

Technical Memorandum

Date: March 19, 2024
To: WSDOT/FHWA
From: WSP
Subject: Draft Preliminary Study Area Limits and NEPA Purpose and Need Statements
Project Name: US 2 Trestle Capacity Improvements and Westbound Trestle Replacement PEL Study

1 Introduction

WSDOT is proceeding with the US 2 Trestle Capacity Improvements and Westbound Trestle Replacement Planning and Environmental Linkage Study (US 2 Trestle PEL Study) under the 23 U.S.C. 168 PEL authority, which includes defining the travel corridor or Study limits and the Purpose and Need.

A trestle is a type of bridge structure composed of a number of short spans supported by closely spaced rigid frames, typically in the form of a tripod or a pair of isosceles triangles. A trestle differs from a viaduct, which typically supports much longer spans and has a higher elevation.

This memorandum provides a description of the Preliminary Study Area for the US 2 Trestle PEL Study and the draft Purpose and Need statements. The purpose defines the transportation problem to be solved, and the need(s) provides information and data to support the assertion made in the purpose. Collectively, the Purpose and Need statements provide the framework for identifying and evaluating alternative transportation solutions and identifying the reasonable range of alternatives. Reasonable alternatives, which are further evaluated in the National Environmental Policy Act (NEPA) environmental documentation, are those that address the Purpose and Need statements and are economically and technically feasible.

Throughout the US 2 Trestle PEL Study process WSDOT will conduct outreach and engagement with local agencies, resource agencies, tribes, and the public. This outreach and engagement will include the opportunity to provide input on this draft Purpose and Need. Once the US 2 Trestle PEL Study is complete, the public will be notified that the Purpose and Need will be adopted into the project's NEPA review, which is anticipated to begin immediately following this PEL Study.

2 Background

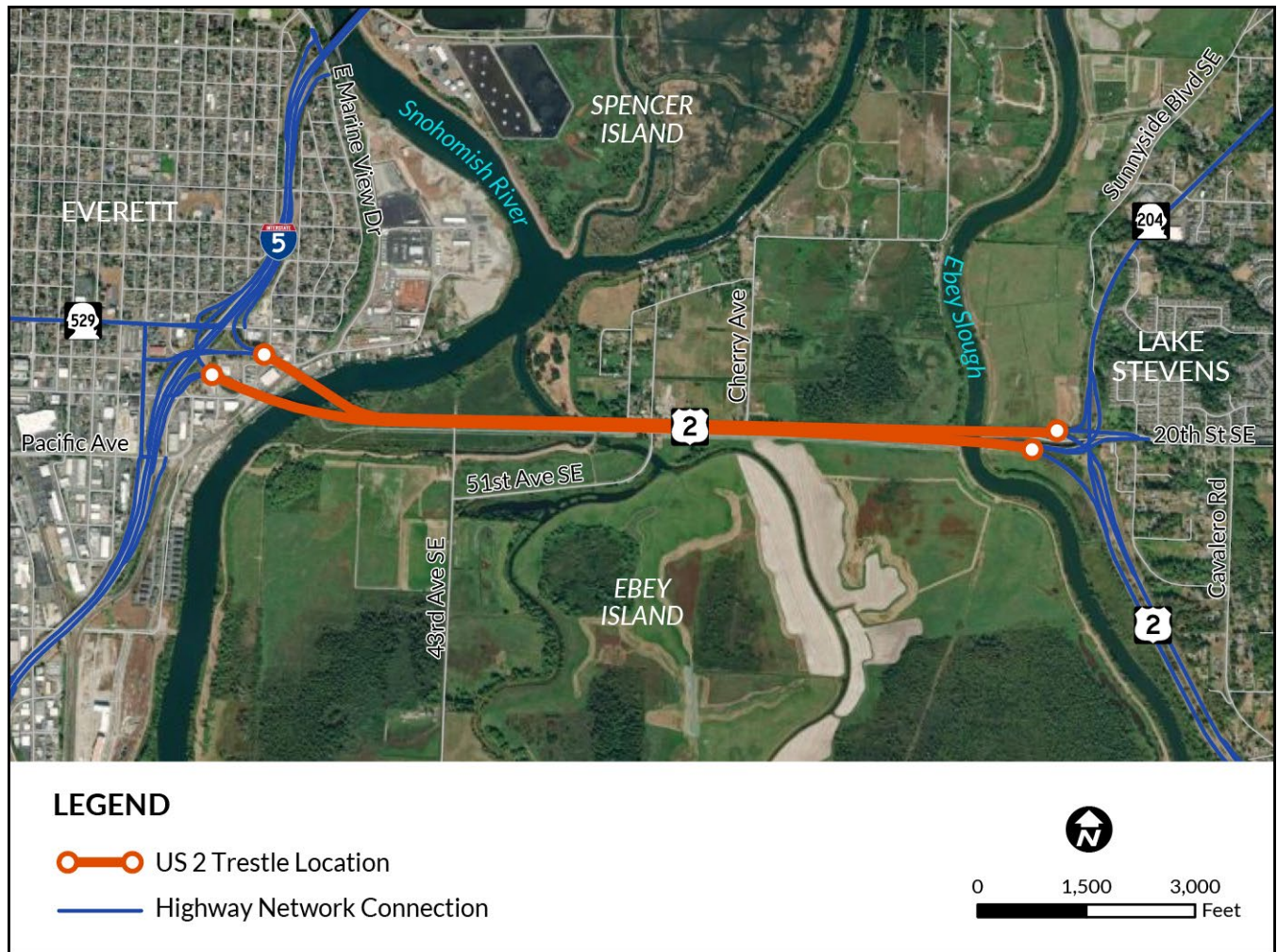
The US 2 trestle in Snohomish County connects US 2 to Interstate 5 (I-5) on the west and the interchanges of State Route (SR) 204 and 20th Street SE on the east (Figure 1). The US 2 Trestle is the only direct route across the Snohomish River, Deadwater Slough, and Ebey Slough from eastern Snohomish County cities, such as Lake Stevens and Snohomish, to downtown Everett and the I-5 corridor. On a national level, US 2 begins in Everett and extends eastward to St. Ignace, Michigan. The significance of this segment of US 2 as a highway has been formalized through the following federal and state designations:

- Included in the National Highway System by the U.S. Department of Transportation.
- Classified as a federal and state Urban Principal Arterial.
- Identified as part of a Washington state scenic byway (the Cascade Loop).
- Identified as part of a National Scenic Byway (Stevens Pass Greenway).
- Designated as a Highway of Statewide Significance by the Washington State Legislature.
- Designated by WSDOT as a T2 Freight Economic Corridor.

