US 2 Westbound Trestle Study

Planning and Environmental Linkages Documentation

WSDOT

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
NORTHWEST REGION

US 2 Westbound Trestle Planning and Environmental Linkages Study

Approved by:

01/07/2021

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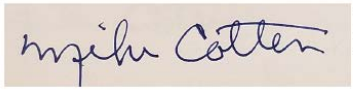

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01/06/2021

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01/07/2021

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FHWA, Area Engineer

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Acronyms

BAT	Business Access and Transit
CED	Chronic Environmental Deficiency
EAG	Executive Advisory Group
EJ	Environmental Justice
ESA	Endangered Species Act
ESO	Environmental Service Office
FHWA	Federal Highway Administration
HOV	High Occupancy Vehicle
I-5	Interstate 5
IJR	Interchange Justification Report
NEPA	National Environmental Policy Act
PEL	Planning and Environmental Linkages
PSRC	Puget Sound Regional Council
RAC	Resource Agency Committee
SOV	Single Occupancy Vehicles
TWG	Technical Working Group
US 2	United States Highway Route 2
USDOT	United States Department of Transportation
WDFW	Washington Department of Fish and Wildlife
WOFM	Washington State Office of Financial Management
WSDOT	Washington State Department of Transportation


INTERSTATE
5
SOUTH
Seattle
Everett
Hewitt Ave
INTERSTATE
5
NORTH
Vancouver B C
EXIT
RAMP METERED AHEAD WHEN FLASHING
Zips
Zips

Executive Summary

This report presents the results of a Planning and Environmental Linkages (PEL) Study conducted by the Washington State Department of Transportation (WSDOT), in cooperation with the Federal Highway Administration (FHWA). This PEL Study sought to develop a long-term solution for westbound United States Highway Route 2 (US 2) between the interchange with SR 204 and 20th Street Southeast at Lake Stevens, Washington, and the interchange with Interstate 5 (I-5) at Everett, Washington. In 2018, the Washington State Legislature authorized funding for the development of a preliminary preferred option to replace this segment of westbound US 2, known as the US 2 westbound trestle.

This PEL Study followed FHWA guidance and the WSDOT draft PEL handbook regarding the integration of transportation planning and the environmental review process established by the National Environmental Policy Act (NEPA). FHWA promotes the use of PEL studies to integrate environmental issues and public involvement with project planning and shorten the time required to take projects from planning to implementation.

WSDOT closely collaborated with local study proponents and stakeholders. Three groups were formed to provide guidance and input: An Executive Advisory Group (EAG), a Technical Working Group (TWG), and a Resource Agency Committee (RAC). WSDOT also initiated coordination with tribal governments.

This PEL Study differs from a NEPA project-level approach of developing and evaluating alternatives to determine a preferred alternative. The westbound trestle study was set up to define and analyze a series of representative configurations. Following an evaluation process, two representative configurations were selected for transportation analysis. The analysis data was used to compare the configurations and to develop recommendations and an expanded list of actions for future studies and reviews under NEPA.

Key Findings

Traffic operations on the US 2 westbound trestle in 2040 were the focus of this PEL Study. The analysis indicates that adding lanes to the trestle alone will not alleviate the forecasted congestion on the trestle. A larger study area that includes portions of I-5 and a better understanding of how travelers move through the network are required to adequately assess future conditions, evaluate reasonable alternatives, and develop a long-term solution for the westbound US 2 corridor. The following conclusions from this PEL Study will inform future studies and NEPA review:

1. **Network congestion.** Increasing the capacity of the US 2 westbound trestle does not alleviate congestion during the morning peak hours. The analysis found that the increased demand generated by a larger trestle could not be accommodated by I-5 and resulted in longer travel times across the westbound trestle.
2. **Trestle span.** Three travel lanes on the US 2 westbound trestle would provide enough capacity for future conditions if network congestion is addressed.

3. **Managed lanes.** Managed lanes (transit, high occupancy vehicles (HOV), express toll, or peak-use shoulder lane) on the trestle could provide people an option to bypass general-purpose traffic during the morning rush hours and would potentially improve conditions on I-5.
4. **Active transportation (walk, bike, roll).** Developing a long-term solution for the US 2 westbound trestle would provide opportunity to create a valuable active transportation corridor between communities east of the Snohomish River and downtown Everett.
5. **Mode share.** The share of HOV and transit (bus) vehicles on the corridor during the morning commute hours is expected to be less than 9% in 2040. Transit providers would need to include or increase service plans in the area to give people a choice beyond single occupancy vehicles and ensure that transit service is coordinated with local and regional land use planning to best serve desired trips.
6. **Environmental considerations.** Baseline environmental conditions are unlikely to serve as key differentiators among the trestle alternatives. Potential adverse effects on sensitive areas and regulatory requirements to avoid, minimize, and/or mitigate environmental impacts will be considerations in the development of any long-term solution.

As the US 2 westbound trestle nears the end of its useful life, WSDOT will continue to pursue plans to replace this important east-west connection. The trestle is a critical piece of infrastructure, providing irreplaceable connections across the Snohomish River and connecting growing communities.

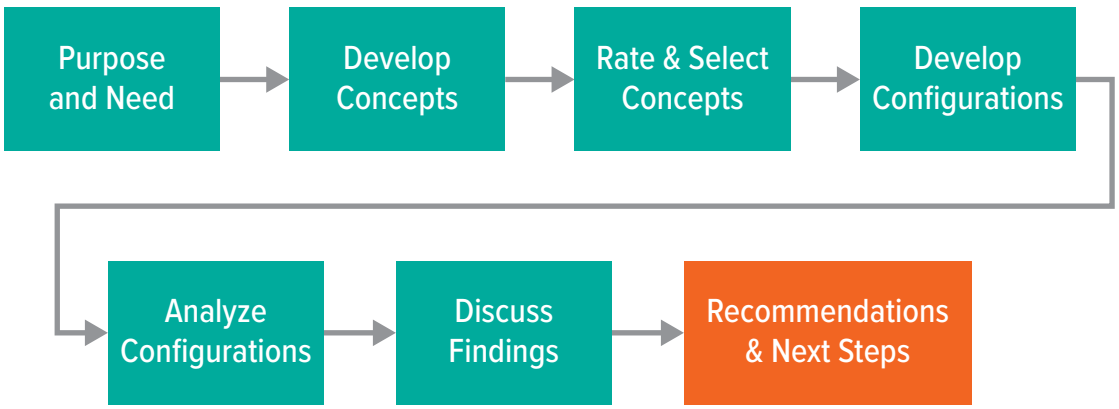
This executive summary introduces the outcomes of this document. An overview of the approach is shown in Figure ES-1, and the study steps are described briefly below.

Purpose and Need

The PEL Study developed a draft Purpose and Need statement. The purpose defines the transportation problem to be solved. The need provides evidence that supports the defined transportation problem.

The draft purpose of the US 2 Westbound Trestle Study is to develop a long-term solution that will increase travel reliability, reduce crash potential, and improve multimodal system linkages to support regional and community growth. In addition, a solution should modify roadway geometrics and satisfy current operational standards. The draft need statement will be addressed in a long-term solution that includes mobility, safety, multimodal use, and sustainability.

Figure ES-1. US 2 Westbound Trestle PEL Study Process



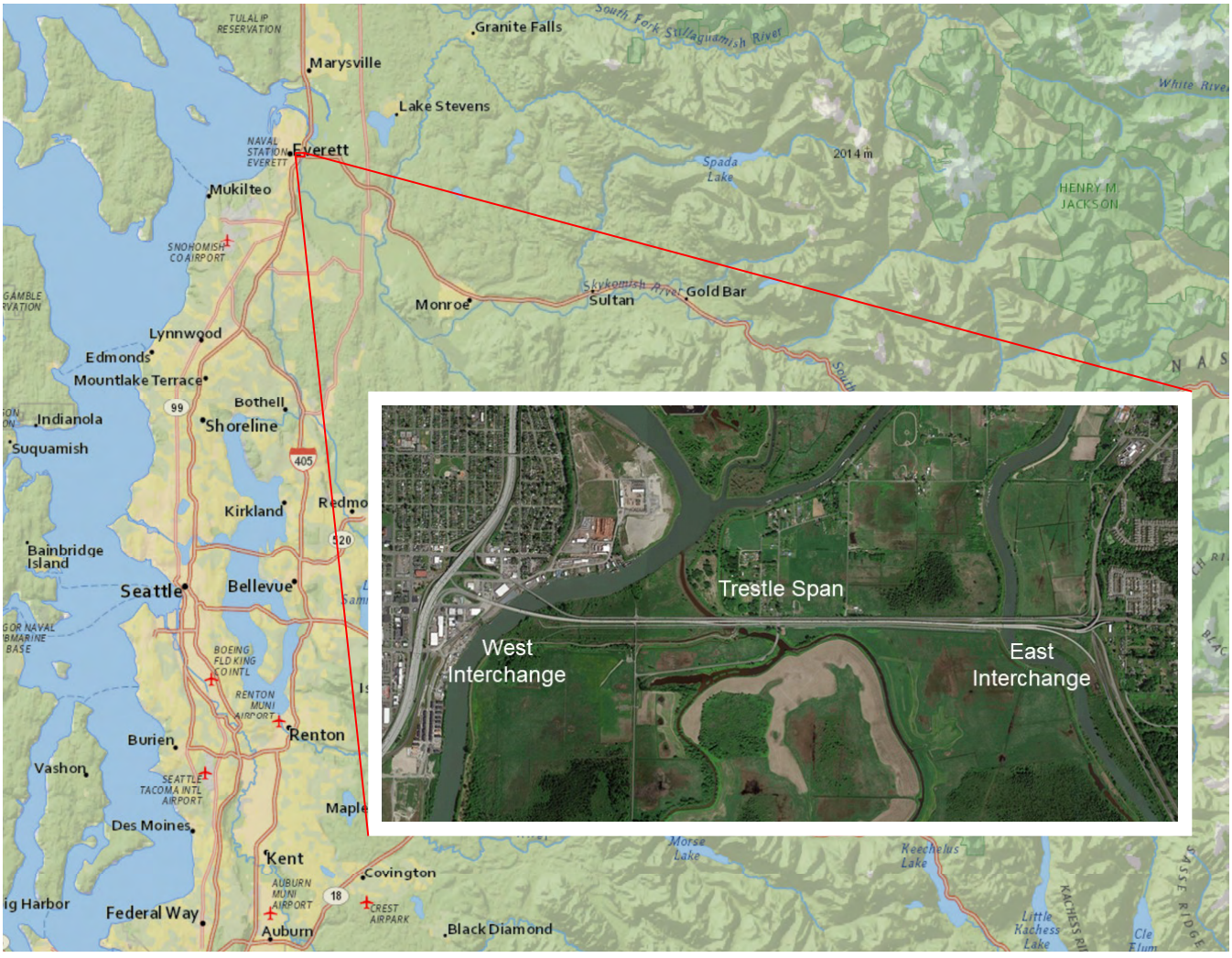
Concepts and Configurations

The US 2 westbound trestle study corridor was divided into three sections to simplify conceptual design, evaluation, and discussion, as shown in Figure ES-2. West to east these sections are the west interchange, the trestle span, and the east interchange. The east interchange connects SR 204, 20th Street Southeast and US 2. The trestle span describes the elevated structure across Ebey Island. The west interchange connects US 2 with I-5 near downtown Everett.

A long list of potential solutions for each section, identified as concepts, was developed in response to the need. These were guided by input from the TWG. The concepts were rated relative to one another. Potential configurations were developed using combinations of the highest-rated concepts. Three configurations were selected to be representative of the many options that could be assembled from the highest-rated concepts. Each of the configurations was refined to a conceptual level of design for transportation analysis.

Each configuration would accommodate a pedestrian and bicyclist pathway to provide active transportation connections to the east and west. The conceptual designs for the pedestrian and bicyclist connections will be developed after reasonable alternatives have been identified.

Figure ES-2. Overview of the US 2 Westbound Trestle



Transportation Analysis

An analysis of traffic operations was done to understand and evaluate how vehicles would move through each of the configurations. The key finding of the traffic analysis was that the increased demand that comes with a larger facility could not be accommodated by the overall roadway network, resulting in increased delays across the westbound trestle. As a result, a larger study area and analysis of traveler movements and destinations is recommended for future study phases. The new study area would include portions of I-5 and parts of the overall roadway network in the surrounding areas.

One configuration contains two general-purpose lanes and one HOV lane. Managed lanes would provide options for travelers and discourage solo driving, which would support regional goals to increase transit. If network capacity was addressed, a three-lane trestle span would accommodate the traffic expected in 2040.

Currently there are no active transportation options on the US 2 westbound trestle, although east-west travel is possible on the US 2 eastbound trestle. Development of a long-term solution for the US 2 westbound trestle provides an opportunity to create a valuable active transportation corridor, and further study is required in future phases.

In terms of safety, all concepts and configurations considered during this PEL Study meet or exceed current geometric design guidelines. It is anticipated that safety would be analyzed quantitatively during future studies and NEPA review.

Environmental Phases Considerations

A planning-level environmental analysis was used to inform the development of concepts, consistent with FHWA and WSDOT guidelines. Readily available data from local, regional, state, and federal agencies were used. The PEL Study did not conduct any field reviews.

Primary findings were that the study area and its immediate vicinity contain several areas of environmental concern. These include climate vulnerability, historic bridges, environmental justice populations, habitat connectivity, wetlands, fish passage barriers, and the presence of protected species and habitat. The full range of social and environmental issues will be addressed during NEPA review. Future studies may also redefine the study area limits, undertake field studies, conduct additional public outreach activities, and develop mitigation plans in accordance with current guidelines.

Government Consultation

WSDOT began coordination with interested tribal governments, including the

- Tulalip Tribes
- Confederated Tribes and Bands of the Yakama Nation (Yakama Nation)
- Stillaguamish Tribe of Indians (Stillaguamish Tribe)
- Snoqualmie Tribe (Snoqualmie Tribe)
- Sauk-Suiattle Indian Tribe (Sauk-Suiattle Tribe)

Key points of discussion included transportation, economic, and environmental topics and potential impacts to treaty fishery resources. Formal consultation with interested tribes will begin during NEPA review and continue throughout the life of the project or projects. WSDOT has maintained a tribal communications log to document the coordination to date.

NEPA review will address the full range of cultural and natural resource considerations and will continue to coordinate with tribal governments on all transportation, planning, environmental justice, and land use considerations, as well as associated potential impacts to tribal members and tribal enterprises.

Agency Coordination

The Washington State legislative direction for the US 2 Westbound Trestle Study included requirements to work in close collaboration with local study proponents and stakeholders. To meet this requirement, WSDOT formed an EAG, TWG, and RAC.

The EAG included senior staff from state and local agencies, elected or appointed officials, and tribal governments. The TWG was composed of technical experts focused on transportation planning. The RAC included tribal representatives and federal, state, and local agencies. During the PEL Study process, the EAG met twice; the TWG met four times; and the RAC met once. Additionally, to facilitate coordination, WSDOT and consultant staff held biweekly cross-disciplinary project management team meetings. WSDOT also held a series of stakeholder interviews to help inform the draft Purpose and Need. Outreach to the general public consisted of an online open house and survey.

Next Steps

To advance study and design of the US 2 westbound trestle, it is recommended that future studies place the corridor in a broader context that recognizes capacity limits on the I-5 corridor and on the surface streets and intersections in downtown Everett. In future studies, the transportation analysis approach used in this PEL Study could be expanded to include person-throughput in the corridor as a primary criterion for evaluation. Multimodal strategies could be explored to increase the use of HOV and transit, including an assessment of gaps in transit access to communities. This PEL Study concludes with an expanded list of actions recommended for future studies.


Ebey Island
Homeacres Rd
NEXT LEFT
FREEWAY ENTRANCE
2 EAST
204
2 WEST

1. Introduction

The Washington State Department of Transportation (WSDOT), in cooperation with the Federal Highway Administration (FHWA), conducted this Planning and Environmental Linkages (PEL) Study to develop a long-term strategic plan for the United States Highway Route 2 (US 2) corridor between the interchange with Washington State Route 204 (SR 204) at Lake Stevens, Washington, and the interchange with Interstate 5 (I-5) at Everett, Washington. This segment of US 2 (US 2 westbound trestle) crosses the Snohomish River on elevated structures or "trestles." Previous WSDOT studies have identified a need to replace the US 2 westbound trestle, including reconfiguration of the interchanges, by 2045 to accommodate regional and local growth. In 2018 the Washington State Legislature authorized funding for the development of a preliminary preferred option through an environmental process.

The PEL represents an approach to transportation decision-making that considers environmental, community, and economic goals early in the planning stage and carries them through project development, design, and construction. This approach can lead to a seamless decision-making process that minimizes duplication of effort, promotes efficient and cost-effective solutions and environmental stewardship, and reduces delays in project implementation. The PEL questionnaire provided in Appendix P outlines the framework supporting this PEL Study. The completed questionnaire helps to ensure that the collected information and decisions made during this PEL Study can be used during subsequent National Environmental Policy Act (NEPA) reviews.

The PEL Study followed FHWA guidance and the WSDOT draft PEL handbook regarding the integration of transportation planning and the environmental review process established by NEPA. FHWA guidance encourages the use of planning studies to provide information for incorporation into NEPA documents (23 Code of Federal Regulations 450). FHWA promotes the use of PEL studies to integrate environmental issues and public involvement with project planning and shorten the time required to take projects from planning to implementation.

This PEL Study served to identify transportation priorities and set the groundwork for future improvements on the US 2 westbound trestle through the following actions:

- Preparation of a draft Purpose and Need statement.
- Coordination with federal, state, and local agencies.
- First phase of tribal coordination.
- Review and documentation of baseline information to determine the scope of issues.
- Development and documentation of concepts and configurations.
- Documentation of unreasonable concepts and configurations that could be eliminated.
- Initial screen of affected environmental resources.
- Preliminary transportation analysis.

Taken together, these actions can support an efficient transition to NEPA reviews, final design, and construction once funding is identified.

1.1 Project Location

The project area of the US 2 Westbound Trestle PEL Study is the westbound segment of US 2 between and including the interchanges at SR 204/20th Street Southeast and I-5. This segment of US 2 crosses the Snohomish River on elevated structures or "trestles." The westbound trestle runs parallel to the eastbound trestle and both traverse an estuarine environment that includes Ebey Island, Ebey Slough, and Deadwater Slough (Figure 1-1).

1.2 Planning Context

The US 2 westbound trestle is a multimodal transportation corridor that connects the residential communities of Snohomish, Lake Stevens, and Monroe to I-5 and the city of Everett, and to businesses and industries on both sides of the Snohomish River. Previous studies have indicated that the recent and planned growth in Snohomish County has resulted in an increase in automobile trips with a high percentage in single-occupancy vehicles (SOV) across the corridor. Significant congestion occurs at the US 2/I-5 and the SR 204/20th Street Southeast interchange, particularly during the morning peak. VISION 2040[1] developed by the Puget Sound Regional Council (PSRC) designates Everett as a regional growth center with Lake Stevens and Snohomish as two of the region's 24 small cities. For this growth strategy to be successful, the US 2 westbound trestle must operate reliably and serve transit and active transportation in addition to automobile traffic.

WSDOT has considered improvements to the US 2 westbound trestle in three recent studies funded by the Washington State Legislature, WSDOT, and the cities of Everett and Snohomish.

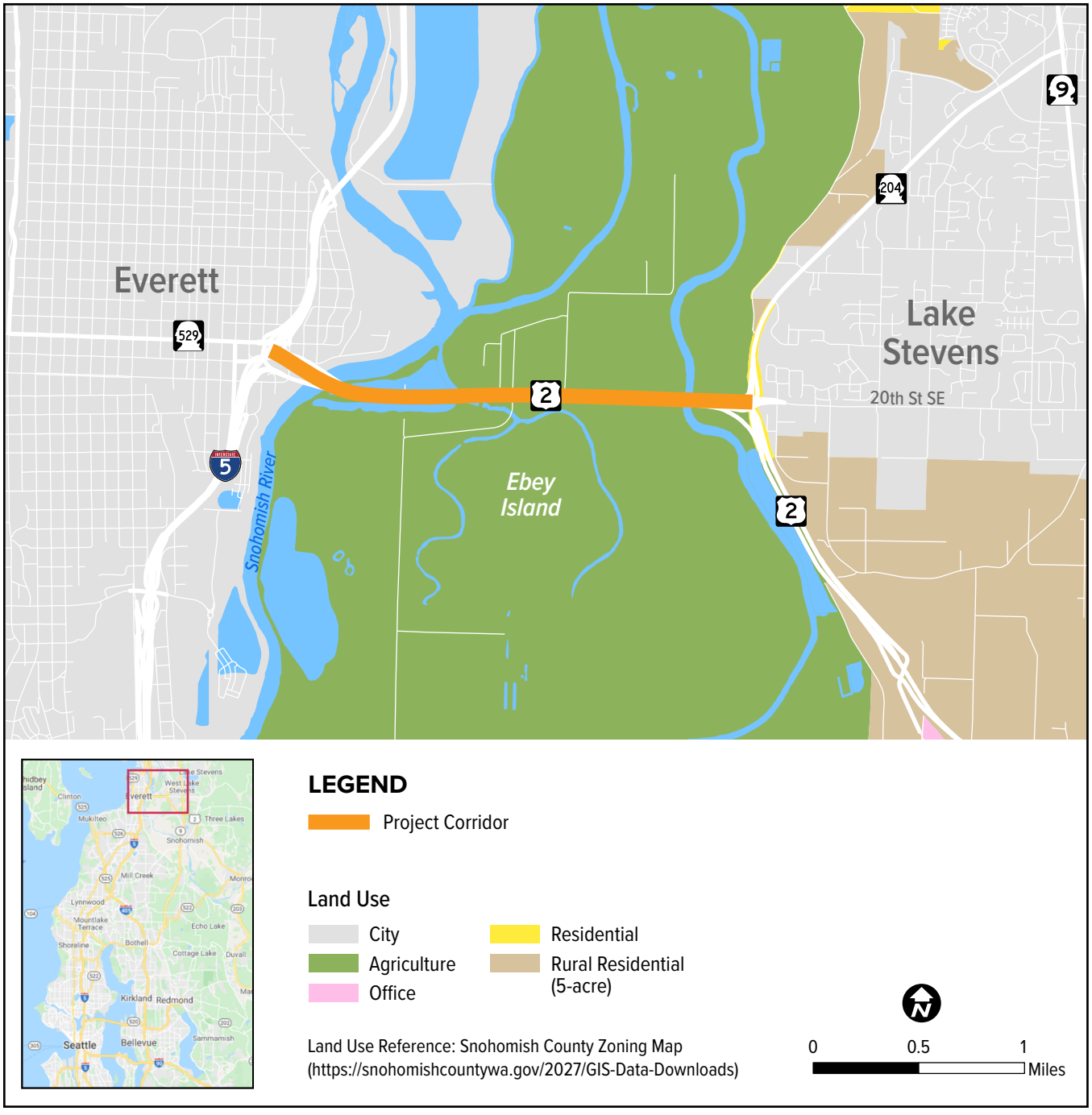
The US 2: Everett Port/Naval Station to SR 9 Corridor Planning Study[2] (US 2 Corridor Study) focused on short and long-range improvements for the westbound trestle and was completed by WSDOT in August 2016. The study concluded that the future replacement of the westbound trestle would be driven by traffic congestion and the useful life of the existing structure. It identified that traffic congestion currently lasts for one to two hours during the morning peak at the SR 204 and 20th Street Southeast merge area and near the I5/US 2 ramps. The study identified, analyzed, and evaluated improvements to determine the most cost-effective near-term and long-term approaches to address safety and congestion issues. For the year 2020, the study recommended a series of safety and preservation projects, as well as short-range investments that included a travel demand management program, a dedicated incident response team, and intelligent transportation systems. Over the long term, rehabilitation projects completed in 2011 along with continued maintenance could extend the useful life of the US 2 westbound trestle until approximately 2045, when a full replacement is likely to be required. To simulate future traffic operations and to produce a high-level cost estimate, a new three-lane trestle with dedicated approach lanes from SR 204, 20th Street Southeast, and US 2 was assumed. It was noted that the final configuration of the US 2 westbound trestle replacement would be determined during a future design and environmental process.

The *US 2-SR 204-20th Street SE Interchange Justification Report (IJR)*[3] was initiated by the 2016 Washington State Legislature to evaluate

1 www.psrc.org/vision-2040
2 www.wsdot.wa.gov/sites/default/files/2006/02/14/US2CorridorPlanningStudySigned20160901.pdf
3 www.wsdot.wa.gov/publications/fulltext/LegReports//17-19/US2_SR204_20thStSE_IJR_Report.pdf

the need for improvements to the interchange and immediately surrounding highway system to improve traffic conditions and mobility for people and freight in the project area. The report was finalized by WSDOT in April 2018 and includes summaries of current and future needs, existing environmental conditions, a preliminary recommended improvement, and additional system considerations. The report addressed the eight policy points outlined in the FHWA policy for approving new or revised access to the interstate system.

