SR 167 Master Plan
Planning and Environmental Linkages Study

Attachment B. Existing and Future Baseline Conditions Report

Final Study

JUNE 2023




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Washington State Department of Transportation

WSDOT

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Acronyms and Abbreviations

Acronym/ Abbreviation	Definition
ACS	American Community Survey
APE	Area of Potential Effects
AST	above ground storage tank
BEIST	Bridge Engineering Information System
BIPOC	Black, Indigenous, and people of color
BMP	best management practice
BNSF	Burlington Northern Santa Fe
BRT	Bus Rapid Transit
CDC	Centers for Disease Control
CFR	Code of Federal Regulations
CED	chronic environmental deficiency
CEQ	Council on Environmental Quality
CSZ	Cascadia Subduction Zone
DAHP	Washington Department of Archaeology and Historic Preservation
dBA	A-weighted decibel
DOH	Washington State Department of Health
EA	environmental assessment
Ecology	Washington State Department of Ecology
EDNA	Environmental Designations for Noise Abatement
EIS	environmental impact statement
EJTF	Environmental Justice Task Force
EO	Executive Order
ESA	Endangered Species Act of 1973
FAF	Freight Analysis Framework
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FGTS	Freight and Goods Transportation System

Acronym/ Abbreviation	Definition
GED	General Educational Development Test
GIS	geographic information systems
GP	general purpose
HEAL	Healthy Environment for All
HHS	Department of Health and Human Services
HRM	Highway Runoff Manual
HOT	high-occupancy toll
I-	Interstate
Injunction	United States et al. vs. Washington et al. No. C70-9213 Subproceeding No. 01-1, dated March 29, 2013
ITS	Intelligent Transportation Systems
KCM	King County Metro
LUST	leaking underground storage tank
LWCF	Land and Water Conservation Fund
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MAP	Maintenance Accountability Process
MIC	Manufacturing and Industrial Centers
MP	Milepost
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act of 1966
NHTS	National Household Travel Survey
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priority List
NRHP	National Register of Historic Places
NW	northwest

Acronym/ Abbreviation	Definition
OSPI	Washington Office of Superintendent of Public Instruction
PEL	Planning and Environmental Linkages
PGIS	pollutant generating impervious surfaces
PHS	Priority Habitat and Species
PM	particulate matter
ppm	parts per million
PSRC	Puget Sound Regional Council
PT	Pierce Transit
PTR	Permanent Traffic Recorder
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
RGC	Regional Growth Center
RTP	Regional Transportation Plan
SAO	Sensitive Areas Ordinance
SE	southeast
Section 106	Section 106 of the NHPA
Section 4(f)	Section 4(f) of the USDOT Act
Section 6(f)	Section 6(f) of the LWCF Act of 1965
SEPA	State Environmental Policy Act
SIP	State Implementation Plan
SOV	Single Occupancy Vehicle
SR	State Route
ST	Sound Transit
SW	southwest
Title VI	Title VI of the Civil Rights Act of 1964 (EO 12898)
TSMO	Transportation System Management and Operations
U.S.	United States
U.S.C.	United States Code
USDOT	United States Department of Transportation
US EPA	United States Environmental Protection Agency
USFWS	United States Department of the Interior, Fish and Wildlife Service
USGS	United States Geological Survey
UST	underground storage tank
TCP/Ls	Traditional Cultural Properties/Landscapes
TIP	Transportation Improvement Program
VIA	visual impact assessment
VMS	Variable Message Signs
VMT	Vehicle Miles Traveled
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington State Department of Natural Resources
WRIA	Water Resource Inventory Area
WSDOT	Washington State Department of Transportation

Executive Summary

The Washington State Department of Transportation (WSDOT) is developing a Master Plan Planning and Environmental Linkages (PEL) Study for the State Route (SR) 167 corridor to address existing issues. Figure ES-1 illustrates the corridor and study area.

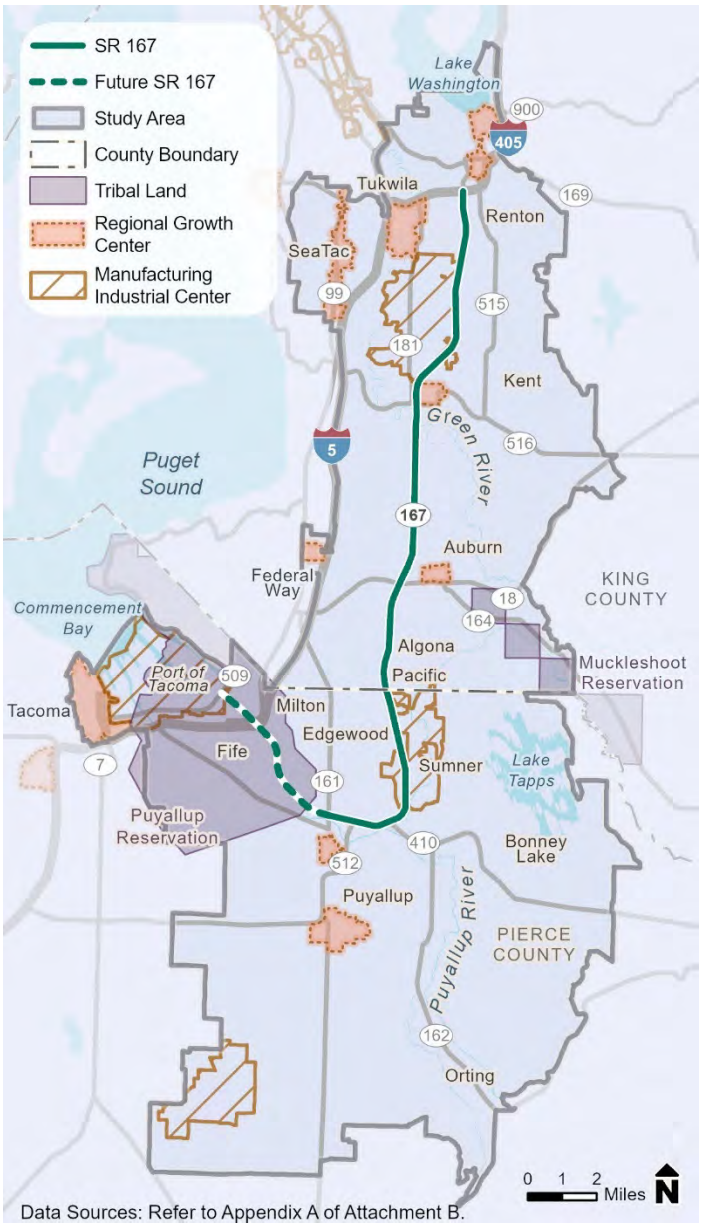


Figure ES-1. SR 167 Study Area Map

SR 167 runs through one of the fastest growing areas in the Puget Sound Region and includes a diverse set of neighborhoods with varying social and economic backgrounds and a mix of businesses and employment opportunities. The facility serves as a freeway extension of Interstate 405 (I-405) south of the Tukwila/Renton area and a critical alternative to Interstate 5 (I-5) for moving both people and goods, connecting numerous communities in the Green River and Puyallup River valleys.

Over the next 30 years, this study's horizon period, the SR 167 corridor will continue to attract new residents and businesses. Freight will continue to increase with a growth in trade and urban and suburban deliveries. Like the rest of the region, it is expected the population will grow older and more diverse. Meeting the changing mobility needs of this larger, more diverse population base, while taking advantage of the array of new transportation technologies being developed is key to a successful Master Plan PEL Study.

This report details the existing and future conditions of the SR 167 corridor. This information, alongside agency partner and community feedback gathered throughout all stages of the study, will be used by the SR 167 Master Plan PEL Study team to develop and evaluate scenarios (combinations of projects and strategies) intended to test a range of multimodal mobility investment options for SR 167 and help WSDOT narrow to a final set of recommended projects and strategies.

The vision for SR 167 is to identify near-, medium-, and long-term solutions intended to facilitate the movement of both people that travel on and across SR 167 for work, school, other essential and non-essential trips, and goods that support economic vitality. Travel along and across the SR 167 corridor will be safe, connected, resilient, and reliable. The SR 167 Master Plan will strive for practical solutions to (a) prioritize the needs of vulnerable populations and overburdened communities, (b) reduce physical

Study Goals

Equity: Provide a range of transportation options that address the needs of vulnerable populations and overburdened communities.

Safety: Improve existing and future safety conditions.

Environment: Provide improvements that reduce greenhouse gas emissions and limit environmental impacts.

Multimodal: Transform how people and goods travel in support of the Regional Growth Strategy, focusing on Regional Growth Centers, Manufacturing and Industrial Centers and Countywide Centers through multimodal and multiagency investments, while reducing single occupancy vehicle demand and removing barriers for all modes that limit local connectivity across the corridor.

Mobility and Economic Vitality: Manage mobility for local, regional, state, and inter-state trips leveraging technology advancements, supporting economic vitality, and considering the unique needs of all travelers and modes, including freight/goods movement, active transportation, and transit.

Practical Solutions and State of Good Repair: Identify strategies that are practical, implementable, and fundable in a realistic timeline.

barriers of the current system, (c) support the Puget Sound Regional Council (PSRC) Regional Growth Strategy, (d) facilitate transit and active transportation, (e) support projected growth and land-use changes, (f) accommodate freight movement, and (g) reduce greenhouse gas emissions.

Key Findings by Chapter

Chapter 1 provides an overview of why WSDOT is preparing a Master Plan PEL Study for SR 167, a description of the goals for the Master Plan PEL Study, and an overview of the entire process.

Early community and partner listening sessions provided preliminary insights summarized in *Chapter 2*. Equity priorities include the need for transit routes and frequency throughout the corridor (particularly east/west), “final miles” solutions to reach jobs at Manufacturing and Industrial Centers, considering language and cultural barriers, and lack of internet access. Other partner priorities include considering the impacts of traffic congestion on freight access and reliability, local arterial congestion related to SR 167, and limited active transportation infrastructure (sidewalks, bike lanes, or trails) along the corridor.

The Community Profile in *Chapter 3* documents that vulnerable populations and overburdened communities are more prevalent within the study area than across the four-county PSRC geography (Snohomish, Kitsap, King, and Pierce Counties). Within the study area, vulnerable populations and overburdened communities are most concentrated north of SR 18. According to the literature, most vulnerable populations are likely to have safety concerns, technology barriers, and cost and time constraints. They are also less likely to own a vehicle.

The Facility Summary in *Chapter 4* finds SR 167 has adequate right-of-way for capacity expansion, unlike many highways in the region. And although infrastructure is in relatively good state of repair, over the next 30 years many of the infrastructure and systems will need upgrading or replacement.

Chapter 5 details land use, housing, and employment patterns for both current and future conditions. Although the study area predominantly consists of suburban, single-family land uses, it also includes the largest manufacturing and warehousing/distribution cluster in the Pacific Northwest. Over a third of the current employment within the study area is related to manufacturing and concentrated in manufacturing centers. About 236,000 housing units and 401,500 jobs are found in the study area today. By 2050,

forecasts predict an estimated 433,000 housing units (an 84% increase) and 645,300 jobs (a 61% increase).

Chapter 6 summarizes how critical freight movement on SR 167 is for the economic vitality of the region and state. SR 167 is the second busiest freight corridor in the state, carrying approximately 10,000 trucks daily. This flow of trucks represents between 10% and 20% of all vehicles on the freeway, a substantially higher share than many other Puget Sound Region freeways. Only 9% of freight trips along the corridor pass through, meaning most freight trips begin or end within the study area, most likely at a port facility or manufacturing center. Freight volumes are estimated to grow by at least 50% by 2050.

The active transportation (pedestrian and bicycle) network described in *Chapter 7* is relatively spotty and disconnected due to the predominant suburban development pattern. Only about half of principal and minor arterials have sidewalks on both sides of the street and more than half completely lack bicycle facilities. Several regional trails in the study area provide a strong connection between homes and businesses, particularly for bicyclists. Local agency plans provide evidence that continued investment in the regional trail network, connections to regional trails, and additional expansion of sidewalks and bike facilities are of interest.

Chapter 8 describes how transit ridership and services are concentrated north of SR 18. Transit coverage is sparse in unincorporated Pierce County. In 2019 (reflecting pre-pandemic transit ridership patterns), the highest ridership routes were oriented north/south and include the Sounder S Line, and King County Metro Route 150, Route 180, and Route 169. North/south routes offer 15-minute headways for most of the day, but east/west routes are lacking.

By 2050, substantial transit investments planned by transit agencies serving the study area will result in improved service and increased ridership. Notably, King County Metro plans to increase the level of east/west service with three new frequent routes that connect through major transit hubs in the study area.

Chapter 9 summarizes historic safety data; 24 fatalities and 120 serious injuries occurred within 1 mile of SR 167 in a five-year span. Fatalities were evenly distributed between pedestrian or bicycle related vs. vehicle related, but more serious injuries occurred for pedestrians and bicyclists. Given that there are far more vehicle trips compared to active mode trips within the study area, these data suggest that the fatality and serious injury rates for active modes are much higher than for vehicle passengers. Vehicle crash density is highest near I-405 in the northbound direction and near the southern end in the southbound direction. Bicycle and pedestrian crashes occur mostly in the downtown areas of cities along arterials and major collector roadways where active mode destinations are often located.

The system performance detailed in *Chapter 10* reveals the SR 167 facility is characterized by frequent recurring congestion at peak hours, (northbound in the AM peak and southbound in the afternoon) mostly caused by high demand. Spillover congestion from I-405 affects the northbound direction and geometric bottlenecks like the High Occupancy Toll (HOT) lane termination at Stewart Road and the weaving area between SR 410 and SR 512 also affect southbound congestion. Arterial congestion is an issue, more so in the PM peak, particularly in the southern part of the corridor.

Regional Growth Centers (RGCs) and the downtown areas of the cities along the corridor were found to generate substantially lower Vehicle Miles Traveled (VMT) per household. By 2050, traffic congestion is expected to increase for both the SR 167 facility and arterials in the study area, but overall VMT per household is expected to decrease as the area densifies and additional transit service is added to the network.

Chapter 11 describes the travel patterns on SR 167, using a relatively new data source, StreetLight Data. Most trips on SR 167 begin or end south of SR 18,

which is in contrast with the fact that more people live north of SR 18. While most truck trips have an origin or destination within the study area, a major pattern for long-distance truck trips is between Eastern Washington and the Port of Tacoma and other locations further south along I-5 via SR 167.

Considering environmental risks when developing and evaluating scenarios is critical to the Master Plan PEL Study process. *Chapter 12* includes a desktop GIS-based analysis of environmental conditions that are typically considered during the environmental protection review process. Notably, flooding and stormwater quality is and will continue to be a challenge in this low-lying corridor with many wetlands. Twenty known fish passage injunction barriers were identified. Most soils have moderate to high susceptibility to liquefaction. These and other considerations will be factored in to identify potential impacts, increased costs, and potential mitigating strategies of each scenario.

Chapter 1. Introduction

Chapter Overview

This chapter provides an overview of why the Washington State Department of Transportation (WSDOT) is preparing a Master Plan Planning and Environmental Linkages Study for State Route 167 (SR 167), a description of the goals for this study, and an overview of the entire process.

Although separate, this Master Plan PEL Study takes into consideration the findings in the "SR 167 Corridor Plan Final Report" completed by WSDOT in December 2008, which documents two phases of planning efforts and a recommended set of capacity improvement projects on the SR 167 facility.

What is the SR 167 Master Plan?

WSDOT has developed Master Plans for other highways in the past, but there is no standard definition for a Master Plan as they evolve over time and build on the lessons learned from earlier plans.

The SR 167 Master Plan PEL Study is therefore defined by the following characteristics:

- **Centered on Equity.** The SR 167 corridor is in one of the most diverse areas of the state with many vulnerable populations and overburdened communities. Focusing mobility investments on projects that address issues for vulnerable populations and overburdened communities and equity priority areas is a key outcome.
- **Transparent.** The planning process is open and transparent to partners and the community. The process includes thoughtful and proactive outreach and engagement at all stages of development. Consistent with the equity focus of this plan, outreach focuses on listening and working with vulnerable populations and overburdened communities.
- **Data Driven – Partner Refined.** The planning process is rooted in data analysis and data driven evaluation methods. It also considers partner input that helps understand the full context of the transportation network and needs.
- **Considers the Full Transportation System.** This plan focuses on improving mobility along and across SR 167 by looking holistically at the entire transportation system, including the travel patterns that influence conditions on SR 167 and the adjacent city and county systems.
- **Multiagency.** No single agency or organization can effectively address the myriad of transportation needs along this 28-mile corridor; therefore, this plan highlights critical transportation investments that improve mobility on SR 167 and support the regional growth strategy. In partnership with WSDOT, local jurisdictions, tribes, and transit agencies along the corridor will have the responsibility of leading and advancing some of the transportation solutions identified in this plan.
- **Multimodal.** This study considers all modes when addressing SR 167 corridor travel needs. Multimodal improvements reduce traffic demand on the SR 167 freeway by making transit, bicycling, and walking more viable and attractive.
- **Focus on Freight.** The SR 167 corridor features the largest warehousing and distribution cluster in the Pacific Northwest. These land uses not only provide thousands of jobs, but they also are the nexus of the regional supply chain.

By incorporating environmental and community values, a **PEL approach can provide the following elements and benefits** (FHWA 2021).

1. Supporting project delivery by allowing flexibility for agencies to agree to a project Purpose and Need, preliminary range of alternatives and eliminating unreasonable alternatives.
2. Reducing duplication of efforts in planning and environmental phases by information sharing and therefore reducing delays in implementation and costs.
3. Assisting the environmental process by promoting environmental stewardship with cost-effective transportation solutions, providing early identification of potential impacts and ability to engage the public in potential concerns.
4. Documenting analysis, data, and models to inform NEPA review, and help in interpreting and visualizing large datasets.
5. Providing flexibility in the authorities for implementing PEL, and consistency in project decision-making by using planning products to inform environmental review.
6. Offering transparency with the public and agencies through early and continuous coordination to identify transportation solutions and potential impacts and benefits.

- **Sustainable.** This plan is sustainable from an environmental and fiscal perspective. By leveraging Transportation System Management and Operations (TSMO) including technology and travel demand management solutions, the plan seeks more efficiency from existing infrastructure, which minimizes environmental harm. Doing more with less also reduces the ongoing costs to operate and maintain the system, which is a key objective of WSDOT.
- **Practical.** By fully implementing WSDOT's Practical Solutions performance-based framework (which prioritizes quickly solving issues with data driven and performance-based solutions), this plan results in a set of projects and strategies that clearly advance the plan's goals and can be implemented with existing and planned resources.

Also, an integral part of this Master Plan is the Planning and Environmental Linkages (PEL) approach to ensure relevant environmental considerations are addressed early.

What is a PEL Study?

Introduction

Planning and Environmental Linkages (PEL) is helpful in early planning studies that will eventually require a major environmental review. The PEL brings together what traditionally are separate transportation planning and environmental analysis/documentation studies.

Having a disjointed process can create higher costs, project delays, and potential duplication of efforts. Using a PEL approach, WSDOT can consider environmental, community and economic goals early in the planning process, in advance of National Environmental Policy Act (NEPA) review processes.

PEL Approach

A PEL is a collaborative approach to transportation decision-making. It is flexible and supports efficient project delivery. This PEL study will evaluate a broad range of projects and strategies and ultimately identify the Master Plan's recommended solution that can be carried forward in the design and environmental review process with the support of the completed PEL Questionnaire.

The PEL approach involves the following:

- Early and ongoing involvement of resource agencies including the Federal Highway Administration (FHWA), Washington State

Department of Ecology, Washington Department of Health, U.S. Fish and Wildlife Service, Washington Department of Archaeology and Historic Preservation, U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, National Oceanic and Atmospheric Administration (NOAA) Fisheries, Puyallup Tribe of Indians and Muckleshoot Indian Tribe, Puget Sound Regional Council (PSRC), and transit agencies, as well as county, city, and local agencies.
- Agency partner and public engagement
- Documentation of data and analyses
- Concurrence from the lead federal agency (e.g., FHWA) to confirm that the requirements are met
- Completion of the FHWA PEL Questionnaire

Decision-Making

A PEL approach supports program-level and project-level decisions. Potential products that can come from a PEL study include defining a purpose and need, identifying partners and environmental concerns, refining, and prioritizing a range of transportation scenarios or solutions, identifying future analyses, and identifying potential impacts and mitigation.

Results of the PEL study and the process used to achieve the results, such as the public outreach efforts, a defined project Purpose and Need, or eliminated alternatives may be approved by FHWA to fulfill some NEPA requirements. The adoption and use of a PEL study in the NEPA process should happen within five years and is subject to a determination by FHWA. If NEPA begins more than five years after FHWA's approval of this PEL study, then WSDOT must verify that this information is still valid and appropriate for use in the NEPA process.

Documentation

Documentation is essential for carrying forward information from a PEL to NEPA. During a PEL study, documentation should (a) explain the thought process behind conclusions and decisions, (b) describe the information and data used including how current the information is and what will need updating over time, and (c) document public engagement and agency involvement.

Early and ongoing community engagement and agency involvement are essential throughout key steps in the PEL process. All engagement should be documented so that it can be carried forward into future NEPA processes. Documentation may include copies of handouts, photos of displays, exhibits and visuals, summaries of purposes for activities, contact lists, summary of public meetings including locations, dates, times, and attendees.

During a PEL study process, there are **four key coordination points with the lead agency** (FHWA or FTA). (CDOT 2016)

1. Determining the reason for the PEL Study
2. Presenting the project Purpose and Need
3. Alternatives to be evaluated during the PEL Study
4. PEL document (Draft and Final)

Coordination with FHWA will support timely reviews, obtain early agreement on which steps FHWA will be involved in, and clarify relationships with other federal projects in the vicinity.

Evaluation criteria based on the project Purpose and Need should be developed for screening alternatives or scenarios. Alternatives or scenario screening may involve multiple levels of analysis and will require partner and community engagement and agency involvement before eliminating scenarios from further analysis. The evaluation will be documented within the PEL final report or associated technical reports.

This report provides a description of existing environmental conditions, which is used in evaluating potential environmental consequences and minimizing potential impacts. Environmental analysis also supports early identification of key resources

that may require lengthier or more complex environmental clearances. Documentation may include datasets, maps, or other visualizations.

The FHWA PEL Questionnaire is required to provide documentation of the study and is included in the final PEL report. The questionnaire should be referenced throughout the PEL process and used as a guidance document. For references and relevant sources on the PEL refer to *Appendix A, Sources and Additional Resources.*

Relationship of the Master Plan PEL Study

Many of the PEL requirements (early and ongoing engagement with partner agencies, community/public engagement, and a robust analytical framework) are also integral to the Master Planning process envisioned for the SR 167 corridor. Utilizing the PEL framework during the Master Plan development ensures the process takes into consideration crucial environmental information and feedback from resource agencies. Also, the PEL can expedite the environmental review and implementation of future transportation projects that are identified through the SR 167 Master Plan process to accelerate implementation. Therefore, this study is a combined Master Plan PEL Study.

Study Area

The SR 167 study area was developed though a data-driven and partner-refined process to capture the entire "area of influence" of the SR 167 facility. This involved several steps:

Step 1 – Traveler information from a data vendor, StreetLight Data (refer to *Chapter 11, Travel Patterns*), was used to determine where the majority of trips along SR 167 either start or end. This formed a "travelshed" around the SR 167 facility. Some major outlying destinations such as downtown Seattle and Bellevue were excluded from this travelshed because they are well-off the corridor, however the influence of these major employment areas is considered throughout the Master Plan.

Step 2 – The travelshed was expanded slightly and refined based on equity analysis and demographics data research (refer to *Chapter 3, Community Profile*). Specifically, the team reviewed demographic and equity data to ensure that concentrations of vulnerable populations and overburdened communities were not excluded if they were just outside the travelshed. Examples of the study area expansion included areas of the Muckleshoot Indian Reservation and portions of SeaTac.

Step 3 – Once the initial data-driven study area was developed, the project team solicited input from stakeholders, including the Technical Advisory Committee, the Policy Advisory Committee, and Community Based Organizations. The major additions to the study area after stakeholder input were to extend the study area to the Tacoma Tideflats along the future SR 167 extension and to Seattle-Tacoma International Airport area along I-405 and SR 518.

Step 4 – Lastly, the area within 1 mile on either side of the SR 167 corridor between I-405 in Renton and SR 509 in Fife was identified as the focus area for the more detailed environmental, safety, active mode, and system performance evaluations. This one-mile focus area allows the project team to concentrate the analysis of the more fine-grained transportation data in the area that has the most influence on SR 167 travel.

Figure 1-1 illustrates the final study area.

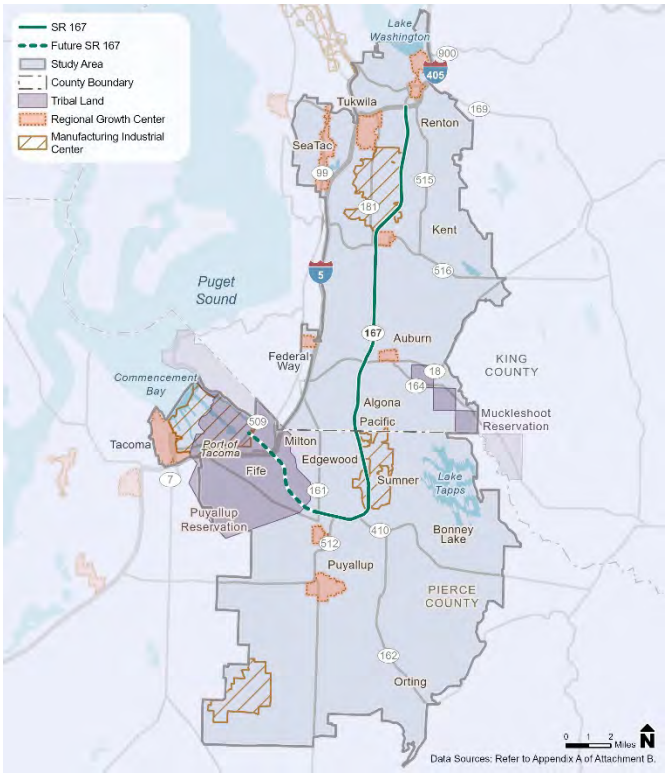


Figure 1-1. SR 167 Study Area Map

SR 167 Master Plan PEL Study Vision, Purpose (Goals) and Need

WSDOT staff along with partner agencies and community-based organizations collaboratively developed this vision and the project Purpose and Need. The specific needs are based on the analysis and findings obtained from the existing conditions analysis documented in subsequent chapters of this report, as well as data and community input from previous studies.

The SR 167 Master Plan PEL Study vision and preliminary project Purpose and Need is a guiding framework for the development of high-level multimodal transportation solutions. This project Purpose and Need will support the screening and evaluation of multimodal corridor level scenarios. During future environmental review processes of individual projects, more specific purpose and need statements might be required.

Vision

The SR 167 Master Plan identifies transportation solutions intended to facilitate the movement of both people that travel on and across SR 167 for work, school, other essential and non-essential trips, and goods that support economic vitality. Travel along and across the SR 167 corridor will be safe, connected, resilient, and reliable. The SR 167 Master Plan will strive for practical solutions to (a) prioritize the needs of vulnerable populations and overburdened communities, (b) reduce physical barriers of the current system, (c) support the PSRC Regional Growth Strategy, (d) facilitate transit and active transportation, (e) support projected growth and land-use changes, (f) accommodate freight movement, and (g) reduce greenhouse gas emissions.

Preliminary Project Purpose and Need

Multimodal transportation investments along the SR 167 corridor are crucial to manage mobility within the physical and environmental constraints of the area. Travel on SR 167 can be transformed by exploring new ways to manage and reduce single-occupancy vehicle (SOV) demand, accommodating the movement of goods and services serving major industries and businesses located along the corridor, prioritizing the mobility needs of vulnerable populations and overburdened communities, and embracing new transportation technologies. It will take the combined efforts of WSDOT and all the partner agencies and jurisdictions along the corridor to make this transformation a reality.

The purpose (i.e., goals) of this Master Plan PEL Study is to develop transportation solutions that promote the following items:

- **Equity:** Provide a range of transportation options that addresses the needs of vulnerable and overburdened communities.
- **Safety:** Improve existing and future safety conditions.
- **Environment:** Provide improvements that reduce greenhouse gas emissions and limit environmental impacts.

- **Multimodal:** Transform how people and goods travel in support of the Regional Growth Strategy, focusing on Regional Growth Centers (RGCs), Manufacturing and Industrial Centers (MICs), and Countywide Centers through multimodal and multiagency investments, while reducing single occupancy vehicle (SOV) demand and removing barriers for all modes that limit local connectivity across the corridor.
- **Mobility and Economic Vitality:** Manage mobility for local, regional, state, and inter-state trips leveraging technology advancements, supporting economic vitality, and considering the unique needs of all travelers and modes, including freight/goods movement, active transportation, and transit.
- **Practical Solutions and State of Good Repair:** Identify strategies that are practical, implementable, and fundable in a realistic timeline considering the importance of maintaining a State of Good Repair throughout the facility's lifecycle.

The goals in the previous bullet points were developed through an understanding of the existing and future conditions documented in this report. Following is a summary of the specific need and relevant data that supports each goal:

The corridor runs through areas with diverse populations. Vulnerable populations and overburdened communities need transportation solutions that reduce environmental risk and serve their transportation needs. (Equity Goal)
About 30% of households in the study area have an income under $50K while 25% of the households have a household income of over $125K. People of color represent over 40% of the study area population and about 25% of the population is considered low-income for the Puget Sound region (people who are at or below 200% of the federal poverty guidelines). About 6% of the study area households do not own a vehicle. The Washington Health Disparities Map (developed by the Washington Department of Health) identifies many communities along SR 167 as having high vulnerability and risk of cumulative health impacts from multiple environmental hazards. Refer to *Chapter 3, Community Profile*.

Fatal and severe crashes have occurred on the SR 167 corridor. (Safety Goal)
From 2015 through 2019, there were 7 fatalities and 33 serious injury crashes recorded on the SR 167 mainline (all through lanes) and 5 fatalities and 22 serious injury crashes recorded on ramps, ramp terminals, and interchange cross streets. Refer to *Chapter 9, Safety Analysis*.

Vehicle emissions are the top source of greenhouse gas emissions in Washington State, and they negatively impact health outcomes. (Environmental Goal)
Vehicle emissions are highly correlated with vehicle miles traveled. According to the United States Environmental Protection Agency (EPA), the emissions for an average passenger vehicle is 4.6 metric tons of carbon dioxide per year, assuming the average fuel economy is 22.0 miles per gallon and average VMT is 11,500 miles per year (U.S. EPA, 2022a). Reducing single-occupancy vehicle demand helps reduce per capita vehicle miles traveled and emissions. Refer to *Chapter 11, Travel Patterns*.

The SR 167 corridor experiences high travel demand and congestion. (Mobility and Economic Vitality Goal)
The facility currently carries 100,000 to 135,000 vehicles on an average day, making it the fourth busiest freeway in the Puget Sound region. The low-density development along the corridor, limited availability of transit options, and patchy non-motorized network means that most trips are made by driving SOVs. SR 167 experiences substantial AM and PM peak period congestion, specifically, about 45% of the SR 167 southbound general purpose lanes experience stop-and-go traffic in the afternoon peak period. Major parallel arterials to SR 167 and some of the east-west arterials that have interchanges with the facility also experience high travel demand to arterial capacity (often called a volume-to-capacity

ratio, or v/c ratio). Refer to *Chapter 10, System Performance.*

The SR 167 corridor is one of the fastest growing areas in the state, and it is changing. (Multimodal Goal)
As identified in the PSRC, new travel patterns and needs are emerging from changing demographics and increased density as the communities along the corridor expand. The SR 167 study area is expected to grow by more than 550,000 new residents and 240,000 new jobs by 2050. The comparatively affordable properties of South King and North Pierce County will fuel continued growth and development for both housing and employment. This growth will include continued expansion of the manufacturing and warehouse facilities in the corridor and the suburban residential development pattern. However, a series of higher density/mixed-use areas is expected to develop along the corridor, creating new opportunities for walking, biking, and transit. Refer to *Attachment B, Chapter 4. Facility Summary*.

SR 167 can act as a barrier for local trips. (Multimodal Goal)
SR 167 runs through many cities, and it has limited east-west connectivity due to limited crossing opportunities at interchanges, overpasses, and underpasses within and between cities, increasing reliance on the automobile for east-west trips. Refer to *Chapter 7, Active Transportation Network.*

The SR 167 corridor has limited capacity to accommodate additional SOV travel demand. (Multimodal and Mobility and Economic Vitality Goals)
Over the past 20 years, traffic volumes on SR 167 have only grown about 3-5%, which is significantly less than the area's population and employment growth. Growth in traffic volumes, which is limited by vehicular capacity constraints on SR 167, has resulted in changes to travel behavior and mode choice. Urban areas as well as sensitive environmental areas such as wetlands and wildlife habitats increase the cost and complexity of physical capacity improvements, and it is not feasible to "build our way out of congestion" on the SR 167 corridor. Refer to *Chapter 10, System Performance* and *Chapter 12, Environmental Baseline.*

SR 167, a key alternate route to Interstate 5 (I-5), has moderate vulnerability to climate change and is subject to non-recurring congestion. (Mobility and Economic Vitality Goal) In concert with SR 410, SR 18, SR 512, and Interstate 405 (I-405), SR 167 provides a limited access state route alternative to the congested I-5 corridor and adds resilience to the state highway system in the event of a natural disaster, a serious crash on I-5, or climate driven disruptions. Refer to *Attachment B, Chapter 4. Facility Summary, and Chapter 12. Environmental Baseline.*

SR 167 is the second busiest freight corridor in the state, and it connects key freight hubs, including the Port of Tacoma. (Mobility and Economic Vitality Goal)
Freight makes up 10% to 20% of all traffic on the SR 167 facility; these trucks have more limited route options than other vehicles and trips. The corridor is home to many MICs, the Port of Tacoma, and other manufacturing and industrial areas outside of the MICs that are all of great importance to freight (91% of all truck trips on SR 167 begin or end within the study area). Freight depends on SR 167, particularly the south segments, to connect Eastern Washington via SR 18 with southern Washington and interstate destinations via I-5 (20-30% of all truck trips on SR 167 come from or are going to southern or eastern Washington, well beyond the study area boundary). Accommodating reliable movement of truck trips is critical for the economic health of the region and ports (on average, trucks that travel on SR 167 for part of their route travel a total distance of 40 to 70 miles per trip). Refer to *Chapter 6, Freight Network*, and *Chapter 11, Travel Patterns*.

Transit is critical to mobility in the corridor. (Mobility and Economic Vitality Goal)
Sound Transit's commuter rail, the S Line (formerly Sounder South line), which parallels the SR 167 corridor and connects downtown Seattle to Tacoma

and Lakewood, is the second busiest transit route in the region and had more than 16,000 average weekday boardings in 2019. However, the S line operates at limited times (peak am/pm weekdays only), with no alternative transit options to directly serve many of the transit stations (e.g., Kent to Sumner) along the corridor between service runs, during early morning and late evening hours, and on weekends. Rapid growth in transit ridership prior to the pandemic also resulted in crowding on Sounder and several bus routes with many of the corridor's park-and-ride lots full before 8 AM. The transit network to and from these stations is not sufficiently reliable and convenient; it does not connect to high-capacity transit and transit hubs which would provide a competitive alternative to driving that can help alleviate congestion pressures from passenger traffic. This can also reduce greenhouse emissions and other environmental impacts. Additionally, Amtrak Cascades operates within the study area, with intercity service from Vancouver, British Columbia to Eugene, Oregon. Amtrak Cascades has a corridor area stop in Tukwila. Refer to *Chapter 8, Transit Network* and *Chapter 11, Travel Patterns*.

Maintain and preserve the system. (Practical Solutions and State of Good Repair Goal)
The SR 167 facility from Renton to Puyallup was built in the 1970s. The facility has 64 bridges; 17 bridges are rated as Functionally Obsolete and 2 are Structurally Deficient. Much of the SR 167 facility pavement is in fair or good condition, although there are portions of the northbound lanes between Kent and Auburn and in Puyallup that are in poor condition. As the facility ages, the costs to maintain and preserve the system will increase, and these costs must be considered when adding new infrastructure that will increase the overall costs of the corridor over time. The need to maintain and preserve the existing system prior to expanding the system is in accordance with the transportation system policy preservation goal (RCW 47.04.280). Underfunding of maintenance and preservation puts the functions currently served by SR 167 at risk. WSDOT's current annual unfunded preservation and maintenance need (adjusted for inflation) is $9.1 billion over ten years (from WSDOT's 23-25 CIPP). Refer to *Attachment B, Chapter 4*.

Master Plan PEL Process

This Existing and Future Baseline Conditions Report is just a part of the overall Master Plan PEL Study process for SR 167. As illustrated in Figure 1-2, the data in this Existing and Future Baseline Conditions Report are integral in developing and screening strategies, developing and evaluating multimodal scenarios, and ultimately developing a Preferred Transportation Solution and Final Master Plan PEL Study for SR 167.

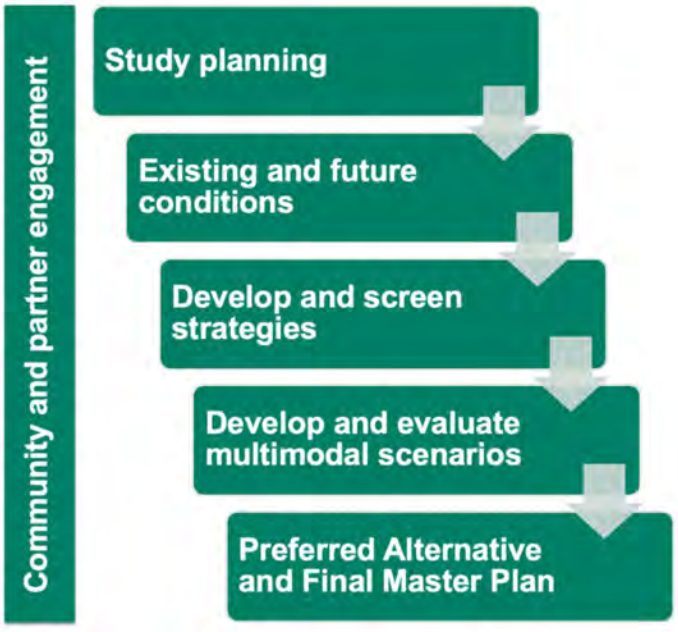


Figure 1-2. SR 167 Master Plan PEL Study Overall Process

Chapter 2. Community Outreach Summary

Chapter Overview

An extensive and inclusive community outreach process is a hallmark of the SR 167 Master Plan PEL Study. This chapter highlights the community and partner groups that the SR 167 team engaged with at listening sessions and a high-level overview of their key comments. This feedback is being considered throughout the Master Plan process, from shaping the goals, to evaluation metrics, to scenarios, and ultimately the preferred alternative.

Organizations and Government Agency Partners

Community Based Organizations (CBOs) and key study area partners involved to date:

- Asian Counseling and Referral Services
- Atlantic Street Center
- Center for Independence
- IDIC Filipino Senior and Family Services
- Forever Green Trails
- Futurewise
- Low Income Housing Institute
- Northwest Seaport Alliance
- Puyallup Tribe of Indians
- Renton Inclusion Task Force
- Sea Mar Community Health Centers
- Somali Community Services of Seattle
- Tilth Alliance
- Washington Trucking Associations
- Port of Seattle
- Port of Tacoma
- Chambers of Commerce
- Cities in study area (Algona, Auburn, Bonney Lake, Edgewood, Fife, Kent, Pacific, Puyallup, Renton, SeaTac, Sumner, Tukwila)
- Counties in study area (King County and Pierce County)
- Transit agencies in study area (King County Metro, Pierce Transit, and Sound Transit)

Summary of Feedback

WSDOT conducted early listening sessions with CBOs and study area partners to understand the issues and opportunities around mobility in the SR 167 corridor. These listening sessions focused on reaching consensus on the Vision, Purpose (Goals) and Need for the SR 167 Master Plan PEL Study, and then collected feedback on the mobility issues and opportunities within the study area. These listening sessions were held between October 2021 and February 2022. Some feedback centered on the outreach process, providing recommendations on how to better reach and support historically underserved communities through partnerships with CBOs and planning for accessible outreach strategies.

Key themes expressed by the CBOs and partner agencies relevant to current conditions are summarized below:

- Lack of public transit is an issue for historically underserved communities. There is a need for more bus routes and higher bus frequency throughout the study area. Mini shuttle vans/buses are valued as an alternative to traditional bus routes when there is limited regular bus access in an area.
- Bus stops and other transit facilities must be well designed to feel safe and inviting to riders, with seating and better lighting at and leading to them.
- Language and cultural barriers and lack of internet access make navigating public transit a challenge for historically underserved communities. The cost of public transit is also a barrier for some vulnerable populations and overburdened communities.

- Common destination points for vulnerable populations and overburdened communities include social service organizations, churches, community centers, food banks, and public libraries. Better transit access to these locations should be a priority.
- Many resources for vulnerable populations and underserved communities are in Seattle even though some community members have moved south within the SR 167 study area because housing is more affordable. Traveling to Seattle to reach vital community services can take 1 to 3 hours via transit depending on the location and time of day—far longer than driving a car (which is unaffordable, inaccessible, or inconvenient for some people).
- Carpooling is a common alternative to public transit for historically underserved communities.
- Connections to Sounder and other transit stations (first and last mile) are important to provide mobility options to people who can't park-and-ride or don't live or work close to the stations.
- The "final mile" is a challenge in manufacturing and industrial areas, including at designated MICs. Even when there is transit service to a station nearby, there are few or no connections between existing transit hubs and the "front doors" of businesses 1 to 3 miles away. Better public transit options are needed.
- East-west connectivity should be a higher priority; not just north-south transit service. The public transportation options that run east-west generally do not run as late into the day and are infrequent.
- It is important to account for the future of vehicles: electric buses, electric cars and charging stations; commercial autonomous vehicles. Who will have access to this technology, where will charging be available, where will communities lack access?
- It is important to make sure there is capacity for freight trucks. Freight movement is important to economic development and prosperity both internal to the study area and for the region as a whole. Truck parking needs to be considered.
- It is critical to work with regional and city partners to ensure that improvements on WSDOT facilities are coordinated with local efforts to improve mobility.
- There needs to be an emphasis on building trail connections across the corridor.
- Projects and solutions must consider the full slate of environmental impacts.
- The plan must include a multimodal project list.

Notable excerpts from listening sessions:

We have people who take the bus to the Somali Community Services of Seattle from Kent— it's a one-to-two-hour commute. It is really challenging to commute.
– Somali Community Services of Seattle

More and more of the population that we support are moving further south – the cities of Algona and Pacific are where they are identifying affordability.
– Asian Counseling and Referral Service

Local transit plans for King County Metro RapidRide routes are an issue. It concerns us that regular bus stops in-between RapidRide bus stops are not supported – they are still critical bus stops. The bus stops that the RapidRide routes do not serve are important to [Black, Indigenous, and people of color] BIPOC and low-income community members lacking transportation and they represent the groups that need public transit the most. While we recognize the concept of "how do we move the most people," we must identify how do we provide equity for the people without access to RapidRide bus stops. Serving the most people does not always mean serving the most vulnerable people. Serving more people is not the only important criteria in public transportation planning.
– Asian Counseling and Referral Service

Chapter 3. Community Profile

Chapter Overview

The Community Profile chapter summarizes the existing demographic, social, and economic characteristics of the study area that help identify vulnerable populations and overburdened communities in the study area and likely mobility barriers and needs. As highlighted in earlier chapters, this Master Plan PEL Study is centered on equity and has incorporated these data into the development of the study area, vision, goals, and preliminary project Purpose and Need.

The findings in this chapter describe that vulnerable populations and overburdened communities can be found across the study area in higher concentrations for most indicators than across the Puget Sound Regional Council (PSRC) geography (King, Pierce, Snohomish, and Kitsap counties). Within the study area, vulnerable populations, and overburdened communities, including environmental justice protected classes, are more concentrated north of SR 18.

According to the literature, most vulnerable populations are likely to have safety concerns, technology barriers, cost and time constraints and lack vehicle ownership. These barriers create

Introduction

This chapter summarizes more than 10 demographic indicators (summarized in Table 3-1 for the study area and the PSRC region, the comparison geography) and summarizes the potential mobility barriers and needs for populations within the study area, and is based on literature review as referenced in *Appendix A*.

While some groups of people may be more exposed to certain mobility barriers and may have greater needs for certain services than others, there is intersectionality between all vulnerable populations, and it is likely that every group discussed in this chapter experiences these mobility barriers and needs to some degree. Vulnerable populations do not exist independently of one another; therefore, an intersectional lens is necessary when discussing mobility barriers and needs.

Table 3-1. Study Area Demographics Summary

Demographic	Study Area	PSRC Area [a]
Total Population	660,400	4,137,205
Minority Population [b, c]	43%	34%
Low-Income Population [b, c, d]	25%	20%
In-Poverty Population	10%	9%
Youth Population (under 18) [c]	24%	22%
Senior Population (over 64) [c]	12%	13%
Foreign Born Population [c]	19%	17%
Limited English Proficiency Population [c]	11%	8%
Cost Burdened Households [c]	34%	32%
Population with a Disability [c]	11%	11%
Unemployed Population	5%	4%
Owner-Occupied Households	60%	61%
Renter-Occupied Households	40%	39%
Households without a Vehicle [c]	6%	7%
Single-Parent Families [c]	27%	22%

Source: U.S. Census Bureau 2019 5-year ACS data

Notes:

[a] The PSRC area represents the geography within King, Pierce, Kitsap, and Snohomish counties.

[b] Indicator used to identify environmental justice communities.

[c] Indicator used to identify equity priority areas for the SR 167 Master Plan PEL Study.

[d] Includes populations at or below 200 percent of the Federal Poverty Threshold.

For the purposes of the SR 167 Master Plan PEL Study, geographic areas with high concentrations of vulnerable populations and overburdened communities were identified as potential equity

focus areas to be used during scenario analysis and evaluation. The information and methodology in this chapter will be reviewed and refined with the Equity Advisory Committee and community.

Table 3-2. Potential Mobility Barriers and Needs

Potential Mobility Barriers	Potential Mobility Needs
• Lack of transportation options • Unreliable transit service • Uneven distribution of transportation services • Long commute times • Time constraints • High cost of travel	• Increased transportation services and reliability including transit, paratransit, medical shuttle/cabs, and bike lanes • Increase affordable transportation options, including active transportation • Reduced-fare programs
• Safety and security concerns • Physical limitations • Transportation facility design	• Safe and comfortable access to transportation facilities including transit stops • Transportation services including paratransit, medical shuttle/cabs • Sidewalks with even pavement, curb ramps and bike paths
• Technology and smartphones • Transportation information unavailability • Absence of translated materials including route schedules • Lack of bank account for payment • Lack of driver's license	• Technology adaption education and alternative ways to access real-time travel information • Technology adaption for declining vision, hearing, motor skills and cognitive function • Translation of materials like route information and way-finding signage into other languages

Source: Literature review by HNTB (Refer to *Appendix A* for references and *Appendix E* for mobility barrier definitions).

Note:

Research on potentially vulnerable populations includes but is not limited to low-income populations, minority populations, disabled populations, seniors and youth, and single parents.

Community Profile Analysis Area

The community profile area of demographics analysis closely aligns with the overall project study area and includes 384 census block groups in King and Pierce counties. As illustrated in Figure 3-1, the study area includes several cities and some areas within the Puyallup Tribe Reservation and Muckleshoot Tribe Reservations. It also includes several RGCs, MICs, and Candidate Countywide Centers.

Vulnerable Populations and Overburdened Communities

Chapter 70A.02 RCW, Environmental Justice (HEAL Act 2021) defines vulnerable populations as those at higher risk for poor health in response to environmental harms from adverse socioeconomic and sensitivity factors.

Vulnerable populations include, but are not limited to:

- Racial or ethnic minorities;
- Low-income populations;
- Populations disproportionately impacted by environmental harms; and
- Populations of workers experiencing environmental harms.

Overburdened communities are defined as the geographic areas where vulnerable populations face combined, multiple environmental harms and health impacts.

(Washington State Legislature 2021)

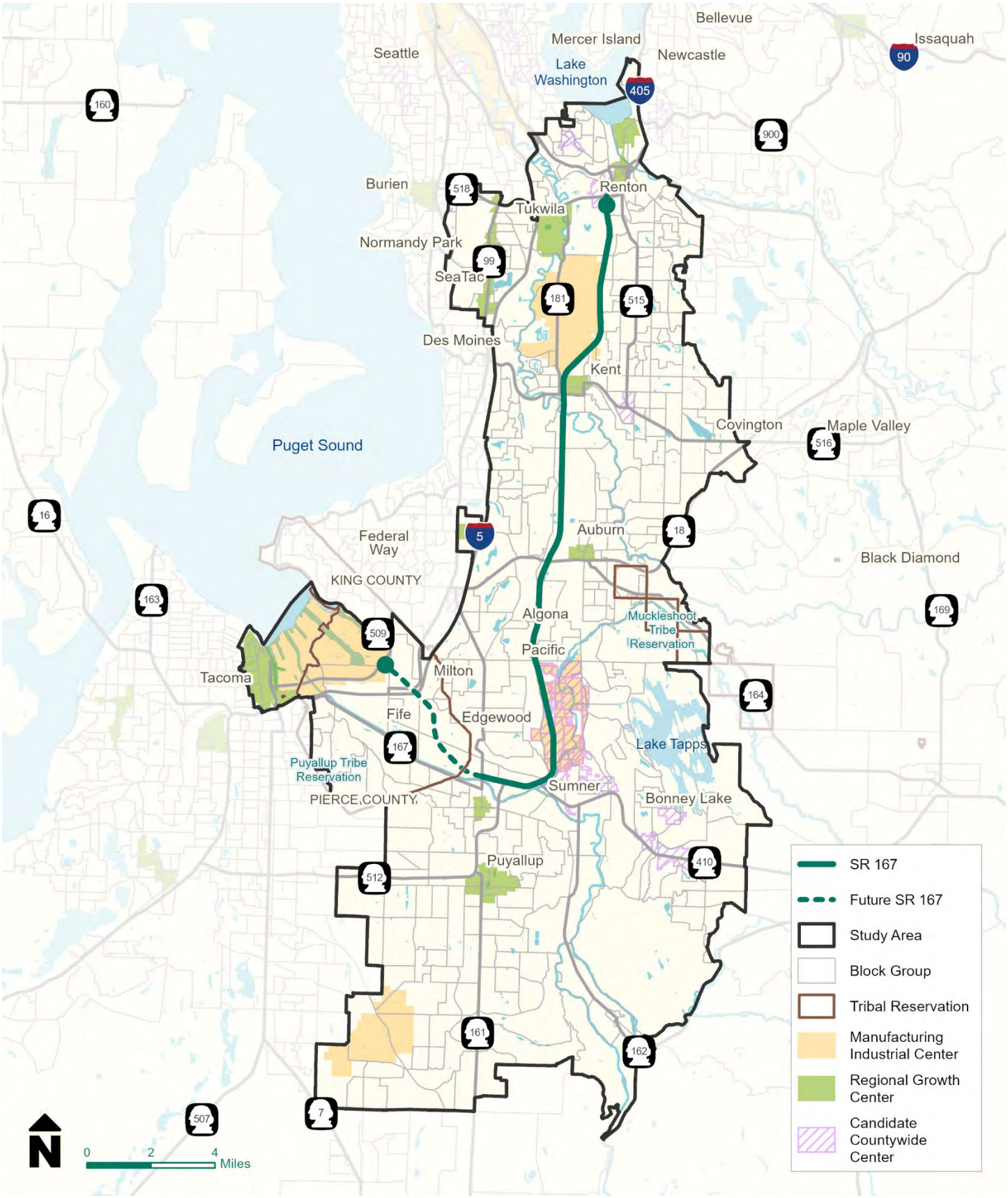


Figure 3-1. Study Area Map

Study Area Demographics

Population and Age

Figure 3-2 illustrates population by census block group in the study area. Approximately 660,400 people live in the study area, as detailed in Table 3-1. About 36% of the people in the study area are under 18 or over 64. There are about the same number of women and men in the study area.