With recent and locally planned population growth in the area, traffic and traffic back-ups have increased on and near the trestle, especially westbound in the morning and eastbound in the afternoon. Additionally, the westbound trestle structure is aging and requires replacing. In recent years, several studies have focused on identifying needed short-and long-range improvements to the US 2 westbound trestle. Starting in 2018, WSDOT conducted a preliminary PEL Study focused on replacement and improvement options for the US 2 westbound trestle span, bounded by I-5 and SR 9. The key finding of that PEL Study indicated that a larger study area is required to adequately assess future conditions, evaluate reasonable alternatives, and develop long-term solutions.

In 2022, the City of Everett launched the I-5/US 2 Interchange Planning Study to identify improvements to the interchange and connecting city streets. Also in 2022, the Washington State Legislature authorized funding for this US 2 Trestle Capacity Improvements and Westbound Trestle Replacement study with a specific request to consider options to enhance transit and multimodal mobility.

Figure 1. US 2 Trestle Location



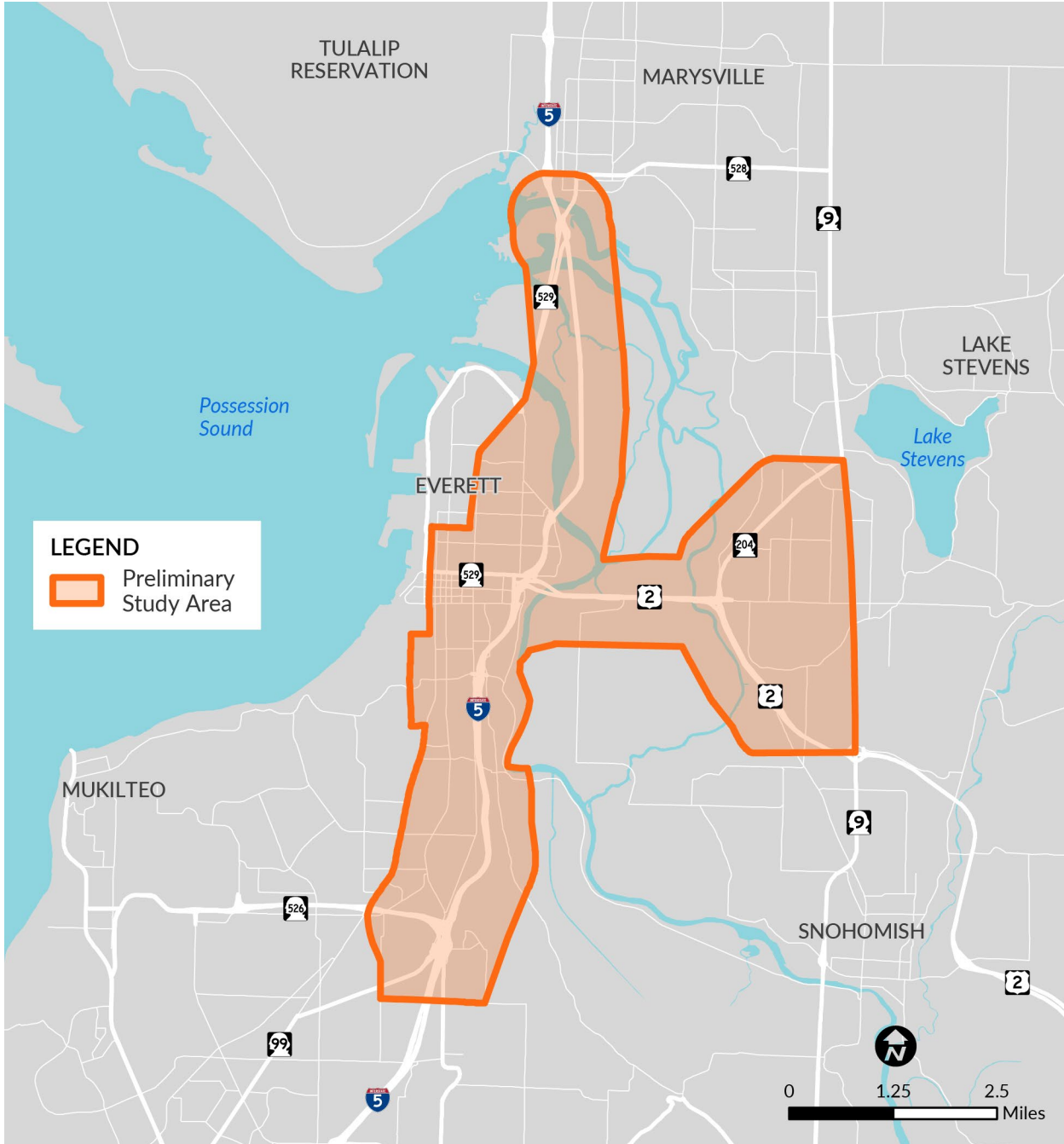
3 Preliminary PEL Study Area Limits

To assess capacity issues on the US 2 trestle a prior study, which focused on 2040 traffic operations on the westbound trestle, indicated that adding lanes to the US 2 westbound trestle alone would not alleviate the forecasted bottlenecks (WSDOT 2021). The prior study showed that adding lanes to the trestle would reduce the length of the bottleneck on the trestle but would not address the receiving capacity of I-5.

