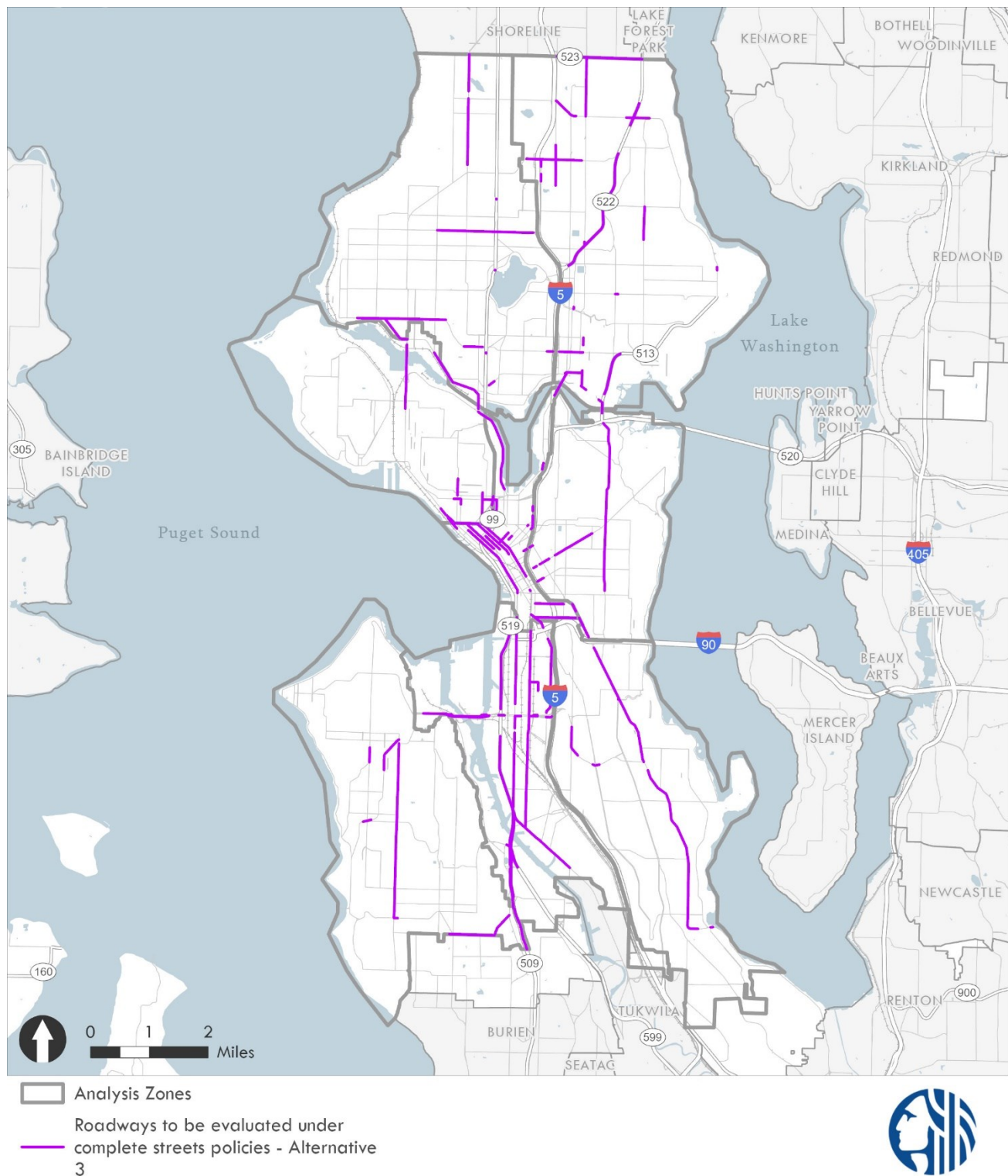
**Exhibit 3-166. Corridors Evaluated for Transit and/or Freight Priority in Alternative 3**

Analysis Zone	General Purpose Lane Miles Removed
NW Seattle (Area 1)	6.9
NE Seattle (Area 2)	9.9
Queen Anne/Magnolia (Area 3)	5.8
Downtown/Lake Union (Area 4)	9.3
Capitol Hill/Central District (Area 5)	4.6
W Seattle (Area 6)	5.9
Duwamish (Area 7)	22.2
SE Seattle (Area 8)	6.2
<b>Total</b>	<b>70.8</b>