Figure 1-1. US 2 Westbound Trestle Project Area



The IJR determined that roadway geometries and capacity on the west end of the trestle could not accommodate the forecasted increases in roadway traffic. The increase in demand from present day to 2040 results in significantly worse travel times for westbound traffic during the morning peak. Safety was also reported as a significant concern for travelers on the corridor today and in the future. The IJR found that both the westbound trestle and the east interchange contributed to congestion and both would need to be addressed and improved. Using 2040 traffic volumes and network assumptions, the IJR analyzed a preliminary preferred alternative with the following characteristics:

- Ramps would connect with a new trestle segment located to the north of the existing structure.
- The 20th Street Southeast on-ramp would align with the planned high occupancy vehicle (HOV) lane on 20th Street Southeast being implemented by the city of Lake Stevens.
- The 20th Street Southeast off-ramp would be realigned to meet the lower roadway.
- A wider trestle that would be capable of supporting four-lane operations during the peak hour, assuming re-striping of a three-lane structure and leaving minimal widths for shoulders.
- One lane of the future 2040 US 2 westbound trestle would be configured as an HOV lane.
- Nonmotorized connection(s) would be included in all alternatives.

Primary operational benefits include the following:

- Travel-time savings for westbound travelers during the morning peak.
- Reduction of westbound congestion along SR 204, 20th Street Southeast, and US 2.
- Improved connectivity for pedestrians and cyclists through the interchange.
- Improved opportunity for transit and HOV to connect with a future US 2 trestle HOV lane.
- Improved connectivity for future transit access to a future light rail station in Everett (via the 20th Street Southeast on-ramp alignment with the mainline US 2 HOV lane).

Operational analysis revealed that the interchange improvements would improve traffic operations on the east end of the US 2 trestle. This would shift some of the congestion to the west end of the trestle at the I5/US 2 interchange. The report recommended that the next steps include a more fully funded project that would support community engagement, full environmental analysis and documentation, and design to a level that outlines environmental impact and methods to avoid, minimize, and/or mitigate such impacts.

The *US 2 Westbound Trestle Funding and Financing Study*[4] was completed by WSDOT in January 2018. The Washington State Legislature directed WSDOT to prepare a cost estimate for replacing the westbound trestle, including the east interchange improvements proposed in the IJR, and to examine and recommend financing options. The directive did not include examining the west interchange. The study estimated that replacing the westbound trestle would cost approximately $1.1 billion in 2018 capital dollars. A combination of federal, state, and local grant and fee sources were assumed to cover up to $100 million in funding. Tolling was considered, and the analysis found that if tolling were to start during construction (estimated to begin in 2024), it could be leveraged to provide $440 million to $690 million in project funding. Based on limited analysis, tolling could be financed to provide a capital funding contribution between $300 million and $660 million. The study concluded that with

4 www.wsdot.wa.gov/publications/fulltext/LegReports/17-19/US2WestboundTrestleFunding_FinanceStudy_WithAppendixA.pdf

the proper statutory authority, a public-private partnership approach could be a viable alternative to state-backed toll financing.

Information from these three studies provided an early understanding of stakeholders' positions and supported the development of a draft Purpose and Need statement and project goals. Key findings from these three previous studies were brought together under this PEL Study and were utilized in the development of reasonable concepts and configurations.

1.3 Limits of the PEL Study Area

US 2 crosses the Snohomish River, Ebey Island, Deadwater Slough, and Ebey Slough on structurally independent trestles—one westbound and another eastbound. The IJR and the US Corridor Study identified the need to address the roadway geometries and capacity of the westbound trestle to accommodate future growth independently from the eastbound trestle. As a result, this PEL also considers the planning and analysis of the westbound trestle independently from the eastbound trestle.

The two facilities have different needs. The eastbound trestle was built in the 1990s and is in better physical condition. It carries two general-purpose lanes and one peak-period shoulder lane, which gives the eastbound trestle a higher throughput capacity than the westbound trestle. A need to fully replace the eastbound trestle has not been identified. The westbound trestle was completed in 1968 and carries two lanes of general-purpose traffic. As identified in the IJR, the westbound trestle needs improvements to address mobility, safety, multimodal use, and sustainability that require study in the near term and a full replacement in the long term. The physical structure of this segment of US 2 allows the westbound trestle to be improved or replaced independently from the eastbound trestle.

In terms of transportation analysis, the configurations of the trestle spans and interchanges allow for the traffic operations of the westbound trestle to be analyzed independently from the eastbound trestle.

1.4 Existing Configuration

To simplify the discussion and conceptual design of the US 2 westbound trestle during this PEL Study, the corridor was divided into three sections. From west to east, these are the west interchange, the trestle span, and the east interchange.

1.4.1 The West Interchange

Westbound US 2 connects with I-5 and the city of Everett at the west interchange (Figure 1-2), which is elevated over an industrial district of Everett. Both US 2 westbound lanes are carried under I-5 to the signalized intersection of Maple Street/California Street, including a short ramp accessing Walnut Street. A right-side diverging single-lane ramp exits to northbound I-5 prior to the I-5 mainline crossing, and a diverging left-side single-lane ramp exits to southbound I-5 after the I-5 mainline crossing.

The point of intersection with I-5 features three levels of roadway: southbound I-5 to eastbound US 2 on the lower level, westbound US 2 to Everett and southbound I-5 on the middle level, and northbound I-5 on the top level. I-5 is supported by cantilevered columns in this area, with the roadways traveling between and around the columns.

1.4.2 The Trestle Span

The US 2 westbound trestle span is approximately 2.5 miles long. The trestle span provides a left-side off-ramp to access 20th Street Southeast on Ebey Island and an on-ramp from the intersection of 20th Street Southeast and 50th Avenue Southeast on Ebey Island to westbound US 2 (Figure 1-3).

Figure 1-2. Existing West Interchange

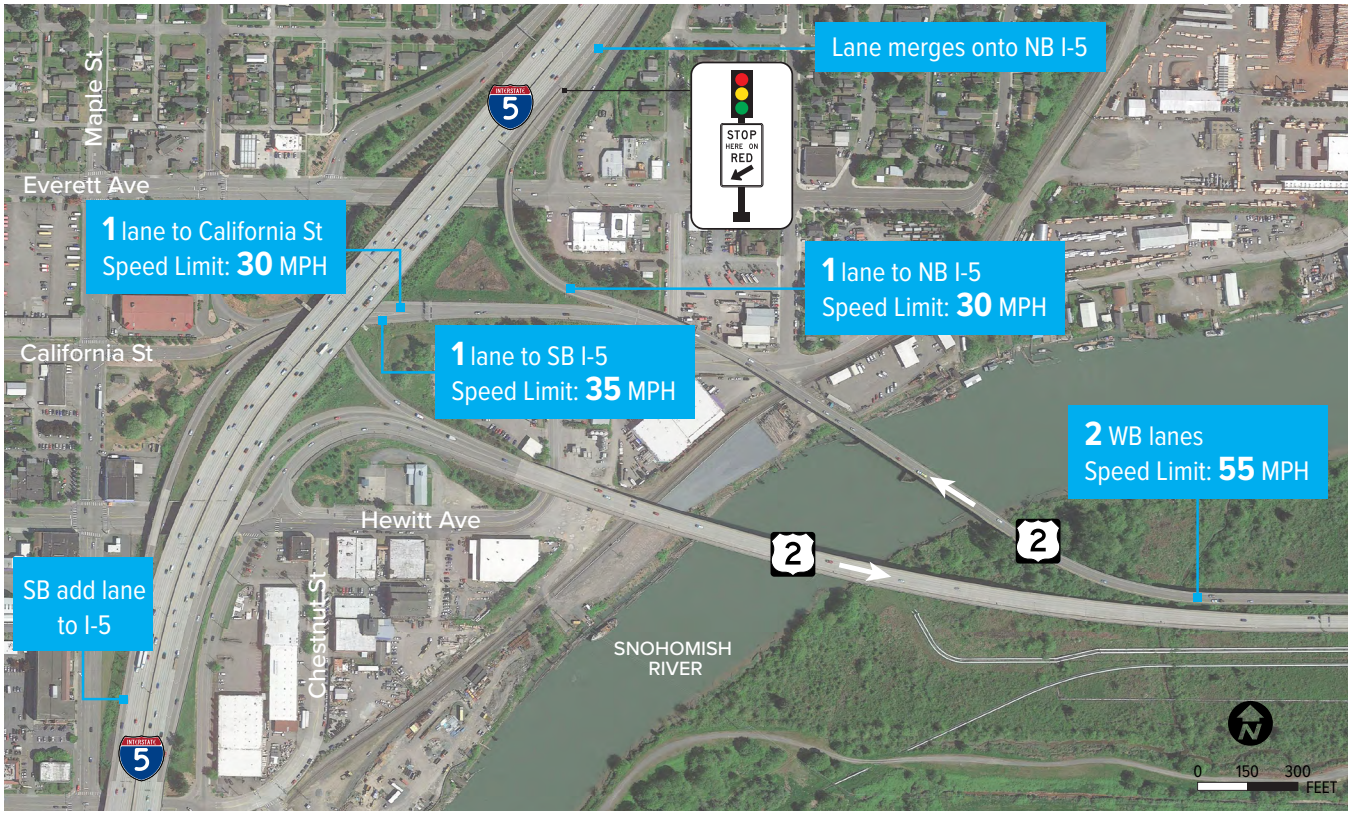


Figure 1-3. Existing Trestle Span

The trestle span consists of two travel lanes with 3-foot shoulders on each side, bounded by WSDOT Type L barriers (Figure 1-4). The Type L barrier includes a raised 11-inch-high by 18-inch-wide curb at the base. A steel railing runs along the top of the barrier (not pictured).

1.4.3 The East Interchange

Southbound SR 204, westbound 20th Street Southeast, and westbound US 2 meet at the east interchange (Figure 1-5) located between the city of Lake Stevens and Ebey Island. The east interchange connects west Lake Stevens to the westbound trestle span via SR 204, Lake Stevens via 20th Street Southeast, and the city of Snohomish via US 2.

Figure 1-4. Existing Trestle Span Cross-Section

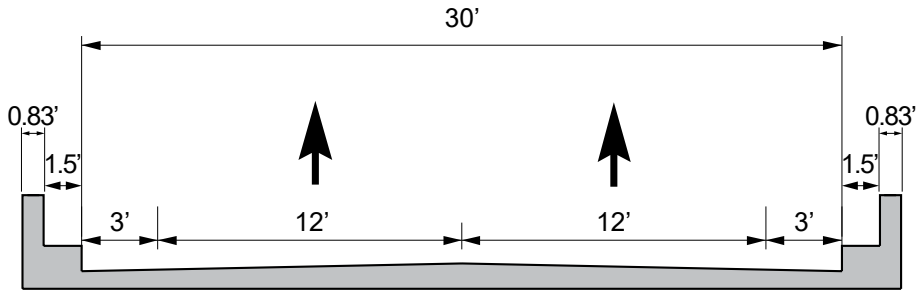
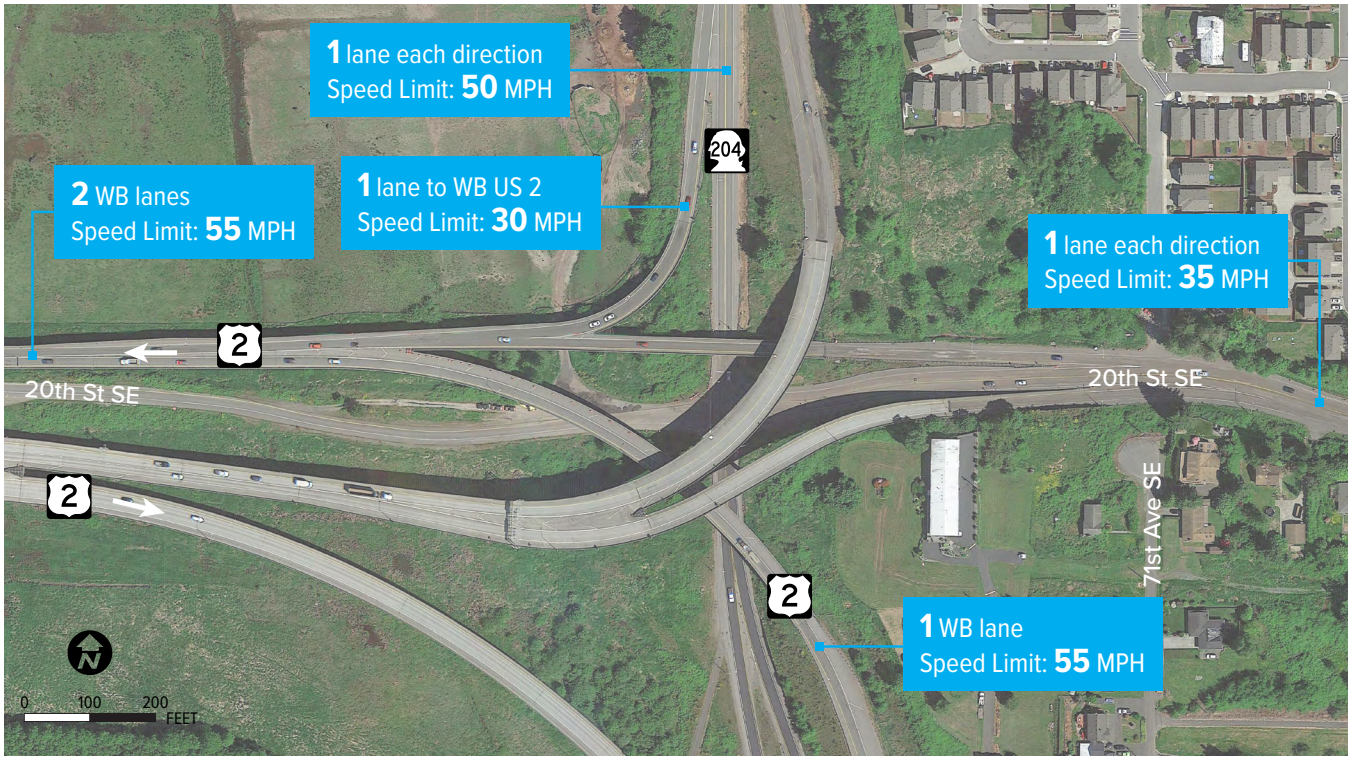


Figure 1-5. Existing East Interchange



1.5 Existing and Planned Use

As noted, the US 2 westbound trestle provides a critical link between the residents, businesses, and industries in the cities of Lake Stevens, Snohomish, and Everett. Anticipated growth in Snohomish County and the Puget Sound region will continue to put pressure on this important multimodal corridor. A full replacement configuration for the US 2 westbound trestle will be developed to support transit, active transportation, freight movement, and commuting to key employers.

1.5.1 Existing Highway Volumes

The US 2 westbound trestle experiences its highest traffic volumes during the morning with a peak of almost 3,600 vehicles per hour between 6:30 and 7:30 a.m. (Figure 1-6).

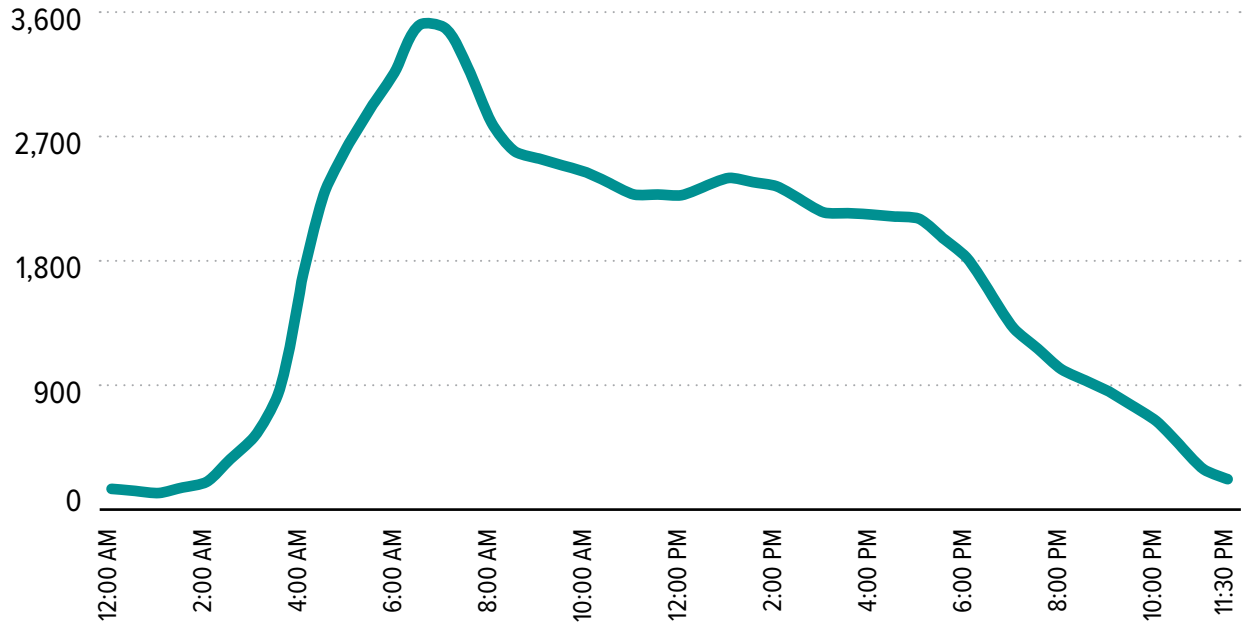
1.5.2 Transit

In its 2019-2024 Transit Development Plan,[5] Community Transit has identified this segment of US 2 as part of the following routes:

- Community Transit Feeder Route.
- Community Transit Rural Route.
- Community Transit Commuter Route.
- Community Transit Paratransit Service Area (weekdays and weekends).

The transit plan recognizes the need for additional transit service across US 2 to provide access to the planned Sound Transit Link light rail service at Everett Station and to Community Transit Core Routes. In 2018, the share of buses on the westbound trestle during the morning peak hour was less than 0.1 percent.

Figure 1-6. Traffic Volumes, Vehicles per Hour, 2018



5 www.communitytransit.org/docs/default-source/projects/2019-transit-development-plan_adopted.pdf?sfvrsn=cafc5576_0

To the east of the east interchange, improvements to 20th Street Southeast are being planned and implemented by the city of Lake Stevens. These include the US 2 Trestle HOV/Transit Trestle Congestion Jump Project, which will construct an additional westbound lane for westbound transit and HOVs during the morning peak hour. More information about this project is included in Section 1.6 – No-Build Configuration.

1.5.3 Active Transportation

This segment of US 2 connects growth areas, identified by PSRC VISION 2040, which are planning and improving their transit and active transportation networks. Snohomish County is currently reaching out to stakeholders to develop its Pathways for Active Transportation.[6] The city of Everett developed a Bicycle Master Plan in 2011, which includes access to the pedestrian and bicyclist path across the eastbound trestle. Lake Stevens is implementing a dedicated pedestrian and bicyclist path along 20th Street Southeast.

However, the existing structure of the westbound trestle span is not wide enough to accommodate two travel lanes plus a dedicated pedestrian and bicyclist path. In the westbound direction, US 2 presents a gap in the existing and planned active transportation network.

1.5.4 Freight Transportation

US 2 is an important freight route connecting western and eastern Washington. US 2, including the westbound trestle, has been designated as a T1 Freight Economic Corridor (carrying more than 10 million tons of freight per year) and a Connector freight route by WSDOT. Major freight facilities, including the Port of Everett, utilize this corridor. Freight vehicles account for approximately 12% of the traffic in the morning peak hour over the westbound trestle.

1.5.5 Highway Significance

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 multiple 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).[7]
- Identified as part of a National Scenic Byway (Stevens Pass Greenway).[8]
- Designated as a Highway of Statewide Significance by the Washington State Legislature.
- Provides year-round access to many recreational opportunities in local, state, and national parks.

1.5.6 Major Employers

Everett is the employment and industrial center of Snohomish County and home to several major facilities with large numbers of employees, including the following:

- Everett Boeing plant
- Port of Everett
- Naval Station Everett

Commute trip reduction strategies will be considered as part of transportation demand management approaches during future studies.

6 www.snohomishcountywa.gov/5450/Pathways-for-Active-Transportation
7 www.wsdot.wa.gov/sites/default/files/2018/07/17/scenic-byways-travel-planner.pdf
8 www.fhwa.dot.gov/byways/byways/2231

1.6 No-Build Configuration

The no-build configuration serves as a baseline for comparing future solutions. The no-build configuration contains the planned and programmed projects in the transportation analysis area that would be in place by 2040 without a replacement of the US 2 westbound trestle. They include projects that have been identified in long-range plans or have committed funding.

No capacity improvements are planned for the US 2 westbound trestle itself. However, directly adjacent to the east interchange, improvements to 20th Street Southeast are being planned and implemented by the city of Lake Stevens as part of the US 2 Trestle HOV Congestion Jump Lane project. This project will construct an additional westbound lane for priority use by transit and HOVs, install traffic operations modifications and traffic signal enhancements, and provide additional pavement markings and signage. The project, extending from a point approximately 1,000 feet east of the east interchange to 91st Avenue Southeast is being planned as an interim solution until funding is available to widen the entire 20th Street Southeast corridor and reconstruct the east interchange.[9]

However, a direct connection to the US 2 Trestle HOV Congestion Jump Lane project is not possible without replacing or significantly altering the structure of the westbound trestle. The existing structure is not wide enough to accommodate a designated HOV lane without repurposing one of the two existing general-purpose lanes. The existing shoulder is not wide enough for peak shoulder use.

9 www.lakestevenswa.gov/CivicAlerts.aspx?AID=334&ARC=677

Although these planned improvements in Lake Stevens are not within the project area of the westbound trestle, they are included in the study limits of the transportation analysis area. Additional transportation projects that are included as part of the no-build configuration are listed in the Traffic White Paper in Appendix C.

The no-build configuration does not include an active transportation connection over the westbound trestle span. The traffic demand for the no-build configuration in 2040 significantly increases as compared to the existing condition in 2018. The anticipated increase in volumes varies throughout the facility, as shown in Figure 1-7.

In both the existing and no-build configurations, most travelers on the westbound trestle are headed for southbound I-5, although in 2040 the volume of traffic to downtown Everett rises more significantly. Most travelers enter the westbound trestle from US 2, and in 2040 this volume increases substantially more than the other on-ramp volumes. This information was used to develop concepts for the westbound trestle to accommodate the various traffic flows.

To develop an understanding of regional movements that rely on the westbound trestle, data collected from the PSRC and StreetLight was analyzed to indicate by travel district where the trips across the westbound trestle begin and end. Figure 1-8 illustrates the results of this data analysis for the morning peak hour for the no-build configuration in 2040. The highest percent of trips begin in east Snohomish County, and the highest percent of trips end in Everett. Only 6% of travelers across the westbound trestle are headed for King County and Seattle. These data will be useful for developing a multimodal strategy for the corridor that considers all trip types and purposes.