Therefore, to better understand how travelers for all modes move through the network, and considering the capacity on I-5 and surface streets and intersections in downtown Everett, on the west side of the US 2 trestle the Preliminary Study Area limits for this PEL Study include the segment of I-5 from just south of the connection with SR 99 and SR 526 to just north of the connection of I-5 and SR 529 and downtown Everett. Similarly, on the east side of the US 2 trestle the Preliminary Study Area limits include the segments of SR 204 and US 2 east to SR 9 and the local streets and segment of SR 9 between SR 204 and US 2. The Preliminary Study Area, shown in Figure 2, is where traffic changes are expected to be most prominent as a result of changes to the US 2 trestle

and the area where a more detailed traffic analysis will be conducted to adequately assess future conditions, evaluate reasonable alternatives, and develop a long-term multimodal solution for the US 2 Trestle.

Figure 2. US 2 Trestle PEL Preliminary Study Area



Once the evaluation and screening of alternatives is complete, the Preliminary Study Area limits for the US 2 Trestle PEL Study will be refined to reflect the determination of logical termini, as will be required for the subsequent NEPA analysis.

4 Draft Purpose and Need

4.1 Purpose

The purpose of this PEL Study is to develop long-term, equitable transportation solutions to improve multimodal mobility and safety to and across the US 2 trestle and to address the resiliency of the westbound trestle.

4.2 Needs

Multimodal mobility: The US 2 trestle faces challenges accommodating all transportation modes, which limits equitable travel options.

Mobility is defined as the ability to move freely, easily, and in a reliable manner.

Vehicular – All motorized vehicles using the US 2 trestle face recurring traffic bottlenecks during the weekday morning and afternoon peak travel periods.

- In the westbound direction, three major roadways (US 2, 20th Street, and SR 204) converge to feed traffic onto the two-lane westbound trestle. Similarly, in the eastbound direction, ramps from northbound and southbound I-5 combine with ramps from downtown Everett and funnel onto the eastbound trestle, which has two lanes throughout the day and shoulder driving (for a third lane of capacity) during the PM peak travel period.
- Existing peak period traffic volume demand for the US 2 trestle exceeds the corridor’s capacity, resulting in multiple hours of delay for people accessing the trestle from I-5, SR 204, and US 2. Traffic bottlenecks occur at the SR 204/20th Street on-ramp, the US 2/SR 204 ramp, the west end of the trestle, and at the US 2/I-5 ramp connection (Figure 3 and Figure 4).
- Traffic bottlenecks affect average peak period travel times for people using the US 2 trestle. Travel times range from 12 to 22 minutes for westbound traffic in the morning and from 18 to 20 minutes for eastbound traffic in the afternoon. This amounts to 3 to 13 minutes of delay per vehicle in the morning and 9 to 11 minutes of delay per vehicle in the afternoon. Although classified as an urban principal arterial, and part of the national highway network with a posted speed limit of 55 miles per hour (mph), due to traffic bottlenecks vehicle speeds on key segments approaching and on the trestle remain under 30 mph for all travel modes in the peak travel periods and peak directions.
- Local jurisdictions have projected a future increase in employment and households, which will result in increased traffic demand. Projections indicate over 30% growth in peak period traffic demand for the US 2 trestle by 2050. By 2050 future traffic growth is projected to increase average morning peak period westbound travel times to between 18 and 48 minutes (9 to 39 minutes of delay per vehicle) and average afternoon peak period eastbound travel times to between 36 and 42 minutes (27 and 33 minutes of delay per vehicle).
- Within the preliminary study area, census tracts west and northwest of the US 2 trestle are identified by the U.S. Department of Transportation’s (USDOT’s) Equitable Transportation Community Explorer as

transportation disadvantaged communities (experiencing transportation cost burdens and transportation safety burdens¹) (USDOT n.d.-a). These census tracts, in Everett and South Everett, are identified as some of the highest areas of transportation disadvantage in Washington State (75th to 78th percentile), including transportation cost burden (77th to 95th percentile) and transportation safety burden (74th to 82nd percentile).

Transportation disadvantaged communities spend more, and longer, to get where they need to go (USDOT n.d.-b).

- The US 2 trestle is an important transportation connection used by vehicles originating from locations (called forecast analysis zones or FAZs) that include these transportation disadvantaged communities. In 2018, about 60% of vehicles traveling eastbound on the US 2 trestle during the AM peak period come from FAZs that include transportation disadvantaged communities in Everett and South Everett. About 70% of vehicles traveling westbound on the US 2 trestle travel to these same FAZs. By 2050, over 80% of eastbound and westbound travel on the US 2 trestle during the AM peak period is projected to come from these FAZs (Figure 5).

¹ The USDOT's Transportation Cost Burden indicator assigns higher scores to communities that spend a greater percentage of household income on transportation, "including transit costs; vehicle maintenance and insurance costs; gasoline and fuel, which leaves less money for housing, medical care and food, potentially leading to households living in substandard housing with higher rates of chronic illness and obesity." The USDOT's Transportation Safety indicator assigns higher scores to communities that experience higher levels of fatalities per 100,000 persons related to motor vehicle crashes (USDOT n.d.-c).

Figure 3. Existing and 2050 AM Peak Period Bottlenecks Experienced by US 2 Trestle Users

