I-90 CORRIDOR – EASTON TO CLE ELUM FEASIBILITY STUDY

VOLUME I: FEASIBILITY REPORT

KITTITAS COUNTY

September 2024

I-90 CORRIDOR – EASTON TO CLE ELUM FEASIBILITY STUDY

VOLUME I: FEASIBILITY REPORT

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September 2024

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I-90 Corridor – Easton to Cle Elum Feasibility Study
VOLUME I: FEASIBILITY REPORT

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Acknowledgements

This study relied on the guidance and review of the WSDOT M3 (Multimodal, Multidisciplinary, Multi-agency) Team, whose members provided input and local perspective on the content of the study at specific decision points. The M3 Team consisted of the following members:

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TABLE OF CONTENTS

List of Appendices vi
List of Figures vii
List of Tables viii
Acronyms ix
Glossary x
Project Background xiv

1 INTRODUCTION 1
1.1 Study Area 1
1.2 Purpose of This Feasibility Study 1
1.3 Study Partners 4
1.4 Study Process and Approach 6

2 RANGE OF ALTERNATIVES 8
2.1 No Build Alternative (Existing Conditions) 10
2.2 Alternative 1: Widen I-90 on the Outside 11
2.3 Alternative 2: Widen I-90 in the Median 14
2.4 Alternative 3: Widen I-90 in the Median, Reversible Lanes 16
2.5 Alternative 4A: North – SR 903 19
2.6 Alternative 4B: North – Bullfrog Road 21
2.7 Alternative 5: South 23
2.8 Other Potential Improvements 25

3 EXISTING CONDITIONS IN THE STUDY AREA 28
3.1 Safety 29
3.2 Transportation Demand 34
3.3 Freight Mobility 40
3.4 Environment 42
3.5 Resiliency 48
3.6 Environmental Justice and Equity 48

4 ALTERNATIVES EVALUATION CRITERIA 52

4.1 Evaluation Criteria 52
4.2 Tier 1 Evaluation Approach and Results 57
4.3 Tier 2: Targeted Evaluation 63
4.4 Alternatives Selected to Move Forward 65

5 COMMUNITY AND STAKEHOLDER INVOLVEMENT 71

5.1 Public Outreach Plan 72
5.2 STEER I-90 Coalition 72
5.3 Tribal Coordination 73
5.4 Public and Stakeholder Engagement 73

6 NEXT STEPS 82

6.1 Legislative Outreach and Funding 82
6.2 Preliminary Engineering 83
6.3 Environmental Analysis and Documentation 84
6.4 Outreach and Engagement 84
6.5 NEPA Preferred Alternative, Final Design, and Implementation 85
6.6 Other Opportunities for I-90 in the Study Area 85
6.7 Immediate Next Steps 86

REFERENCES 87

LIST OF APPENDICES

The appendices listed below can be found in the **I-90 Corridor – Easton to Cle Elum Feasibility Study, Volume II: Appendices**.

Appendix A Traffic Modeling Reports – 2019 and 2024

Appendix B Environmental Maps – 2024

Appendix C Cultural Resources Review – 2024

Appendix D FHWA Screening Tool for Equity Analysis of Projects (STEAP) Data

Appendix E EJ Screen Results

Appendix F Detailed Evaluation Worksheets for Each Alternative

Appendix G In-depth Environmental Evaluation by Alternative

Appendix H Detailed Evaluation Worksheets for the I-90 Alternatives

Appendix I Public Survey Results – Summer 2023

Appendix J Public Survey Results – February 2024

Appendix K Webinar Polling Results – February 2024

LIST OF FIGURES

Figure 1-1 Project Study Area 2
Figure 1-2 Feasibility Study Process and Approach 6
Figure 2-1 Range of Alternatives 9
Figure 2-2 No Build Conditions (Alternative 6) 10
Figure 2-3 Alternatives 1, 2, and 3 – General Alignment 12
Figure 2-4 Alternative 1 – Proposed Configuration 13
Figure 2-5 Alternative 2 – Proposed Configuration 15
Figure 2-6 Alternative 3 – Proposed Configuration 18
Figure 2-7 Alternative 4A – Conceptual Cross-Section 19
Figure 2-8 Alternative 4A – General Alignment 20
Figure 2-9 Alternative 4B – Conceptual Cross-Section 21
Figure 2-10 Alternative 4B – General Alignment 22
Figure 2-11 Alternative 5 – Conceptual Cross-Section 23
Figure 2-12 Alternative 5 – General Alignment 24
Figure 3-1 Monday Summer Westbound Average Vehicle Volumes on I-90 in the Study Area, 2018 35
Figure 3-2 Future Year 2040 No Build Modeled Travel Speeds by Time of Day and Location along I-90 in the Study Area on Memorial Day Monday 36
Figure 3-3 Cultural and Historic Sites, Parks, and Recreational Facilities in the Study Area 47
Figure 3-4 Environmental Health Disparities Map of I-90 Corridor Study Area 51
Figure 4-1 Tier 1 Evaluation Summary by Alternative – Weighted Score 62
Figure 4-2 Tier 2 Evaluation Summary by Alternative – Weighted Score 70
Figure 5-1 Public Survey 1 Results Summary – Biggest Public Concerns 75
Figure 5-2 Public Survey 1 Results Summary – Prioritization of Improvements 76
Figure 5-3 Public Survey 2 Results Summary – Preferred Alternative 76
Figure 5-4 Webinar 2, February 2024 – Sample Polling Question 80

LIST OF TABLES

Table 1-1 WSDOT M2 and M3 Teams 5
Table 1-2 Feasibility Study Process and Approach 7
Table 3-1 Collision Types along I-90 in the Study Area, 2018 through 2023 29
Table 3-2 Collisions by Injury Severity along I-90 in the Study Area, 2018 through 2023 29
Table 3-3 Injury Severity by Collision Type along I-90 in the Study Area, 2018 through 2023 30
Table 3-4 Injury Severity by Time of Year along I-90 in the Study Area, 2018 through 2023 30
Table 3-5 Injury Severity by Road Conditions along I-90 in the Study Area, 2018 through 2023 31
Table 3-7 ESA Listed Species Potential Presence and Designated Critical Habitat Adjacent to Each Alternative 44
Table 3-8 Select Socioeconomic Indicators 49
Table 3-9 Environmental Health Disparities Summary for the I-90 Corridor Study Area 50
Table 4-1 Tier 1: Initial and Revised Evaluation – Project Goals, Criteria, Performance Measurements, and Weight 54
Table 4-2 Tier 1 Evaluation Results – Non-Weighted 58
Table 4-3 Tier 1 Evaluation – Weighted Scores 61
Table 4-4 Tier 2: Targeted Evaluation – Additional Criteria and Rating Descriptions 64
Table 4-5 Tier 2 Evaluation Results – Non-Weighted 66
Table 4-6 Tier 2 Evaluation – I-90 Alternatives Weighted Scores 69
Table 5-1 Stakeholders Contacted and Interviewed 74
Table 5-2 Public Survey 1, Summer 2023 – Survey Questions 75
Table 5-3 Public Survey 2, February 2024 – Survey Results 77
Table 5-4 Webinar 1, August 2023 – Questions and Answers 79

ACRONYMS

BUILD: Better Utilizing Investments to Leverage Development (U.S. Department of Transportation Discretionary Grants Program)

CCTV: Closed-Circuit Television

DAHP: Washington State Department of Archaeology and Historic Preservation

EPA: Environmental Protection Agency

ESA: Environmental Species Act

FGTS: Washington State Freight and Goods Transportation System

FHWA: Federal Highway Administration

FLAP: Federal Lands Access Program

FMSIB: Washington State Freight Mobility Strategic Investment Board

FRA: Federal Railroad Administration

I-90: Interstate 90

IBL: Information by Location

INFRA: Infrastructure for Rebuilding America

ITS: Intelligent Transportation System

KCSR: Kittitas County Search and Rescue

KVFR: Kittitas Valley Fire and Rescue

KVH: Kittitas Valley Hospital

LEP: Limited English Proficiency

M2 Team: WSDOT Multimodal, Multidisciplinary Team

M3 Team: WSDOT Multimodal, Multidisciplinary, Multi-agency Team

MP: Milepost

NEPA: National Environmental Policy Act

NSFLTP: Nationally Significant Federal Lands and Tribal Projects

NWI: National Wetlands Inventory

O&M: Operations and Maintenance

PEL: Planning and Environmental Linkages Study

SEPA: Washington State Environmental Policy Act

SR: State Route

STEAP: Screening Tool for Equity Analysis of Projects

STEER I-90: Safety, Transportation, Environment, Equity, and Resiliency on I-90 Coalition

TIFIA: Transportation Infrastructure Finance and Innovation Act

USFS: U.S. Forest Service

WDFW: Washington Department of Fish and Wildlife

WSDOT: Washington State Department of Transportation

GLOSSARY

A

Active transportation network: Infrastructure and facilities that support human-powered modes of transportation, such as walking and bicycling.

Alignment: The path or route followed by a transportation facility, such as a roadway.

Alternative(s): Possible solutions to accomplish a defined purpose and need that are considered as part of a decision-making process. These can include local and state transportation system mode and design options, as well as travel demand management and transportation system management-type improvements such as ramp metering, mass transit, and high occupancy vehicle (HOV) facilities.

C

Closed-circuit television (CCTV) monitoring: A closed system of traffic surveillance cameras designed for highway and road monitoring, allowing for remote management and data gathering.

Commercial truck parking facilities: Designated areas or facilities where commercial trucks can safely park or stop for rest periods, reducing the need for trucks to park on highway shoulders or in nearby communities.

Commercial vehicle systems: Technologies and tools designed for use by commercial vehicles, including navigation systems, tracking devices, and safety features.

Connectivity: The degree to which the various roadways and other transportation facilities within a network are linked and integrated, facilitating smooth and efficient travel.

Corridor: A defined path or route for transportation, typically referring to a major road or highway like the I-90 corridor.

Crash assessment: Evaluation of the history and patterns of vehicle collisions within a specific area to identify trends and deficiencies.

E

Ecosystem resiliency: The ability of ecosystems to withstand and recover from disturbances, such as floods or climate change impacts. Evaluations focus on maintaining ecosystem functions and adapting to changing conditions.

Environmental justice (EJ): 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. This includes using an intersectional lens to address disproportionate environmental and health impacts by prioritizing highly impacted populations, equitably distributing resources and benefits, and eliminating harm.

Environmental review: The consideration of environmental factors as required by NEPA and SEPA. The environmental review process is the procedure used by agencies and others to give appropriate consideration to the environment in decision making.

Equity: Fairness and impartiality in the distribution of benefits, resources, and impacts of transportation projects among different groups within a community.

Evaluation criteria: Standards or factors used to assess the performance of proposed alternatives in transportation planning. These criteria are developed based on project objectives and may include factors such as environmental impact, cost-effectiveness, and community benefits.

F

Feasibility study: A study conducted to assess the practicality, constructability, and potential impacts of a proposed project.

Freight mobility: The ability of goods and cargo to move efficiently and effectively within a transportation network.