Source: Kimley-Horn, 2023

Citywide and shown in Exhibit 3-167, there are a total of 65.4 lane miles on city roadways where transit or freight and bus (FAB) lanes would be considered as part of Alternative 3. Streets that may have reprioritization to align with Complete Streets in this alternative are concentrated in the Duwamish, Downtown/Lake Union and NE Seattle subareas. Streets with potential for reprioritization include Rainier Ave S, 4th Ave S, 1st Ave S, 35th Ave SW, East Marginal Way S, Lake City Way NE, Greenwood Ave N, 15th Ave NE, NW Market St, Westlake Ave N, SR 509. Based on modeling for the Comprehensive Plan, some roadways have been identified as capacity constrained using the STP No Action Alternative and the Comprehensive Plan Land Use Scenario 5. See Exhibit 3-161 There may be additional roadways that are capacity constrained based on the STP Alternative 2 and 3 networks and the Comprehensive Plan Land Use Scenario 5. Reprioritization to align with Complete Streets under Alternative 3 is likely to increase mobility throughput for people and goods. No significant adverse impacts are anticipated. As required, the City would prepare additional analysis and consider public input before implementing specific transportation projects.

Exhibit 3-167. Corridors Evaluated for Transit and/or Freight Priority in Alternative 3



Map Date: August 2023

Source: Kimley-Horn, 2023



### Subarea Impacts

Analysis on the subareas can be found in [Appendix D](#).

## 3.6.3 Summary of Impacts

Exhibit 3-168 represents a summary of the impact thresholds for three alternatives: Alternative 1: No Action, Alternative 2: Moderate Pace, and Alternative 3: Rapid Progress. Each alternative is evaluated based on the following criteria: policy consistency, the number of people walking or biking in locations with network gaps, VMT per capita, future job or housing growth more than 300 feet from the future sidewalk network, future job or housing growth more than a quarter-mile of the future bicycle network, future job or housing growth more than a half-mile of community & mobility hubs and light rail stations or within a quarter-mile of improved transit lanes and RapidRide lines and the extent of mobility priority for transit and freight.

Alternative 1 has the potential to result in significant adverse impacts with respect to future job or housing growth and its connections to the sidewalk, bicycle, and transit network. These impacts are primarily due to the lower level of sidewalk, bicycle, and transit network investments compared to Alternatives 2 and 3.

No other potential significant adverse impacts are identified for any of the alternatives. As required, the City would prepare additional analysis and consider public input before implementing specific transportation projects.

**Exhibit 3-168. Summary of Land Use Impacts by Transportation Alternative**

Impact Threshold	Alternative 1	Alternative 2	Alternative 3
POLICY CONSISTENCY	▲	▲	▲
JOBS/HOUSING ACCESS TO SIDEWALK NETWORK	▼	▲	▲
JOBS/HOUSING ACCESS TO BICYCLE NETWORK	▼	▲	▲
JOBS/HOUSING ACCESS TO TRANSIT	▼	▲	▲
EXTENT OF MOBILITY PRIORITY	▲	▲	▲

Notes: Impacts are considered either: No potential for significant adverse impacts (▲), Potential for significant adverse impact (▼).

## 3.6.4 Mitigation Measures

Potential for significant adverse impacts identified for Alternative 1 could be mitigated through adoption of one of the action alternatives, or through amendment of Alternative 1 to ensure that transportation improvements more adequately provide access to existing and future jobs and housing.

Additional mitigation measures include the following.

### **Transportation Systems Management and Operations (TSMO)**

Transportation systems management and operations (TSMO) maximizes efficiency of the existing multimodal transportation system by implementing low-cost, near-term improvements to improve overall system performance.

Seattle already utilizes some TSMO strategies to reduce traffic congestion and improve vehicle flow, including providing drivers with updated travel information and managing the flow of traffic through intersections. SDOT has an ongoing effort to improve the operations of traffic signals, including some corridors with adaptive signal control, which coordinates signal timing changes in response to real-time traffic volume data in order to reduce traffic congestion and improve vehicular flow. Additionally, Seattle's Transit Master Plan, Freight Master Plan, and Seattle Industrial Areas Freight Access Project identify speed and reliability improvements, such as transit and/or freight lanes that could improve mobility for those modes. Expanding existing programs or implementing new TSMO strategies, in coordination with regional partners, could help mitigate impacts to by increasing efficiency of the existing system.

Potential strategies that Seattle might consider include:

- Intelligent transportation systems (ITS) applications such as dynamic message signs to alert travelers to incidents and provide travel information about route choices.
- Transit signal priority (TSP) to facilitate transit movements at intersections, reducing travel times for transit vehicles.
- Freight operations management to prioritize freight movements at specific locations and times.
- Reallocating travel lanes to serve specific uses such as transit and/or freight.
- Signal timing to improve vehicular flow along corridors.
- Wayfinding to improve route decisions and reduce illegal movements.
- Geometric improvements at intersections to facilitate key bus or truck turning movements.
- Improvements to pedestrian facilities such as crosswalk designs for increased safety, curb bulb-outs to reduce the distance to cross a street, curb ramps for accessibility, and signal timing improvements that increase pedestrian visibility at intersections.