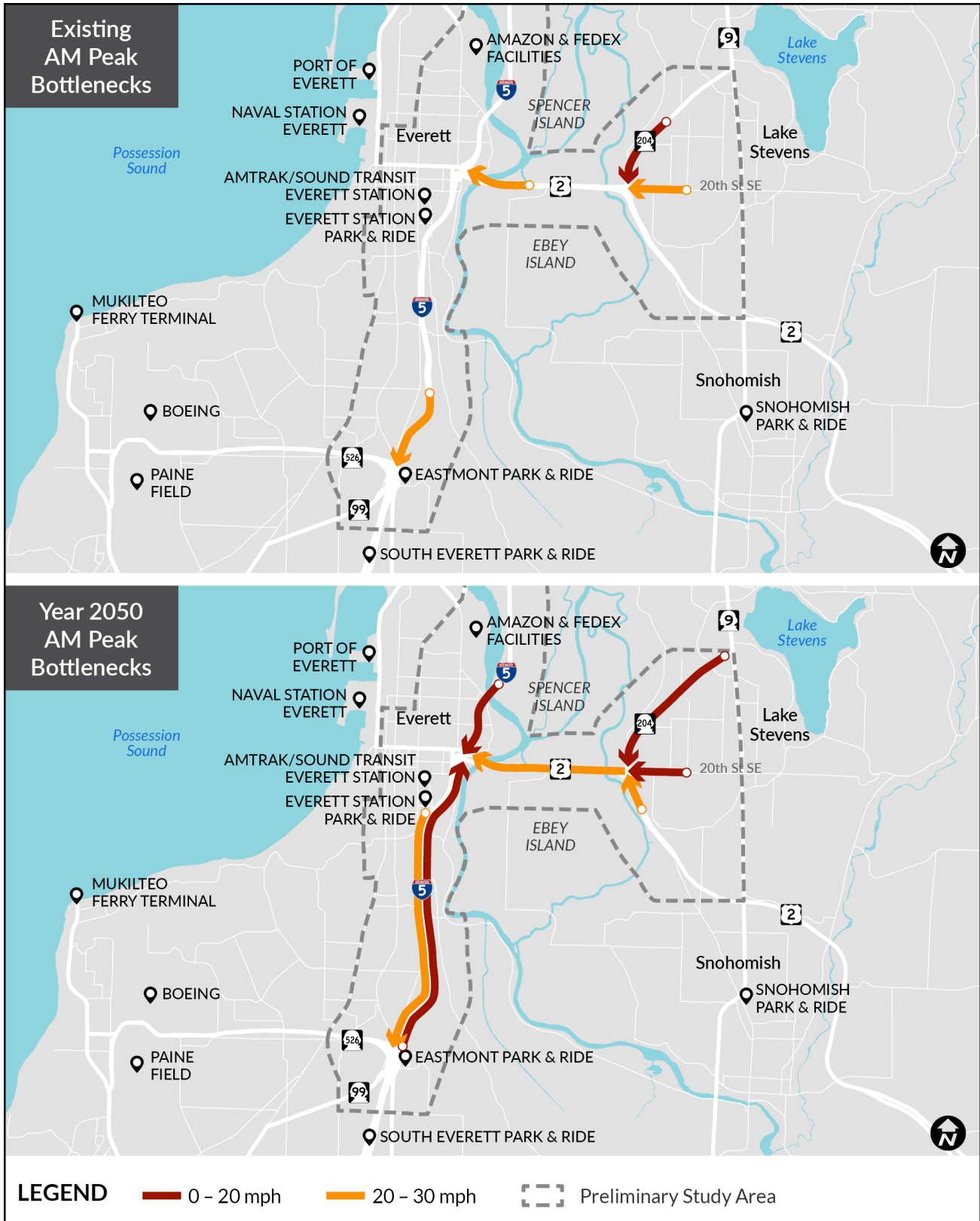


Figure 4. Existing and 2050 PM Peak Period Bottlenecks Experienced by US 2 Trestle Users