I

Intelligent Transportation System (ITS): An integrated system of advanced sensor, computer, electronics, and communication technologies and management strategies, used to increase the safety and efficiency of the surface transportation system.

M

Median: The portion of a divided highway separating vehicular traffic traveling in opposite directions.

Mobility: The ability of people and goods to move freely and easily within a transportation network.

Multimodal: Involving or accommodating multiple modes of transportation, such as cars, buses, bicycles, and pedestrians.

N

National Environmental Policy Act (NEPA): A U.S. environmental law that requires assessment and publication of environmental impacts related to any federally funded project.

No build (existing conditions) alternative: A scenario where no changes are made to the existing transportation infrastructure, maintaining current conditions. Potential impacts of the no build alternative are evaluated and used a baseline for evaluation of the proposed alternative(s).

P

Performance ratings: Scores or ratings assigned to alternatives based on their performance against evaluation criteria. These ratings may be qualitative or quantitative and help decision-makers assess the effectiveness and suitability of each alternative.

Planning and Environmental Linkages (PEL): A collaborative and integrated approach to transportation decision-making, intended to minimize duplication of work and streamline project development, that (1) considers environmental, community, and economic goals early in the planning process, and (2) uses the information, analysis, and products developed during planning to inform the environmental review process.

Preferred alternative: The highest-scoring alternative as identified through the tiered evaluation process, indicating that it best meets project objectives while minimizing impacts on the environment, communities, and stakeholders.

Preliminary design: The initial phase of design development for transportation projects, where conceptual designs are refined and detailed to a level suitable for environmental review and analysis.

Project need statement: A statement identifying the baseline performance need for the project. For each identified project need, there may be one or more performance metrics, targets, and gaps.

Project purpose: The primary objective or goal of a transportation project, often established to address specific needs or challenges within a community or region.

Q

Qualitative analysis: Evaluation method that focuses on assessing the quality or characteristics of alternatives based on subjective judgments rather than numerical data. Qualitative analysis may involve assessing factors such as feasibility, social impact, and environmental compatibility.

Quantitative data: Numerical data used in the evaluation process to measure the performance of alternatives against predefined criteria. Quantitative data may include metrics such as cost estimates, traffic flow, and environmental impact assessments.

R

Resiliency: The ability of a transportation system to withstand and recover from disruptions or disasters, such as extreme weather events or accidents.

Reversible lanes: Traffic lanes that can be switched in direction to accommodate peak traffic flow, typically operated during specific times or conditions.

Right of way: The land or property owned or controlled by a government agency (e.g. WSDOT, the County, or a municipality) for the construction and maintenance of transportation infrastructure.

Roadway widening: Increasing the width or capacity of a roadway by adding additional lanes or shoulders.

S

Safety: Measures and conditions aimed at protecting travelers and reducing the risk of crashes or injuries within the transportation system.

Shoulder: The portion of the roadway adjacent to the travel lanes, used primarily for accommodation of stopped vehicles, emergency use, lateral support of the travel lanes, and where allowed, use by pedestrians and bicycles.

Stakeholders: Individuals, groups, or organizations with an interest or concern in the outcome of a project, including residents, businesses, advocacy groups, and government agencies.

State Environmental Policy Act (SEPA): State-level environmental legislation modeled after NEPA, requiring assessment of environmental impacts for projects within state jurisdiction and codified in RCW 43.21C.

T

Tiered evaluation: An evaluation process divided into tiers or phases, with each tier assessing alternatives based on different levels of detail or criteria. Tier 1 typically involves an initial assessment of all alternatives, while Tier 2 focuses on a more detailed evaluation of top-ranked alternatives.

Traffic conditions: The state of traffic flow and congestion on roadways, often assessed based on factors like volume, speed, and density of vehicles.

Traffic congestion: The condition of excessive traffic volumes or slow speeds on roadways, often resulting in delays and reduced efficiency of transportation systems.

Traffic monitoring devices: Equipment used to collect data on traffic volume, speed, and other parameters for transportation planning and management.

Transit network: System of public transportation services, including buses, shuttles, and rail transit, designed to move people within a region or area.

Transportation demand: The demand travelers will make on the transportation system based on the number and types of trips they will take and the mode and routes they will use.

W

Weighted score: A composite score assigned to each alternative based on the relative importance or weight of different evaluation criteria. Weighted scores help prioritize alternatives based on their overall performance against project objectives.

Wildlife connectivity: Refers to the ability of wildlife to move across landscapes, often impeded by roads and other barriers. Assessments aim to determine how transportation projects can impact wildlife habitats and migration corridors.

PROJECT BACKGROUND

In response to citizen-led task forces such as the Upper Kittitas County Traffic Committee, working groups, and public comment, Kittitas County Public Works initiated the **I-90 Corridor – Easton to Cle Elum Feasibility Study** in partnership with corridor stakeholders including the Washington State Department of Transportation (WSDOT) and the Safety, Transportation, Environment, Equity, and Resiliency on I-90 (STEER I-90) Coalition.

Study Area

Interstate 90 (I-90) spans 300 miles in Washington State from the Port of Seattle to the Idaho state line, continuing east across the United States. I-90 is the major east-west transportation corridor in Washington State and is vital to commerce, economy, and recreation statewide. Passing through Kittitas County it is a scenic highway identified as the Mountain to Sound Greenway (National Heritage Area). Residents, tourists, and businesses have long commented on transportation inefficiencies between Easton and Cle Elum impacting safety, freight, and mobility.

The area of study is located **along the I-90 corridor from Easton to Cle Elum**, a 15-mile portion in Upper Kittitas County beginning at the West Easton interchange at **milepost (MP) 70.3** and ending at the I-90/State Route 970/903 interchange at **MP 85** within WSDOT's South Central Region, and the Upper Kittitas County surrounding communities. Upper Kittitas County generally includes the Town of South Cle Elum, City of Cle Elum, City of Roslyn, and the areas of Ronald and Easton.

Study Objectives

The feasibility study aims to investigate concerns from stakeholders by engaging agencies and the public to identify and describe issues related to transportation demand, safety, freight mobility, the environment, resiliency, and equity/inclusion issues within the study area to identify possible solutions.

1 INTRODUCTION

Working in partnership with the Washington State Department of Transportation (WSDOT), the Kittitas County Public Works Department (County) has undertaken this feasibility study as an initial step in a planning and design process for improvements within the I-90 corridor in Upper Kittitas County.

Chapter Overview

- Purpose of this feasibility study and why it is needed
- Description of the study area
- Why improvements are needed in the study area
- Study partners

1.1 Study Area

Kittitas County is located at the geographic center of Washington State, midway between the heavily populated Puget Sound region and the eastern rural areas centered around Moses Lake. More than half of the County is covered by forests, while less than two percent (2%) of the County is in urban development.

The study area is a 15-mile section of I-90 located in Upper Kittitas County beginning in Easton at milepost (MP) 70.3 and ending at the I-90/State Route 970/903 interchange at MP 85 in Cle Elum, as well as the surrounding local roads and populated areas located north and south of I-90 in this area (Figure 1-1).

Within the study area, directly along the I-90 corridor are the communities of Easton, Cle Elum, and South Cle Elum. Other communities north of I-90 include Ronald and Roslyn. Numerous recreational areas serve residents and tourists, including the Palouse to Cascades State Park, Washington State Horse Park, Memorial Park, and the Sun Country Golf Course. Both the Yakima and Cle Elum Rivers run through the study area.

Besides I-90, key transportation facilities in the study area include the BNSF Snoqualmie Pass main line, and SR 903 serving Roslyn and Cle Elum. I-90 in the study area is a designated scenic highway and is also part of the Mountains to Sound Greenway (National Heritage Area).

1.2 Purpose of This Feasibility Study

Feasibility studies are used to determine the practicability, constructability, and level of impact of a proposed project. Based on stakeholder and community feedback, the conceptual alternatives that could potentially reduce or alleviate the concerns or issues at

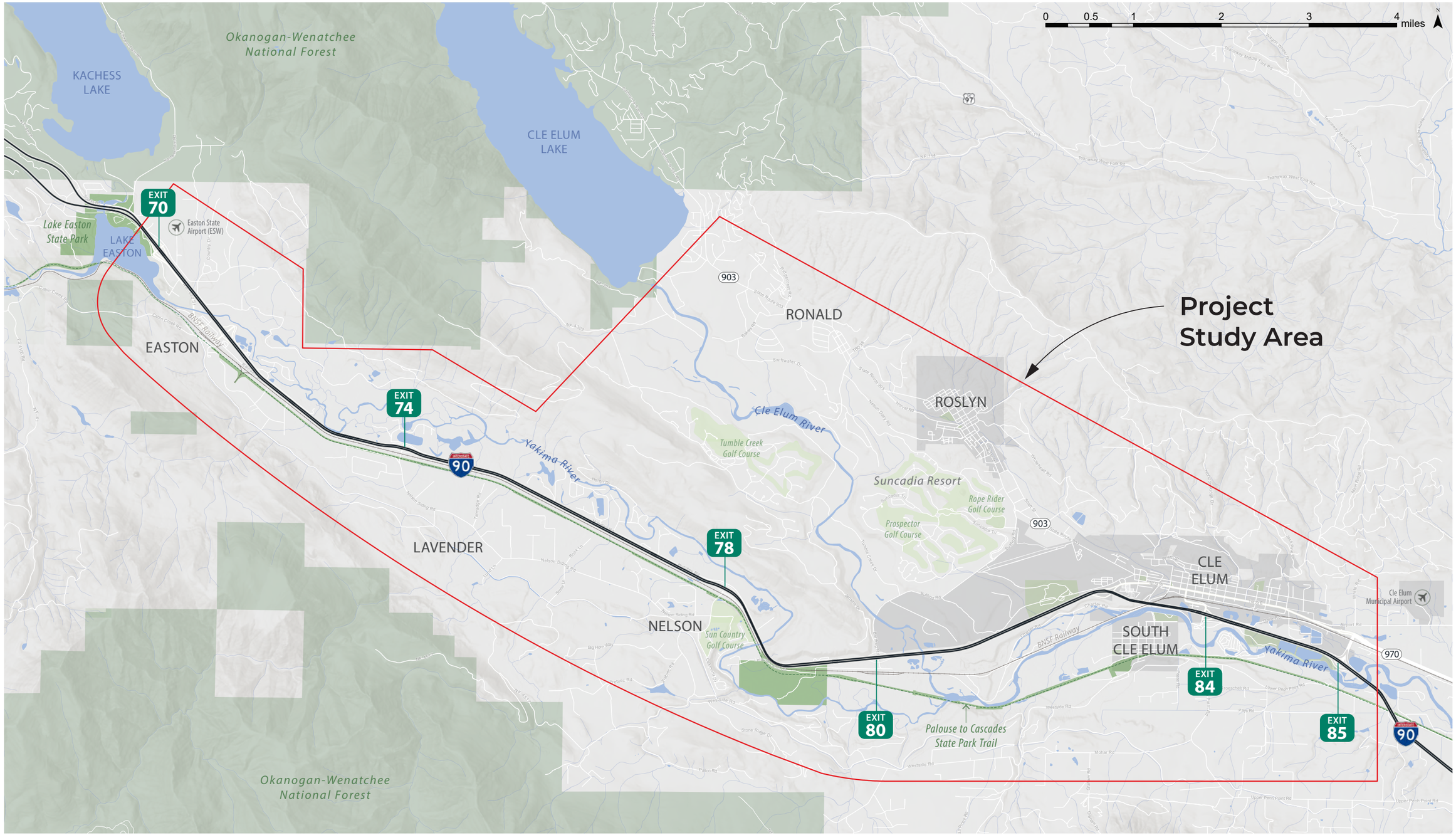


Figure 1-1 Project Study Area

hand are developed. Feasibility studies are then conducted to analyze these alternatives based on a variety of factors including transportation and mobility, environment, equity, resiliency, government and local agency coordination, and public input. Although such an analysis is not as detailed as a design or environmental study, it is intended to provide enough information to allow project sponsors to make decisions by reducing the quantity and scope of alternatives. The findings of the feasibility study will guide a shift towards a more focused allocation of resources, facilitating effective investment in the subsequent stages of design and environmental assessment.