Figure 1-7. Morning Peak Hour Traffic Volumes, Existing (2018) and No-Build (2040) Configurations

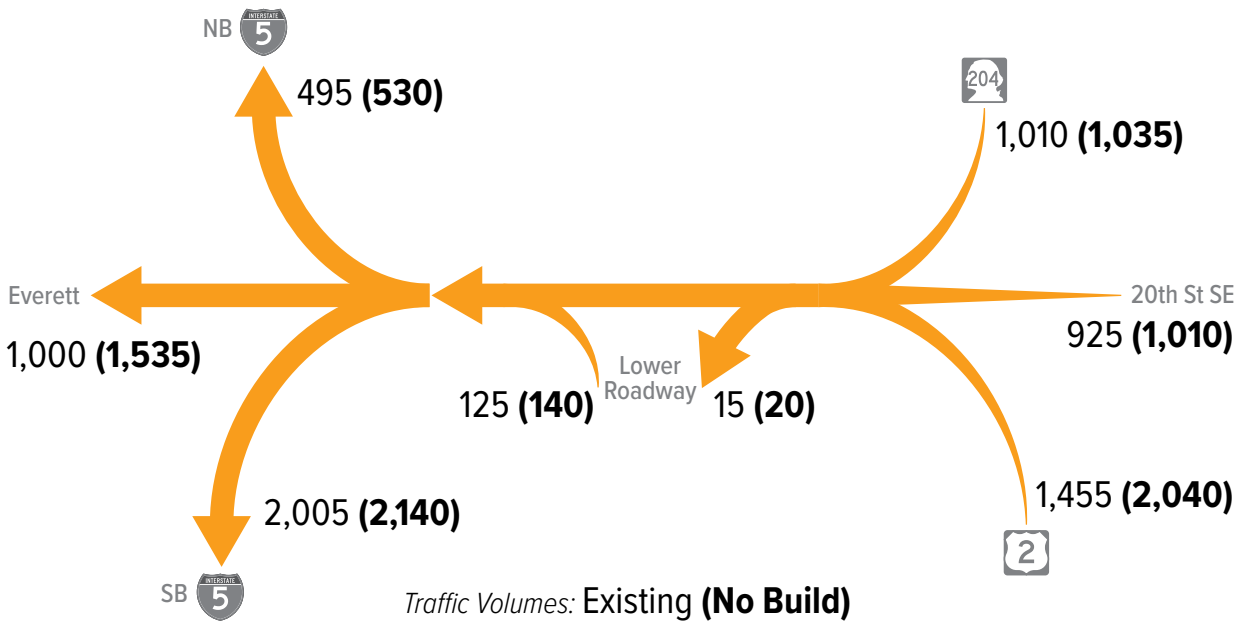
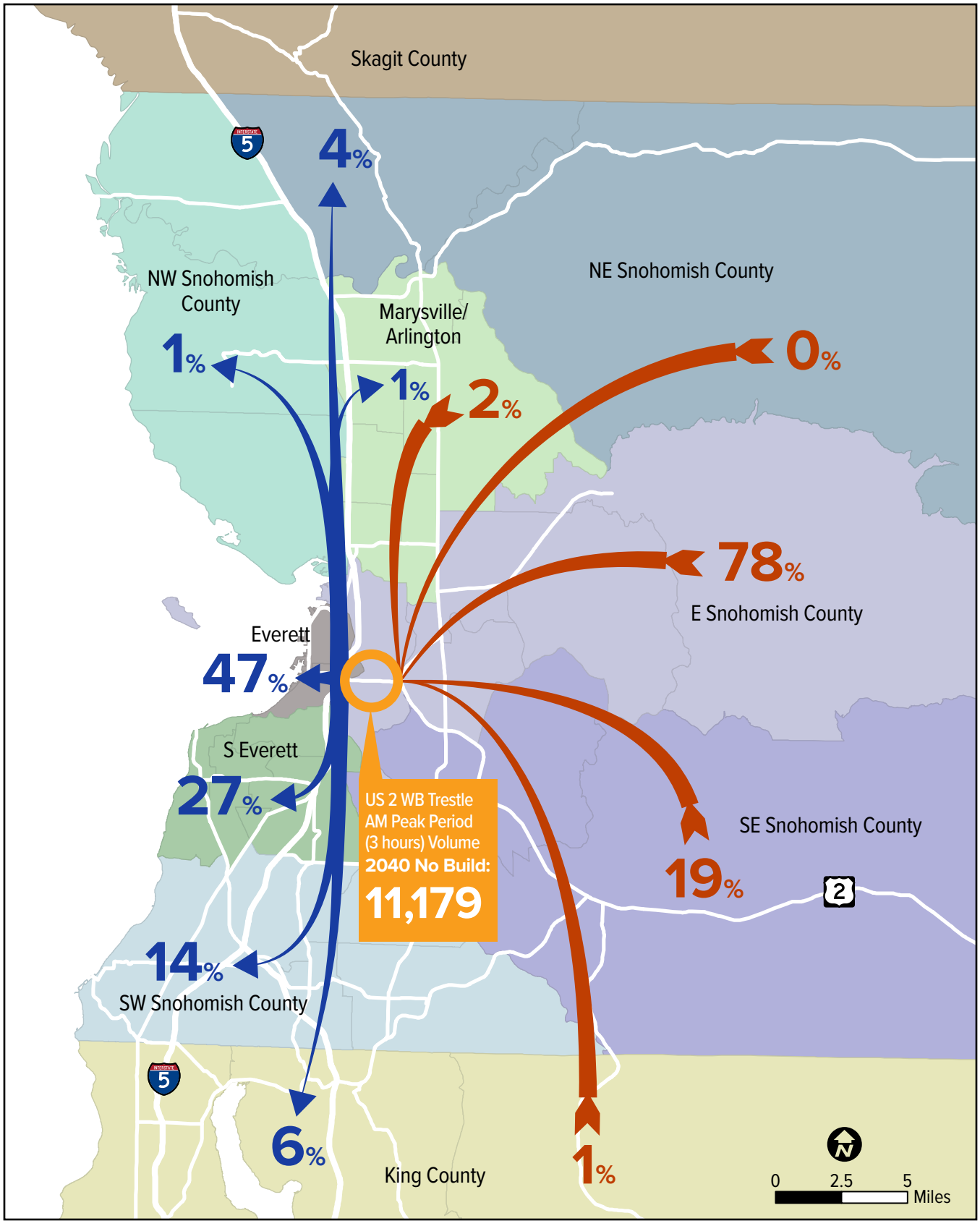


Figure 1-8. Trip Origins and Destinations by Travel District, No-Build 2040



2. Purpose and Need

A Purpose and Need statement is an important component of PEL studies and environmental reviews prepared by WSDOT. It sets the stage for the specific problems to be addressed. The purpose defines the transportation problem to be solved. The need provides evidence that supports the assertion made in the purpose.

The draft Purpose and Need statement developed for this PEL Study reflects feedback from the TWG and the EAG (see Section 8 – Project and Agency Coordination). Extensive coordination with members of the public, local jurisdictions, communities, stakeholders, and agencies will be undertaken in future planning phases before the final Purpose and Need statement is defined.

The transportation needs assessment is based on a 2040 planning horizon and builds from PSRC long-range plans and data gathered in previous studies by WSDOT.

2.1 Draft Purpose

The purpose of the US 2 Westbound Trestle PEL Study is to develop a long-term solution that will:

- Increase travel reliability for all modes.
- Reduce the potential for fatal and serious injuries for all users.
- Improve multimodal system linkages to support regional and community growth.
- Modify roadway operations and geometrics to current standards.

2.2 Draft Need

A long-term solution for the US 2 westbound trestle will address the following primary issues:

- Mobility
- Safety
- Multimodal use
- Sustainability

2.2.1 Mobility

The US 2 westbound trestle regularly experiences slow travel speeds and congestion resulting from high traffic volumes and/or incidents, especially during the morning peak period. Recurring congestion and reduced travel speeds are observed during peak travel periods at predictable locations on the corridor resulting from high traffic volumes and physical conditions. Figure 2-1 shows vehicle speeds and typical travel times by segment in 2018.

Congestion, especially at peak commuting hours, exists on both ends of the westbound trestle. Although classified as an urban principal arterial and part of the national highway network, vehicle speeds on key segments of the westbound trestle remain under 30 miles per hour for all travel modes in the peak morning period due to congestion. Delays in travel time during the morning peak period are highly variable and can range between eight and 24 minutes.

Figure 2-1. Travel Speeds and Times on US 2 Westbound Trestle (2018)

Traffic demand on the westbound trestle is anticipated to rise significantly, creating heavier congestion and longer backups in the peak periods and increasing travel times. The cities and communities served by this segment of US 2 have grown significantly over the last two decades. High levels of population and employment growth are projected to continue (Figure 2-2 and Figure 2-3).

Snohomish County's population is estimated to increase 30% by 2040. Everett, identified as a regional growth center in the PSRC's VISION 2040, is the largest city in Snohomish County, with 20% of the county's population and 40% of its jobs. The PSRC projects Everett's population to grow to over 182,000 people by 2040, an increase of 73% from 2015. During this same 25-year period,

Figure 2-2. Estimated Regional Population Growth, 2015 and 2040

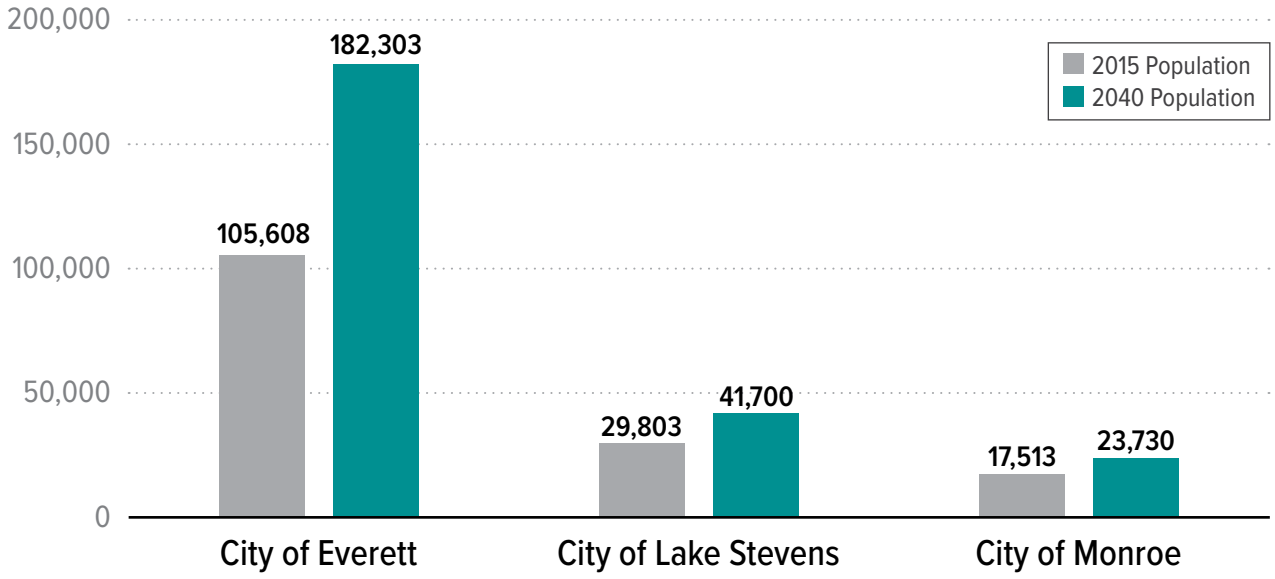
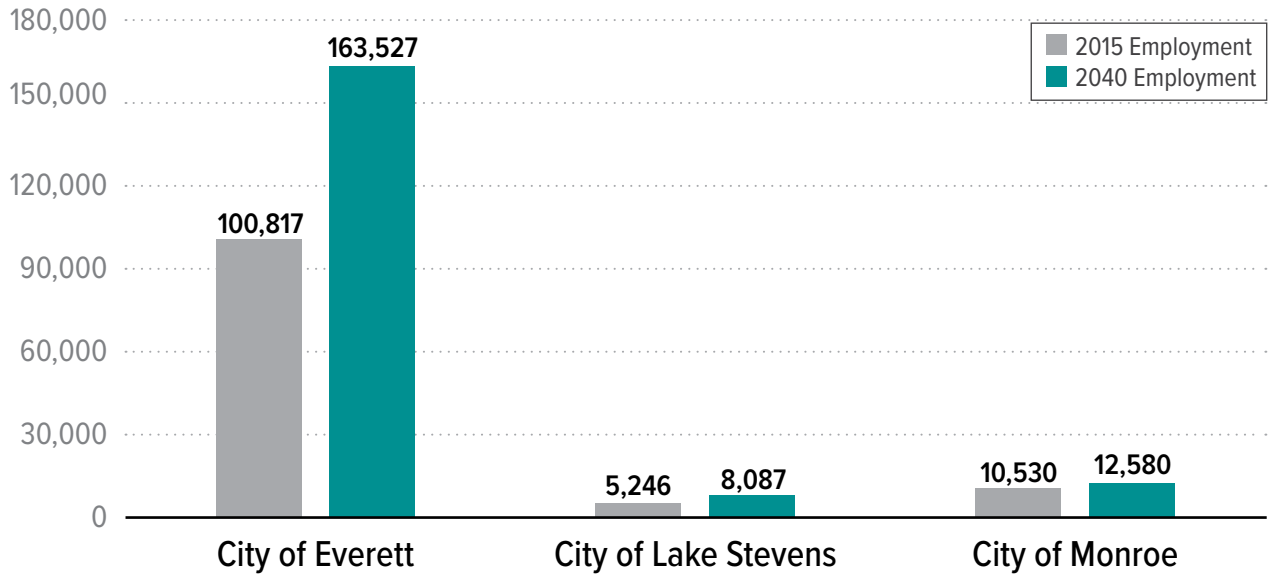


Figure 2-3. Estimated Regional Job Growth, 2015 and 2040



Everett is forecast to add over 62,000 jobs, an increase of 62%.

Communities east of the Snohomish River are also experiencing rapid growth. Lake Stevens, Snohomish, and Monroe are anticipated to have over 8,000, almost 9,000, and over 23,000 residents, respectively, by 2040. This growth represents an increase of 54%, 48%, and 35%, respectively, resulting in more people traveling across US 2 every day. A reliable US 2 connection to transit and employment in Everett and to the I-5 north-south corridor will be crucial for the economic development and quality of life in these communities.

The communities dependent on the westbound trestle for their mobility are growing at substantially higher rates than the entire Puget Sound region and the state of Washington. Improvements to the westbound trestle are critical to achieving the population and employment growth planned under VISION 2040 and county and city comprehensive plans.

2.2.2 Safety[10]

Traffic safety data are often used to diagnose factors that contribute to incidents and to identify potential countermeasures that would reduce the frequency and severity of these incidents. This PEL Study considered the traffic safety data from the IJR. These data indicated that from January 2011 to December 2015, 467 collisions occurred in the study corridor, including two with serious injuries and one with a fatality.

Interviews held as part of the IJR found that westbound travelers on SR 204 have difficulty seeing vehicles merging from 20th Street Southeast because of the roadway slope, which blocks the view of approaching vehicles. In addition, vehicles exiting at the Ebey Island off-ramp experience a weaving conflict with other vehicles traveling along westbound US 2 (Figure 2-4).

The width of the existing travel corridor, built in 1968, is 30 feet curb to curb, with two 12-foot-wide travel lanes and 3-foot-wide shoulders, which 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.

2.2.3 Multimodal Use

To open the use of the corridor to a wide range of people, a long-term solution to encourage HOV, transit, and active transportation on the westbound trestle is needed.

The heavy demand for vehicle trips is caused by travelers driving alone and the lack of convenient and reliable alternative modes to automobiles. Currently, HOV and transit vehicles are mixed with general-purpose traffic on the westbound trestle. The existing structure is not wide enough to accommodate a designated HOV/transit lane without repurposing one of the two existing general-purpose lanes. The existing shoulder is not wide enough for peak shoulder use. Adding additional lanes on the trestle would require replacing or significantly modifying the structure.

During the morning peak period (Figure 2-5), HOV and transit vehicles combined comprise only 7% of vehicles traveling on the westbound trestle. The majority of these are carpools and

10 Safety Disclaimer: Under 23 U.S. Code § 409, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings 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 or addressed in such reports, surveys, schedules, lists, or data.

vanpools. Community Transit currently operates one commuter bus route (425) and three local bus routes (280, 270, and 271) across the trestle. At the time this document was developed, Community Transit did not have plans to increase bus service across the trestle; however, the corridor is identified as a feeder route by Community Transit with links to identified core bus routes in downtown Everett and to Sound Transit's planned Link light rail station at Everett Station.

Figure 2-4. East Interchange and Ebey Island Off-Ramp Maneuvers

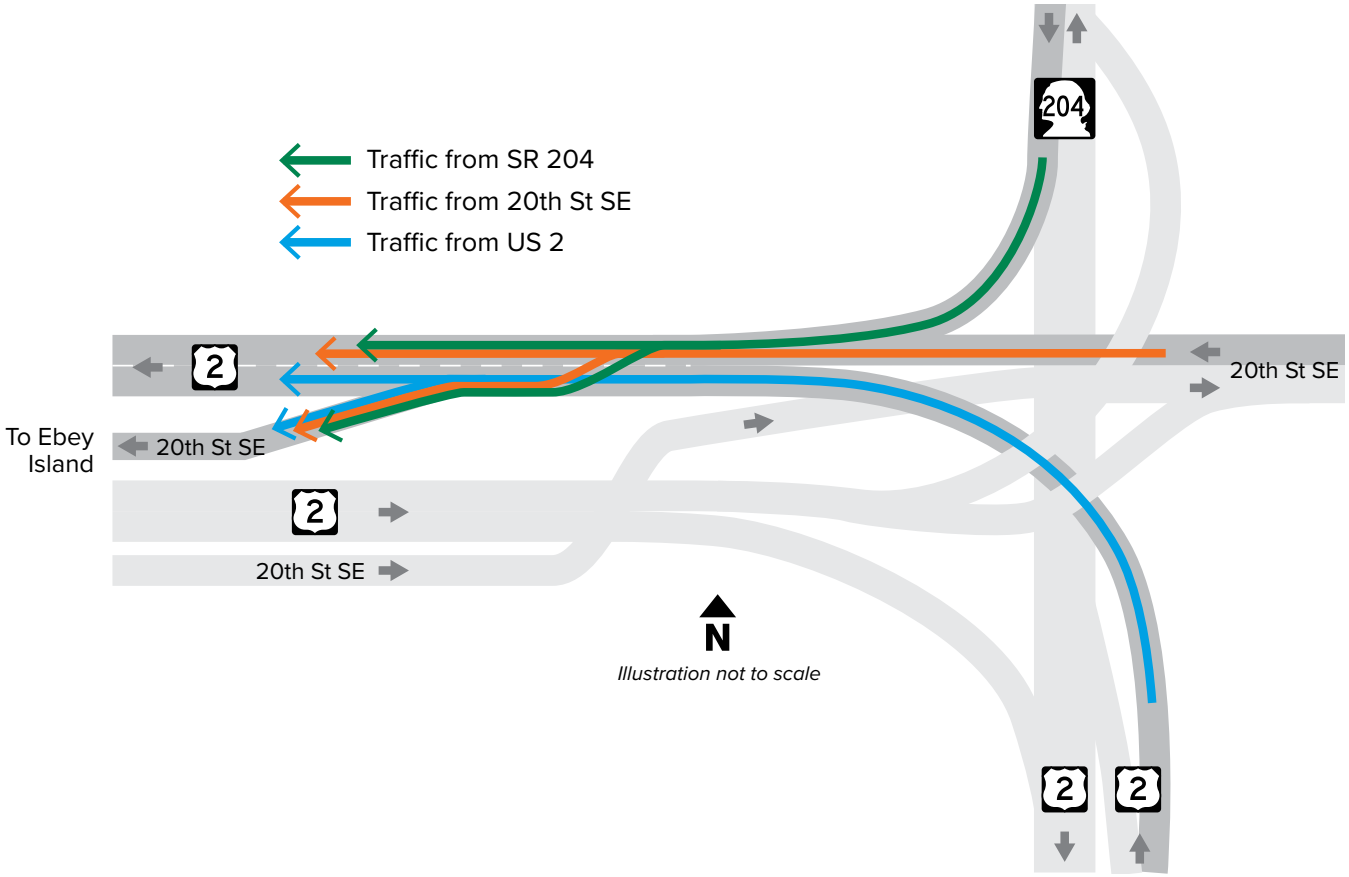
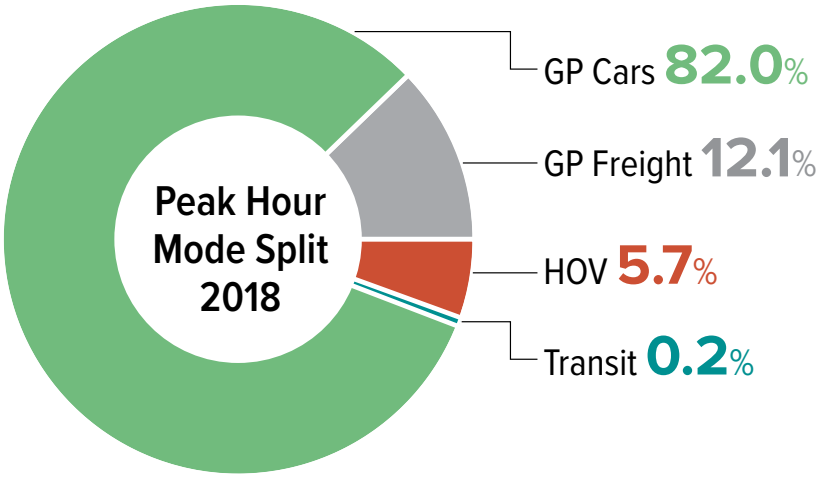


Figure 2-5. Existing Morning Peak Hour Mode Split (2018)



The existing westbound trestle does not include active transportation facilities, such as a designated pedestrian or bicyclist path. In the eastbound direction, a barrier-separated trail offers a pedestrian and bicyclist connection from the US 2 on-ramp at Hewitt Avenue to 43rd Avenue Southeast, where the trail turns and provides access to Ebey Island. Active transportation networks are being planned in Lake Stevens and downtown Everett at each end of the trestle. Providing an active transportation path on the westbound trestle is the only viable opportunity for a westbound connection between these areas. A long-term solution for the westbound trestle offers an opportunity to expand and connect these active transportation facilities into a regional system.

As discussed in Section 1, this segment of US 2 is an important freight connector for regional and national goods movement. During the morning peak period, the share of freight vehicles is approximately 12%; however, the existing roadway geometry, including slopes and width of the travel corridor, does not meet the current design criteria for current and projected truck movements on this highway corridor.

2.2.4 Sustainability

The westbound trestle was constructed in 1968, prior to the current stormwater management systems and water quality controls that WSDOT now requires for new state roadways and bridges. A replacement of the westbound trestle will be designed to meet all current specifications, including WSDOT National Pollution Discharge Elimination System Municipal Stormwater Permit requirements for runoff treatment and/or flow control.

As the westbound trestle nears the end of its planned lifecycle, substantial and ongoing maintenance will be required to maintain the aging roadway in a state of good repair, increasing annual operating costs. Planned shutdowns and lane closures of the westbound trestle to travelers have not been uncommon and are a result of repair work and roadway conditions. As the trestle continues to age, these planned repairs will continue, and unplanned repairs may also occur leading to an increase in planned operating and maintenance costs. Travelers using the westbound trestle will experience travel delays caused by lane closures or by the need to use longer, alternate routes to reach their destinations.

In the WSDOT Climate Impact Vulnerability Assessment,[11] this segment of US 2 is identified as a highly critical asset or "lifeline" route. However, the segment of US 2 is rated low for potential climate impacts, indicating that the segment is highly resilient against climate impacts. A "low" rating indicates that operations reduced by potential climate change events could be restored fully within 10 days.

Sustainability, including stormwater requirements, potential climate change impacts, and complete lifecycle costs, will be addressed and evaluated during future studies and NEPA review.

11 WSDOT, Washington Geospatial Open Data Portal, WSDOT-Climate Impact Vulnerability Assessment – State Routes (Olympia: WSDOT, April 29, 2019), www.geo.wa.gov/datasets/WSDOT::wsdot-climate-impact-vulnerability-assessment-state-routes?geometry=-122.223%2C47.963%2C-122.049%2C47.984).

3. Concept Development and Screening

3.1 Approach

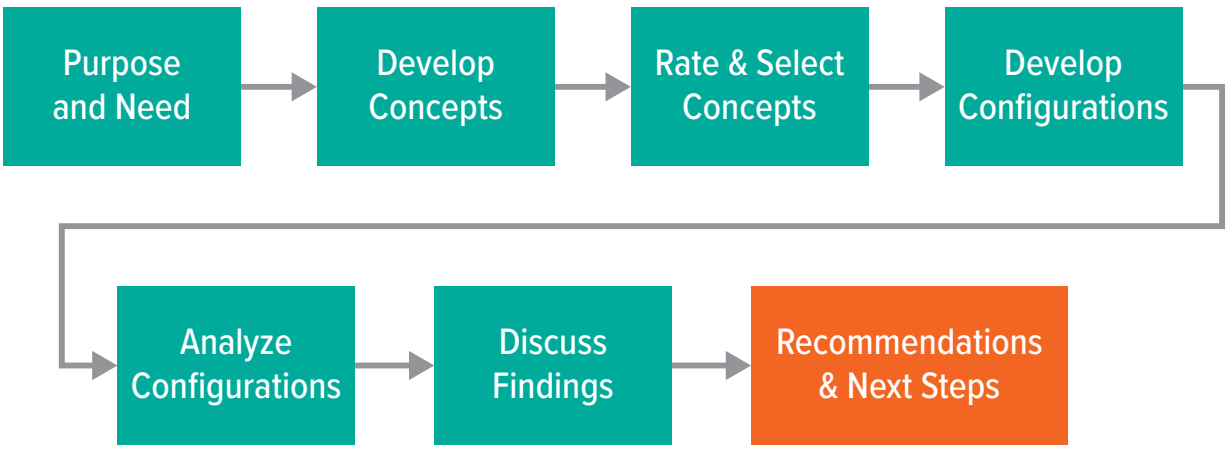
This section outlines how transportation concepts for achieving the Purpose and Need were identified, screened, and assembled into configurations. Figure 3-1 illustrates the step-by-step approach.