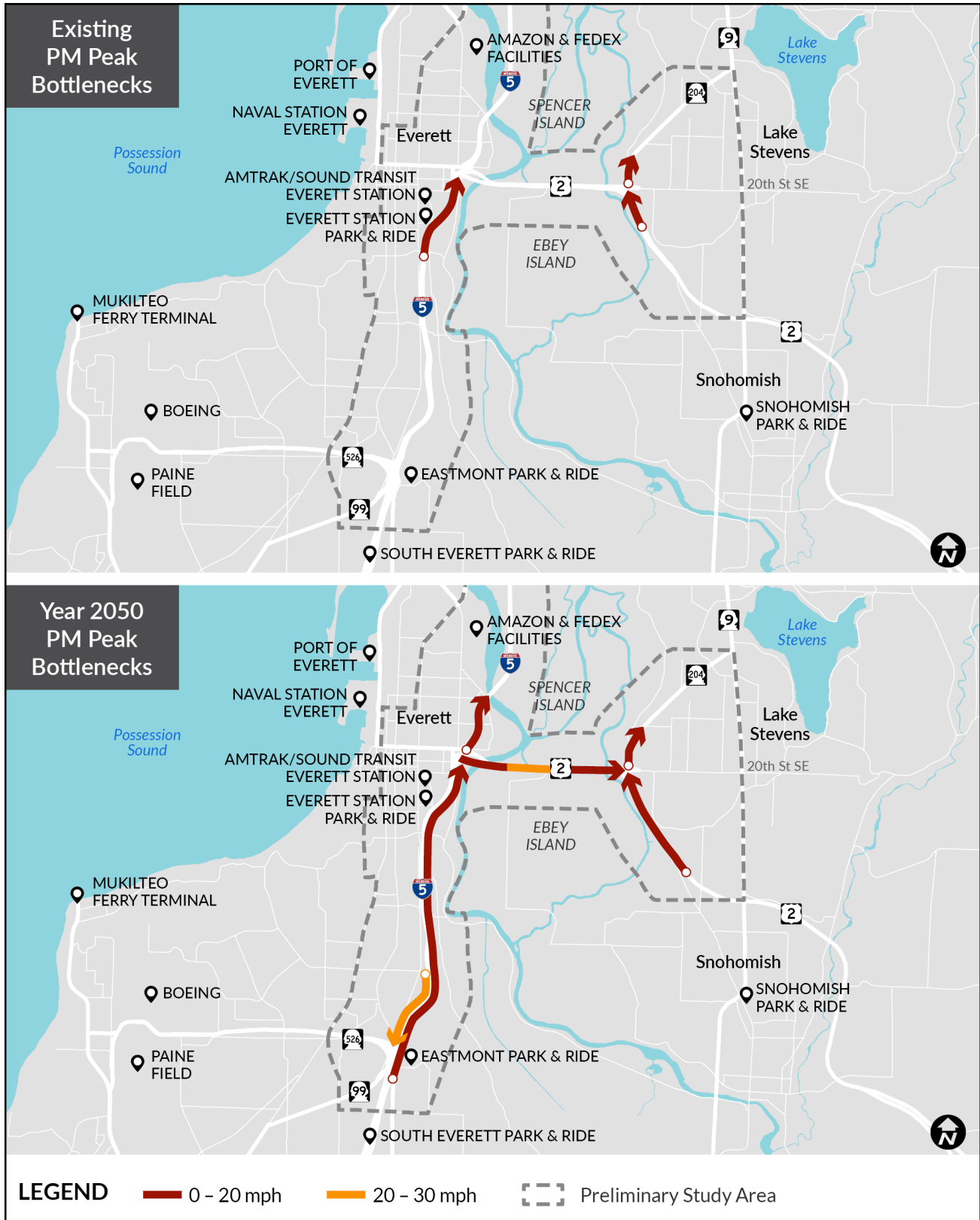
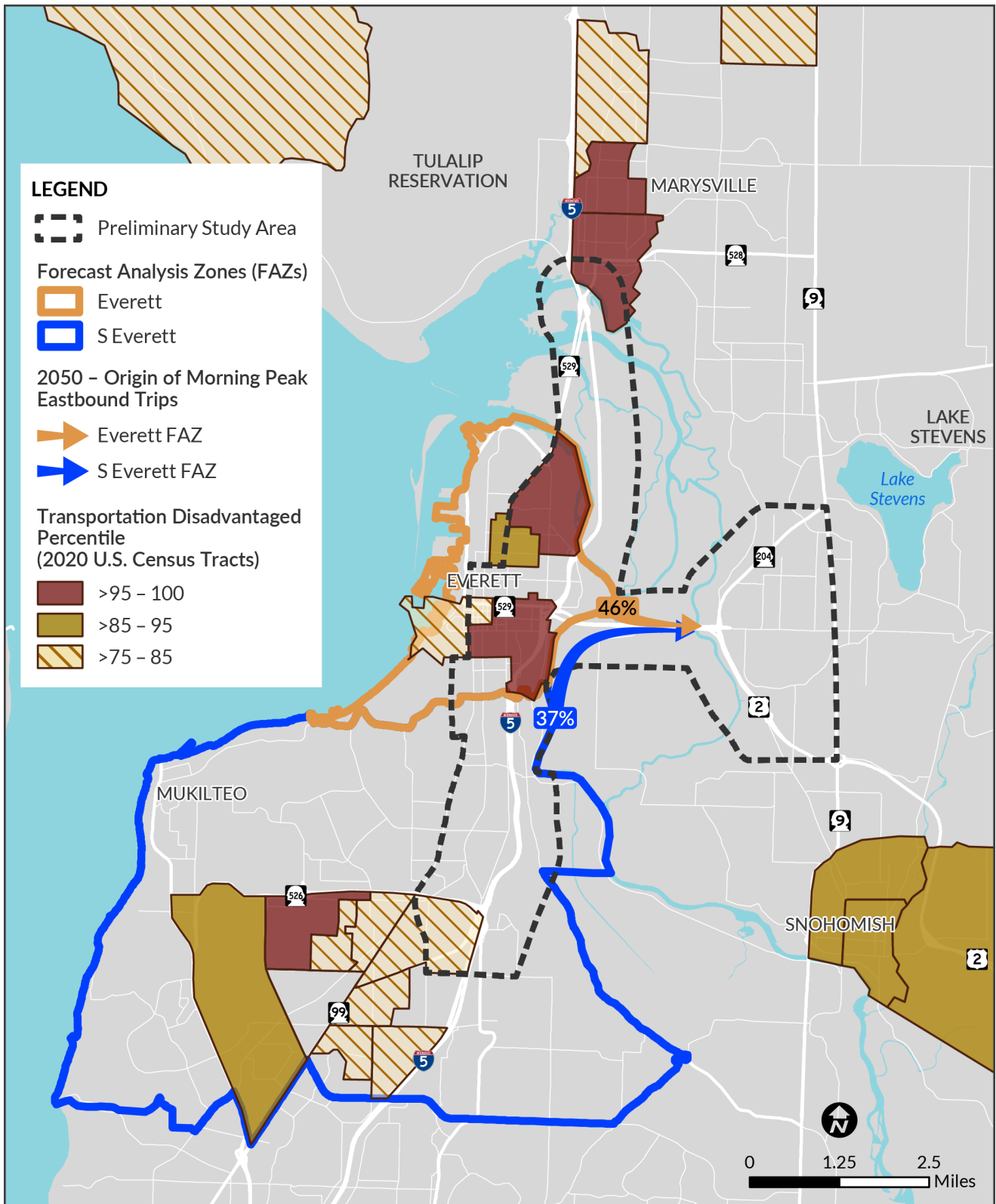


Figure 5. Morning Peak Period Eastbound Trips on the US 2 Trestle from Locations that Include Transportation Disadvantaged Communities



Freight – Recurring bottlenecks affect the reliability of freight truck movement across US 2, which is a designated freight route for the movement of goods.

- Freight truck vehicles experience the same bottlenecks and travel time variability as general purpose traffic.
- US 2 is a T2 Freight Economic Corridor (carrying an average of 2,800 trucks per day and over 9 million tons of freight per year) and a Connector freight route, providing direct access between eastern Washington and western Washington.
- Major freight facilities and industrial centers use this corridor, including the Port of Everett, Everett Boeing plant, and Naval Station Everett.
- Westbound freight vehicles account for approximately 17% of morning traffic and 7% of afternoon traffic over the US 2 trestle. Eastbound freight vehicles account for 14% of morning traffic and 9% of afternoon traffic.

High Occupancy Vehicles (HOV) and Transit – Due to a lack of dedicated facilities, existing HOV and transit using the US 2 trestle face the same bottlenecks as general purpose traffic.