Project Purpose and Need

This feasibility study is designed to identify potential solutions which can fulfill the project's purpose and goals, and why the project is needed.

Project Purpose and Goals

The purpose of the project is to:

- Ensure continued and improved safety to I-90 users, including travelers, maintenance crews, freight operators, and emergency responders.
- Enhance mobility and connectivity on I-90 for passenger vehicles, freight, transit, and active modes and provide support for increased person and freight throughput.
- Respect the surrounding environment and provide measures to address the resiliency of the system, improve wildlife connectivity, and reduce impacts to environmental baseline conditions.
- Support equity by ensuring communities and individuals are not disproportionately impacted.

Need for the Project

The project is needed to ensure continued safety and mobility throughout the study area. Kittitas County is home to many key freight-generating and time-sensitive industries, including agriculture and forestry, with I-90 serving as a key thoroughfare for these industries. Providing a transportation system that accommodates these key economic generators and the timely movement of goods is important to Kittitas County. As such, WSDOT has identified this corridor as one of the state's major truck corridors, which is a major economic driver in the region, through both customers to the businesses along the routes and providers of goods movement for producers and growers in the County.

In addition, growth within the County – industrial and residential – is contributing to increased congestion along I-90. Such growth is putting a strain on the roadway network, both in terms of traffic congestion and wear and tear. Most of the congestion in Kittitas County occurs at certain times of the year – near ski resorts in winter or routes accessing the lakes in the summer. Heavy seasonal congestion on I-90 and state routes within the study area can lead to traffic diverting onto local county roads. This poses both safety risks and delays to residents and also increases the maintenance burden on the County. This feasibility study addresses potential solutions to such traffic growth and congestion.

A study initiated by the County in 2019 (see Appendix A) found congestion along I-90 is heaviest during summer weekends and major holidays (Memorial Day, 4th of July, and Labor Day). In the westbound direction, this regularly occurs between MP 70 and MP 93 on Sundays in summer, with the most extreme congestion occurring on the Mondays of Memorial Day and Labor Day holiday weekends. Holiday traffic

volumes are approximately four times higher on I-90 and three times higher on county roads than typical days. Speeds drop from an average of 70 miles per hour (mph) to 15 mph on I-90, and increase by approximately 5 mph on county roads, reflecting that non-local travelers tend to speed along the local roads as they avoid I-90 congestion. On those specific Mondays, congestion lasts for 12 hours on I-90, while diversion and increased speed lasts approximately 6 hours on the county roads.

The study also found the average travel speed along I-90 within the study area, at 1:00 pm on Memorial Day 2018, was less than 20 mph. Based on the historical speed data, there is congestion along the corridor between 10:00 am and 9:00 pm. Travel speeds increased past MP 70 (traveling westbound) where the freeway widens from two to three lanes.

Compared with typical volumes on I-90 (mid-week during the fall and spring months), the volumes on summer and holiday weekends were significantly higher. On an average weekday, the hourly volume never exceeded 1,000 vehicles per hour. On Memorial Day, the hourly volumes exceeded 2,500 vehicles per hour for 12 hours and the total daily demand is almost three times higher.

Although this 2019 study focused on traffic between MP 70 and MP 93, the modeling results indicated major congestion resulted from traffic entering at MP 80. Therefore, this feasibility study addresses these traffic challenges by developing and analyzing potential alternative solutions between MP 70 and MP 85.

1.3 Study Partners

In conducting this study, the County's priority was to coordinate with a broad range of groups who utilize or operate the transportation network within the study area. A key element of this effort included partnering with WSDOT to confirm proposed alternatives align with the State's goals and plans. Since I-90 is a federal (Federal Highway Administration, FHWA) facility operated by WSDOT, it is

critical to follow established guidelines and requirements to ensure any proposed solution can be implemented, pending funding and various state and federal approvals. Throughout this process, the County and WSDOT maintained ongoing and substantive discussions, including the creation of a WSDOT M3 (multimodal, multidisciplinary, multi-agency) Team. Complementing the work of the M3 Team and the County, review and input was also sought from the WSDOT M2 (multimodal, multidisciplinary) Team. Table 1-1 provides more information about these teams and their roles.

In addition, it was important to the County and WSDOT to gather meaningful input from local agencies and legislators, the U.S. Forest Service (USFS), and business representatives. As part of this outreach, the County funded the creation of the STEER I-90 Coalition, which provides local leaders and the general public with a voice in this process. A meaningful public outreach program was also an important element of this study. Chapter 5 provides an overview of the public and stakeholder outreach, as well as input provided during outreach efforts.

Table 1-1 WSDOT M2 and M3 Teams

Team	WSDOT Participants	Role and Responsibility
M3	◆ WSDOT South Central Region • Regional Administrator • Assistant Regional Administration • Local Programs • Design and Traffic Engineering ◆ Multimodal Planning and Data Division	◆ Provided input and local perspective on the content of the study at specific decision points ◆ Focused on consistency with local plans and policies ◆ Reviewed alternatives and evaluation methodology
M2	◆ Multimodal Planning and Data Division ◆ Active Transportation Division ◆ Capital Program Development and Management ◆ Development Division ◆ Environmental Services Office ◆ Maintenance ◆ Office of Equal Opportunity ◆ Public Transportation Division ◆ Rail, Freight and Ports Division ◆ Traffic; Transportation Safety and Systems Analysis	◆ Provided input and statewide perspective on the content of the study at specific study decision points ◆ Focused on consistency with WSDOT modal plans and policies

Note: Kittitas County staff and project consultant team members also participated in the M3 and M2 meetings.

1.4 Study Process and Approach

Based on meaningful discussions with stakeholders and insights into public concerns, the County and WSDOT developed a study process designed to ensure that alternatives effectively addressed the project's needs. The criteria used to evaluate each alternative were carefully selected to accurately measure how well each alternative aligned with the project's purpose. Figure 1-2 provides a general overview of the process employed during this study, and Table 1-2 briefly describes each step in the process.

Figure 1-2 Feasibility Study Process and Approach

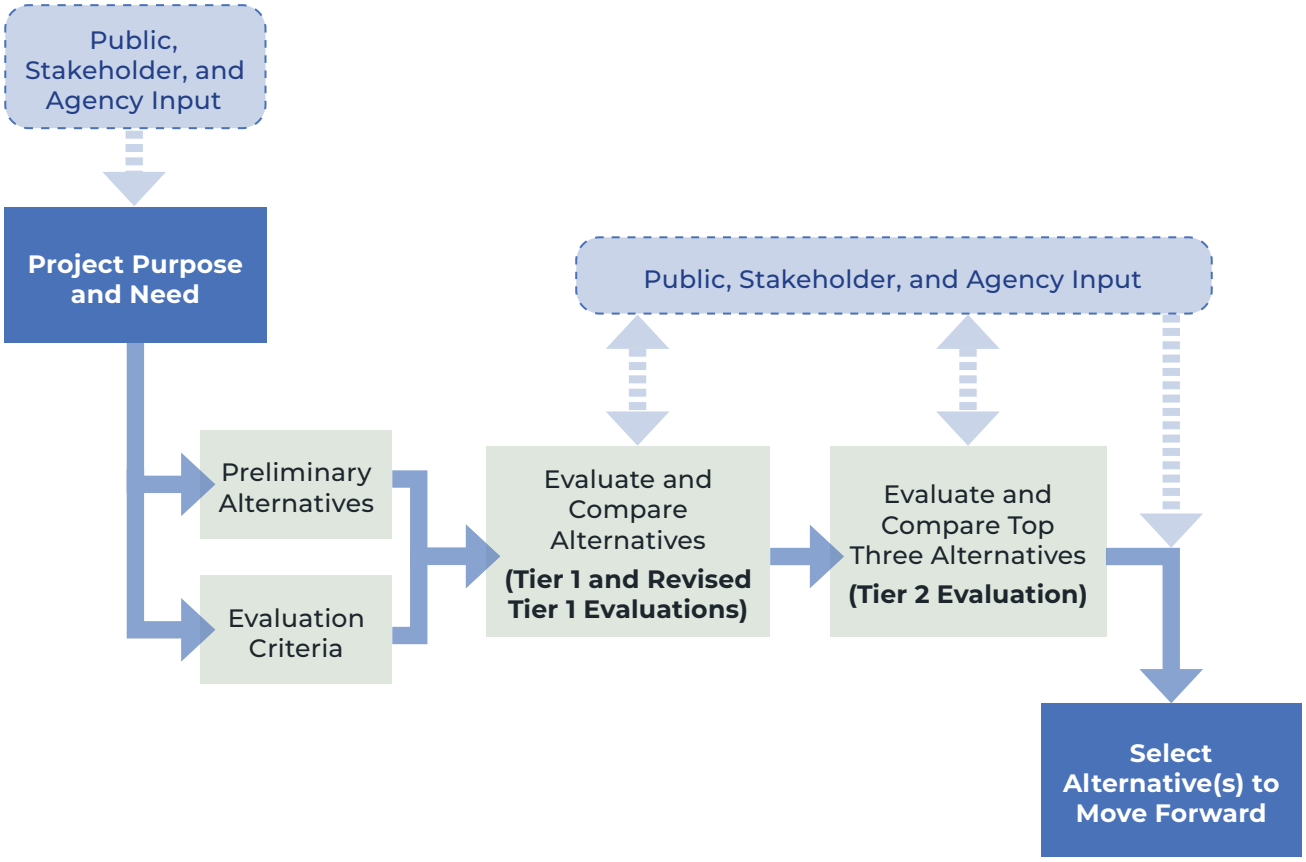


Table 1-2 Feasibility Study Process and Approach

Step	Activity
1	To kick off the project, the County and WSDOT met and interviewed key stakeholders and held a webinar to collect public comments and concerns. A public survey was also conducted to obtain community concerns regarding current travel conditions on I-90 in the study area.
2	Based on the information provided from the outreach process, the purpose for evaluating and confirming the needs to the I-90 corridor were confirmed. The study area and priority of needs were refined.
3	Based on the purpose and need stemming from public input, alternative solutions were identified. Measures to rate the effectiveness of the alternatives (how they met the purpose and need of the project) were also developed.
4	The alternatives were evaluated (Tier 1 Evaluation) based on the criteria. As part of this analysis, the current, existing conditions within the study area were documented in support of the evaluation. Traffic modeling was performed to assess current and future conditions on I-90 during periods of issues.
5	Findings from the initial Tier 1 Evaluation were presented to the M2 and M3 Teams. Based on input from the M2 Team, the evaluation criteria were revised, and a Revised Tier 1 Evaluation was performed.
6	Following the Revised Tier 1 Evaluation, the three alternatives that scored the highest in their ability to solve the challenges along the I-90 corridor in the study area were identified.
7	The top three alternatives were then evaluated against each other, with some criteria modified or updated to further differentiate the three alternatives.
8	Based on public and stakeholder input, as well as discussion between the County and WSDOT, an alternative was chosen to move forward for further design and environmental analysis, pending project funding.