Travel Patterns, Mobility Barriers, and Needs

People under 18 or over 64 (youth and seniors) may have different transportation needs than other age groups. Most trips are for recreational purposes, school, shopping/errands, and healthcare. Seniors living in urban areas typically spend less time traveling to medical facilities than those living in rural areas. Seniors are also less likely to use transit when shopping or running errands, and more likely to share rides with others. Nearly half of all seniors have a disability which may pose a mobility barrier (CDC 2020). People under 18 are more likely to use ride-hailing or e-scooters and have a greater degree of comfort with smartphone apps and technology than seniors (Golub et al. 2018). For areas with higher concentrations of senior or youth populations, potential mobility barriers may include lack of reliable transportation options such as paratransit services and lack of driver's licenses. A summary of the common mobility barriers and needs is provided in Table 3-2.

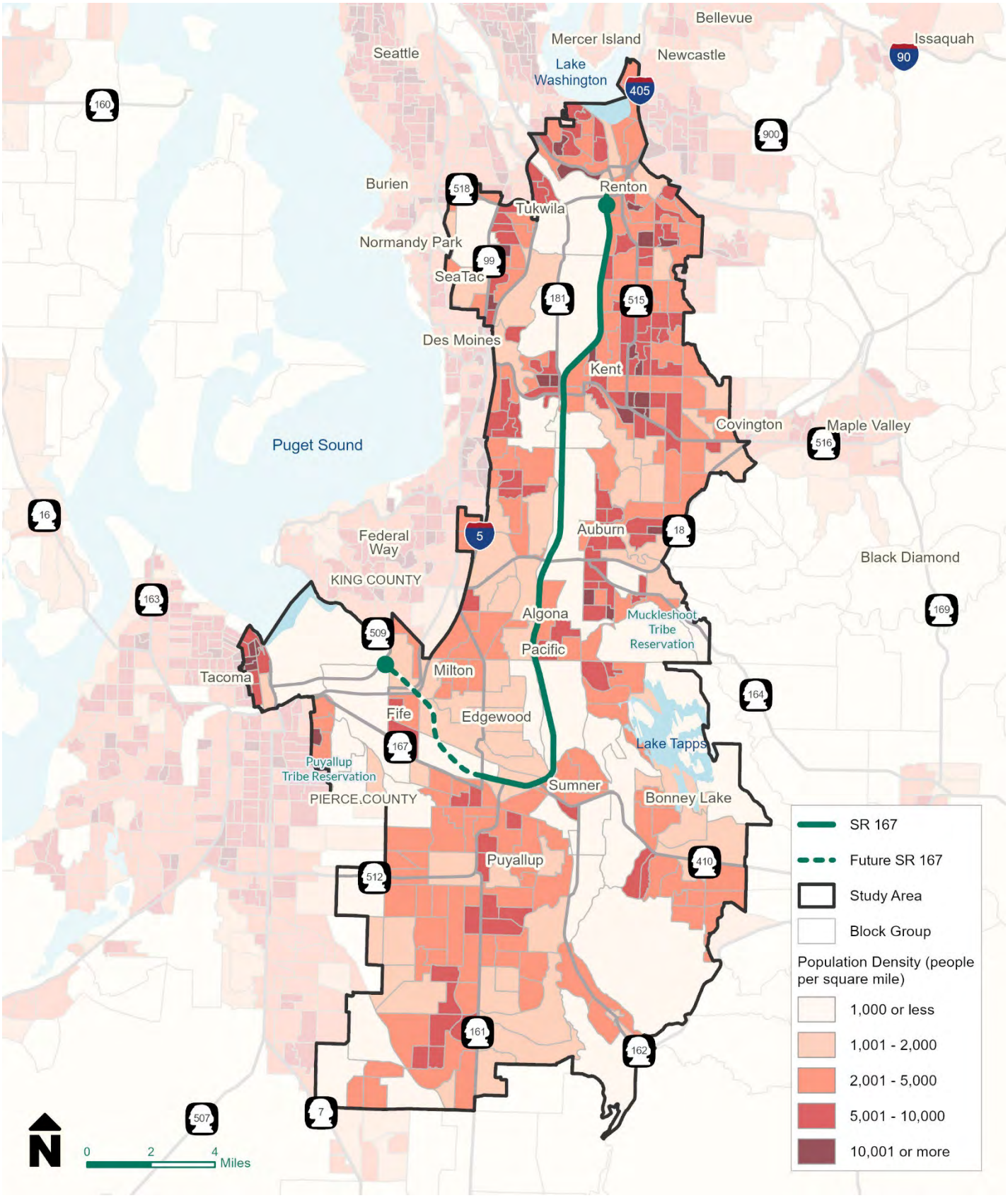


Figure 3-2. Population Density

Minority Population

Minority populations[1] account for nearly half of the total population in the study area, as summarized in Table 3-3. Figure 3-3 illustrates that north of SR 18, minority populations account for over half of the population, and south of SR 18, minority populations make up about one-third of the population. Asian and Hispanic/Latino people make up the largest proportion of minority populations. These populations are concentrated in more urban areas of the study area and along major roadway corridors including SR 18, I-5, SR 164, SR 167, SR 516, SR 515, and within the Muckleshoot and Puyallup Tribal Reservations (Figure 3-4). There are also high concentrations near SeaTac Airport and near the Port of Tacoma (although the total populations near those land uses are small). Minority populations account for about 60% of the total population living in poverty and about 45% of the labor force. Refer to the *Income* section and *Education and Employment* sections for more information on people in-poverty and employment.

Table 3-3. Minority Population within the Study Area

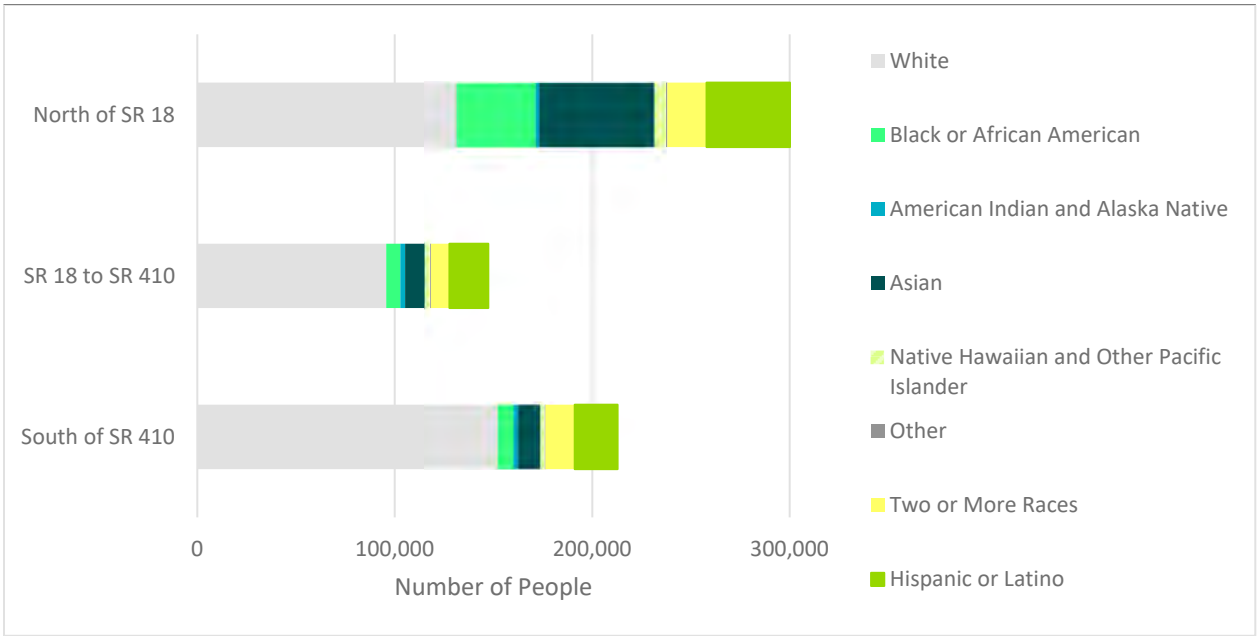
Demographic	Study Area	King County	Pierce County
Minority Population	43% (281,156)	40% (886,842)	33% (291,535)
White [a]	57% (379,244)	60% (1,308,660)	67% (585,478)
Black or African American [a]	8% (54,950)	6% (137,919)	7% (57,136)
American Indian and Alaska Native [a]	1% (6,704)	<1% (10,965)	1% (9,221)
Asian [a]	12% (79,194)	18% (384,359)	6% (54,504)
Native Hawaiian and Other Pacific Islander [a]	2% (11,216)	1% (16,608)	1% (12,208)
Some other race [a]	<1% (1,370)	<1% (5,738)	<1% (1,458)
Two or more races [a]	7% (44,060)	5% (119,012)	7% (61,681)
Hispanic or Latino	13% (83,662)	10% (212,241)	11% (95,327)

Source: U.S. Census Bureau tables B01003, B03002

Note:

[a] Non-Hispanic populations

[1] Although language connected to equity and representation is evolving, the terms used in this report are drawn from the data source they are taken from (e.g. Census or American Community Survey) for consistency.



Source: U.S. Census Bureau tables B01003, B03002

Figure 3-3. Race/Ethnicity of Population within Study Area

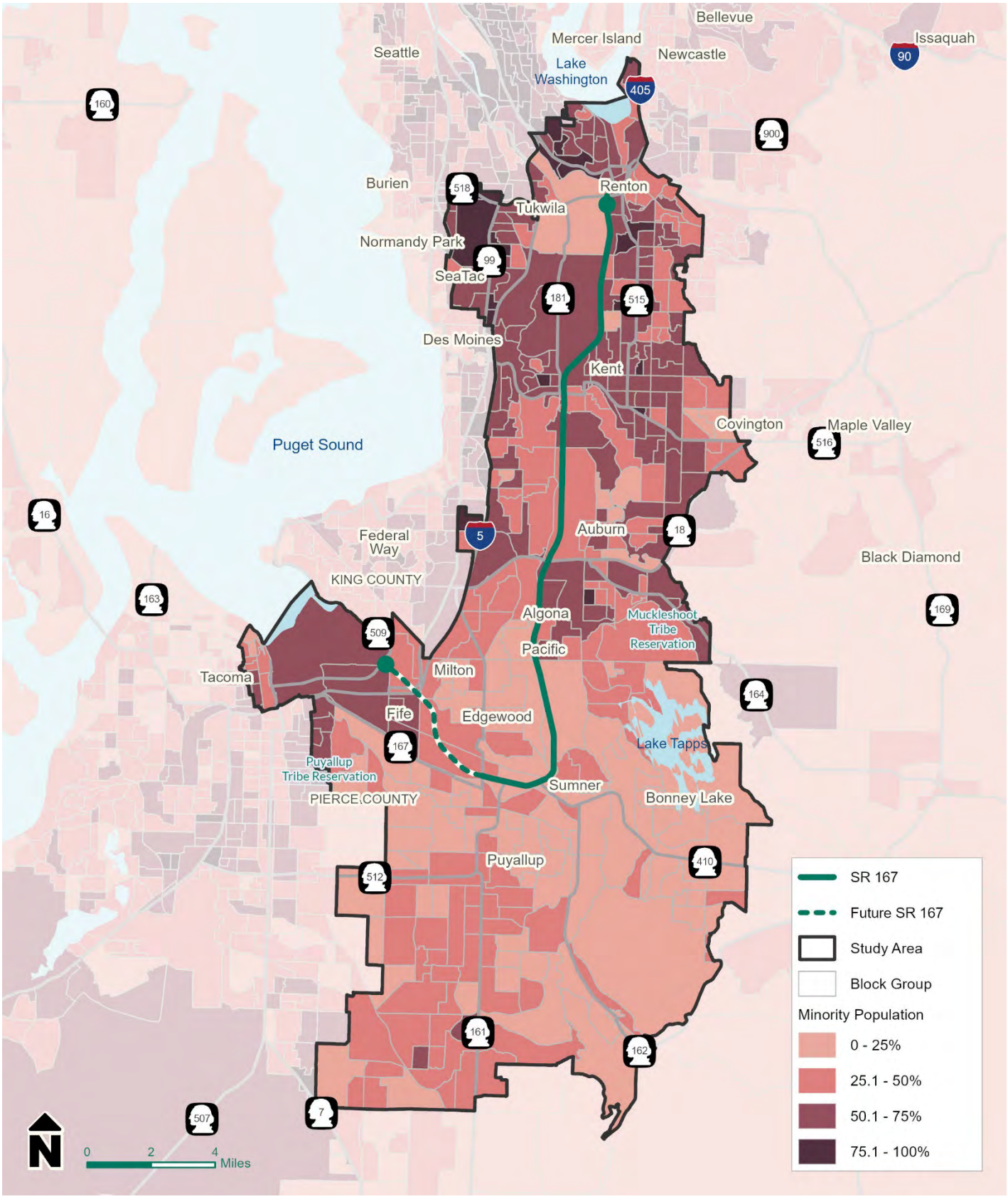
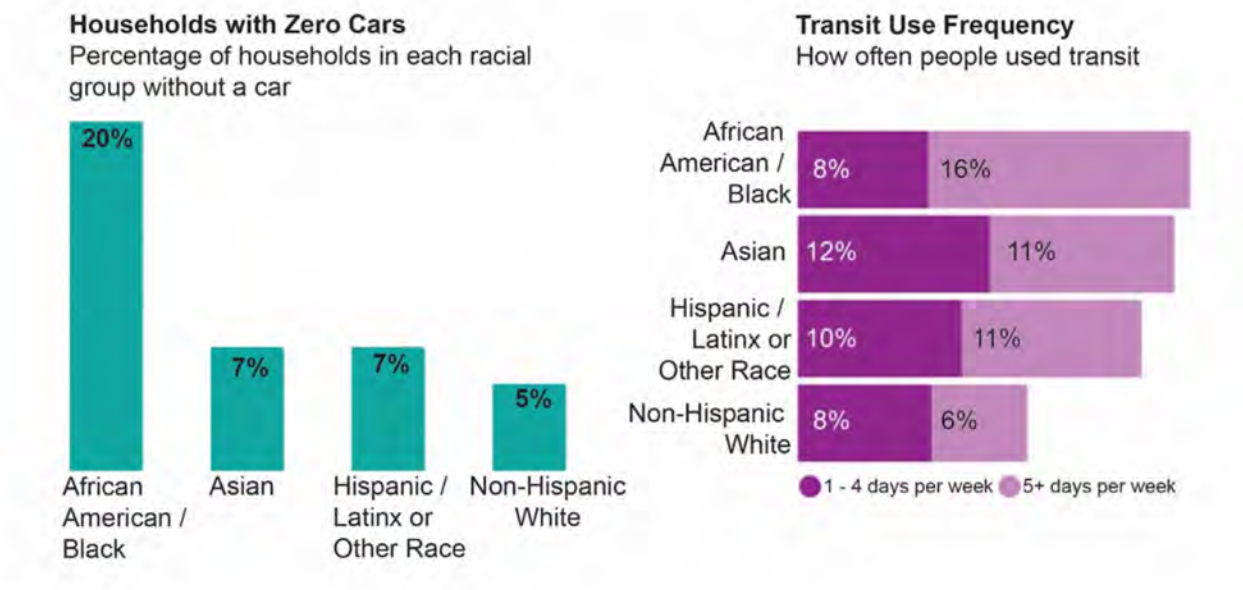


Figure 3-4. Minority Populations Map

Travel Patterns, Mobility Barriers, and Needs

As depicted in Figure 3-5, in the Puget Sound Region, minority populations are more likely to live in a household without a vehicle and are also more likely to rely on transit (Puget Sound Regional Council 2020a). As depicted in Table 3-4, commute times are similar for minority populations and non-minority populations. For areas with higher concentrations of minority populations, potential mobility barriers may include greater distances to travel; lack of vehicle ownership; high costs of transportation; and uneven distribution of transportation services. A summary of the common mobility barriers and needs is provided in Table 3-2.



Source: Puget Sound Regional Council 2019

Figure 3-5. Vehicle Ownership and Transit Use Frequency by Race

Table 3-4. Commute Times in King County and Pierce County

Demographic	King County	Pierce County
Minority Populations	All Modes: 30 minutes Transit: 43 minutes	All Modes: 32 minutes Transit: 66 minutes
White-only Populations	All Modes: 30 minutes Transit: 43 minutes	All Modes: 33 minutes Transit: 70 minutes

Source: National Equity Atlas 2019

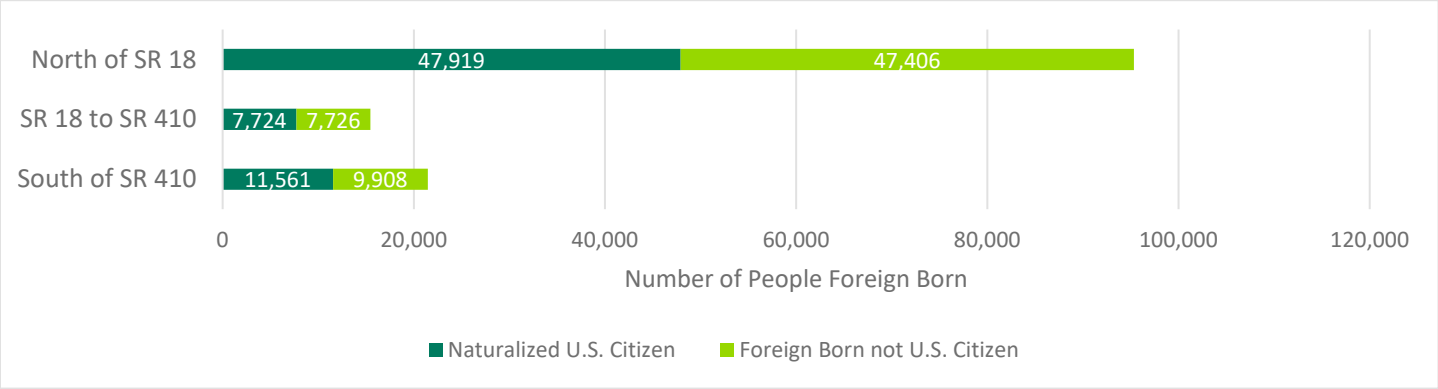
Note: Commute times are provided in minutes for one-way trips.

U.S. Citizenship and English Proficiency

U.S. Citizenship

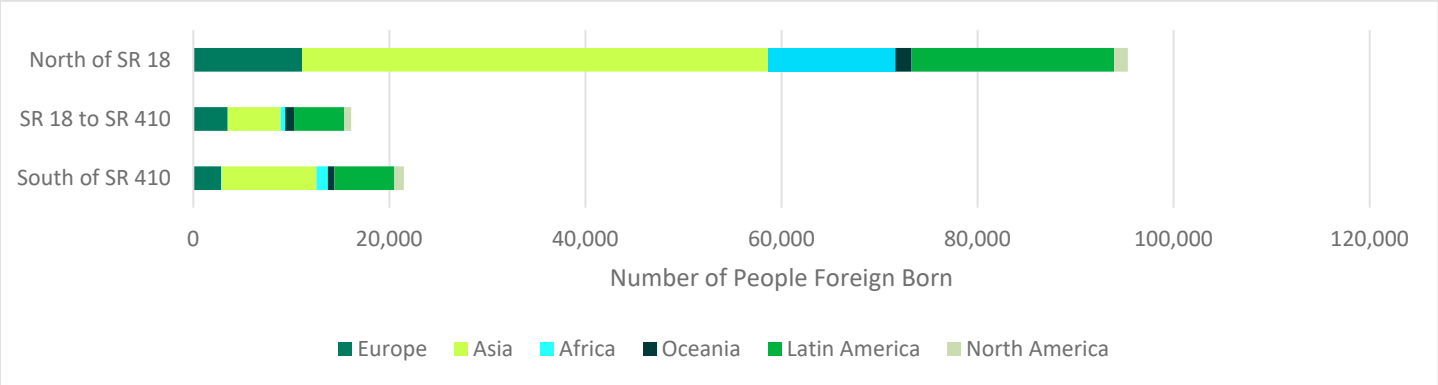
About 20% of the people in the study area are foreign born, and approximately half of those people are naturalized U.S. citizens. As depicted in Figure 3-6, the majority of foreign born people within the study area live north of SR 18. Figure 3-7 summarizes the birth locations for foreign born populations in the study area. People born in Asia make up the largest proportion of foreign born people and the largest concentrations of these populations are found north of SR 18.

According to the Port of Seattle, a majority of truck drivers with short truck hauls are from Africa (34%) or Eastern Europe (34%) (Port of Seattle 2018). Most of these drivers are independent owner-operators. In addition, 83% of these drivers live in the Puget Sound area, with a high concentration in the Kent/Auburn valley area. Less than a quarter live in the City of Seattle. While these data are from the Port of Seattle, it seems reasonable to assume that a similar pattern holds for the Port of Tacoma since many truck drivers serve both ports.



Source: U.S. Census Bureau table B05002

Figure 3-6. Foreign Born Population within Study Area



Source: U.S. Census Bureau table B05002

Figure 3-7. Location of Birth for Foreign Born Population within Study Area

Limited English Proficiency

Of the population age 5 or older in the study area, about 10% speak English less than 'very well' (Table 3-5). Of the limited English-speaking populations, most speak Spanish or Asian languages including Korean, Chinese, Vietnamese, Tagalog (including Filipino), and Pacific Islander languages. As depicted in Figure 3-8, most of the population with limited English proficiency lives north of SR 18.

Table 3-5. Limited English Proficiency Populations within Study Area

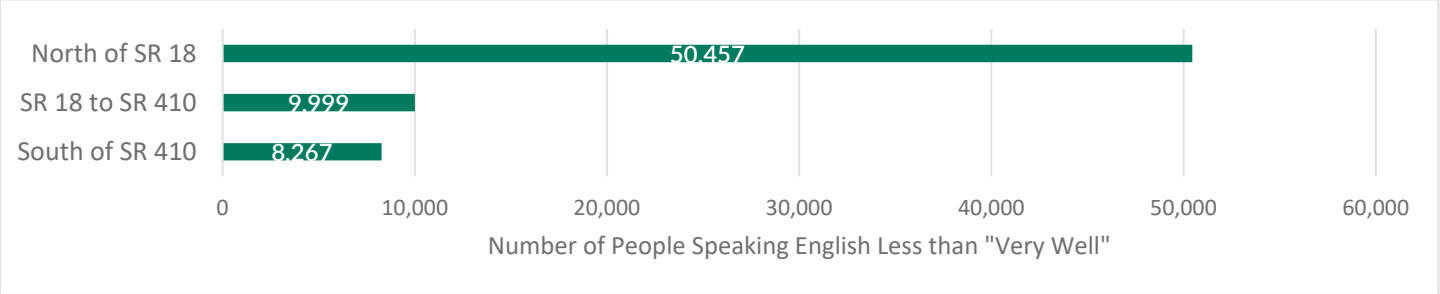
Demographic	Study Area	King County	Pierce County
Population Age 5 or Older	616,151	2,067,175	818,443
Limited English Proficiency	11% (68,723)	11% (220,279)	6% (45,207)

Source: U.S. Census Bureau table B16004

Figure 3-9 depicts that of the population with limited English proficiency in the study area, the language spoken most commonly at home is Spanish. Public outreach materials are being translated into multiple languages, as described in *Chapter 2. Community Outreach Summary*. Figure 3-10 depicts the percentage and locations of limited English-speaking communities.

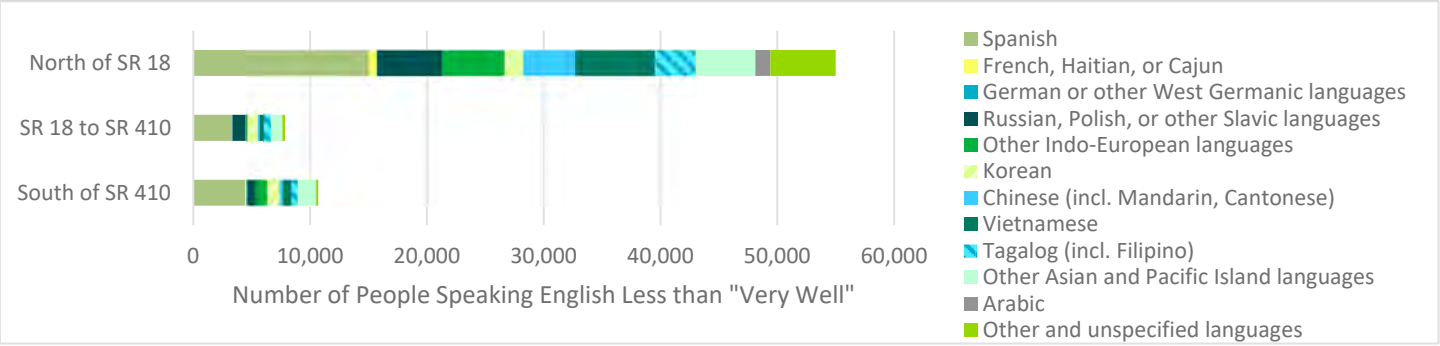
Travel Patterns, Mobility Barriers, and Needs

Immigrants rely more on alternative modes of travel, including carpooling, public transit, walking, and bicycling, and are less likely to commute by single-occupant vehicle (NHTS 2017). For areas with higher concentrations of immigrants and populations with limited English proficiency, potential mobility barriers may include a lack of driver's licenses and bank account and the absence of translated materials. A summary of the common mobility barriers and needs is provided in Table 3-2.



Source: U.S. Census Bureau table B16004

Figure 3-8. Limited English Proficiency Population by Geography within Study Area



Source: U.S. Census Bureau table C16001

Figure 3-9. Language Spoken at Home for Limited English Proficiency Populations within Study Area

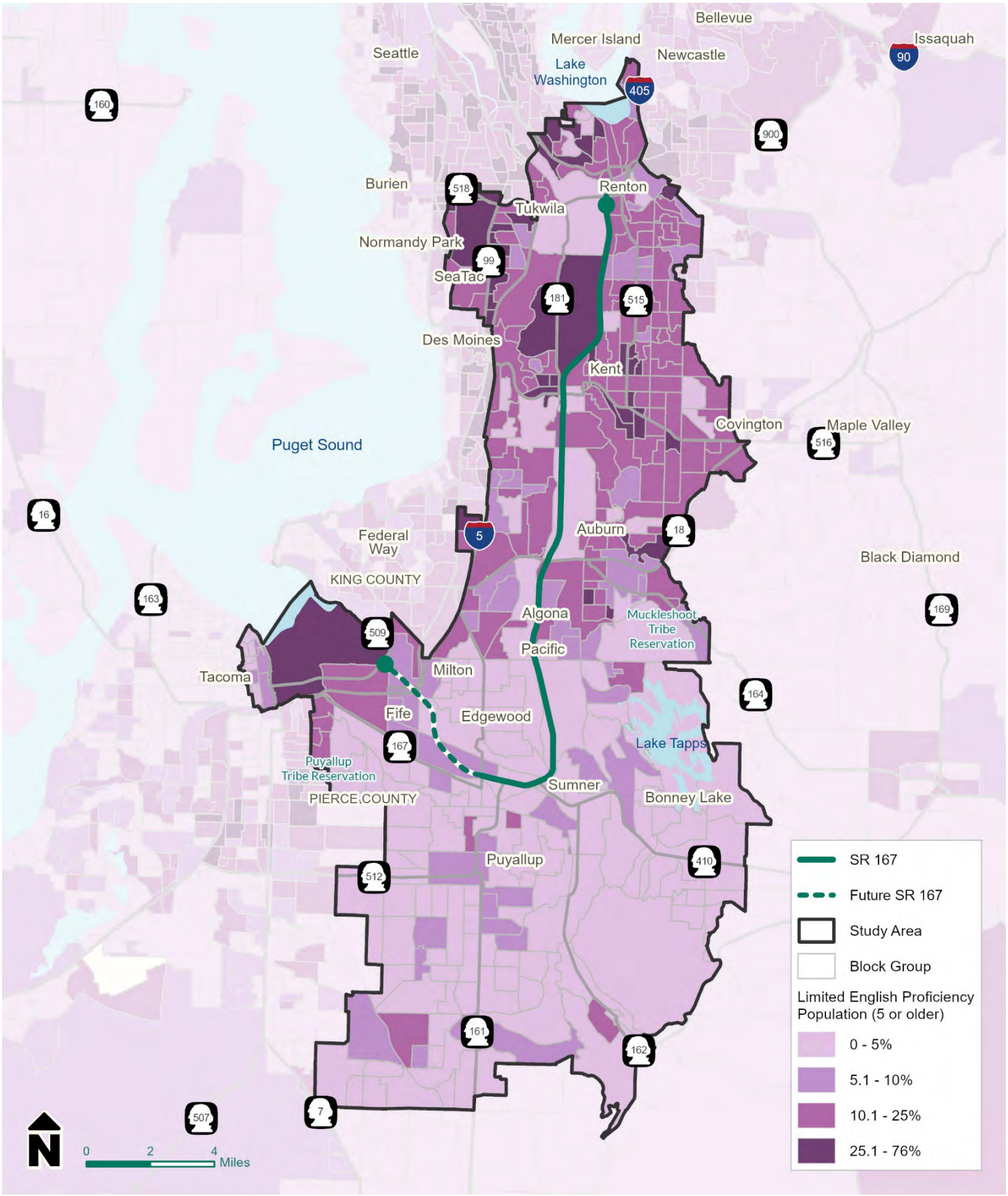
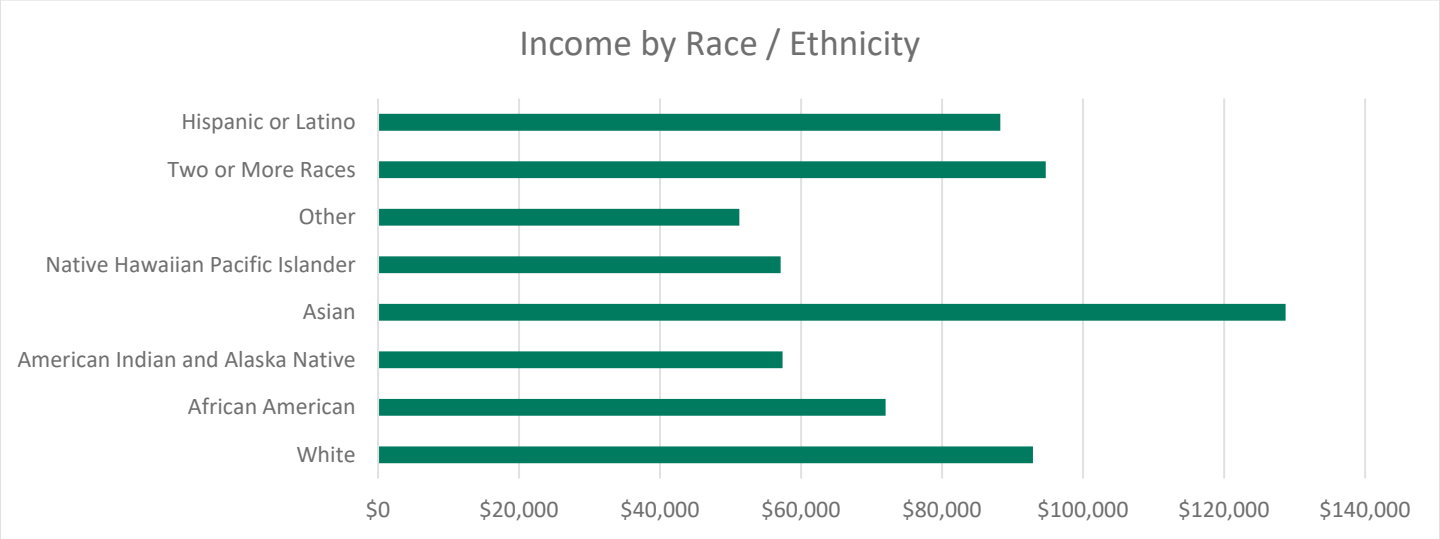


Figure 3-10. Limited English Proficiency Populations Map

Income

The median income for households in the study area is approximately $80,000 per year, which is lower than the median for King County ($105,000) but higher than the median for Pierce County ($76,000). Households with a Native Hawaiian or Pacific Islander household member have the lowest household income in the study area (about $57,000), and households with an Asian household member have the highest household income in the study area (about $128,000) (Figure 3-11). Tribal Reservation areas within the study area have a lower median income ($73,000) than the study area average.



Source: U.S. Census Bureau table B19013

Note: Income is calculated as the average of the median household income.

Figure 3-11. Median Household Income by Race and Ethnicity within Study Area

In-Poverty and Low-Income Populations

People living in or near poverty generally have fewer resources to meet basic needs and may struggle to find affordable housing. Given the high cost of living in the Puget Sound region, PSRC has identified that people who are at or below 200% of the federal poverty guidelines as being 'low-income' (PSRC 2018a). People at or below 100% of the federal poverty guidelines are referred to as 'in-poverty'.

Approximately 25% of the people in the study area are considered low-income (Table 3-6). As summarized in Figure 3-12, most minority populations that are living in-poverty are north of SR 18 and SR 164. Of the people living in-poverty, about 60% are minority populations (compared to the overall minority share of the study area population of 43%). Figure 3-13 depicts the locations of low-income populations in the study area. The percentage of people living in-poverty or low-income in the Muckleshoot and Puyallup Tribal Reservation areas within the study area is similar to the study area average.

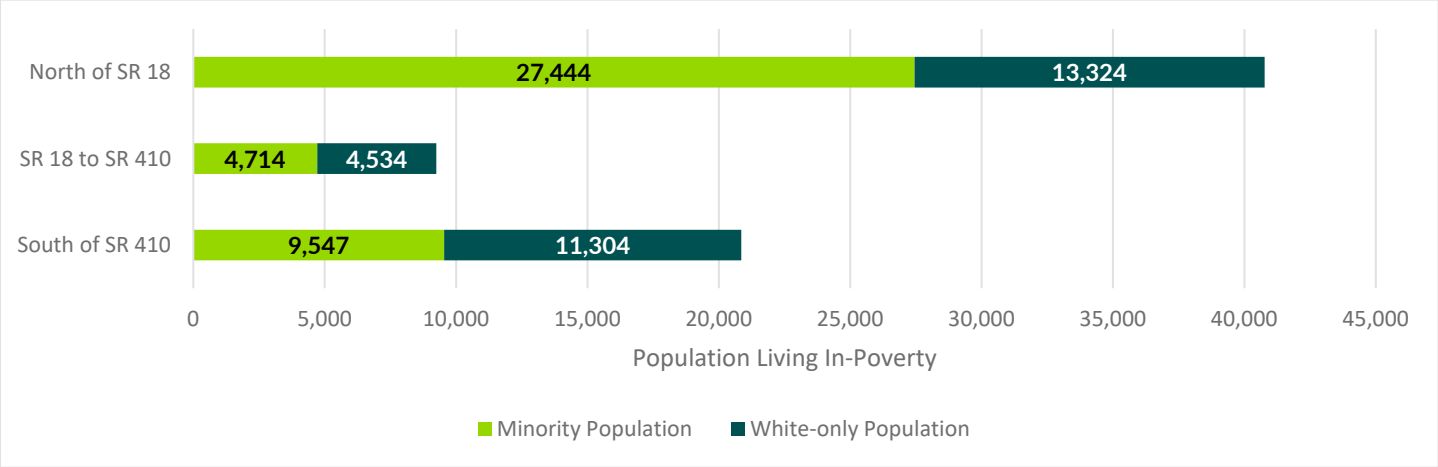
Table 3-6. In-Poverty and Low-Income Populations within Study Area

Demographic	Study Area	King County	Pierce County
Total Population	660,400	2,195,502	877,013
In-Poverty [a]	10% (66,506)	9% (193,603)	10% (89,714)
Low-Income [a]	25% (163,063)	19% (421,681)	25% (215,478)

Source: U.S. Census Bureau tables B17021, C17002

Note:

a. In-poverty includes populations living at or below 100% of the federal poverty level. Low-income includes populations living at or below 200% of the federal poverty level.



Source: U.S. Census Bureau table B17001

Figure 3-12: Ratio of Minority Populations Living In-Poverty within Study Area

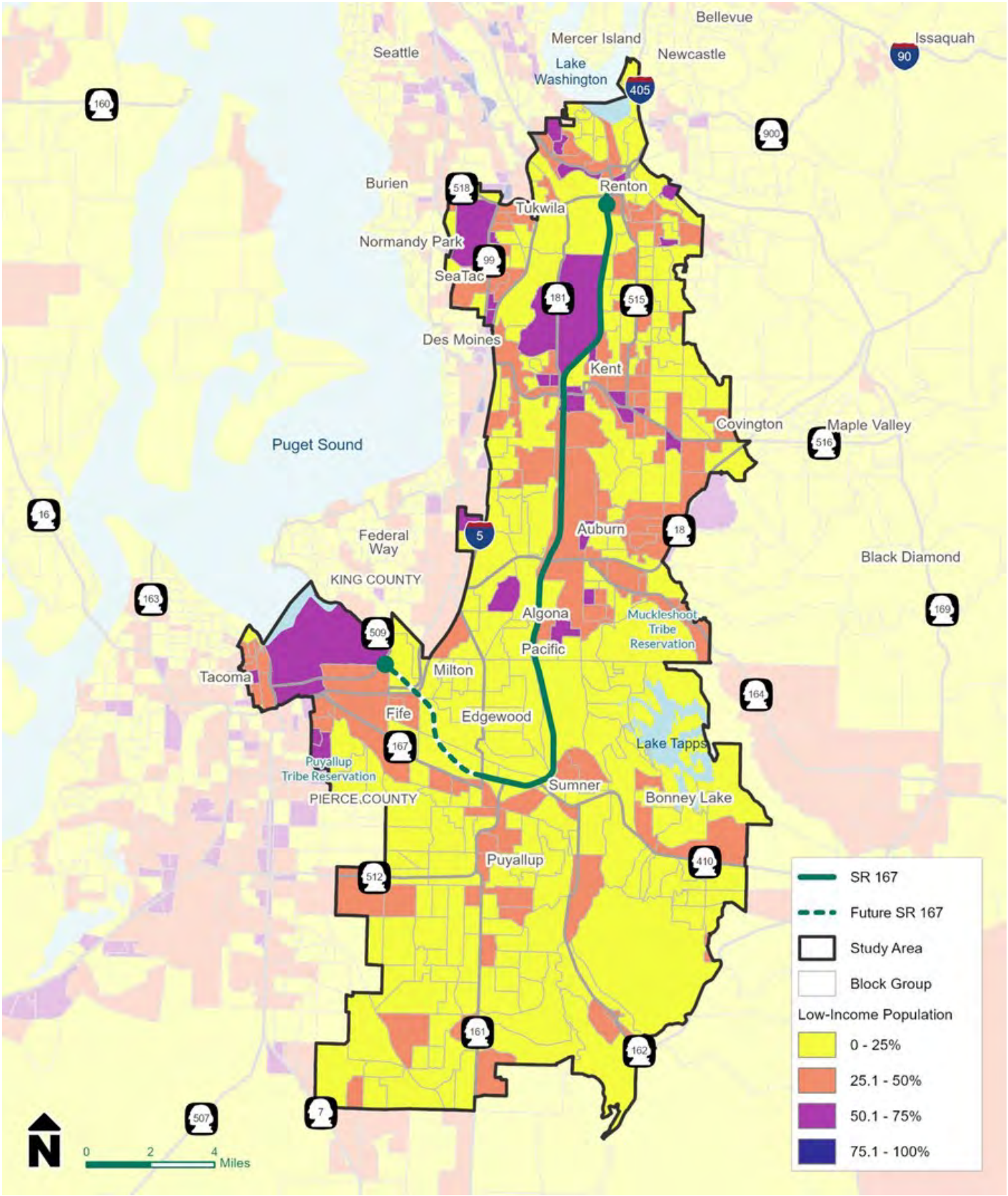


Figure 3-13. Low-Income Populations Map

Cost Burdened Households

For most households, housing costs account for the largest expenses. Households that spend more than one-third of their income on housing costs are considered cost-burdened. A household is considered severely cost burdened if it pays more than 50% of its income on housing (Department of Housing and Urban Development 2017).

Cost-burdened households have less money available for basic needs or to make investments. Over 30% of the households in the study area are considered cost burdened (Table 3-7), which is similar to King and Pierce counties. There are more cost burdened households north of SR 18 than south of SR 18 (Figure 3-14).

Table 3-7. Cost Burdened and Severely Cost Burdened Households within Study Area

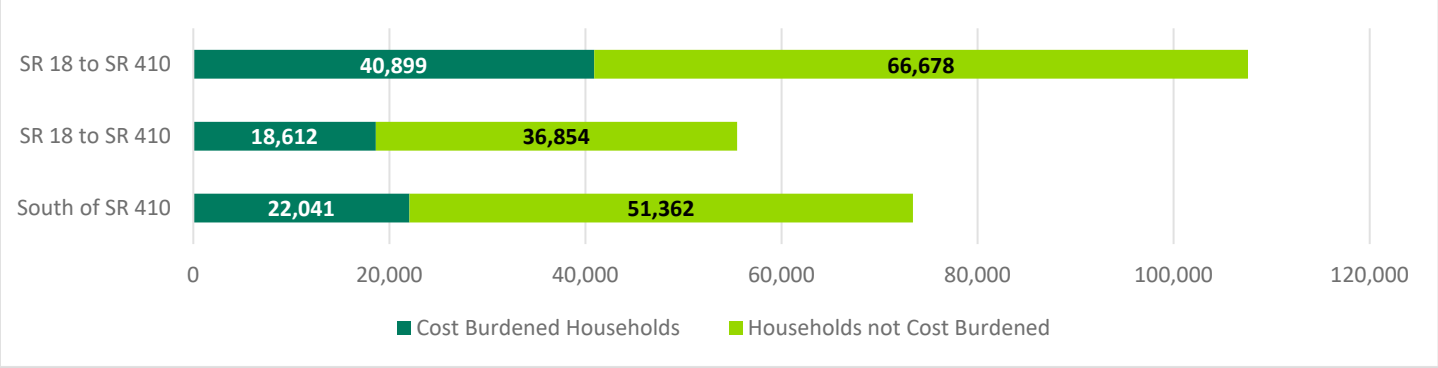
Demographic	Study Area	King County	Pierce County
Total Housing Units	159,253	529,563	216,606
Cost Burdened Households [a]	34% (81,552)	33% (290,046)	34% (109,995)
Severely Cost Burdened Households [b]	13% (31,707)	14% (123,204)	14% (45,143)

Source: U.S. Census Bureau tables B25003, B25091, B25070

Notes:

[a] Cost burdened households include the households spending more than one-third of the household income on housing costs.

[b] Severely cost burdened households include the households spending more than one-half of the household income on housing costs.



Source: U.S. Census Bureau tables B25003, B25091, B25070

Figure 3-14. Cost Burdened and Non-Cost Burdened Households within Study Area

Travel Patterns, Mobility Barriers and Needs

Populations with lower incomes may have longer commute times compared to higher income populations. Commute times for low-wage working adults (in the bottom 25% of wages) are about two hours longer per week than higher-paid workers (in the top 25% of wages) (Giurge and Whillans 2019). This can be caused by living further from the workplace because of housing costs and having to use multiple modes of transportation. For areas with higher concentrations of low-income populations, potential mobility barriers may include high costs of transportation; high cost of car ownership relative to income; greater distances to travel in locations where housing costs are high; lack of options for payment. A summary of the common mobility barriers and needs is provided in Table 3-2.

Persons with a Disability

As summarized in Table 3-8, about 11% of the people in the study area are disabled. Less than 5% of the adult population have a disability and are living in-poverty in the study area (Table 3-8). There are similar ratios of households with at least one disabled person north of SR 18 as there are between SR 18 and SR 410 and south of SR 410; approximately one-quarter of the households in the study area include at least one person with a disability.

Table 3-8. Populations with a Disability

Demographic	Study Area	King County	Pierce County
Total Population	703,149	2,195,502	877,013
Total Population with a Disability	11% (80,845)	9% (206,381)	13% (113,477)
Total Adult Population [a]	407,434	1,415,718	532,057
Total Adult Population with a Disability and In-Poverty [a]	2% (8,539)	2% (24,482)	2% (12,921)

Source: U.S. Census Bureau tables B01001, B22010, B23024

Note:

[a] It includes ages 20 to 64.

Travel Patterns, Mobility Barriers, and Needs

People with a disability may travel less than people who do not have a disability because they could have less transportation options or could be housebound. Approximately 10% to 15% of people with a disability live in a household without a vehicle. People with disabilities travel less by personal vehicles (but travel more as passengers) than people without disabilities (Brumbaugh 2018). For areas with higher concentrations of persons with a disability, potential mobility barriers may include lack of reliable transportation options such as paratransit services; lack of driver's licenses; lack of adaptive technology for limited vision, hearing, motor skills and cognitive function (such as reachers, wheelchairs, and hearing aids). A summary of the common mobility barriers and needs is provided in Table 3-2.

Education and Employment

Education

Higher educational attainment can lead to higher wealth accumulations later in life. There are three colleges within a mile of the SR 167 corridor. As detailed in Table 3-9, about 40% of the people (25 or older) in the study area have a college degree, about 20% lower than King County as a whole.

Table 3-9. Educational Attainment for Population 25 or Older

Demographic	Study Area	King County	Pierce County
Total Population 25 or Older	443,971	1,567,088	589,306
Population 25 or Older with a high school diploma or GED but no College	27% (120,216)	15% (234,991)	27% (160,553)
Population 25 or Older with a College or Professional Degree	38% (168,779)	60% (946,604)	39% (227,922)

Source: U.S. Census Bureau tables B01001, B15003

Employment

Approximately 95% of the labor force[2] was employed in the study area in 2019. Minority populations make up about 45% of the employed

[2] "The labor force includes all people classified in the civilian labor force, plus members of the U.S. Armed Forces (people on active duty with the United States Army, Air Force, Navy, Marine Corps, or Coast Guard). The civilian labor force consists of people classified as employed or unemployed." – US Census Bureau

population, with Asian and Hispanic or Latino populations making up the largest portion (Figure 3-15). This proportion of minority employment is similar to the overall minority share of population within the study area.

According to the Longitudinal Employer-Household Dynamics (LEHD), approximately 65% of the jobs in the study area are north of SR 18. There are several employers with 100 or more jobs/employees including Boeing, Paccar, and Amazon.

Approximately 16% of the jobs within the study area pay less than $1,250 per month, and over half of the jobs in the study area pay more than $3,333 per month. These percentages are similar to King and Pierce counties, where approximately 14% of jobs in King County and 19% of jobs in Pierce County pay less than $1,250 per month, and 65% of jobs in King County and 51% of jobs in Pierce County pay more than $3,333 per month.

Manufacturing or warehousing jobs account for the largest portion of jobs in the study area (about 20%). Other industries that each account for about 10% of jobs include construction, retail trade, and healthcare. Nearly all of the manufacturing and warehousing jobs are found north of SR 410. Many of the healthcare and retail trade jobs are found south of SR 410.

Travel Patterns, Mobility Barriers, and Needs

Unemployed people may face long commute times over large distances in search for job opportunities. They likely have less disposable income, and therefore may be more likely to not own a vehicle. For areas with higher concentrations of unemployed populations, potential mobility barriers may include similar barriers to those listed in the low-income section. A summary of the common mobility barriers and needs is provided in Table 3-2.

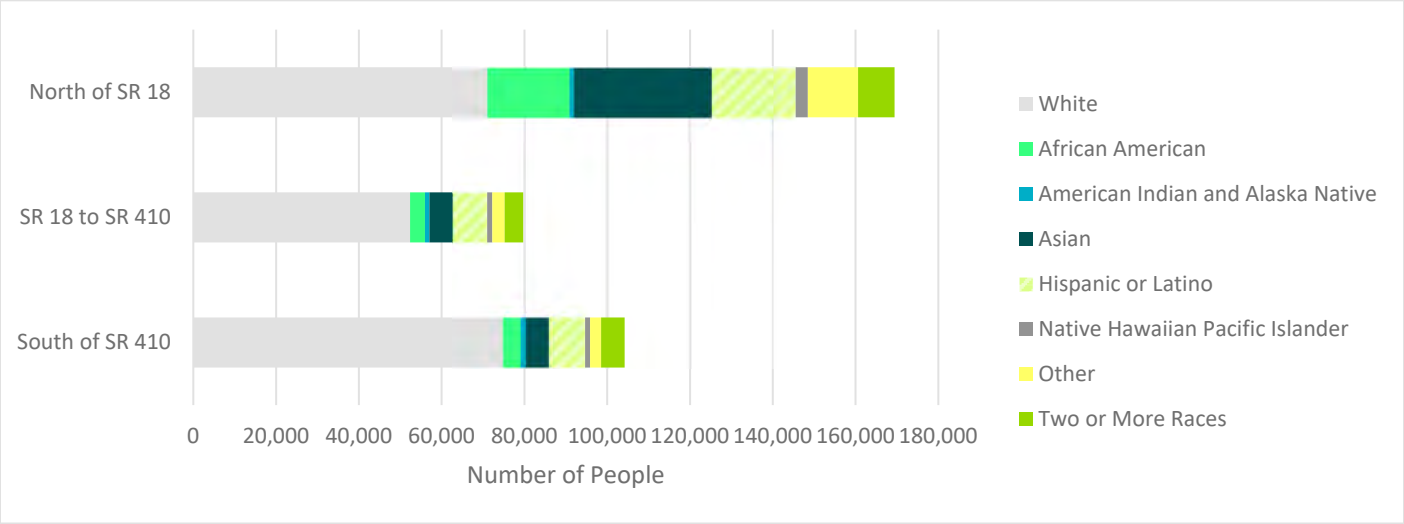


Figure 3-15. Employment by Race/Ethnicity within Study Area

Housing Tenure and Vehicle Ownership

Owning one's home is generally associated with more stable housing than renting, and generally helps build financial equity which allows for more opportunity. Home ownership rates can be an indicator of housing equality or inequality. Households without a vehicle can be much more dependent on other means of transportation, such as public transit.