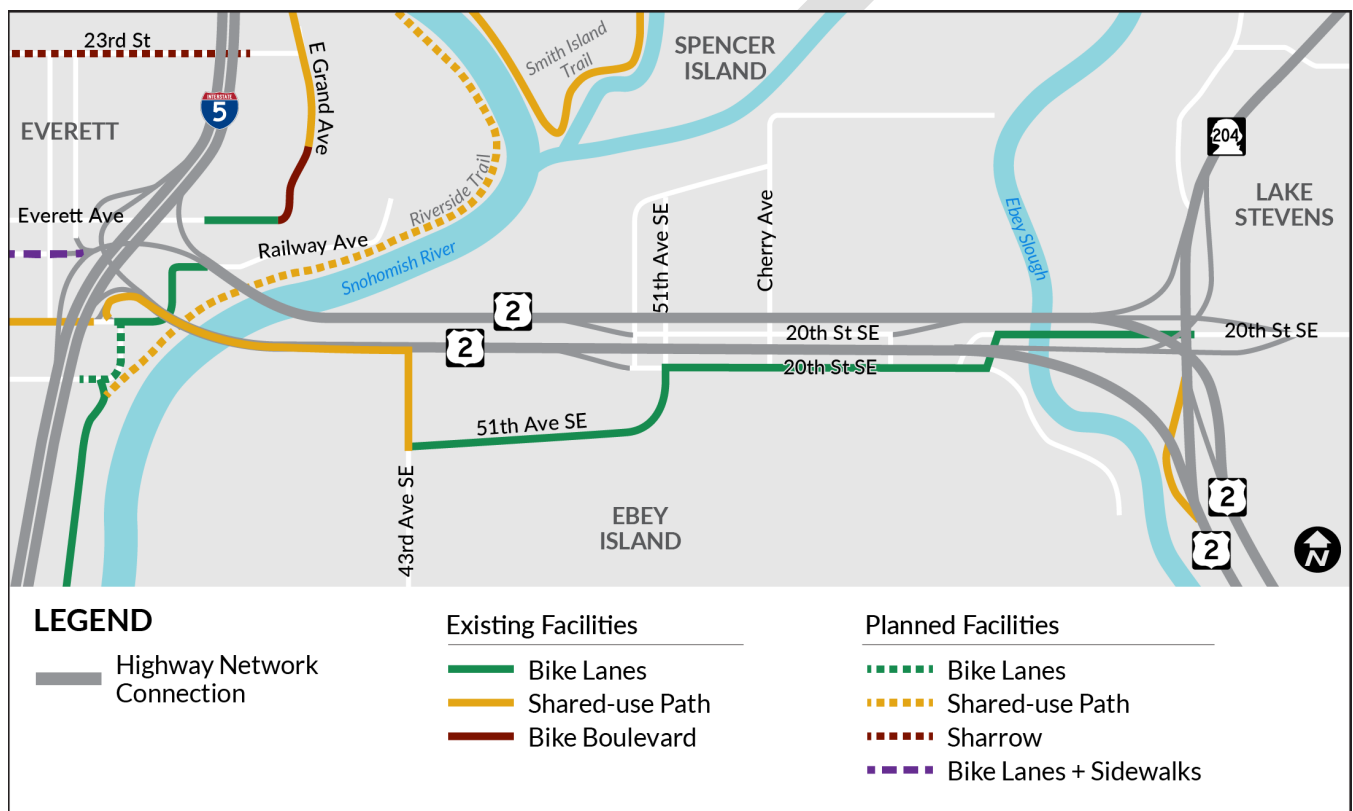
- Today, HOV trips make up approximately 3% of the westbound traffic across the trestle in the morning where there are no HOV facilities. This is in contrast to the I-5 corridor within the preliminary study area limits, which has between 13% and 28% HOV traffic and a dedicated HOV lane.
- Community Transit currently operates four bus routes that provide 9 to 10 buses per hour in the peak direction (westbound in the morning and eastbound in the afternoon) across the US 2 trestle during the peak period. Existing bus ridership for both directions of US 2 trestle travel ranges from about 200 people during the morning peak period to about 260 people during the evening peak period.
- Transit routes using the 20th Street SE corridor to access the US 2 trestle have a slight benefit of bypassing morning bottlenecks using the Business Access Transit (BAT) lane that extends from 91st Avenue SE to just west of Cavalero Road. In the year 2050 transit travel time savings from the 20th Street SE BAT lane are estimated to be approximately 15 minutes.
- In 2021, the Washington State Legislature directed WSDOT to work toward establishing local vehicle miles traveled (VMT) reduction targets for 10 counties, including Snohomish County. Achieving the reduction targets will require a combination of strategies to: eliminate some trips; reduce the length of some trips; and improve transportation choices using transit, walking, biking, rolling, or telework (WSDOT 2023).
- Within the preliminary study area, two intersecting census tracts have more than 15% of households with no car available and six census tracts have 5 to 15% of households with no car available (U.S. Census Bureau 2017-2021).

Active Transportation – There are no bicycle and pedestrian facilities on the westbound trestle, existing bicycle and pedestrian facilities on the eastbound trestle do not serve all ages and abilities, and there are missing connections to existing active transportation facilities at either end of the trestle.

- The existing shared-use path only extends for approximately 0.75 miles along the eastbound US 2 Trestle, before turning south and terminating at 43rd Avenue SE on Ebey Island. From there bike route signs direct two-way bicycle traffic to the wide shoulder along eastbound 20th Street SE, which also has a short shared-use path section under the US 2 Trestle just west of the Ebey Slough (Figure 6).

- Bicycle use is prohibited on the eastbound US 2 Trestle between the eastern end of the adjacent shared-use path and the SR 204/US 2 interchange.
- Revised Code of Washington (RCW) 47.24.060 directs state transportation projects (starting after July 1, 2022 and with a cost of \$500,000 or more) to “incorporate the principles of complete streets with facilities that provide street access with all users in mind, including pedestrians, bicyclists and public transportation users.”
- Experienced bicyclists use the existing facilities across Ebey Island to connect to regional facilities, including the Interurban Trail in downtown Everett and the Centennial Trail east of Lake Stevens.

Figure 6. Existing and Planned Active Transportation Facilities



Safety: Serious injury and fatal crashes are reported on WSDOT facilities in the preliminary study area.