2 RANGE OF ALTERNATIVES

This chapter presents the range of conceptual alternatives that were considered as part of this feasibility study. These alternatives were developed through a collaborative process, incorporating feedback from the community and stakeholders, as well as input and guidance from Kittitas County (the County) and the Washington State Department of Transportation (WSDOT). Alternatives development was focused on addressing the project's overarching purpose: to enhance mobility and connectivity in the study area while ensuring continued and improved safety.

The seven alternatives considered include three situated within the existing I-90 right of way, one representing the no-build scenario (reflecting existing conditions), and three alternatives involving the widening of existing roadways or the creation of new ones (see Figure 2-1).

Once an alternative(s) is selected to move forward into the next phase of analysis, the concepts presented in this chapter will be further refined and designed. As part of the design, WSDOT's Complete Streets process will be incorporated into the process, as appropriate. Complete Streets is an approach to planning, designing, building, operating, and maintaining the transportation system that enables safe and convenient access to destinations for all people, including pedestrians, bicyclists, motorists, and transit riders. It uses a set of tools or treatments that create a more balanced and resilient transportation system.

Chapter Overview

- General description of alternatives
- Other near-term solutions

Figure 2-1 Range of Alternatives

2.1 No Build Alternative (Existing Conditions)

This alternative would leave I-90 between MP 70 and MP 85 in its current configuration, with no changes to its posted speed, lane width, or access points. The No Build Alternative is referred to as Alternative 6 throughout this document.

Description

This section of I-90 provides two 12-foot wide lanes in each direction, with inside shoulders of 5 feet and outside shoulders of 10 feet. The median is a 66-foot-wide grassy area, which currently serves as storage for snow during severe winter conditions. Current posted speeds along this section of I-90 are 70 mph. Figure 2-2 shows a perspective rendering of the existing conditions.

Considerations

- Based on a 2019 analysis performed along this corridor (Appendix A), key results indicated congestion along I-90 is heaviest during summer weekends and major holidays (Memorial Day, 4th of July, and Labor Day).
- During these periods of congestion, speeds drop from an average of 70 mph to 10 mph on I-90, and increase by approximately 5 mph on county roads, reflecting that non-local travelers tend to speed along the local roads as they avoid I-90 congestion.
- On those specific holiday weekends, congestion lasts for 10 hours on I-90, while diversion and increased speed lasts approximately 6 hours on the county roads.

Figure 2-2 No Build Conditions (Alternative 6)

2.2 Alternative 1: Widen I-90 on the Outside

Alternative 1 would widen I-90 on the outside to add one new lane in each direction. Existing lane widths would not change, nor would the existing median and inside shoulder. The new lane would be 12 feet wide with a new outside shoulder of 10 feet (in both directions) and inside shoulders of 4 to 10 feet.

The new roadway would result in three lanes in each direction. Most of the land required for expansion is located within existing WSDOT right-of-way, though some additional property will be required.

Figure 2-3 presents the general alignment for Alternative 1 (as well as Alternatives 2 and 3, presented later in this chapter). Figure 2-4 shows a perspective cross-section of the proposed alternative.

Considerations

- Widening would occur primarily within existing WSDOT right-of-way.
- Some private property impacts would occur at MP 74.
- Property impacts to Washington State Department of Fish and Wildlife at MP 79.1 due to realignment.
- Median would stay intact, allowing for continued use for WSDOT maintenance.
- Both Cle Elum River Bridges 90/134N and 90/134S would need to be replaced at MP 80.85.
- Widening towards the median would still be required to locations to avoid larger impacts.
- Most existing bridges spanning over the I-90 corridor would need to be replaced.
- This alternative assumes the replacement of all culverts and stream structures to the current requirements for fish or hydraulic demand.
- Stormwater treatment facilities may require additional property needs due to reduction of width in the right of way.
- This option provides the ability for WSDOT Maintenance and/or contractors to close a single lane on I-90 during daytime hours and maintain two lanes of traffic.

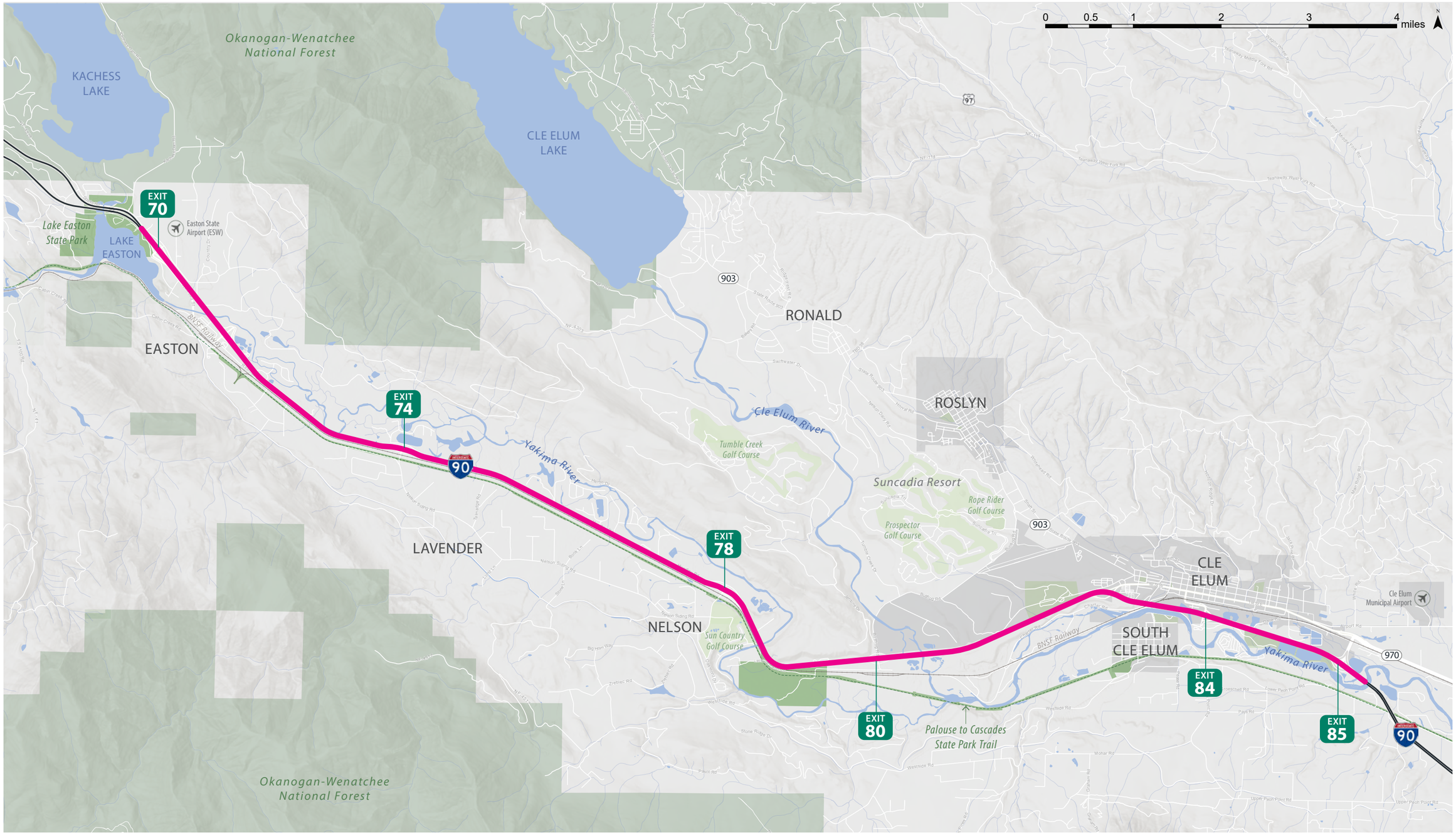


Figure 2-3 Alternatives 1, 2, and 3 – General Alignment

Figure 2-4 Alternative 1 – Proposed Configuration

2.3 Alternative 2: Widen I-90 in the Median

Alternative 2 would widen I-90 on the inside to add one new lane in each direction. Existing lane widths would not change, nor would the existing outside shoulder. The median would be used for the two new lanes and a new inside shoulder; the new lanes would be 12 feet wide with a new inside shoulders of 4 to 10 feet (in both directions).

The new roadway would result in three lanes in each direction. Most of the land required for expansion is located within the existing WSDOT right-of-way.

Figure 2-3 presents the general alignment for Alternative 2. Figure 2-5 shows a perspective cross-section of the proposed alternative.

Considerations

- Widening would occur within existing WSDOT right of way (median).
- Additional median barriers/cable barriers would be required due to the reduction in the clear zone.
- Interior existing lanes would need to be replaced to change the cross slope of the road to drain to the outside.
- Median width would be decreased, possibly interfering with current WSDOT maintenance and emergency vehicle use.
- Property impacts to Washington State Department of Fish and Wildlife at MP 79.1 due to realignment.
- Both Cle Elum River Bridges 90/134N and 90/134S would need to be replaced at MP 80.85.
- This alternative assumes the replacement of all culverts and stream structures to the current requirements for fish or hydraulic demand.
- Widening towards the outside would still be required in select locations to avoid larger impacts.
- This option presents the least risk of affecting or necessitating the replacement of the current bridges spanning the I-90 corridor. The center barrier would be constructed around the existing center piers. However, it's important to acknowledge that many of the bridges in this corridor are approaching the end of their designed lifespans and might require replacement regardless of efforts to avoid impacts.
- This option provides the ability for WSDOT Maintenance and/or contractors to close a single lane on I-90 during daytime hours and maintain two lanes of traffic.

Figure 2-5 Alternative 2 – Proposed Configuration

2.4 Alternative 3: Widen I-90 in the Median, Reversible Lanes

Alternative 3 is based on an approach to add flexibility to the I-90 corridor by adding more lanes in the direction of traffic when at the times they are most needed. This alternative would add two new lanes within the existing I-90 median. The direction of the two lanes would change direction based on peak demand (for example, Sunday westbound, Friday eastbound). This alternative would create four lanes in the direction during the days/hours when traffic is heaviest. Access into the reversible lanes would occur only at MP 70 and MP 85 with potential intermediate access points. Additionally, opportunities for emergency service vehicles to exit at various locations would be provided. Interlocal traffic would generally not use the reversible lanes while long-distance commercial freight and those looking to get through this section without stopping would use this bypass route during peak travel times.