Within the study area, about 60% of the housing units are owner-occupied (Table 3-10), and most of these owner-occupied households are located south of SR 410 and have a household member who is white (Figure 3-16). About 6% of the households in the study area do not have a vehicle

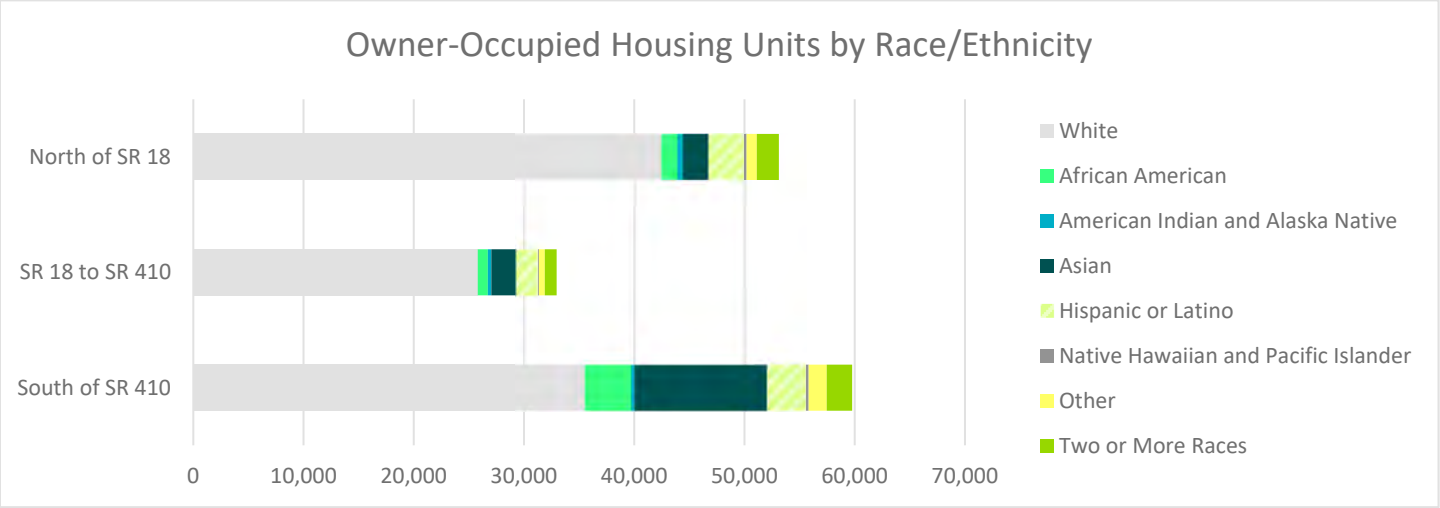
available, and most are located north of SR 18 (Figure 3-17). Households without a vehicle are much more likely to be renter-occupied.

Households with an Asian household member make up the largest minority group that own their own home.

Table 3-10. Housing Tenure and Vehicle Ownership within Study Area

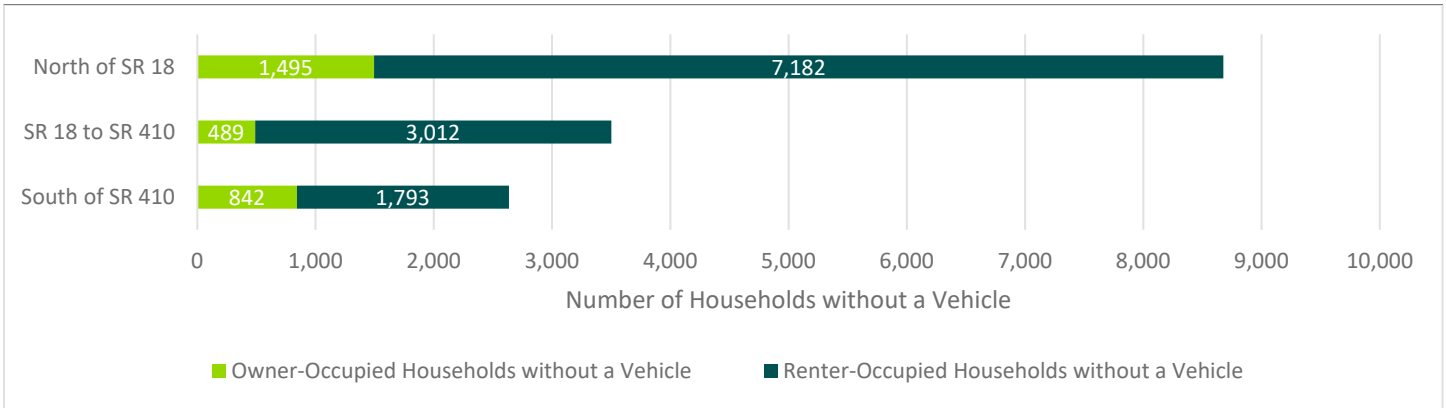
Demographic	Study Area	King County	Pierce County
Total Occupied Housing Units	236,446	882,028	323,296
Owner-Occupied Units	60% (142,015)	57% (502,293)	62% (200,836)
Renter-Occupied Units	40% (94,431)	43% (379,735)	38% (122,460)
Households with no Vehicle	6% (14,813)	10% (90,880)	5% (16,726)
Owner-Occupied Units with no Vehicle	1% (2,826)	2% (13,366)	1% (3,780)
Renter-Occupied Units with no Vehicle	5% (11,987)	9% (77,514)	4% (12,946)

Source: U.S. Census Bureau tables B25003, B25044



Source: U.S. Census Bureau table B25003

Figure 3-16. Owner-occupied Housing Units by Race/Ethnicity



Source: U.S. Census Bureau table B25044

Figure 3-17. Households without a Vehicle within Study Area

Travel Patterns, Mobility Barriers, and Needs

Household vehicle ownership rate is associated with home tenure (Litman 2019). People living in households that do not have a vehicle available have fewer options for traveling to essential destinations, such as grocery stores with better food quality and/or lower prices (Walker et al. 2010). In addition, they tend to take more trips by public transit, walking and bicycle (Lachapelle 2016). For areas with higher concentrations of households without a vehicle available, potential mobility barriers may include high costs of transportation and greater distances to travel. A summary of the common mobility barriers and needs is provided in Table 3-2.

Single-parent Families

Single-parent households can be more likely to experience financial hardship and time constraints than households with two parents. As summarized in Table 3-11, nearly one-third of the families in the study area are single-parent families with children under 18, which is higher than King and Pierce counties. Figure 3-18 illustrates concentrations of single-parent families within the study area. There are slightly more single-parent households north of SR 18 compared to south of SR 18.

Table 3-11. Single-parent Families within Study Area

Demographic	Study Area	King County	Pierce County
Total Families	159,253	529,563	216,606
Single-Parent Families with Children under 18	27% (42,249)	20% (107,663)	24% (52,901)

Source: U.S. Census Bureau table B11003

Travel Patterns, Mobility Barriers, and Needs

Single-parent families generally rely on transit more than households with two parents, as they can be more financially constrained and tend to have less access to a vehicle compared to two parent households. They also have a greater number of daily trips to make and spend more time traveling than households with two parents (Wang et al. 2020). For areas with higher concentrations of single-parent families, potential mobility barriers may include high costs of transportation; greater time constraints; and greater distances to travel. A summary of the common mobility barriers and needs is provided in Table 3-2.

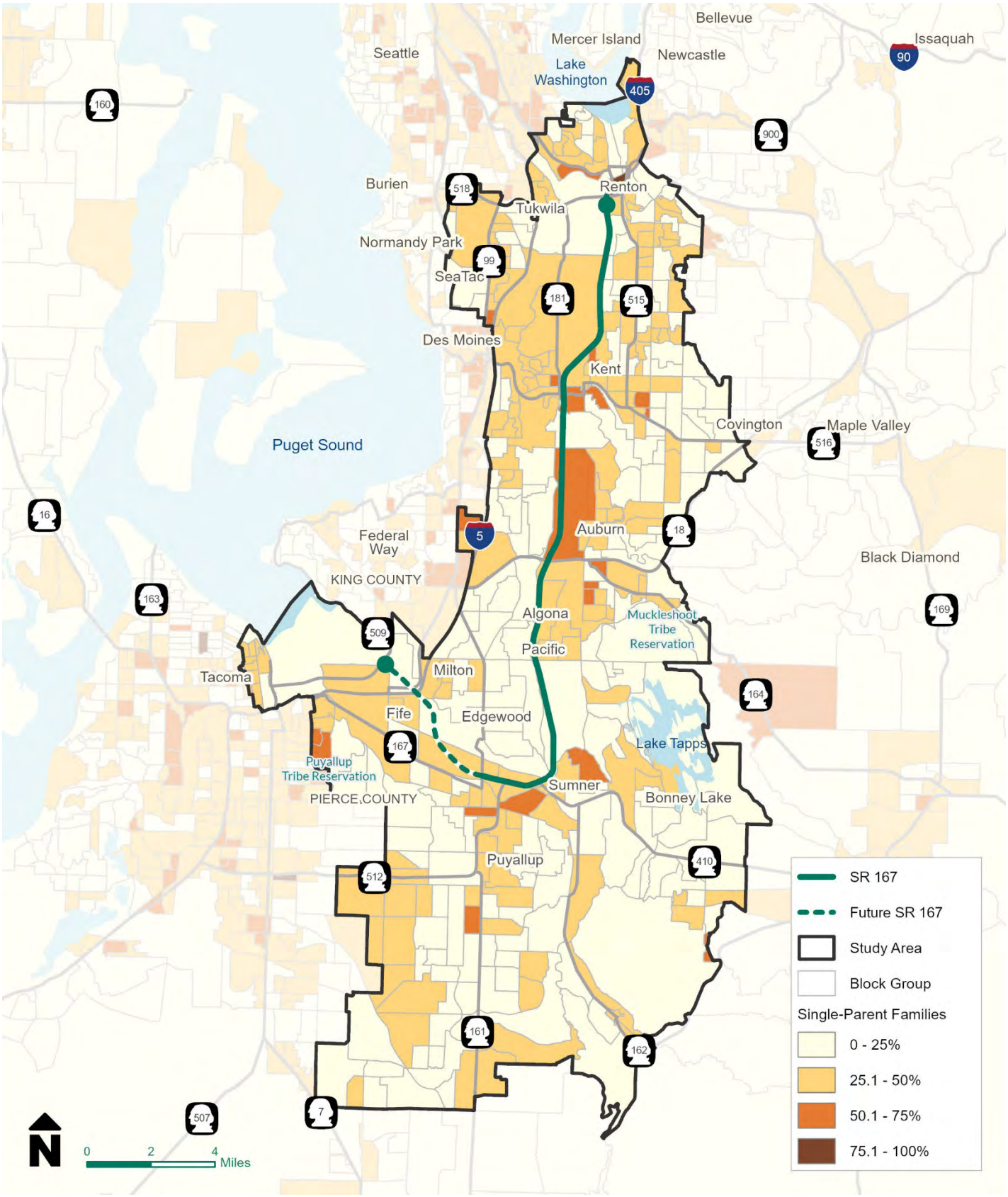


Figure 3-18. Single-parent Families Map

Tribal Lands Demographic Summary

Selected demographics are summarized in Table 3-12 for the block groups that are within or partially within the Muckleshoot and Puyallup Tribe Reservation areas within the study area. The following observations were made:

- Almost 30% of the population is considered low-income for the Puget Sound Region. This is higher than the study area average of 25%.
- Over 30% of the households in the study area are considered cost-burdened, indicating that these households have less money to spend on non-housing related expenses.
- Similar to the study area average, about 10% of people over the age of 5 speak English less than 'very well'.
- About 60% of the housing units are owner-occupied. About 5% of the households do not have a vehicle available, and almost all are renter-occupied homes.
- Close to one-third of the families in the study area are single parent families with children under 18.

Table 3-12. Tribal Reservation within Study Area Demographic Summary

Demographic	Muckleshoot [a]	Puyallup [a]	Total [a]
Total Population	10,772	37,881	48,653
Youth Population (under 18)	23%	24%	24%
Senior Population (over 64)	13%	11%	12%
Minority Population	40%	43%	42%
Foreign Born Population	11%	15%	14%
Limited English Proficiency Population	7%	10%	10%
In-Poverty Population	9%	14%	13%
Low-Income Population	23%	28%	27%
Cost Burdened Households	33%	32%	32%
Population with a Disability	12%	12%	12%
Unemployed Population	5%	5%	5%
Owner-Occupied Households	71%	58%	61%
Renter-Occupied Households	29%	42%	39%
Households without a Vehicle	5%	5%	5%
Single-Parent Families	22%	28%	27%

Note:

[a] Includes block groups or tracts within or partially within the Muckleshoot Tribe Reservation or Puyallup Tribe Reservation boundaries.

Environmental Justice and Equity Priority Areas

Environmental justice is a component of Title VI of the Civil Rights Act and is an important consideration in transportation planning projects. The environmental justice analysis helps to ensure that the benefits of transportation investments are equitably distributed and that the impacts are not concentrated on an overburdened or historically marginalized population.

The following statutes, requirements, and regulations are applicable to environmental justice populations. Refer to WSDOT Environmental Manual Chapter 460 for more information on statutes and regulations regarding environmental justice.

Federal:

- Americans with Disabilities Act of 1990, Title II
- EO 12898 – Environmental Justice
- Title VI of the Civil Rights Act of 1964
- EO 13166 – Limited English Proficiency
- EO 13985 – Advancing Racial Equity and Support for Underserved Communities
- Rehabilitation Act of 1973, Section 504
- USC Title 42 Parts 4321-4370 – NEPA
- USC Title 49 Part 303 – Tribal
- U.S. Department of Transportation (USDOT) Order 5610.2(a) – Final DOT Environmental Justice Order

State:

- Chapter 70A.02 RCW - Environmental Justice WSDOT Secretary's EO E 1018 – Environmental Policy Statement
- WSDOT Secretary's EO E 1087 – Title VI Policy
- Governor's EO 93-07 – Affirming Commitment to Diversity and Equity in the Service Delivery and the Communities of the State

Title VI of the Civil Rights Act of 1964 prohibits discrimination on the basis of race, color, or national origin in any program or activity that receives federal funds or other federal financial assistance. Programs that receive federal funds cannot distinguish among individuals on the basis of race, color, or national origin, either directly or indirectly, in the types, quantity, quality, or timeliness of program services, aids, or benefits that they provide or the manner in which they provide them (HHS 2022).

The Healthy Environment for All (HEAL) Act (Chapter 70A.02 RCW, Environmental Justice) is more recent state legislation enacted in July 2021 that directs state agencies to implement recommendations from the Environmental Justice Task Force (EJTF). Key elements include incorporating environmental justice as part of agency work, promoting the equitable sharing of environmental benefits, investing in communities that have experienced the most environmental and health burdens, providing a voice for disproportionately affected communities, and supporting evaluation tools and processes (Washington Department of Health 2021).

Environmental Justice is: "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, rules, and policies. Environmental justice includes addressing disproportionate environmental and health impacts in all laws, rules, and policies with environmental impacts by prioritizing vulnerable populations and overburdened communities, the equitable distribution of resources and benefits, and eliminating harm."

Environmental justice populations are traditionally identified using the U.S. Census Bureau ACS data representing minority populations, low-income and

in-poverty populations, and limited English proficiency populations.

For this study, a broader set of draft demographic indicators is being considered to understand vulnerable populations in the SR 167 study area (Refer to *Appendix F* for resources reviewed to inform the selection of indicators). Indicators selected include:

- Low-Income Population (200% federal poverty)
- Minority Population
- Limited English Proficiency (speaking English less than 'very well')
- Youth or Seniors (under 18 or over 64)
- Single Parent Families (with children under 18)
- Population with a Disability
- Cost Burdened Households (more than 30% income on housing)
- Households without a Vehicle (rented and owned)
- Foreign Born Populations

The Washington Department of Health hosts an Environmental Health Disparities Map to compare communities for environmental health risks and disparities using a risk index and ranking (Washington Department of Health 2018). This information was also considered for identifying overburdened communities. Relevant methodology, data and maps are available in *Appendix F*.

The Environmental Health Disparities Map gives a score of 1 to 10 to represent environmental health risks and community risk by environmental health burdens. A ranking of 1 indicates populations least impacted while 10 represents populations most impacted.

Census block groups with higher concentrations of vulnerable populations and overburdened communities were identified through an iterative analysis that considered the demographic indicators and the health disparities data. All block groups intersecting tribal reservation lands were includes as a preliminary equity focus area. *Appendix F* summarizes the methodology used for identifying the preliminary equity focus areas. Figure 3-19 illustrates the preliminary equity focus areas and areas identified for further study.

Most of the preliminary equity focus areas are concentrated along SR 167, SR 516, and SR 18 and most are north of SR 18.

Travel Patterns in Preliminary Equity Focus Areas

The preliminary equity focus areas are mostly concentrated on the north of the study area. As described in *Chapter 11, Travel Patterns*, SR 167 is more heavily used by people who live south of SR 410 (26%) than by those who live north of SR 18 (17%). This usage pattern is notable because more people live north of SR 18 compared to south of SR 410 (300,151 versus 212,883).

As noted earlier in this chapter, equity focus populations tend to own fewer vehicles (about 9% of the households in preliminary equity focus block groups do not own a vehicle which is 3% more than the study area as a whole). National and regional data also indicate that equity focus populations tend to use transit and active modes more than the population as a whole. The travel pattern data in *Chapter 11* aligns with these national/regional trends with greater transit and active mode activity concentrated north of SR 18. These patterns are important considerations when evaluating which groups might benefit most from general capacity expansions on SR 167 compared to expanding capacity on transit and active modes.

It is worth noting that many manufacturing and industrial areas (such as the Port of Tacoma) tend to have vulnerable populations and overburdened communities in select areas but in much smaller numbers, given the limited residential land uses. These communities can be particularly hard to serve but should be considered when designing last mile transit solutions.

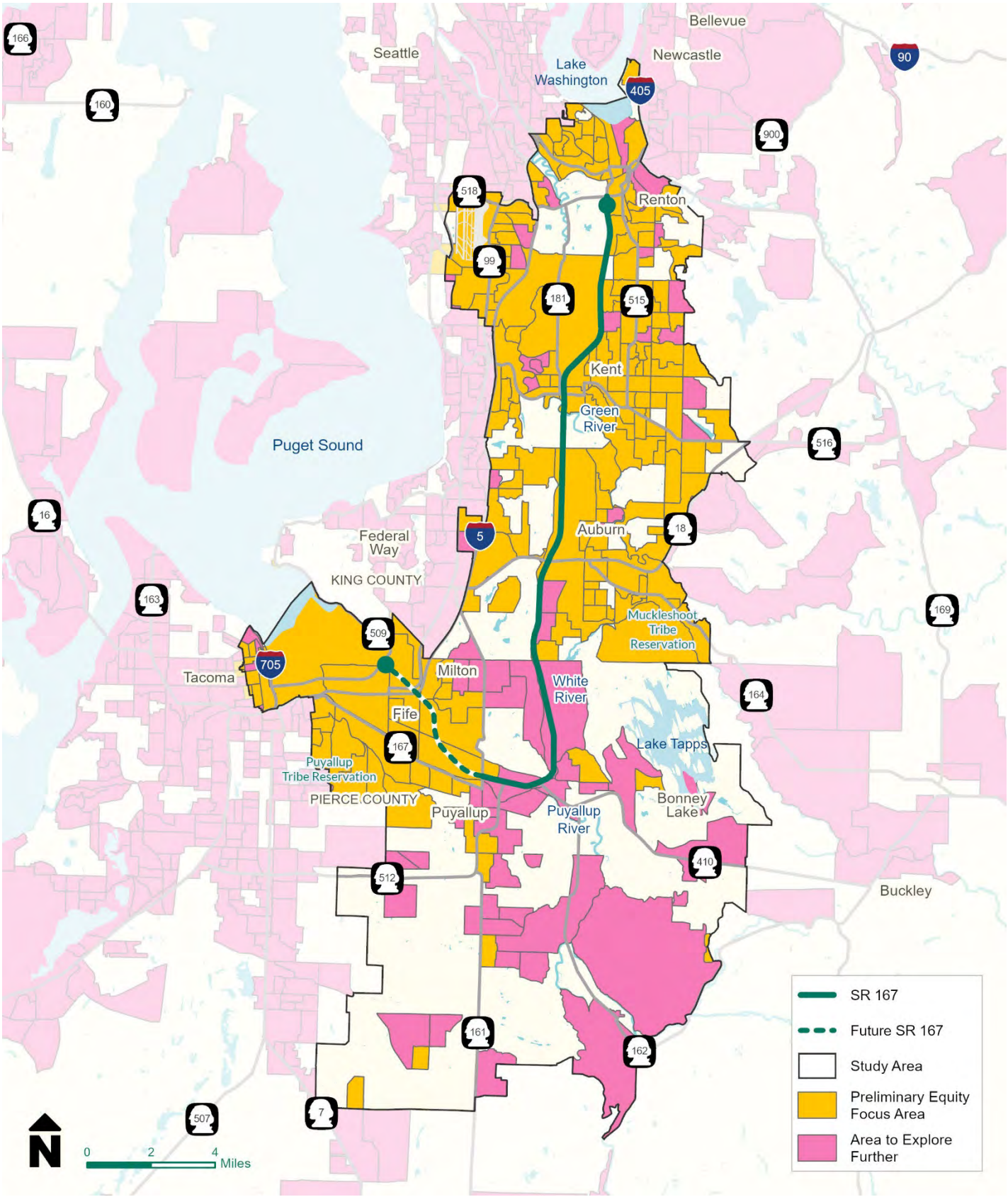


Figure 3-19. Preliminary Equity Focus Areas and Areas to Further Explore

Refined Equity Priority Areas

The methodology and geographies for the preliminary equity focus areas were refined based on input from the Equity Advisory Committee and other community groups, as summarized in *Appendix F*. Census block groups and tracts with the highest concentrations of vulnerable populations and overburdened communities were selected as equity priority areas. These areas are used in identifying and analyzing transportation solutions that aim to maximize benefits and minimize impacts to people within equity priority areas.

Chapter 4. Facility Summary

Chapter Overview

This facility summary chapter describes the basic geometry (number of lanes and access points), right-of-way, and a summary of the conditions of the facility (namely bridges, culverts, pavement, and electrical infrastructure). This chapter helps to establish the baseline from which the Master Plan PEL Study is starting as it relates to what is built today, its current condition, and upcoming maintenance and preservations needs.

Key findings in this chapter Include:

- There is sufficient right of way along SR 167 for considering strategic capacity projects.
- SR 167 is in relative strong State of Good Repair.
- Over the next 30 years, it is expected that some bridges, all culverts, and the majority of ITS systems will need upgrading or replacement.
- New project design will need to consider and account for environmental conditions such as liquefaction, protection of water quality and other environmental risks (refer to *Chapter 12, Environmental Baseline*).

Basic Description

SR 167 is a state highway located in the Central Puget Sound region, extending from Renton in King County to Tacoma in Pierce County. From a functional standpoint, the SR 167 facility serves as a freeway extension of Interstate 405 (I-405) south of the Tukwila/Renton area and a critical alternative to Interstate 5 (I-5) for moving both people and goods, connecting numerous communities in the Green River and Puyallup River valleys. SR 167 is also a major freight corridor. There are numerous manufacturing and warehousing centers along the corridor, and SR 167 provides a direct connection between these centers, I-5, the Port of Tacoma, and SR 18 for east/west travel to Eastern Washington.

Basic Geometrics

SR 167 is a 28-mile corridor from Puyallup to Renton, and it is part of the great 50+ mile-long I-405/SR 167 corridor. SR 167 primarily consists of two access-controlled general-purpose lanes in each direction. About half of the corridor includes a single high-occupancy toll (HOT) lane in each direction. The HOT lane system extends for approximately 12.5 miles in the northbound direction from 15th Street Southwest to I-405 and approximately 14 miles in the southbound direction from I-405 to Ellingson Road. The corridor's HOT lanes are part of the larger I-405/SR 167 managed lanes system and currently operate seven days a week between 5:00 a.m. and 7:00 p.m. with a 2+ vehicle occupancy requirement for non-tolled trips. Outside of these times, the HOT lanes are open to all.

A short segment of SR 167 (less than 1 mile) is an arterial street in Renton, between I-405 and SR 900/S 3rd Street. The southern 6.5 miles between I-5 in Tacoma and SR 161 in Puyallup are also not built to freeway standards, although the southern segment is being realigned and built as a limited access highway as part of WSDOT's Puget Sound Gateway Program. Figure 4-1 provides a facility overview by milepost.

County	Location	Accumulated Route Mile	Destinations
King	Renton	28.46	SR 900 (Sunset Boulevard / South 3rd Street)
		27.56	I-405 to I-5 - Bellevue, Everett, Seattle
		25.70	South 180th Street, Southwest 41st Street, Southwest 43rd Street, East Valley Road
	Kent	23.68	South 212th Street
		22.61	84th Avenue South, North Central Avenue
		20.90	SR 516 (Willis Street) – Des Moines
		19.21	South 277th Street
	Auburn	17.05	15th Street Northwest – Auburn
		15.61	SR 18 to I-5 - Auburn, Federal Way
		15.09	To SR 18 west / 15th Street Southwest
	Pacific	13.52	Ellingson Road – Algona, Pacific
Pierce		11.93	8th Street – Pacific, Milton
	Sumner	10.88	24th Street East, West Valley Highway
		8.30	SR 410 east – Sumner, Yakima
	Puyallup	7.23	SR 161 south / SR 512 west – Olympia, Eatonville
		6.50	SR 161 north – Milton, Edgewood
	Tacoma	0.00	I-5 to SR 16 – Olympia, Portland, Seattle

Figure 4-1. SR 167 Facility Overview

Right-of-Way

The right-of-way along SR 167 is approximately 144 feet to 250 feet wide. Larger right-of-way areas are located around each of the interchanges.

In some locations, properties owned by the state are adjacent to or near SR 167. These properties are primarily used for stormwater detention ponds and enhanced wetland sites developed as mitigation for previous improvement projects.

From Auburn to Puyallup, available space for highway widening is primarily in the median between the northbound and southbound travel lanes. From Renton to Auburn, available space for highway widening is typically to the outside edges of the highway.

The existing right-of-way is sufficient to construct at least two additional lanes in each direction between I-405 and SR 512. However, additional land will be needed for stormwater management (such as detention ponds) and wetland mitigation. A significant amount of additional right-of-way could be required depending on the mitigation strategy and regulations in place at the time of project implementation.

WSDOT has secured adequate right-of-way for the SR 167 extension between Puyallup and the Port of Tacoma, with a typical width of 78 feet.

Asset Conditions Summary

Washington's highway system is composed of numerous components, such as pavements, bridges, drainage systems, and electrical systems, all of which must be maintained on a regular basis and replaced or restored when they wear out. Maintaining infrastructure in a state of good repair is one of WSDOT's highest priorities.

This section summarizes the current state of WSDOT's assets (bridges, culverts, pavement, etc.), based primarily on GIS data and coordination with the different maintenance and preservation groups in WSDOT's Northwest (responsible for SR 167 in King County) and Olympic (responsible for SR 167 in Pierce County) regions. Knowing the existing conditions of these assets will be informative in understanding the level of investment necessary to preserve and maintain current and expanded infrastructure on SR 167.

WSDOT currently utilizes a Maintenance Accountability Process (MAP) as an asset management tool. MAP uses outcome-based performance measures to evaluate the effectiveness of the maintenance program. It highlights individual components in the system, their physical condition,

and unmet needs. MAP uses a Priority Matrix[3] that ranks maintenance activities by identifying how critical each activity is in helping the Maintenance Program achieve broad policy objectives, which are consistent with the WSDOT Strategic Plan, and ensures that the highest risk assets are addressed first. This section of the planning study will stay consistent with the MAP Priority Matrix and will cover maintenance, where work is performed on a frequent, recurring cycle, and preservation, where cycle duration for an individual asset may be a decade or longer.

Bridges and Major Structures

SR 167 has 64 bridge structures. Bridges cross arterial roadways, railroad tracks, and streams. Figure 4-2 displays the bridge structures along the corridor. Bridges can serve as barriers to active transportation when facilities for active modes are not included or are limited by bridge foundations.

Most existing bridges were initially constructed in the 1970s. About half were rebuilt in the 1980s or 1990s. Nearly all the facility's bridges have a rating of Good or Fair; only two bridges over railroads have a Poor rating. The Bridge Engineering Information System (BEIST) rates 17 of the 64 bridges as Functionally Obsolete and 2 as Structurally Deficient.

FHWA requires all state transportation agencies to report annual state, city, and county data concerning the structural condition, functional adequacy, and essentiality for public use of all bridges statewide. FHWA uses these data to determine if a bridge is Structurally Deficient and/or Functionally Obsolete.

Structurally Deficient: Means a bridge is in a structurally deteriorated condition and does not adequately carry its intended traffic loads.

Functionally Obsolete: Means the bridge does not have adequate approach alignment, geometry, or clearance to meet the intended traffic needs and is below accepted design standards.

The SR 167 corridor lies within the moderate to high liquefaction susceptibility area (*Chapter 12, Environmental Baseline*). Liquefaction areas require more engineering measures, such as ground stabilization, deeper foundations, and appropriate structural systems, which increases the cost and complexity of retrofits and new capacity.

[3] https://wsdot.wa.gov/sites/default/files/2022-01/2021-2023-MAP-Priority-Matrix.pdf

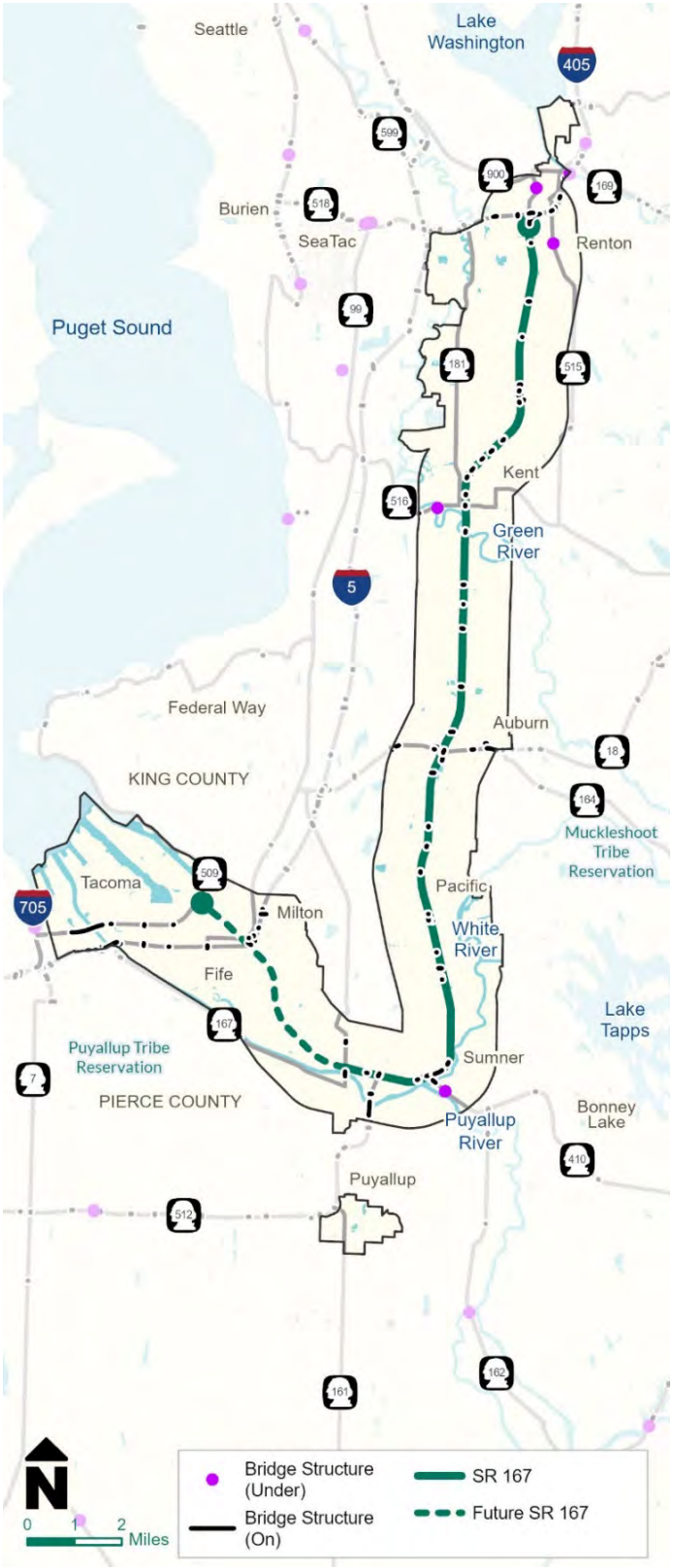


Figure 4-2. Bridge Structures on or Under SR 167

Culverts

The typical lifespan of culverts is 50 to 75 years, and most of the cross culverts were built with the corridor in the 1970s. It is WSDOT policy to replace all storm drainage systems and non-fish culverts within project limits for all capital projects where those facilities are near the end of their 50-year life cycle, unless inspections find them to be in acceptable condition. There are a total of 123 known culverts along the SR 167 corridor, 60 of which convey streams with confirmed fish use. Fish passage inventory data should be verified as projects develop along the SR 167 corridor.

Approximately 20 culverts along SR 167 are "uncorrected injunction barriers" which are culverts that inhibit the passage of certain fish, including salmon and steelhead. It is a high priority for WSDOT to replace or upgrade these culverts by 2030; the culverts are illustrated in Figure 4-3. The remaining culverts need preservation or replacement work at the end of their useful life or as part of project that would otherwise replace the culvert, whichever comes first. Refer to the Fish Passage Barriers section of *Chapter 12, Environmental Baseline,* for more details.

There are a few known areas along the corridor that flood frequently due to undersized facilities, presence of artesian wells, creeks and high-water events, beaver activity, and issues stemming from local, regional, and state infrastructure deficiencies. These specific locations are included in *Appendix B*. For further information on flooding risks, refer to Flood Hazards section in *Chapter 12.*

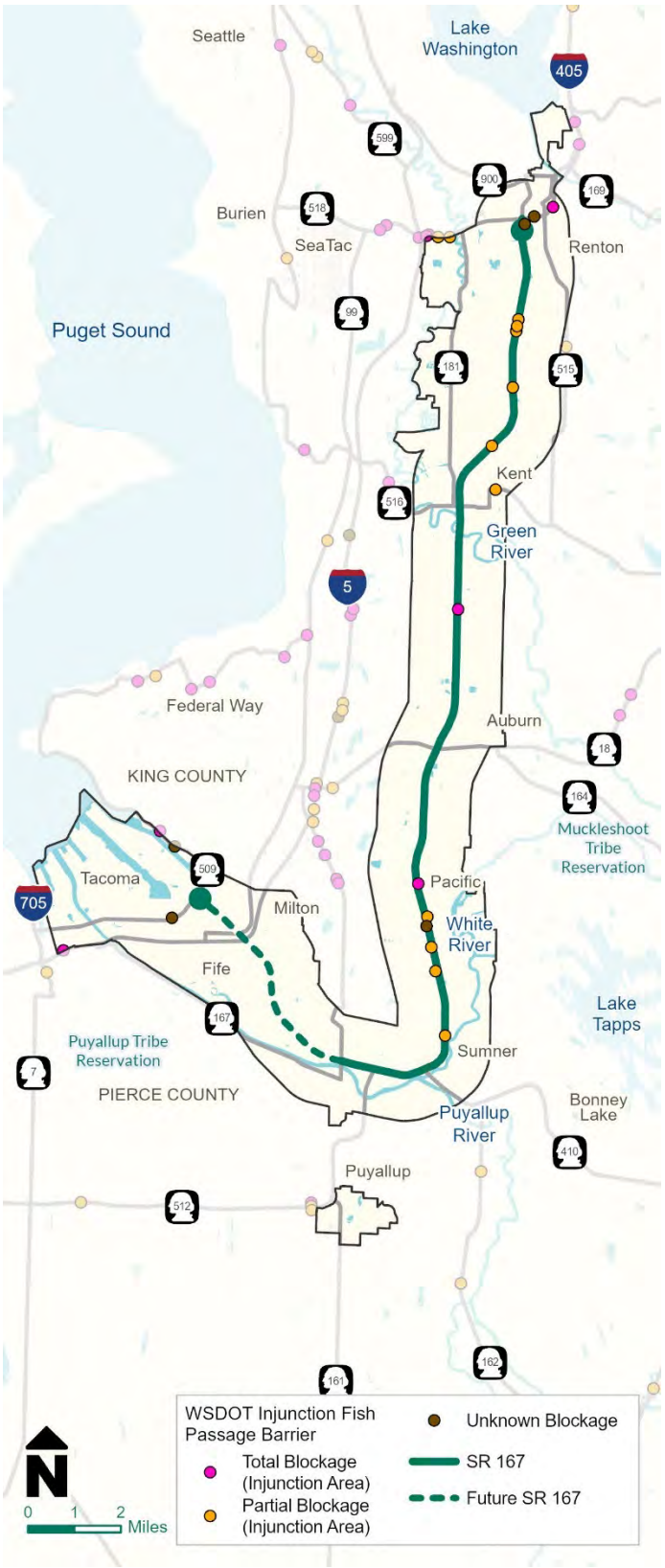


Figure 4-3. SR 167 Uncorrected Injunction Barriers

Pavement Condition

Much of the SR 167 facility pavement is in Fair or Good condition, although some northbound lanes in Puyallup and between Kent and Auburn are rated Poor or Very Poor.

The WSDOT GIS Data Portal gives pavement rating values for all sections along SR 167. Figure 4-4 displays the pavement data conditions, which are summarized in Table 4-1.

Table 4-1. WSDOT-Pavement Condition Summary

Rating	Northbound SR 167 (total miles)	Southbound SR 167 (total miles)
Very Good	1.3	6.9
Good	8.8	4.3
Fair	11.5	3.0
Poor	2.7	0.2
Very Poor	0.1	0.0
Not Surveyed, Not Rated, or Under Construction	4.2	13.9
Total Miles:	28.5	28.3

Source: WSDOT GIS Data Portal 2021

Three-fourths of the northbound corridor is rated Fair or better, 10% of the pavement is rated Poor or Very Poor, and the remaining 15% is unrated. Half of southbound SR 167 is unrated, and the other half of southbound pavement is rated Fair or better. Only 1% of the southbound pavement is rated Poor or Very Poor.

Flooding on shoulders and several ramps contributes to degrading pavement along the corridor, specific problem areas are included in *Appendix B*.

Figure 4-4. SR 167 Pavement Condition

Signals, Intelligent Transportation Systems, Illumination, and Other Electrical and Electronic Systems

Technology and electrical components of the corridor, including Intelligent Transportation Systems (ITS), enhance the performance of modern transportation systems by improving efficiency, safety, and security. Because ITS often includes sophisticated devices, computer hardware and software, and communications infrastructure, traditional asset management tools are not always appropriate, and systems need to be upgraded or replaced more frequently.

The SR 167 corridor contains diverse technology focused assets that support most communication, tolling, and ITS systems, which have been installed and/or upgraded under different projects. There are also upcoming funded projects in the area, most notably:

1. The Southbound SR 167Auxiliary Lane Project in Northwest Region.
2. The Stage 6 – HOT Lane Extension Project in Olympic Region.
3. The SR 167 Completion Project; that will include tolling and ITS as part of the realignment of SR 167 from Puyallup to Fife.

What follows in this section is a summary of signal, ITS, and other electrical systems that need upgrades, repair, or replacement as identified by WSDOT Olympic Region Signal staff. It will also include challenges that maintenance and preservation groups are currently facing.

The existing infrastructure that needs upgrades includes:

1. Signal system, services, illumination, ITS cameras, and ramp meters for SR 167 at Stewart Road/Jovita Boulevard/West Valley Highway.
2. Signal system, illumination, and services for SR 167 northbound and southbound on- and off-ramps at 24th Street.
3. Signal system and illumination for SR 167 at Meridian.

4. Illumination system and services at the SR 167 and SR 410 interchange.
5. Illumination system and services at the SR 167 and SR 512 interchange.

In general, the ITS equipment on the corridor, including Variable Message Signs (VMS), ramp meters, fiber, and conduits, is either in good condition or will be replaced as part of funded improvements over the next several years.

However, in discussions with Northwest and Olympic Region staff, vandalism and water infiltration are ongoing issues that require either continual attention or more resilient equipment to address.

Chapter 5. Land Use, Housing, and Employment

General Zoning and Land Use Designations

Land use zoning designations and current land use throughout the study area vary widely, from single family zoning to multifamily to heavy industrial areas. Although historically the Green River Valley was largely agricultural land, this has changed since the construction of SR 167 in the 1970s. The study area is now heavily utilized for residential, commercial, and industrial land uses.

Current land use information from PSRC was aggregated down to seven categories to provide a high-level overview of how land in the study area is currently used. Table 5-1 details the breakdown of land uses as a percentage of the total study area. Note that the percentages in Table 5-1 do not include public streets and highways within the total land use area. Streets and highways total approximately 6% of the study area. The most prevalent type of land use in the corridor is single family residential, which typifies the relatively low-density suburban development pattern in the corridor. The next-most common land use in the study area includes parks and open space, and manufacturing and industrial uses, which are often related to large-scale warehousing uses. *Chapter 6, Freight Network*, provides an overview of freight mobility in the study area.

Chapter Overview

This chapter summarizes the general land use patterns within the study area including the total number of households and employment. Both existing and 2050 future conditions are described. Land use patterns and housing/employment growth are key to the SR 167 Master Plan PEL Study because land uses generate demand for travel and transportation services.

As of 2019 the study area had approximately 236,000 housing units and 401,500 jobs. By 2050, 433,000 housing units and 645,300 jobs are expected in the study area, an increase of 84% and 61%, respectively. Over one-third of the current employment is related to manufacturing and jobs are concentrated in manufacturing centers.

Table 5-1. Existing Land Uses within Study Area

Land Use Categories	Percentage of Study Area
Commercial/Retail/Food/Services	7%
Farm	3%
Manufacturing/Industrial	14%
Office/Government/Medical/Schools/ Military	6%
Multi-Family Residential	7%
Single Family Residential	43%
Parks/Open Space	20%

Source: King County and Pierce County Parcel Data 2021

There are isolated areas of higher-density land uses, particularly in the downtown areas of Tukwila, Renton, Kent, Auburn, and Puyallup. These areas tend to have multi-family residential developments, higher-intensity retail, and office employment.

For the most part, the land uses in the study area result in relatively high numbers of vehicle trips, which is typical of lower-density suburban areas. However, the higher density areas are associated with more trips by transit, walking, and biking as noted in *Chapter 7, Active Transportation Network*, and *Chapter 8, Transit Network*.

Regional Growth Centers, Manufacturing and Industrial Centers, and Countywide Centers

As part of the PSRC Regional Growth Strategy, PSRC and local agencies defined special area designations. The 2018 update to the Regional Centers Framework adopted the following designations:[4]

- Regional Growth Centers
  - Urban Growth Centers. Areas where major investments may offer new opportunities for growth
  - Metro Growth Centers. Areas that already have dense existing jobs and housing and are planning for significant growth
- Manufacturing/Industrial Centers
  - Industrial Growth Centers. Clusters of industrial lands that have potential for future job growth and long-term potential
  - Industrial Employment Centers. Highly active industrial areas with significant existing jobs and a history of industrial activity, with a goal to maintain or grow industrial employment

As part of the Vision 2050 Regional Growth Strategy, PSRC updated is Regional Centers Framework to allow jurisdictions to identify Candidate Countywide Centers, which may be adopted in the future (2025 to 2026) as part of the Regional Growth Strategy. Countywide Centers are described in the following text.

- Candidate Countywide Centers. Areas with concentrations of jobs, housing, shopping, and recreational opportunities. They are often smaller downtowns, high-capacity transit station areas, or neighborhood centers that are linked by transit, provide a mix of housing and services, and serve as focal points for local and county investment.

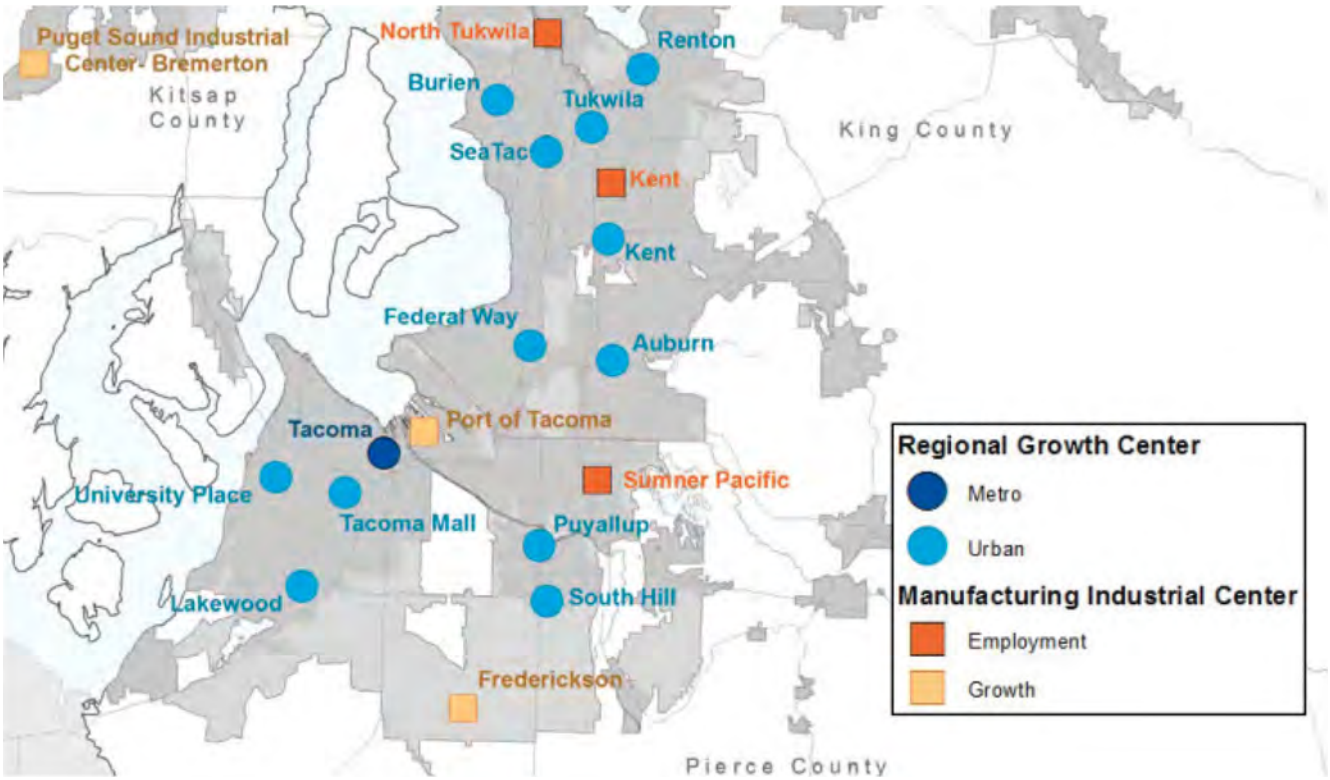
PSRC-designated Centers are planned to concentrate household and employment growth with investments in transit and other infrastructure supportive of higher densities, including freight to and from MICs. Centers will likely grow faster than surrounding areas that are not designated.

Currently designated PSRC Centers, as adopted in the Vision 2050, within the SR 167 Study Area are illustrated in Source: PSRC Vision 2050 Regional Growth Strategy, Figure 25

Figure 5-1. At the time of publication of this report, PSRC has not yet mapped Countywide Centers; however, Candidate Countywide Centers include:

- Skyway in unincorporated King County between Renton and Seattle
- Grady Way transit-oriented development in Renton around the South Renton Bus Rapid Transit (BRT) station
- Canyon Ridge near the intersection of Southeast 256th Street and 104th Avenue Southeast in Kent
- Sumner Town Center
- Downtown Bonney Lake

[4] PSRC Designation Procedures for New Regional Centers, Adopted June 2018



Source: PSRC Vision 2050 Regional Growth Strategy, Figure 25

Figure 5-1. Designated Centers within South King and North Pierce County

Existing Housing Units

As of 2019, there are approximately 236,000 housing units in the study area, which represents a growth of 40% since the year 2000. While most of the housing is single family, multifamily housing is growing, particularly in Regional Growth Centers. Housing is distributed throughout the study area[5] (Figure 5-2), but it is more concentrated east of SR 167 in places like the East Hill area of Renton, Kent, and Auburn and in the southern end of the study area, notably in places like Lakeland Hills, Bonney Lake and Puyallup's South Hill.

[5] This land use information is provided by PSRC by Traffic Analysis Zone, a geographical boundary used in land use and travel demand modeling programs.