### **Transportation Demand Management (TDM)**

Transportation demand management (TDM) strategies can help reduce congestion and travel time impacts by reducing demand for automobile travel and supporting travel by other modes. Seattle currently promotes a variety of TDM strategies to encourage travel by carpooling, vanpooling, transit, walking, and biking, as well as reducing trips by teleworking. These include the Commute Trip Reduction (CTR) Program, Transportation Management Programs (TMPs), and the Commuter Benefits Ordinance.

Additional new or expanded TDM measures could include:

- Expand subsidized transit pass programs.
- Expand trip reduction programs to include new participants such as smaller businesses, residents, or community members.
- Improve bicycle and pedestrian facilities, including last-mile connections and end of trip facilities such as bicycle parking.
- Expand bike share/scooter share programs.

TDM program expansion, combined with other complementary strategies included in this section could help increase non-SOV mode share and reduce impacts related to reprioritization.

### **Pedestrian & Bicycle System Improvements**

Improvements to the pedestrian and bicycle network can help provide last-mile connections and active transportation options that could increase the share of people walking and biking and mitigate impacts related to reprioritization. A well-documented connection exists between improved, safer bicycle and pedestrian accessibility and reduced demand for vehicle travel (CAPCOA 2010).

### **Incorporated Plan Features**

The key policies of the Seattle Transportation Plan even with limited improvements to the future transportation system are aimed at improving multimodal access throughout the city, creating a safer environment for all road users and making traffic and transit operations more efficient. The goals and policies of the Plan and potential implementation of those policies through improvements to the pedestrian, bicycle and transit networks are more likely to result in reduced demand for vehicle travel, with the most VMT reductions features in Alternative 3, more in Alternative 2, and the fewest in Alternative 1.

### **Other Potential Mitigation Measures**

Proven strategies to decrease vehicle travel demand apart from improvements to the bicycle, pedestrian and transit network include travel demand management and parking management strategies. Examples include constraining or managing the City's parking supply together with established Commute Trip Reduction (CTR) and Transportation Management Programs (TMPs). Continued management of paid on-street parking spaces through SDOT's Performance Based Parking Program, with a goal of one to two available spaces per block, can help manage parking supply and pricing appropriately to reduce demand for vehicle travel and parking. Higher parking costs and constrained parking supply are both associated with reduced vehicle trips and VMT (Carlson & Howard, 2010). Seattle currently has reduced parking requirements for new development near frequent transit. Improvements to the transit network as part of Alternative 2 and Alternative 3 including speed and reliability improvements and improved lanes paired with higher service frequencies are likely to expand these frequent transit service areas. Reduced parking requirements for new development in more areas of Seattle is likely to reduce work-based commute trips and home-based trips which are more sensitive to parking cost and supply.

The City of Seattle could also consider management strategies at a neighborhood or district scale, including management of the city's existing Restricted Parking Zone (RPZ) program. RPZ permits make it easier for local residents to park on public streets for an annual fee, while restricting short-term parking for visitors. Currently, the city does not limit the number of RPZ permits issued within each zone based on supply, only limiting the number of permits issued to a single address. The City could manage long-term parking and permit pricing in the existing RPZs to meet the goals of the Seattle's Performance Based Pricing Program.

### 3.6.5 Significant Unavoidable Adverse Impacts

Alternative 1 has the potential to result in significant adverse impacts with respect to future job or housing growth and its connections to the sidewalk, bicycle, and transit network. These impacts are primarily due to the lower level of sidewalk, bicycle, and transit network investments compared to Alternatives 2 and 3. Potential for significant adverse impacts identified for Alternative 1 could be mitigated through adoption of one of the action alternatives, or through amendment of Alternative 1 to ensure that transportation improvements more adequately provide access to existing and future jobs and housing.

No other potential significant adverse impacts are identified for any of the alternatives.

## Section 3.7

# Utilities: Electrical Power





This section documents the affected environment, impacts, and mitigation measures, and significant unavoidable adverse impacts to public utilities in the study area. The utility discussed in this section is the electrical system.

Impacts of the alternatives on utilities are considered significant if they:

- Are inconsistent with utility system planned growth and capital plans.
- Have the potential to require major new projects or initiatives for energy system upgrades to accommodate redevelopment.

### 3.7.1 Affected Environment

This section describes the current regulations, service provider in the study area, and current plans and studies relevant to the transportation network and its effect on electrical demand.