Existing lane widths on I-90 would not change, nor would the existing outside shoulder. The median would be used for the two new lanes, barriers from existing I-90 lanes, and new inside shoulders. Each new lane would be 12 feet wide with new inside shoulders of 4 to 10 feet. Most of the land required for expansion is located within the existing WSDOT right-of-way.

Figure 2-3 presents the general alignment for Alternative 3. Figure 2-6 shows a perspective cross-section of the proposed alternative.

Considerations

- Widening would occur within existing WSDOT right of way (median).
- Median width would be decreased, possibly interfering with current WSDOT maintenance strategies.
- During non-peak travel times, reversible lanes could be offline or not operational.
- Congestion in the non-peak direction would occur during the heaviest travel periods.
- Access to the reversible lanes would be limited to MP 70 and MP 85.
- Median barriers would delineate the new lanes.
- The alignment of the new lanes within the existing median would vary to avoid impacts and also accommodate constructability.
- This alternative assumes the replacement of all culverts and stream structures to the current requirements for fish or hydraulic demand.
- Property impacts to Washington State Department of Fish and Wildlife at MP 79.1 due to realignment.
- This option would not trigger the replacement of the Cle Elum River Bridges 90/134N and 90/134S at MP 80.85. An independent structure has been constructed previously in the median between the existing bridges (2022 Bridge Painting Project).
- Widening towards the outside of the existing roadway would still be required in select locations where median width is not available.
- Most existing bridges spanning over the I-90 corridor would need to be replaced due to impacts to the center pier.

- Existing on and off ramps between MP 70 and MP 85 would not require alteration unless the new bridge overcrossing.
- This alternative may be conducive to providing an emergency detour/bypass route when incidents require the closure of the existing eastbound or westbound I-90 lanes within MP 70 and 85 (collisions, wildfires, roadway repairs).
- This option allows WSDOT Maintenance or contractors to fully close two lanes of I-90 in either direction and be able to perform construction, maintenance, and preservation duties in the safest work zone environment.
- Commercial truck weigh station notifications, methods, or locations would need to be relocated before MP 70 and MP 85 before entering the bypass/reversible lanes.

Figure 2-6 Alternative 3 – Proposed Configuration

2.5 Alternative 4A: North – SR 903

Alternative 4A was developed to explore whether improvements outside the interstate system could address the identified project needs. This alternative focuses on areas north of I-90, starting at SR 903 near Cle Elum Lake and extending to I-90 at MP 70. The primary objective of this alternative is to offer an alternative route for communities and businesses without relying solely on I-90 between MP 70 and MP 85. It involves constructing approximately 12 miles of new roadway and widening existing roads to add capacity, featuring two 12-foot lanes in each direction with 6-foot shoulders adjacent to each lane. Upgrades will be made to existing roads such as Lake Cle Elum Dam Road, Tumble Creek Drive, various Forest Roads, and Sparks Road (East and West) to meet current roadway design standards. Some sections will require constructing new roads on undisturbed terrain or utilizing existing gravel maintenance roads, while other sections will involve using existing roads with one 12-foot wide lane in each direction.

Figure 2-7 shows a conceptual cross-section of Alternative 4A. Figure 2-8 presents the general alignment for the proposed alternative.

Considerations

- Provides an alternative route for the Ronald and Roslyn community.
- Provides a new emergency route for the communities if a major failure occurs on Interstate 90.
- Creates a new fire break and access for wildland firefighters.
- Could provide a connection from Lake Cle Elum to the Palouse to the Cascades State Park Trail.
- Alternative length is long based upon steep terrain where existing roads do not exist. Grading for a roadway would result in major land transformation to the existing area along the corridor.
- New bridge structures would be required across Cle Elum River and side channels.
- This volume of new roadway in a river area is a very high risk to culturally sensitive areas (fatal flaw element).
- This alternative could provide economic growth opportunities if land use zoning changes were modified.
- Impacts to Endangered Species Act (ESA) listed fish and terrestrial species as well as to aquatic resources.
- Potential impacts to historic and cultural sites, as well as parks and recreational facilities.
- Could impact wildlife connectivity.

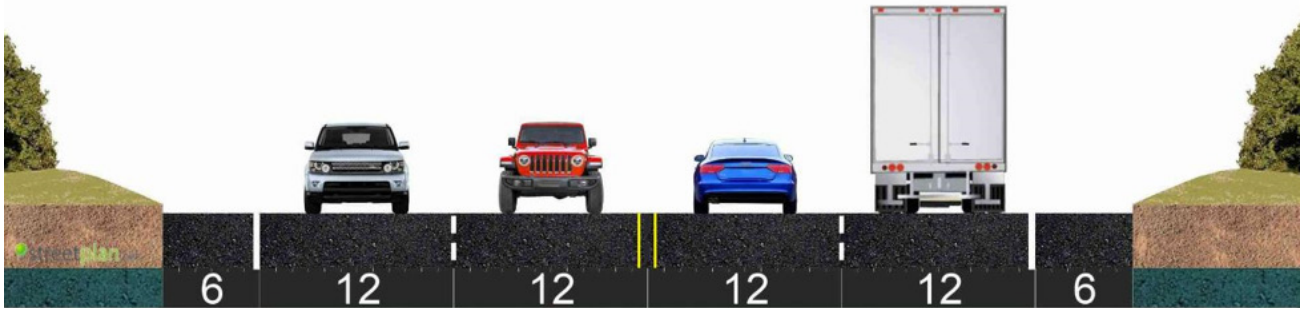


Figure 2-7 Alternative 4A – Conceptual Cross-Section

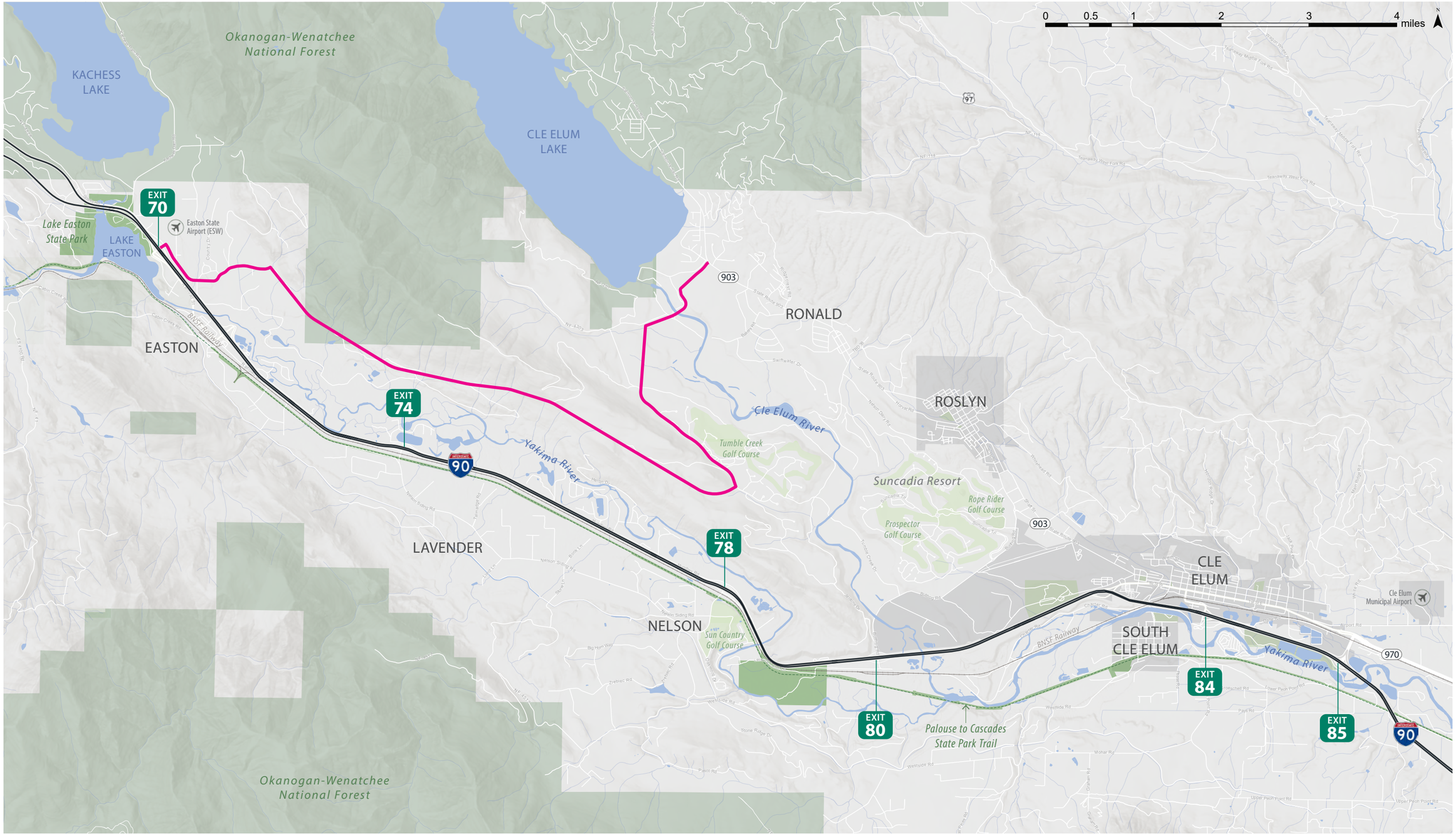


Figure 2-8 Alternative 4A – General Alignment

2.6 Alternative 4B: North – Bullfrog Road

Alternative 4B was formulated to investigate whether enhancements outside the interstate system could meet the identified project requirements. This option concentrates on a route less impactful to undisturbed areas around the outlet of Lake Cle Elum and the riparian area of the Cle Elum River and establishing a more parallel collector-distributor route north of I-90, commencing at Bullfrog Road just south of Suncadia and Roslyn and connecting to I-90 at MP 70. Spanning approximately 10 miles, this alternative involves both new construction and upgrades to existing roadways. Parts of the route will run alongside existing power line right-of-ways and access roads. The new roadway will feature two 12-foot lanes in each direction with 6-foot shoulders adjacent to each lane. Additionally, certain existing roadways like Bullfrog Road, Jenkins Drive, Heron Drive, and Sparks Road (East and West) will be widened and straightened. Currently, these roads have one lane in each direction, with lanes approximately 12 feet wide.

Figure 2-9 shows a conceptual cross-section for Alternative 4B. Figure 2-10 presents the general alignment for the proposed alternative.

Considerations

- Provides an alternative route for Roslyn and Suncadia.
- Could provide a connection or paralleling non-motorized route to the Palouse to Cascades State Park Trail.
- Provides a new emergency route for the communities if a major failure occurs on Interstate 90.
- Creates a new fire break and access for wildland firefighters.
- Grading for a roadway would result in major land transformation to the existing area along the corridor.
- This volume of new roadway in a forested area near streams is a very high risk to culturally sensitive areas (fatal flaw element).
- This alternative could provide economic growth opportunities if land use zoning changes were modified.
- Impacts to ESA listed fish and terrestrial species as well as to aquatic resources.
- Potential impacts to historic and cultural sites, as well as parks and recreational facilities.
- Could impact wildlife connectivity.