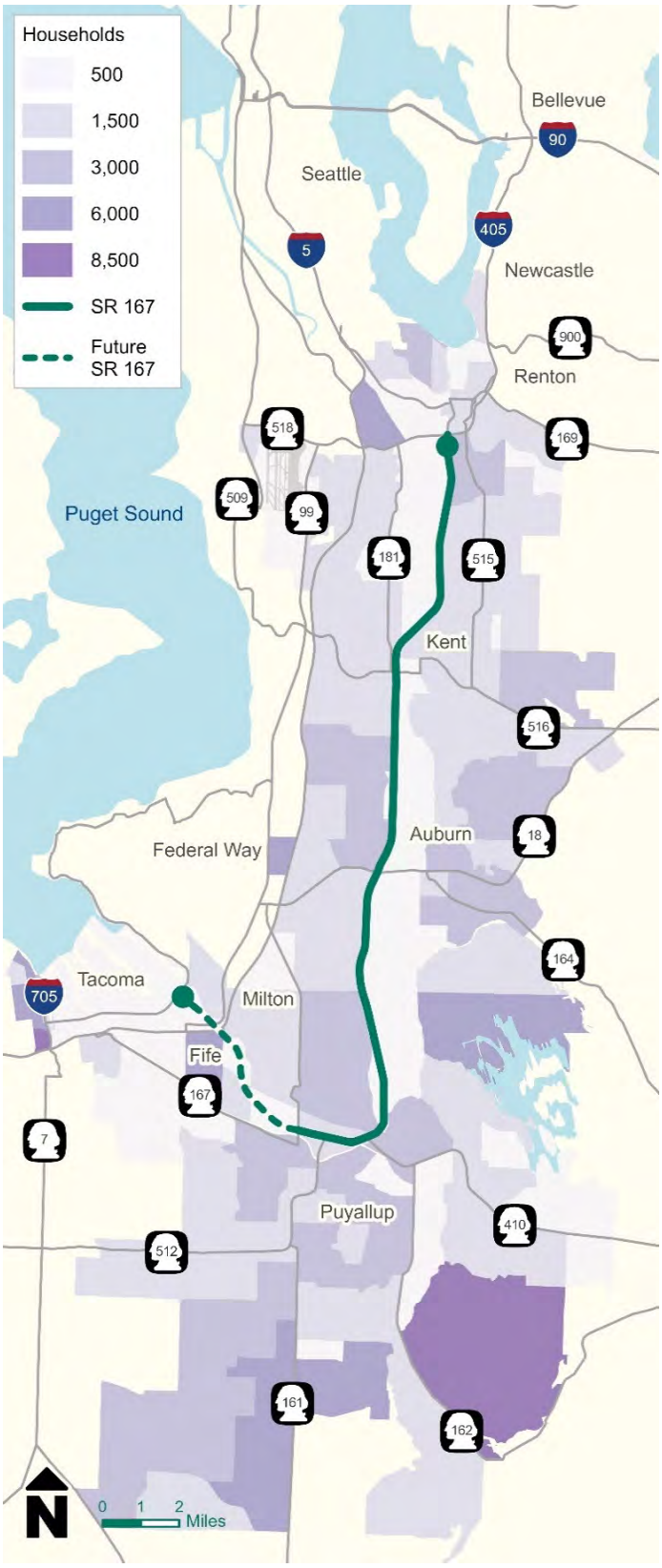


Figure 5-2. Households by Traffic Analysis Zone

2050 Housing Unit Forecasts

Over the next 30 years, the total number of housing units in the study area is forecast to increase by about 84% to a total of more than 433,000. Much of this growth will occur with increased infill of existing lots that can be redeveloped at higher densities, as well as new and expanded master planned communities like Tehaleh, which are largely located in unincorporated Pierce County.

While much of the area is currently zoned for single family dwelling units, recent trends at a national and state level have pointed towards potential future legislation that allows for higher density among existing single family zones, such as accessory dwelling units or duplexes. If such legislation passes, redevelopment at higher density in former single family zones would take many years to increase housing units, and many areas may continue to host little or no increased density.

A smaller, but notable increase in housing units will continue within the areas RGCs and Countywide Centers as older, lower-density land uses are replaced with multi-family developments. This trend is already visible in places like Southcenter in Tukwila, downtown Renton, Kent, Auburn, and Puyallup, but is expected to accelerate in pace over the coming decades.

Existing Employment

There are approximately 401,500 jobs within the study area as of 2019. Much of the employment is concentrated in certain areas, particularly city centers and industrial areas. Figure 5-3 illustrates the relative density of employment throughout the area. Due to the nature of the land use along SR 167, employment and housing are often located in separate areas, meaning that areas with high employment density often have low housing density. Manufacturing and industrial employment often incudes unique characteristics, such as shift work, which can be challenging to serve with transit.

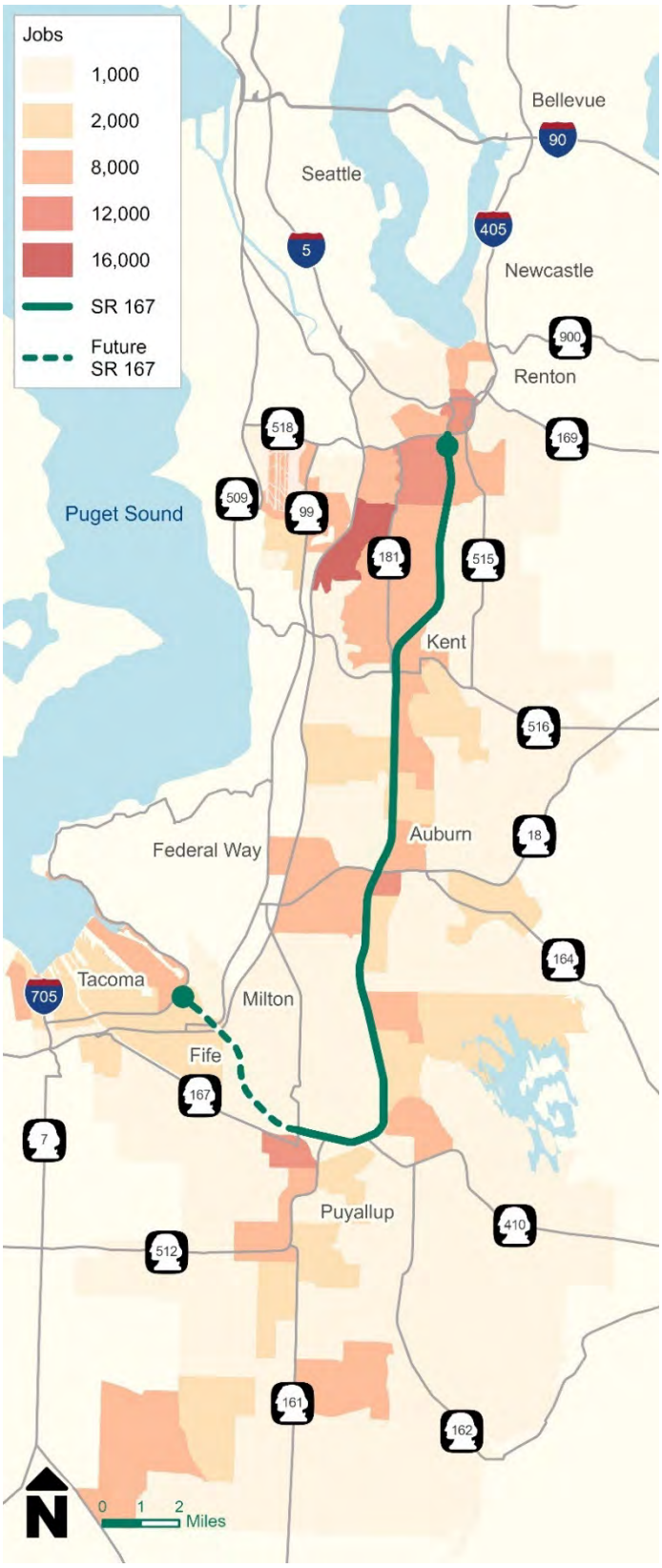


Figure 5-3. Jobs by Traffic Analysis Zone

According to U.S. Census Bureau data, as of 2019, about 34% of the jobs within the study area are related to manufacturing, wholesale trade, warehousing, and transportation. This compares to 19% of employment in those same categories across King and Pierce Counties as a whole. Many of these jobs are concentrated in MICs like Frederickson, the Port of Tacoma, Kent, and Sumner Pacific.

2050 Employment Forecasts

Employment within the study area is expected to continue to increase over the next 30 years. Based on PSRC land use growth estimates, employment within the study area is expected to increase by 61% to 645,300 jobs in 2050.

Chapter 6. Freight Network

Chapter Overview

The study area is home to the largest cluster of warehousing and distribution centers in the Pacific Northwest. These land uses, combined with major manufacturers and the nearby Ports of Tacoma and Seattle result in substantial freight movement through the study area. This chapter summarizes the role of SR 167 as part of the regional freight network and some key freight routes that connect manufacturing, warehousing, and industrial uses to the SR 167 facility.

Some notable results summarized in this chapter include the fact that SR 167 carries approximately 10,000 trucks daily, which represent between 10% and 20% of all vehicle volumes on the freeway. Freight volumes are estimated to grow by at least 50% by 2050. The Port of Tacoma, MICs, and other manufacturing and industrial areas along the corridor are the primary truck trip generators, with only 9% of the truck volumes passing through the corridor. Most of the truck trips have one or more trip ends in the corridor, contributing to jobs and the economy. Refer *Chapter 11. Travel Patterns*, for further information on truck travel patterns.

SR 167 as a Piece of the Regional Freight Network

Freight, which includes raw materials and finished goods transported by trucks, trains, ships, barges, or airplanes, plays a critical role in the Puget Sound region's economic vitality. Businesses, manufacturing industries, and residents rely on freight shipped via the region's multimodal transportation system which consists of roadways, railways, waterways, airports, pipelines, and freight intermodal facilities. Additionally, there are numerous manufacturing and warehousing facilities along SR 167 between Renton and Fife, many of which are used to supply consumer goods to the region. Figure 6-1 illustrates the regional freight network. The freight network also facilitates pass-through freight trips that use SR 167 as a link along their trip.

Freight Corridors

Various freight vehicles traverse the SR 167 corridor and other roadways in the study area, ranging from single-unit trucks facilitating package deliveries to large semi-trucks delivering vehicles and freight to local and regional businesses. Rail freight also plays a large role in local, regional, and nationwide freight movement within and through the SR 167 study area.

Trucks transporting goods throughout the region contribute to and are impacted by traffic congestion. Freight vehicles emit higher levels of greenhouse gas emissions and other harmful pollutants. Growing congestion within the SR 167 corridor, as well as the rest of the region, directly impacts freight movement and increases travel time, costs, and the environmental impact of transporting goods. State, local, and regional agencies actively partner in building and maintaining an efficient freight transportation network through the Freight and Goods Transportation System (FGTS).

FGTS is a Washington-specific freight designation system, which classifies the state's freight corridors by modes based on annual freight tonnage moved through truck, rail, and waterway freight corridors.[6]

[6] WSDOT Washington State Freight and Goods Transportation System (FGTS) 2019 Update, 2020 https://wsdot.wa.gov/sites/default/files/2021-10/washington-freight-and-goods-transportation-system-2019.pdf

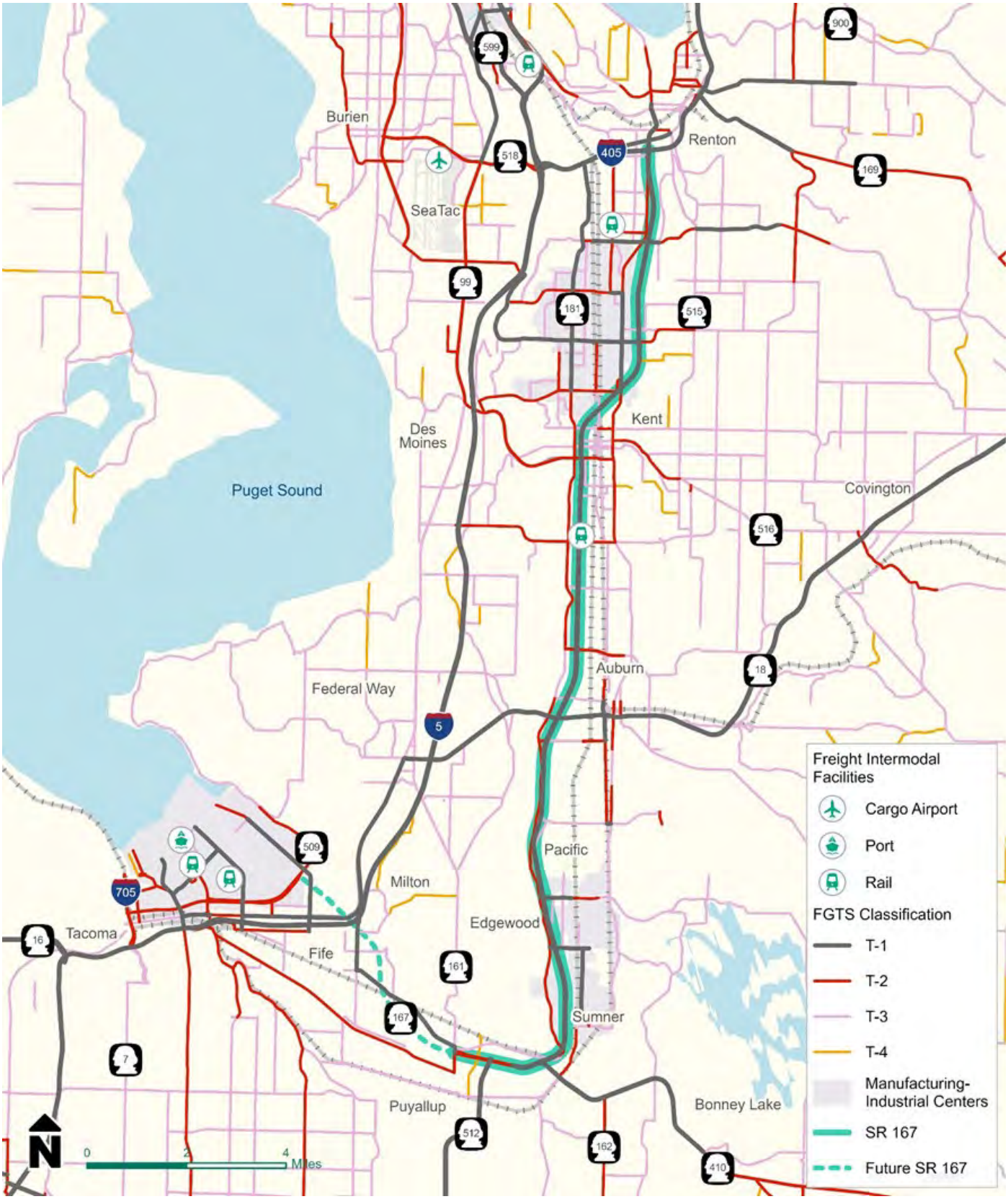


Figure 6-1. Regional Freight Network

Designated FGTS routes aim to prevent heavy truck traffic on lower volume streets and promote the use of adequately designed roadways. WSDOT classifies freight corridors using five freight tonnage

classifications described in Table 6-1. The tabulated criteria are tied to the economic value of a corridor, with T-1 and T-2 truck freight corridors having the most economic importance.

Table 6-1. WSDOT Freight Classification

Freight Corridor	Description
T-1	More than 10 million tons of freight per year
T-2	Between 4 million and 10 million tons of freight per year
T-3	Between 300,000 and 4 million tons of freight per year
T-4	Between 100,000 and 300,000 tons of freight per year
T-5	At least 20,000 tons of freight in 60 days and less than 100,000 tons per year

Source: WSDOT Washington State Freight and Goods Transportation System (FGTS) 2019 Update 2020

As illustrated in Figure 6-1, SR 167, I-405, I-5, I-90, SR 18, SR 410, SR 512, SR 181, and several arterials adjacent to manufacturing and warehousing facilities in the region serve as T-1 corridors, which facilitate the transportation of more than 10 million tons of freight per year. The study area also has several road segments classified as T-2 through T-5 freight corridors. SR 167 and I-405 are the second busiest freight corridors in Washington after I-5, as detailed in Table 6-2. In 2019, approximately 10,000 trucks per day utilized the SR 167 corridor.

Daily truck percentage on SR 167, taken from permanent traffic recorder (PTR) data range from 8% to 13%, with the highest concentration of trucks occurring between SR 410 and SR 18. Table 6-2 graphically illustrates the daily truck percentage at northbound SR 167 south of 15th Street SW, with truck percentage as high as 18% during the AM period.

Two north-south R-1 rail freight corridors (Union Pacific and BNSF) run parallel and adjacent to the SR 167 corridor and connect the Port of Tacoma to the Port of Seattle. The east-west BNSF Auburn-to-Pasco Railway connects to the BNSF Tacoma-to-Seattle Railway near SR 18. Both rail freight corridors serve as R-1 corridors in the Freight and Good Transportation System, which means they facilitate the transportation of more than 5 million tons of freight per year. The freight rail network is congested and often impacts or delays shared passenger travel via Amtrak and Sounder.

Table 6-2. 2019 Daily Truck Volumes Estimates Along Major Regional Corridors

Freight Corridor	Daily Truck Volume	Truck Percentage Relative to all Traffic
I-5	15,000	5 to 10%
SR 167	10,000	10 to 20%
I-405	10,000	5 to 10%
SR 18	7,000	10 to 15%
SR 512	7,000	5 to 10%
I-90	5,500	5 to 15%
SR 410	4,000	5 to 10%

Source: WSDOT Washington State Freight and Goods Transportation System (FGTS) 2019

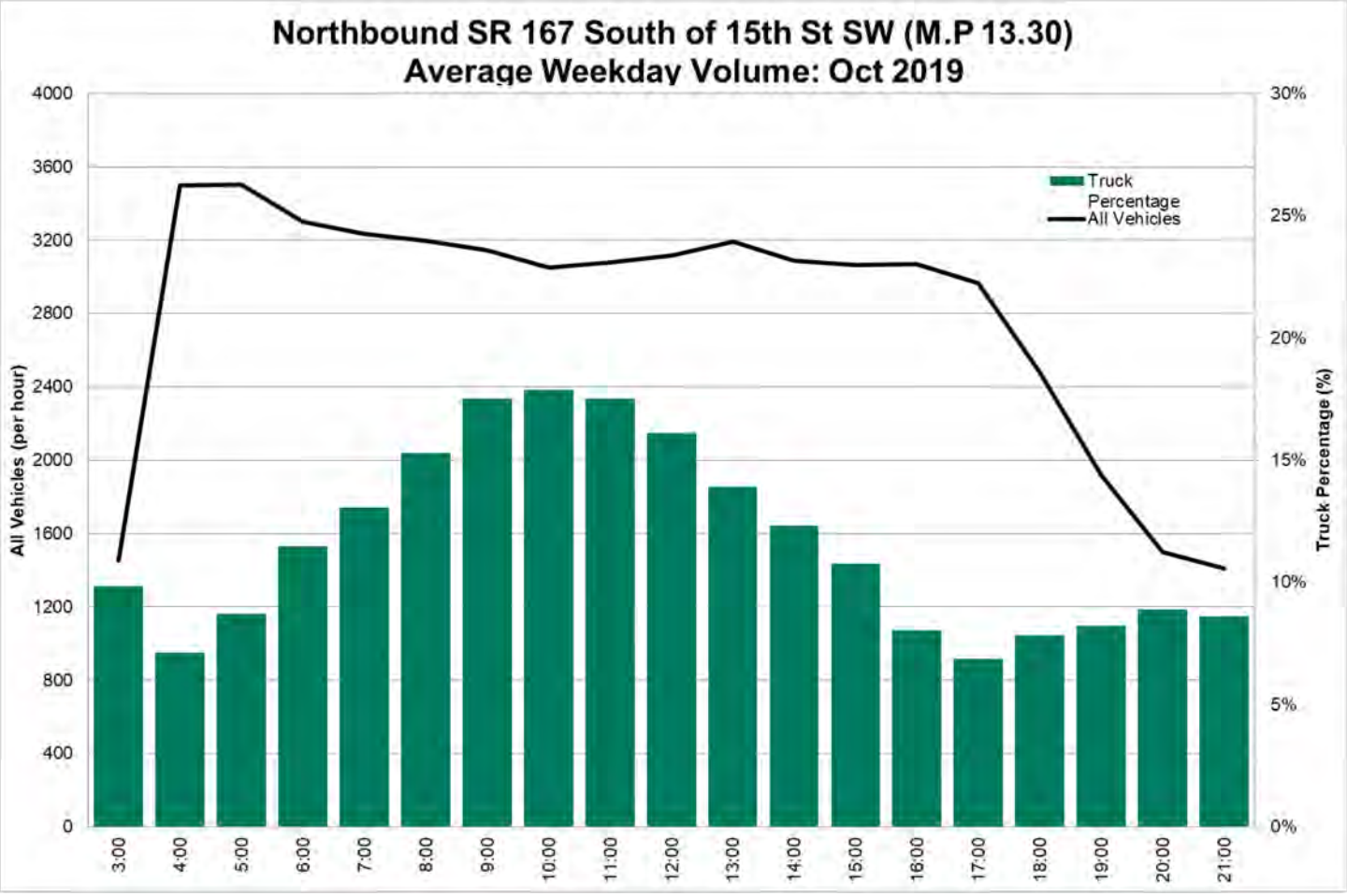


Figure 6-2. Northbound SR 167 Average Weekday Volume and Truck Percentage South of 15th Street SW, October 2019

Because of SR 167's proximity to the ports and major warehousing clusters, truck parking is a key freight issue within the study area. Truck parking is necessary to accommodate trucks awaiting entry to facilities like the Port of Tacoma, which have specific operating hours, and to allow for a safe area for drivers to rest after they reach their federally allowed number of operating hours.

The 2016 *Washington State Truck Parking Study* identified SR 167 as the fifth highest corridor in the state with a substantial unmet demand for truck parking. The 2022 *Washington State Freight System Plan Update* identified undesignated truck parking in the vicinity of the Port of Tacoma. There are numerous land use compatibility issues, equity implications, and land use regulations that need a coordinated effort to address and implement truck parking. WSDOT is committed to partner with other agencies and the private sector on addressing truck parking. Of note, the 2023-2025 Biennium allocated $12 million to assess, develop, and implement truck parking strategies across the state, including in the Puget Sound region.

2050 Baseline Freight Outlook

Washington is one of the most trade-dependent states; therefore, an efficient freight transportation system will continue playing a pivotal role in fostering economic vitality and competitiveness in regional and

global markets.[7] The Freight Analysis Framework (FAF), a national annual freight commodity flow database, projects growth in total annual truck freight flow of 58 to 67% in the State between 2020 and 2050 under the tabulated scenarios as detailed in Table 6-3.

In addition to the growth in regional/national freight flows described by FAF, last-mile truck deliveries to homes and businesses are also anticipated to increase over the years, primarily due to the prevalence of e-commerce. Between 2009 to 2019, U.S. e-commerce sales increased an average of about 4% each quarter, growing from approximately 4% of all retail sales to 11% of all retail sales. In 2020 alone, the U.S. Census Bureau reported that e-commerce sales grew by 43% and made up 15% of all retail sales. The majority of these-commerce sales require physical delivery, thus increasing the number of delivery vehicles on roadways. Many of the Puget Sound Region's major distribution centers are located within the study area, and this type of land use continues to exhibit rapid growth.

Table 6-3. Annual Truck Freight Flow Projections for Washington

Scenario	Origin Commodities (thousand tons)	Destination Commodities (thousand tons)	Total (thousand tons)	% Growth
Base Year – 2020 [a]	291,148	301,554	592,701	-
2050	460,036	476,429	936,465	58%
2050 Low Growth	437,349	453,024	890,373	50%
2050 High Growth	485,464	503,169	988,633	67%

Source: Freight Analysis Framework 5 Database

Note:

[a] The FAF database does not have data for 2019; therefore, 2020 was considered the base year for this analysis.

Table 6-4 presents 2050 forecasts of truck flows along SR 167 during the PM peak hour as forecasted by the version of the PSRC Regional Travel Demand Forecasting Model that has been developed for the Master Plan PEL Study. The reported growth in truck flow along the corridor aligns with truck freight flow growth projections for the state in Table 6-3. Increased truck trips are attributed to expected growth in land use in the study area between 2019 and 2050 discussed in *Chapter 5, Land Use, Housing, and Employment*. Anticipated transportation infrastructure, including new HOT lanes north of SR 410 and north of Jovita Boulevard E, will aid in supporting expected growth in truck trips.

Table 6-4. PM Peak Trucks along SR 167

Location on SR 167	2019	2050	% Growth
North of SR 410	1,750	2,700	54%
North of Jovita Boulevard East	2,200	3,050	39%
North of SR 18	2,900	3,550	22%
South of SR 516	3,100	3,950	27%
South of South 212th Street	2,600	3,400	31%
South of I-405	2,550	3,700	45%

Source: 2019 and 2050 SR 167 travel demand models

[7] 2017 Washington State Freight System Plan https://wsdot.wa.gov/publications/fulltext/freight/Freight-Plan-2017SystemPlan.pdf

Chapter 7. Active Transportation Network

Chapter Overview

This chapter describes the network that supports active modes along the SR 167 corridor. The focus of the analysis is on major and minor arterials within 1 mile of SR 167 and the adjacent RGCs since this is where most of the active mode travel that would affect the SR 167 facility will take place. All the regional trails within the study area are documented since they accommodate longer distance travel, particularly by bicycle. A connectivity analysis is also included to quantify how SR 167 and other human-made and natural barriers increase the circuity of active mode travel within 1 mile of the corridor.

Under existing conditions, just over half of all the principal and minor arterials have sidewalks on both sides of the street. About 57% of these arterials completely lack bicycle facilities. Within the RGCs, the percentage of streets with pedestrian facilities is higher than the overall study area average. By contrast, RGCs tend to have fewer bicycle facilities than other areas. The lack of active mode infrastructure was cited by several partners as a barrier to access in the study area.

A review of local agency capital plans indicates continued investment in the regional trail network, connections to regional trails, and some additional expansion of sidewalks and bike facilities in RGCs. However, substantial gaps in the pedestrian and bike system will likely remain in the study area through 2050.

Active Transportation Network

There is a wide variety of active transportation infrastructure (facilities that support walking, rolling, and biking) in the corridor in terms of availability of facilities and facility types. As noted in *Chapter 5, Land Use, Housing, and Employment*, the study area is largely a lower-density suburban environment, and this is reflected in a generally sparse and somewhat disconnected active mode network. Denser areas like the RGCs and neighborhood commercial centers tend to have more complete and connected sidewalk networks, but major gaps in the bicycle network remain.

Trails

There are approximately 37 miles of independent paved trails within 1 mile of the SR 167 corridor. The network is comprised of multiple major regional trails and smaller local trails. Major trails in the study area include:

- Interurban Trail is the primary trail corridor in the study area and runs from just north of I-405 in Tukwila to Pacific in northern Pierce County. The Interurban Trail's straight and level alignment make it a good option for bike commuters who might otherwise drive on SR 167. Segments of the Interurban trail also are complete in Edgewood and Fife.
- Green River Trail runs between Tukwila and Kent with a shorter disconnected section in Auburn. This trail follows the meandering Green River and is less direct (but may offer more recreational opportunities) than the Interurban Trail.
- Lake to Sound Trail is a largely incomplete trail that is envisioned to extend between Puget Sound in Des Moines to Lake Washington in Renton. Within the study area there is a segment of the trail between the Green River Trail and Naches Avenue in Tukwila. When complete, this trail will provide a good connection between the Interurban Trail and employment centers and RGCs in SeaTac and Renton.
- Springbrook Trail runs for about 3 miles parallel to SR 167 through the Longacres area of Renton

between Oakesdale Avenue and approximately Southwest 43rd Street.
- Soos Creek Trail runs parallel to SR 167 from 192nd Street in Kent to Meridian Park.
- Kent Puget Power Trail connects the Green River Trail to 68th Avenue S/SR 181.
- Kent Regional Trails Connector provides a connection between the Puget Power Trail and the Interurban Trail in Kent.
- White River Trail runs between A Street and the Game Farm Park in Auburn.

Sidewalks and Bike Lanes

The evaluation of sidewalks and bike lanes within the SR 167 study area was constrained to principal and minor arterials within 1 mile of SR 167 and within RGCs. Complete and uniform data on principal and minor arterials was available for all jurisdictions within the study area from the Transportation System Conditions Visualization Tool dataset from PSRC.

System Completeness

"System completeness" rates the degree to which a transportation network has been built to what is planned by a jurisdiction. This approach was used to evaluate the extent of the existing sidewalk and bike lane facilities within the study area. The PSRC data used in this analysis rates whether each principal or minor arterial within the study area has incomplete (e.g., missing), partially complete, or complete sidewalk and bike lane facilities relative to a community's design manual and/or active transportation plan.

While the system completeness metric is valuable at a basic level, it only measures the presence of such facilities, not the sufficiency of such facilities. Poor maintenance, inadequate accessibility accommodations, facilities that do not feel safe next to high traffic volumes and speed, and narrow facilities may not meet the needs of users.

Table 7-1 through Table 7-6 summarize system completeness for facilities on minor and principal arterials within each of the RGCs in the study area. As detailed in the tables, there is a general pattern to system completeness for each of the RGCs, namely that the pedestrian system is much more complete than the bicycle system. This result is typical for the entire region and reflects that sidewalks have been planned for and included in standard design plans for much longer than bicycle facilities.

Table 7-1. Renton RGC Active Transportation Network

System Completeness	Pedestrian		Bicycle	
	Total (miles)	%	Total (miles)	%
Incomplete	0.0	0	8.1	61
Partial	1.9	19	1.6	12
Complete	8.4	81	3.5	27

Table 7-2. Tukwila RGC Active Transportation Network

System Completeness	Pedestrian		Bicycle	
	Total (miles)	%	Total (miles)	%
Incomplete	0.1	2	7.1	66
Partial	2.2	31	0.0	0
Complete	4.8	68	3.7	34

Table 7-3. Kent RGC Active Transportation Network

System Completeness	Pedestrian		Bicycle	
	Total (miles)	%	Total (miles)	%
Incomplete	0.0	0	3.5	77
Partial	0.0	0	0.1	3
Complete	3.8	100	0.9	20

Table 7-4. Auburn RGC Active Transportation Network

System Completeness	Pedestrian		Bicycle	
	Total (miles)	%	Total (miles)	%
Incomplete	0.2	12	2.0	96
Partial	0.0	2	0.0	0
Complete	1.7	86	0.1	4

Table 7-5. Puyallup RGC Active Transportation Network

System Completeness	Pedestrian		Bicycle	
	Total (miles)	%	Total (miles)	%
Incomplete	0.0	0.0	4.1	100
Partial	0.3	7	0.0	0
Complete	3.8	93	0.0	0

Table 7-6. Within 1 Mile of SR 167 Active Transportation Network

System Completeness	Pedestrian		Bicycle	
	Total (miles)	%	Total (miles)	%
Incomplete	26.3	22	90.4	57
Partial	30.1	25	17.0	11
Complete	66.5	54	52.6	33

Overall, along the corridor there are approximately 123 miles of minor and principal arterials. 54% have complete pedestrian facilities. About 21% of the arterials have completely missing sidewalk facilities.

There are approximately 160 miles of bicycle facilities within 1 mile of SR 167, including trails. Trails alone make up 37 miles of the total bicycle facilities and therefore comprise the largest proportion of the "complete" bicycle facilities in the study area. Approximately 90 miles of arterials are completely missing bicycle facilities.

Comparing the corridor system completeness results to the RGC results, it is evident that the sidewalk system is less complete outside of the RGCs, but the study area's extensive trail network provides a more complete bicycle system outside of the RGCs.

Active Mode Barrier Analysis

SR 167 can serve as a barrier to communities on either side of the corridor due to limited crossing opportunities at interchanges, overpasses, and underpasses. Even existing available crossings may present barriers for many users due to the facility characteristics at those locations. These barriers are more challenging for active transportation modes, where detours are more impactful to convenience and comfort of the overall trip. Areas without complete street grids can increase travel distances between points. Discontinuities like dead ends limit the extent pedestrians and bicyclists can travel within a given time limit.

A connectivity analysis was completed to measure areas where routes may take considerably longer to distance to travel when compared to a straight line between the origin and destination. This helps to identify barriers in the network, particularly for active modes where circuitous routes can push people to travel by car or not make the trip at all. Figure 7-1 illustrates overall connectivity analysis results surrounding the corridor. Overall, connectivity is highest around denser, mixed-use areas with complete street grids like the downtown areas of Puyallup, Sumner, Auburn, Kent, and Renton. Connectivity near SR 167 is poor due to the barrier it presents, as east-west crossings of the highway can be far apart. In addition to the connectivity barrier created by SR 167, other barriers highlighted by the analysis include the freight railroads, large blocks in the MICs, disconnected cul-de-sac neighborhoods that are largely east of SR 167, and the steep bluffs on both sides of the highway that limit the number of roadways connecting the hilltops to the valley.

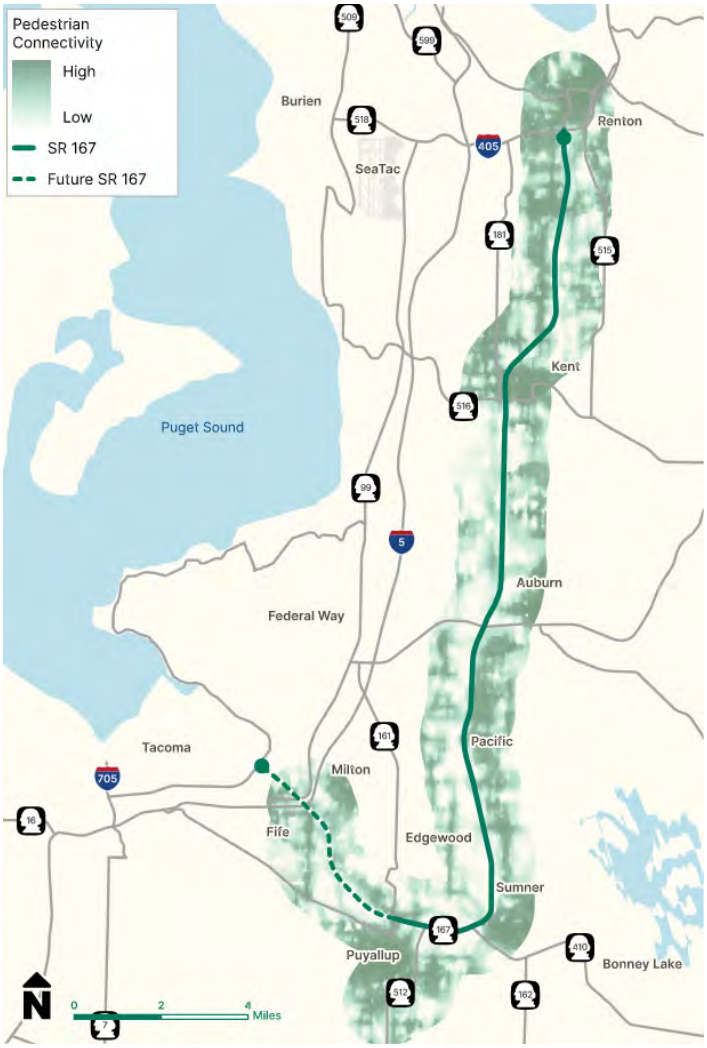


Figure 7-1. SR 167 Barrier Analysis

It should be noted that this connectivity analysis does not account for the detailed design features of the active mode infrastructure that is present along each roadway due to an incomplete active mode data set across the study area. For example, while a roadway may cross SR 167, there may be no paved sidewalk or comfortable place for bicyclists to travel. While there is a connection across SR 167 in this example, many active mode travelers would not feel comfortable using this connection. Similarly, connections between regional trails and destinations at either end of a trip may be nonexistent or uncomfortable for many users.

Future Active Transportation Network Expansion Plans

Multiple Regional Growth Centers have plans to expand their active mode and trail network.

In the middle of the corridor, the City of Auburn has outlined new trail segments called the A Street Southeast Trail and the recreational Auburn Environmental Park Loop in its comprehensive plan. These segments will add active mode infrastructure near the urban growth center and SR 167. The City of Kent is planning to build new projects to better connect local and regional trails. One project would improve sidewalks and bike facilities along South 228th Street between the Green River and Interurban Trails. This project will provide continuous facilities between the two regional trails while also connecting to the local 64th Avenue South Trail. A similar project is also planned on South 212th Street to connect the Green River and Interurban Trails. The City of Tukwila is planning to extend the Lake to Sound Trail, creating an east-west regional trail. The segment will be built along Southcenter Boulevard connecting to the recently completed segment of trail by Renton near Fort Dent Park. The City of Renton is also in the process of completing trails networks and arterial bicycle facilities within the city. Projects include phases of the Lake Washington Loop Trail and the second phase of the Lake to Sound Trail.

Further south, the City of Puyallup is planning to fill in gaps of its River Walk Trail adjacent to the Puyallup River by constructing River Walk Trail Phase V. This project outlined in the 2020-2026 Transportation Improvement Program (TIP) is halfway between SR 167 and downtown Puyallup, measuring about half a mile away from each. Additionally, WSDOT is leading efforts to build out the Tacoma to Puyallup Trail, which would connect downtown Tacoma to downtown Puyallup with a connection to the existing segment of the Interurban Trail in Milton. A portion of the trail is funded through the SR 167 extension project, but other segments are still in the planning phase.

Even with these expansions to the active mode network by 2050, a substantial portion of the corridor will still have incomplete facilities and indirect access caused by the SR 167 facility.

Additionally, while trails and active transportation connections to, from, and between trails can increase connectivity, many origins and destinations are not along these trails and connections, but instead are along arterial roadways. Most of the communities along the SR 167 corridor have active transportation plans, but the implementation of improvements in these plans tends to be less well-defined when compared to trail investments. Many of these improvements tend to be made as part of roadway overlay projects or development frontage improvements. This translates into an incremental, but sometimes disconnected set of improvements. In other words, while the active mode system is expanded over time, some of the more challenging gaps in the system sometimes remain unaddressed due to lack of funding or complexity. Active modes continue to be underfunded, although more funding is becoming available as the focus on active modes grows.

Chapter 8. Transit Network

Chapter Overview

Transit is a critical component of the Master Plan PEL Study when considering the concentrations of vulnerable populations and overburdened communities and feedback from Community Based Organizations. As noted in this chapter, most of the transit ridership and activity is concentrated in the northern portion of the study area, which is also the area with the most robust transit network. These findings are echoed in the travel patterns summarized in *Chapter 11, Travel Patterns*. Transit coverage is notably sparse in unincorporated Pierce County.

The analysis for this report focused on 2019 conditions to reflect pre-pandemic levels of transit ridership. Note, however, that King County Metro (KCM) made a substantial change in routing in the fall of 2020 and subsequent refinements in 2022.

As of 2019, the highest ridership routes were all oriented north/south and include the Sounder S Line, and KCM Route 150, Route 180, and Route 169. Many of these north/south routes offer frequent headways (15-minute frequencies for most of the day). There are no frequent east/west routes that run through the core of study area (KCM's RapidRide F Line is on the far northern edge). This lack of east/west transit access (which is how many people access the more frequent north/south routes) is highlighted by partners in *Chapter 2, Community Outreach Summary*. Pierce Transit does not offer any frequent routes in the study area.

By 2050, substantial transit investments by all the transit agencies in the study area will result in improved service and increased ridership throughout the study area. Notably, KCM plans to substantially increase the level of east/west service in the study area with three new frequent routes that connect through major transit hubs and to Link Light Rail. Despite these investments, some gaps in transit coverage will remain in 2050.

Routes

Multiple transit agencies, including Sound Transit (ST), King County Metro (KCM), Pierce Transit (PT), and Muckleshoot Tribal Transit provide commuter rail and bus service in the study area along or parallel to the SR 167 corridor. ST offers north/south connections via the Sounder Commuter Rail and Regional Express bus service, while KCM facilitates both regional and local transit trips within the study area. Additional bus service options between King County and Pierce County and within Pierce County are provided by PT. Muckleshoot Tribal Transit operates on the reservation and in south Auburn to Auburn Station. While ST, KCM, PT, and Muckleshoot Tribal Transit provide extensive service within the study area, there is a gap in local transit service that encompasses Sumner, Bonney Lake, Orting, and much of unincorporated Pierce County.

Amtrak Cascades offers intercity rail service between Vancouver, British Columbia, and Eugene, Oregon, with a stop within the SR 167 corridor area in Tukwila. A summary of transit routes in the study area is presented in Table 8-1. The listed transit routes reflect 2019 pre-pandemic conditions.

One notable characteristic of the transit routes in the study area is the strong north/south orientation. This orientation reflects the dominant travel pattern in the area, which is in part an outcome of the study area

geography. Namely, the bluffs east and west of the Green and White River valleys make it more difficult to construct roads and route buses in east-west directions. However, the lack of east-west connections was brought up by several partner agencies and CBOs as a barrier to improved transit access in the study area.

Table 8-1. Transit Service Providers Within the Study Area

Transit Agency	Routes
Sound Transit	Sounder S Line, 566, 567, 578, 580, 596
King County Metro	150, 153, 169 [a], 180 [a]
Pierce Transit	400, 402, 497, 501
Amtrak	Amtrak Cascades

Sources: Sound Transit, King County Metro, Pierce Transit, WSDOT.

Note:

[a] As of September 2020, Routes 169 and 180 were replaced by Route 160, a frequent route that connects Renton, Kent, and Auburn.

The regional transit network and the KCM and PT service areas are presented in Figure 8-1. This figure also includes several transit hubs, including stations and park-and-ride lots which serve a wide variety of commuters, including carpoolers, vanpoolers, transit riders, commuter rail passengers, bicyclists, and pedestrians.

It should be noted that while many study area arterial roadways have at least one transit route, the frequency of bus trips on the transit network varies widely, from frequent (10 to 15 minutes or better) to hourly or peak only service.

High Speed Rail

WSDOT, in partnership with agencies in Oregon and British Columbia, has been actively studying the potential for a high-speed rail connection that could travel through the study area. While much study is necessary to bring this vision to reality, one potential alignment could be adjacent or near SR 167 or the parallel freight railroad/Sounder/Amtrak tracks. This potential for high-speed rail will be a consideration for the Master Plan PEL Study.

Figure 8-1. Regional Transit Network

Ridership

Transit ridership varies widely between different routes and transit modes and is based on 2019 pre-pandemic data. Table 8-2 presents aggregated average weekday boardings based on transit service type. Sounder commuter rail is evaluated separately, and commuter bus routes include ST Express bus routes while local bus routes include routes that primarily connect communities within the study area.

In addition to average weekday boardings, the PM peak period peak direction seat utilization was calculated based on ridership and capacity data. Seat utilization provides another way to examine the capacity of existing transit service and the number of seats available for additional riders. The Sounder S Line is the dominant transit route in the study area during weekdays with a high seat utilization of 93% in the peak direction, indicating that the commuter rail is typically close to the seated capacity during the PM peak period. In 2019, local bus routes also had competitively high average weekday boardings compared to the Sounder S Line; however, only an average of 56% of seats were utilized.

Table 8-2. Combined Ridership

Service Type	Average Weekday Boardings	PM Peak Period Seat Utilization
Sounder S Line	16,500	93%
Commuter Bus Routes	5,600	87%
Local Bus Routes	16,800	56% [a]
Amtrak Cascades [b]	50	57%

Sources: Sound Transit Service Implementation Plan, 2020; King County Metro Fall Ridership Data 2019; Pierce Transit Ridership Data, 2019; 2019 Washington State Rail Plan, 2019

Notes:

[a] At the time of publication, there was no available data on seat utilization for Pierce Transit; therefore, PM peak period seat utilization for local routes does not include Pierce Transit routes.

[b] Amtrak Cascades includes only Tukwila Station boardings. Only annual ridership data was available by station in the 2019 State Rail Plan, this was converted to average weekday boardings. Seat utilization also represents annual data.

Table 8-3 highlights average weekday boardings for the primary transit hubs in the study area and which agencies serve the hubs. Kent Station is the busiest transit hub in the study area and serves considerably more transit riders than any other hub.

Table 8-3. Major Transit Hubs

Transit Hub	Associated Transit Agency	Average Weekday Boardings
Kent Station	KC Metro, ST	6,600
Auburn Station [a]	KC Metro, PT, ST	2,800
Puyallup Station [a]	PT, ST	2,200
Tukwila Southcenter	KC Metro, ST	1,900
Sumner Station	ST	1,700
Renton Transit Center	KC Metro, ST	1,400
Tukwila Station	KC Metro, ST, Amtrak	1,300

Sources: Sound Transit 2020 Service Implementation Plan, King County Metro Fall 2019 Ridership Data, and 2019 Washington State Rail Plan

Note:

[a] At the time of publication, there was no available data on boardings at Auburn and Puyallup stations for Pierce Transit routes.

Park-and-ride lot usage on the SR 167 corridor varies substantially between lots, but each lot has remained relatively steady between 2015 and 2019. In 2019, five out of nine park-and-ride lots along the SR 167 corridor had utilization rates at or above 85%, which, from a practical standpoint means that the lots are full during a typical weekday.

Sound Transit Routes

Sound Transit offers regional transit service via the Sounder S Line and ST express bus routes 566, 567, 578, 580, and 596. These routes connect various communities in the Puget Sound region, including Seattle, Lakewood, Tacoma, Auburn, Redmond, Kent, Overlake, Puyallup, Sumner, Bonney Lake, and several others. Routes 566 and 578 operate on SR 167, which is also a route used by transit agencies for deadheading coaches. Sounder S Line is the busiest transit line in the vicinity of the SR 167 corridor, with more than 16,000 boardings on an average weekday in 2019, as detailed in Table 8-4. Ridership for ST Express bus routes ranged from 600 to 2,000 boardings.

Frequencies on the Sound Transit services range from peak-only commuter services like routes 566, 567, 580, and 596, to all-day bus services like route 578 that has 30-minute headways. Sounder S Line has headways as low as 20 minutes during the peak period in the peak direction, but there is no midday, evening, or weekend service and only limited non-peak direction service.

Table 8-4. Sound Transit Ridership

Route	Route Description	Average Weekday Boardings
Sounder S Line	Lakewood/Tacoma – Seattle	16,500
Rt-566	Auburn – Redmond	1,400
Rt-567	Kent – Overlake	700
Rt-578	Puyallup – Seattle	2,000
Rt-580	Puyallup – Lakewood	900
Rt-596	Sumner – Bonney Lake	600

Source: Sound Transit 2020 Service Implementation Plan

King County Metro Routes

Transit service provided by KCM is mostly focused on location connections within the study area, but Routes 150 and 180 also offer connections to Seattle and Burien. Other routes, such as DART and local routes, are not included in this regional-focused report. Table 8-5 presents average weekday boardings for KCM transit routes along or parallel to the SR 167 corridor. The highest ridership route (150) connects Kent and Seattle every 15 to 30 minutes during weekdays. Routes 169 and 180 also provide frequent all-day service. Note that there are several east/west routes in the study area (161, 165, 168, 181) that generally offer 30-minute frequencies. The RapidRide F Line is at the norther end of the study area and offers frequent all-day service between Burien, Tukwila, and Renton.

Table 8-5. King County Metro Ridership

Route	Route Description	Average Weekday Boardings
Rt-150	Kent – Downtown Seattle	5,500
Rt-153	Kent Station – Renton Transit Center	800
Rt-169	Kent Station – Renton Transit Center	3,400
Rt-180	Auburn – Burien Transit Center	4,800

Source: King County Metro Fall 2019 Ridership Data

Pierce Transit Routes

PT operates three types of service: fixed route, SHUTTLE paratransit, and vanpools. However, service within the study area is limited to Routes 400, 402, 497, and 501, as detailed in Table 8-6. In 2019, the Route 402 connection between Federal Way and South Hill along Meridian had substantially more riders than the other PT routes that provide service in the study area. PT routes within the study area generally have one-hour frequencies, except for Route 497, which is a peak-hour route that connects with the Sounder S Line at Auburn Station.

Table 8-6. Pierce Transit Ridership

Route	Route Description	Average Weekday Boardings
Rt-400	South Hill Mall Transit Center – 10th and Commerce Transit Center	500
Rt-402	Meridian East and 171st St Court East – Federal Way Transit Center	1,100
Rt-497	69th St Southeast and Lakeland Hills Way – Auburn Transit Center	300
Rt-501	10th and Commerce Transit Center – Federal Way Transit Center	400

Source: Pierce Transit 2019 Ridership Data, provided on request to Fehr & Peers

Amtrak Cascades

Amtrak Cascades operates daily service within the SR 167 study area, with Tukwila Station serving intercity rail passengers. In 2018, there were four daily round trips between Seattle and Portland. Ridership at Tukwila station accounted for 16,400 riders in 2018, approximately 2% of all Cascades Ridership. While weekday ridership was not available in the 2019 Washington State Rail Plan, estimated weekday ridership is between 40 and 50 passengers per day for Tukwila Station. While the Tukwila Station is not a major node for Amtrak Cascades, the overall seat utilization for trains through the study area was 57% in 2019.

2050 Baseline Transit Outlook

All the jurisdictions within the study area anticipate continued population and land use growth which will require more investment in transit infrastructure to meet the associated demand. Weekday ridership for routes in the study area is generally expected to increase by 2050, particularly for the Sounder S Line, as detailed in Table 8-7. A reduction in daily boardings for commuter bus routes is noted due to the anticipated Sounder S Line capacity expansion and reconfiguration of ST commuter bus routes as Link light rail is extended to from SeaTac to Tacoma and Stride BRT service is operated between Burien and Bellevue via Renton. Connections to these new high-capacity transit routes will largely be made via reconfigured local routes.

Table 8-7. Growth in Daily Boardings

Service Type	2019 Daily Boardings	2050 Daily Boardings [a]	Growth (percent)
Sounder S Line	16,500	33,000	100%
Commuter Bus Routes	5,600	4,600	-18%
Local Bus Routes	16,800	26,300	57%
Amtrak Cascades	50	65 to 135	30% to 170%

Sources: Sound Transit Ridership 2017 and 2042 Models, Sound Transit 2020 Service Implementation Plan, King County Metro Fall 2019 Ridership Data, 2019 Pierce Transit Ridership Data, and 2019 Washington State Rail Plan

Note:

[a] 2050 Ridership data references existing routes and does not include new routes that will be implemented as part of KC Metro, ST, or PT's long-range plans. Amtrak Cascades Ridership is forecast as a range from baseline (no major system expansion) to high (additional trips, longer trains, quicker travel time, and more reliable trips) scenarios. Annual ridership at Tukwila station is converted to weekday average.