For each section of the westbound trestle, a long list of conceptual designs or concepts was developed by the TWG. The concepts were evaluated, and a short list of highly rated concepts was selected for each section. Using these concepts, representative configurations were assembled and refined. Transportation analyses were performed on selected representative configurations. The analysis data were used to compare configurations and develop recommendations for future studies and NEPA review.

WSDOT worked closely throughout this process with other agencies and local jurisdictions. Each step in the development process proceeded in collaboration with the TWG. Outcomes were then reviewed by members of the EAG. Both working groups communicated feedback from their organizations to WSDOT.

This PEL Study differs from a NEPA project-level approach of developing and evaluating alternatives to determine a preferred alternative. The westbound trestle study was set up to define and analyze a series of representative configurations. The analysis focused primarily on traffic operations. This provides an understanding of potential solutions, grounded by data, that could be used to engage elected officials, communities, travelers, and other interested stakeholders.

Figure 3-1. PEL Study Process



The TWG identified the following key transportation considerations to guide the development of concepts:

- Provide vehicular connections that will serve multiple communities.
- Improve transit pathways; for example, between Lake Stevens and the new Everett Link Station, connections to southwest Everett, and other east-west connections.
- Examine a separation of local and interstate traffic flows.
- Address operational, geometric, and capacity characteristics of the existing westbound trestle to determine if modifications are appropriate.
- Explore ways to separate HOV/transit from general-purpose traffic to encourage transit use.
- Ensure that all concepts can accommodate active transportation improvements.
- Consider constraints posed by the environmentally sensitive area underneath the westbound trestle, including farmlands, floodplains, and wetlands.
- Consider various combinations of HOV/transit and general-purpose lanes.
- Align taper and merge designs with design speeds.
- Recognize that a large facility (trestle) increases the vehicular traffic demand.
- Assume the replacement of the westbound trestle span for all concepts.

Figure 3-2. Planning Considerations

Planning Considerations

1. Everett Station accessibility
2. Everett land use plans
3. I-5 interchange and downtown Everett connections
4. Bridge type
5. Possible arsenic
6. Timing for lower roadway construction
7. Fish passage culvert
8. Noise
9. 20th Street BAT Lane

Potential Property Impacts

0 1000 2000 FEET

3.2 Evaluation Matrix

Categories, criteria, and qualitative metrics were developed in coordination with the TWG and EAG to guide the evaluation and rating of concepts. The categories and criteria address the Purpose and Need statement identified in Section 2. Qualitative metrics for each criterion were developed to evaluate the concepts relative to the no-build configuration. The resulting matrix is shown in Table 3-1. Several criteria were adopted from WSDOT's Practical Solutions Performance Framework.[12]

WSDOT's 2019 Strategic Plan identifies Practical Solutions as the agency's preferred approach to decision-making and project delivery. This data-driven approach uses tools and performance measures to seek lower-cost approaches and efficiencies in serving the travel needs of people and business, to reduce travel demand to save money, and to reduce the need to build costly new infrastructure.

The concepts were rated by category on a scale from one to five relative to the no-build configuration. Five was the highest/best rating, and one was considered the lowest/worst rating. Each concept received an overall rating calculated by averaging the total score across all categories rounded to the nearest half point. Results were discussed and refined with the TWG and EAG. A series of high-rated concepts determined by their overall ratings was selected for further consideration. In the case of a tie, the actual average across all categories was used to select the higher-rated concept. The results are discussed below.

12 WSDOT, Practical solutions performance framework (Olympia: WSDOT, 2020), www.wsdot.wa.gov/about/practical-solutions/performance-framework).

Table 3-1. Evaluation Matrix

Category	Criterion	Qualitative Metric & Measure
Reliability	General purpose traffic and freight	Travel Time: Does the Concept provide design and connectivity that reduces crash potential and unexpected delays?
	Transit	
	Active Transportation	Does the Concept reduce active transportation travel time?
	Predictability*	Does the system support consistent travel time for all modes and is it resilient to incidents?
Safety	Traffic	Crash Frequency: Do the Concepts reduce crash rate and severity?
	Non-motorized – all build concepts will included improved non-motorized improvements	
System Accessibility	Are all areas connected	Are all vehicle movements supported? Can all neighborhoods/ areas access the facility?
	Are connections to transit supported	Is there an efficient/prioritized access route for bus transit to and from the trestle?
	Active Transportation	Are safe and continuous active transportation connections provided to all directions and through the corridor?
	Proximity to Services*	Are the distances between origins and destinations maintained or minimized?
	Travel Experience*	Is access convenient and easy for all vehicular modes? Are driver decision distances comfortable?
Design Solution	Geometric concerns/deficiencies	Does the design meet or exceed WSDOT guidelines, considering project context?
	Lifecycle Cost	How do the capital and operating costs compare with traveler benefits such as time travel savings?
	Constructability	Can the Concept be efficiently phased and constructed to minimize timeline, impact to the environment and users?
Sustainability	Permanent footprint	Is the environmental and right of way footprint minimized at project completion?
	Social effects	Are social effects minimized and benefits available to all users, including low-income and zero-car households?
	Natural environment effects	Are effects on the natural environment minimized, including consideration to air quality, stormwater, and impacts on wetlands and floodplains?
Efficiency	Mode Share and Vehicle Occupancy*	Does the Concept support an increase in HOV/transit use?
	Vehicle Throughput*	Is vehicle capacity sufficient?
	Person Throughput*	Vehicle Throughput times Vehicle Occupancy

*Criterion from the WSDOT Mobility Performance Framework

3.3 West Interchange

3.3.1 Concepts

The TWG considered a range of design solutions for connecting westbound traffic to downtown Everett. The high traffic volumes destined for Everett required multi-lane ramps and enough space in Everett to accommodate the surge of vehicles. Various connections at California Street, Everett Avenue, and Hewitt Avenue were investigated. Roundabouts to accommodate the additional traffic flow in Everett were considered.

As shown in Figure 3-3, I-5 bridges over westbound US 2 and over Everett Avenue at the west interchange. Concepts that would require significant structural modifications to these bridges were considered less feasible than concepts that left these bridges intact due to the construction phasing required and the potential for impacts on adjacent properties.

A single-lane ramp connection to northbound I-5 was common to all concepts. Connections to southbound I-5 included various configurations of one- and two-lane ramps with and without HOV bypass ramps.

The long list consisted of 11 west interchange concepts, numbered W1–W11 for reference. Diagrams are included in Appendix D.

3.3.2 Results

When comparing the 11 concepts, the following six conditions contributed directly to the screening (Figure 3-4 and Table 3-2):

1. Concepts requiring modifications to I-5 received a low rating.
   - Adding westbound US 2 ramp lanes under existing I-5 would require I-5 reconstruction.
   - Reversible ramps connecting to the I-5 median HOV systems would require I-5 reconstruction.

Figure 3-3. View of westbound US 2 at I-5

Figure 3-4. West Interchange Considerations

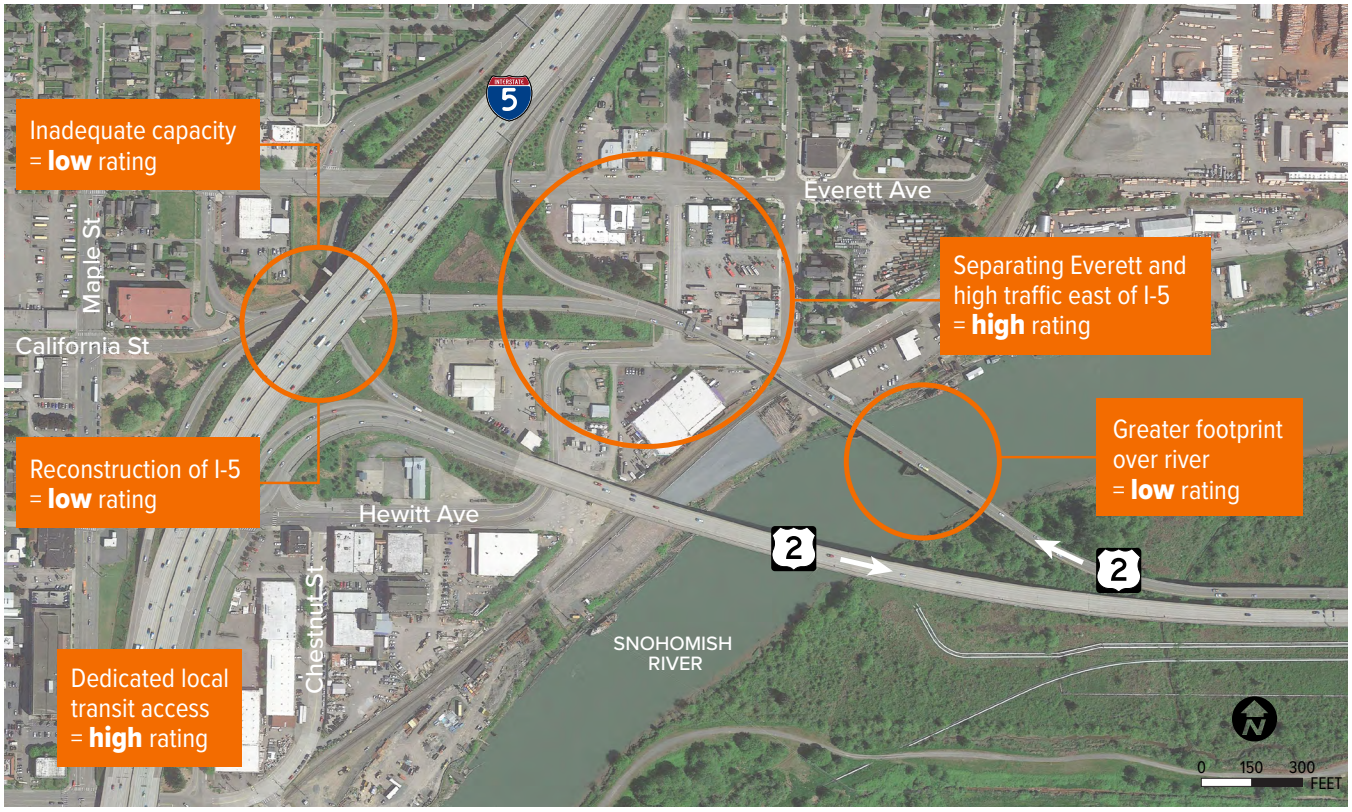


Table 3-2. West Interchange Rating Summary

	CRITERIA					
	Reliability	Safety	System Accessibility	Design Solution	Sustainability	OVERALL RATING
W1: No Build	3	3	3	3	3	**3**
W2: 2L NB, 2L SB, 2L Local	4	2	4	3	3	**3**
W2A: 2L NB, 2L SB, 1L Local	**5**	**3**	**4**	**3**	**3**	**3.5**
W3: 2L NB, 2L SB over I-5, 2L Local	4	4	4	2	2	**3**
W4: Reversible I-5 Inside Connections	1	1	1	1	1	**1**
W5: 1L NB, 2L SB, 3L Local	5	4	4	1	1	**3**
W6: 1L NB, 2L SB, 2L Local	5	4	4	2	2	**3.5**
W7: 1L NB, 2L SB, 2L Local on Separate Structure	1	1	1	1	1	**1**
W8: 1L NB, 2L SB, 2L Local to Summit Ave	**5**	**4**	**4**	**4**	**2**	**4**
W9: 1L NB, 2L SB, 2L Local to Everett Ave	**5**	**4**	**4**	**4**	**2**	**4**
W10: 1L NB, 3L SB, 2L Local on Existing Structure	4	3	4	2	2	**3**
W11: 1L NB, 3L SB, 2L Local on Existing Structure to Hewitt Ave	**5**	**4**	**4**	**4**	**2**	**4**

LEGEND 5=highest, 1=lowest

2. Adding travel lanes over the Snohomish River resulted in a lower rating.
    - Increased trestle width increased the potential for adverse environmental effects.
3. Maintaining the full local access to California Street resulted in low ratings.
    - The resulting complex design received low marks.
4. Placing the westbound-to-southbound US 2 movement onto a ramp over I-5 alleviated the issues described in condition 3.
5. Downtown Everett access to Everett Avenue east of I-5 and transit-only to California Street resulted in a high rating.
6. Downtown Everett access, including transit, directly to Hewitt Avenue east of I-5 resulted in a high rating.

Four west interchange concepts — W2A, W8, W9, and W11 — were selected as having the highest rating (Figure 3-5). Although shown as tied in Table 3-2, W2A was selected over W6 due to the slightly higher actual average rating of W2A (3.6 as compared to 3.4).

3.4 Trestle Span

3.4.1 Concepts

The trestle span is an elevated structure and includes access to Ebey Island. All trestle span concepts were located north of the existing span. The TWG considered the following range of design solutions to accommodate the forecasted vehicular traffic demand and provide options for HOV/ transit and active transportation:

» Designs with two, three, and four travel lanes.

» Various HOV lane positions (inside, outside, center).

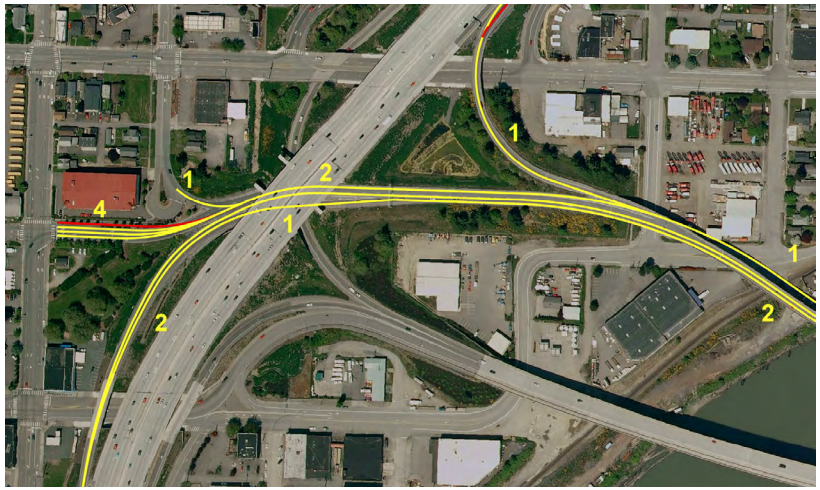
» Accommodation of a designated active transportation path.

» Use of a reversible center lane or peak-period shoulder use.

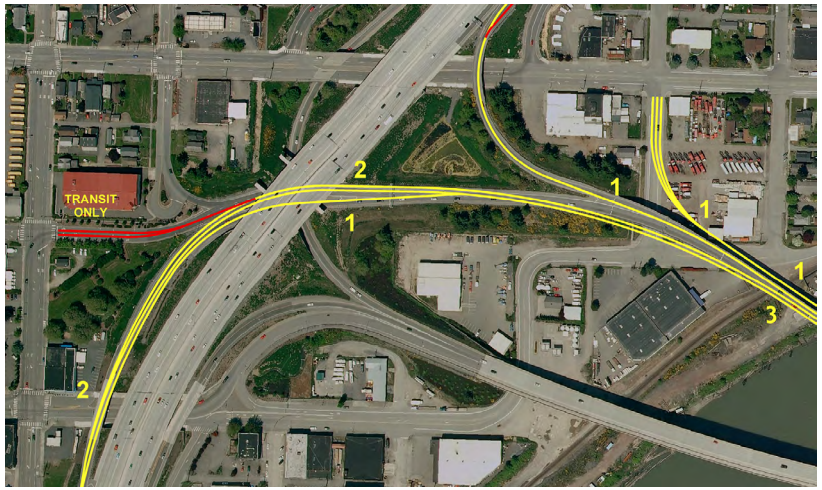
» Replacing the existing Ebey Island access with a two-way, two-lane bridge.

The long list consisted of 15 trestle span concepts, numbered T1–T15 for reference. Diagrams are included in Appendix D.

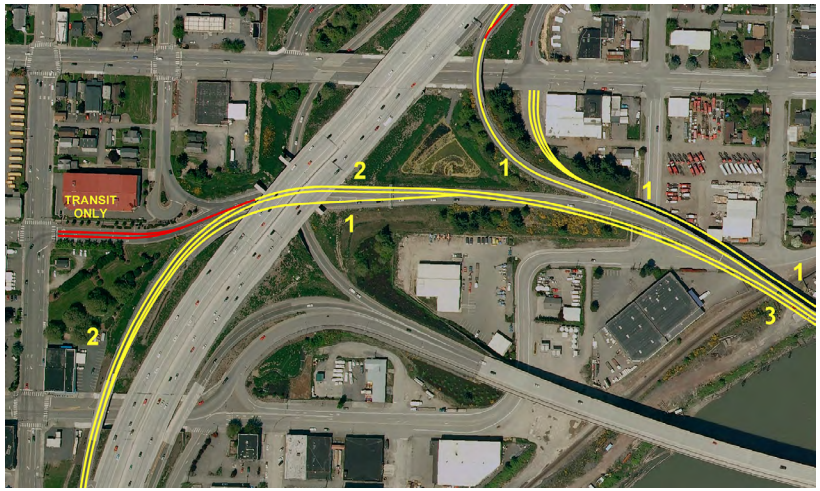
Figure 3-5. Highest-Rated West Interchange Concepts



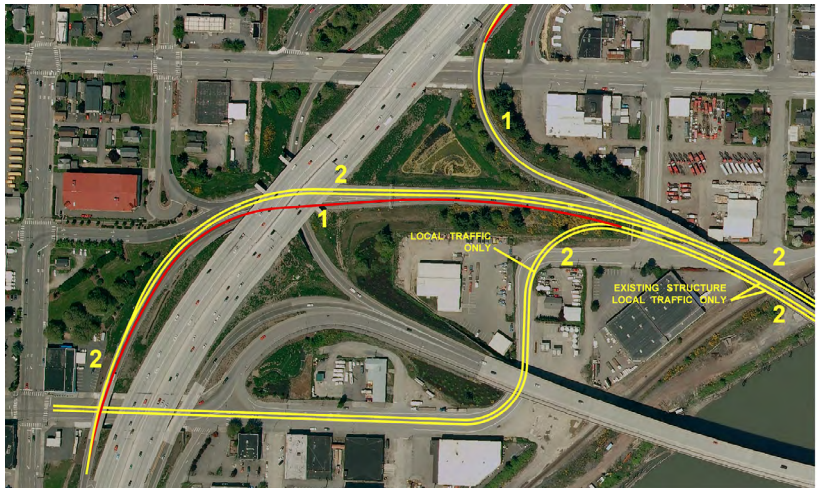
W2A: 2L NB, 2L SB, 1L Local



W8: 1L NB, 2L SB, 2L Local to Summit Ave



W9: 1L NB, 2L SB, 2L Local to Everett Ave



W11: 1L NB, 3L SB, 2L Local on Existing Structure to Hewitt Ave

LEGEND — GP Lane — HOV/Transit Lane

3.4.2 Results

When comparing the 15 concepts, the following four conditions contributed directly to the screening (Table 3-3):

- Overall, the highest ratings were given to the three- and four-lane replacement structures.
- Tolling was considered to improve the reliability of the trestle by reducing traffic volumes, but tolling would have a negative impact on social benefits.
- All conceptual design solutions that were considered would improve stormwater treatment, resulting in high ratings for sustainability for every concept.
- A relatively large footprint resulted in lower environmental rankings.

Three trestle span concepts — T4, T5, and T7[13] (identical cross section to T8)— were selected as having the highest rating (Figure 3-6).

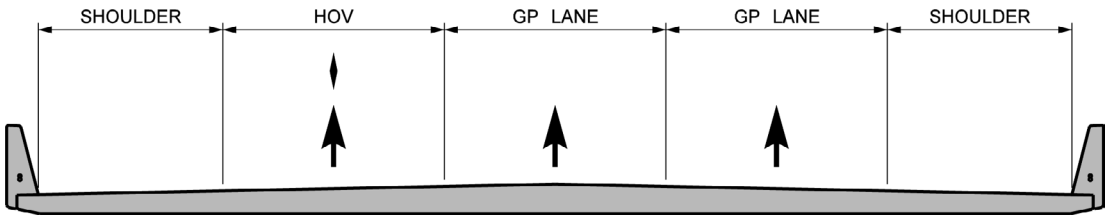
Table 3-3. Trestle Span Rating Summary

	CRITERIA					
	Reliability	Safety	System Accessibility	Design Solution	Sustainability	OVERALL RATING
T1: No Build	3	3	3	3	3	**3**
T2: 2L Retrofit w/ Expanded Deck	3	3	3	2	3	**3**
T3: 2L GP + Transit Shoulder	4	4	3	4	5	**3.5**
T4: 2L GP + HOV	**4**	**5**	**3**	**5**	**4**	**4**
T5: 3L GP	**5**	**5**	**3**	**5**	**4**	**4.5**
T6: 2L GP + ETL	**4**	**3**	**3**	**5**	**4**	**4**
T7: 3L GP + HOV	**5**	**5**	**3**	**4**	**3**	**4**
T8: 3L GP + HOV	5	5	3	4	3	**4**
T9: 3L GP + ETL	5	3	3	4	3	**3.5**
T10: 2L GP + 2 ETL	4	3	3	4	3	**3.5**
T11: 2L GP + 1L REV	4	4	3	4	3	**3.5**
T12: 2L GP + 2L Local REV	4	4	3	2	2	**3**
T13: 2L GP + 1/1L Local	4	4	3	2	2	**3**
T14: 3L GP + 1/1L Local (Viaduct)	5	4	3	1	3	**3**
T15: 2L GP + 1/1L Local (Viaduct)	5	4	3	1	3	**3**

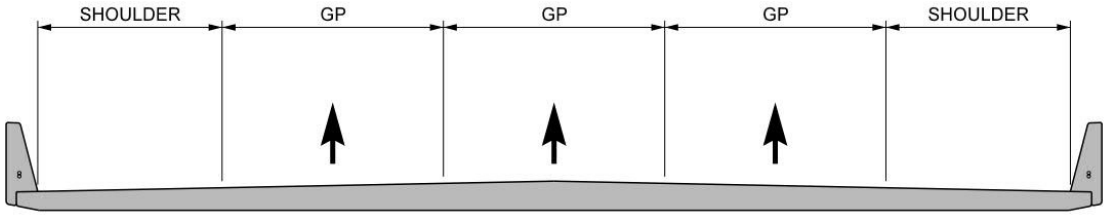
LEGEND 5=highest, 1=lowest

13 Concepts T7 and T8 have the same cross section (3 GP and 1 HOV lane) and were given the same score in the concept evaluation. However, the GP lanes in T8 were planned as toll lanes. A transportation analysis of toll lanes was not included in this PEL study and therefore T8 was dropped from further consideration.

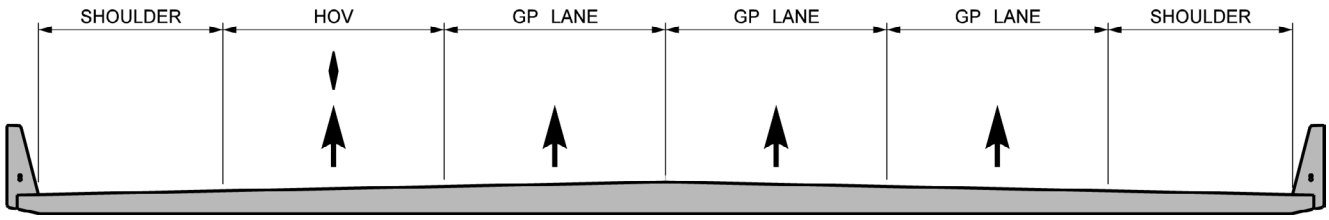
Figure 3-6. Highest-Rated Trestle Span Concepts



T4: 2 GP Lanes + 1 HOV Lane



T5: 3 GP Lanes



T7: 3 GP Lanes + 1 HOV Lane

3.5 East Interchange

3.5.1 Concepts

The east interchange combines traffic from SR 204, 20th Street Southeast, and US 2 onto the westbound trestle. Building from the IJR, various design solutions were combined to improve the flow of traffic:

- Adding a second lane to the SR 204 ramp.
- Eliminating or moving the merge of SR 204/20th Street Southeast by maintaining each in a separate lane onto the span.
- Relocating the 20th Street Southeast ramp to the outer lane of the trestle span.
- Moving merge locations.
- Adding HOV bypass lanes to one or more ramps.