#### Current Regulations

##### House Bill 1512, Electrification of Transportation

House Bill (HB) 1512 was a part of a package of bills, including the 2019 Washington State Clean Energy Transformation Act (SB 5116), focused on reduction of greenhouse gas emissions. HB 1512 authorizes electric utilities to adopt transportation electrification plans and provide incentive plans for transportation electrification.

##### Senate Bill 5116, Washington State Clean Energy Transformation Act (CETA)

CETA requires Washington utilities to fully transition to power resources that do not emit greenhouse gases by 2045. SLC met the requirements of CETA before its passage.

##### Electrical Safety Standards Regulations

The 2020 National Electric Code (NEC) is a model code produced by the National Fire Protection Association (NFPA) that is adoptable by states and municipalities, either in whole or as amended, for the purpose of providing uniform electrical standards across jurisdictions. The NEC provides requirements for safe installation of electrical infrastructure in residential, commercial, and industrial structures. This code is directly applicable to the implementation of electrification infrastructure. The State of Washington adopted the 2020 NEC in November 2020 (WAC 296-46B, Electrical Safety Standards, Administration, and Installation).

In addition to the NEC, the State also adopted the 2018 International Energy Conservation Code (IECC), (RCW 19.27A,020). The IECC is a model code that sets minimum energy efficiency standards structures. This code has been adopted by the State Building Code Council (see Chapter 51-11C and 51-11R WAC).

The City of Seattle adopted the 2020 NEC as part of the 2020 Seattle Electrical Code and the International Energy Conservation Code as part of the Seattle Energy Code. This code generally states that the State of Washington energy code shall be designed to construct increasingly energy efficient homes and buildings

that help achieve the broader goal of building zero fossil-fuel greenhouse gas emission homes and buildings by the year 2031, and to require new buildings to meet a certain level of energy efficiency.

## Service Providers

Seattle City Light (SCL or City Light), is a non-profit, publicly owned utility that manages generation of electric power, power transmission, and electrical power supply to over 460,000 residential and business customers in the city of Seattle (study area) and some portions of King County north and south of the Seattle city limits. SCL owns seven hydroelectric facilities in Washington and delivers electricity through a network of approximately 2,330 miles of distribution circuit lines and 16 major substations (Seattle City Light, 2023b).