KCM, ST, and PT are expanding their transit systems to facilitate continued growth, both locally and regionally. ST is currently expanding its transit system under the voter-approved Sound Transit 2 (ST2) and Sound Transit 3 (ST3) plans. The plans include expanding the regional light rail system, new BRT lines that will serve I-405 (including new BRT stations at SR 518/International Boulevard in SeaTac/Tukwila and Grady Way/Rainier Avenue in Renton), Sounder S Line capacity expansion, and station improvements.

KCM is restructuring and expanding route service as part of the agency's METRO CONNECTS vision, which includes new RapidRide routes in the study area. Under the Destination 2040 Long Range Plan Update, PT is also looking into a systemwide expansion with new Stream BRT corridors, along with greater frequencies for the four existing routes listed in Table 8-6. Some of the notable transit improvements planned by KCM and PT include:

- New KCM RapidRide and frequent all-day lines between:
  - Overlake and Renton via Eastgate (Metro Connects 1030; planned for future funding)
  - Renton and Auburn via Kent (RapidRide I Line; funded; planned to open in 2025)
  - Kent Des Moines and Fairwood via Tukwila (Metro Connects 1046; not currently planned for funding)
  - Rainier Beach and Federal Way via SeaTac, extension of RapidRide A Line (Metro Connects 1047; planned for future funding)
  - Kent and Rainier Beach via Tukwila, modification to Route 150 (Metro Connects 1049; planned for future funding)
  - Twin Lakes and Green River College via Federal Way (Metro Connects 1052; planned for future funding)
  - Highline Community College and Green River College via Kent (Metro Connects 1056; planned for future funding)
  - Covington, Kent, and Burien Transit Center, extension of Route 168 (Metro Connects 1514; planned for future funding)
  - Kent Station to Federal Way (Metro Connects 1515; planned for future funding)

Note that some of these new KCM frequent routes fill the gap of east/west connections highlighted earlier (routes 1046, 1052, and 1056).

- New PT Stream BRT lines:
  - BRT 1 between Spanaway and Downtown Tacoma (in progress)
  - BRT 2 between Lakewood Towne Center Transit Center and Downtown Tacoma via Tacoma Mall (proposed)
  - BRT 3 between Lakewood Towne Center Transit Center and Downtown Tacoma via Tacoma Community College (proposed)
  - BRT 4 between Thun Field and Puyallup Station (proposed)
  - BRT 5 between South Hill Mall Transit Center and the SR 512 Park and Ride at I-5 (proposed)

Note that the order of PT Stream BRT Routes 2 through 5 is currently being studies and is subject to change.

Amtrak Cascades is also considering expansions to service under a WSDOT planning process. The 2019 Washington State Rail Plan provided forecasts that range from a baseline service level that maintains current to a high service level that includes additional trips, reduced travel time, longer trains, and increased reliability.

Chapter 9. Safety Analysis

Chapter Overview

This chapter summarizes crash data for vehicles, pedestrians, and bicyclists. The safety analysis focuses on SR 167 freeway mainline lanes from SR 161/Meridian to I-405, as well as associated on- and off-ramps and cross streets. Pedestrian and bicycle crashes include all highways and city and county streets within 1 mile of SR 167. Crash history was examined over a five-year period from January 1, 2015, through December 31, 2019.

Between 2015 and 2019 there were 24 fatalities and 120 serious injuries along the corridor; 12 fatalities and 55 serious injuries where vehicle related, and 12 fatalities and 65 serious injuries were pedestrian or bicycle related. Bicycle and pedestrian crashes occur mostly in the urban areas, where activity is highest. For SR 167 mainline crashes, northbound SR 167 crash density is highest near I-405, southbound crash density is highest in the southern end of SR 167.

Motorized

Crash Frequency

The crash history[8] on SR 167 was examined to locate crash clusters and identify crash types and severity in the study area. The total number of crashes in the study area is summarized in Table 9-1.

Table 9-1. Total Number of Vehicle Crashes in SR 167 Study Area, 2015-2019

Facility	All Crashes	Fatal	Serious Injury
Northbound SR 167 Mainline	2,555	2	18
Southbound SR 167 Mainline	2,351	5	15
SR 167 Ramps	1,237	3	13
Interchange Cross Street	919	2	9
Total	**7,062**	**12**	**55**

Source: WSDOT 2021

Figure 9-1 and Figure 9-2 illustrate the northbound and southbound SR 167 mainline crash frequency within the study area, respectively, as well as locations of fatal and serious injury crashes. Of note, northbound SR 167 between the South 180th Street off-ramp and the northbound I-405 on-ramp has approximately 212 crashes per year and regularly experiences congestion related to the I-405 interchange for many hours throughout the day. On southbound SR 167, the segment between the 24th Street East off-ramp and SR 512 off-ramp had approximately 71 crashes per year. It is congested in the PM peak period and has frequent lane changes between SR 167, SR 410, and SR 512.

Ramps within the SR 167 with the highest crash frequency include southbound SR 167 off-ramp to SR 512, southbound SR 167 on-ramp from southbound I-405, and northbound SR 167 off-ramp to northbound I-405. Interchange cross streets with the highest crash frequency per year include 84th Avenue South (36 crashes), SR 516 (26 crashes), and South 212th Street (23 crashes).

[8] Under 23 U.S.C. § 148 and 23 U.S.C. § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned.

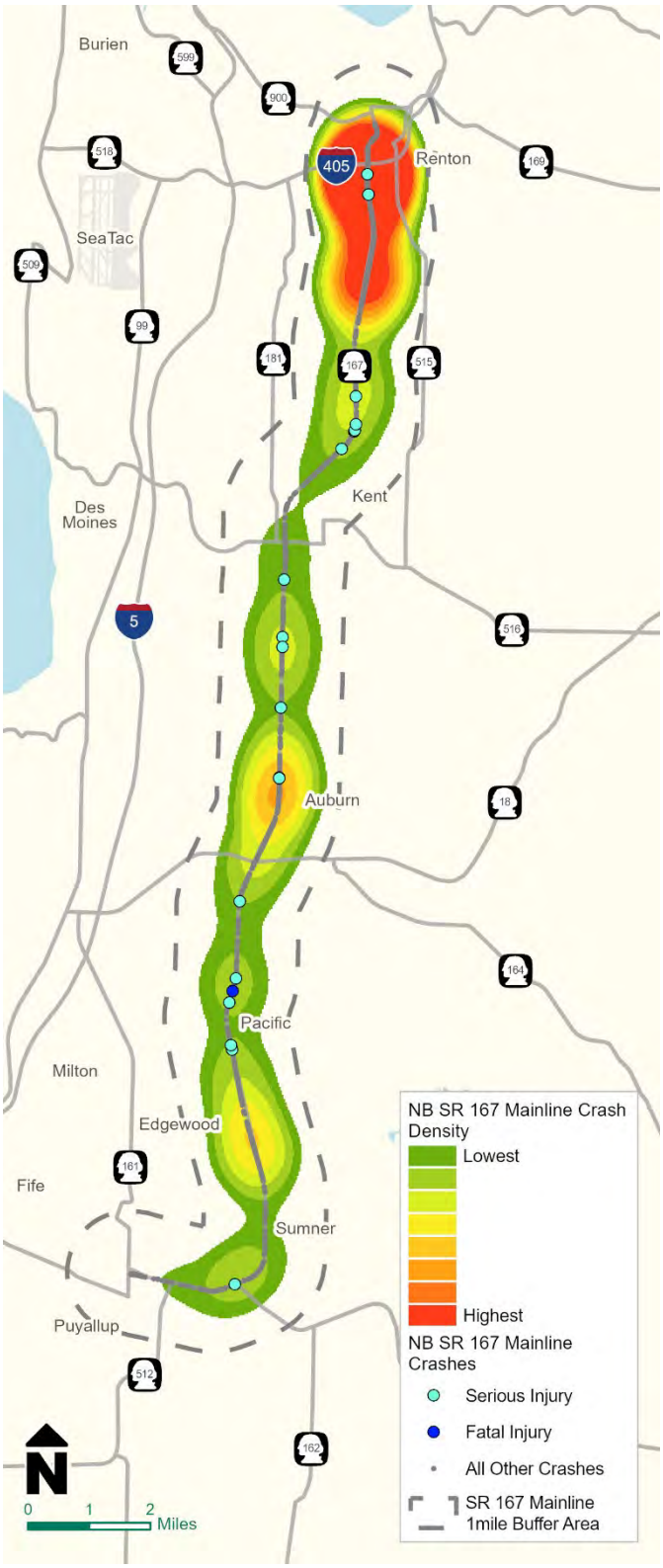


Figure 9-1. Northbound SR 167 Vehicle Crash Frequency and Severity, 2015-2019 Data

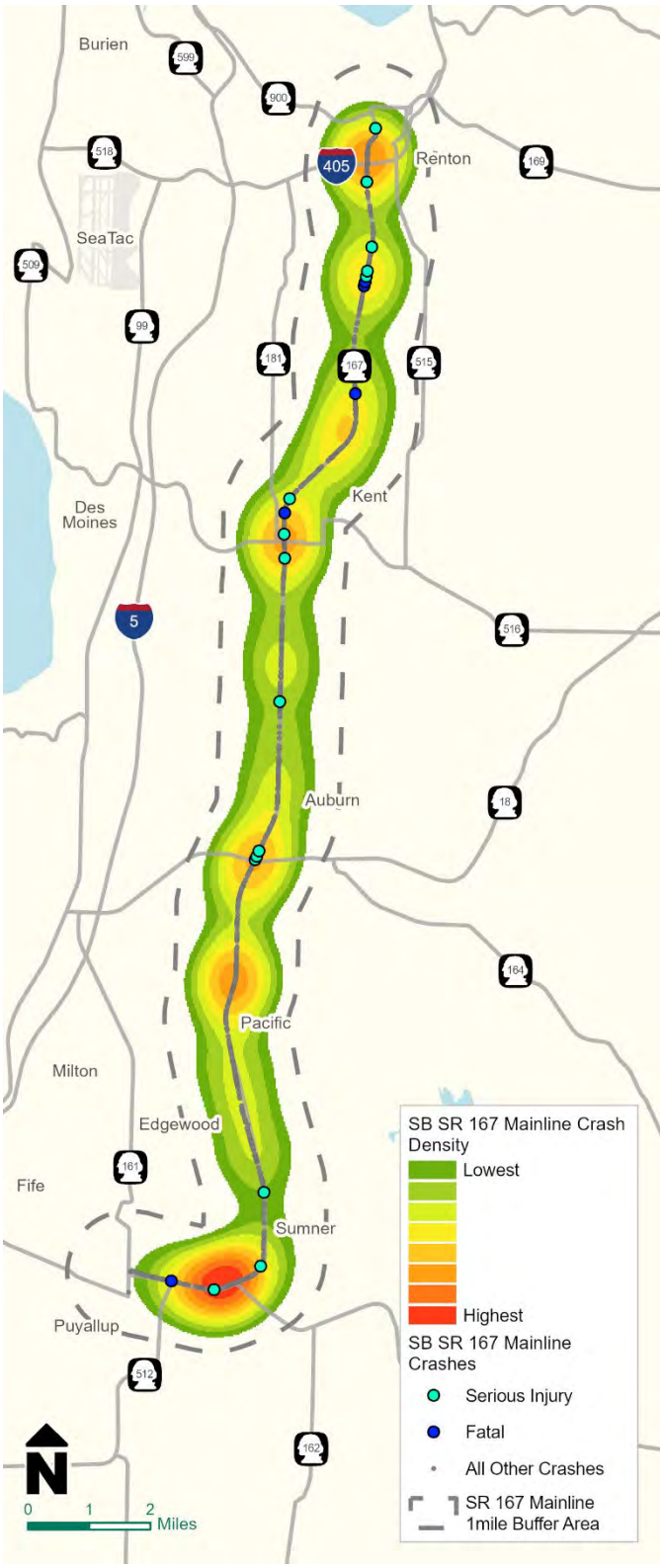


Figure 9-2. Southbound SR 167 Vehicle Crash Frequency and Severity, 2015-2019 Data

Crash Severity

Crash history was examined on the SR 167 mainline for the severity of crashes, with fatal and serious injury crashes detailed in Table 9-1, Figure 9-1, and Figure 9-2. There were a total of seven fatal crashes and 33 serious injury crashes on the SR 167 mainline over the five-year analysis period. The locations with the highest concentration of fatal and serious injury crash frequency include:

- Southbound SR 167 between the South 180th Street ramps, with 2 fatal and 2 serious injury crashes
- Northbound SR 167 between the Ellingson Road ramps, with 1 fatal and 2 serious injury crashes
- Northbound SR 167 from the 84th Avenue South on-ramp to the South 212th Street off-ramp, with 3 serious injury crashes
- Southbound SR 167 from the westbound SR 18 off-ramp to the 15th Street Southwest off-ramp, with 3 serious injury crashes

SR 167 ramps with the highest concentration of fatal and serious injury crashes include the southbound SR 167 off-ramp to westbound SR 18 (with 1 fatal and 2 serious injury crashes) and the southbound SR 167 off-ramp to SR 512 (with 3 serious injury crashes). No other ramp had more than 1 fatal or serious injury crash.

There were two interchange cross streets along SR 167 where fatal crashes occurred, including 15th Street Northwest (one fatal crash) and SR 516 (one fatal crash). South 212th Street had three serious injury crashes occur over the five-year study period.

Crash Types

Figure 9-3 illustrates the existing crash type distribution for the SR 167 mainline. Rear-end and angled/sideswipe crashes accounted for 85% of all crash types. These crash types are typically related to congestion and weaving movements. Fixed-object crash types accounted for 9%, while “other” accounted for any remaining crash types.

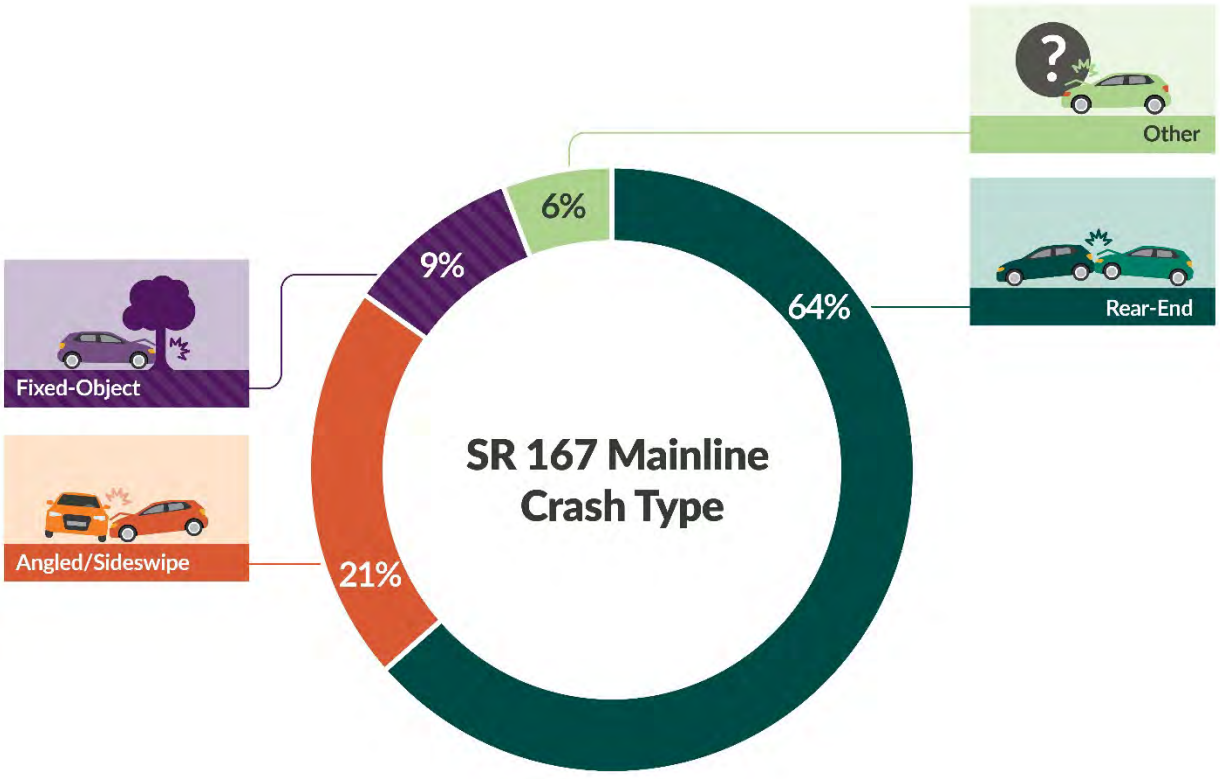


Figure 9-3. SR 167 Mainline Vehicle Crash Types, 2015-2019 Data

Active Mode

Table 9-2 provides the total number of pedestrian and bicycle crashes in the study area within a 1-mile buffer of the SR 167 mainline.

Table 9-2. Total Number of Pedestrian and Bicycle Crashes in SR 167 Study Area, 2015-2019

Travel Mode	All Crashes	Fatal	Serious Injury
Pedestrian Crashes	360	11	52
Bicycle Crashes	139	1	13
Total	**499**	**12**	**65**

Source: WSDOT 2021

Pedestrian Crashes

Pedestrian crashes are provided graphically in Figure 9-4 (north part of study area) and Figure 9-5 (south part of study area). The highest concentration of pedestrian crashes occurred in downtown areas (such as Puyallup, Sumner, Auburn, Kent, and Renton) that have higher level of pedestrian activity relative to other areas, a pattern that is typical of communities throughout the region.

Other interchange cross streets where a high concentration of pedestrian crashes occurred include 84th Avenue South, SR 516, and South 180th Street.

Bicycle Crashes

Figure 9-6 and Figure 9-7 depict bicycle crashes in the northern and southern parts of the study area, respectively. Similar to the pedestrian crash pattern, downtown areas (including Puyallup, Kent, and Renton) contained the highest concentration of bicycle crashes in the study area. These areas also contain a relatively high amount of bicycle activity compared to other locations in the study area. The pattern of bicycle crashes is less concentrated than pedestrian crashes in downtown areas (potentially reflecting the lower mode share of bicycle travel). The bicycle crashes also tend to be more focused on the larger arterial streets without dedicated bicycle facilities, where there tends to be less room and ability for vehicles to maneuver around bicycles when considering traffic volumes and speeds (as compared to local or low-volume streets).

Other interchange cross streets where a high concentration of bicycle crashes occurred include SR 516 and 84th Avenue South.

It should be noted that bicycles are permitted on the shoulder of SR 167 freeway mainline in two segments: from SR 161/North Meridian Avenue to SR 410, and from SR 18 to Rainier Avenue. Bicycles are not permitted on the SR 167 freeway mainline from SR 410 to SR 18. However, bicycles do not often use the SR 167 mainline, possibly due to the very uncomfortable conditions generated by high speeds and heavy traffic volumes. No bicycle crashes were recorded on the SR 167 freeway mainline within the five-year study period.

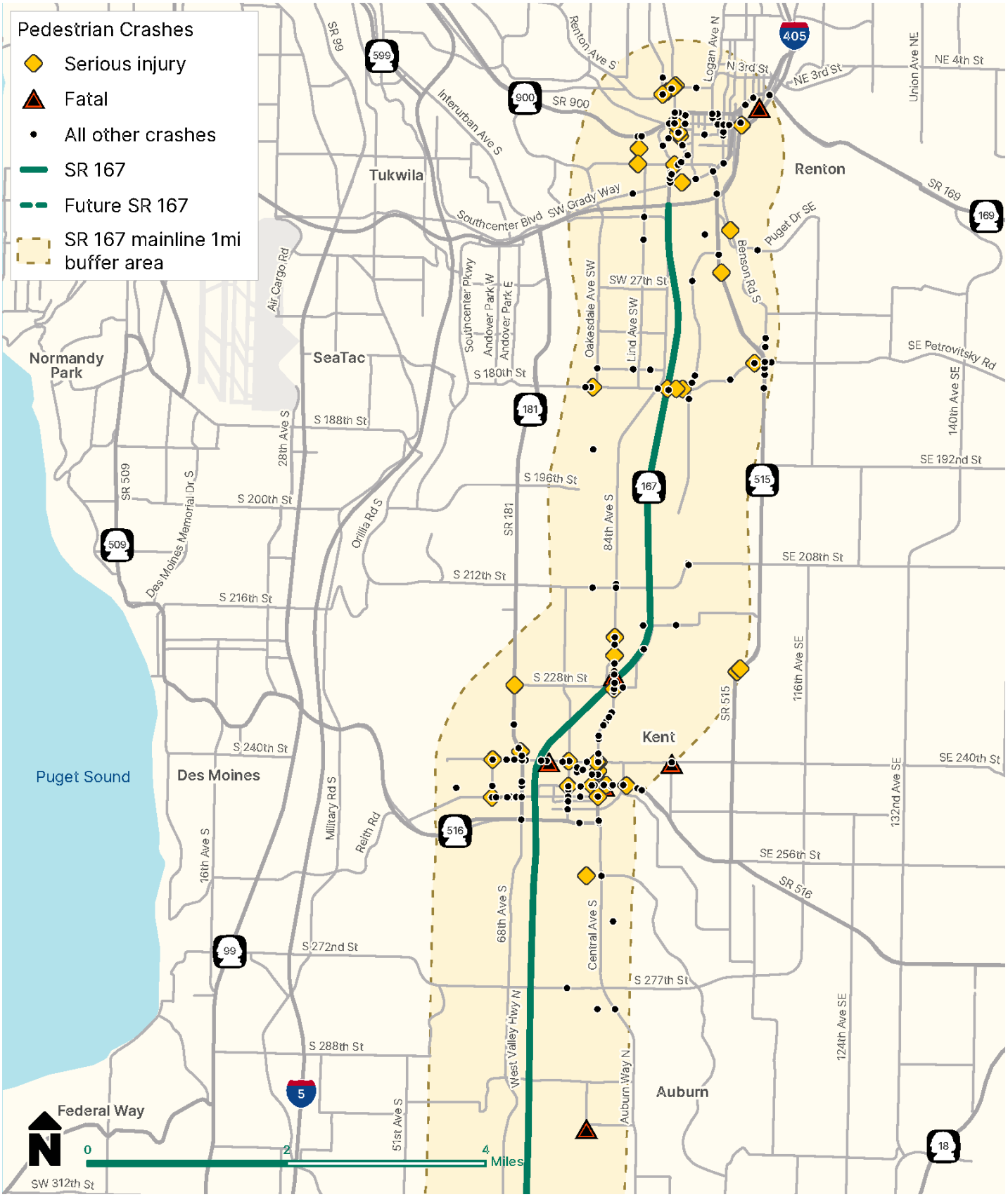


Figure 9-4. Pedestrian Crashes – Northern Part of Study Area, 2015-2019 Data

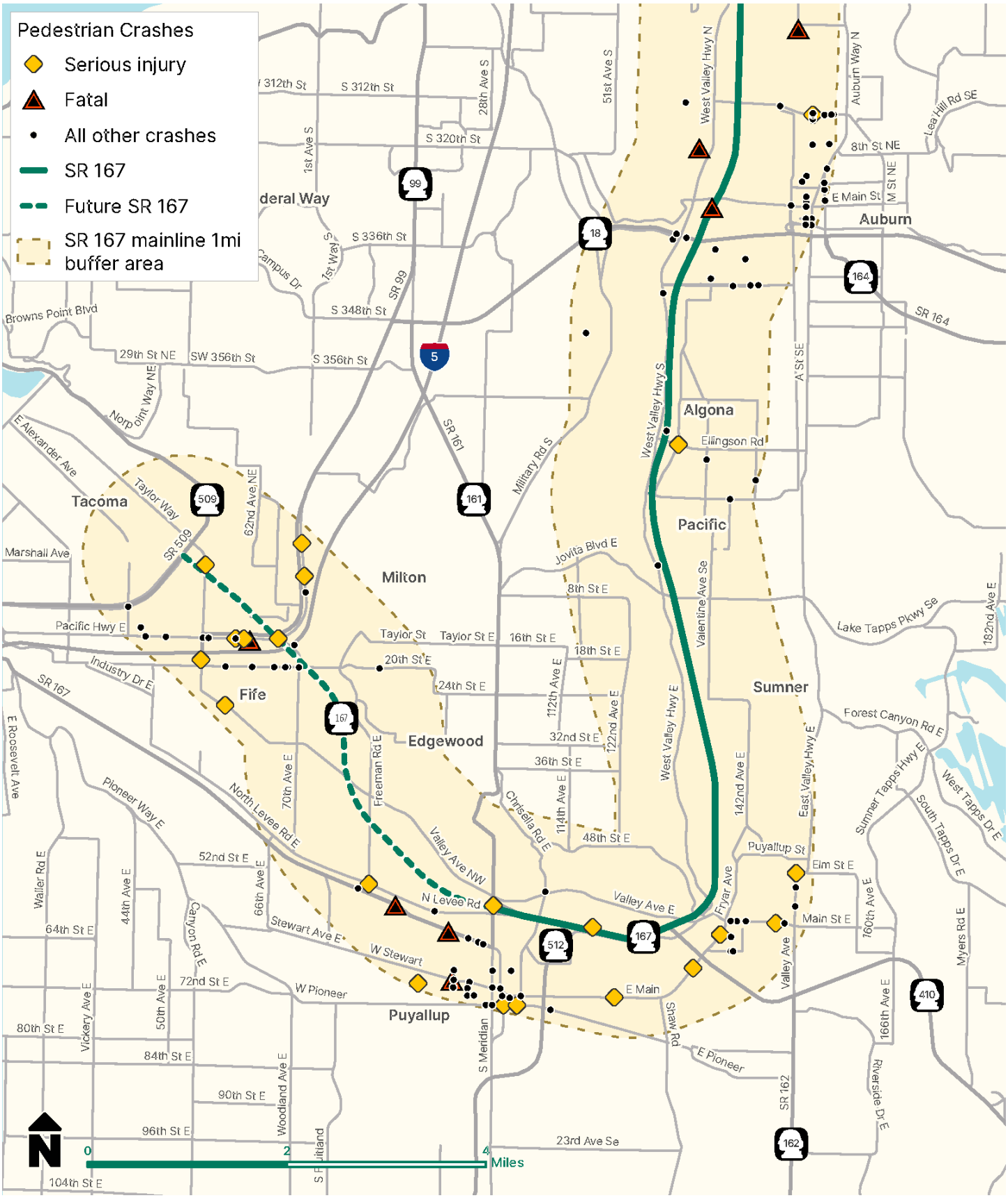


Figure 9-5. Pedestrian Crashes – Southern Part of Study Area, 2015-2019 Data

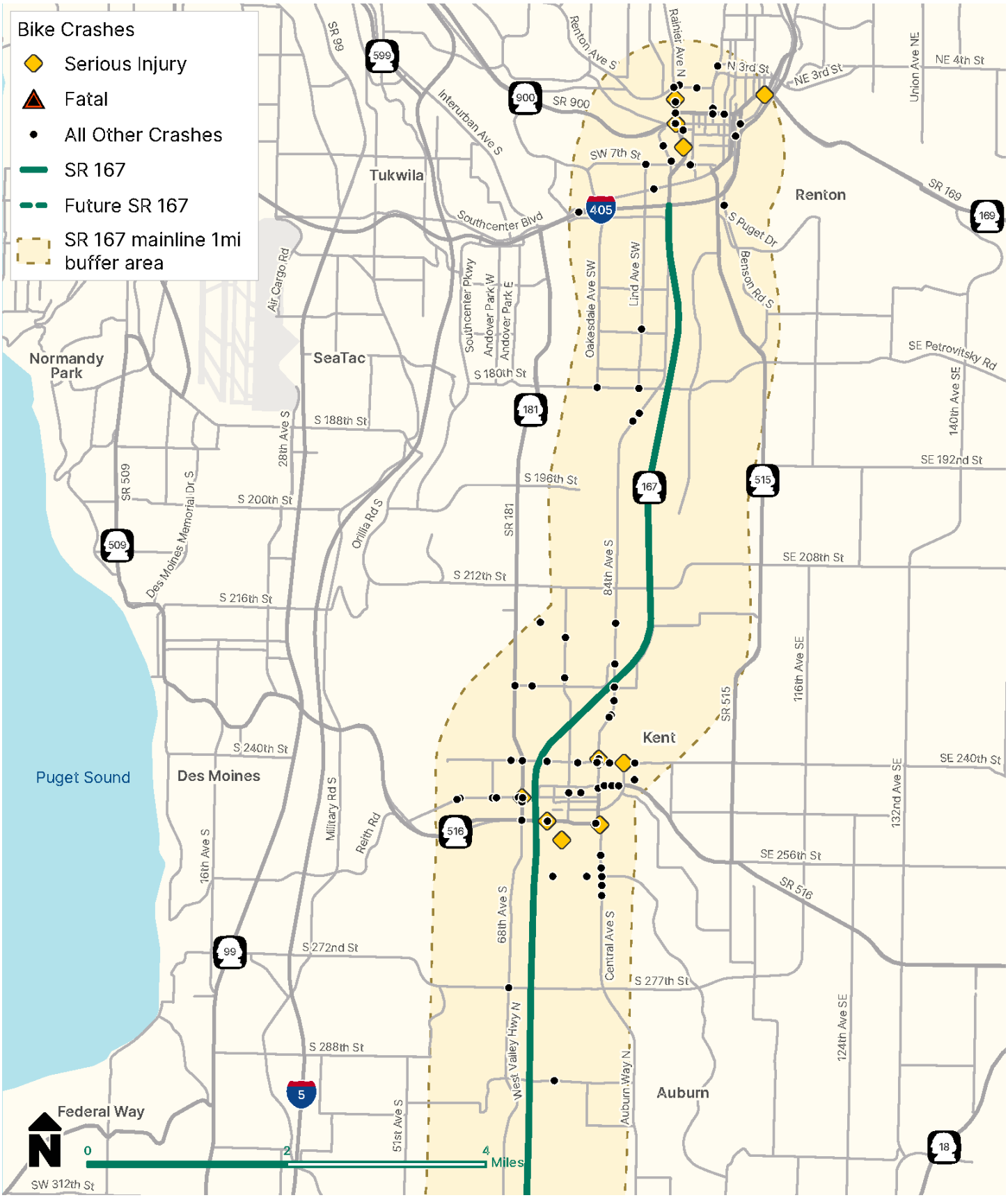


Figure 9-6. Bicycle Crashes – Northern Part of Study Area, 2015-2019 Data

Figure 9-7. Bicycle Crashes – Southern Part of Study Area, 2015-2019 Data

Chapter 10. System Performance

Chapter Overview

This chapter describes recurring and non-recurring congestion that occurs on SR 167 reflecting pre-pandemic (2019) conditions. Freeway mainline performance was evaluated on SR 167 between SR 161/Meridian and I-405. Additionally, traffic congestion on arterials within 1 mile of the SR 167 corridor is evaluated.

This chapter also describes forecasted traffic congestion for SR 167 and adjacent arterials under 2050 baseline conditions with currently planned and funded multimodal (highway, arterial, transit, and active mode) modeled, while also considering growth in population and employment. In addition, a summary of vehicle-miles traveled (VMT) and travel mode shares are also presented for 2019 and 2050 baseline conditions.

Major findings for 2019 conditions are summarized in the following bullet points:

- There is substantial recurring traffic congestion in the corridor, notably northbound in the morning and southbound in the afternoons.
- A major cause of afternoon congestion is the weaving area between SR 410 and SR 512 in the southbound direction.
- The terminus of the southbound HOT lane at Stewart Road is also a major contributor to afternoon congestion.
- Northbound SR 167 mainline congestion is generally caused by high traffic demand, and it has fewer geometric (lane drops and weaving areas) causes than the southbound direction; congestion that spills back from I-405 can cause slow traffic on northbound SR 167 throughout much of the day.
- The corridor also is subject to non-recurring traffic congestion that is often related to weather, crashes, or special events. Non-recurring congestion is an issue throughout the Puget Sound Region because of the high utilization of freeway facilities that are often operating near or above capacity.
- Arterial traffic operations mirror those of the SR 167 mainline with more congestion in the afternoon than in the morning. North/south corridors tend to experience the highest congestion levels, although east/west streets near the SR 167 interchange are busy.

By 2050, the growth in the study area (refer to *Chapter 5, Land Use, Housing, and Employment*) will result in substantial new traffic demand and more congestion. By 2050, most of the SR 167 mainline will experience heavy congestion during both peak periods in the peak direction, even with the planned improvements. Arterial traffic congestion will also increase. The PM will continue to be more congested overall, but the percentage of congested arterial milage will grow more in the AM (more than doubling).

Findings related to VMT indicate that under 2019 conditions, the Regional Growth Centers generate substantially less VMT than the study area as a whole, although that is largely due to shorter vehicle trips rather than more transit or active mode usage. In the future, higher densities will continue to reduce VMT per capita and support an increase in transit and active mode shares, although they may not reduce demand for vehicle travel on the corridor itself.

Recurring Congestion

Freeway traffic congestion and travel delays that occur repeatedly during weekday commute periods or on weekends is commonly referred to as "recurring congestion." This type of congestion happens in the general purpose (GP) lanes when there are more vehicles on the roadway than can be accommodated due to roadway capacity constraints which typically occur near interchanges. A HOT lane typically operates at higher speeds and with less congestion than GP lanes, although slow speeds in the adjacent GP lanes can influence HOT lane operations. Drivers in the HOT lane may need to slow down to weave out of congested GP lanes, which can slow vehicles behind them. Also, some drivers in the HOT lane become uncomfortable traveling at a much higher speed than drivers in the adjacent GP lane without a buffer and will slow their speeds (also known as sympathy slowing).

Weekday AM Peak Period

Recurring weekday AM peak period congestion occurs on SR 167 in the northbound direction. Congestion can start as early as 4:30 a.m. and end as late as 11 a.m. Contributing factors to the early start to congestion include early shift work at manufacturing centers along the corridor, high truck activity, and peak period spreading as drivers seek to leave earlier or later to avoid systemwide congestion.

Congestion is typically worse in the GP lanes but also occurs in the adjacent HOT lane. The following list describes locations with recurring bottlenecks in the northbound direction general purpose lanes during the weekday AM peak period (also detailed graphically in Figure 10-1):

- SR 512 (MP 6.0) to Stewart Road/North 8th Street (MP 11.5)
- Ellingson Road (MP 12.0) to 15th Street Southwest (MP 13.5)
- SR 18 (MP 14.0) to SR 516 (19.5)
- 84th Avenue South (MP 20.5) to South 212th Street (MP 22.5)
- South 180th Street (MP 23.0) to I-405 (MP 25.5)

Congestion on both directions of I-405 can also cause queues that spill back to the northbound SR 167 mainline.

Recurring congestion on northbound SR 167 also occurs between SR 410 and Ellingson Road between noon and 3 p.m.

Some congestion also occurs in the northbound HOT lane between 15th Street Northwest (MP 15.0) and South 277th Street (MP 18.5) during the early morning peak period (5:30 a.m. to 7 a.m.) as well as approaching the I-405 interchange.

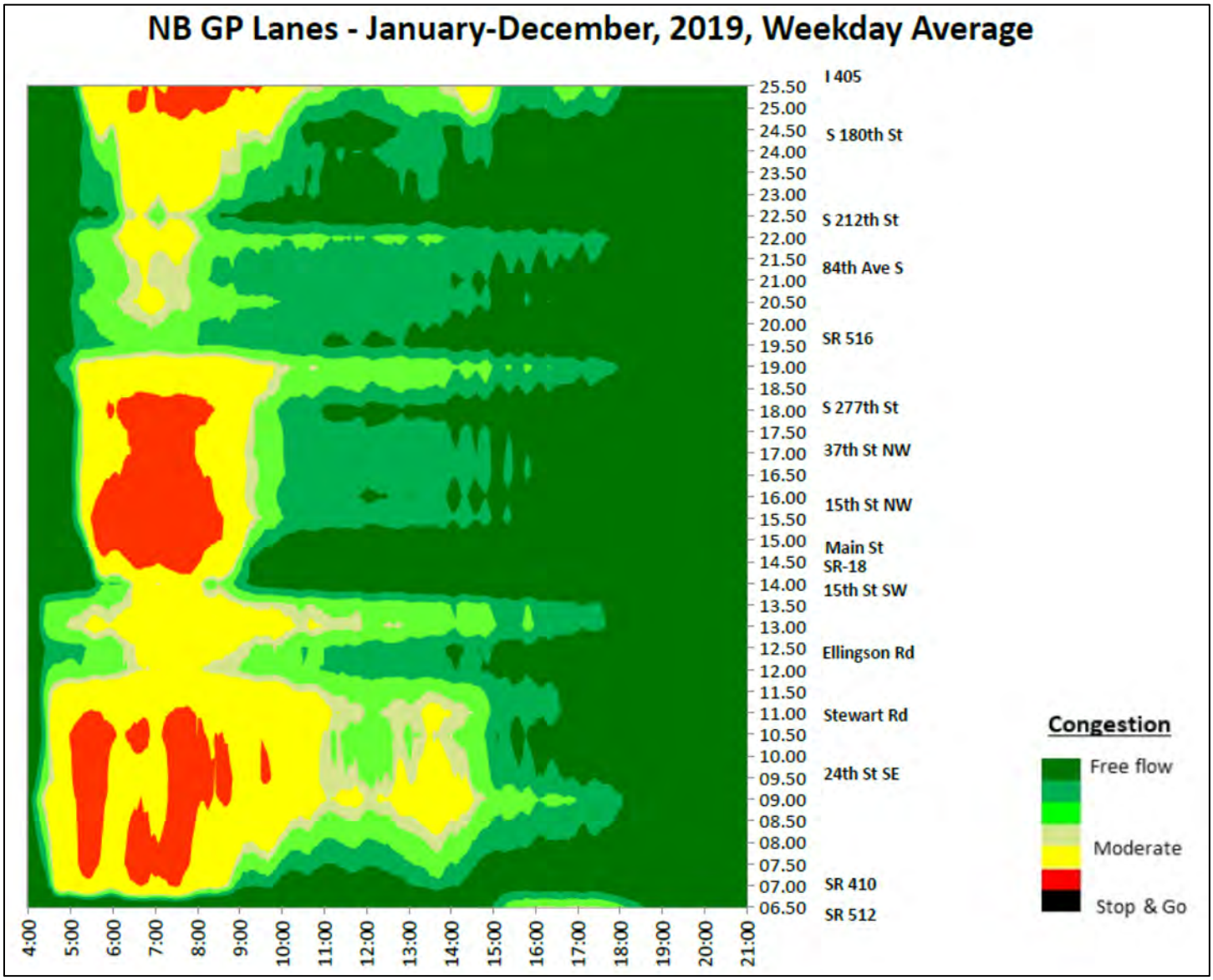


Figure 10-1. Northbound SR 167 Congestion for the AM Peak Period (6:00-9:00 a.m.)

Weekday PM Peak Period

PM peak period recurring traffic congestion occurs in the southbound direction on SR 167. Southbound congestion can occur as early as 1 p.m. and as late as 7 p.m. Like the AM peak period, the southbound congestion generally occurs in the GP lanes but can also affect the HOT lane between I-405 and 15th Street SW. Locations of recurring bottlenecks in the southbound general purpose lanes during weekday PM peak period are as follows (and are detailed graphically in Figure 10-2):

- I-405 (MP 25.5) to South 180th Street (MP 23.0)
- S 212th Street (MP 22.5) to 15th Street Northwest (MP 16.5)
- SR 18 (MP 14.0) to SR 512 (MP 6.5)

The southernmost bottleneck on SR 167 between SR 18 and SR 512 is heavily influenced by congestion on southbound SR 512 near the Pioneer Way interchange, which causes queues that spill back onto the SR 167 mainline. Also, congestion on southbound SR 167 near the I-405 interchange can affect operations on both directions of I-405 mainline.

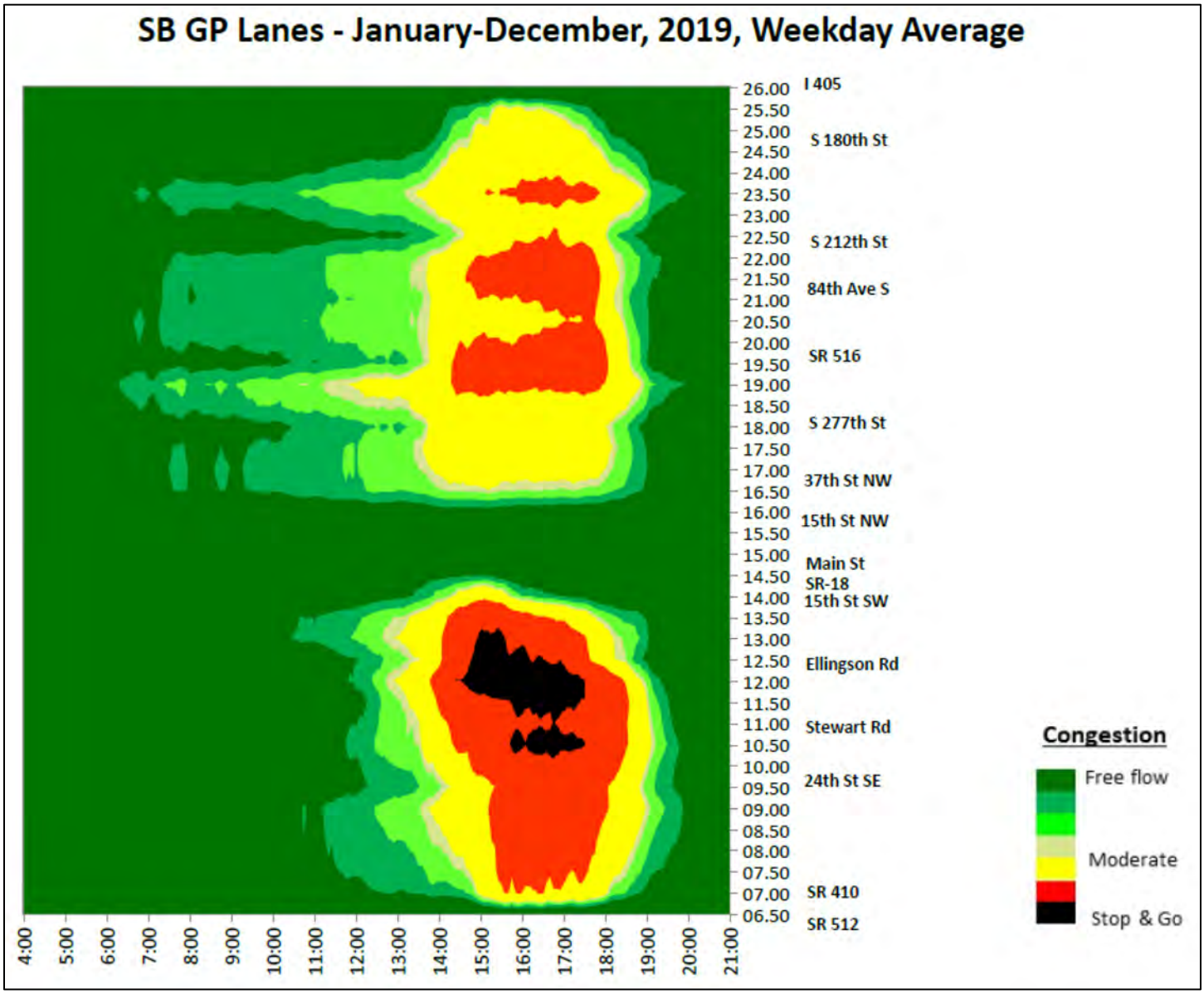


Figure 10-2. Southbound SR 167 Congestion for the PM Peak Period (3:00 p.m. to 6:00 p.m.)

The southbound HOT lane experiences moderate congestion between I-405 (MP 25.5) and 84th Avenue South (MP 21.0), as well as approaching the end of the HOT lane at Ellingson Road (MP 12.5).

SR 512/SR 410 Weaving Segment

The southernmost segment of SR 167 between SR 512 and SR 410 is an important regional highway connection in Washington State. This segment of SR 167 connects the communities west of this location via SR 512 and River Road. The SR 167 mainline is a weave configuration in both directions between the SR 512 and SR 410 interchanges (Figure 10-3), with traffic congestion occurring frequently in both directions during the AM and PM peak periods due to traffic crossing in both directions.

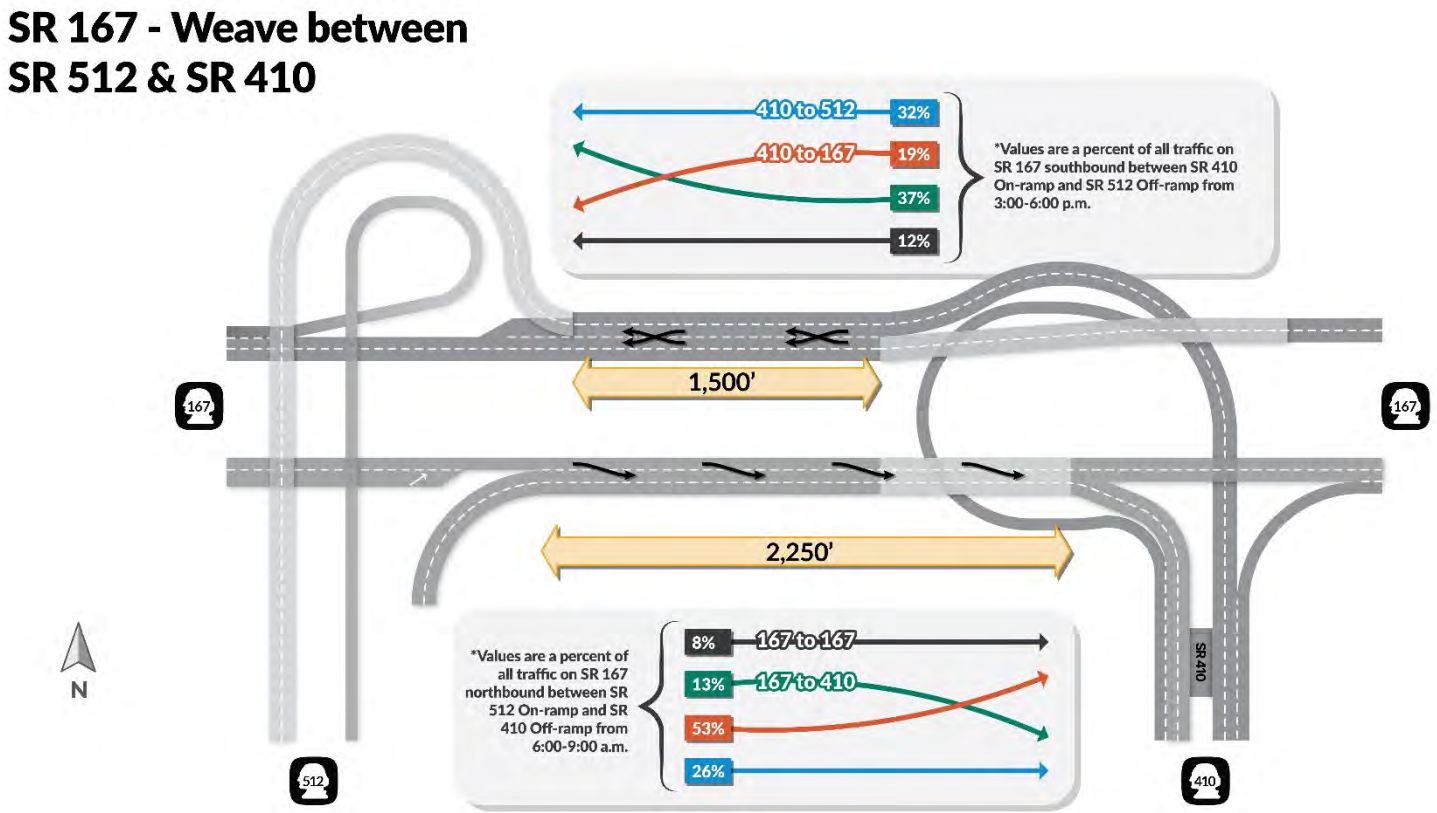


Figure 10-3. Weaving Segment Between SR 512 and SR 410

The northbound SR 167 segment contains three lanes, with one lane coming from SR 167 Mainline and two lanes coming from SR 512. The northbound weave segment requires vehicles entering the weave segment from SR 167 mainline to weave across one lane to exit to SR 410.

The southbound SR 167 segment contains four lanes, with two lanes coming from both SR 167 and SR 410. The southbound weave segment requires vehicles entering the weave segment from SR 167 mainline to weave across one lane to exit to SR 512.

Weekend Congestion

Weekend recurring congestion typically occurs on Saturdays in both directions of the GP lanes in the southernmost segment of the study area between SR 512 and Ellingson Road. Sundays do not have recurring congestion in either the GP or HOT lanes.

Arterials

Major and minor arterials parallel or adjacent to SR 167 aid the corridor in facilitating local and regional vehicle travel. In addition, arterial roadways provide the study area with a multimodal transportation environment permitting access to pedestrians and bikes, which are not allowed on the SR 167 corridor between SR 410 and SR 18. The performance of arterials is particularly important during peak periods. Volume-to-capacity (v/c) ratio, a measure of congestion on a roadway, is used to evaluate the performance of these arterials. The v/c ratio compares the traffic volume along a roadway to its theoretical capacity. A v/c ratio close to or greater than 1.0 is typically an indication of congested conditions, including extended delays and queuing. *Appendix H* provides details on how arterial v/c ratios are set using national research data.

Figure 10-4 and Figure 10-5 reflect v/c ratios along arterials within a 1-mile buffer of SR 167. In the context of this study, roadway segments with v/c ratios between 0.85 and 1.0 indicate a level of service (LOS) E, whereby a segment is operating near or at capacity. V/C ratios greater than 1.0 indicate LOS F, whereby a road segment is over capacity. Out of all the arterial centerline miles in the study area, 6% operate with v/c ratios greater than 0.85 in the AM peak hour, and only 2% operate above capacity (LOS F). Higher congestion levels are noted during the PM peak hour, with v/c ratios greater than 0.85 for 21% of roadway miles and 12% operating at LOS F.