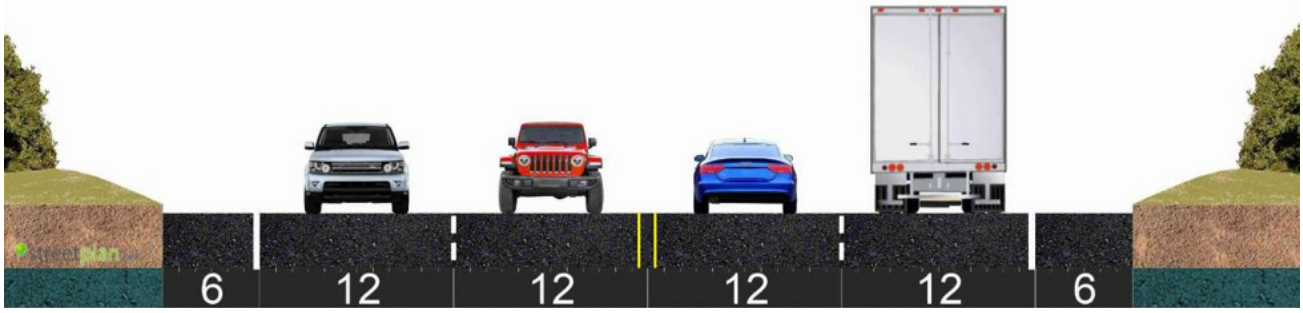


Figure 2-9 Alternative 4B – Conceptual Cross-Section

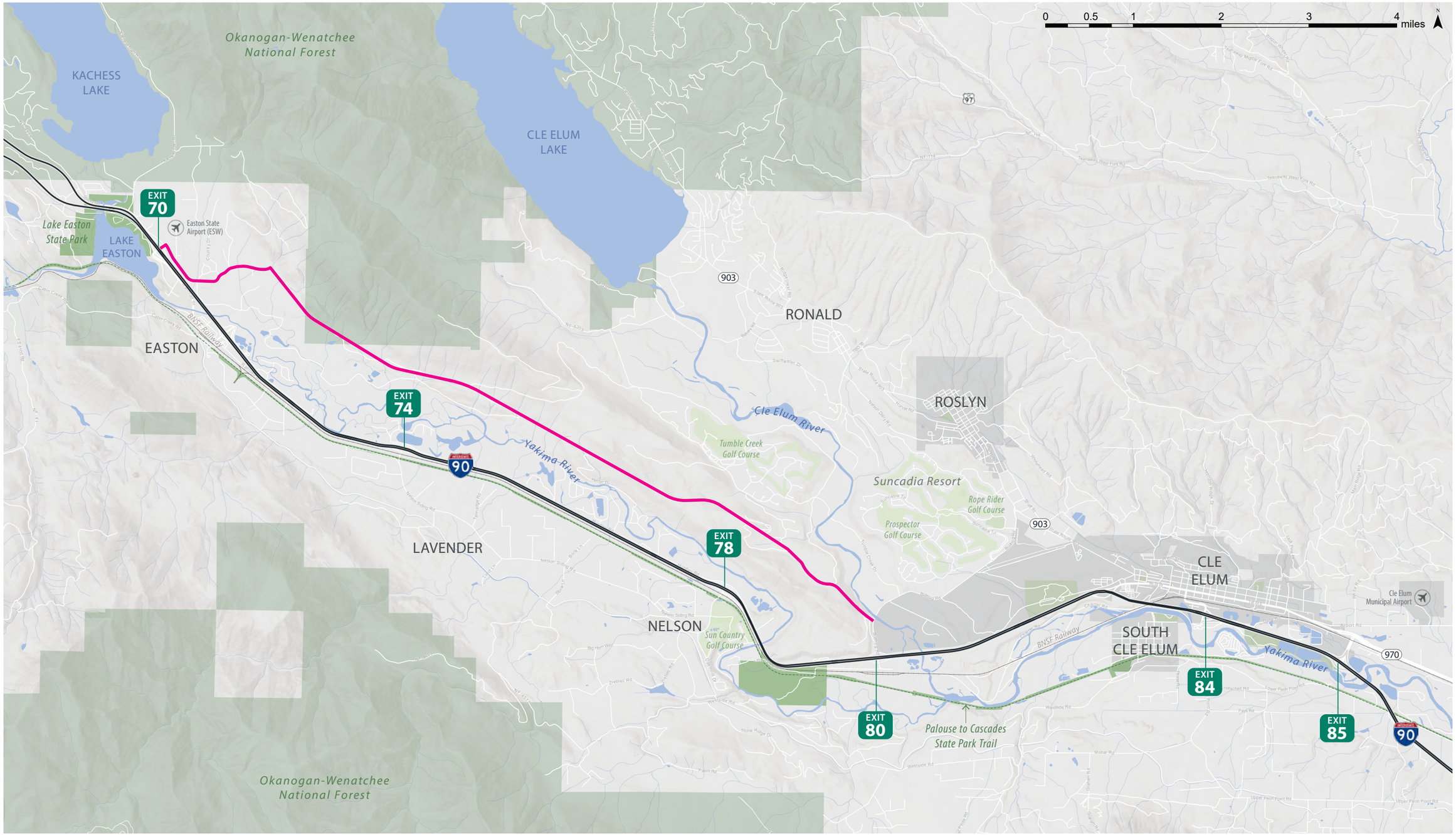


Figure 2-10 Alternative 4B – General Alignment

2.7 Alternative 5: South

Alternative 5 was proposed as a means to assess non-interstate enhancements south of the I-90 corridor, aiming to meet the needs of the community. This alternative explores the possibility of upgrading the current roadway serving as an I-90 bypass route to accommodate increased traffic volumes and speeds during times of congestion on I-90. The upgraded corridor would enhance capacity and connectivity between Easton and Cle Elum, bypassing the I-90 roadway. The proposed realignment would start at Exit 70 and reconnect to I-90 at Exit 85. To achieve this, a total of four lanes (adding one new lane in each direction) would be incorporated into Lake Easton Road, Railroad Street, Nelson Siding Road, Westside Drive, and Lower Peoh Point Road. Some segments of the alignment might require the construction of entirely new roads, each featuring two lanes in each direction. These roadways would consist of two 12-foot lanes in each direction with 6-foot shoulders adjacent to each lane. Currently, existing roadways primarily feature one lane in each direction, with lanes approximately 12 feet wide.

Figure 2-11 shows a conceptual cross-section for Alternative 5. Figure 2-12 presents the general alignment for the proposed alternative.

Considerations

- Provides an alternative route for Nelson and South Cle Elum.
- Route is currently often used by travelers when I-90 traffic is congested.
- This route would require multiple bridge structures over streams and creeks, including one over the Yakima River.
- The new bridge structure over the Yakima River would impact proposed restoration work happening along the Yakima River at Hanson Ponds.
- This would create a new southern connection to the existing interchange at MP 85 to better serve access to South Cle Elum.
- Provides a more efficient emergency route for the communities if a major failure occurs on Interstate 90.
- Grading for a roadway would result in major land transformation to the existing area along the corridor.
- This route moves through areas of existing rural residential developments and communities.
- This volume of new roadway expansion in undisturbed areas near streams is a very high risk to culturally sensitive areas (fatal flaw element).
- This alternative could provide economic growth opportunities if land use zoning changes were modified.
- Impacts to ESA listed fish and terrestrial species as well as to aquatic resources.
- Potential impacts to historic and cultural sites, as well as parks and recreational facilities.
- Could impact wildlife connectivity.