The combinations of design solutions resulted in a long list of 10 east interchange concepts, numbered E1-E9 including one variation. Diagrams are included in Appendix D.

3.5.2 Results

When comparing the 10 concepts, the following four conditions contributed directly to the screening (Figure 3-7 and Table 3-4):

- Separating the merges onto the trestle resulted in a higher rating.
- Additional merges resulted in a lower rating.
- Adding capacity to the US 2 on-ramps resulted in a higher rating.
- Compatibility with the transit-priority lane on 20th Street Southeast resulted in a higher rating.

Four east interchange concepts — E2, E5, E6, and E7 — were selected as having the highest rating (Figure 3-8).

Figure 3-7. East Interchange Considerations

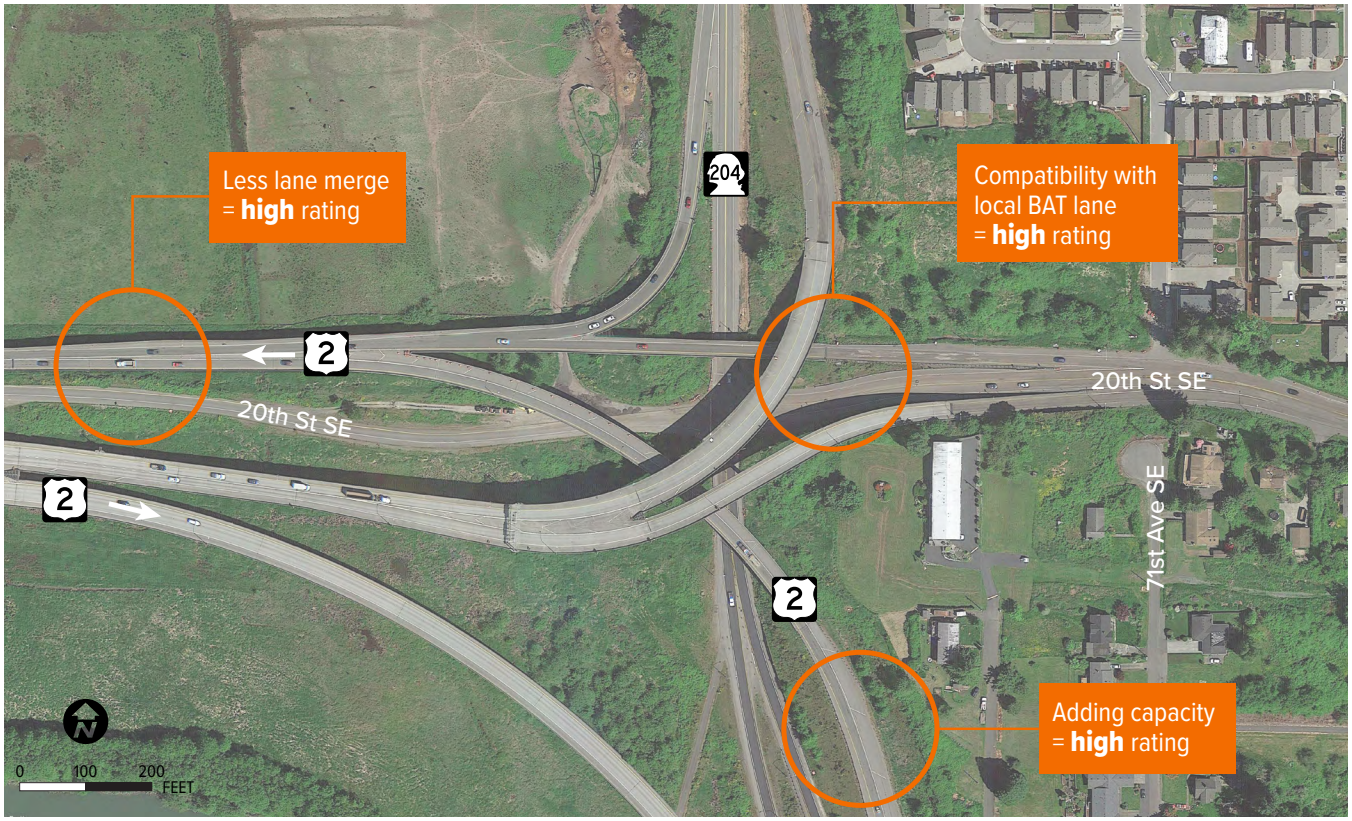


Table 3-4. East Interchange Rating Summary

	CRITERIA					
	Reliability	Safety	System Accessibility	Design Solution	Sustainability	OVERALL RATING
E1: No Build	3	3	3	3	3	**3**
E1A: No Build + ITS	3	3	3	3	3	**3**
E2: 1L SB, 1L NB, 1L WB	**4**	**4**	**3**	**5**	**4**	**4**
E3: 1L SB, 1L NB, 1L WB, 1L WB ETL	4	4	2	4	3	**3.5**
E4: 1L SB, 2L NB, 1L WB	4	3	3	4	4	**3.5**
E5: 1L SB, 2L NB, 1L WB	**4**	**4**	**3**	**4**	**4**	**4**
E6: 1L SB, 2L NB, 1L WB	**4**	**4**	**3**	**4**	**4**	**4**
E7: 1L SB, 2L NB, 1L WB	**4**	**4**	**3**	**4**	**4**	**4**
E8: 1L SB, 1L NB, 1L WB, 1L NB ETL, 1L WB ETL	3	3	3	4	4	**3**
E9: 1L SB, 1L NB, 1L WB, 1L NB ETL, 1L WB ETL	3	3	3	4	4	**3**

LEGEND 5=highest, 1=lowest

Figure 3-8. Highest-Rated East Interchange Concepts

E2: 1L SB, 1L NB, 1L WB

E5: 1L SB, 2L NB, 1L WB

E6: 1L SB, 2L NB, 1L WB

E7: 1L SB, 2L NB, 1L WB

LEGEND — GP Lane

3.6 HOV and Transit

Strategies to accommodate HOV lanes were considered for each section of the westbound trestle, and concepts that offered HOV lanes were given high ratings. These strategies would provide a designated lane on the trestle span or bypass lanes on-ramps to ensure reliable travel times for HOV and transit users even during peak-period congestion.

3.7 Active Transportation

As discussed by the TWG and EAG, all concepts for the westbound trestle would accommodate a pedestrian and bicyclist pathway to provide active transportation connections to the east and west. The conceptual designs for the pedestrian and bicyclist connections will be developed in future studies and NEPA review as reasonable alternatives are identified. The new east-west pedestrian/bicyclist pathways would connect to existing and planned nonmotorized networks east of the US 2 trestle, at Ebey Island, and to downtown Everett. Without this link, active travelers would need to make an unreasonably long detour to travel in the east-west direction.

This PEL Study did not consider north-south active transportation movements in the study area. It is recommended that future studies look at alternative roadways and access gaps in the north-south active transportation network.

4. Configurations

4.1 Overview

Using combinations of the highest-rated concepts, potential configurations for the US 2 westbound trestle were developed. Three configurations (Figure 4-1) were selected to be representative of the multiple permutations that could be assembled from the highest-rated concepts.

Configuration 1 combines:

- **W9** Local ramp connections to Everett Avenue.
- **T4** Three-lane trestle (two general-purpose and one HOV lane).
- **E2** Lane connections for all movements from US 2, SR 204, and 20th Street Southeast.

Configuration 2 combines:

- **W11** Local ramp connections to Hewitt Avenue east of I-5.
- **T7** Four-lane trestle (three general-purpose and one HOV lane).
- **E6** Two lanes to US 2 from SR 204/20th Street Southeast vicinity.

Configuration 3 combines:

- **W2A** Local ramp connections to Everett Avenue same as existing with additional southbound I-5 ramp lane.
- **T5** Three-lane trestle (three general-purpose lanes).
- **E7** Two lanes northbound to westbound US 2 connection from SR 204/20th Street Southeast vicinity.

Each of the representative configurations was refined to a conceptual level of design for transportation analysis. Each configuration crosses the Snohomish River and Ebey Island immediately north of the existing westbound trestle. The three configurations are described in more detail below.

4.2 Configuration 1

Configuration 1 utilizes the local grid network, maintains transit connectivity, and supports connections to the planned Everett light rail station (Figure 4-2). To accommodate the forecasted traffic volumes over the westbound trestle, configuration 1 includes three turning lanes onto westbound Everett Avenue at the west interchange. A series of design revisions were explored to reduce the potential impact of an Everett Avenue redesign on the northbound and southbound 1-5 bridges. Although the impacts to the I-5 structure could not be avoided, the result of the conceptual design work on configuration 1 is described below.

The west interchange of configuration 1 provides ramp connections to southbound I-5, northbound I-5, and the city of Everett. The key components are as follows:

- One-lane ramp to northbound I-5 widening to two lanes to allow room for vehicle queuing.
- Two-lane off-ramp to southbound I-5, merging to one lane prior to entering I-5.
- Two-lane off-ramp to downtown Everett, entering surface streets at the Everett Avenue/ northbound I-5 on-ramp intersection.

Figure 4-1. Three Representative Configurations

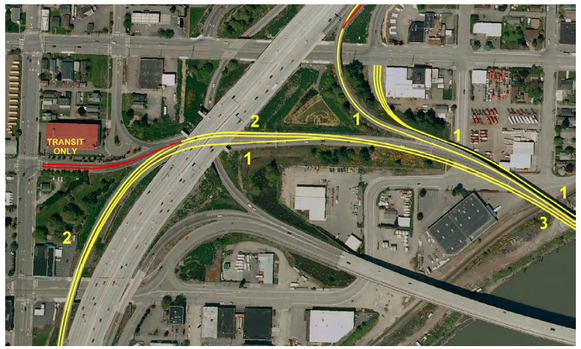
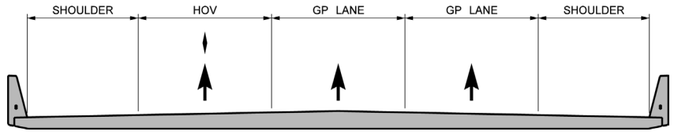
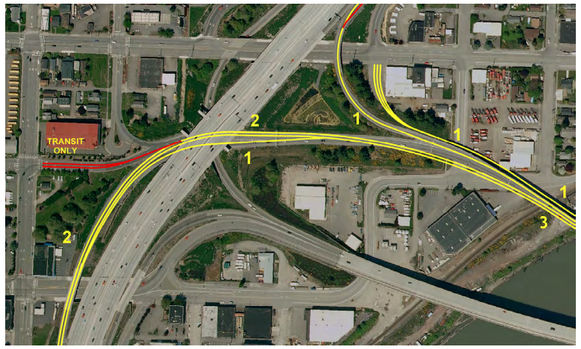
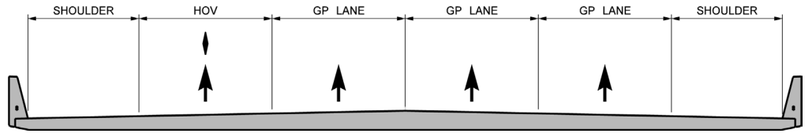
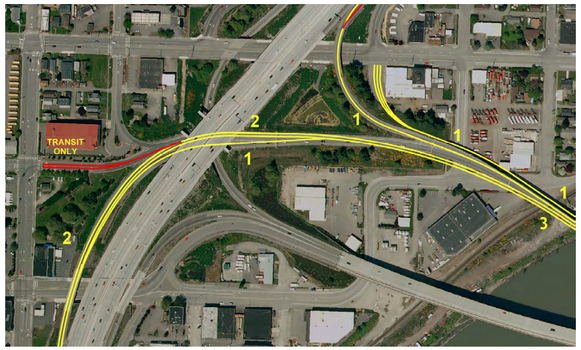
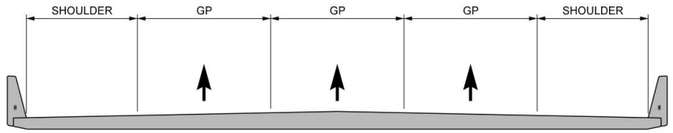
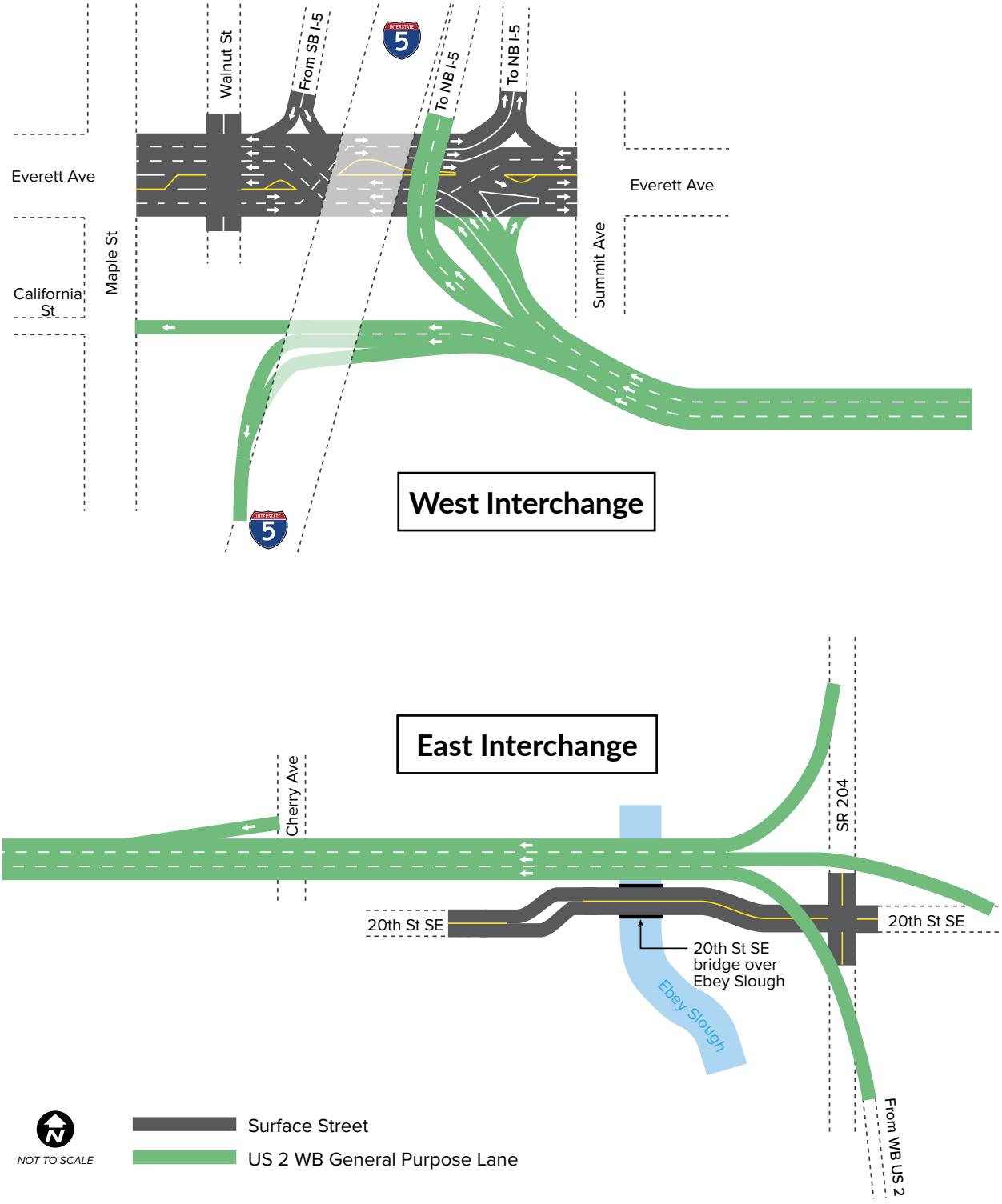
	WEST INTERCHANGE	TRESTLE SPAN	EAST INTERCHANGE
CONFIGURATION 1 W9 + T4 + E2			
CONFIGURATION 2 W11 + T7 + E6			
CONFIGURATION 3 W2A + T5 + E7			

Figure 4-2. Configuration 1 Roadway Diagrams



» Additional one-lane HOV off-ramp to downtown Everett, entering surface streets at California Street/Maple Street.
» Local improvements along Everett Avenue, including a potential diverging diamond interchange to accommodate three left turning lanes.

The trestle span of configuration 1 has three lanes and the following features:

» Two general-purpose lanes and one HOV lane.
» A new two-lane, two-way bridge from Ebey Island west of the SR 204/20th Street Southeast interchange.
» Local improvements at Cherry Avenue.

The east interchange of configuration 1 reproduces the existing lane arrangement with improved roadway geometrics to improve traffic flow and safety. The key components of the east interchange are as follows:

» One westbound US 2 lane at the SR 204/20th Street Southeast interchange.
» Two-lane on-ramp to westbound US 2 at the SR 204/20th Street Southeast interchange.
» On-ramp from lower roadway to westbound US 2 relocated to Cherry Avenue.
» Local improvements at 20th Street Southeast/ SR 204 intersection.
» 20th Street Southeast improvements will be coordinated with the city of Lake Stevens US 2 HOV Congestion Jump Lane project.

4.3 Configuration 2

Configuration 2 combines a four-lane trestle span with the recommended east interchange from the IJR and explores the use of a HOV bypass lane to southbound I-5 (Figure 4-3).

The west interchange consists of ramp connections to southbound I-5, northbound I-5, and downtown Everett. The key components of the west interchange are as follows:

» One-lane off-ramp to northbound I-5 widening to two lanes for traffic queuing.
» Two-lane off-ramp to southbound I-5, merging to one lane prior to accessing southbound I-5.
» Two-lane off-ramp (one general-purpose, one HOV lane) from westbound US 2 to downtown Everett, entering the local system at Hewitt Avenue/Walnut Street.
» Improvements on Hewitt Avenue as required to accommodate traffic volumes from US 2.

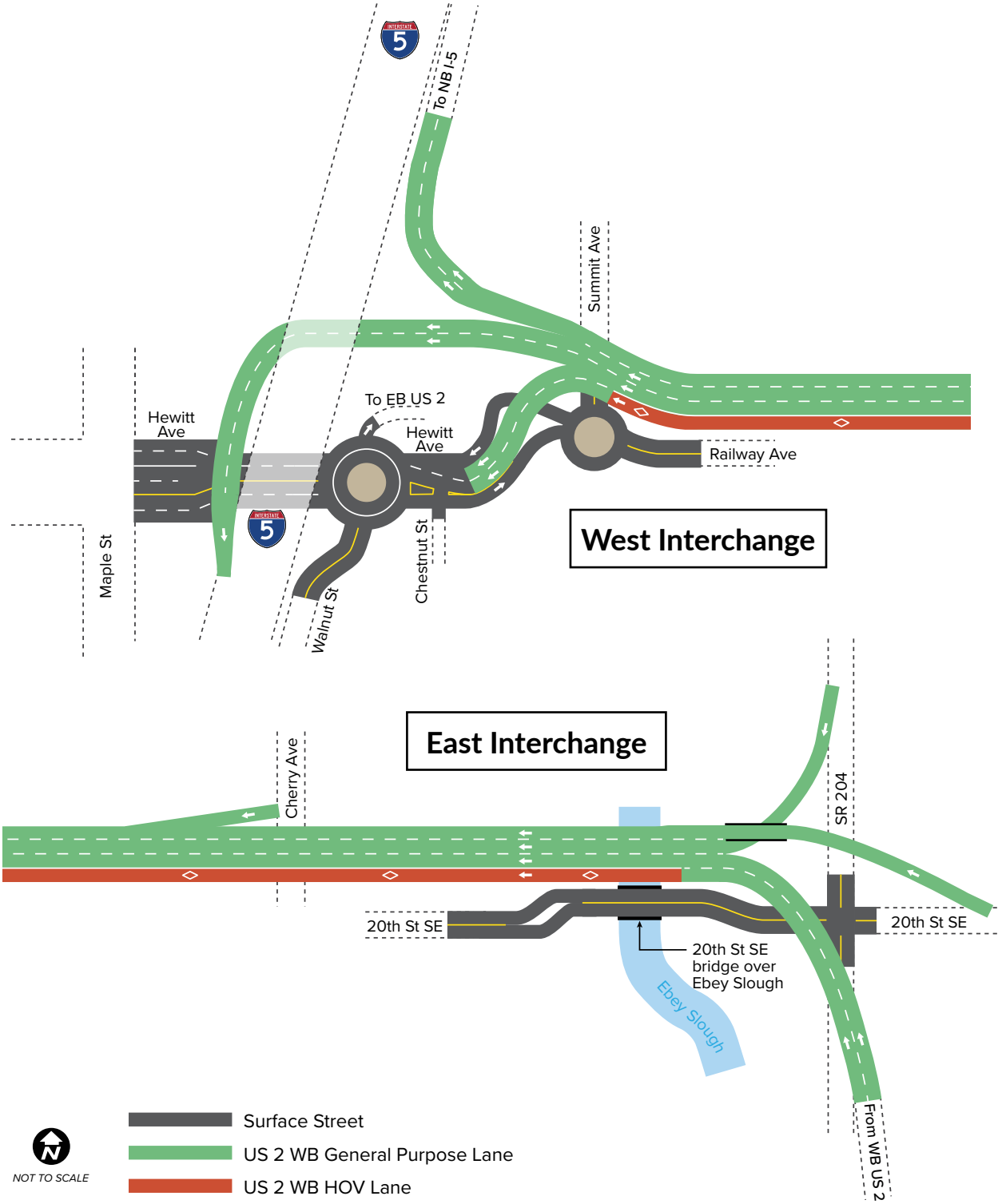
The trestle span of configuration 2 has the following features:

» Three general-purpose lanes and one HOV lane.
» New two-lane, two-way bridge from Ebey Island west of the SR 204/20th Street Southeast interchange.
» Improvements at Cherry Avenue.
» On-ramp from lower roadway to westbound US 2 relocated to Cherry Avenue.

The east interchange in configuration 2 reflects the roadway geometry recommended in the IJR. Each approach lane finds a direct connection onto a four-lane trestle span. The key components of the east interchange are as follows:

» Two westbound US 2 lanes at the SR 204/20th Street Southeast interchange.
» Two-lane on-ramp to westbound US 2 at the SR 204/20th Street Southeast interchange.

Figure 4-3. Configuration 2 Roadway Diagrams



- A direct connection between the HOV lane along the left side of the trestle span and the HOV lane on the 20th Street Southeast corridor planned as part of the US 2 Trestle HOV Congestion Jump Lane project is not provided in this analysis. In configuration 2, users of the HOV lane in Lake Stevens would need to change lanes to enter the HOV lane on the westbound trestle.
- Local improvements at 20th Street Southeast/ SR 204 intersection.
- 20th Street Southeast improvements will be coordinated with city of Lake Stevens US 2 HOV Congestion Jump Lane project.

4.4 Configuration 3

Configuration 3 includes ramp connections to southbound I-5, northbound I-5, and the city of Everett (Figure 4-4).

The key components of the new west interchange are as follows:

- One-lane off-ramp to northbound I-5 widening to two lanes as it crosses over Everett Avenue to join northbound I-5.
- One-lane HOV off-ramp and one-lane general-purpose off-ramp to southbound I-5; merge into a one-lane ramp to southbound I-5.
- One-lane off-ramp to downtown Everett; widens to three lanes approaching the ramp terminus at California Street.
- Gap shown between lanes needed to accommodate existing piers.
- Access lane to Walnut Street is retained.

The trestle span of configuration 3 has three travel lanes and the following features:

- Three general-purpose lanes.
- On-ramp from lower roadway to westbound US 2 relocated to Cherry Avenue.
- New two-way bridge from Ebey Island west of the SR 204/20th Street Southeast intersection.
- Improvements at Cherry Avenue.

The east interchange of configuration 3 consists of single-lane connections to the mainline trestle from SR 204 and 20th Street Southeast, and a two-lane connection from westbound US 2. The lanes come together to meet the three-lane trestle span.