During the AM peak hour, arterial congestion is primarily along north-south corridors, including SR 181 and SR 515, which parallel SR 167 and provide an alternative route for some travelers. There is substantially more congestion during the PM peak hour due to the high southbound volumes in the study area. Facilities that are operating at LOS E or LOS F during the PM peak hour include but are not limited to:

- SR 515 between I-405 and Southeast 240th Street between Tukwila and Kent
- West Valley Highway between Kent and Pacific
- Central Avenue South/83rd Avenue South/Auburn Way North between Kent and Auburn
- SR 181 between I-405 and Southeast 240th Street between Tukwila and Kent
- SR 161/Meridian Avenue between SR 167 and 31st Avenue Southwest in Puyallup
- 15th Street Southwest between SR 167 and C Street Southwest in Auburn
- Ellingson Road between SR 167 and A Street Southeast in Auburn
- A Street Southeast between SR 18 and Ellingson Road in Auburn
- C Street Southwest between 15th Street Southwest and Ellingson Road in Auburn
- East Valley Highway between Ellingson Road and Lake Tapps Parkway in Auburn
- South 212th Street between SR 167 and 64th Avenue South in Kent
- North Meridian Avenue between SR 167 and SR 161/31st Avenue Southwest in Puyallup
- South 180th Street between West Valley Highway and Talbot Road South in Renton
- South 212 Street/S 208th Street between SR 167 and 116th Avenue Southeast in Kent
- South 277th Street east of 83rd Avenue in Kent

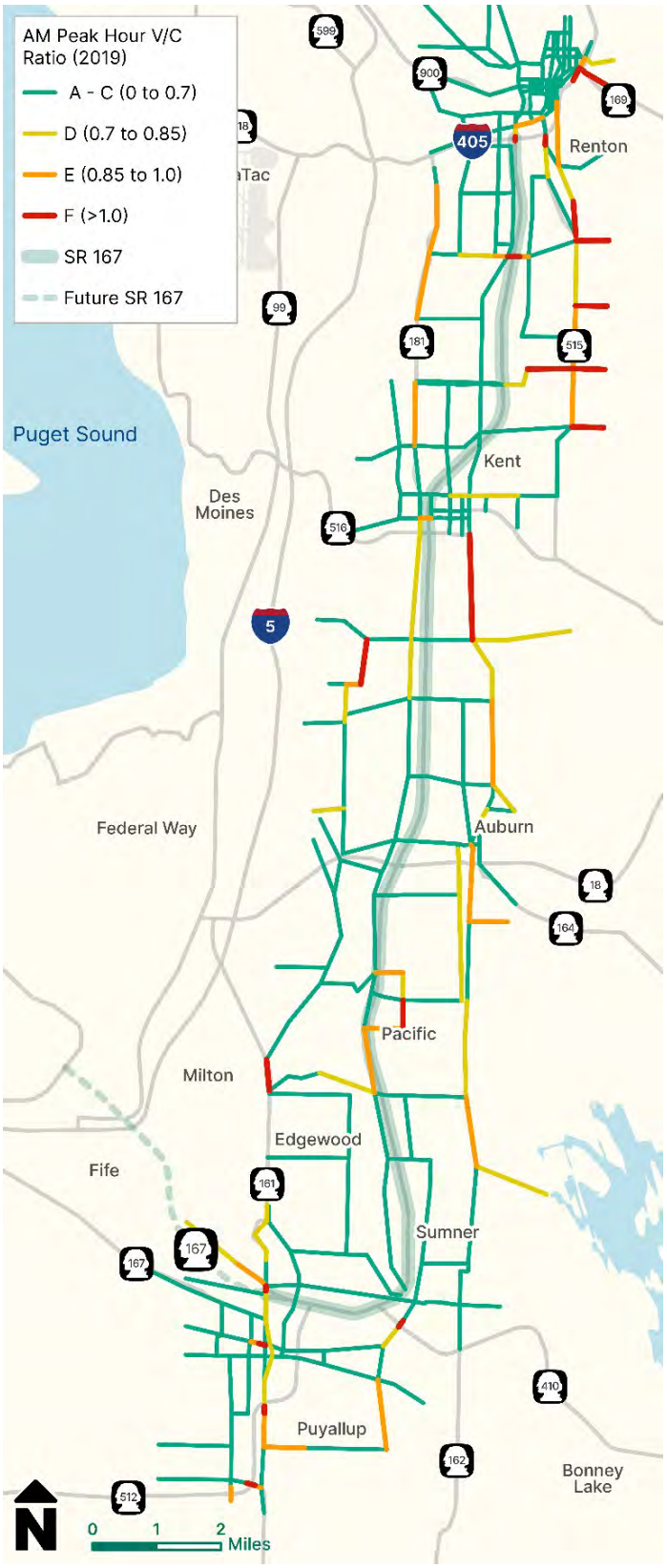


Figure 10-4. Volume-to-Capacity Ratio along Arterials during the AM Peak Hour (2019)

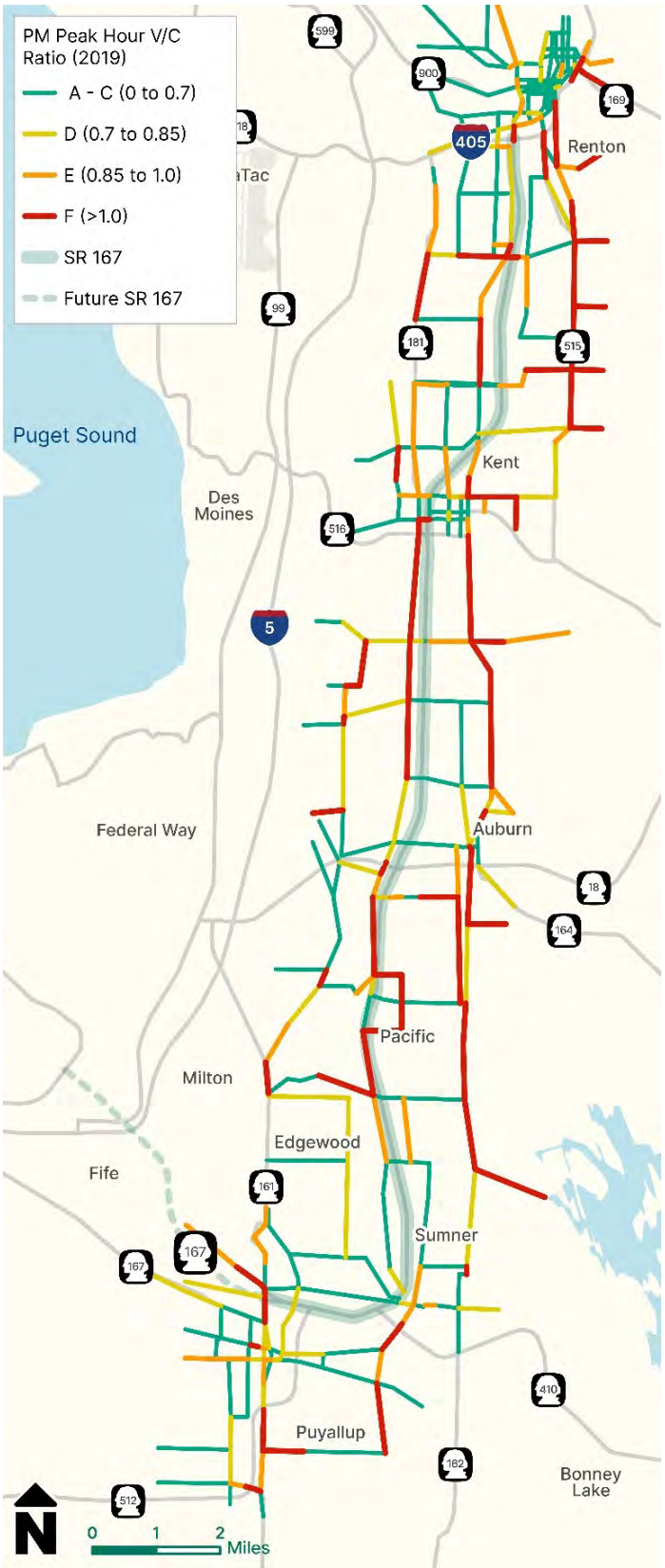


Figure 10-5. Volume-to-Capacity Ratio along Arterials during the PM Peak Hour (2019)

Non-Recurring Congestion

Non-recurring congestion is defined as unpredictable, irregular, or occasional events that cause traffic congestion. Such events include:

- Traffic incidents that occur outside of typical commute periods that block travel lanes, such as vehicle crashes, breakdowns, or debris in travel lanes, or incidents that occur on the shoulder that can cause a visual distraction
- Construction work zones, which can include a reduction in the width of travel lanes or shoulders
- Weather events that can affect driver visibility, such as bright sun or fog, or cause the need for drivers to increase the space between vehicles, such as rain, snow, or icy conditions
- According to FHWA, traffic incidents are the biggest source of non-recurring congestion on freeways and SR 167 is not an exception. The SR 167 corridor and ramps average over 1,200 traffic incidents per year or slightly over three crashes per day. 36% of all SR 167 mainline crashes occurred outside of time periods when recurring congestion typically happens, with many of these crashes causing congestion and unexpected delays.
- The Washington State Fair, located in Puyallup, is a special event that occurs annually in September, with a smaller Spring Fair in April. The Washington State Fair can cause peak surges in traffic demand and congestion in the study area due to queues from streets surrounding the fairgrounds that spill back to the freeway mainline. The fair also attracts visitors from around the state that may not be familiar with the street network, which can lead to an increase in traffic congestion. The White River Amphitheatre, located in Auburn, hosts concert events from May to October that impact PM weekday and weekend traffic. The 6,500-seat ShoWare Center located adjacent to SR 167 between the SR 516 and Central Avenue interchanges in Kent, hosts sporting events such as minor league hockey, concerts, and indoor soccer.

WSDOT manages non-recurring congestion with several tools, including an incident response program and a traffic management center.

2050 Baseline Conditions

Under 2050 baseline conditions, there is an increase in congestion levels in the AM and PM peak hours, as illustrated in Table 10-1. Compared to 2019, more centerline miles of arterials are anticipated to operate at v/c ratios that exceed thresholds of 0.85 or 1.0 in 2050. Notably, the growth in congested centerline miles will be particularly pronounced in the AM peak hour (since it is starting from a lower level of congestion), although the PM peak hour will continue to experience considerably more congestion with one-third of all the arterial roadway miles forecast to operate at a v/c ratio of 0.85 or greater in 2050. Increased congestion affects the cost of freight, resulting in higher costs of goods.

Table 10-1. Percent of Total Arterial Roadway Miles over 0.85 v/c Ratio

Scenario	2019	2050	Percent Change in Congested Miles
AM Peak Hour: v/c >0.85	6%	13%	116%
AM Peak Hour: v/c >1	2%	7%	250%
PM Peak Hour: v/c >0.85	21%	33%	57%
PM Peak Hour: v/c >1	12%	20%	67%

Sources: 2019 and 2050 SR 167 travel demand models, Fehr & Peers 2022

Figure 10-6 and Figure 10-7 illustrate 2050 baseline conditions for both arterials and freeways within 1 mile of SR 167. 2050 traffic volumes developed from the SR 167 travel demand model exhibit growth throughout the SR 167 study area.

Specifically related to SR 167 facility operations, the bottlenecks noted earlier in this chapter are expected to become more pronounced under 2050 conditions even with planned improvements on the I-405 and SR 167 corridors.

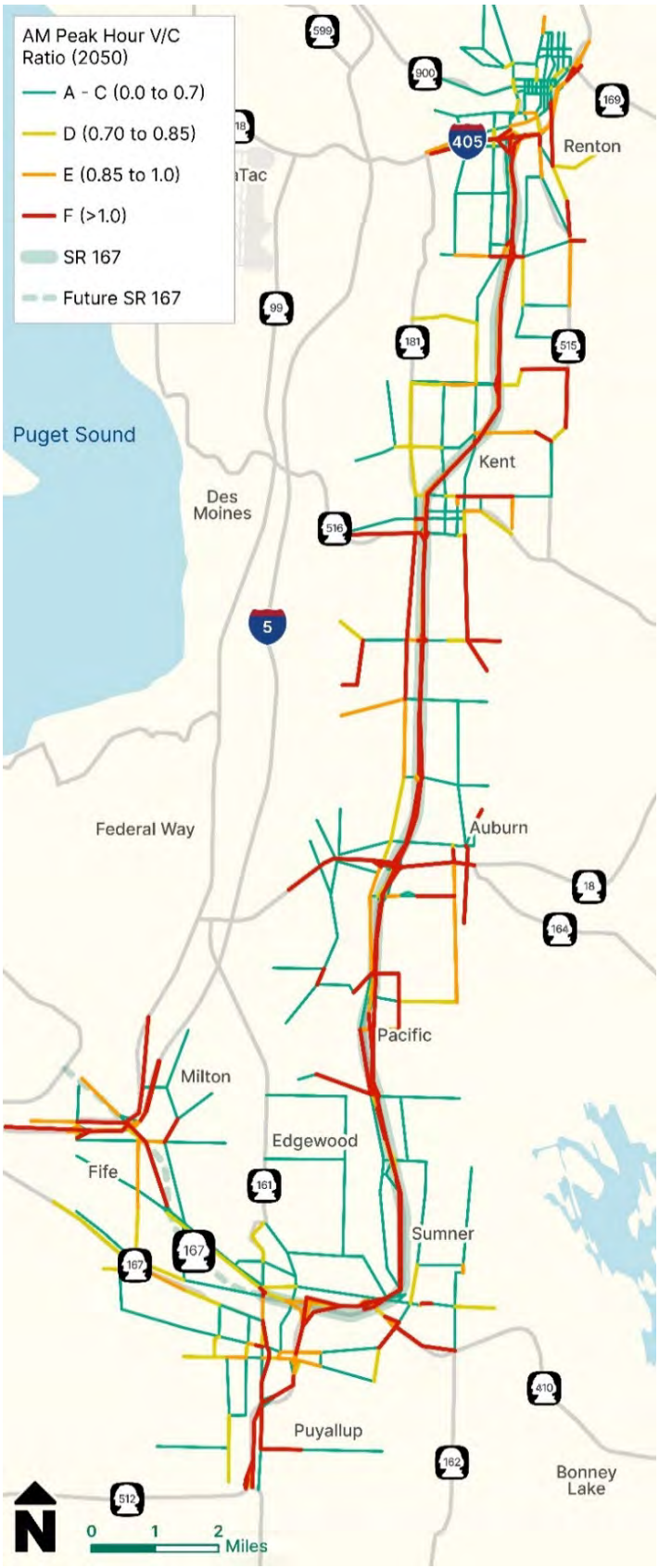


Figure 10-6. Volume-to-Capacity Ratio along SR 167 and Arterials during the AM Peak Hour (2050)

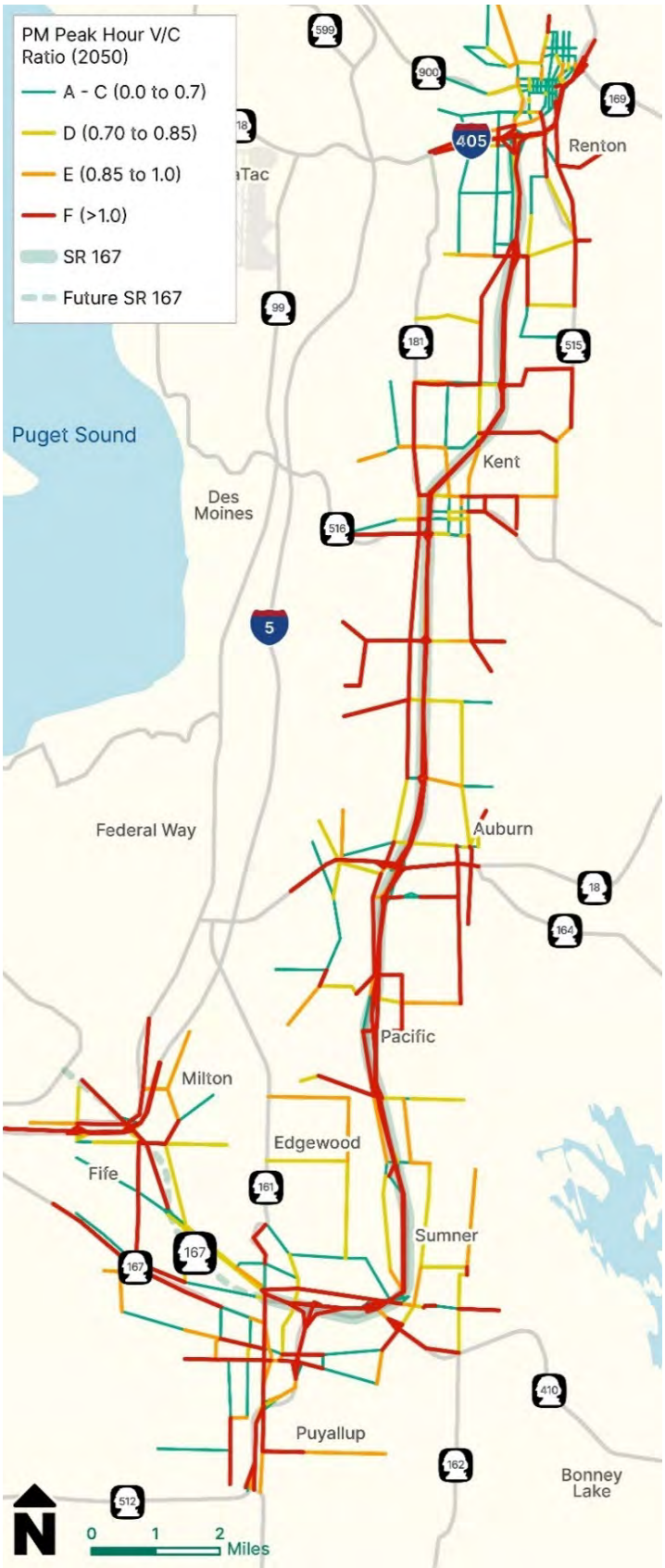


Figure 10-7. Volume-to-Capacity Ratio along SR 167 and Arterials during the PM Peak Hour (2050)

A review of the data indicate that AM SR 167 congestion will extend nearly continuously between Stewart Road and I-405. The new HOT Lanes north of SR 410 will reduce the bottlenecks south of Stewart Rd to some degree. In the PM peak hour, both directions of SR 167 are forecast to experience substantial congestion. While the new southbound HOT lanes to SR 410 improve conditions somewhat, the weaving area between SR 410 and SR 512 remains.

In summary, travel demand growth caused by population and employment growth will exceed the planned capacity of SR 167 without additional travel demand management and strategic bottleneck enhancements.

Vehicle Miles Traveled (VMT) and Travel Mode Share

Total vehicle-miles-traveled (VMT) is a valuable metric when looking at the overall performance of the transportation system. VMT is generated by all vehicles, but it is most strongly associated with single-occupancy vehicle (SOV) trips, and no VMT is generated at all with active mode or transit trips. Generally, areas with more transportation options and with denser land uses generate fewer VMT per capita compared with lower-density suburban areas. Lower VMT is a combination of shorter vehicle trips associated with land uses that are closer together and higher non-vehicle mode shares where there is adequate transit service and infrastructure to accommodate transit and active mode trips. Lower VMT also is associated with fewer greenhouse gas emissions and energy usage from transportation.

Existing conditions daily VMT was summarized for all vehicle trips generated by households within the study area. Results are detailed in Table 10-2. Existing conditions mode shares for AM peak period trips and all-day travel within the study area are detailed in Table 10-3.

Note that the RGCs within the study area have lower VMT per household than the study area as a whole, particularly in Renton, Tukwila, and Auburn. In contrast to VMT per household, mode shares for the RGCs tend to be similar to the study area as a whole on a daily basis and with even higher SOV mode shares during the AM peak period for several of the RGCs.

Table 10-2. 2019 Average Daily Vehicle Miles Traveled within Study Area

Location	2019 VMT/Household
Study Area	42
Renton RGC	22
Tukwila RGC	26
Kent RGC	33
Auburn RGC	23
Puyallup South Hill RGC	33
Puyallup Downtown RGC	39

Sources: 2019 Base Year SR 167 Travel Demand Model, Fehr & Peers 2022

Table 10-3. 2019 Study Area AM and Daily Mode Share

AM				
Area	SOV	HOV	Transit	Active
Study Area	66%	21%	5%	8%
Regional Growth Centers				
Renton	69%	19%	6%	6%
Tukwila	75%	18%	5%	2%
Kent	67%	19%	7%	7%
Auburn	73%	17%	5%	5%
Puyallup South Hill	71%	17%	4%	8%
Puyallup Downtown	63%	20%	4%	12%
Entire Model	65%	19%	6%	9%

Daily				
Area	SOV	HOV	Transit	Active
Study Area	46%	48%	2%	4%
Regional Growth Centers				
Renton	47%	47%	2%	4%
Tukwila	48%	49%	2%	2%
Kent	47%	46%	2%	4%

Daily				
Area	SOV	HOV	Transit	Active
Auburn	49%	45%	1%	4%
Puyallup South Hill	47%	44%	2%	7%
Puyallup Downtown	45%	46%	1%	8%
Entire Model	45%	47%	2%	5%

Sources: 2019 Base Year SR 167 Travel Demand Model, Fehr & Peers 2022

These results indicate that much of the VMT benefit of the RGCs under existing conditions is related to shorter vehicle trips as opposed to higher non-vehicle mode shares. This may be due to less-robust transit services and active mode infrastructure, as voiced by partners summarized in *Chapter 2, Community Outreach Summary.*

Future Vehicle Miles Traveled

Under future year (2050) conditions, VMT per household decreases in all RGCs and the study area, as detailed in Table 10-4. The increased population and employment within the study area by 2050 leads to shorter trip lengths and lower VMT per household across the entire study area. The RGCs in the south end of the study area exhibit similar decreases in VMT per household, and their 2050 travel patterns are forecast to resemble 2019 travel in the northern study area near Renton and Tukwila.

Similar patterns are seen in the mode share results between 2019 and 2050 as well (Table 10-5). Overall, the SOV mode share is forecast to decrease (modestly in the daily condition and more in the AM condition). Within the RGCs, the HOV mode share is forecast to increase substantially and, particularly in the northern RGCs of Renton, Tukwila, and Kent, transit mode shares are forecast to grow strongly. The model does not forecast much active transportation mode share growth; however, the model does not have a detailed representation of the bicycle and sidewalk network and additional model refinements and post-processing will take place as part of scenario evaluation later in the SR 167 Master Plan PEL Study process. *Chapter 6, Freight Network* discusses the growth in truck trips on SR 167 and throughout the state.

In summary, the 2050 conditions indicate that there is strong opportunity to influence VMT and mode share. The planned land use changes are setting the table for a denser and more mixed land use environment. Strategic transportation investments, demand management strategies, and transportation system management strategies can all leverage this shift in land use to a less auto-oriented condition while preserving capacity for reliable freight trips.

Table 10-4. 2050 Vehicle Miles Traveled

Location	2050 VMT/Household
Study Area	32
Renton RGC	16
Tukwila RGC	17
Kent RGC	23
Auburn RGC	19
Puyallup South Hill RGC	23
Puyallup Downtown RGC	26

Source: 2050 Baseline SR 167 Travel Demand Model, Fehr & Peers 2022.

Table 10-5. 2050 AM and Daily Mode Share

AM				
Area	SOV	HOV	Transit	Active
Study Area	49%	38%	5%	8%
Regional Growth Centers				
Renton	45%	36%	11%	8%
Tukwila	46%	38%	10%	7%
Kent	42%	38%	12%	8%
Auburn	53%	33%	9%	6%
Puyallup South Hill	53%	32%	4%	10%
Puyallup Downtown	48%	35%	5%	11%
Entire Model	47%	35%	8%	10%

DAILY				
Area	**SOV**	**HOV**	**Transit**	**Active**
Study Area	44%	47%	2%	7%
Regional Growth Centers				
Renton	42%	47%	3%	8%
Tukwila	40%	51%	3%	7%
Kent	41%	47%	3%	8%
Auburn	47%	44%	2%	6%
Puyallup South Hill	46%	42%	2%	10%
Puyallup Downtown	44%	44%	2%	11%
Entire Model	43%	46%	3%	8%

Sources: 2050 Baseline SR 167 Travel Demand Model, Fehr & Peers 2022

Chapter 11. Travel Patterns

Chapter Overview

This chapter highlights a relatively new data source, StreetLight Data, that can summarize the travel patterns of people who travel along, across, and within the SR 167 corridor study area. These travel patterns offer insights about the types of trips in the corridor (longer or shorter), the trip purpose (commuting, freight, home to other locations), and the mode of travel (private auto, truck trips, bus, pedestrian, or bicycle). Using this information, the Master Plan PEL Study can identify opportunities to increase the efficiency of travel on the corridor and provide more options that are more convenient and lower cost, particularly for vulnerable populations and overburdened communities.

Most users of SR 167 begin or end their trip south of SR 18, which is in contrast with the fact that more people live north of SR 18. Many trucks traveling on SR 167 begin or end their trips at locations between SR 410 and SR 18, which is where many large distribution centers are located that receive goods from the Port of Tacoma or from locations on I-5 south of Tacoma. Table 6-4 also details the truck volumes at different locations along the corridor. Most trucks traveling on SR 167 begin or end their trip within the study area, only 9% of trucks pass through the SR 167 corridor without stopping. Nonetheless, a major pattern for long-distance truck trips include using SR 167 to connect between Eastern Washington and Port of Tacoma as well as other locations further south along I-5. Not surprisingly, most people using the corridor live or work within the study area. Bus activity is mostly concentrated in the north section of the corridor. Pedestrian and bicycle activity is low across the study area. Where it occurs, it is concentrated near retail centers, adjacent to transit hubs, hospitals, and the area surrounding the Washington State Fairgrounds.

StreetLight Data

StreetLight Data is a type of “Big Data” service that is collected from a large number of “anonymized devices,” notably smart phones, internet-connected vehicles, in-vehicle global positioning system (GPS) services, and fleet management systems. The data are collected in a way that there is no personally identifiable information, and it is blended and transformed into travel patterns for cars, trucks, bus, and active (pedestrian and bicycle) modes. WSDOT utilized StreetLight Data to understand vehicle/truck travel patterns, home and work locations, and multimodal activity of people within the study area. *Appendix G* provides a complete methodology and summary of how StreetLight was used for the SR 167 Master Plan PEL Study.

SR 167 Corridor Origins and Destinations

The analysis of StreetLight data indicates the SR 167 corridor can be generalized into three distinct segments that have similar travel characteristics and are illustrated in Figure 11-1:

- **South Segment, SR 161 (Meridian Avenue) to SR 410,** is a short but critical segment of SR 167, facilitating a mix of shorter east-west based trips serving as a regional connection between SR 512 and SR 410 and more regionally based freight travel that largely travels on SR 167.
- **Middle Segment, SR 410 to SR 18,** is often congested in the weekday peak direction of travel. This section has the highest percentage of heavy vehicles and has the longest trip lengths on the corridor. A notable travel pattern is trucks that move from Southern to Eastern Washington (i.e., from I-5 to I-90, via SR 512, SR 167, and SR 18, bypassing Tacoma, Seattle, and Bellevue).
- **North Segment, SR 18 to I-405,** has a diverse mix of trucks, commuters, and other non-home or

work-based trips. This segment connects the study area to the Central Puget Sound Region, including Seattle and Bellevue. HOT lanes are present that attract users from parallel facilities by providing a more reliable and faster trip.

- StreetLight Data analysis centered on trips that use SR 167, identifying where all SR 167 users begin or end their trips, what roadways are commonly used to access the corridor, and the regional trips that are using local roads to bypass congestion. Origins and destinations were categorized into eight subareas that are illustrated in Figure 11-1.

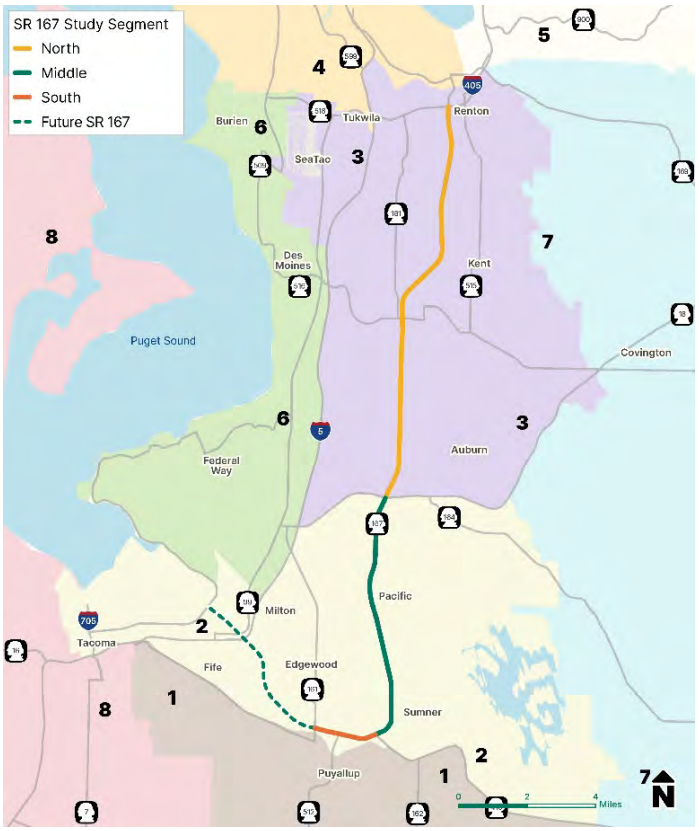


Figure 11-1. StreetLight Data Origin/Destination Zones

Table 11-1 details the northbound[9] weekday daily travel patterns (origins and destinations) for users in each of the SR 167 segments. The highest percentage of all users' trips begin to the south and west of the corridor in Pierce County. The highest percentage of middle and north segments trips end in Kent, Renton, Seattle, and on the Eastside of Lake Washington, while the south segment has more destinations to the south and east of SR 18.

[9] Southbound travel patterns are similar but reversed; that is, origins become the destinations and vice versa.

Table 11-1. Northbound SR 167 Origins and Destinations – All Vehicles

Origin and Destination Zone	South Segment		Middle Segment		North Segment	
	Origin	Destination	Origin	Destination	Origin	Destination
1: SR 167 Study Area South (south of SR 410)	40%	24%	52%	<1%	21%	<1%
2: SR 167 Study Area Middle (SR 410 to SR 18)	25%	34%	24%	16%	29%	<1%
3: SR 167 Study Area North (SR 18 to I-405)	<1%	16%	<1%	42%	27%	44%
4: Seattle and Shoreline	<1%	3%	<1%	12%	1%	23%
5: Eastside, Northshore, Snohomish County, & Northern Washington	<1%	11%	<1%	13%	1%	27%
6: Federal Way/Des Moines	3%	2%	<1%	7%	6%	3%
7: Eastern King, Pierce, & Eastern Washington	<1%	5%	5%	10%	5%	3%
8: Kitsap Peninsula, Central & Southern Washington	30%	5%	18%	<1%	10%	<1%
Other [a]	1%	<1%	1%	<1%	<1%	<1%

Source: StreetLight Data, October 2019 Data

Notes:

Data may not sum to 100% due to rounding.

[a] Outside the state of Washington

Truck travel patterns differ from private vehicles and are detailed in Table 11-2. Most northbound truck trips start in the middle area, which includes the Port of Tacoma, the Sumner Pacific MIC, and industrial land uses between Fife and Puyallup near the Puyallup River. Approximately 20% of all truck trips generated at the Port of Tacoma have destinations within the SR 167 corridor. Another large portion of northbound truck trips start in Southern Washington, Oregon, and California and travel to SR 167 via the I-5 corridor. Northbound truck trips also tend to end in similar locations as other SR 167 corridor users, except a larger portion of trucks are destined to Eastern and Southern Washington via SR 167 to SR 18, I-90, and I-82.

Table 11-2. Northbound SR 167 Corridor Origins and Destinations – Trucks

Area	South Segment		Middle Segment		North Segment	
	Origin	Destination	Origin	Destination	Origin	Destination
SR 167 Study Area South (south of SR 410)	8%	6%	11%	<1%	6%	<1%
SR 167 Study Area Middle (SR 410 to SR 18)	49%	50%	60%	21%	52%	<1%
SR 167 Study Area North (SR 18 to I-405)	<1%	16%	<1%	32%	19%	48%
Seattle and Shoreline	<1%	4%	<1%	10%	1%	19%
Eastside, Northshore, Snohomish County, & Northern Washington	<1%	9%	<1%	13%	1%	28%
Federal Way/Des Moines	<1%	<1%	<1%	1%	1%	1%
Eastern King, Pierce, & Eastern Washington	<1%	8%	1%	22%	1%	4%
Kitsap Peninsula, Central & Southern Washington	32%	6%	21%	<1%	13%	<1%
Other [a]	10%	1%	6%	1%	5%	<1%

Source: StreetLight Data, October 2019 Data

Notes: Data may not sum to 100% due to rounding.

[a] Outside the State of Washington

SR 167 users' origin and destinations were classified based on where their trips begin and end as follows:

- **Internal only:** trips that begin *and* end *within* the SR 167 study area.
- **Internal to/from external:** trips that start or end inside going to or coming from outside the study area.
- **External only or pass through**: trips that both begin *and* end *outside* of the SR 167 study area.

As detailed in Table 11-3, most of the trips on SR 167 have at least one end outside of the study area. This is true for both private vehicles and trucks. Considering the size of the study area (refer to Figure 1-1), this suggests that most trips along SR 167 are not short or local. This indicates the importance of the study area from a goods movement perspective. Areas with few manufacturing or warehousing uses have much higher through trip percentages.

Table 11-3. SR 167 Internal, External, and Through Trips

Type of trip	All Vehicles	Trucks
Internal Only	27%	25%
Internal to/from External	54%	66%
External (Pass through)	19%	9%

Source: StreetLight Data, October 2019 Data

When SR 167 is congested south of SR 18 (middle segment), some motorists shift to parallel roadways, including East Valley Highway, West Valley Highway, Meridian (SR 161) and I-5. North of SR 18, parallel arterials are not as frequently used to avoid travel on SR 167 due to longer travel times. This analysis is discussed further in Appendices G-7 through G-16. As an example, StreetLight Data details that 70% of trips on Auburn Way between SR 18 and SR 516 have a total trip length of less than 20 miles, indicating more local trips than longer regional trips. The data also conveys that East Valley Highway and West Valley Highway south of SR 18 have 55% and 52%, respectively, of trips less than 20 miles long, indicating a higher percentage of long-distance regional trips on these arterial segments.

Trip Lengths

SR 167 is utilized for a mix of short, medium, and long-distance trips, dependent on location on the corridor and mode of travel as detailed in Table 11-4. Average trip lengths are provided as ranges.

In the south segment of SR 167, between Meridian and SR 410, the corridor has a higher concentration of shorter trips for all vehicles. This may also reflect the fact that this analysis segment is relatively short and that there are few alternatives to traveling between Puyallup/Edgewood and Sumner. The middle segment of SR 167, between SR 410 and SR 18, has the longest trip lengths as it serves the highest proportion of truck trips and regional commuters, while the north segment, between SR 18 and I-405, has a mix of residents, commuters, trucks, and other non-home-based travel. Excluding the south segment of SR 167, average vehicle trips lengths are approximately the same or longer than most other comparable freeways in the Puget Sound, indicating the facility is predominately used for longer-distance, non-local travel.

Table 11-4. All Vehicles and Truck Approximate Trip Lengths (miles)

Segment Description	All Vehicles	Trucks
South SR 167	23-31	41-69
Middle SR 167	35-36	61-69
North SR 167	30-32	47-59
Other Regional Freeways		
Northbound I-5 at SR 599	37	64
Eastbound SR 512 at SR 7	31	91
Northbound I-405 at I-90	31	83
Eastbound I-90 at I-405	32	100
Eastbound SR 520 at I-405	18	29

Source: StreetLight Data, October 2019 Data

Truck trips on the corridor comprise both short and long-haul trips. Truck trip lengths are between 17 and 46 miles longer than the other vehicle trips on the corridor. However, SR 167 truck trip lengths compared to other regional freeways are shorter,

indicating a large portion of trucks have stops that begin or end in the study area. While SR 167 has a relatively high proportion of shorter-distance truck trips compared to other regional highways, the corridor does carry a substantial share of long-distance freight travel. Notably, about 30% of all freight trips are longer than 60 miles in length. An analysis of these longer distance truck trips indicates that they are a mix of either trips with an origin/destination in the Sumner, Pacific, and Kent MICs or through trips. The middle segment has the longest overall truck trip lengths and the greatest share of through trips (which tend to travel via SR 18 to/from Eastern Washington).

Home and Work Locations

Information from StreetLight Data was analyzed to infer the home and work locations of SR 167 users as detailed in Table 11-5. Approximately 44% of SR 167 users' home locations are to the south of the SR 167 corridor, with the highest concentration in the communities of Puyallup, South Hill, Bonney Lake, Enumclaw, Parkland, and Summit. Another 33% of all SR 167 users reside within the study area between SR 410 and I-405. A relatively low percentage of users live north or east of the study area. This pattern is reflective of the fact that the Master Plan team drew the study area with the SR 167 travelshed in mind. For example, people east of the study area generally use SR 169, while people to the north use I-5 and I-405.

Table 11-5. Home and Work Locations of SR 167 Users

Area	Home Locations	Work Locations
SR 167 Study Area South (south of SR 410)	26%	17%
SR 167 Study Area Middle (SR 410 to SR 18)	16%	16%
SR 167 Study Area North (SR 18 to I-405)	17%	24%
Seattle and Shoreline	5%	10%
Eastside, Northshore, Snohomish County, and Northern Washington	7%	11%
Federal Way/Burien	5%	4%
Eastern King, Pierce, and Eastern Washington	9%	6%
Kitsap Peninsula, Central and Southern Washington	14%	11%
Other [a]	1%	1%

Source: StreetLight Data, October 2019 Data

Note:

[a] Outside the state of Washington

Work locations are predominately adjacent to the corridor with clusters in the Summer-Pacific MIC, Kent MIC, and the Renton Boeing facilities. A smaller portion of users work in Seattle and Eastside locations while few SR 167 users work north of downtown Seattle or Bellevue.

The work location of SR 167 users can vary widely throughout the day. During the morning commute period, specifically between 4 a.m. and 5 a.m., work locations are predominately at MICs and Renton Boeing facilities. Between 6 a.m. and 7 a.m., work locations transition to longer distance locations including downtown Bellevue and Seattle. Toward the end of the AM peak period, between 8 a.m. and 9 a.m., most work-based trips are adjacent to the corridor.

Bus Activity

Bus activity within the study area is illustrated in Figure 11-2, which illustrates a heat map based on the number of bus riders from StreetLight Data. The highest bus activity occurs near Kent Station, representing approximately 7% of all activity in the SR 167 study area. This is also consistent with the transit boarding data in *Chapter 8, Transit Network*, which found that Kent Station is the busiest transit hub in the study area. Other areas with moderate to high levels of ridership are near Sounder commuter rail and Link light rail stations and on roadways with all day, frequent bus service, such as 68th Avenue South, which is south of SR 18. Bus activity is low or is not provided and is noticeably absent in Sumner and Bonney Lake, which are outside of the Pierce Transit service area.

On SR 167, bus activity is low to very low compared to the surrounding areas. The corridor is only served by a few limited, all day routes including routes 566 and 578, operated by Sound Transit. A few segments along SR 167 do not have bus service and those segments south of SR 18 have low ridership and infrequent service. Refer *Chapter 8, Transit Network*, for further information.

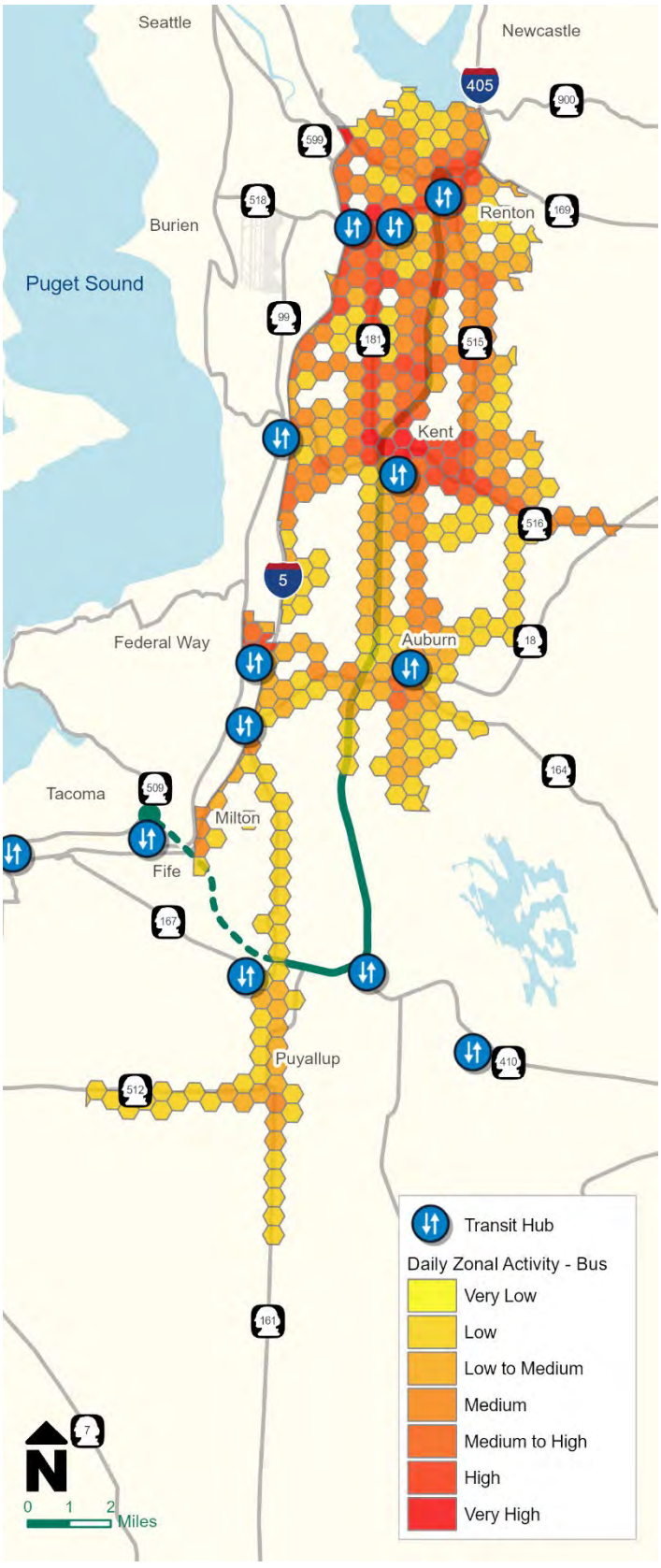


Figure 11-2. Bus Activity

Active Transportation Activity

The highest concentrations of walk and bicycle trips are illustrated in Figure 11-3 and Figure 11-4, respectively. The greatest proportion of pedestrian and bicycle activity occurs near retail centers, adjacent to transit hubs, hospitals, and the area surrounding the Washington State Fairgrounds[10]. Bicycles also exhibit higher areas of activity along roadways with bicycle facilities and on regional trails including the Green River and Interurban trails.

Most of the study area has low pedestrian activity, but it is lowest west of SR 167 between I-5, SR 516, and SR 512. Much of this area has challenging terrain, is rural or undeveloped, has intermittent pedestrian facilities, and limited number of connections across freeways and arterials.

[10] While the area around the Fairgrounds is most active during the Washington State Fair in September, pedestrian data was collected from May through October of 2019. The high activity reflects not just the September Fair but also ongoing events and other activities that occur year-round at the Fairgrounds.

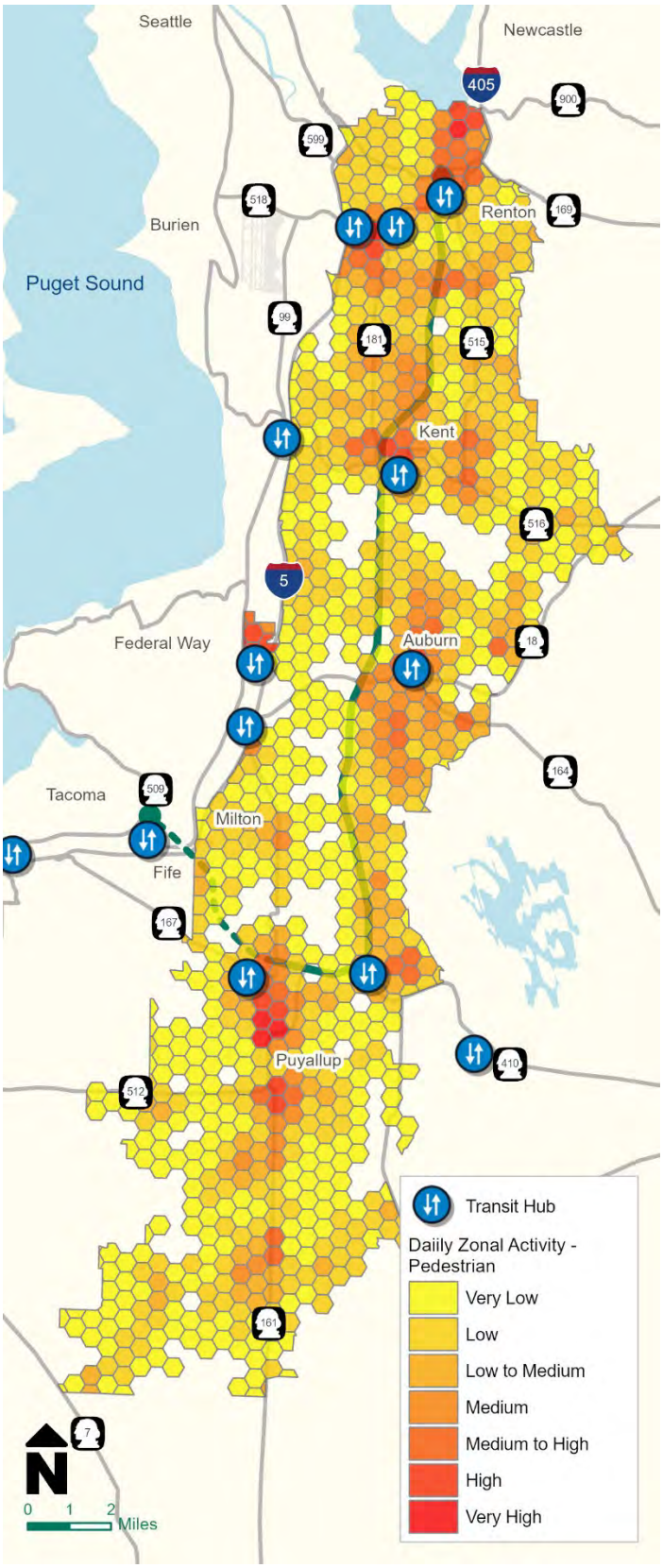


Figure 11-3. Pedestrian Activity

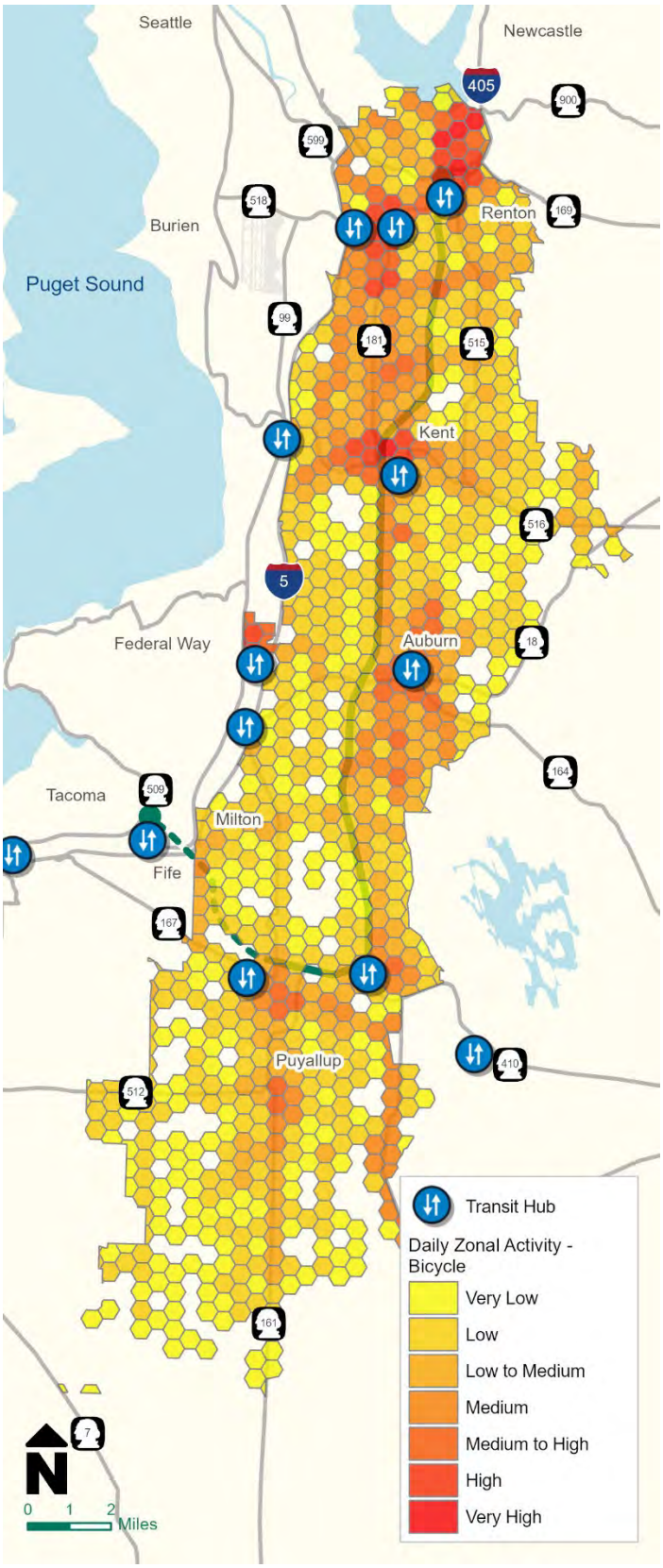


Figure 11-4. Bicycle Activity

Chapter 12. Environmental Baseline

Chapter Overview

This chapter provides an overview of the existing environmental conditions within an approximate 1-mile radius of SR 167. Environmental resources reviewed include built and natural resources such as air and climate, hazardous materials, cultural resources, fish barriers, priority habitats, geologic and flood hazards, noise walls, social resources, parks/trails, and water resources. The data in this chapter will be considered for the development and evaluation of scenarios in the SR 167 Master Plan PEL Study.

Key findings of the environmental analysis include:

- The Muckleshoot and Puyallup Tribal Reservations may have traditional cultural properties/landscapes that will need to be identified through the engagement process.
- Environmental justice populations are present. These populations are primarily concentrated in the northern portion of the corridor; *Chapter 3, Community Profile*, includes additional details.
- There are 20 known fish passage injunction barriers identified.
- Flooding occurs in the Green River Valley. There are 100- and 500-year floodplains associated with several waterbodies.
- Most soils have moderate to high susceptibility to liquefaction.
- There are two Superfund sites listed on the National Priority List (NPL), as well as state cleanup sites and underground storage.
- Some waterbodies are on the 303(d) list, denoting they do not meet the state water quality standards.