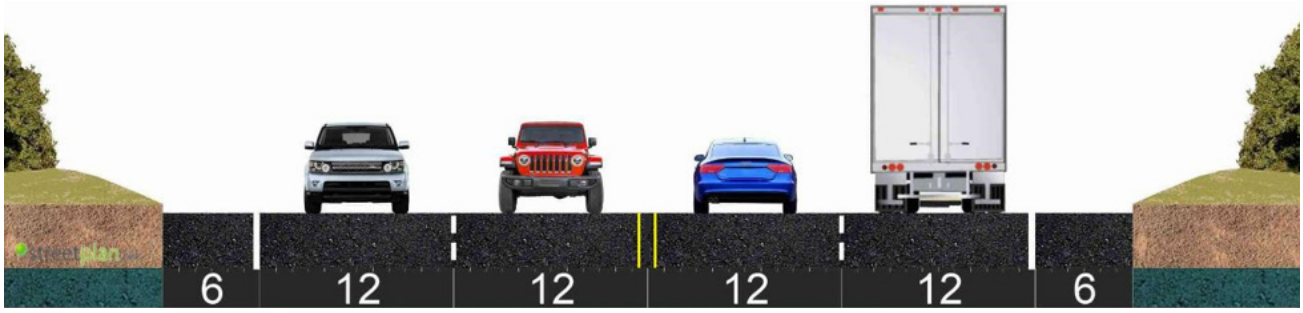


Figure 2-11 Alternative 5 – Conceptual Cross-Section

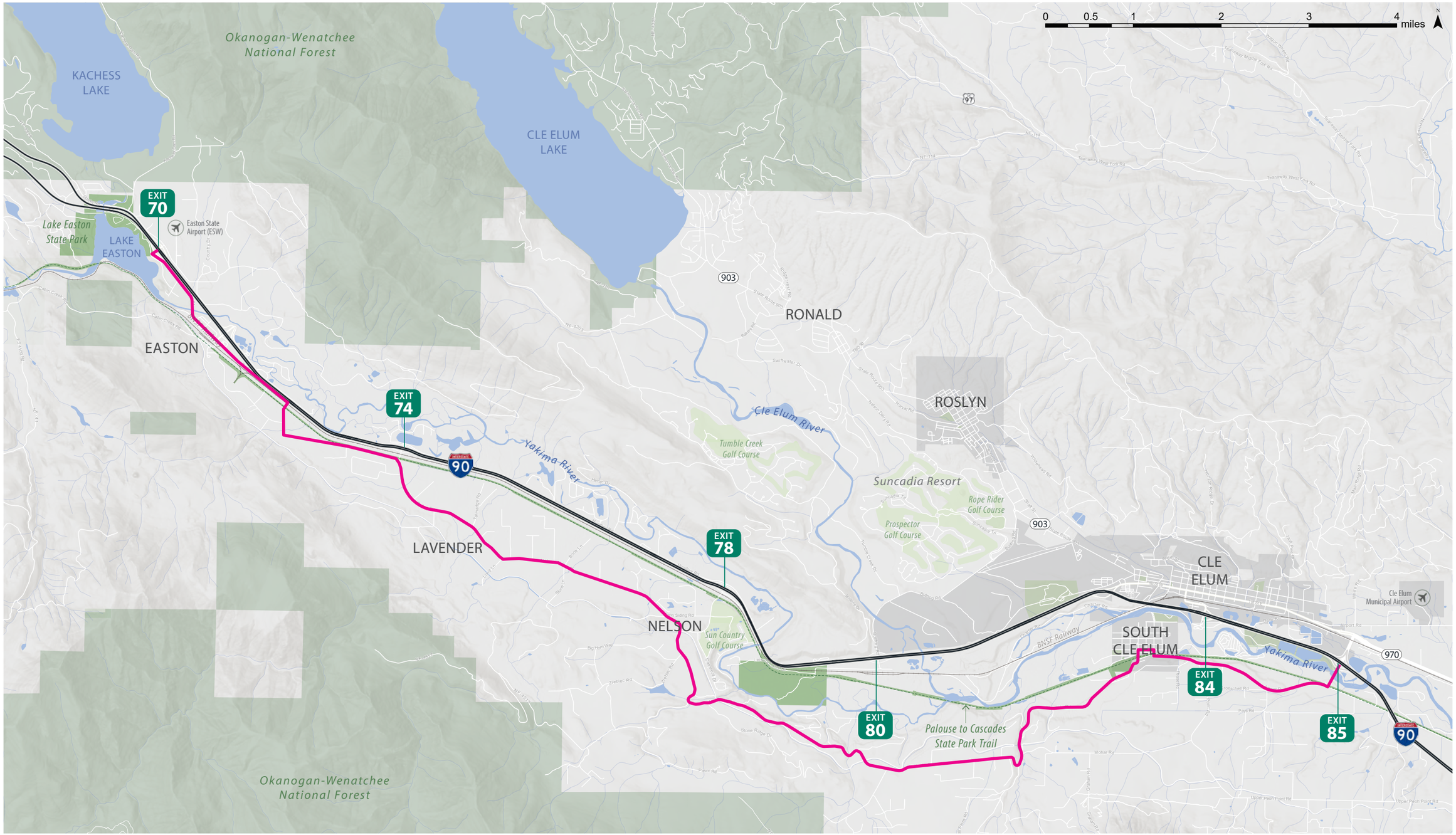


Figure 2-12 Alternative 5 – General Alignment

2.8 Other Potential Improvements

Apart from the alternatives outlined earlier, various other initial alternatives were identified and deliberated upon during stakeholder meetings, public input sessions, and M2 Team meetings. While these suggested improvements hold value in enhancing the corridor or as a short-term action item, they were not deemed comprehensive enough to proceed as part of the Tier 1 analysis. These improvements include the following:

County Road Safety Improvements

In recent years, a number of techniques and tools have been considered by the County to increase safety and decrease congestion along County roads. The County and local agencies can continue to work with the public and stakeholders to further consider and implement various safety features, such as new striping and signage. Local and County law enforcement can increase patrols along County roads to discourage speeding in residential areas.

Intelligent Transportation System (ITS) Infrastructure

The alternative of incorporating additional Intelligent Transportation System (ITS infrastructure was considered, which involves integrating more advanced messaging signs, speed reduction signs, closed-circuit television (CCTV) monitoring, and traffic monitoring devices. These enhancements aim to alert drivers about a change in conditions, congestion, collisions blocking the roadway, and slow speeds ahead of the study area, enabling them to avoid potential issues.

However, this option was not advanced as an independent Tier 1 alternative.

- ITS infrastructure is already in place along the I-90 corridor and is continually being upgraded.
- WSDOT has diversified their public outreach methods such as text messaging, website notices, commercial vehicle systems, and cell phone applications, which effectively provide early notifications to drivers.
- The implementation of ITS is an existing WSDOT policy for any new project, especially concerning interstate improvements. It's understood that with any proposed alternatives on I-90, additional and upgraded ITS components would already be included in the project scope of work.

Commercial Truck Parking Facilities

Based on input from stakeholders and local business leaders, parking facilities either in or outside the existing I-90 right of way were suggested. These independent facilities could be implemented independently from this project and funded privately or with public funds.

This initiative aims to alleviate issues such as trucks parking on the side of the interstate, occupying on and off-ramp shoulders, and parking in adjacent communities while awaiting deliveries to regional ports or for closed roadways to reopen. This proposal emerged consistently during interviews with stakeholders and local communities. However, while such facilities could assist trucks during delivery wait times and closures, they do not fully address the majority of the purposes and needs identified in this study.

There is a clear demand and necessity for additional truck parking. Integrating such facilities into any of the identified I-90 alternatives or developing them as standalone projects in collaboration with local public agencies or private entities would be highly beneficial. Currently, ongoing efforts are being made to address this specific concern by various public agencies:

- WSDOT is currently evaluating potential opportunities to expand truck parking at safety rest areas and commercial vehicle inspection sites along Interstate 5 and Interstate 90.
- WSDOT is coordinating with local governments, ports, and private entities in developing recommendations for state assistance in the development of private truck parking sites, including a feasibility analysis of sites adjacent to Interstate 90 near North Bend.
- The Washington State Freight Mobility Strategic Investment Board (FMSIB), in consultation with WSDOT, is developing an implementation plan for truck parking solutions.[1] FMSIB designated strategic freight corridors in 2023 and will soon begin prioritizing these corridors and addressing related issues, which may include the development of truck parking facilities.

Passenger Rail

The Federal Railroad Administration (FRA) is currently conducting a rail study which is reevaluated discontinued long distance passenger rail service in the United States. As part of this study, a stakeholder group

1 https://wsdot.wa.gov/construction-planning/statewide-plans/freight-plans

from Washington State has been stressing the importance of evaluating train service from Seattle to central Washington, including stops in Kittitas County and through Yakama. The current train service, although it does travel to Spokane from Western Washington (and Portland, OR) travels along a northern route and does not provide service to residents and travelers in Kittitas. The rail study, *FRA Long Distance Rail Study*, is in the early stages of working with stakeholders and collecting information.[2]

In addition, in June 2020, the Washington Legislature directed the Joint Transportation Committee to study the potential for passenger rail service that would serve Auburn, Ellensburg, Yakima and the Tri-Cities. The study, *Feasibility of an East-West Intercity Passenger Rail System for Washington State*, concluded that ridership "is not expected to be high due to long journey times and relatively low number of long-distance car trips today." The study is expected to be completed by year end 2024.[3]

2 https://fralongdistancerailstudy.org/

3 https://leg.wa.gov/JTC/Documents/Studies/East%20West%20Rail/EastWestRail_FinalReportJune2020.pdf

3 EXISTING CONDITIONS IN THE STUDY AREA

The study area is located along the I-90 corridor from Easton to Cle Elum in Upper Kittitas County and includes I-90 and surrounding county and local roads. Communities in the study area include Easton, Cle Elum, South Cle Elum, Roslyn, Nelson, and Ronald. The following sections provide an overview of the current transportation and traffic conditions along the roadways, as well as existing environmental and community conditions within the study area.

Each section is organized based on the project goals and evaluation criteria discussed in Chapter Four.

Chapter Overview

Current conditions in the study area for:

- Safety
- Transportation and Freight Mobility
- Environment
- Resilience and Equity

3.1 Safety

The safety discussion includes information regarding collisions along I-90, as well as surrounding County roads. In addition, common emergency and evacuation routes are also discussed, including typical responders.

3.1.1 Existing Crash Assessment

An assessment of existing crash history was performed to determine overall trends/deficiencies on the I-90 corridor in the study area. The existing safety assessment of the I-90 corridor is focused on both eastbound and westbound travel lanes between Easton and Cle Elum. The Washington Department of Transportation (WSDOT) provided existing crash history data on this portion of I-90 and local roads in the study area for the most recent complete six years (2018 through 2023). The existing crash data is summarized in the following sections.

I-90 Crash History

Existing data includes 756 crashes that occurred on the I-90 mainline between mileposts (MP) 70 and 85 during the six-year period. This averages a total of 126 crashes per year or roughly one every three days.

As shown in Table 3-1, the most common collision types on this section of I-90 include rear-ends (24%), a vehicle hitting a barrier or median (17%), and a vehicle hitting an animal (predominantly deer and elk; 16%).

As illustrated in Table 3-2, 74 percent of all crashes that occurred on this portion of I-90 during the six-year period were property-damage-only crashes. There were eight fatalities and twelve serious injury crashes over the six-year period.

Table 3-1 Collision Types along I-90 in the Study Area, 2018 through 2023

Collision Type	Crashes	% of Total
Barrier/Median	131	17%
Struck Animal	119	16%
Object/Road Debris	57	8%
Vehicle Overturned	40	5%
Rear End	180	24%
Side-swipe	86	11%
Snow/Earth Bank	44	6%
Over Embankment/ Ditch	30	4%
Other*	69	9%
Total	**756**	**100%**

Source: WSDOT, January 30, 2024

** Note: "Other" collision types include, but are not limited to: fire started in vehicle; jackknife trailer; vehicle struck pedestrian; one parked - one moving; and from same direction - all others*

Table 3-2 Collisions by Injury Severity along I-90 in the Study Area, 2018 through 2023

Injury Severity	Crashes	% of Total
Fatal	8	1%
Serious Injury	12	2%
Minor Injury	73	10%
Possible Injury	97	13%
Property Damage Only (PDO)	558	74%
Unknown	8	1%
Total	**756**	**100%**

Source: WSDOT, January 30, 2024

Table 3-3 Injury Severity by Collision Type along I-90 in the Study Area, 2018 through 2023

Injury Severity	Barrier/ Median	Struck Animal	Object/ Road Debris	Vehicle Overturned	Rear End	Side-swipe	Snow/Earth Bank	Over Embank-ment/Ditch	Other*
Fatal	3	0	1	1	0	0	0	1	2
Serious Injury	1	1	2	2	3	0	1	2	0
Minor Injury	9	7	7	8	22	3	8	6	3
Possible Injury	16	8	6	9	37	4	4	6	7
Property Damage Only (PDO)	101	102	41	17	118	79	29	14	57
Unknown	1	1	0	3	0	0	2	1	0
Total	**131**	**119**	**57**	**40**	**180**	**86**	**44**	**30**	**69**

Source: WSDOT, January 30, 2024

** Note: "Other" fatal collision types included: vehicle struck pedestrian; and one parked - one moving*

Table 3-4 Injury Severity by Time of Year along I-90 in the Study Area, 2018 through 2023

Injury Severity	Spring (Mar–May)	Summer (Jun–Aug)	Fall (Sep–Nov)	Winter (Dec–Feb)
Fatal	4	2	1	1
Serious Injury	2	3	6	1
Minor Injury	12	27	17	17
Possible Injury	18	36	13	30
Property Damage Only (PDO)	84	159	126	189
Unknown	0	2	1	5
Total	**120**	**229**	**164**	**243**

Source: WSDOT, January 30, 2024

As shown in Table 3-3, the collision type involving a vehicle hitting a barrier or median resulted in the highest percentage of severe injury collisions. Rear end crashes were recorded at the most common collision type, predominantly resulting in less severe injuries or no injury at all.

As presented in Table 3-4, the spring season experienced the fewest overall collisions on this section of I-90, but had the highest percentage of fatal and serious injury crashes (5%). The winter season experienced the highest number of collisions overall, and also the highest percentage of property damage only collisions (78%).

Table 3-5 Injury Severity by Road Conditions along I-90 in the Study Area, 2018 through 2023

Injury Severity	Dry	Ice	Snow/ Slush	Wet
Fatal	7	0	1	0
Serious Injury	8	0	2	2
Minor Injury	48	6	13	6
Possible Injury	66	10	12	9
Property Damage Only (PDO)	340	40	134	44
Unknown	5	1	2	0
Total	**474**	**57**	**164**	**61**

Source: WSDOT, January 30, 2024

As shown in Table 3-5, approximately 65% of all collisions and 75% of all fatal and serious injury collisions on I-90 in the study area occurred during dry road conditions.