The key components of the east interchange are as follows:

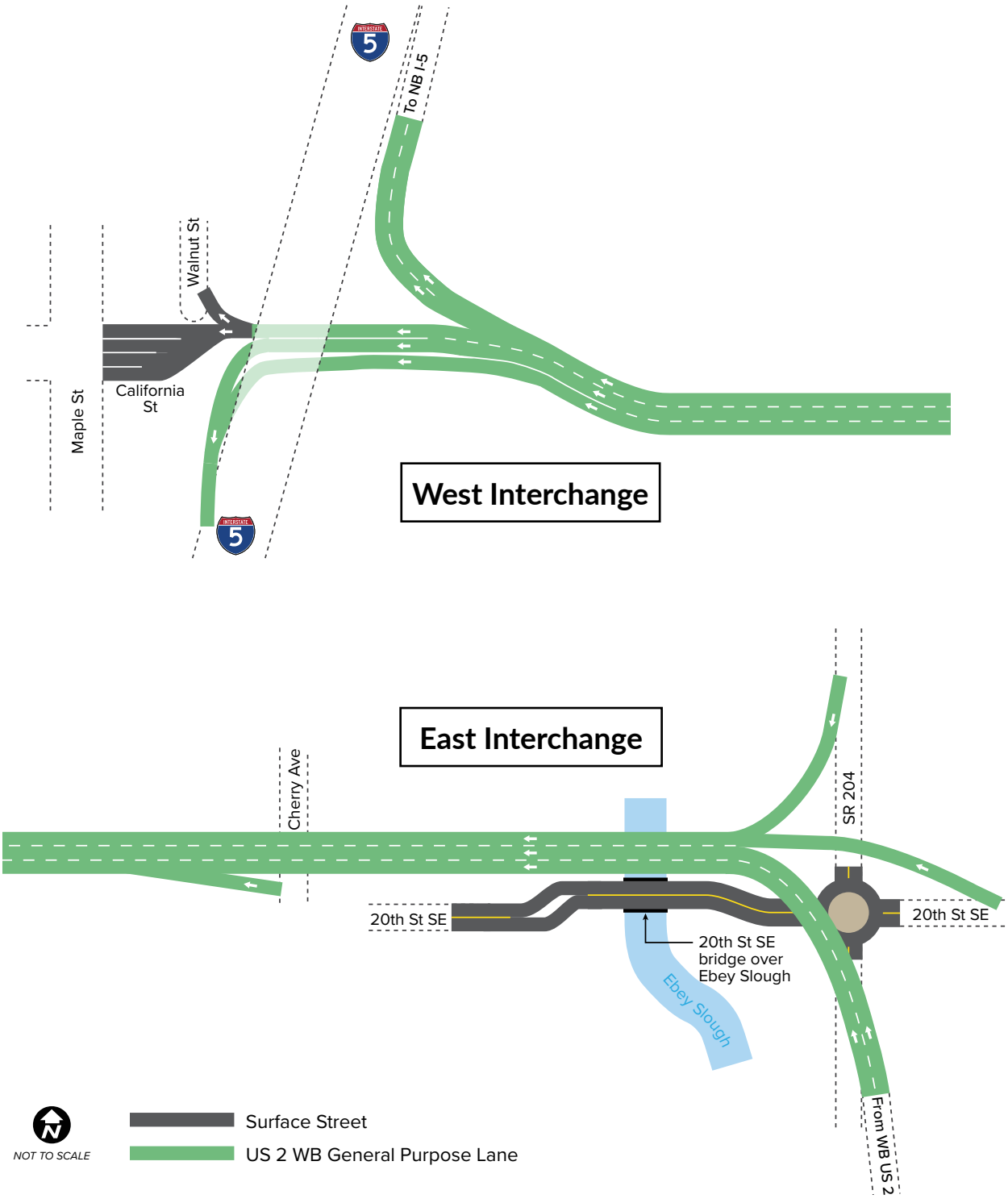
- Two westbound US 2 lanes at the SR 204/20th Street Southeast interchange.
- One-lane on-ramp to westbound US 2 at the SR 204/20th Street Southeast interchange.
- Two-way local bridge west of the SR 204/20th Street Southeast interchange.
- 20th Street Southeast improvements will be coordinated with city of Lake Stevens US 2 HOV Congestion Jump Lane project.

4.5 Selection Results

Configurations 2 and 3 and the no-build configuration were moved forward for transportation analysis, while configuration 1 was screened out from further consideration and analysis.

To accommodate the forecasted traffic volumes over the westbound trestle, configuration 1 included three turning lanes onto westbound Everett Avenue at the west interchange (Figure 4-2). Everett Avenue is a two-way arterial and includes two lanes in the eastbound direction to access northbound I-5. A redesign of Everett Avenue to accommodate these traffic flows would require significant modifications to the northbound and southbound I-5 bridges, which currently cross over Everett Avenue. As discussed in Section 3.3, concepts that resulted in significant modifications to these I-5 structures were given low ratings due to construction phasing requirements and potential adverse impacts on adjacent properties. As a result, configuration 1 was not moved forward for additional consideration in this PEL Study.

Figure 4-4. Configuration 3 Roadway Diagrams




Ebey Island
Homeacres Rd
NEXT LEFT
2 EAST
Snohomish
204 EAST
Lake Stevens
2 EAST
204
2 WEST

5. Transportation Analysis

5.1 Overview

The transportation analysis in this PEL Study compared traffic operations in configurations 2 and 3 with the no-build configuration. This analysis resulted in the following key findings:

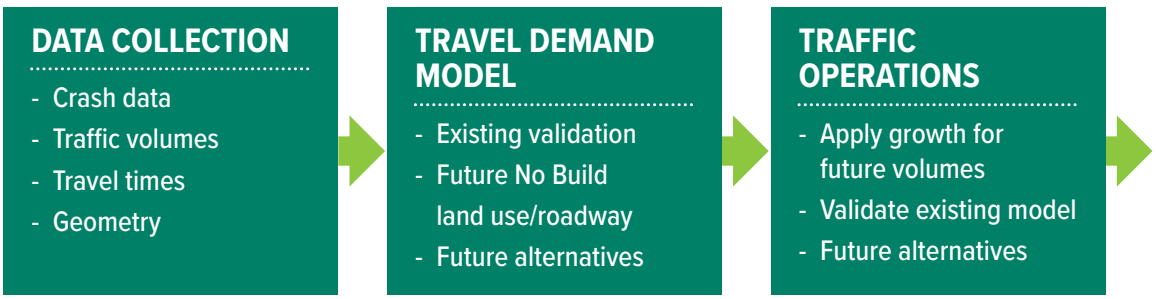
1. Traffic operations on the westbound trestle are dependent on the operations of I-5. To alleviate congestion on the westbound trestle, improved connections onto I-5 are required.
2. Three travel lanes on the US 2 westbound trestle would provide enough capacity for future conditions if network congestion is addressed.
3. Managed lanes (transit, HOV, express toll, or peak-use shoulder lane) on the trestle could provide people an option to bypass general-purpose traffic during the morning peak and potentially improve conditions on I-5.
4. Developing a long-term solution for the US 2 westbound trestle provides an opportunity to create a valuable active transportation corridor between communities east of the Snohomish River and downtown Everett.
5. The share of HOV and transit (bus) vehicles on the corridor in the morning peak is expected to be less than 9% in 2040. Transit providers would need to include or increase service plans in the area to give people a choice beyond SOV and ensure that they are coordinated with local and regional land use planning to best serve desired trips.

Congestion on southbound I-5 in 2040 limited the ability to evaluate potential US 2 westbound trestle configurations. During the morning peak, forecasts indicated that traffic would back up over the westbound trestle in all configurations. Additional study is required to determine how a replacement of the US 2 westbound trestle could provide connections for active transportation.

5.2 Traffic Operations

Traffic operations describe how vehicles would move through each of the configurations. The key measures used to compare the performance of configurations 2 and 3 to the no-build are vehicle travel times and levels of congestion. Figure 5-1 outlines the steps used to prepare the analyses.

Figure 5-1. Transportation Analysis Process



Data were collected to support the validation and update of the travel demand model and the simulation model developed as part of the IJR. Peak volumes occur during the morning rush hours (Figure 1-6).

To determine 2040 traffic volumes, existing traffic volumes were combined with rates of growth from the travel demand model. Mode share was also sourced from the travel demand model.

Travel times during the morning peak hour were identified for general-purpose and HOV vehicles using the simulation model. Congestion diagrams were generated using the simulation model to illustrate areas of reduced speed.

More details about the transportation analysis can be found in the Traffic White Paper provided in Appendix C.

5.2.1 Mode

Vehicles traveling on the trestle span were classified into the following modes:

- General purpose
- HOV (carpools and vanpools)
- Transit (bus)
- Heavy vehicle (freight truck)

The breakdown by mode for each configuration in 2040 is shown in Figure 5-2. General-purpose vehicles, which include SOVs, make up the largest share of vehicles, ranging from 78% in the no-build configuration to 80% in configuration 2. Approximately 12% are heavy vehicles, with the largest share occurring in the no-build configuration.

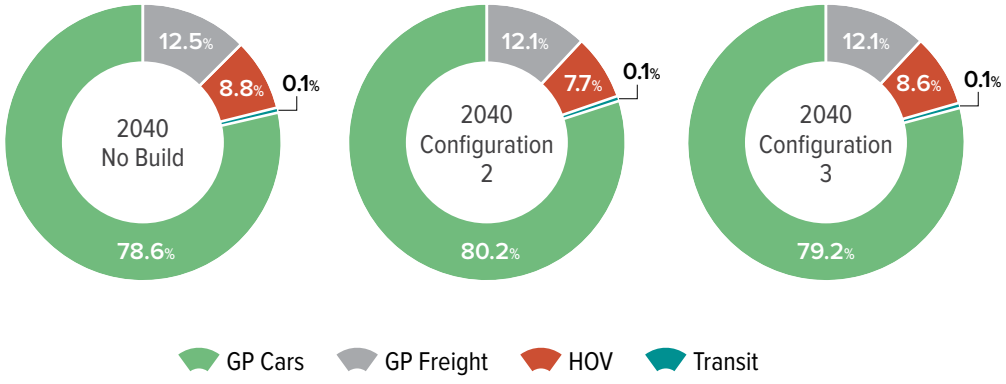
The share of HOV vehicles only constitutes 8.8% in the no-build configuration and drops to 7.7% in configuration 2. The share of transit (bus) vehicles during the morning peak hour does not rise above 0.1% in any of the 2040 configurations.

5.2.2 Forecast Volumes 2040

Future traffic volumes rise incrementally with the number of travel lanes on the trestle span. In other words, additional lanes on the westbound trestle would result in more people using the trestle during their morning commute. The following traffic volumes were forecast for the morning peak hour in 2040:

- **No-build configuration** (Two-lane span) **4,210** vehicles per hour
- **Configuration 2** (Four-lane span) **5,670** vehicles per hour
- **Configuration 3** (Three-lane span) **5,200** vehicles per hour

Figure 5-2. US 2 Westbound Trestle Peak Hour Mode Split – 2040

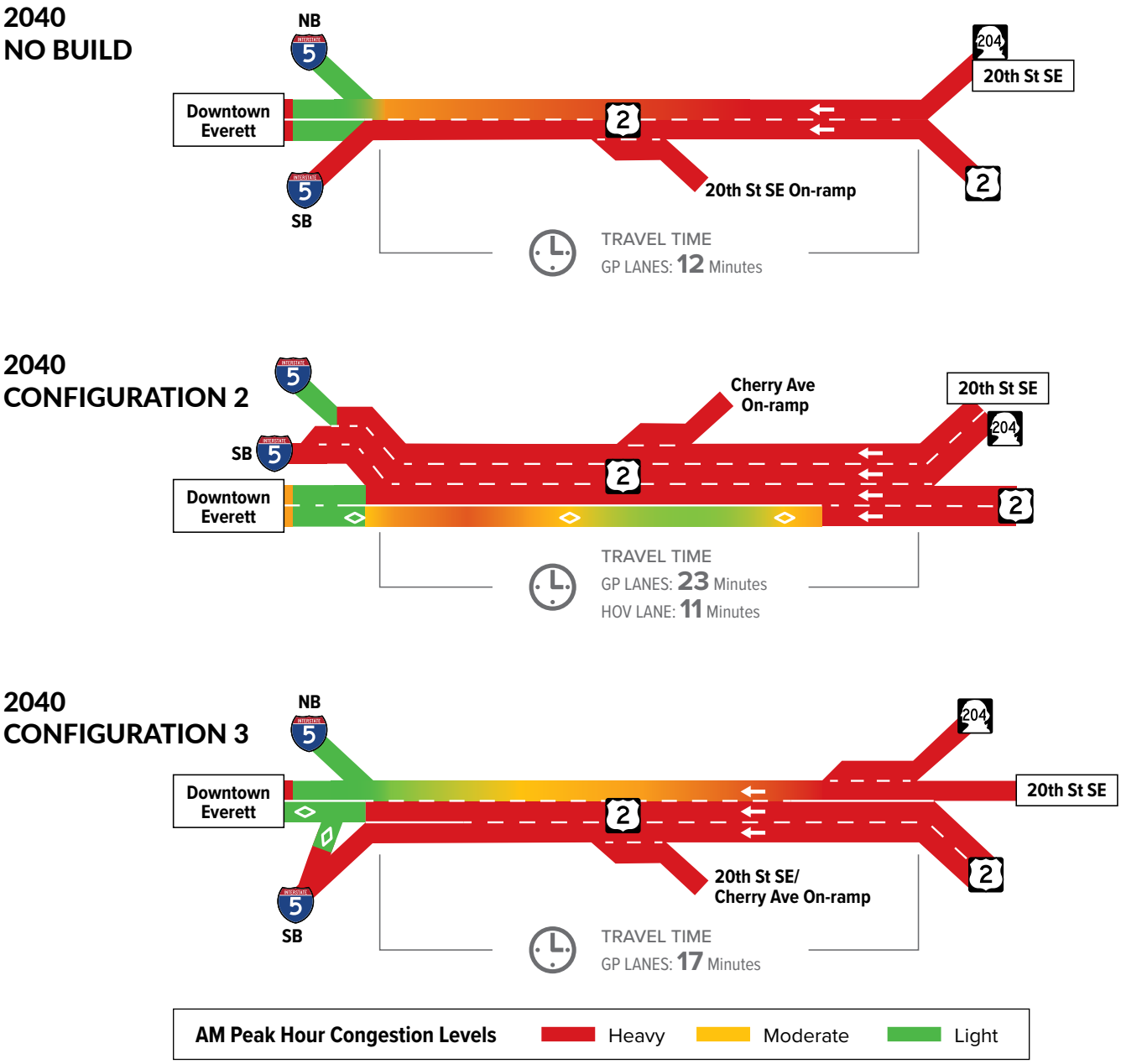


A first round of estimated travel times and congestion maps for 2040 conditions was generated using the travel demand volumes described above. High traffic volumes and congestion on southbound I-5 caused backups that resulted in extremely long travel times across the US 2 westbound trestle. To model future traffic operations more realistically, the 2040 no-build volumes were used to generate travel times and congestion diagrams for configurations 2 and 3.

Figure 5-3 shows travel times and congestion results during the morning peak hour for each configuration. The darkest red indicates areas where vehicles are in stop-and-go traffic. Green indicates that vehicles are operating close to the speed limit.

Travel times by segment and congestion maps that illustrate traffic conditions over a longer travel period are included in the Traffic White Paper (Appendix C).

Figure 5-3. Travel Times and Congestion 2040



5.2.3 No-Build Configuration Results

In 2040 during the morning peak hour (7–8 a.m.), vehicles take approximately 12 minutes to cross the trestle span. The no-build configuration has a two-lane trestle span with two general-purpose lanes. During the off-peak period, vehicles take approximately two minutes to cross the trestle span.

Vehicles along most of the US 2 westbound trestle experience stop-and-go traffic in the morning peak hour. Congestion is anticipated to begin as early as 5 a.m., caused by backups from the southbound I-5 ramp, which slow the flow of vehicles exiting US 2. Traffic slowdowns then extend east onto SR 204, 20th Street Southeast, and US 2 past SR 9. The merge of 20th Street Southeast and SR 204 in the no-build configuration also contributes to traffic backups east of the east interchange.

As shown in Figure 5-3, traffic destined for northbound I-5 and downtown Everett is shown to operate better once it bypasses congestion from the southbound I-5 on-ramp that is shown in the left most lane. The I-5 on-ramp consists of a single lane and that does not provide enough capacity to serve the future traffic demand. In downtown Everett, vehicles entering from the US 2 westbound trestle encounter heavy congestion at several surface streets and intersections.

The diagram shows heavy congestion on southbound SR 204 and westbound US 2 on the approach to the east interchange (Figure 5-3). During the morning peak, this heavy congestion extends east along these routes beyond the eastern limits of the model. This congestion limits the amount of traffic that can enter the westbound trestle span.

HOV and Transit

The study area of the model included the transit-priority lane planned in Lake Stevens, which approaches the east interchange. No HOV lane was included on the trestle span or on either of the interchanges in the no-build configuration.

5.2.4 Configuration 2 Results

In 2040 during the morning peak hour (7–8 a.m.), general-purpose vehicles take 23 minutes and HOV/transit vehicles take 11 minutes to cross the trestle span. Configuration 2 has three general-purpose lanes and one HOV lane that connects to downtown Everett.

The most severe congestion is found in the center two lanes. Except for northbound I-5 and downtown Everett off-ramps and most of the HOV lane, vehicles across the US 2 westbound trestle experience stop-and-go traffic during the morning peak hour. As in the no-build configuration, congestion is anticipated to begin as early as 5 a.m.

Although configuration 2 provides more travel lanes than the no-build, travel times for general-purpose traffic increase. This is a result of several conditions.

The new east interchange allows traffic from SR 204, 20th Street Southeast, and US 2 to flow more quickly onto the trestle span. As the morning peak progresses, this influx of traffic, combined with backups from southbound I-5, results in heavier congestion and longer travel times on the trestle span than in the no-build configuration. As in the no-build, heavy congestion extends across the trestle onto SR 204, 20th Street Southeast, and US 2 past SR 9. This congestion limit would be less than no-build because more cars have moved onto the trestle and a higher number of cars get onto I-5 or into downtown Everett.

In downtown Everett, vehicles exiting US 2 encounter moderate congestion on several surface streets and at intersections. This level of congestion is less than in the no-Build configuration because the heavy congestion on the trestle span results in fewer vehicles exiting the US 2 westbound trestle during the morning peak hour.

HOV and Transit

Configuration 2 provides a dedicated HOV lane across the trestle span. This HOV lane provides a travel-time benefit for HOV and transit vehicles traveling to downtown Everett. HOV and transit vehicles traveling to southbound I-5, however, have to merge into the heavy congestion of the general-purpose lanes to reach the off-ramp.

5.2.5 Configuration 3 Results

In 2040 during the morning peak hour (7-8 a.m.), vehicles take approximately 17 minutes to cross the trestle span. Configuration 3 has a three-lane trestle span with three general-purpose lanes. There is an HOV ramp into downtown Everett, and there is an HOV bypass at the southbound I-5 ramp.

As in the no-build configuration, congestion is anticipated to begin as early as 5 a.m. Although configuration 3 provides more travel lanes than the no-build, travel times for general-purpose traffic increase. This is a result of several conditions.

The new east interchange allows traffic from SR 204, 20th Street Southeast, and US 2 to flow more quickly onto the trestle span. As the morning peak progresses, this influx of traffic, combined with the backups from southbound I-5, results in heavier congestion and longer travel times on the trestle span than in the no-build configuration. As with the no-build, heavy congestion extends across the trestle span onto SR 204, 20th Street Southeast, and US 2 past SR 9.

In downtown Everett, general-purpose vehicles entering from the US 2 westbound trestle encounter heavy congestion at several surface streets and intersections.

Although configuration 3 has fewer travel lanes than configuration 2, travel times for general-purpose traffic decrease and vehicles headed for northbound I-5 encounter less congestion at the west end of the trestle. Vehicles move freely on the northbound I-5 ramp and on the downtown Everett ramps.

The congestion maps offer a snapshot of traffic operations during the morning peak hour. Fewer lanes on the trestle span and a different east interchange concept limit the number of vehicles that can enter the trestle span per hour as compared to configuration 2. To offer a fuller analysis of the traffic operations, a larger study area for the model is needed.

HOV and Transit

Configuration 3 includes a HOV bypass to the southbound I-5 ramp and to downtown Everett at the west interchange. Before reaching their ramps, however, these vehicles are caught up in the heavy congestion on the trestle span. HOV and transit vehicles move freely into downtown Everett surface streets via the HOV ramp. The short length of the HOV lane and congestion at the ramp intersection with Maple Street results in little to no measurable travel time savings for transit. At the end of the southbound I-5 ramp, HOV, transit, and general purpose traffic merge into a single lane that then joins southbound I-5. This results in heavy congestion that backs onto the US 2 westbound trestle.

5.2.6 Traffic Operations Conclusions

An examination of the modeling results indicates that traffic operations in 2040 on the US 2 westbound trestle would be impacted by the following conditions:

- Southbound I-5 on-ramp does not have the capacity to accommodate traffic volume across westbound US 2.
- Selected surface streets and intersections in downtown Everett will experience congestion, which will impact the movement of vehicles from future westbound US 2 traffic.

These conditions will cause heavy-to-moderate congestion even if the US 2 westbound trestle is replaced with a new configuration. As the two representative configurations demonstrate, a replacement may even result in increased

congestion and travel times. To develop a long-term solution for the US 2 Westbound Trestle, a more comprehensive system connection and a larger study area for the transportation analysis is needed.

Sensitivities

A sensitivity test was conducted to test whether a peak shoulder lane on southbound I-5 between US 2 and 41st Street would improve traffic operations on the westbound trestle. In 2040, the right lanes on southbound I5 become congested in the AM peak as vehicles exiting at 41st Street mix with traffic entering from US 2 and Pacific Street. The congestion on southbound I-5 backs up onto the US 2 westbound trestle, beyond the east interchange, and past SR 9.

A second sensitivity test was conducted that removed southbound I-5 congestion issues from the analysis. This was completed to understand how downtown Everett streets can accommodate future demand from westbound US 2. If the trestle ramps and southbound I-5 were improved to accommodate the demand in 2040, more vehicles would reach downtown Everett from US 2, causing heavy congestion at surface streets and intersections and potentially impact US 2 operations. This heavy congestion then results in backups across the US 2 westbound trestle during the AM peak hour.

To develop a successful transportation solution for the replacement of the US 2 westbound trestle, the capacity of southbound I-5, the US 2/I-5 interchange configuration, and potential surface streets improvements should be considered and addressed.

HOV and Transit

Configurations 2 and 3 were developed to represent the potential of a three-lane and a four-lane trestle span. The analysis of configuration 2 shows the potential travel-time savings for an HOV lane across the trestle span as compared to general-purpose traffic. Designated ramps in configuration 3 also offer an option for HOV and transit users to bypass congestion. It is anticipated that future studies will continue to develop alternatives that offer HOV and transit linkages to a regional network to improve options for travelers. Connections from the corridor to a regional HOV and transit system are needed to optimize the effectiveness of managed lanes.

5.3 Capacity of the Trestle Span

The analysis of traffic operations shows heavy congestion on the US 2 westbound trestle in 2040, even with the addition of travel lanes. However, congestion and long travel times for general-purpose traffic are a result of conditions external to the design of the trestle span.

An analysis was undertaken to determine the optimal number of lanes on the trestle span for the forecasted volumes in 2040. The range of capacity, expressed as vehicles per hour, increases with the number of lanes:

- Two-lane span **4,000** vehicles per hour
- Three-lane span **6,000** vehicles per hour
- Four-lane span **7,500** vehicles per hour

This calculation of capacity assumes that each lane is full of vehicles all moving freely. It does not account for lane changes by vehicles or traffic operations on either the west or east interchanges. The capacity is then compared with the morning peak hour demand volumes for 2040 described in Section 5.2.2.

The bar graph in Figure 5-4 illustrates that a three-lane trestle span, such as the one included in configuration 3, could accommodate the forecasted traffic volumes, including the higher demand of configuration 2. The no-build configuration is the only configuration with a lower trestle span capacity than its forecasted demand.

5.4 HOV and Transit

A three-lane trestle span could be managed in several ways:

- Three general-purpose lanes.
- Two general-purpose lanes and one HOV lane.
- Three general-purpose lanes and a peak-use shoulder.

Each of these managed lane scenarios varies in capacity, as shown in Figure 5-5.

The share of HOV and transit vehicles forecast for 2040 ranges from 7 to 8%, which would not be enough to fill the HOV lane. Given the anticipated congestion in the study area, a long-term solution to increase HOV and transit use could be developed to allow more people to move through the corridor. Improved HOV and transit connections would also offer mobility options to a wider range of populations in the study area.

The development of scenarios and policies to create incentives and support for HOV and transit operations beyond the forecast mode shares and existing transit plans was not part of this PEL Study. It is anticipated that future studies would include a more detailed assessment of HOV and transit.