Environmental Analysis Area

The analysis area for the environmental baseline is illustrated in Figure 12-1. It includes the area within approximately 1-mile radius of SR 167 as well as the RGCs and MICs identified by PSRC. The analysis area extends from Lake Washington on the north, south to Puyallup, and westward to the Port of Tacoma.

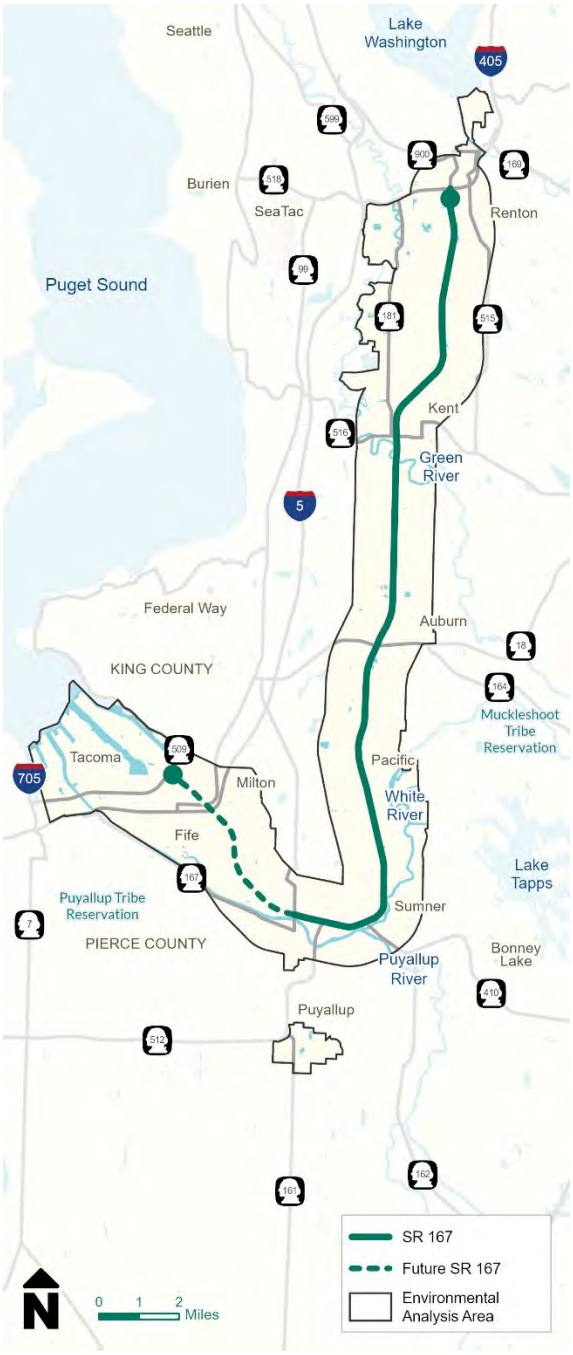


Figure 12-1. SR 167 Master Plan PEL Study Environmental Analysis Area

Air Quality

WSDOT reviewed the analysis area for areas that do not meet the National Ambient Air Quality Standards (NAAQS). The analysis did not include carbon monoxide or other air modeling.

All areas within Washington State, except a portion of Whatcom County, currently meet the NAAQS (Ecology 2022). Figure 12-2 illustrates the attainment status in the analysis area. The southern portion of the analysis area (Edgewood south to Puyallup and Tacoma) is within the Tacoma–Pierce County maintenance area for $PM_{2.5}$, ending in year 2035. The analysis area also includes the Kent and Tacoma Tideflats maintenance areas for PM_{10}. The 20-year period for those areas ended in 2021. Strategies to reduce air pollution remain in effect after the end of the maintenance period. To discontinue the strategies, a state must demonstrate that the measure is no longer needed to meet the NAAQS or any other federal Clean Air Act requirement, and US EPA must approve it. Vehicle miles traveled and congestion metrics will be used in scenario analysis to comparatively assess potential air quality impacts. Refer *Appendix D, Environmental Considerations for Future Phases*, for more information.

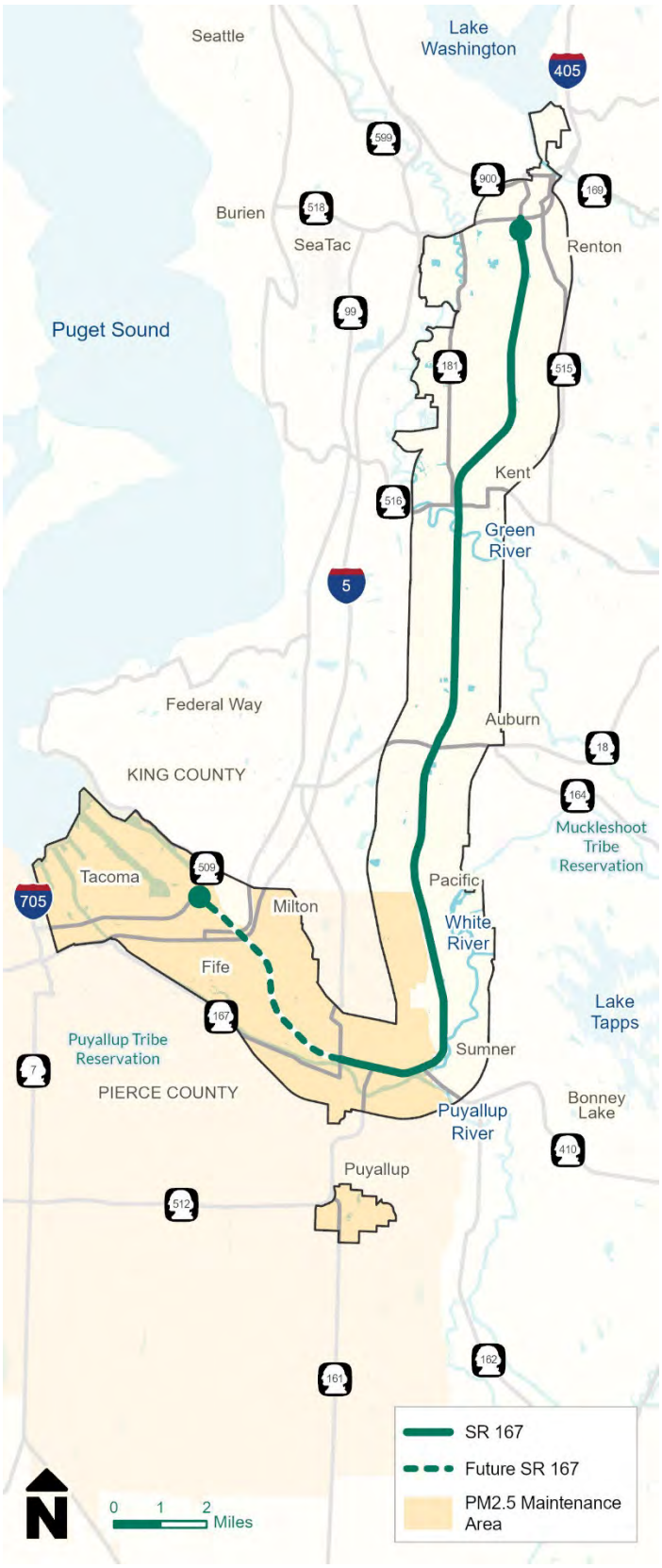


Figure 12-2. Air Quality Attainment Status Map

Climate Vulnerability

WSDOT's climate vulnerability assessment GIS layer was reviewed to summarize the vulnerability (ranked from low to high) to climate change impacts for state highway systems.

As illustrated on Figure 12-3, the northern portion of the SR 167 corridor has a moderate potential for impacts from climate change, meaning it could have temporary operational failure and closure, but would reopen or be repaired within 60 days. The southern portion of the SR 167 corridor has low potential for impacts from climate change, indicating that this portion of the corridor could have reduced capacity but would be partially open to use with full operations restored within 10 days. Most other state-owned facilities within the analysis area are also considered to have low to medium vulnerability to climate impacts. SR 181 has a high vulnerability to the impacts from climate change due to its proximity to the low-lying areas adjacent to the Green River. Most of SR 167 has moderate vulnerability and may be affected by climate change induced flooding. Sea level rise is not projected to directly impact either corridor, according to available modeling. For information about flood risks, refer to the *Flood Hazards* section. Scenario analysis will comparatively evaluate likelihood of maintaining a State of Good Repair and improving the resilience of the facility to mitigate climate vulnerability.

Refer to *Appendix C* for more information on WSDOT assets and vulnerability to climate threats. Refer to *Appendix D* for information future environmental review.

Figure 12-3. Climate Vulnerability Map

Cultural Resources and Historic Bridges

WSDOT used readily available datasets from the Washington Department of Archaeology and Historic Preservation (DAHP), King County assessor, and Pierce County assessor to identify potentially historic resources.

Native occupation sites were located along the edges of Puget Sound and along inland waterways, lakes, and wetlands. Estuary environments were favored locations for Native use. The analysis area incorporates several known/recorded archaeological sites in and near the Duwamish, Green, White, and Puyallup rivers; their associated wetlands; and some smaller, glacially formed lakes and ponds. Euro-American and other historic sites (both archaeological and still-standing buildings, bridges, and other structures) are present throughout the analysis area, reflecting the recent history of logging, farming, and transformation of the landscape for agricultural and industrial uses.

As summarized in the *SR 167 Corridor Plan* (WSDOT 2008b), the analysis area includes portions of the Puyallup and Muckleshoot Tribal reservations and the landscape within which Native and non-Native peoples made their home. Three barns in the analysis area are listed in the Washington Heritage Barn Register, but the State Historic Preservation Officer has determined only one (Daniel Upper Farm) is eligible for listing in the National Register of Historic Places (NRHP). Historic resource locations are depicted in Figure 12-4.

Descendants of the Duwamish, Suquamish, Puyallup, Muckleshoot, and other Native peoples in the vicinity consider not only archaeological sites but also traditional places on the landscape where they hunted, fished, gathered plants and shellfish, and conducted sacred activities to be cultural resources. In state and federal regulations, such places are included in the definitions of *traditional cultural places* or *traditional cultural landscapes.*

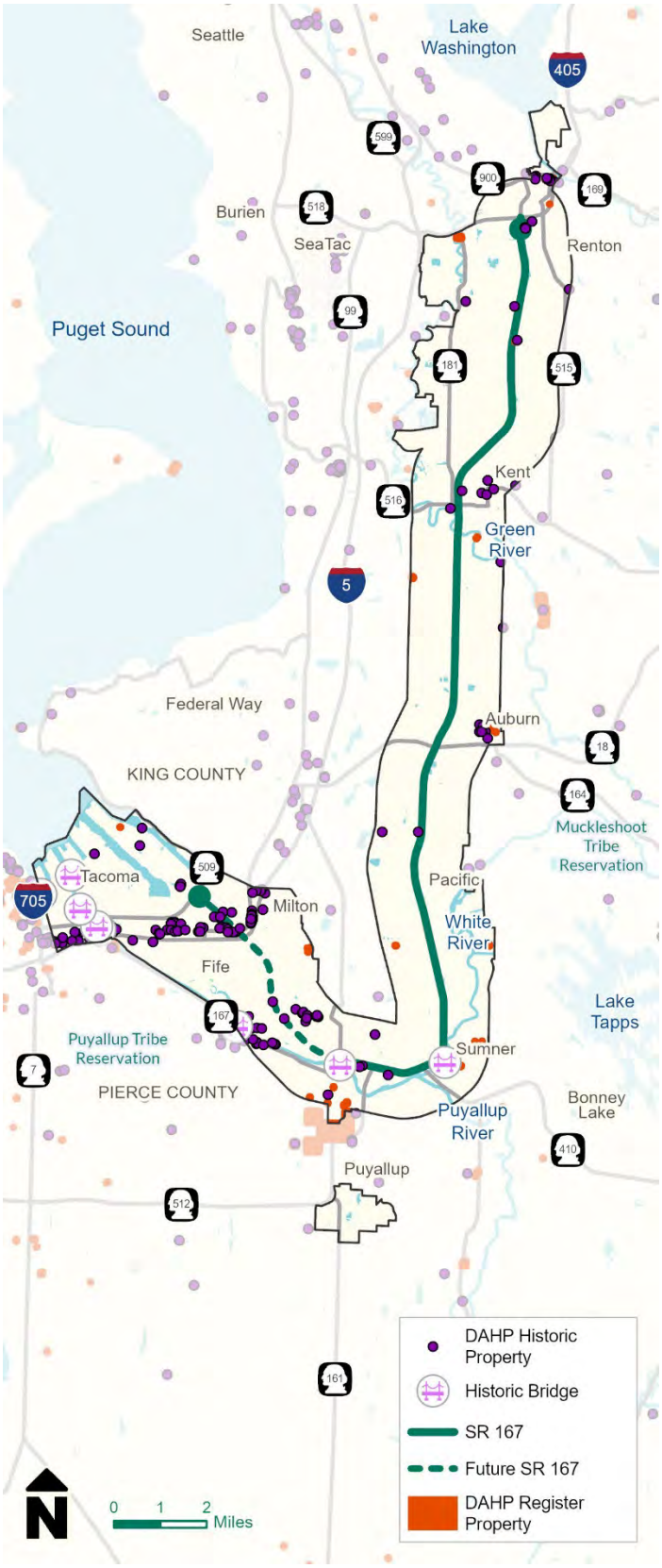


Figure 12-4. Existing Historic Resources and Historic Bridges Map

Resources Listed in the NRHP

- Masonic Temple Auburn (Property ID 340812, Resource ID 288587)
- F.W. Woolworth Co. Store Renton (Property ID 341622, Resource ID 289391)
- Jovita Land Company Model Home, Corbett House (Property ID 700353, Resource ID 662763)
- M.V. Kalakala Ferry (Property ID 700376, Resource ID 662786)
- Christ Episcopal Church Puyallup (Property ID 32139, Resource ID 25916)
- Ryan House (Property ID 32381, Resource ID 26155)
- Dieringer School (Property ID 32414, Resource ID 26185)
- Blomeen, Oscar, House (Property ID 38987, Resource ID 29495)
- U.S. Post Office Auburn (Property ID 339261, Resource ID 287039)

There are no historic bridges within the King County portion of the analysis area. In Pierce County, there are historic bridges along White and Puyallup rivers and at the Port of Tacoma, as depicted in Figure 12-5.

Many other properties meet the 45-year threshold (Figure 12-4) and should be further reviewed for NRHP eligibility during a National Environmental Policy Act of 1969 (NEPA) review. There are no NRHP-listed historic districts in the analysis area according to the DAHP Washington Information System for Architectural & Archaeological Records Data (WISAARD) system.

Traditional Cultural Properties/Landscapes (TCP/Ls) are only minimally represented in DAHP records; consultation with tribal cultural resources staff is recommended to identify locations of TCP/Ls and to define "environmentally sensitive" areas/zones. TCP data will not be publicly disclosed. Scenario analysis will consider potential impacts on historic properties listed on or eligible for the NRHP. Refer to *Appendix D* for more information.

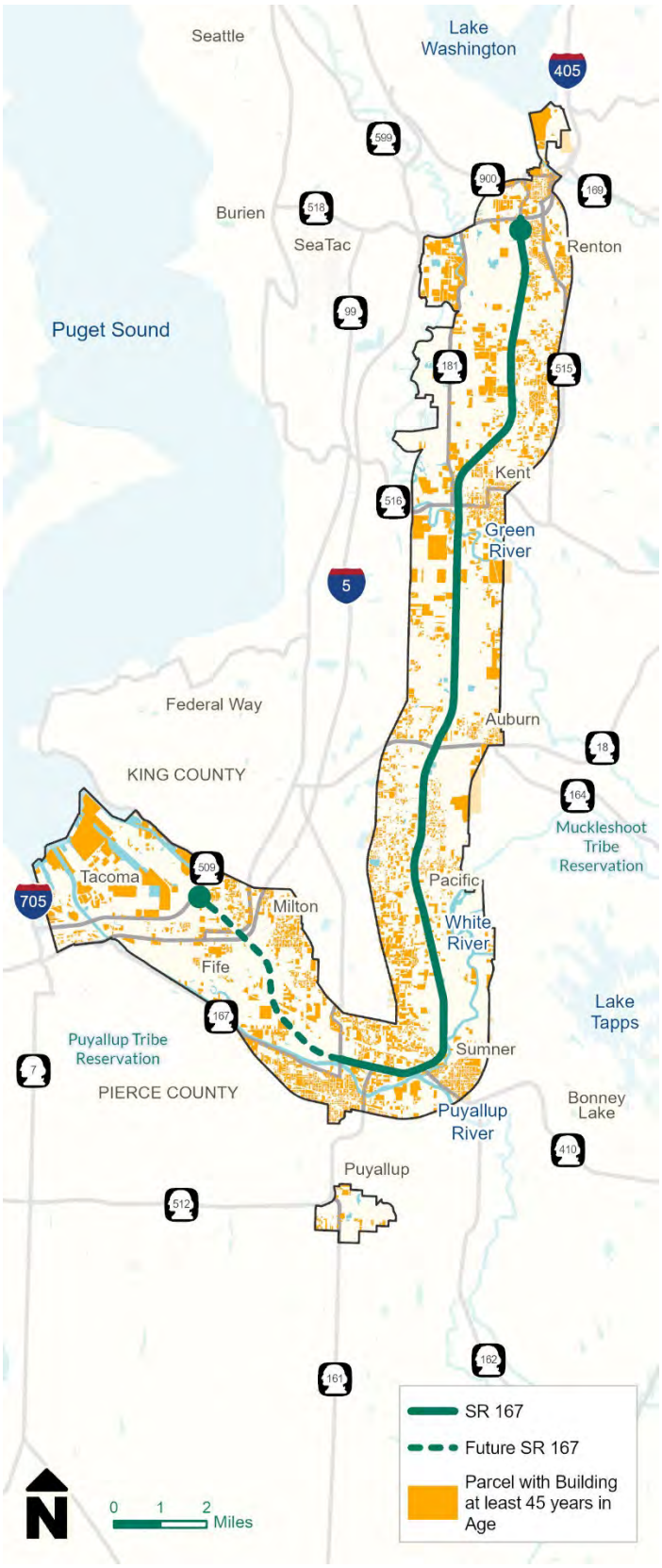


Figure 12-5. Locations of Potentially Significant Historic Properties over 45 Years of Age Map

Environmental Justice Populations

Environmental justice is the fair treatment and access to meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, rules, and policies. The principles of environmental justice include avoiding, minimizing, and mitigating disproportionately high and adverse effects on minority and low-income populations; ensuring full/fair engagement and participation by potentially affected communities; and preventing the denial, reduction, or significant delay in receiving benefits by minority and low-income communities (WSDOT Environmental Manual Chapter 460).

Transportation improvement projects must meet environmental justice requirements during the environmental review process.

The environmental justice analysis and methodology is included in *Chapter 3, Community Profile.* The analysis was performed on broader geographic area (study area for the Master Plan PEL Study) to include communities that rely on SR 167 (according to origin and destination analysis). The community profile provides demographic information to help characterize communities in the study area—such as households with no vehicle available, renter-occupied households, cost-burdened and severely cost-burdened households, unemployment rates, educational attainment, limited English proficiency, foreign-born populations, disabled, and youth and seniors. It also includes information regarding Chapter 70A.02 RCW - Environmental Justice, which was passed by the Washington legislature in 2021.

Analysis of scenarios will consider impacts and benefits to EJ populations and other potentially vulnerable populations or overburdened communities. Refer to *Appendix D* for more information.

Key Community Profile Findings:

- People of color account for almost half of the total population in the community profile study area. North of SR 18, people of color account for over half of the population, and south of SR 18, people of color make up about one-third of the population. Asian and Hispanic/Latino peoples make up the largest proportion of minority populations.
- Minority populations account for about 60% of the total population living in poverty and about 45% of the labor force.
- The median income for households in the study area is approximately $80,000 per year. Households with an Asian householder have the highest household income in the study area. Approximately 25% of the people in the study area is considered low-income. Nearly 35% of the households in the study area (mostly concentrated in the northern half) are considered cost burdened.
- About 10% of the people within the study area speak English less than ‘very well’. Of the limited English-speaking populations, most speak Spanish, or Asian languages including Korean, Chinese, Vietnamese, Tagalog (including Filipino), and Pacific Islander. Most of the population with limited English proficiency lives north of SR 18.
- Within the study area, about 60% of the housing units are owner-occupied. Less than 10% of the households in the study area do not have a vehicle available, and most are located north of SR 18.
- Close to one-third of the families in the study area are single parent families with children under 18.

Fish Passage Barriers

A fish barrier is either a natural or humanmade structure that prevents the upstream movement of fish and aquatic organisms. Replacing fish barriers with restored stream connections provides improved anadromous fish access to upstream habitat. As described in the *SR 167 Corridor Plan* (WSDOT 2008b), in the 1970s when SR 167 was constructed, round culvert pipes and box culverts were placed to convey flow from one side of the highway to the other, but they were not designed to provide passage for fish. Today, culverts must be identified and verified to evaluate and determine if they are fish passage barriers in compliance with a federal permanent injunction issued in *United States et al. vs. Washington et al.* No. C70-9213 Subproceeding No. 01-1, dated March 29, 2013 (Injunction). The injunction requires the state to significantly increase the effort for removing state-owned culverts that block habitat for salmon and steelhead by 2030, including maintenance and monitoring these culverts for fish passage. The review of injunction barriers is coordinated through WSDOT, Washington Department of Fish and Wildlife (WDFW), and the affected tribes.

There are 20 known injunction barriers identified within the analysis area using the WSDOT GIS layer for Fish Passage Uncorrected Injunction Barriers (Table 12-1). Potential barriers that have not been identified or field verified may also be present. WDFW data detail fish passage sites along state-highways that have either a partial or total blockage, are a natural barrier, or the blockage/barrier is unknown. The WSDOT-identified, uncorrected injunction barriers are depicted in Figure 12-6.

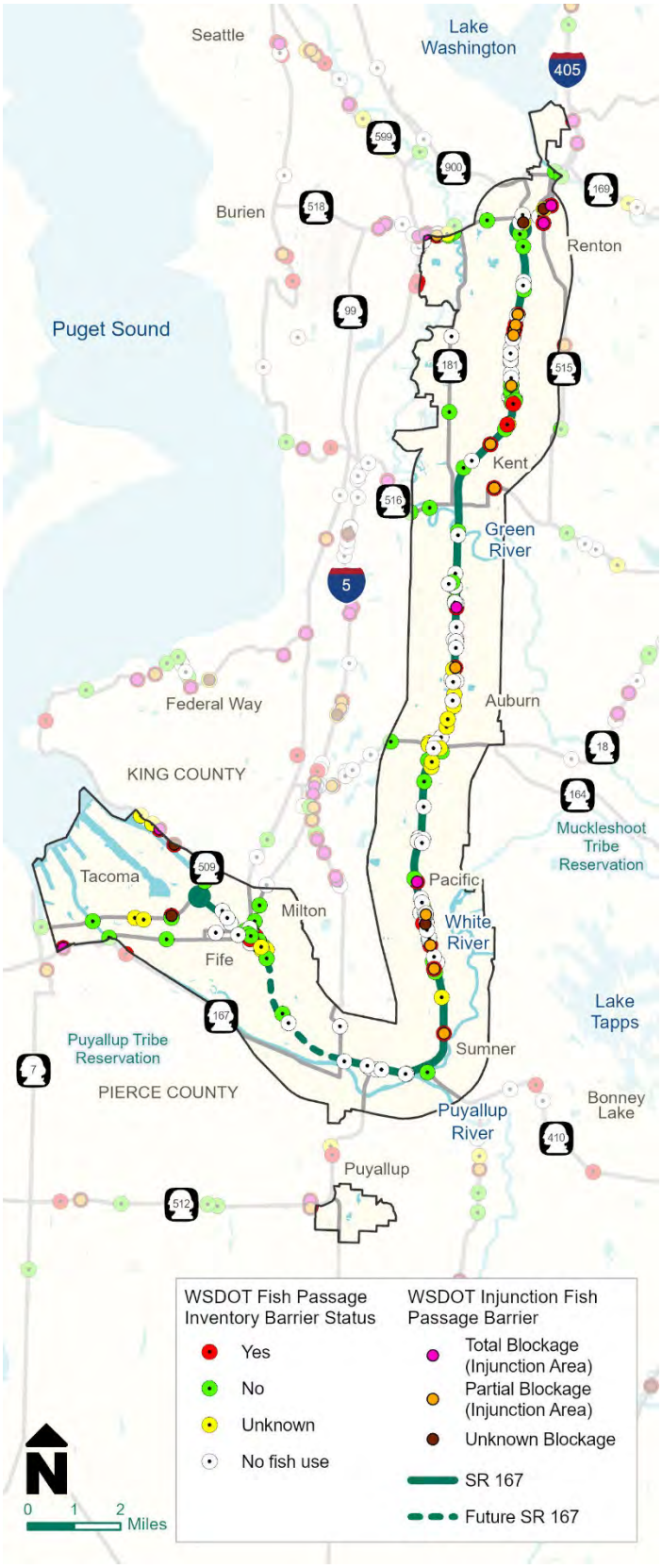


Figure 12-6. Fish Passage Barrier Status Map

Fish barriers are corrected either through stand-alone correction projects or as part of a larger transportation improvement project. No barriers within the analysis area were identified as WSDOT projects planned for completion in 2021 (WSDOT 2021b).

As of 2021, WSDOT has completed 365 fish passage barrier corrections statewide, restoring access to approximately 1,215 miles of potential upstream habitat (WSDOT 2021b).

The barrier status of culverts in or next to potential project areas will be reviewed for during scenario analysis. Refer to *Appendix D* for more information.

Table 12-1. WSDOT-Owned Culverts Relevant to the Injunction in the Analysis Area

Site ID	Road	Milepost	Stream	Lineal Gain (feet)	Species
995470 [a]	I-405	2.31	Rolling Hills Creek	1,865	CO, RT, SH, SRCT
994406	I-405	3.06	Thunder Hills Creek	810	CO, RT, SH, SRCT
933186	I-5	134.33	Unnamed Tributary to Puyallup River	36	RT, SH, SRCT
933530	SR 167	23.93	Unnamed Tributary to Springbrook Creek	Unknown	CO, RT, SH, SRCT
991681	SR 167	23.84	Unnamed Tributary to Springbrook Creek	Unknown	CO, RT, SH, SRCT
996288	SR 167	10.46	Unnamed Tributary to Milwaukee Canal	406	CH, CO, RT, SH
995469	SR 167	22.63	Unnamed Tributary to Springbrook Creek	95	CO, RT, SH, SRCT
996290	SR 167	11.37	Unnamed Tributary to Milwaukee Canal	2,320	CH, CO, RT, SH
991200	SR 167	24.16	Unnamed Tributary to Springbrook Creek	102	CO, RT, SH, SRCT
991211	SR 167	10	Milwaukee Canal	10,745	CH, CO, RT, SH
991202	SR 167	25.94	Rolling Hills Creek	2,291	CO, RT, SH, SRCT
991198	SR 167	21.17	Mill Creek	6,280	CO, RT, SH, SRCT
991212	SR 167	8.05	Milwaukee Canal	Unknown	CH, CK, CO, RT, SH, SRCT
935187	SR 167	17.39	Unnamed Tributary to Mill Creek	Unknown	CH, CO, RT, SH, SRCT
105 R050320b	SR 167	10.65	Milwaukee Canal	9,143	CH, CO, RT, SH, SRCT
930603	SR 167	9.47	Unnamed Tributary to Milwaukee Canal	313	CH, CK, CO, RT, SH, SRCT
933183	SR 509	5.24	Unnamed Tributary to Commencement Bay	Unknown	CH, CK, CO, PK, RT, SH, SRCT
105 R121419a [b]	SR 509	2.97	Wapato Creek	18,513	CH, CK, CO, PK, RT, SH, SRCT
994409 [a]	SR 515	7.08	Rolling Hills Creek	1,231	CO, RT, SH, SRCT
997651	SR 516	5.8	Mill Creek	4,561	CO, RT, SH, SRCT

Source: WSDOT 2021b

Notes:

CH = Chinook salmon, CO = coho salmon, RT = resident trout, SH = steelhead, SRCT = sea run cutthroat trout

[a] The barrier status is not known at this time.

[b] Information based on most up to date WSDOT GIS Layer for Fish Passage Uncorrected Injunction Barriers.

Fish and Wildlife Habitat and Chronic Environmental Deficiencies

Fish and wildlife habitat and habitat connectivity are important components of an ecosystem's health and function. The presence of wildlife in urban landscapes depends on the availability of appropriate habitat and vegetation. Transportation systems can represent the main cause of habitat fragmentation for wildlife (FHWA 2011). Roadways next to rivers or streams are often subject to damage from streambank erosion, sedimentation, flooding, or washouts that require frequent emergency repairs or maintenance and potentially disturb fish habitat (WSDOT 2020c). Such sites are known as *chronic environmental deficiencies* (CEDs). This section describes fish and wildlife habitat areas and CEDs in the analysis area.

Habitat and Habitat Connectivity

The analysis area consists of developed urban land with some lower-density residential developments and open space areas. The National Landcover Dataset details the land in the analysis area consists primarily of medium- and high-intensity developed land. There are some areas of pasture/hay or other agricultural lands south Tacoma and southwest of downtown Kent, emergent herbaceous wetlands in Auburn, and scrub-shrub across Tacoma and Puyallup. The National Landcover Dataset describes that there are areas of deciduous forest west of SR 167, south of Kent.

Human activities have greatly altered natural habitats in the analysis area. The area has become more urban, reducing functional riparian habitats and connectivity between and within aquatic and terrestrial habitats. Habitat limiting factors in both the Green and Puyallup River watersheds include extensive urban growth, heavy industry, dredging, agriculture, and miles of revetments and levees. The addition of dams and diversions has affected salmonid production by impeding fish access to the upper reaches of the watersheds (King County 2000; Kerwin 1999).

Rivers, streams, and their tributaries are present within the analysis area (refer to the *Water Quality and Stormwater* section). Riparian areas are present along these waterbodies and provide habitat for plants and animals. However, riparian conditions and functions are degraded by bank armoring, channelization, and development.

Deepwater marine and tidal systems are located within Commencement Bay, as described in the *Wetlands* section. These areas provide habitat for marine mammals and plants. Habitat functions have been degraded due to Port of Tacoma operations adjacent to and within the bay, as well as widespread contamination of the water, sediments, and upland areas that have resulted in the bay's designation as a Superfund site (refer to the *Hazardous Materials* section of this chapter).

Priority habitats identified by WDFW include wetlands (refer to the *Wetlands* section), biodiversity areas and corridors, and waterfowl concentrations. Biodiversity areas and corridors are mostly on steep slopes along the river valleys with native vegetation providing wildlife habitat and migration corridors. Pierce County has also identified White River and Puyallup River in its dataset for biodiversity networks. There are no King County identified wildlife networks within the analysis area. Waterfowl concentration areas are mainly found south of SR 516.

As illustrated in Figure 12-7, most of the identified habitat connectivity investment areas are ranked as low priority, indicating that there is a low safety ranking and/or a low ecological stewardship ranking. Refer to *Appendix A* for data sources and descriptions. One area along SR 167 is ranked as medium priority and is between South 272nd Street in Kent and 37th Street Northwest in Auburn, near several wetlands. While wildlife could potentially cross the corridor, there are no wildlife crossing structures or barrier fencing structures identified.

Potential for impacting habitat or connectivity will be reviewed during scenario analysis. Refer to *Appendix D* for more information.

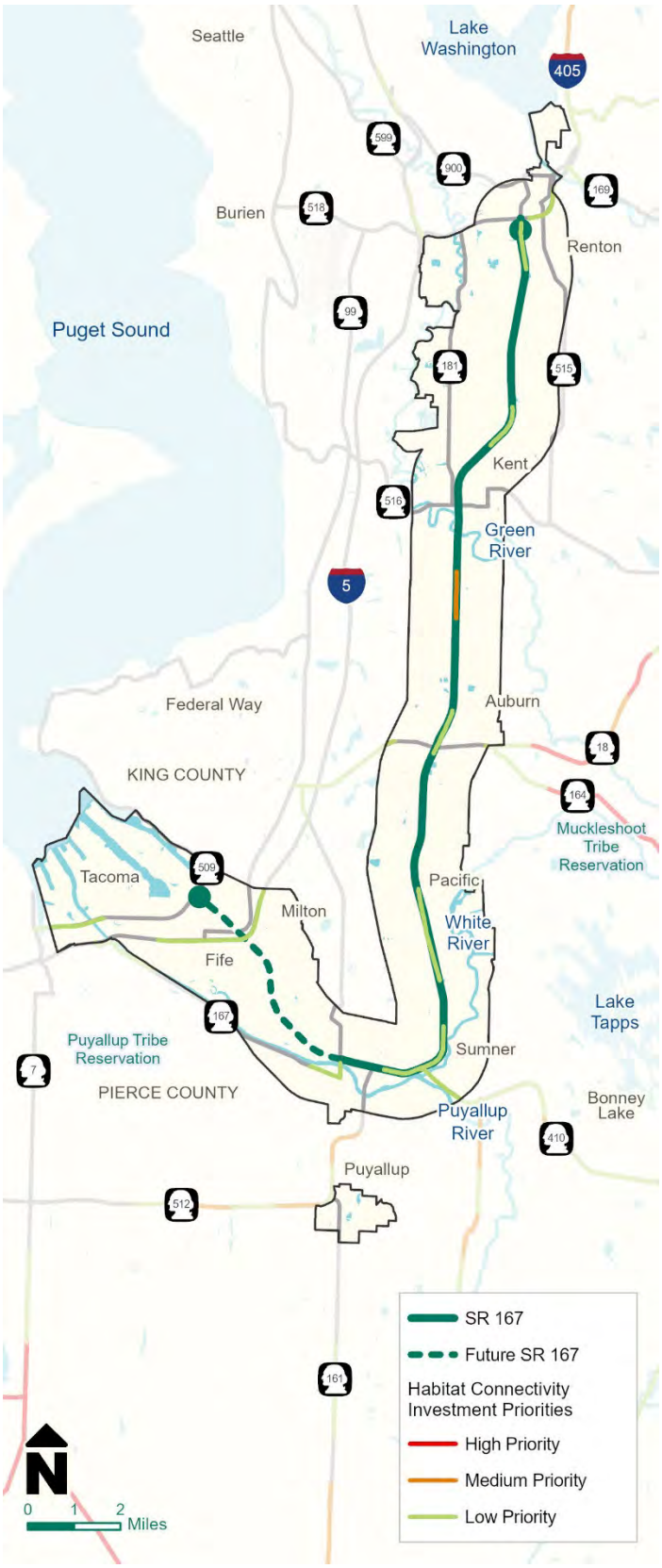


Figure 12-7. Habitat Connectivity Investment Priorities Map

Chronic Environmental Deficiencies

No locations within the analysis area have been identified as chronic environmental deficiencies, and therefore will not be assessed for each scenario.

Species of Interest

Table 12-2 lists the federal- and state-listed species that are identified by United States Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and WDFW to potentially occur in the analysis area. One species (bull trout) has critical habitat present within the analysis area. Additional species of interest and WDFW Priority Habitat Species are summarized in Table 12-3.

Potential for impacting species of interest or critical habitat will be reviewed during scenario analysis. Refer to *Appendix D* for more information.

Table 12-2. Listed Species that May Occur in the Analysis Area

Species	Federal Status	State Status	Critical Habitat Present within Analysis Area
Bull trout (Salvelinus malma)	Threatened	Candidate	Yes
Chinook salmon (Oncorhynchus tshawytscha)	Threatened	None	Yes
Steelhead (Oncorhynchus mykiss)	Threatened	None	Yes
Marbled murrelet (Brachyramphus marmoratus)	Threatened	Endangered	No
Oregon spotted frog (*Rana pretiosa*)	Threatened	Endangered	No
Streaked horned lark (Eremophila alpestris strigata)	Threatened	Endangered	No
Yellow-billed cuckoo (*Coccyzus americanus*)	Threatened	Endangered	No
Taylor's checkerspot butterfly (*Euphydryas editha taylori*)	Endangered	Endangered	No
Golden paintbrush (*Castilleja levisecta*)	Threatened	None	No
Marsh sandwort (Arenaria paludicola)	Endangered	None	No

Sources: USFWS 2023; WDFW 2021; NMFS 2022

Table 12-3. Other PHS Listed Occurrences, Migration, Habitat, or Breeding Areas in the Analysis Area

Fish	Animals
Resident coastal cutthroat trout (*Oncorhynchus clarki*) Pink salmon (Oncorhynchus gorbuscha) Sockeye salmon (Oncorhynchus nerka) Kokanee salmon (Oncorhynchus nerka) Surf smelt (Hypomesus pretiosus) Pacific sand lance (*Ammodytes hexapterus*) Chum salmon (Oncorhynchus keta)	Big brown bat *(Eptesicus fuscus*) Dungeness crab (*Cancer magister*) Great blue heron (*Ardea herodias*)

Source: WDFW 2021

Flood Hazards

WSDOT used readily available data from FEMA to identify flood hazard areas. Many streams, drainage ways, rivers, and waterbodies cross the analysis area, and have associated FEMA floodplains. Most of the floodplains are classified as either 100-year or 500-year floodplains. Some regulatory floodways cross the analysis area, including areas around Green, White, and Puyallup Rivers and near the Mullen Slough Natural Area near SR 516. There are no special floodways in the analysis area.

As described in the *SR 167 Corridor Plan* (WSDOT 2008b); many floodplains surround the SR 167 corridor. Water does not drain very well in the area because of its relatively flat topography, low lying valley areas, and high water table depth. Many parts of the analysis area are prone to frequent flooding. Figure 12-8 depicts the locations of flood hazards and floodways in the analysis area.

The SR 167 corridor is impacted by floodplains associated with Springbrook Creek, Green River, Mill Creek, White River, Puyallup River, and Hylebos Creek. Springbrook Creek influences the section from Kent to I-405 in Renton where flood levels are controlled by the Black River Pump Station, and discharges are stopped when the Green River reaches a specific flood stage in Auburn. The Green River crosses under SR 167 in Kent and runs along the western edge of the analysis area.

Although there are levees, flood control dams, and improved stormwater facilities, flooding occurs in the Green River Valley. Mill Creek is a tributary of the Green River and interacts with wetlands on both sides of SR 167 in Kent and Auburn. When the Green River is at flood stage, Mill Creek and its associated wetlands are significantly influenced by backwater from the Green River. Between Auburn and Puyallup, the White River, which runs through Pacific and Sumner, is a major tributary of the Puyallup River SR 167. Near Puyallup, SR 167 turns west to run along the north side of the Puyallup River floodplain. Where SR 167 turns north toward the Port of Tacoma, the corridor passes through the Hylebos Creek system wetlands and floodplains. North of I-5, Hylebos Creek is considered a tidal backwater of the Puget Sound. Potential impacts to flood hazard areas, including floodways and floodplains will be evaluated for each scenario. Refer *Appendix D* for more information.

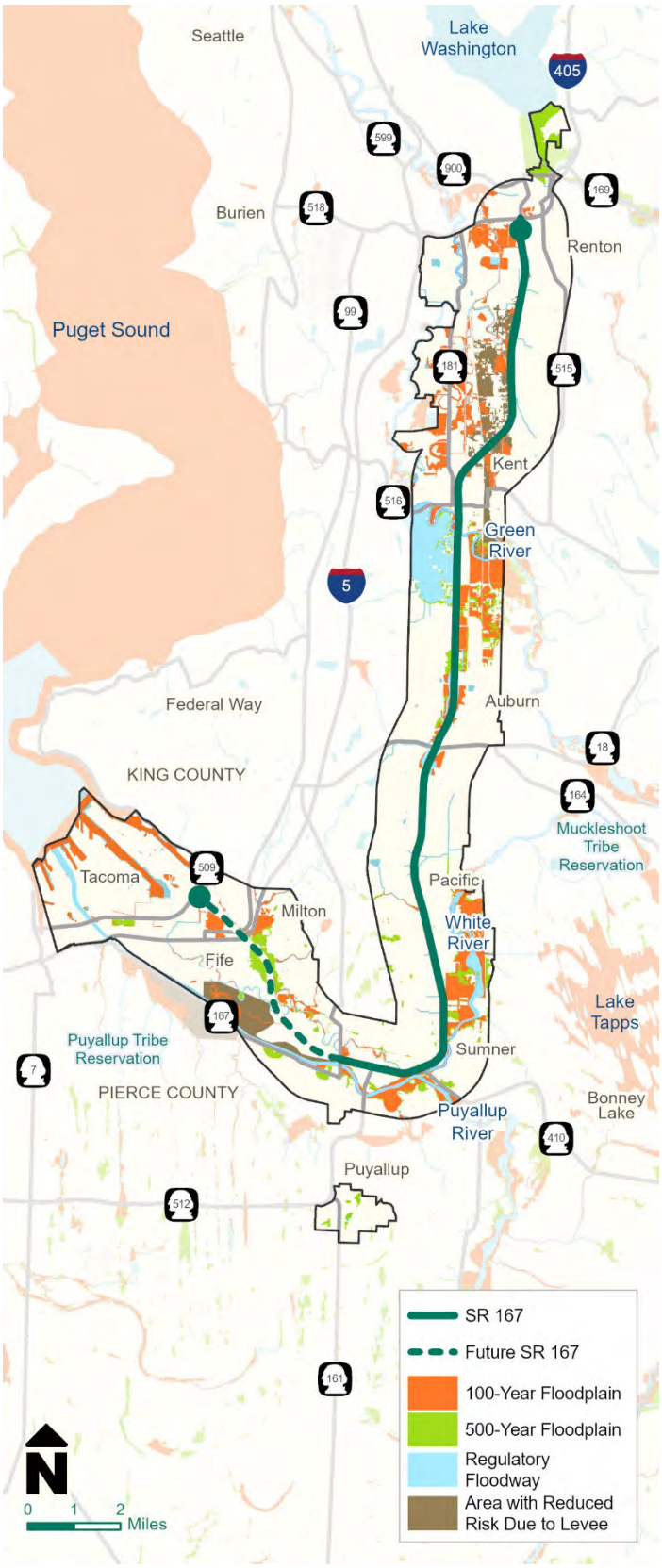


Figure 12-8. Flood Hazards and Floodways Map

Geologic Hazards

WSDOT used available GIS data to identify geologic hazard areas. As described in the *SR 167 Corridor Plan* (WSDOT 2008b), the Green River Valley is a low-lying region located west of the Cascade Mountains and east of the Olympic Mountains. The Green River Valley is susceptible to liquefaction due to soils created by a lahar from Mt. Rainier approximately 5,600 years ago. Soil types are mostly saturated silt loam or silty clay loam (NRCS 2019), which may be particularly susceptible to liquefaction during an earthquake.

Figure 12-9 illustrates the fault zones and liquefaction susceptibility in the analysis area. Part of the analysis area is within the Tacoma fault zone. The Washington State Department of Natural Resources (WDNR) data detail that most of the analysis area includes soils with moderate to high susceptibility to liquefaction, and there are larger areas with high susceptibility at the north end of the analysis area and west of SR 512 in Puyallup and Tacoma. Some bridges within the analysis area do not meet current design standards for earthquake or liquefaction. Most bridges within the analysis area are predicted to have high levels of damage with a Cascadia Subduction Zone (CSZ) earthquake.

Figure 12-10 illustrates erosion and landslide hazards. Within King County, there are erosion hazard areas east of SR 167 (north of SR 516) and west of SR 167 (south of SR 516). There are landslide hazard areas south of SR 18. Erosion and landslide hazard data for Pierce County are only available for unincorporated county areas and include some areas near SR 410 and SR 99. Steep slopes are primarily present west of SR 167, mostly in the southern portion of the study area.

Scenarios will be evaluated against areas with high liquefaction susceptibility and other potential geologic hazards. Refer to *Appendix D* for more information.

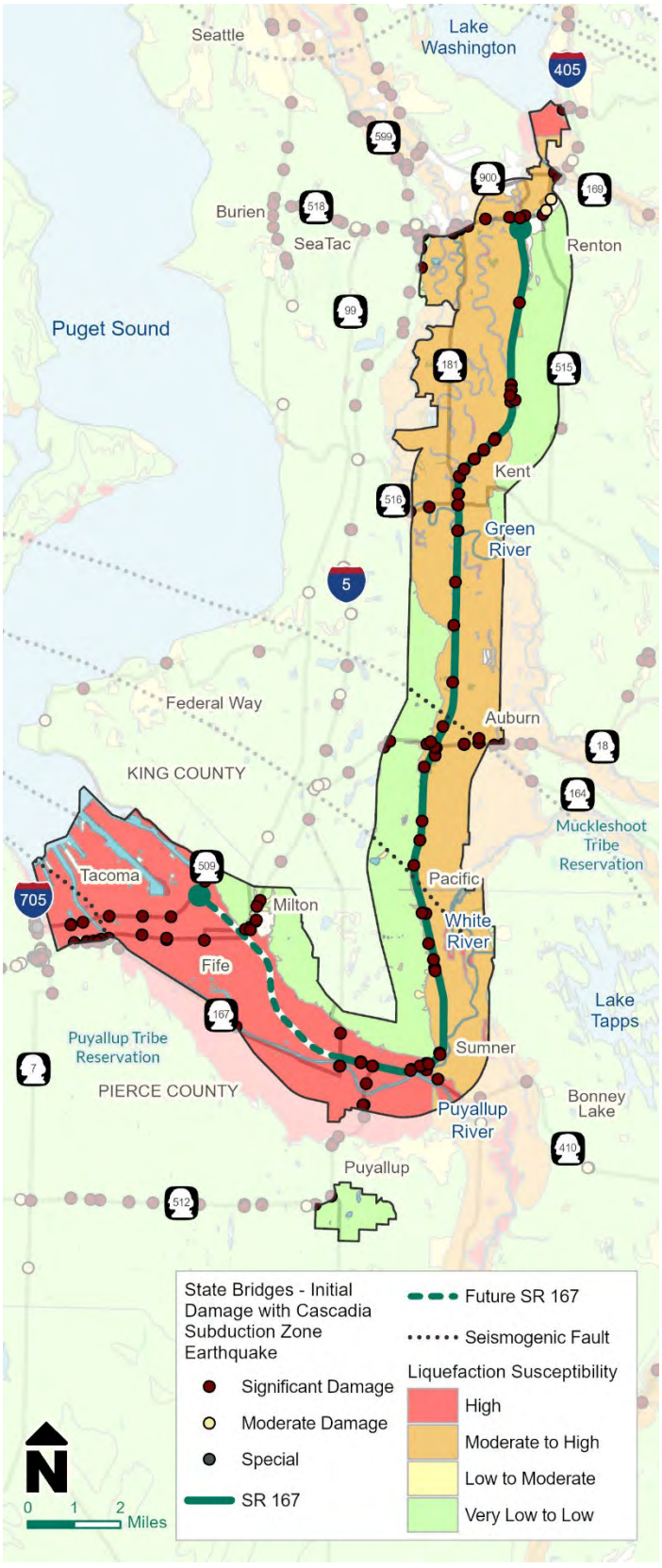


Figure 12-9. Liquefaction Susceptibility Map

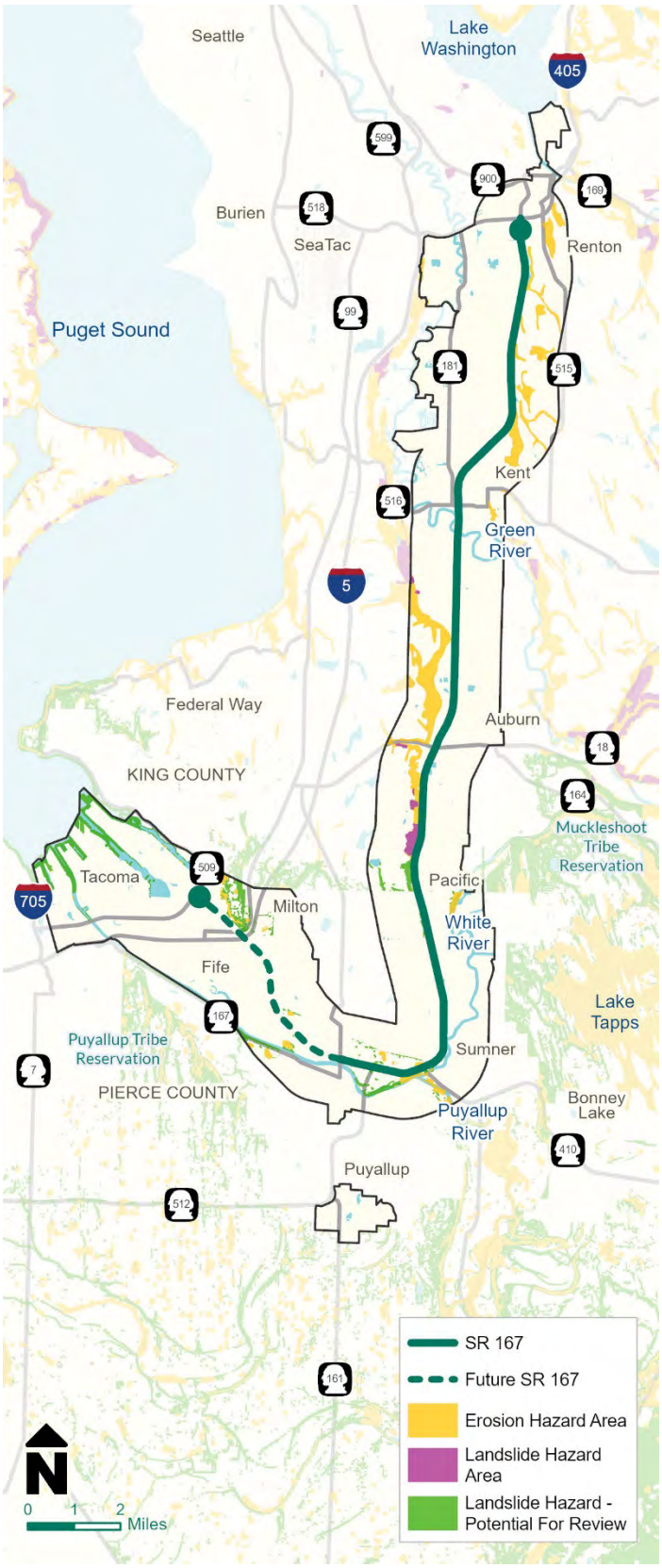


Figure 12-10. Erosion and Landslide Hazards Map

Hazardous Materials

WSDOT used GIS data from Ecology to identify potential hazardous materials sites. Table 12-4 summarizes the hazardous materials sites within the analysis area, and Figure 12-11 through Figure 12-13 depict the sites on maps.