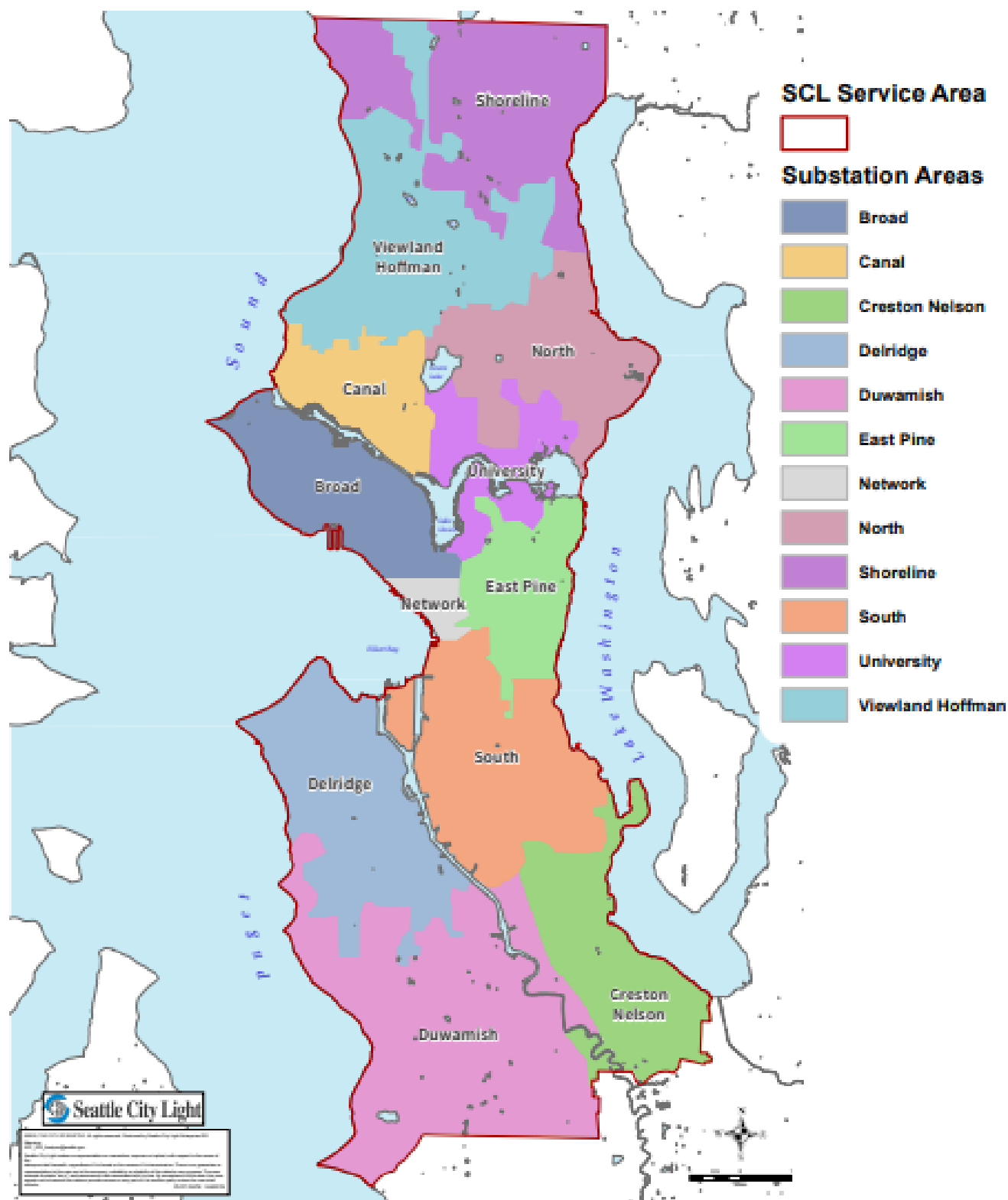
Approximately 90 percent of SCL's power supply is generated by hydroelectric dams, with the remaining power coming from a variety of sources. More than half of the hydroelectric power supplied originates from SCL owned hydroelectric facilities. The remaining hydroelectrical power supplied by SCL is purchased from the Bonneville Power Administration (BPA) (Seattle City Light, 2022). Seattle City Light has been carbon-neutral since 2005 and continues to invest in new technologies and approaches to energy conservation, energy storage, and other opportunities to meet our customers' energy needs. Furthermore, it is expected that City Light will meet or exceed the deadlines established by the Washington Clean Energy Transformation Act (CETA) that require utilities to serve customers with energy from 100% renewable and/or non-emitting resources by 2045 and to be greenhouse gas neutral by 2030.

Exhibit 3-169 depicts the 12 substation areas within which power is distributed throughout the city of Seattle. Electricity is carried to the city from the power source via high-voltage 115- and 230-kilovolt transmission lines. Transformers in the 12 substations "step down" the voltage before transferring it to overhead and/or underground neighborhood distribution lines. Transformers on the neighborhood distribution lines further step down the voltage before transmission to customer homes and businesses.

SCL is engaged in the process of electrification, moving beyond just supplying power to homes and businesses to powering other sectors traditionally dependent on fossil fuels, such as transportation and building heating and cooling.

The following sections describe some of the efforts employed by SCL in pursuit of transportation electrification.

Exhibit 3-169. Power Infrastructure in City of Seattle



Source: SCL, 2021.

## Seattle City Light Electrification Assessment (2022)

The increasing popularity of electrical vehicles and the development of technologies such as more efficient cold climate heat pumps, is leading to wide scale electrification. To better understand the energy needed for electrification, in 2021, SCL worked with the Electric Power Research Institute (EPRI) to conduct an Electrification Assessment. The Electrification Assessment evaluated how electrification would affect consumption of electricity (load) over time and how to best meet the demand using SCL's grid and other resources. To conduct the Electrification Assessment, EPRI worked with SCL as well as other City of Seattle departments to define different electrification scenarios. The three electrification scenarios evaluated included Scenario 1: Moderate Market Advancement, a scenario that forecasted that growth in adoption of electric transportation would continue at established rates and building and industrial electrification would be driven by customer choice and relative economics; Scenario 2: Rapid Market Advancement, a scenario that forecasted a more aggressive growth rate consistent with several City of Seattle goals and policies (e.g., Climate Action Plan, Drive Clean Seattle, and Seattle's Clean Transportation Electrification Blueprint); and Scenario 3, Full Adoption of Electrification Technologies, a scenario based on the City of Seattle's Green New Deal, which envisions full electrification by 2030.