Figure 5-4. Trestle Span Capacity vs 2040 Demand (vehicles per hour)

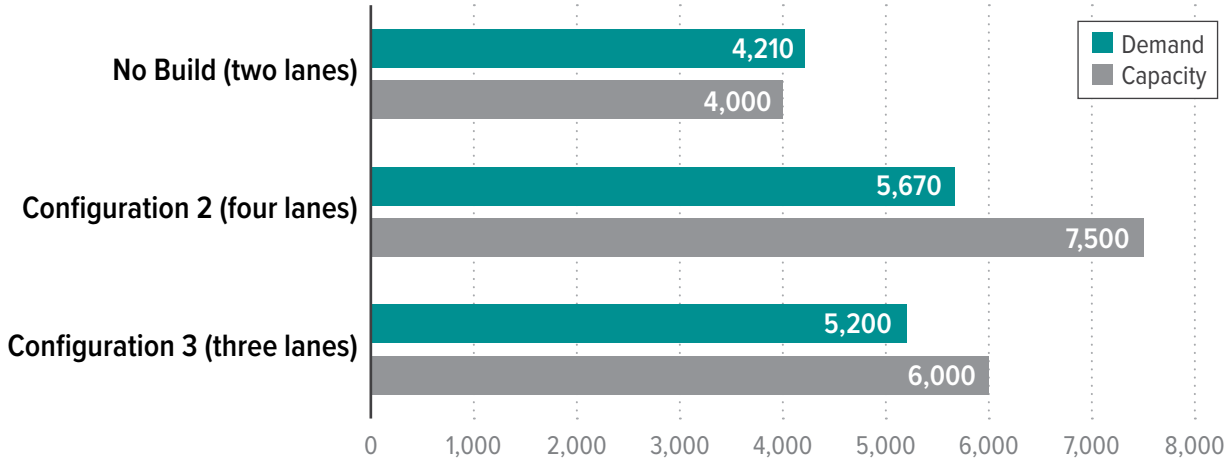
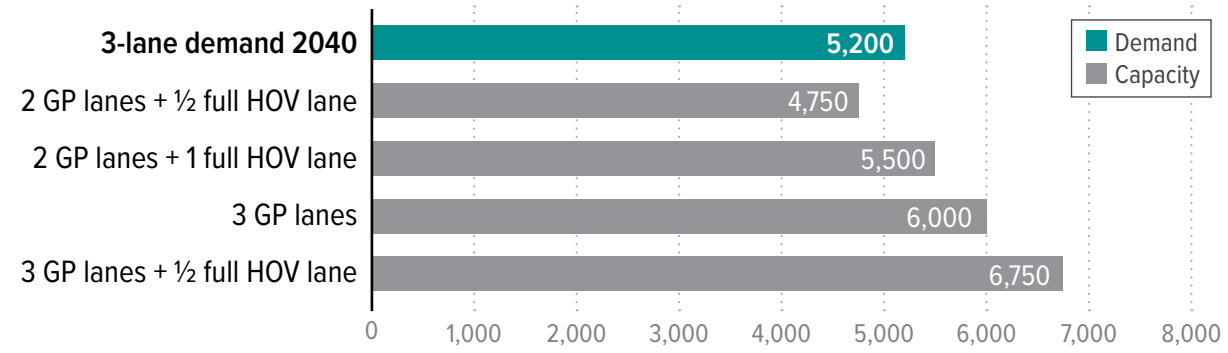


Figure 5-5. Trestle Span Capacity with Managed Lanes (vehicles per hour)



5.5 Regional Movements

PSRC and StreetLight data were collected and analyzed to estimate how a three-lane trestle span would serve regional movements. Figure 5-6 illustrates by travel district where the trips across the westbound trestle begin and end for a three-lane westbound trestle span during the morning hours in 2040.

As in the no-build configuration, the highest percent of trips begin in east Snohomish County and the highest percent of trips end in Everett. Only 6% of travelers across the US 2 westbound trestle are headed for King County and Seattle. As compared to the no-build configuration, a slightly higher percent of trips across the westbound trestle begin in southeast Snohomish County along with a slightly lower percent in east Snohomish County data. The percent of trips ending in Everett also decreases given a three-lane trestle span in 2040 with increases in south Everett and southwest Snohomish County.

5.6 Active Transportation

Designated lanes for active transportation, which include bike lanes, shared lanes, and pedestrian walkways, were assumed to be an integral part of each configuration. As each of the concepts and configurations was developed, the need to include pedestrian and bicyclist connectivity was understood to be a key future refinement to the selected configurations.

The IJR identified the lower roadway, 20th Street Southeast, as the primary location for the active transportation crossing of Ebey Island. Inclusion of a shared pedestrian and bicyclist path on the new US 2 trestle was not excluded from consideration, and both concepts would require further coordination with local agencies, active transportation groups, and WSDOT to create final concepts.

No qualitative analysis was completed for traffic operational impacts caused by potential active transportation connections. Active transportation connections were not a differentiator among the various configurations.

5.7 Safety

The safety of the proposed configurations as compared to the no-build was not analyzed quantitatively. The proposed improvements to roadway geometrics, shoulder widths of 8 to 10 feet, merge conditions, and horizontal stopping sight distance, which were incorporated into the conceptual design of each configuration, align with current WSDOT design specifications. It is anticipated that safety would be analyzed quantitatively to evaluate alternatives in future studies.

5.8 Recommendations

The following recommendations are offered for further study of a long-term solution for the US 2 westbound trestle.

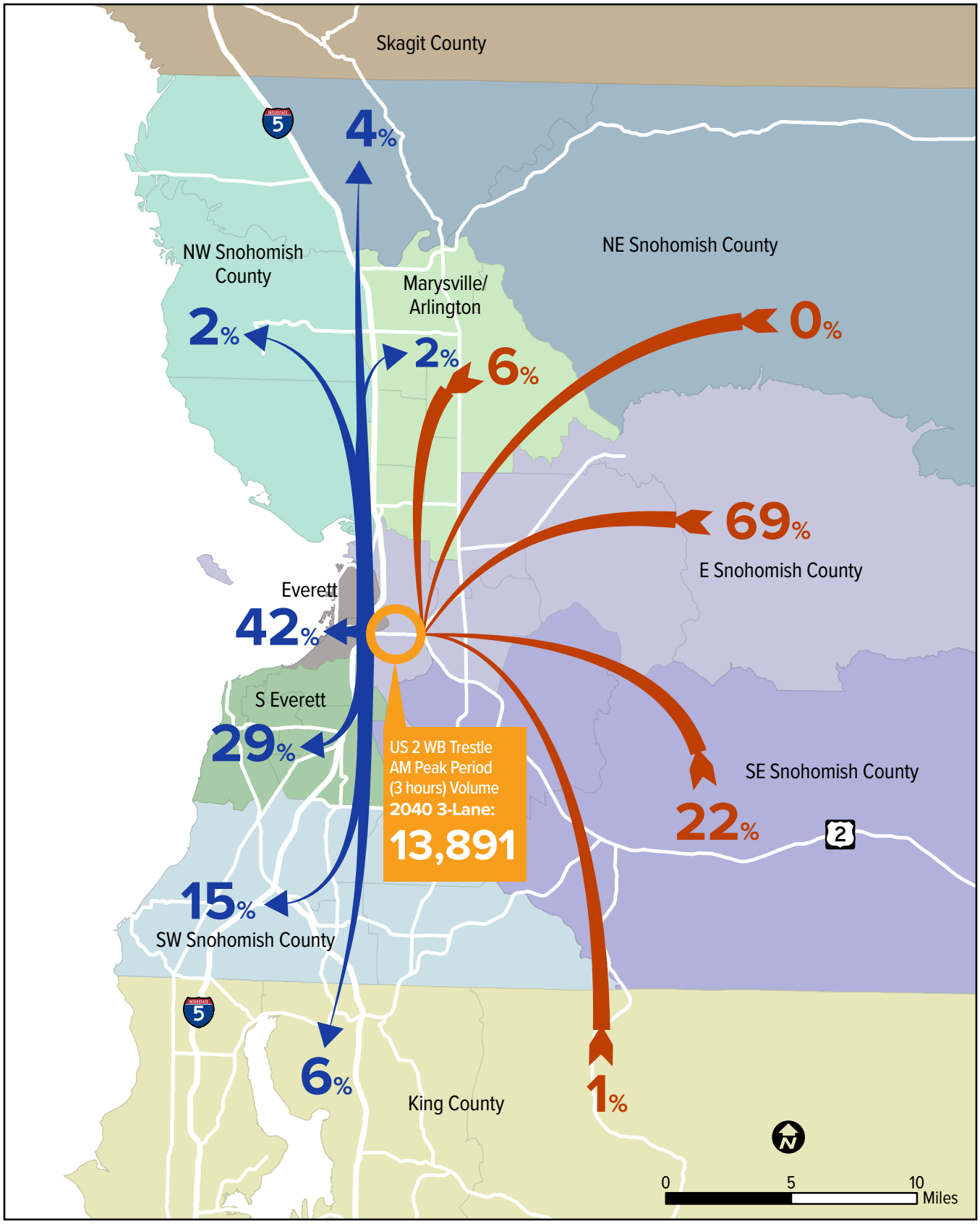
I-5 as a Constraint

Forecast 2040 traffic volumes and the limited capacity of the southbound I-5 on-ramp resulted in significant backups across the US 2 westbound trestle that are not related to the trestle design of configurations 2 and 3. To develop and evaluate potential alternatives for the US 2 westbound trestle in future studies, potential alternatives would need to address system connectivity with I-5 and/or include changes to travel demand and traffic operations in a larger study area.

Capacity of the Trestle Span

A three-lane US 2 westbound trestle could accommodate future traffic demand in 2040 if network capacity is addressed. A three-lane

Figure 5-6. Trip Origins and Destinations by Travel District, Three-Lane Span 2040



cross-section could be managed in several ways, including three general-purpose lanes, two general-purpose lanes, and an HOV/transit lane, or three general-purpose lanes and a peak-use shoulder.

Managed Lanes

Managed lanes could provide transit, HOV, and vanpools with a travel-time advantage. Further consideration of managed lane alternatives and improved connectivity could increase the number of people that could travel across the three-lane trestle span. Current analysis shows a potential for travel time savings for people using the HOV lane across the length of the trestle. With additional system connectivity, that travel-time savings is likely to improve and possibly encourage more people to use HOV, transit, or vanpool.

Potential Impacts on Downtown Everett

Potential configurations should provide multiple access points to downtown Everett from the westbound trestle to avoid overloading a single point in the local network.

Active Transportation

Development of a long-term solution for the US 2 westbound trestle provides an opportunity to create a valuable active transportation corridor between communities east of the Snohomish River and Everett.

Alternative Travel Options

This PEL Study focused on the numbers of vehicles forecasted to cross the westbound trestle. Future studies could incorporate the movement of people as a key performance metric and use their travel characteristics to establish or confirm the project area and the network for the transportation analysis. Using this approach, future studies could develop scenarios to improve HOV, transit, and active transportation connections across the trestle to provide mode options as an alternative to automobiles.

6. Environmental Considerations

6.1 Summary of Resources

This section provides a planning-level review of selected environmental resources. These are based on a WSDOT list of assets that need to be protected or have the potential to influence the evaluation of transportation solutions in the region. It is important to note that this planning-level review does not examine the full range of environmental and social issues, which will be addressed during NEPA review.

The methodology of this planning-level environmental review is consistent with NEPA, FHWA, and WSDOT guidelines. Information was compiled and mapped using readily available data from local, regional, state, and federal agencies. Field studies were not conducted during this PEL Study.

As discussed in Section 5, it is anticipated that future studies of the US 2 westbound trestle will reevaluate the limits of the study area. As a result, the study area limits for each resource may need to be revised.

This planning-level environmental analysis was used to inform the development of concepts. More detailed information is included in the following appendices:

- US 2 Westbound Trestle Draft Summary of Project Environmental Baseline and PEL Study Plan (Appendix G)
- Draft Environmental Constraints – US 2 Westbound Trestle NEPA Documentation (Appendix H)
- WSDOT Environmental Services Office, Environmental Context Memo (Appendix O).

Table 6-1 summarizes the consideration of environmental resources identified in this PEL Study.

During NEPA review, the full range of environmental resources will be analyzed, including a reassessment of the appropriate study areas.

6.2 Potential Impacts

Study area limits, methodologies, and potential impacts are summarized below for each of the environmental resource categories.

6.2.1 Climate Vulnerability

This review is a qualitative assessment of risks to the state's transportation infrastructure from climate change. WSDOT relies on the University of Washington Climate Impacts Group as its primary source for climate information, and its Washington Climate Change Impacts Assessment provides information for planning-level review of forecasted climate impacts.

Climate impacts were assessed for three corridors within the study area. The corridors were ranked from low to high vulnerability, assuming a baseline sea level rise of about 2 feet (Figure 6-1).

Table 6-1. Summary of Environmental Resources

Resource	Context	Evaluation Approach
Climate vulnerability	Areas of high vulnerability identified on the I-5 corridor near the interchange with US 2.	Qualitatively assessed in this PEL Study based on current study area.
Historic bridges	Five bridges have been identified on SR 529 in Everett. Low probability of impact owing to location separate from project area.	Identified in this PEL Study based on current study area.
Cultural resources	Very few archaeological sites have been recorded in proximity to the project corridor (US 2), and no sites are directly within the corridor.	Archaeological sites were qualitatively assessed in this PEL Study based on current study area.
Environmental Justice (EJ)	EJ populations are present in the study area.	Identified in this PEL Study based on current study area.
Habitat connectivity	Five segments with high rankings as Urban Gateway pollinator habitat have been identified.	Identified in this PEL Study based on current study area.
Noise	No existing, proposed, or non-WSDOT noise walls are in the study area.	Identified in this PEL Study based on current study area.
Stormwater retrofits	No medium or high-priority areas for stormwater retrofit are found in the study area. Study area is within Snohomish River Estuary Multiparameter Total Maximum Daily Load.	Identified in this PEL Study based on current study area.
Wetlands	The potential impact on wetlands did not vary substantially among the concepts and did not play a role in their evaluation and ranking.	Qualitatively assessed in this PEL Study based on current study area.
Wetland mitigation sites	Two WSDOT wetland mitigation sites were identified: 1.5 acres near the western end of the existing trestle, east of the Snohomish River; and 14 acres along 51st Avenue Southeast south of the westbound trestle.	Identified in this PEL Study based on current study area.
Fish passage barriers	One documented fish passage injunction barrier on SR 204 at MP 0.21 near the study area.	Identified in this PEL Study based on current study area.
Fish, wildlife, vegetation	Endangered Species Act – listed species and areas that provide habitat for them are present within 500 feet of the project area.	Identified in this PEL Study based on current study area.
Chronic Environmental Deficiencies	None present in the study area.	Identified in this PEL Study based on current study area.
Farmlands	Potential affects on farmlands will be assessed in future studies.	Not identified in this PEL Study based on current study area.

Figure 6-1. Climate Vulnerability and Fish Passage Inventory

I-5 near US 2 Interchange/High

This corridor is in the Snohomish River basin to Quilceda Creek and has a high vulnerability to climate impacts. This section is a low-elevation, tidally influenced river delta with several diking districts. It includes Union and Steamboat sloughs. Embankments are saturated. Bridges in the area are subject to scour (the removal of sediment such as sand and gravel from around bridge abutments or piers) caused by swiftly moving water. The I-5 Snohomish bridges are in good shape with deep piers. Snohomish County has a wetland mitigation bank in the intertidal area.

US 2 Trestle/Low

The corridor is between Everett and Bickford Avenue. There are no scour critical bridges. The road is elevated but there are logjam issues on the Snohomish River bridge. There are aggradation/storm event issues on the Snohomish River.

SR 204/Low

The corridor is between US 2 to SR 9, and this section has overarching issues of blocked culverts and overflowing ditches.

If changes are made to the project or study areas during future studies, a reassessment of the climate vulnerability will be undertaken.

6.2.2 Historic Bridges

Existing cultural resources, including historic bridges, were reviewed within an approximately 800-foot buffer around the existing westbound trestle.

WSDOT identified five bridges near the US 2 westbound trestle as historically significant. These are all on SR 529 in northern Everett and are not directly adjacent to the westbound trestle.

Based upon review of National Bridge Inventory data, the US 2 westbound trestle and several other bridges in the project vicinity are covered under the Program Comment for Common Post-1945 Concrete and Steel Bridges issued by the Advisory Council of Historic Preservation in 2012. This Program Comment eliminates the historic review requirements under Section 106 of the National Historic Preservation Act for common (mass-produced) post-1945 concrete and steel bridges and culverts.

Because of the location of the identified historic bridges, the potential for impacts from improvements to the US 2 westbound trestle is low.

6.2.3 Cultural Resources

Existing cultural resources, including archaeological sites, were reviewed within an approximately 800-foot buffer around the existing westbound trestle.

Very few archaeological sites are recorded in proximity to the study area, with none recorded within the corridors. Historic cemeteries were identified near the study area, and thousands of historic inventory properties were identified in proximity to the project corridors. Properties listed on the historic register are present in the vicinity, although not directly within the corridors.

When more detailed alternatives are identified, a cultural resources survey will be required during NEPA review, along with consultation as outlined under Section 106 of the National Historic Resources Preservation Act. Geological and soil surveys, ethnographic reports, historical maps, and other sources will used to assess the likelihood of finding archaeological sites within the study area. Discussions with affected tribes will support the identification of cultural resources.

More details on cultural resources and tribal coordination are included in the Cultural Resources Approach Plan (Appendix F) and the Draft Tribal Work Plan (Appendix I).

6.2.4 Environmental Justice

As stated by the U.S. Environmental Protection Agency: "Environmental justice (EJ) 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, regulations and policies. Fair treatment means no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental and commercial operations or policies."[14]

The EJ study area consists of over 50 census block groups in Snohomish County. Data from the U.S. Census and the 2013-2017 American Community Survey were used to identify populations protected by Title VI of the Civil Rights Act of 1964 and Executive Order 12898, Federal Actions to address Environmental Justice in Minority and Low-Income Populations. The complete American Community Survey five-year estimate data tables, census block maps, and analysis results can be found online at the United States Census Bureau official website at www.census.gov/programs-surveys/acs.

The EJ study area intersects several census block groups where minority[15] and low-income populations and households with no vehicle exceed the Snohomish County average. The Tulalip Reservation and the southwest quadrant of the EJ study area near Lake Stickney, Paine Field, and Mill Creek contain census block groups with a larger share of minorities (43% or more minority) as compared to the Snohomish County average of 23%. Figure 6-2 provides a map illustrating these locations.

Several census block groups near Lake Stickney, Evergreen, Everett, and Marysville have a larger share of low-income households (28% or more low income) than the Snohomish County average of 8%.

Several census block groups near Evergreen, Everett, and north Marysville have a larger share of households with no vehicle available (25% or more households with no vehicle available) than the Snohomish County average of 5%.

More details and maps can be found in the US 2 Westbound Trestle: Environmental Justice Baseline Data Summary (Appendix E).

Socioeconomic data will be updated and refined, and local communities will be engaged during NEPA review. With more detailed planning, potential impacts will be evaluated to identify whether a future project has the potential to cause adverse effects to these populations and households.

6.2.5 Habitat Connectivity

This environmental review considered wildlife collisions and the potential for pollinator habitat enhancement in the study area.

Wildlife Collisions

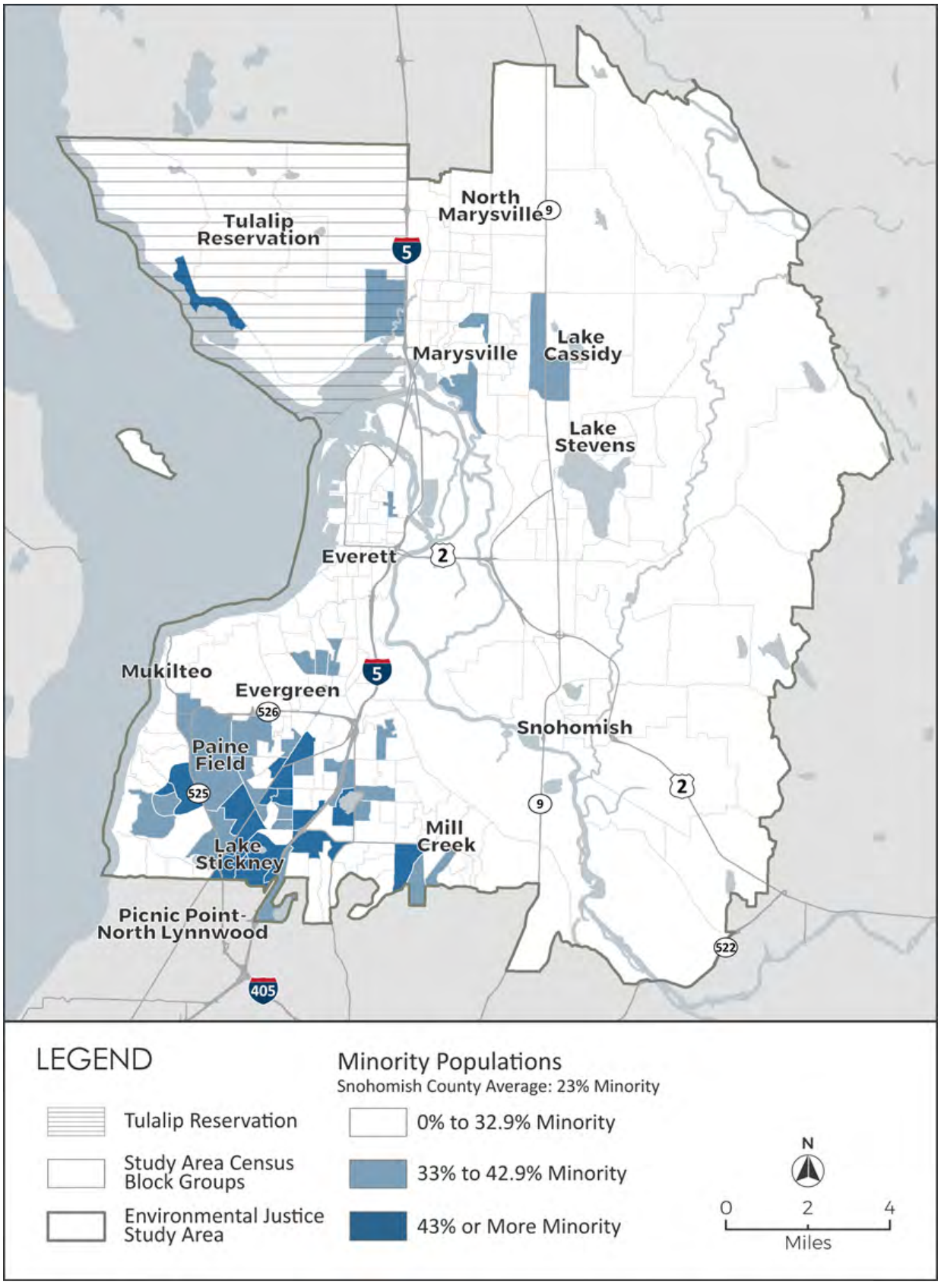
Carcass removals (either by WSDOT maintenance or citizens' salvage of road-killed deer or elk) and crashes involving deer or elk are used to identify high-ranked segments where actions to reduce collisions are warranted. There are no high-ranked segments in this corridor.

Pollinators

The entire Washington state highway system was ranked, by half-mile segment, for the potential to provide pollinator habitat enhancement. Three types of investment ranks could benefit pollinators:

14 www.epa.gov/environmentaljustice/learn-about-environmental-justice, data retrieved 06.08.2020.
15 As identified in the 2013-2017 American Community Survey.

Figure 6-2. Environmental Justice Study Area



1. **General pollinator rank:** Intended to benefit nearby croplands and natural areas.
   No high-priority general segments exist in the study area.
2. **Monarch rank:** Intended to benefit a declining butterfly population.
   No high-priority Monarch segments exist in the study area.
3. **Urban Gateway rank**: Intended to identify areas where local partnerships could be pursued to enhance conditions for pollinators for the appreciation of urban dwellers and their gardens.

   The five high-priority segments in the study area are listed below by route and milepost.

I-5	MP 191.94 – 192.94
I-5	MP 194.44 – 195.44
US 2	MP 0.00 – 0.89
US 2	MP 1.87 – 2.87
SR 204	MP 0.00 – 0.50

6.2.6 Stormwater Retrofits

The US 2 westbound trestle is surrounded by three major watersheds: the Snohomish River Watershed, the Puget Sound Watershed, and the Stillaguamish Watershed. Networks of tributary streams convey stormwater runoff to rivers in each watershed.

The US 2 westbound trestle crosses Ebey Island upstream of the Snohomish River Estuary. The ground surface of Ebey Island is below the average water surface elevation of the surrounding channels. The island is drained by a system of drainage channels, one-way tide gates, and a pump system.

Within the corridor, WSDOT identified a variety of structural and vegetative best management practices to manage stormwater, including seven ponds, one vault, and three ditch type treatments.