The analysis area includes a mix of commercial, industrial, residential, and open space land uses, but the land uses closest to the SR 167 corridor are mostly industrial, which are more likely to be hazardous materials sites.

Hazardous materials transportation routes have not been identified in the analysis area (Federal Motor Carrier Safety Administration 2021). The Olympic Pipeline system carries gasoline, diesel, and jet fuel through the analysis area. As illustrated in Figure 12-11 and Figure 12-12, the Olympic Pipeline system is located west of SR 167 in the northern analysis area and crosses SR 167 near West James Street in Kent. It also crosses SR 167 north of the 15th Street Northwest interchange in Auburn. The Williams Northwest Pipeline system is also west of SR 167 but does not cross SR 167. This pipeline carries natural gas to the Pacific Northwest and Intermountain Region. Two National Priorities List (NPL) Superfund sites are in the vicinity of the SR 167 corridor: Western Processing Co., Inc., and Commencement Bay, Near Shore/Tideflats. The Western Processing Co., Inc. Superfund site is located west of SR 167 in Kent, and the Commencement Bay, Near Shore/Tideflats Superfund site is at the Port of Tacoma. The Pacific Car & Foundry Co. (PACCAR) Superfund site is immediately outside of the analysis area near I-405 and Lake Washington.

The analysis area is within the Tacoma Smelter Plume (former Asarco smelter site). The Tacoma Smelter was operated as a copper smelter before becoming one of the first Superfund sites in the nation (Ecology 2019). Figure 12-11 illustrates predicted arsenic concentrations. Most of the analysis area has predicted arsenic concentrations under 20 parts per million (ppm), which is considered as protective of

both human health and the environment under the Washington State Model Toxics Control Act. Portions of the analysis area have predicted arsenic concentrations between 20 and 40 ppm. The portion of the analysis area in Puyallup at SR 161 and SR 512 is outside of the Tacoma Smelter Plume arsenic concentration area.

Scenarios will be evaluated for their potential for hazardous materials impacts. Refer to *Appendix D* for further information.

Table 12-4. Hazardous Materials Sites in the Analysis Area

Site Type	Number of Agency-Identified Sites [a]
Federal Cleanup Sites	NPL Superfund Sites: 2 Non-NPL Remediation Sites: 37 RCRA Sites: 1,722 [a]
State Cleanup Sites	98
Storage Tanks [b]	Aboveground storage tanks: 0 Underground storage tanks: 170 Leaking underground storage tanks: 118

Sources: Ecology 2021; US EPA 2021

Notes:

NPL = National Priority List; RCRA = Resource Conservation and Recovery Act

[a] RCRA sites are locations used for treatment, storage, or disposal of waste and may also include small and large quantity generators. Not all RCRA sites have experienced a release. Some sites are indicators of permit applications (e.g., Stormwater Pollution Prevention Plan).

[b] Tanks are currently in use at some sites, while others have been remediated and closed. Some UST sites may also be identified as LUST sites.

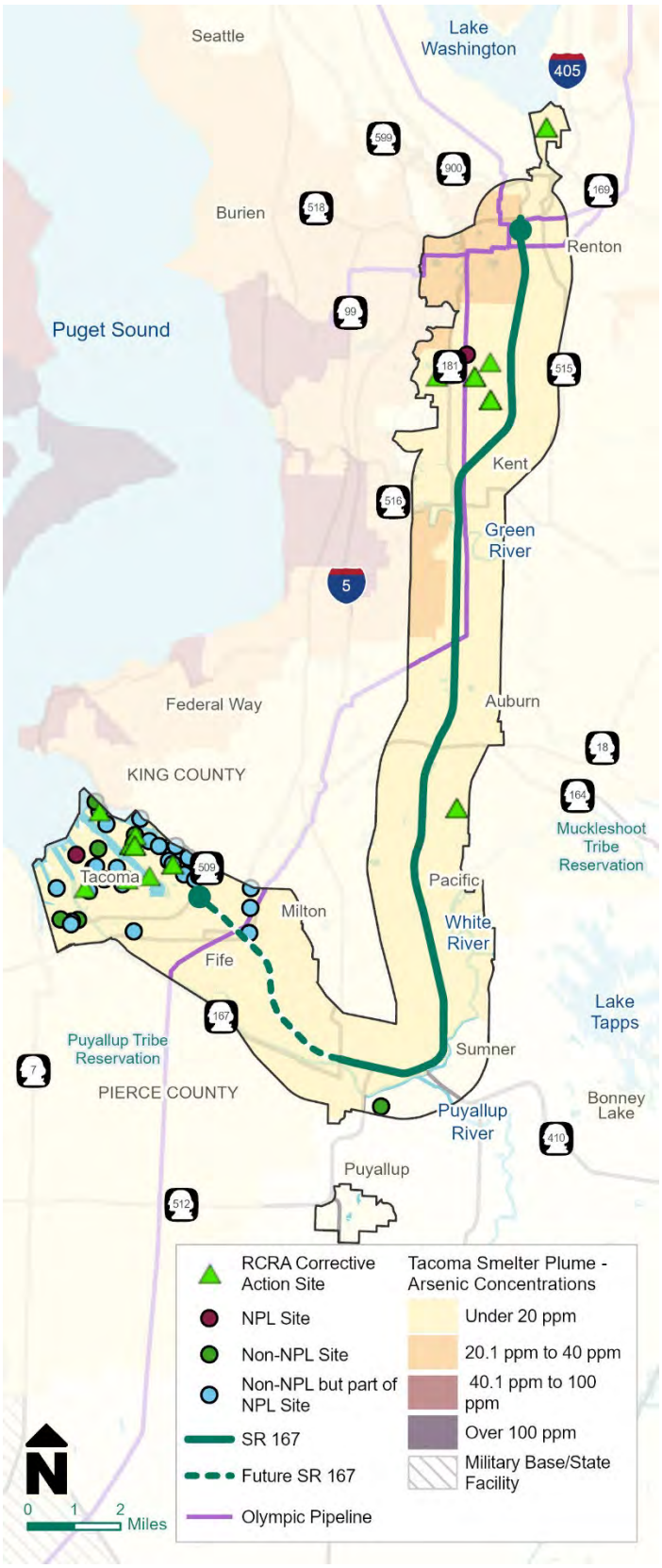


Figure 12-11. Hazardous Materials – Federal Active Cleanup Sites

Figure 12-12. Hazardous Materials – State Active Cleanup Sites

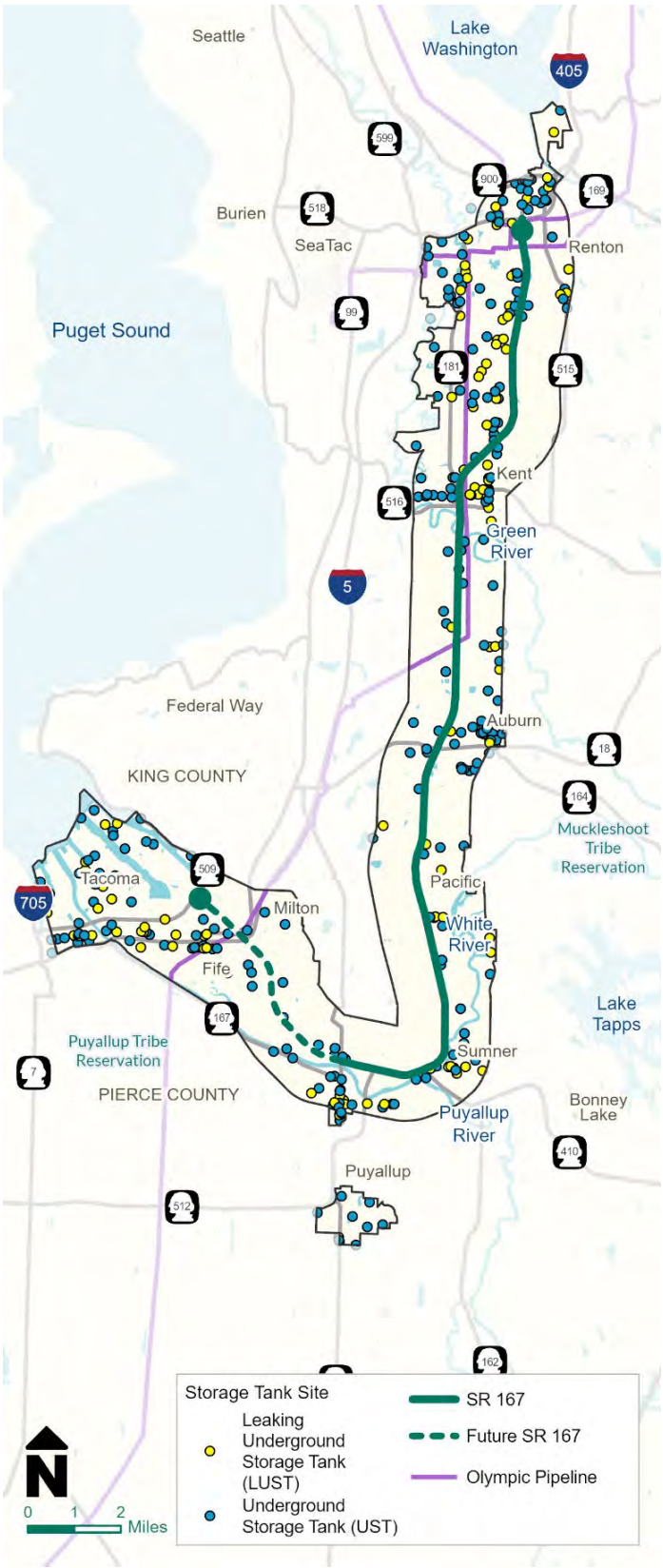


Figure 12-13. Hazardous Materials – Active Storage Tanks

Noise

Existing noise walls were identified using WSDOT's GIS layer and potentially sensitive receivers were identified using county assessor data. Much of the land next to the SR 167 corridor is industrial land (Activity Category F) and, therefore, less likely to be noise sensitive. Existing noise walls are located along SR 167, I-405, and SR 515 (Figure 12-14 and Table 12-5).

Based on county assessor data, existing land uses in the analysis area include many noise sensitive receptors. Land uses, by activity, are summarized as follows.

- Activity Category A land uses are extremely rare, and none is known to occur in the analysis area. FHWA must approve a land use as Activity Category A before a noise analysis on an Activity Category A is initiated.
- Residential receptors (Activity Category B) are present in several residential areas within the analysis area. Some of the larger areas include:
  - Within Renton and Kent, east of SR 167 and north of SR 516
  - Within Auburn in the West Hill neighborhood on the west side of SR 167
  - On either side of SR 167, south of SR 18, within Algona, Pacific, Edgewood, and unincorporated King County
  - Within Edgewood on the west/north side of SR 167 and in the southern part of Sumner on the east side of SR 167
  - Within Puyallup and Fife on the south side of SR 167
  - On the north side of SR 167 within Milton and unincorporated Pierce County
- Many Activity Category C/D land uses are within the analysis area. They include parks, trails, playgrounds, schools, places of worship, cemeteries, daycares, hospitals, auditoriums, and libraries.
- Activity Category E land uses in the analysis area include hotels/motels, restaurants, and offices.
- Activity Category F land uses include manufacturing, warehousing, and retail facilities as well as utilities and emergency services. The Auburn Municipal Airport and a few heliport complexes are within the analysis area. The Renton Municipal Airport is adjacent to the analysis area, south of Lake Washington in Renton.
- Undeveloped lands without permitted development are identified as Activity Category G land uses and were not identified for this PEL study.

Scenarios will be reviewed for their potential to increase traffic noise. Refer to *Appendix D* for more information.

Table 12-5. Existing WSDOT Noise Walls in the Analysis Area

Location	City/County	Wall Height (feet)	Wall Length (feet)
I-405 Northbound	Unincorporated King County	6 to 20	1,580
I-405 Northbound	Unincorporated King County	14 to 16	877
SR 515 Northbound	Renton	Up to 7	420 [a]
SR 167 Northbound	Kent	Up to 8	2,342
SR 167 Northbound	Kent	Up to 9	2,010
SR 167 Southbound	Algona	Up to 14	5,215
SR 167 Northbound	Algona	Up to 14	1,475

Source: WSDOT 2021

Note:

[a] There is also a 2,959-foot-long berm wall located along SR 515.

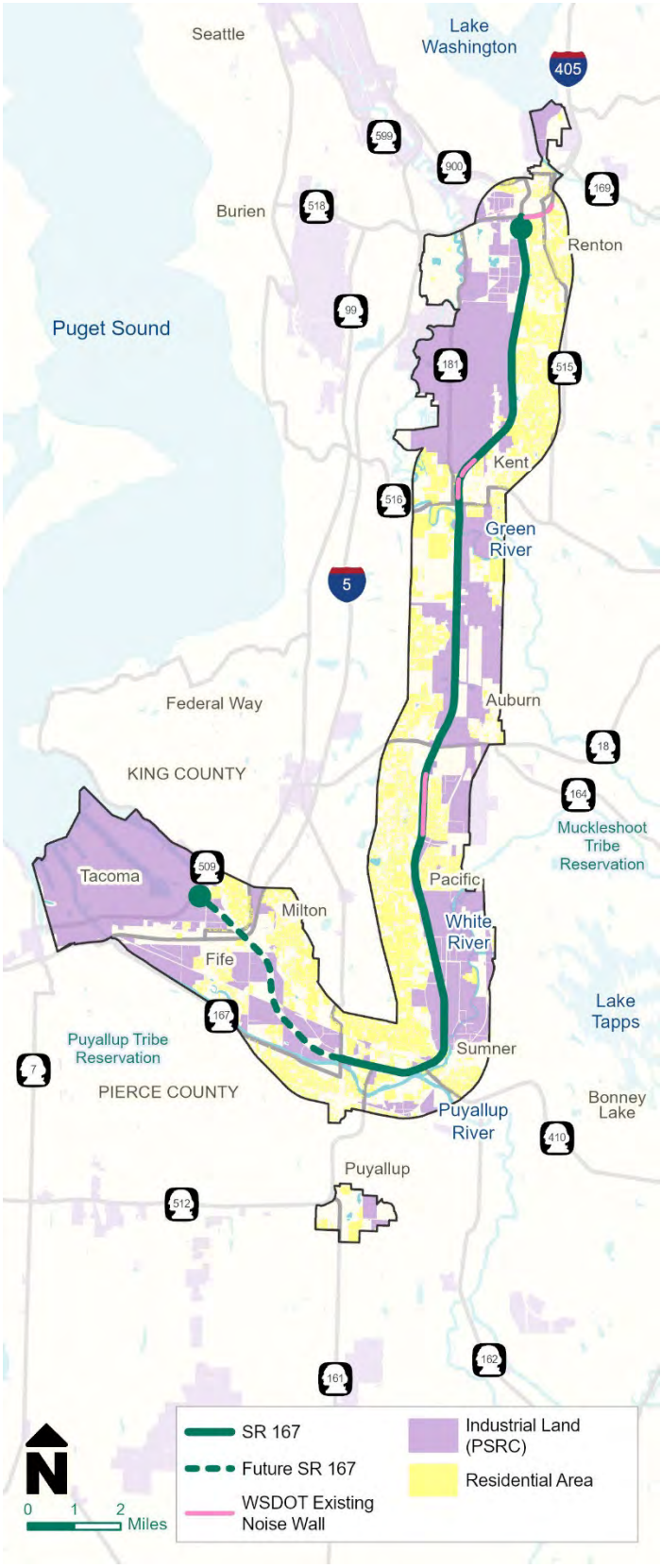


Figure 12-14. Existing Noise Walls with Industrial and Residential Lands

Recreational, Section 4(f), and Section 6(f) Resources

WSDOT used available GIS data to identify recreational resources and potential Section 4(f) resources. Information from the Land and Water Conservation Fund Act was used to identify Section 6(f) resources. Many recreational resources and other potential Section 4(f) resources were identified in the analysis area; illustrated on Figure 12-15 and listed in Table 12-6. Additional recreational opportunities are provided within privately owned recreational vehicle parks and camping areas within the analysis area, notably along the Puyallup River. The potential Section 4(f) resources summarized in Table 12-6 include:

- Publicly owned parks
- Publicly owned recreation facilities and open space areas
- Playgrounds
- Wildlife or waterfowl refuge areas
- Publicly owned trails

Some trails are currently under construction or proposed for construction, such as the Tacoma to Puyallup Trail which is currently under construction with anticipated completion in 2025.

No Section 6(f) resources were identified in the analysis area. Refer to the *Cultural Resources and Historic Bridges* section for more information on NRHP-eligible and potentially eligible sites within the analysis area.

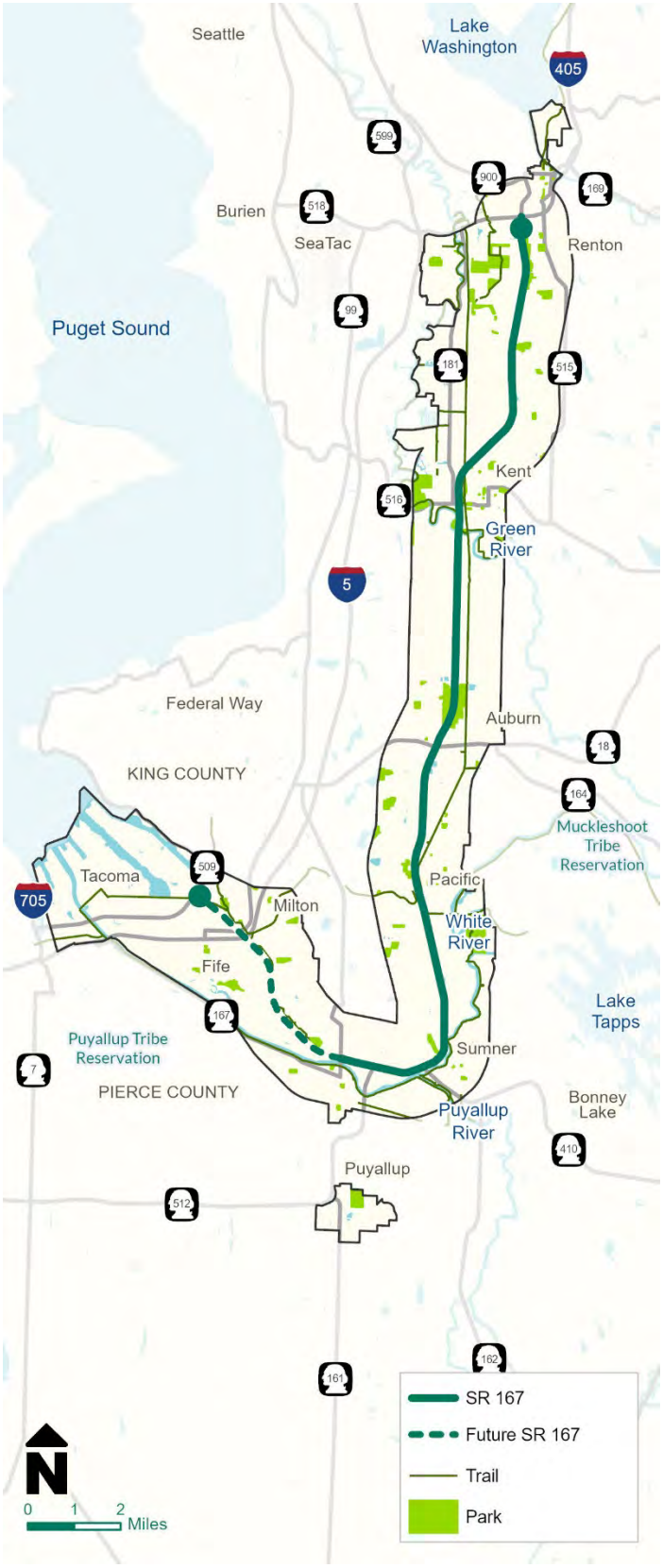


Figure 12-15. Potential Section 4(f) Resources in the Analysis Area

The scenario analysis will evaluate the potential for impacts, such as acquisition of a potential Section 4(f) resource, relocation of a trail, additional highway under or overpass along a trail, proximity effects related to increased noise or air pollution, changes in access, degraded visual setting, or changes in surrounding land uses that could affect the viability of the resource. Refer to *Appendix D* for more information.

Properties should meet USDOT's Section 4(f) definition, using FHWA's Section 4(f) resources and policy papers. Exceptions to Section 4(f) approval may include use for historic bridges or temporary occupancy, as described in 23 CFR Part 774.13.

Table 12-6. Potential Section 4(f) Resources in the Analysis Area

Facility Name			Potential Section 4(f) Reasoning/Determination
Publicly Owned Parks [a]			
5-Acre Park 7th Avenue Park Auburn Environmental Park Bicentennial Park Bike Trail Park Black River Forest Bradley Lake Park Briscoe Park Brookville Gardens Park Burlington Green Burnett Linear Park Centennial Park Centennial Viewpoint Park Chestnut Ridge Park Commons Neighborhood Park Dacca Park Elise Park Five Mile Lake Park Foster Park Fountain Memorial Park Gaines Park Garrison Creek Park	Gateway Park Gene Coulon Memorial Beach Park Gowe Street Park Grayland Park GSA Ballfield Park Hylebos Nature Area Jones Park Jornada Park Jovita Crossroads Park Junction Park Kent Memorial Park Kherson Park (#1-4) Lake Fenwick Park Lake Geneva Park Loyalty Park Matchett Park Mill Creek Earthworks Park Milton Community Park Naden Park Nelson Farm Park Nelson Nature Park	Pacific Park Piazza Park Pioneer Park Riverbend Park Riverview Park Rosebed Park Russell Road Park Sam Peach Park Seibenthaler Park Strawberry Park Talbot Hill Reservoir Park Thomas Teasdale Park Three Friends Fishing Hole Titus Railroad Park Tonkins Park Tukwila Pond Park Turnkey Park Veterans Memorial Park – Auburn Veterans Memorial Park – Renton Volunteer Park Waffle Park Wedge Park	Meet the criteria for parks and recreational areas of national, state, or local significance that are publicly owned and open to the public.
Publicly Owned Recreation Facilities			
Kent Lions Skate Park Puyallup Skate Park Puyallup Valley Sports Complex Riverbend Golf Course		South County Ballfields Uplands Playfield	Meet the criteria for parks and recreational areas of national, state, or local significance that are publicly owned and open to the public.
Playgrounds			
There are several elementary school playgrounds that meet the criteria for school playgrounds that are open to the public for recreational purposes during non-school hours.			
Open Space Areas			
Anderson Greenbelt Crawford Woods Ikuta Greenbelt Kempf Open Space		Mortenson Farm Springbrook Greenbelt West Hills Passive Area Willis Street Greenbelt	Meet the criteria for parks and recreational areas of national, state, or local significance that are publicly owned and open to the public.
Wildlife or Waterfowl Refuge Areas [b]			
Ellenswood Conservancy Horsehead Bend Natural Area Mullen Slough Natural Area Panther Creek Wetlands		Renton Wetlands West Hylebos Osaka Property West Milton Nature Preserves	Meet the criteria for parks and recreational areas of national, state, or local significance that are publicly owned and open to the public.

Facility Name		Potential Section 4(f) Reasoning/Determination
Publicly Owned Trails		
Cedar River Trail Green River Trail Interurban Trail 64th Ave South Trail	Springbrook Trail C Street Trail Lake Washington Trail Kent Regional Trails Connector	Meet the criteria for parks and recreational areas of national, state, or local significance that are publicly owned and open to the public.

Sources: King County 2021; Pierce County 2021; Algona 2021; Auburn 2021; Edgewood 2021; Fife 2021; Kent 2021; Milton 2021; Puyallup 2021; Renton 2021; Sumner 2021; Tukwila 2021; National Park Service 2021; PSRC 2022; Washington State Parks and Recreation Commission 2021

Notes:

[a] The *SR 167 Corridor Plan* (WSDOT 2008b) identified Cleveland Park as a Section 4(f) resource, but the park is not currently listed on city or county websites.

[b] PSRC (2022) data identify an unnamed biodiversity corridor that meets the criteria for publicly owned wildlife and waterfowl refuges.

Social Resources and Public Services

WSDOT used qualitative research and GIS data search to identify social resources and public services. The locations of social resources services relative to city boundaries are summarized in There is a high concentration of warehouses and industrial uses along the SR 167 corridor. In general, single-family residential areas are farther from the SR 167 corridor than large condominium or apartment complexes. North of SR 516, almost all residential areas are west of SR 167. South of SR 516, single-family neighborhoods are west of the SR 167 corridor, as well as east of SR 167 within Algona, Pacific, and Sumner.

Social resources are generally located within the denser urban areas along the corridor. Many parks, trails, and recreational facilities are within the analysis area, as described in the *Recreational, Section 4(f), and Section 6(f) Resources* section. Schools and performing arts centers and theaters are spread out across the analysis area. Most of the schools in the analysis area are elementary schools serving grades kindergarten through fifth. Colleges and universities include the Embry-Riddle Aeronautical University, Charter College, and Pima Medical Institute, in addition to satellite facilities for Green River College and Renton Technical College, and a research facility for the University of Washington Tacoma.

Table 12-7 and illustrated on Figure 12-16. Many of the social resources and public services are in Auburn, Kent, Renton, and Puyallup, concentrated in downtown areas and town centers. Several social resources and public services are near the SR 516 interchange area in Kent, including subsidized housing, Kent city hall, park and ride lots, a police station, and public library. Near the SR 18 interchange and West Main Street in Auburn, there is a concentration of resources, including government buildings, subsidized housing, a shopping center, a park and ride lot, and a Sound Transit train (Sounder) station.

There is a high concentration of warehouses and industrial uses along the SR 167 corridor. In general, single-family residential areas are farther from the SR 167 corridor than large condominium or apartment complexes. North of SR 516, almost all residential areas are west of SR 167. South of SR 516, single-family neighborhoods are west of the SR 167 corridor, as well as east of SR 167 within Algona, Pacific, and Sumner.

Social resources are generally located within the denser urban areas along the corridor. Many parks, trails, and recreational facilities are within the analysis area, as described in the *Recreational, Section 4(f), and Section 6(f) Resources* section. Schools and performing arts centers and theaters are spread out across the analysis area. Most of the schools in the analysis area are elementary schools serving grades kindergarten through fifth. Colleges and universities include the Embry-Riddle Aeronautical University, Charter College, and Pima Medical Institute, in addition to satellite facilities for Green River College and Renton Technical College, and a research facility for the University of Washington Tacoma.

Table 12-7. Social Resources in the Analysis Area

Type	Number of Resources
Emergency Services and Health Services	Police Stations: 8 Fire Stations:15 Medic Units: 3 Hospital or Medical Center: 12 Public Health Clinics: 1
Social Services	Affordable Housing Properties: 17 Food Banks: 5 Emergency Housing (Shelters): 6 Youth and Elderly Centers: 4
Government Facilities	Government Offices: 11 Post Offices: 5
Schools	K-12: 1 Elementary: 19 Junior High: 5 High School: 8 College or University: 7 Alternative: 1 Other School Facility: 3
Community Facilities	Shopping Centers: 16 Libraries: 8 Performing Arts Centers or Theaters: 7 Major Employment Centers or Large Businesses: 7 Cemeteries: 7

Sources: King County 2021; Pierce County 2021

Scenario analysis will consider presence of social resources and community connectivity including travel patterns and accessibility to essential services, defined based on an understanding of the travel options available (e.g., bicycle lanes, sidewalks, transit), commute patterns, such as mode choices, vehicle ownership, other personal travel patterns and characteristics (e.g., traffic congestion, route choice, and safety and security concerns), and freight and goods movement patterns. Refer to *Appendix D* for more information.

The planned community engagement process for this study will help WSDOT understand the concerns, and needs of the people who live, work, and play in the vicinity of future projects, explore the importance of community facilities and resources, identify additional facilities, and validate information collected from other sources.

Social and community effects analysis includes:

- The distribution of benefits and burdens to the community
- Direct and indirect impacts on social networks and social services (school districts, churches, law enforcement, fire protection, and recreation areas)
- Impacts on the local and/or regional economy
- Effects of residential and commercial relocations
- Changes to community cohesion (splitting or isolating areas, generating new development, and separation from services)
- Changes in travel pattern, travel time and accessibility for all modes
- Changes to overall public safety
- Impacts on human health
- Impacts on elderly, disabled, and transit-dependent populations

(WSDOT Environmental Manual Chapter 458)

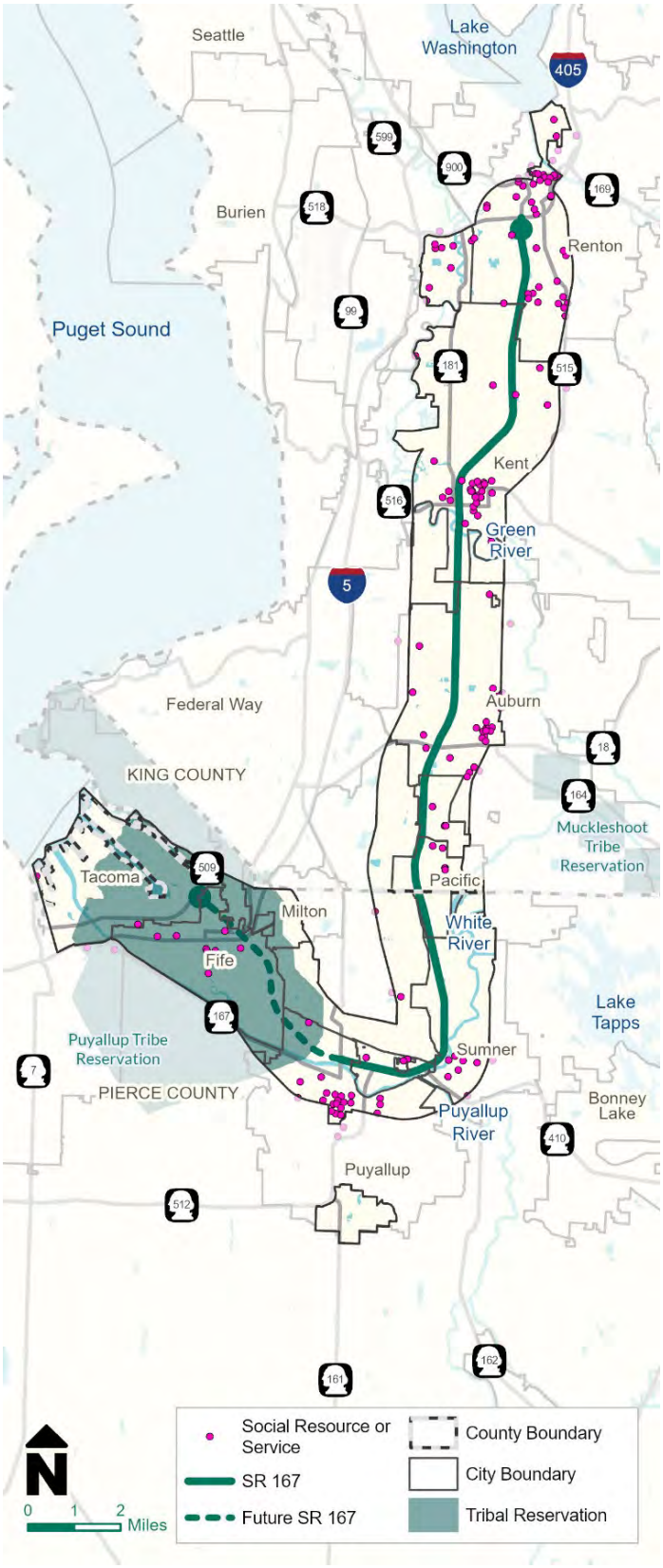


Figure 12-16. Social Resources Analysis Area Map

Visual Resources

The analysis area is east of the Puget Sound and Commencement Bay and within the Green River Valley. Most of the analysis area is in an urban environment, with several industrial uses surrounding SR 167. No rural communities are in the analysis area. The Muckleshoot and Puyallup tribal reservations are near the analysis area; the Tribes may play a role in identifying visual resources sensitive to each. Figure 12-17 illustrates an aerial view of the SR 167 corridor.

Agricultural areas are located immediately south of SR 516 and around South 277th Street, near the Green River. Open space areas and parks offer visual variety and breaks or contrast in developed areas. The Riverbend Golf Course, Linden Golf and Country Club, and Sumner Meadows Golf Course are all in the analysis area. Refer to the *Recreational, Section 4(f), and Section 6(f) Resources* section for more information on recreational resources. Cultural and historic properties are described in the *Cultural Resources and Historic Bridges* section. There are no scenic byways or wild and scenic rivers within the analysis area.

The Auburn Environmental Park includes a birding tower and elevated boardwalk through wetland areas. The park is in Auburn, south the 15th Street Northwest and adjacent to the SR 167 corridor. Lake Geneva Park and Five Mile Lake Park offer views of the lakes. Views of Mt. Rainier, Cascade Mountain range, and the Olympic Mountains are available near the south end of the SR 167 corridor.

Figure 12-17. Aerial View of Analysis Area

Several residential areas within the analysis area may be considered sensitive viewers. Some of the larger residential areas include:

- Within Renton and Kent, east of SR 167 and north of SR 516
- Within the West Hill neighborhood, in Auburn, on the west side of SR 167
- On both sides of SR 167, south of SR 18, in Algona, Pacific, Edgewood, and unincorporated King County
- Within Edgewood on the west/north side of SR 167 and in the southern part of the Sumner on the east side of SR 167
- Within Puyallup and Fife on the south side of SR 167
- On the north side of SR 167 within Milton and in unincorporated Pierce County

Scenarios will be analyzed for their potential to effect visual quality. Refer to *Appendix D* for more information on scenarios and future analysis.

Water Quality and Stormwater

In this analysis surface waters include rivers, streams, lakes, and stormwater. The analysis area includes land in three watersheds: the Lake Washington/Cedar/Sammamish watershed (Water Resource Inventory Area [WRIA] 8), the Green-Duwamish watershed (WRIA 9), and the Puyallup-White watershed (WRIA 10). The Lake Washington/Cedar/Sammamish watershed drains about 692 square miles and includes two major river systems (Cedar and Sammamish) and three large lakes (Union, Washington, and Sammamish). The analysis area contains a small portion of this watershed, and it includes parts of the Cedar River and its tributaries. The Green-Duwamish River basin encompasses 556 square miles and is a 93-mile-long river system originating in the Cascade Mountains about 30 miles northeast of Mt. Rainier and flowing into the Puget Sound at Elliott Bay in Seattle (King County 2000).

Tributaries that contribute flow to the lower Green River include Springbrook Creek, Mill Creek, Mullen Slough, and their tributaries (Figure 12-18). The Puyallup-White River basin encompasses 494 square miles and is a 68-mile-long river system (King County 2016). The river system originates from glaciers on the north and west sides Mt. Rainier. The White River and its tributaries flow northwest and empty into the Puyallup River near Sumner; the Puyallup River then flows west for approximately 10 miles to the Commencement Bay. Historically, the White River emptied into the Green River until a debris jam diverted the waters down the Stuck River and into the Puyallup River (King County 2016). Major tributaries of the Puyallup River are Wapato, Hylebos, and Salmon creeks (Figure 12-18).

Surface waters in the analysis area have been altered from their natural and historical states to accommodate urban growth and agricultural activities. Such alteration includes filling within wetlands, bank hardening such as installing riprap, construction of revetments and levees, placing streams in constricted channels and pipes, reducing or removing streamside vegetation, and removing in-stream habitat. The urban growth and agricultural activities are also a major factor in water quality and stormwater management issues in the analysis area.

Figure 12-18. Watershed Map

Washington State Department of Ecology (Ecology) prepares a 303(d) list identifying waterbodies that do not meet the state water quality standards. Table 12-8 lists impaired waterways and tributaries within the analysis area and elements that do not meet the state water quality standards.

Table 12-8. Impaired Waterbodies on 303(d) List in the Analysis Area

Waterway	Pollutants of Concern
Trout Lake	Total phosphorus
Lake Washington [a]	Bacteria
Commencement Bay	Chlorinated pesticides, DDT (and metabolites), Dieldrin, HPAH, PCB
Black River	Bacteria, bioassessment, DO
Cedar River	DO, pH, temperature
Fife Ditch	NH_3-N, DO
Green River	DO
Harrison Creek	Bioassessment
Hill Creek	Bioassessment, DO
Hylebos Creek	Bacteria
Mill Creek	Bacteria, bioassessment, pH, zinc
Mullen Slough	Bacteria, bioassessment
Puyallup River	Mercury, temperature
Rolling Hills Creek	Bioassessment
Springbrook Creek	Bacteria, bioassessment, DO
Unnamed Tributary to Hylebos Creek	Mercury
Unnamed Tributary to Springbrook Creek	Bioassessment
Unnamed Tributary to White River	DDT (and metabolites), pH
Wapato Creek	Bacteria, DO
White River	DO, pH, temperature

Source: US EPA 2021

Notes:

[a] The analysis area extends to the shore of Lake Washington but does not extend into the waterbody.

DDT = dichlorodiphenyltrichloroethane; DO = dissolved oxygen; HPAH = high molecular weight polycyclic aromatic hydrocarbons; NH_3-N = Ammonia N; PCB = polychlorinated biphenyls

Stormwater is managed through open channels, underground pipes, ecology embankments, wet ponds, and detention ponds. There are numerous culvert crossings within the analysis area, some of which carry fish-bearing streams. Refer to the *Fish Passage Barriers* and *Fish and Wildlife Habitat and Chronic Environmental Deficiencies* sections for more information on fish-bearing streams. Stormwater detention ponds are present along SR 167, mostly at the interchanges and along sections that were widened by recent projects. Recent widening projects also added media filter drain treatment installations (also called "Ecology embankments") along highway side slopes and in the grassy median between the northbound and southbound lanes. The SR 167 Gateway Project is currently in final design; it will add new runoff treatment installations to address the new highway connections between SR 161 and the Port of Tacoma.

As depicted on Figure 12-19, there are four medium priority areas for stormwater retrofit, two of which are located along the SR 167 facility. There are also 33 pond-type best management practices (BMPs), 170 roadside slope-type BMPs, 17 ditch-type BMPs, and 4 vault-type BMPs.

Aquifer recharge areas and sole source aquifers are present in the analysis area and are depicted in Figure 12-20. SR 167 crosses a shallow aquifer that affects water levels in the Green, White, and Puyallup River valleys. A deeper aquifer is also present in Auburn and serves as a primary water source for the city. Wells operated by other cities, including Kent, Algona, Pacific, and Sumner, and the Valley Water Association, also tap into that aquifer. The cities of Sumner and Puyallup have municipal water supplies below Lake Tapps in addition to wellhead protection areas. In King County, over 200 documented water supply wells are classified as Group A and B within the analysis area. Wellhead protection areas around wells for public use are also present within the analysis area.

Scenarios will be analyzed for their potential to impact water quality. Refer to *Appendix D* for more information.

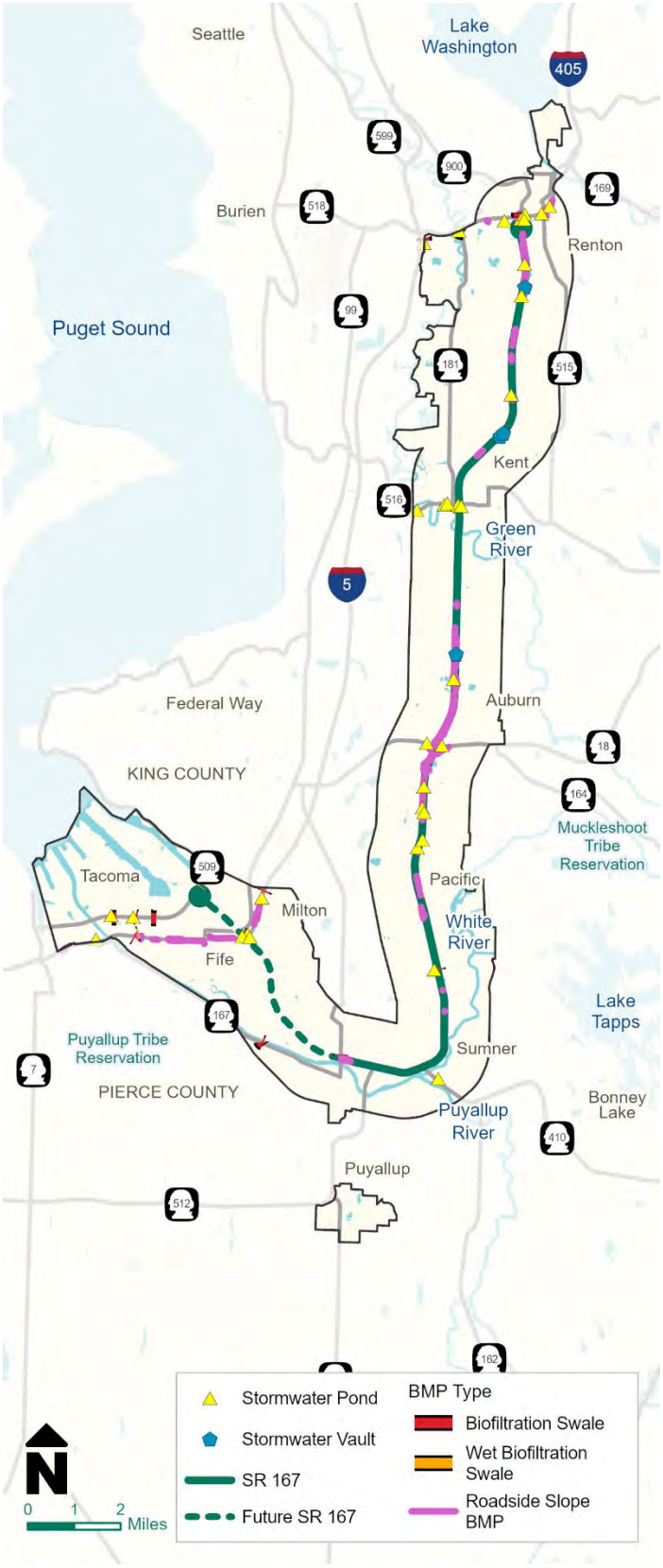


Figure 12-19. Stormwater Retrofit Priority and BMP Map

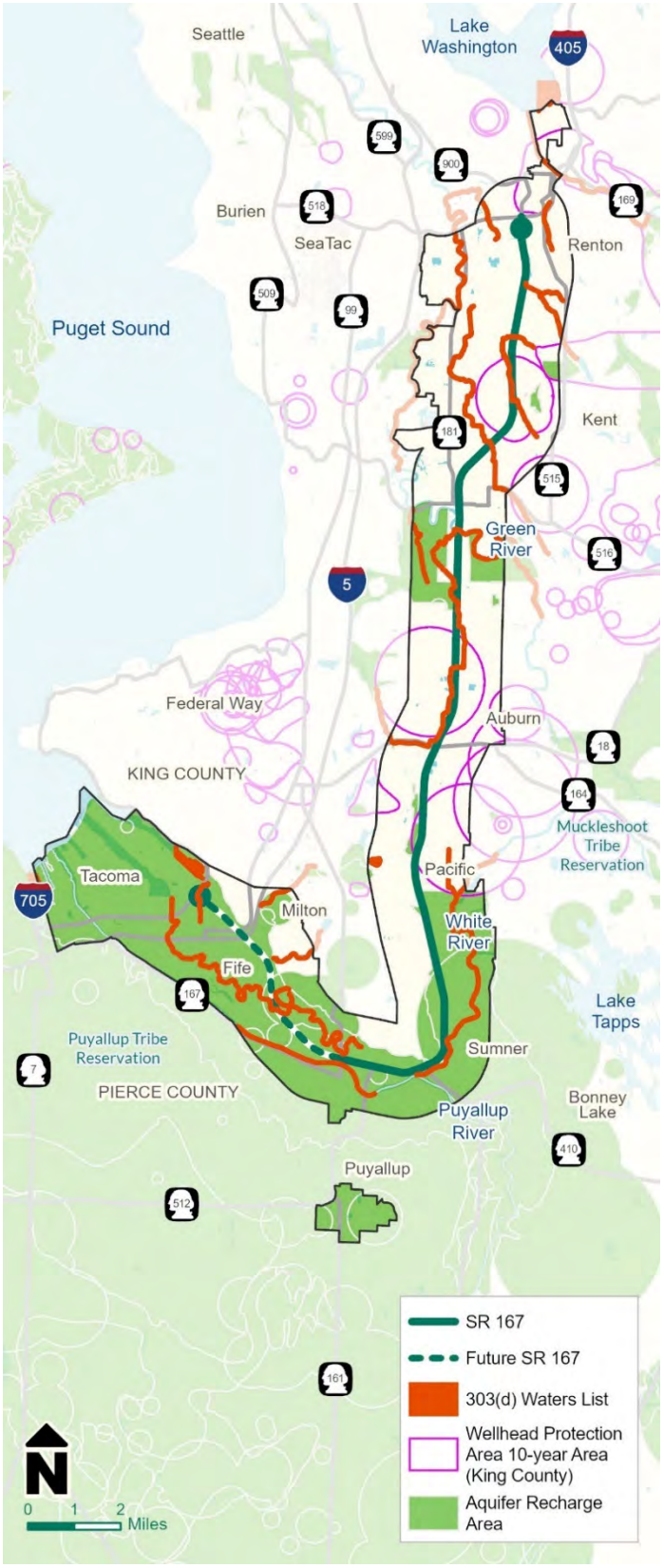


Figure 12-20. Aquifer Recharge Areas, Wellhead Protection Areas, and 303(d) Listed Waters Map

Wetlands

Wetlands provide important functions, including fish and wildlife habitat, water quality treatment, floodwater storage, and groundwater recharge.

Wetlands in the analysis area include estuarine, palustrine, and riverine systems, described in Table 12-9 and depicted on Figure 12-21. Estuarine wetlands are present at the Commencement Bay. Palustrine wetlands are located throughout the analysis area but are more prominent in the Green River and the Puyallup River valleys. Riverine wetlands are located along rivers and streams (Figure 12-20); the wetlands vary in size and typically consist of emergent, scrub-shrub, and forested vegetation.

Table 12-9. Wetland Systems in the Analysis Area

Wetland System	Description
Estuarine System	Deepwater tidal habitats and adjacent tidal wetlands usually semi enclosed by land but with open, partly obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff.
Palustrine System	Nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity is below 0.5 part per thousand.
Riverine System	Wetlands and deep-water habitats contained within a channel, except for: (1) wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens; and (2) habitats with water containing ocean-derived salts of 0.5 part per thousand or greater.

Source: USFWS 2021

There are several wetland compensatory mitigation sites throughout the analysis area that compensate for unavoidable wetland impacts from existing WSDOT projects. WSDOT constructs and is responsible for the protection, monitoring, and maintenance of these sites.

Scenario analysis would consider the potential to impact wetland systems. No fieldwork would be conducted during scenario development. Refer to *Appendix D* for more information.

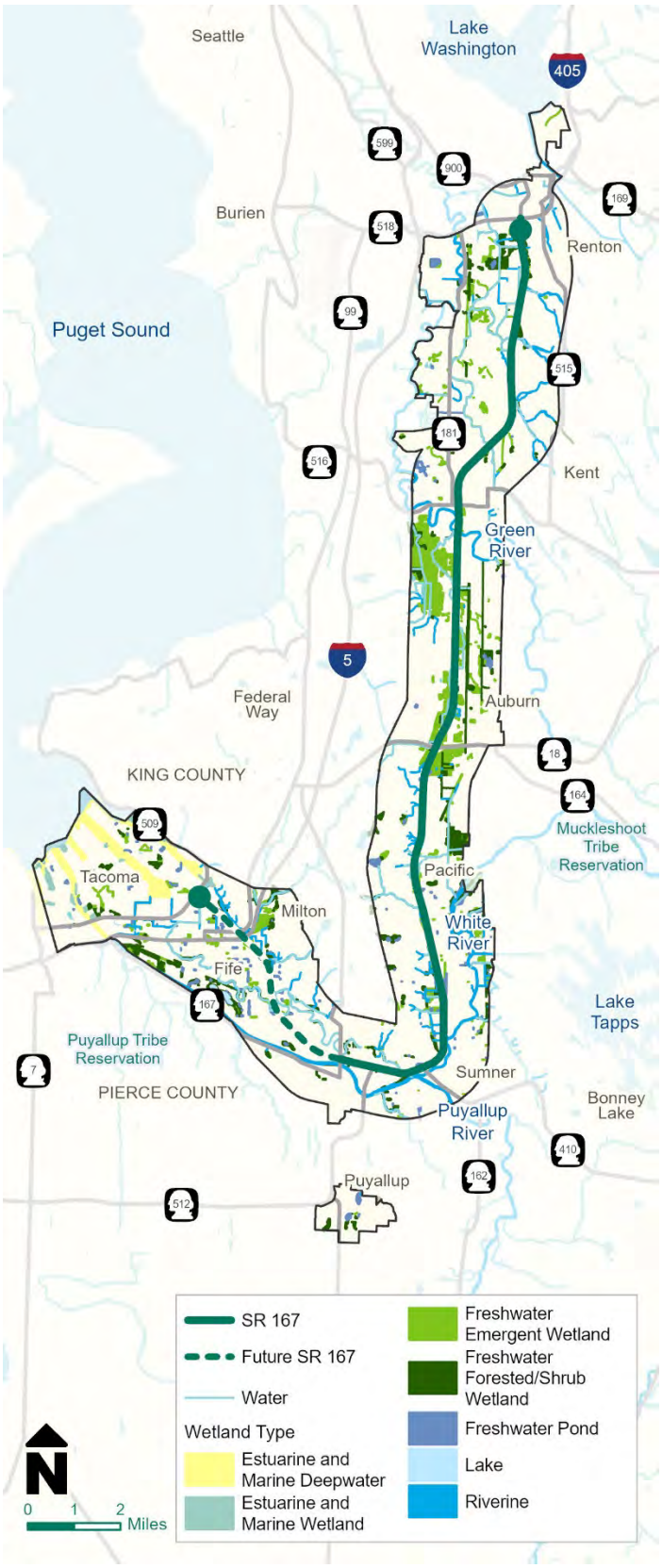


Figure 12-21. Wetlands Map