The study determined that the Moderate Market Advancement scenario (Scenario1), would see consumption increase from 9.15 Terawatt-hour (TWh) in 2020 to 13.16 TWh in 2042. The Rapid Market Advancement scenario (Scenario 2) would see a significant increase in energy consumption, from 9.15 TWh in 2020 to 16.25 TWh in 2042. Finally, the Full Adoption of Electric Technologies scenario (Scenario 3), would see an increase in energy consumption from 9.15 TWh in 2020 to 19.74 TWh in 2042. To understand the impacts of these scenarios to the distribution system, a grid capacity analysis was conducted. The purpose of the grid capacity analysis was to determine how much unused capacity would be free to meet increased power needs resulting from electrification. The results indicated that Scenario 3 would lead to exceedances of capacity during certain periods of the year and technologies that help manage load would be required. The grid capacity analysis also looked at the capacity for each feeder and substation and in general determined that the feeders have a significant level of capacity available for additional electrical load.

The Electrification Assessment provides analysis that will help City Light better understand the energy needed for the electrification of buildings, transportation, and commercial and industrial applications within City Light's service territory. It also provides insight into the available capacity on our existing distribution grid.

The results have been used to inform City Light's other planning and forecasting efforts, such as the Integrated Resource Plan and the load forecast. The assessment will also be used to inform our strategic objectives and policy and program decisions as City Light considers how it can best facilitate equitable electrification.

While this study is extensive, it does not account for all aspects that influence City Light's future. Specifically, this first phase of the Electrification Assessment does not address potential for energy savings through conservation or demand response. City Light is building on this effort in future phases to look into some of these additional questions.

## 2022 Integrated Resource Plan

SCL worked with other City of Seattle Departments to develop the 2022 Integrated Resource Plan (2022 IRP) as a long-term strategy to meet customer energy needs over the next two decades. The 2022 IRP forecasts energy and capacity needs, determines SCL's capabilities, evaluates potential future energy resource portfolios, and provides a recommended portfolio that will help meet electricity demands over the next 20 years, including demand from transportation and building electrification.

The 2022 IRP evaluated three scenarios: a baseline scenario, a scenario that accounts for the impacts of climate change, and a rapid electrification scenario based on the Rapid Market Electrification scenario from the EPRI Electrification Assessment. The baseline scenario forecasts load growth of approximately 0.5 percent per year for the next 10 years. The rapid electrification scenario forecasted a load increase of 32 percent compared to the baseline scenario. Based on these scenarios, the 2022 IRP identified SCL's resource needs through the 20-year planning horizon (2041). Twenty different portfolios featuring potential additional energy resources were initially developed. These portfolios were further reduced to seven portfolios that were evaluated using various metrics accounting for factors such as cost, impacts of climate change, and range of customer options. The top-performing portfolio would add 175 solar resources, 275 wind resources, 116 Energy Efficiency conservation measures, 52 Customer Solar programs, 78 Summer Demand response programs, and 122 Winter Demand response programs. The 2022 IRP also outlines the need to pursue acquisition of additional resources such as local commercial or community solar projects, which reach peak production during the summer months, and offshore wind resources and wind resources in Montana (after 2030), which reach peak production in the winter months. The diversity of resources included in the top-performing portfolio would help SCL keep pace with climate change and the demands of electrification.

## Transportation Electrification Strategic Investment Plan (2020)

In 2020, SCL released a Transportation Electrification Strategic Investment Plan (TESIP). The TESIP was prepared subsequent to the 2019 passage of House Bill 1512 (Concerning Transportation Electrification), which enabled electrical utilities to incorporate transportation electrification into utility modernization. The TESIP relies on technical analyses completed in a 2016 Transportation Electrification Benefit Analysis (Benefit Analysis) that recommended investment in charging infrastructure, developing new rates and improved customer service for the transportation market, and preparation for heavy duty electrification. The Benefit Analysis identified that while electrification would include system costs due to increased transportation electrification, these were outweighed by the economic benefits. In 2019, SCL produced a Transportation Electrification Strategy Report that built upon the Benefit Analysis by identifying where SCL should play a key role in enabling adoption of electric vehicles (EVs) across multiple sectors and engage in planning to accommodate increased demand for electricity. The TESIP identifies SCL's investment priorities in support of electrification. These priorities include:

- extensive public outreach and awareness, including to environmental justice communities;
- electrification of public transit, including buses, ferries, and rail;
- electrification of commercial, government, and non-profit vehicle fleets;
- expansion of at-home and near-home EV charging facilities;
- providing lower costs for charging to high-mileage vehicle drivers;



- accelerating adoption of electric transportation adoption in environmental justice communities;
- expanding public fast charging; and expanding workplace charging. (Seattle, 2020).

The TESIP also describes the partnerships SCL is engaging in with other agencies to further the electrification process, the pilot programs being undertaken, as well as the next steps in the electrification process. The TESIP also commits SCL to preparing a Master Infrastructure Plan and grid Modernization Plan.