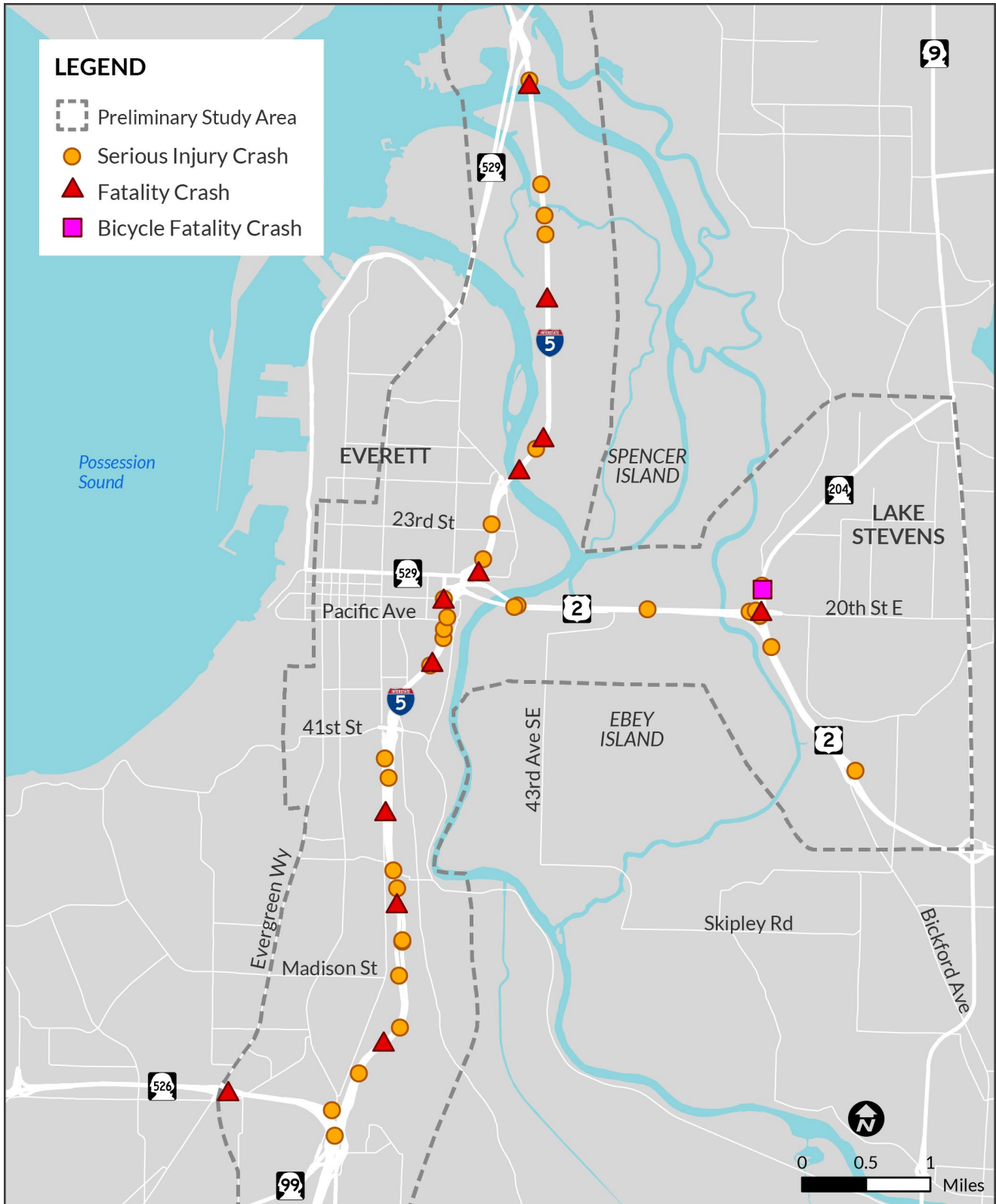
- As shown in Figure 7, from January 2018 to December 2022, there were 3,708 collisions, including 32 serious injuries and 11 fatalities on WSDOT facilities within the preliminary study area. Of those crashes, a total of 644 collisions occurred on the US 2 trestle and ramps, including nine with serious injuries and no fatal crashes.
- During the 2018 and 2022 time period, there were four pedestrian related crashes on the US 2 trestle or ramps. These crashes are likely related to people who exited their vehicle.
- Between 2018 and 2022 there were no reported bicycle related crashes in the preliminary study area. In 2017 there was one fatal bicycle crash at the SR 204 ramp to westbound US 2. This crash occurred in an

area that does not have bicycle facilities but provides direct access to the bike route under the US 2 trestle.

- The westbound US 2 trestle, built in 1968, has an existing width of 30 feet curb to curb, with two 12-foot-wide travel lanes and 3-foot-wide shoulders. The 3-foot-wide shoulders, which are intended to accommodate stopped vehicles for emergency use, no longer meets current design criteria. For an urban principal arterial, such as US 2, WSDOT's Highway Design Manual specifies a 4-foot minimum clearance between the edge of the travel lane and the curb or barrier.
- WSDOT's Target Zero is the Strategic Highway Safety Plan with an adopted goal to reduce traffic fatalities and serious injuries to zero by the year 2030. WSDOT's Target Zero complies with the principles of FHWA's Safe System approach, with the same vision of supporting a safety culture and zero traffic fatalities.

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Figure 7. Serious Injury and Fatal Crashes on WSDOT Facilities in the Preliminary Study Area



Resiliency: The westbound US 2 trestle lacks resiliency, which presents a risk of disrupted travel on this critical route.

- **Seismic Resilience** - The US 2 trestle spans an area identified by the Washington State Department of Natural Resources (DNR) as having a moderate to high liquefaction susceptibility (Figure 8) (DNR 2024). The westbound US 2 trestle was built to the design standards of 1968 and is vulnerable to instability in the event of liquefaction from seismic activity.

A functionally obsolete bridge does not meet current design standards, either because the volume of traffic carried by the bridge exceeds the level anticipated when the bridge was constructed and/or the relevant design standards have been revised.