The Snohomish River Estuary has an approved multiparameter Total Maximum Daily Load for ammonia-N, carbonaceous oxygen demand, and dissolved oxygen.

Issues related to stormwater management are likely to shape the design of alternatives during future studies. Within the broad geographic study area, roadway improvements or expansion of impervious surfaces would be required to meet WSDOT National Pollution Discharge Elimination System Municipal Stormwater Permit requirements for runoff treatment and/or flow control if the Highway Runoff Manual triggers are met or exceeded. In addition, configurations that remove existing stormwater treatment or flow-control facilities would be required to replace those facilities at a minimum. Configurations that remove existing vegetation and/or add impervious surfaces may result in impacts to the water resources discussed above. In addition, stormwater treatment may be imposed during the Endangered Species Act Section 7 consultation. There is typically a requirement to treat stormwater from all new pollutant-generating impervious surfaces, with more stringent requirements if using a programmatic consultation.

Depending on the sensitivity of the water resources, minimizing adverse effects could require stormwater treatment measures. Detention and treatment of stormwater runoff will be addressed in more detail during future studies.

6.2.7 Wetlands

Wetlands are densely distributed in the Snohomish River valley for miles upstream and downstream of the existing trestle. Mapped or modeled wetlands cover almost the entire area within 500 feet of the existing trestle. Several wetland types, including freshwater emergent, riverine, and freshwater forested/shrub wetlands, are present.

An approximately 1.5-acre WSDOT wetland mitigation site for the Everett Bridges project is present near the western end of the existing

trestle, east of the Snohomish River. The mitigation site lies primarily along the eastbound trestle, but some portions extend under the westbound trestle. A second WSDOT wetland mitigation site, approximately 14 acres in size, is present along 51st Avenue Southeast south of the westbound trestle.

Unavoidable impacts to wetlands, wetland buffers, and established wetland mitigation sites are subject to mitigation in accordance with federal, state, and local regulations. Permitting agencies require applicants to demonstrate that they have avoided or minimized impacts to wetlands wherever practicable. Mitigation requirements may necessitate adjustments to a transportation project or alignment unless it can be demonstrated that such adjustments would be impracticable.

Mitigation options could include on-site and in-kind mitigation, participation in a local fee in-lieu program, and mitigation banking. Mitigation requirements reflect the area and quality of the affected wetlands. Impacts to larger areas of wetlands or to higher-quality wetlands would require more mitigation. Wetland mitigation should be consistent with the statewide goal of achieving no overall net loss in acreage and function of Washington's remaining wetlands.

The potential impact on wetlands does not vary substantially among the concepts and did not play a role in their evaluation and ranking. Impacts to wetlands and associated mitigation will be evaluated quantitatively during NEPA review.

6.2.8 Fish Passage Barriers

This review addresses state-owned culverts that are identified as fish passage barriers.

One fish passage barrier, site 995137 crossing SR 204 at milepost 0.21, was documented as "near" the study area (Figure 6-1). This site is an injunction barrier and should be considered for correction if it is located within 1,000 feet of the project limits.

All projects must be assessed for inclusion of fish barrier correction. The WSDOT Fish Passage Barrier Removal Program coordinates with the Washington Department of Fish and Wildlife (WDFW) and tribal governments to inventory culverts on fish-bearing streams within the jurisdiction of WSDOT and assesses how well those structures are allowing fish passage. It is unclear whether this corridor was surveyed for fish passage barriers in the past several years.

WSDOT's Environmental Service Office's (ESO) Stream Restoration Program contracts with WDFW's Fish Passage Program to resurvey stretches of roads in large transportation projects to ensure all fish-bearing road crossings are identified and assessed for fish passage within the project limits. As this project advances, coordination with the ESO Stream Restoration program manager will be critical to have the fish passage inventory updated to ensure that any environmental impact is mitigated.

If any alternatives would require work at locations of culverts that are identified as fish passage barriers, those culverts would need to be replaced with structures that are not barriers. Coordination with the WSDOT Fish Passage Barrier Program for guidance on fish barrier corrections will continue as alternatives are developed during future studies.

6.2.9 Fish, Wildlife, and Vegetation

This review addresses species and habitats protected under local critical areas ordinances.

Endangered Species Act (ESA) Listed Species and Critical Habitat

ESA-listed species that may be found in the broad geographic study area include the following:

- Gray wolf (*Canis lupus*) – Endangered
- North American wolverine (*Gulo gulo luscus*) – Proposed Threatened
- Marbled murrelet (*Brachyramphus marmoratus*) – Threatened
- Streaked horned lark (*Eremophila alpestris strigata*) – Threatened
- Yellow-billed cuckoo (*Coccyzus americanus*) – Threatened
- Oregon spotted frog (*Rana pretiosa*) – Threatened
- Bull trout (*Salvelinus confluentus*) – Threatened
- Golden paintbrush (*Castilleja levisecta*) – Threatened
- Chinook salmon (*Oncorhynchus tshawytscha*), Puget Sound evolutionarily significant unit – Threatened
- Steelhead (*O. mykiss*), Puget Sound distinct population segment – Threatened

Within the 500-foot buffer around the westbound trestle, ESA-listed Puget Sound Chinook salmon and Puget Sound steelhead are documented as inhabiting the Snohomish River and Ebey Slough. Bull trout use the Snohomish River in the 500-foot study area as rearing habitat, and they are presumed to be present in Ebey Slough. The Ebey Island floodplain includes a network of ditches that are accessible to fish. All three of these species are presumed to be present in those ditches.

The segments of the Snohomish River and Ebey Slough crossed by the US 2 trestle have been designated as critical habitat for bull trout, Puget Sound Chinook salmon, and Puget Sound steelhead. Deadwater Slough, which is crossed by the US 2 trestle, has been designated as critical habitat for Puget Sound Chinook salmon and Puget Sound steelhead.

Washington Department of Fish and Wildlife Habitats of Concern

The following WDFW priority habitats and sites associated with priority species have been documented in the broad geographic study area:

- Bald eagle nests and communal roost
- Peregrine falcon nests
- Merlin nest
- Great blue heron nesting colonies
- Purple martin nesting colonies
- Arctic tern nesting colonies
- Harlequin duck breeding area
- Trumpeter swan night roost
- Wood duck and hooded merganser nesting areas
- Waterfowl concentration areas
- Little brown bat maternity colony
- Biodiversity areas and corridors
- Harbor seal haul out (marine areas only)
- Shorebird concentration areas (marine areas only)
- Coastal cliffs and bluffs (marine areas only)
- Eelgrass meadows (marine areas only)
- Estuarine habitat (marine areas only)
- Wetlands

The presence of peregrine falcon nests, waterfowl concentration areas, and wetlands have been documented within the 500-foot study area around the westbound trestle.

State-owned Lands

WDFW conducted a study in 2011 to investigate the feasibility of restoring estuarine functions on state-owned lands immediately south of the US 2 trestle. The restoration would support Chinook salmon recovery in the Snohomish River Estuary. The study found that although technically feasible, the high costs and limited support from local landowners and interest groups would make the restoration difficult to implement. If a habitat restoration project on these state-owned lands becomes viable, the design and implementation of the US 2 westbound trestle would need to be compatible with the goals and objectives of the restoration project.

Summary

The presence of ESA-listed species and areas that provide habitat for them will require additional consideration during NEPA review. The goal will be to ensure that appropriate measures are implemented to avoid or minimize adverse effects and, if necessary, to mitigate unavoidable impacts. Adverse effects resulting from in-water work may be avoided or minimized by (1) performing work during periods when ESA-listed species are unlikely to be present and (2) implementing impact reduction measures.

6.2.10 Chronic Environmental Deficiencies

A Chronic Environmental Deficiency (CED) is a location along the state highway system where recent, frequent, and chronic maintenance to WSDOT infrastructure from changing hydrologic conditions is causing impacts to fish or fish habitat. CED projects are constructed to improve maintenance and environmental conditions of these locations. Currently, no CEDs are present in the study area. Modifications to the study limits in future studies may require a reassessment of this environmental resource.

7. Tribal Coordination

7.1 Introduction

The legislative direction for the US 2 Westbound Trestle Study included requirements to work in close collaboration with local study proponents and stakeholders. In response to this requirement, WSDOT reached out to five tribes to invite their participation in the PEL Study:

- Tulalip Tribes
- Confederated Tribes and Bands of the Yakama Nation (Yakama Nation)
- Stillaguamish Tribe of Indians (Stillaguamish Tribe)
- Snoqualmie Tribe (Snoqualmie Tribe)
- Sauk-Suiattle Indian Tribe (Sauk-Suiattle Tribe)

The study area lies immediately south of the Tulalip Reservation, and the Tulalip Tribes have treaty fishing rights in this area. All tribes may express their economic, cultural, or environmental interest in potential impacts from the project.

During the early stages of the US 2 Westbound Trestle Study, the key objective was to gather information and create trust and transparency with interested tribes.

7.2 Approach

The Tulalip Tribes have expressed interest in transportation to the reservation and treaty fishing rights in the study area. WSDOT formally invited the Tulalip Tribes to participate in the EAG, TWG, and RAC, and made efforts to meet with the tribe.

WSDOT sent written correspondence to the Stillaguamish Tribe, Snoqualmie Tribe, Yakama Nation, and Sauk-Suiattle Tribe and followed up individually to invite them to participate in the RAC and TWG work groups. The WSDOT project team also worked to meet individually with the tribes on cultural resources and other issues as described in the Draft Tribal Work Plan, included as Appendix I and documented in the Tribal Log, included as Appendix J.

Tribal coordination meetings focused on presenting project briefings to the tribes, soliciting their feedback, and identifying any significant issues that would affect project development. For example, if a tribe identified that there are significant cultural resources affected by a configuration, this would be considered in the development of configurations.

Future planning work will consider key tribal government issues that are likely to include economic and transportation issues, and treaty fishing topics previously expressed by the Tulalip Tribes. Cultural or natural resource concerns may be raised by any of the interested tribes and should be anticipated.

NEPA review will include formal consultation with all interested tribes, including continued coordination on natural and cultural resources and on transportation planning, environmental justice, and land use considerations due to potential impacts to tribal members and tribal enterprises.

7.3 Project Documentation

As part of this early planning effort, documentation of all tribal coordination was maintained in a tribal log. The tribal log ensures that early efforts and feedback are carried forward into future studies and NEPA review. Ongoing tribal coordination is intended to help build trust with the tribes and ensure that their efforts are being considered and formally documented. The tribal log from this PEL Study is included as Appendix J.

8. Project and Agency Coordination

8.1 Project Management Team

A cross-disciplinary project management team met biweekly during development of the PEL Study for the US 2 Westbound Trestle Study. The team meetings facilitated coordination between WSDOT and consultant staff. Additional meetings involving team members were held as needed.

8.1.1 WSDOT Staff

The following WSDOT staff participated on the project management team:

- Cathy George, Engineering Manager
- Kyengo Ndile, Project Engineer
- Tim Nau, Assistant Project Engineer
- Harmony Weinberg, Communications Lead
- Kris Olsen, Communications Lead
- Hannah Plummer, Management of Mobility Liaison
- Emily Geralds, Environmental Lead
- Ruth Park, Environmental Lead
- Vanessa Rogers, Environmental Lead
- Miguel Gavino, Traffic Engineer
- Barb Briggs, Traffic Engineer

8.1.2 Consultant Team

The following consultant staff participated on the project management team:

- Dave Warner, Consultant Project Manager
- Jared Nakamoto, Consultant Deputy Project Manager
- Ben Rodenbough, Design Lead
- Michael Horntvedt, Traffic Lead
- Lawrence Spurgeon, Environmental Lead
- Laura Shabe, PEL Lead
- Brent Baker, Funding and Tolling Lead
- Suanne Pelley, Communications Lead
- Liz Mack, Deputy Communications Lead

8.2 Executive Advisory Group

The legislative direction for the US 2 Westbound Trestle Study included requirements to work in close collaboration with local study proponents and stakeholders. In response to this requirement, WSDOT formed an Executive Advisory Group (EAG) comprised of senior staff and elected or appointed officials. The EAG provided a forum for elected officials from the surrounding region to advise this PEL study. EAG members asked questions of the technical team, identified key issues for the team to consider, and communicated the interests of their constituents.

8.2.1 Representatives

The following elected officials and staff were invited to participate in the EAG. Those shown in bold attended (or had a representative attend) one or more meetings.

- Chairwoman Teri Gobin, Tulalip Board of Directors
- Councilmember Brian Sullivan, Snohomish County

- **Councilmember Sam Low, Snohomish County**
- **Emmett Heath, CEO of Community Transit**
- Executive Dave Somers, Snohomish County
- **Les Reardanz, CEO of the Port of Everett**
- **Mayor Cassie Franklin, city of Everett**
- Mayor John Spencer, city of Lake Stevens
- **Representative Carolyn Eslick, 39th District**
- **Representative Jared Mead, 44th District**
- Representative John Lovick, 44th District
- Representative June Robinson, 38th District
- **Representative Mike Sells, 38th District**
- **Representative Robert Sutherland, 39th District**
- Senator John McCoy, 38th District
- **Senator Keith Wagoner, 39th District**
- **Senator Steve Hobbs, 44th District**
- **Steve Thomsen, Director of Snohomish County Public Works**

8.2.2 Meetings

The EAG met twice, and summaries of the following meetings are available in Appendix L:

- December 17, 2018 – Study background, schedule, and discussion on state and local actions.
- December 9, 2019 – Configurations development and analysis and next steps for the study.

8.3 Technical Working Group

WSDOT worked closely with other agencies and local jurisdictions throughout the study process, largely through the Technical Working Group (TWG). The TWG was composed of technical experts focused on transportation planning and provided input on the US 2 westbound trestle configurations development, screening process, and key technical issues. TWG members asked important questions throughout the screening process and communicated the interests of their organizations to WSDOT.

8.3.1 Representatives

The following agencies and jurisdictions were invited to participate in the TWG. Those shown in bold attended one or more meetings.

- **City of Everett**
- **City of Lake Stevens**
- **City of Marysville**
- City of Monroe
- City of Snohomish
- **Community Transit**
- Everett School District
- Everett Transit
- **Federal Highway Administration**
- Port of Everett
- Puget Sound Regional Council
- **Snohomish County**
- **Sound Transit**
- **US Coast Guard**
- **Washington State Patrol**
- **WSDOT Freight Office**

8.3.2 Meetings

The TWG met four times, and summaries of the following meetings are available in Appendix K:

- December 8, 2018 – Study background, schedule, and Purpose and Need.
- February 8, 2019 – Study context and brainstorming workshop for concept development.
- June 20, 2019 – Concept screening, west, east, and trestle span concepts, and identification of representative build configurations.
- December 5, 2019 – Data and analysis of three representative build configurations and recommendations.

8.4 Resource Agency Committee

A Resource Agency Committee (RAC) including tribes, federal, state, and local agencies was

convened at the start of the PEL process. RAC members provided valuable input on resources and constraints that should be considered during the PEL process and the Purpose and Need.

8.4.1 Representatives

The following agencies were invited to participate in the RAC. Those shown in bold attended the meeting.

- **Army Corps of Engineers**
- Bureau of Reclamation
- City of Everett
- City of Lake Stevens
- City of Marysville
- Conservation Commission
- Federal Emergency Management Agency
- **Federal Highway Administration**
- NOAA Fisheries/US Fish and Wildlife
- **Puget Sound Regional Council**
- **Snohomish Conservation District**
- Snohomish County
- Sound Salmon Solutions
- **Stillaguamish Tribe**
- **Tulalip Tribes**
- **US Coast Guard**
- US Environmental Protection Agency
- Washington Department of Archaeology and Historic Preservation
- **Washington Department of Ecology**
- **Washington Department of Fish and Wildlife**
- Washington State Department of Natural Resources

8.4.2 Meetings

The RAC met once, on March 7, 2019, and a summary of the meeting is available in Appendix M.

8.5 Stakeholder Interviews

Stakeholder interviews were conducted at the start of the PEL Study to help inform the project Purpose and Need as well as communication tools and tactics. A demographic and language review of the study area was conducted to understand whether limited English proficiency populations were in the area, as well as other underrepresented populations, such as low-income individuals and veterans. This analysis allowed the team to determine what community organizations to approach for interviews.

The following organizations were asked to participate in an interview, by an introductory email and then follow-up calls. Some organizations noted that they did not have time to participate or that the US 2 trestle was not a priority topic for them. Organizations were invited to represent stakeholder groups in the study area as well as social service providers that work with traditionally underrepresented communities. Those shown in bold participated in an interview. Interviews were conducted in person when possible, and each interview lasted between 30 and 60 minutes and was documented and summarized by the communications team. The interviews were conducted primarily by two consultant staff and one WSDOT staff member.

- **BIKES Club of Snohomish County**
- Boys & Girls Clubs of Snohomish County
- **Community Foundation of Snohomish County**
- Familias Unidas
- **FutureWise**
- Leadership Snohomish County
- Operation Homefront
- Sherwood Community Services
- Sierra Club Sno-Isle Group
- **The Nature Conservancy – Washington**
- United Way of Snohomish County
- **Washington Vocational Services**
- YMCA of Snohomish County

A summary of the stakeholder interviews is included in Appendix N.

8.6 Additional Stakeholder Coordination

The study team provided briefings to the following organizations/offices regarding the PEL process and status of the study:

- Snohomish County Economic Alliance – January 4, 2019.
- WSDOT Freight Office – February 11, 2019.

Copies of the briefing materials have been included in Appendix N.

8.7 Public Outreach

Public engagement is a key part of the PEL process, and community goals are integral to the decision-making process. In addition to stakeholder interviews, the Washington State Department of Transportation produced an informational online open house showcasing early draft concepts for improvement or replacement of the US 2 westbound trestle. It also provided information about the environmental and highway system challenges that must be addressed for any future project. The online open house was held for 3 weeks during October 2020. Because this community engagement effort took place during the COVID-19 pandemic, WSDOT's outreach strategies were largely limited to virtual platforms.

A public survey was included as part of the outreach to the community. Public communications to advertise[16] the online open house and survey consisted of:

- traditional news media, social media, established email lists
- the WSDOT website, local school districts
- local government and tribal partners, and community-based organizations that connect with low-income and limited English proficiency populations

The electronic US 2 westbound trestle improvement survey was completed by 2,273 people and 10 respondents returned the survey via email. The survey was offered in English, Spanish, and Russian based on community demographics. No completed surveys in Spanish or Russian were submitted.

WSDOT asked 22 questions, four of which related to demographics.[17] Some of the questions included were: What do you think are the top three problems with the westbound trestle? Which of the following funding sources would you be most likely to support for construction of a new westbound trestle? Which of the following would help you consider using transit (or using it more often) for your trips across the trestle?

Most responses highlighted an aversion to tolling a new trestle and instead suggested other avenues for funding. Popular responses included using taxes from large companies like Amazon and Microsoft to fund construction, reallocating existing gas-tax revenue, using recreational taxes such as from the sale of liquor, or the implementation of a state income tax.

16 A complete list of organizations, groups, and agencies is listed in Appendix Q.
17 The full list of survey questions can be found in Appendix Q.

9. Summary

9.1 Key Findings

This PEL Study of the US 2 westbound trestle focused on the analysis of traffic operations on westbound US 2 within a study area bounded by I-5 and SR 9. Key findings indicate that a larger study area is required to adequately assess future conditions, evaluate reasonable alternatives, and develop a long-term solution for the corridor. The following conclusions from this PEL Study will inform future studies.

1. **Network congestion.** Increasing the capacity of the US 2 westbound trestle does not alleviate congestion during the morning peak hours. The analysis found that the increased demand generated by a larger trestle could not be accommodated by I-5 and resulted in longer travel times across the westbound trestle.
2. **Trestle span.** Three travel lanes on the US 2 westbound trestle would provide enough capacity for future conditions if network congestion is addressed.
3. **Managed lanes.** Managed lanes (transit, HOV, express toll, or peak-use shoulder lane) on the trestle could provide people an option to bypass general-purpose traffic during the morning rush hour and potentially improve conditions on I-5.
4. **Active transportation (walk, bike, roll).** Development of a long-term solution for the US 2 westbound trestle would provide opportunity to create a valuable active transportation corridor between communities east of the Snohomish River and downtown Everett.
5. **Mode share.** The share of HOV and transit (bus) vehicles on the corridor during the morning peak is expected to be less than 9% in 2040. Transit providers would need to include or increase service plans in the area to give people a choice beyond SOV and ensure that transit service is coordinated with local and regional land use planning to best serve desired trips.
6. **Environmental considerations.** Baseline environmental conditions are unlikely to serve as key differentiators among trestle alternatives. Potential adverse effects on sensitive areas and regulatory requirements to avoid, minimize, and/or mitigate environmental impacts will be considerations in the development of any long-term solution.

9.2 Future Studies

To advance study and design of the US 2 westbound trestle, it is recommended that future studies and environmental reviews place the corridor in a broader context that recognizes capacity limits on the I-5 corridor and on the surface streets and intersections in downtown Everett. Future studies could expand the transportation analysis approach used in this phase to include a focus on person-throughput as an evaluation metric. Multimodal strategies could be explored to increase the use of HOV and transit, including an assessment of potential gaps in transit access to communities. Future studies could consider alternatives in addition to the two representative configurations analyzed in this PEL study.

In addition to activities outlined by WSDOT and FHWA guidance, the following actions are recommended for future studies:

1. **Study limits.** Examine the use of the westbound trestle to establish or confirm the project area and the study limits. Include at a minimum: east Snohomish County, southeast Snohomish County, southwest Snohomish County, south Everett, Everett, Marysville/Arlington, and adjacent cities. Continue to incorporate local and regional transportation planning efforts. Consider travel demand across the westbound trestle in the context of travel characteristics (Marysville to I-405). A dynamic traffic assignment modeling process could be used to understand trip generation, routes, impacts of congestion, and diversion routes.
2. **Public and stakeholder engagement.** Continue to collect feedback on process and findings through targeted outreach. Engage major employers about opportunities that would encourage mode shift.
3. **Agency coordination.** Continue to leverage existing opportunities with partner agencies. Continue work with existing TWG (which includes local agencies, the Port of Everett, and transit agencies), the RAC, and other environmental partners. Continue to coordinate with the city of Lake Stevens on the US 2 Trestle HOV Congestion Jump Lane project.
4. **Alternative travel options.** Using revised study limits and a systems level approach, incorporate the movement of people as a key performance metric. Develop scenarios to improve HOV, transit, and active transportation connections across the trestle to provide mode options as an alternative to SOV.
5. **Purpose and Need.** Update the draft Purpose and Need to incorporate future study inputs, including elements such as transit, special transportation needs, demand management, tolling, and Transportation Systems Management and Operations applications.
6. **Environmental scan.** Update environmental considerations, including the list of key resources to reflect the new study area.
7. **Tribal coordination.** Using the draft work plan, continue to outline an approach for WSDOT to help identify key tribal issues. The goal of the approach is to ensure that interested tribes have opportunity to provide input throughout the process and to engage in comprehensive government-to-government consultation.
8. **Active transportation.** Assess the active transportation network along the trestle and in the surrounding communities and determine if active transportation users (including all ages and abilities) can reach all the destinations along the corridor. Recognize the current active transportation restrictions are a gap in the network and identify additional constraints to active travel. For example, the restriction along I-5 represents a barrier to north-south travel. Work with the Active Transportation Plan to identify appropriate alternatives on the local system.
9. **Accessibility considerations.** Consider non-highway aspects of the corridor, including an assessment of local roads, transit, land use, and human services transportation needs. Incorporate an analysis to determine gaps in mobility with focus on social equity.

10. Appendices

- **A.** Draft Purpose and Need Document
- **B.** Traffic Methodology
- **C.** Traffic White Paper
- **D.** Long List of Concepts
- **E.** US 2 Westbound Trestle: Environmental Justice Baseline Data Summary
- **F.** Cultural Resources Approach Plan
- **G.** US 2 Westbound Trestle Draft Summary of Project Environmental Baseline and PEL Study Plan
- **H.** Draft Environmental Constraints – US 2 Westbound Trestle NEPA Documentation
- **I.** Draft Tribal Work Plan
- **J.** Tribal Log
- **K.** Technical Working Group Materials
- **L.** Executive Advisory Group Materials
- **M.** Resource Agency Committee Materials
- **N.** Stakeholder Interviews and Coordination
- **O.** WSDOT Environmental Services Office, Environmental Context Memorandum
- **P.** PEL Questionnaire
- **Q.** Outreach List and Survey Questions


Ebey Island
Homeacres Rd
NEXT LEFT
FREEWAY
ENTRANCE

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US 2 Westbound Trestle Study:
Planning and Environmental Linkages Documentation

January 2021