## **Grid Modernization**

City Light's electric infrastructure is being pushed to do more than ever. City Light is upgrading and modernizing its grid to support growing electricity use and make its services more resilient, reliable, and affordable. City Light's Grid Modernization Plan and Roadmap was published in 2021 and outlines the improvements being made with more than 15 specific projects now being implemented. City Light prioritizes grid modernization work in environmental justice communities to combat the disproportionate environmental, health, and economic harms these communities experience from fossil fuel use and the resulting climate change and pollution.

### **3.7.2 Impacts**

#### **Impacts Common to All Alternatives**

Due to future growth and development, demand for electrical power is expected to increase into the future. Accordingly, Alternative 1: No Action and the Action Alternatives would all see increased demands on the City's electrical infrastructure. However, as discussed in Affected Environment, SCL has already undertaken planning efforts to accommodate a greater increase in electrification of the City's transportation and building sectors. The 2022 IRP, TESIP, and City Light's Grid Modernization Plan identify needed resources to accommodate increased electrification by identifying resources for acquisition and addition to SCL's energy portfolio, as well as identifying the necessary infrastructure to accommodate levels of electrification beyond what would be required under Alternative 1: No Action and the Action Alternatives. Furthermore, SCL continues to improve its infrastructure through ongoing capital improvement projects. For example, the Denny Substation project completed in 2018 responded to the increase in load caused by rapid redevelopment in the South Lake Union area over the past 15 years. In addition to serving the current and future needs of the South Lake Union area, the project freed up capacity at the Broad Street Substation, providing more system flexibility to accommodate current and future growth in the Ballard/Interbay Northend Manufacturing Industrial Center (BINMIC). These types of ongoing improvements improve system reliability and reduce any potential for impacts associated with ongoing electrification, including the electrification components of the alternatives evaluated.

#### **Impacts of Alternative 1: No Action**

Under Alternative 1, the City's focus would be on optimizing already existing conditions, and there would be no further implementation of transportation improvements beyond what is already funded. This includes additional infrastructure for EVs. Alternative 1 assumes that by 2044, 12 percent of the overall fleet would be electric or plug-in hybrid with the development of no additional EV infrastructure. Alternative 1 is consistent

with SCL's planned growth and capital plans in so much as it would not exceed what has already been planned for nor would it require major new projects or initiatives requiring energy system upgrades to accommodate either new development or redevelopment. No adverse impacts to the electrical system would be anticipated.

### **Impacts of Alternative 2: Moderate Pace**

Under Alternative 2, moderate growth in funding and development for new multimodal infrastructure in Seattle is anticipated. Similar to Alternative 1, Alternative 2 assumes that by 2044, 12 percent of the overall fleet would be electric or plug-in hybrid with the development of no additional EV infrastructure. Alternative 2 is consistent with SCL's planned growth and capital plans in so much as it would not exceed what has already been planned for nor would it require major new projects or initiatives requiring energy system upgrades to accommodate either new development or redevelopment. No adverse impacts to the electrical system would be anticipated.

### **Impacts of Alternative 3: Rapid Progress**

Under Alternative 3: Rapid Progress, Seattle Transportation Plan policies would be fully implemented, including increased electrification infrastructure. This alternative anticipates that 14% of the overall fleet, including freight, is electric or plug in hybrid, 15% higher than 2021 EMFAC fleet mix results in model year 2044 for the state of California. This Alternative anticipates the addition of EV charging infrastructure as part of new development and EV infrastructure would be added at 105 community & mobility hubs. Because of the assumed increase in electric or plug in hybrid vehicles and associated electrical infrastructure, it can be assumed that demand on the electrical system would be greater under Alternative 3, than under Alternatives 1 or 2. However, the level of electrification fits within what is already planned for SCL's infrastructure and is unlikely to require system upgrades to accommodate either new development or redevelopment. No adverse impacts to the electrical system would be anticipated.

## **3.7.3 Mitigation Measures**

Implementation of the Seattle Transportation Plan would not require mitigation measures for Utilities.

## **3.7.4 Significant Unavoidable Adverse Impacts**

No significant unavoidable adverse impacts on the electrical system are anticipated. Recent SCL investments in the power system are anticipated to meet growth needs under all studied alternatives and development proposals that require specific improvements to the system would be addressed at a planning level through regular capital planning cycles as well as on a project-by-project basis.