- **Asset Management** - The westbound US 2 trestle is classified as functionally obsolete. Necessary repair work on the westbound US 2 trestle has resulted in planned shutdowns and lane closures, which requires using alternate routes that add time and distance to trips (Figure 8).

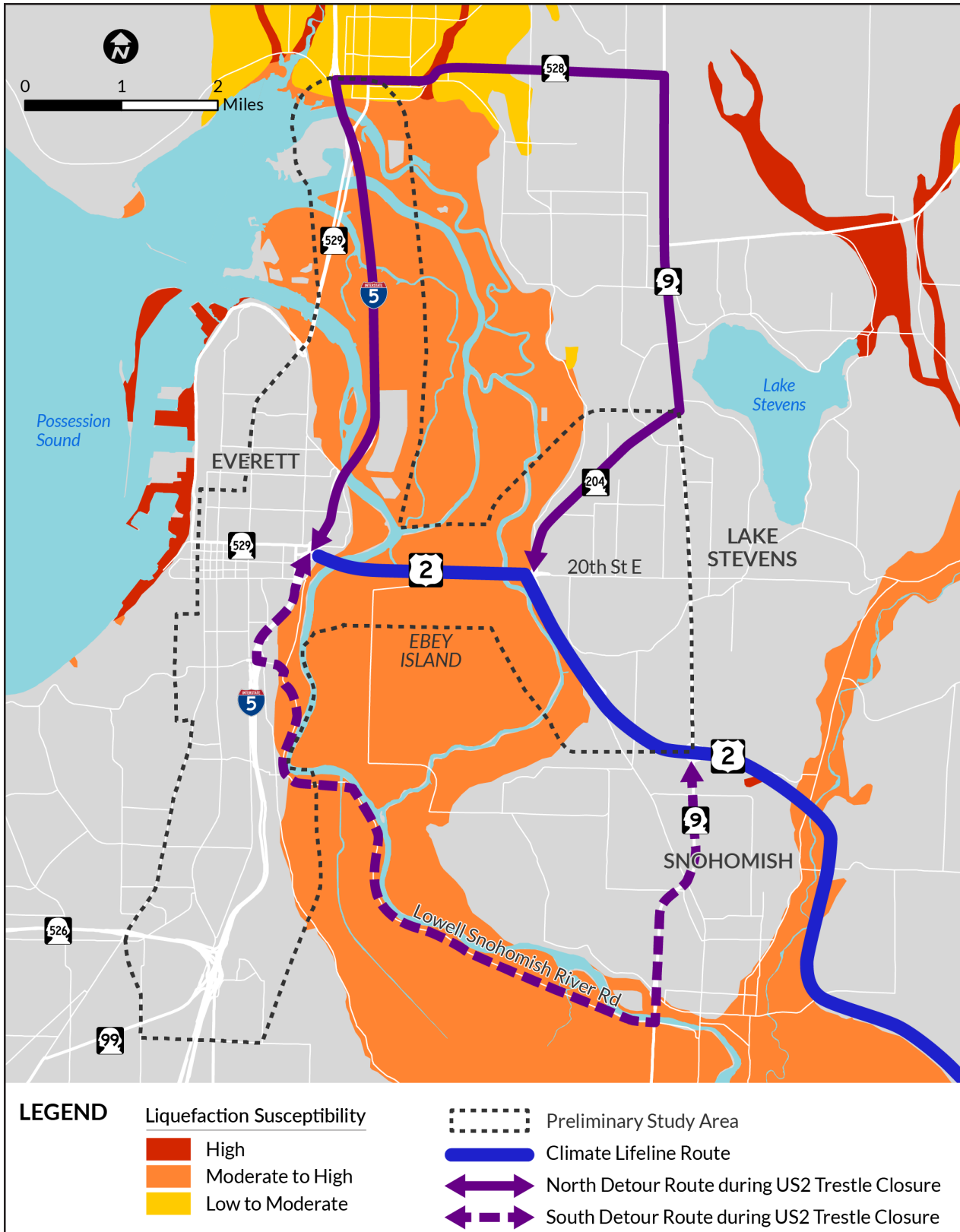
As the westbound US 2 trestle nears the end of its planned lifecycle, substantial and ongoing maintenance would be required to maintain the aging roadway in a state of good repair. Bridge deterioration or damage from exceeding the original design life could result in weight restrictions on heavier freight and transit vehicles to reduce the risk of further damage and ensure the safety of the traveling public (WSDOT 2024).

- **Climate and Natural Hazard Resilience** - WSDOT's Climate Impact Vulnerability Assessment identifies US 2, including the segment within the preliminary study area, as a highly critical asset or "lifeline" route.

During a heavy rain event, the westbound US 2 trestle structure experiences plugged or inefficient drainage, which leads to standing water, lane closures, and continued maintenance. The frequency of heavy rain events may increase as a result of climate change.

- **Operational Resilience** - Log jams can occur in the Ebey Slough after a heavy rain event, which can lead to lane closures on the US 2 trestle, with maintenance costs of approximately \$90,000 per incident. Culverts under the trestle are frequently hit by vehicles, incurring repeated maintenance costs.

Figure 8. US 2 Trestle Liquefaction Susceptibility and Alternate or Detour Routes



5 Goals

As noted in Section 1, the Purpose and Need statements for the US 2 Trestle PEL Study identify the transportation needs that make up the purpose for conducting the PEL study and provide the framework for identifying a reasonable range of alternatives. Goals are desirable outcomes to achieve in addition to meeting the transportation purpose and needs and can help inform the identification of a preferred alternative among the reasonable range of alternatives. For the US 2 Trestle PEL Study the following goals have been identified:

- Avoid or minimize contributions to environmental and health disparities among vulnerable populations and overburdened communities.
- Reduce transportation sector GHG emissions by promoting and investing in efficient, equitable and healthy transportation choices.
- Avoid or minimize the use of sensitive environments for transportation infrastructure.
- Support a sound regional economy consistent with regional plans for growth.
- Ensure cost-effectiveness in design, construction and maintenance, and a reliable funding plan.

6 References

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