## Chapter 4

# Acronyms & References

## 4.1 Acronyms

ADA	Americans with Disabilities Act
ALS	Advance Life Support
ARAR	Applicable or Relevant and Appropriate Requirements
ARPA	Archaeological Resources Protection Act
BINMIC	Ballard Interbay Northend MIC
BIRT	Ballard-Interbay Regional Transportation
BLS	Basic Life Support
BMP	Bicycle Master Plan
BMPs	Best Management Practices
BNSF	Burlington Northern Santa Fe
BPSA	Bicycle and Pedestrian Safety Analysis
BSOs	Buildings, Structures, or Objects
CAPCOA	California Air Pollution Control Officers Association
CARA	Critical Aquifer Recharge Area
CIP	Capital Improvement Program
CIP	Capital Improvement Program
CPPs	King Countywide Planning Policies
CPSC	Community Partners Steering Committee
CRPP	Cultural Resource Protection Plan
CSO	Combined Sewer Overflow
CTR	Commute Trip Reduction
CWA	Clean Water Act
DAHP	Washington State Department of Archaeology and Historic Preservation
dB	Decibel
dBA	A-weighted Sound Level
DNRP	Department of Natural Resources and Parks
DSL	Digital Subscriber Line
EA	Environmental Assessment
EEI	Equity and Environment Initiative
EHD	Environmental Health Disparities
EIS	Environmental Impact Statement
EMS	Emergency Medical Services
EPA	U.S. Environmental Protection Agency
FHWA	Federal Highway Administration
FMP	Freight Master Plan
FTA	Federal Transit Administration
GHG	Greenhouse Gas
GMA	Growth Management Act
GMPC	King County Growth Management Planning Council
HBMS	Hazardous Building Material Survey
HBMS	Hazardous Building Material Surveys

HCM	Highway Capacity Manual
HPI	Historic Property Inventory
HPP	King County Historic Preservation Program
HUD	U.S. Department of Housing and Urban Development
IDDE	Illicit discharge detection and elimination
II	Industry and Innovation
ITS	Intelligent Transportation Systems
KCSWDM	King County Surface Water Design Manual
Ldn	Day-Night Average Sound Level
LEED	Leadership in Energy and Environmental Design
Leq	Equivalent Noise Level
Lmax	Maximum Noise Level
LOS	Level of Service
LTCP	Long-term Control Plan
MCPP	Micro-Community Policing Plans
mgd	Million Gallons per Day
MIC	Manufacturing/Industrial Center
MMDF	Maximum Month Design Flow
MML	Maritime, Manufacturing, and Logistics
MPD	Multiple Property Documentation
MPH	Miles per Hour
MSATs	Mobile Source Air Toxics
MTCA	Model Toxics Control Act
MW NHA	Maritime Washington National Heritage Area
NAAQS	National Ambient Air Quality Standards
NDS	Natural Drainage Systems
NEC	National Electric Code
NEPA	National Environmental Protection Act
NHL	National Historic Landmarks
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NTHP	National Trust for Historic Preservation
NWI	National Wetlands Inventory
OPCD	Seattle Office of Planning and Community Development
OSE	Seattle Office of Sustainability and Environment
PMP	Pedestrian Master Plan
POSPD	Port of Seattle Police Department
PSCAA	Puget Sound Clean Air Agency
PSRC	Puget Sound Regional Council
RCO	Recreation Conservation Office
RCW	Revised Code of Washington
RGC	Regional Growth Center



RMP	Risk Management Plan
RPZ	Residential Parking Zone
SCL	Seattle City Light
SCWQP	Ship Canal Water Quality Project
SDOT	Seattle Department of Transportation
SFD	Seattle Fire Department
SLS	Seattle Library System
SMC	Seattle Municipal Code
SMP	Shoreline Master Program
SOV	Single Occupancy Vehicle
SPD	Seattle Police Department
SPR	Seattle Parks and Recreation
SPS	Seattle Public Schools
SPU	Seattle Public Utilities
SR	State Route
SWMP	Stormwater Management Program
TDM	Travel Demand Management
TMA	Transportation Management Association
TMDL	Total Maximum Daily Load
TMP	Transit Master Plan
TMP	Transportation Management Program
TSA	Transportation Security Administration
TSMO	Transportation Systems Management and Operations
UI	Urban Industrial
USGS	U.S. Geological Survey
USSG	U.S. Surveyor General
V/C	Volume to Capacity
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds
WAC	Washington Administrative Code
WHBR	Washington Heritage Barn Register
WISAARD	Washington Information System for Architectural and Archaeological Records Data
WOTUS	Waters of the United States
WQ	Water Quality
WRIA	Water Resource Inventory Area
WSBLE	West Seattle and Ballard Link Extension
WSDOT	Washington State Department of Transportation
WTD	Wastewater Treatment Division
WTHP	Washington Trust for Historic Preservation
WWTP	Wastewater Treatment Plant

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Photos sourced from the City of Seattle and BERK.

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