Local Roadway Crash History

An assessment of existing crash history was also performed for portions of local roads within Kittitas County where potential roadway improvements may be implemented as part of this project.

Based on County data, there were several roadways that experienced zero crashes during the six-year period, including W Sparks Road, E Sparks Road, Lake Cle Elum Dam Road, S Cle Elum Way, Heron Drive, Tumble Creek Road, Jenkins Drive, Tall Timber Trail, Lake Easton Road, Cle Elum Way, Madison Street, Rossetti Way, and Reservoir Canyon Road.

3.1.2 Emergency Response Services

A number of emergency response agencies operate in the study area, including ambulance, fire, and police services. Depending on where these services are located and where they are dispatched, many use I-90 within the study area and therefore experience current traffic conditions and are impacted by congestion, potentially delaying response times. These services are summarized in the following sections.

Medical

Kittitas County Public Hospital District #2

Kittitas County Public Hospital District #2 provides ambulance services through Upper Kittitas County Medic One and is the only licensed, advanced life support service in Upper Kittitas County. The hospital district also supports a small amount of the care provided at Kittitas Valley Hospital (KVH) Urgent Care – Cle Elum and the Open Door Medical Clinic. The district serves Kittitas County from the King/Kittitas County border at Snoqualmie Pass to the Elk Heights area (about 7 miles southeast of Cle Elum).[1]

Fire

Fire District 3 – Easton

Kittitas County Fire District 3 provides fire protection and emergency response services to the residents of Easton and the surrounding areas.

Fire District 6 – Ronald

The Kittitas County Fire District 6 service area covers 17.2 square miles, serving all of Ronald, Lake Cle Elum, Salmon La Sac north to Hex Mountain, and parts of Suncadia. The district operates three stations and shares automatic mutual aid with Cle Elum Fire Department, Roslyn Fire Department, and Hospital District 2. It also provides mutual aid to Districts 1, 3, and 7 as requested.

Fire District 7 – Cle Elum

Kittitas County Fire District 7 is the largest fire district in the Upper Kittitas County area, covering 126 square miles around the communities of Cle Elum, South Cle Elum, Roslyn, and Ronald. The district provides services from eight stations with 16 full-time firefighters and 52 volunteer firefighters, averaging over 800 calls annually. The district is the primary backup transporting agency for Kittitas County Public Hospital District #2.

In addition to 19 miles of I-90, Kittitas County Fire District 7 covers approximately 20 miles along SR 970, extending to SR 97 up to the top of Blewett Pass. This accounts for many collisions, extrications, and accident responses during the busy summer weekends and snow-covered winter months.[2]

City of Cle Elum Fire Department

The Cle Elum Volunteer Fire Department has two stations and 42 volunteers. The department is responsible for approximately five square miles of area in Kittitas County and receives a current call volume of over 500 calls a year.[3]

1 https://www.ukcmedicone.org/
2 https://kcfd7.org/
3 https://www.cleelumfire.com/

City of Roslyn Fire Department

The Roslyn Fire Department is a volunteer department serving the residents of Roslyn and the surrounding areas with one station.

Town of South Cle Elum Fire Department

The South Cle Elum Fire Department is a volunteer department serving South Cle Elum with one station.

Kittitas Valley Fire and Rescue

Kittitas Valley Fire and Rescue (KVFR) provides mutual aid throughout all of Kittitas County.

Law Enforcement

Kittitas County Sheriff's Office / Search and Rescue

The Kittitas County Sheriff's Office, located in Ellensburg, serves the entire county. The Sheriff's Office is comprised of around 40 officers and is headed by the County Sheriff.[4] Additionally, Kittitas County Search and Rescue (KCSR) is an all-volunteer, non-profit organization whose mission is to provide personnel for the Sheriff's Office to conduct search, rescue, recovery, and evacuation operations, primarily within Kittitas County. KCSR does not act in any capacity except at the direction of the Sheriff's Office.[5]

Cle Elum-Roslyn Police Department

The Cle Elum-Roslyn Police Department has the unique responsibility of providing law enforcement services to the citizens of Cle Elum and Roslyn. These services include traffic safety, community policing, vehicular crash investigation, crime prevention and investigation, and public education. The department consists of a Chief, Corporal, seven patrol officers, and one part-time animal control officer, with at least one patrol officer on-duty at all times.

Depending upon the location of the emergency, and the office/service being dispatched, I-90, as well as surrounding County roads, are used to respond.

3.1.3 Evacuation Routes

I-90 is a major thoroughfare through the study area, and therefore also serves as an evacuation route in case of natural disasters or other emergencies. Because it is generally well-maintained and less susceptible to closures due to weather conditions compared to alternative routes through mountain passes, its reliability makes it a preferred evacuation route over local county or city corridors.

Additionally, the communities of Roslyn, Ronald, South Cle Elum, Cle Elum, Easton, and Kittitas County have various mutual service agreements for fire and medical services, making I-90 a critical link between these communities.

4 https://www.co.kittitas.wa.us/sheriff

5 https://kittitassar.org/

3.2 Transportation Demand

The transportation demand discussion includes information regarding traffic conditions on I-90 and surrounding roadways. Also included below is a discussion of other existing transportation facilities in the study area.

3.2.1 Traffic Conditions

I-90 traffic conditions in the study area were reviewed and modeled to determine peak congestion times. These analyses took place in 2019 and 2023 and are discussed below. Modeling and analysis focused on westbound traffic since data indicate traffic is more dispersed in the eastbound direction over various weekend days.

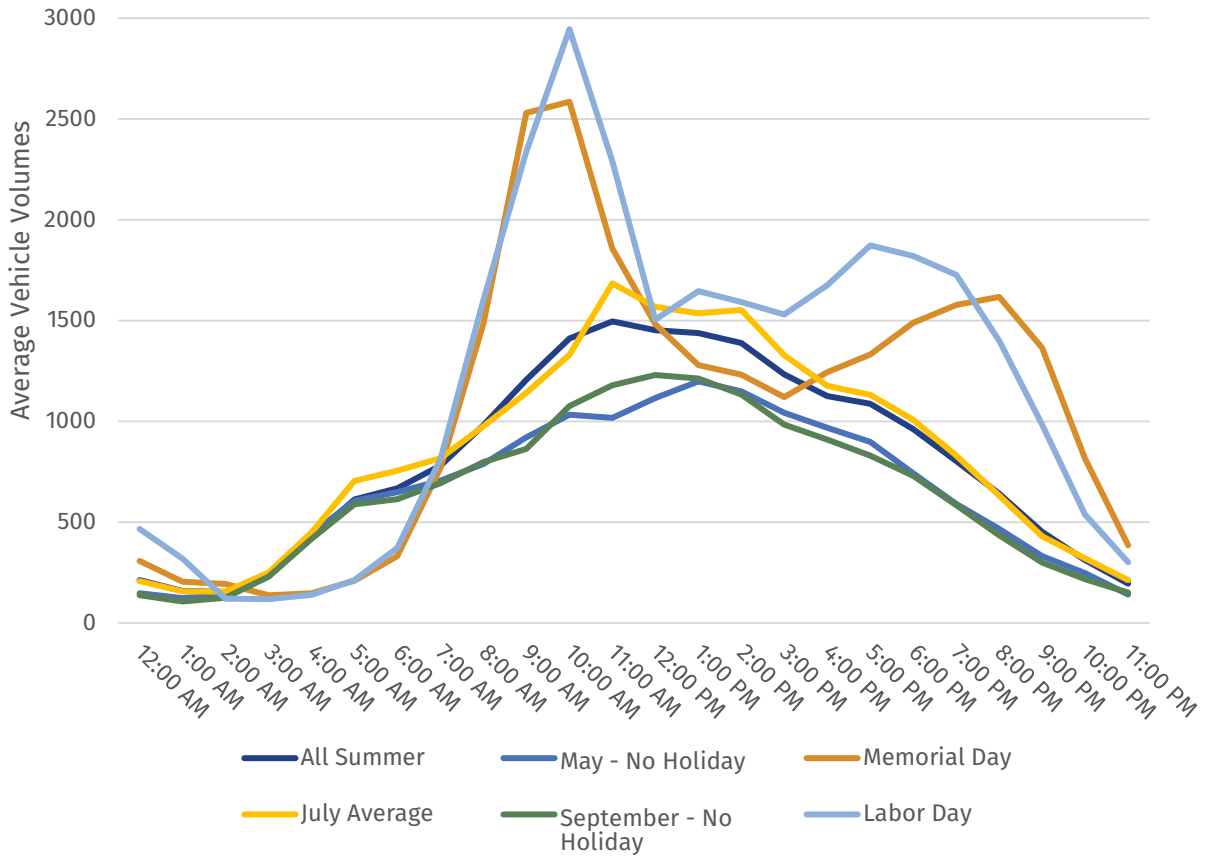
2019 Analysis

An analysis of I-90 and county roads within the Upper Kittitas County area was completed in 2019 (Appendix A), specifically evaluating how holiday traffic congestion on I-90 impacts the local road network. As part of this effort, several potential capital improvements that might address traffic congestion issues stemming from holiday traffic were modeled.

Holiday Congestion

Congestion along I-90 is heaviest during summer weekends and major holidays (Memorial Day, 4th of July, and Labor Day). In the westbound direction, this regularly occurs between MP 70 and MP 93 on Sundays in summer, with the most extreme congestion occurring on the Mondays of Memorial Day and Labor Day holiday weekends. Holiday traffic volumes are approximately four times higher on I-90 and three times higher on county roads than typical days. Speeds drop from an average of 70 mph to 15 mph on I-90, and increase by approximately 5 mph on county roads, reflecting that non-local travelers tend to speed along the local roads as they avoid I-90 congestion. On those specific Mondays, congestion lasts for 12 hours on I-90, while diversion and increased speed lasts approximately 6 hours on the county roads.

Figure 3-1 Monday Summer Westbound Average Vehicle Volumes on I-90 in the Study Area, 2018



Source: WSDOT PTR B04, 2018 data analyzed by Fehr & Peers

2024 Analysis

Based on the existing conditions information collected and analyzed in 2019, an updated model was developed to project how future traffic conditions could potentially change if no improvements were made (see Appendix A).

I-90 in Upper Kittitas County experiences recurring seasonal congestion, particularly at the end of summer weekends and holiday weekends in the westbound direction. This congestion typically causes slower speeds and congestion as far as east of the Elk Heights Road interchange and dissipates when I-90 widens to three lanes in each direction. There is a current WSDOT construction project to widen I-90 from two lanes in each direction to three lanes in each direction from the Cabin Creek Interchange to the West Easton Interchange (scheduled for completion fall 2028).[6]

Average 2018 volumes were collected by a WSDOT permanent traffic recorder and are shown for different Mondays throughout the year in Figure 3-1. Memorial Day and Labor Day volumes peak and then decrease considerably in the late morning hours. This sudden decrease reflects the limited capacity of I-90 under congested conditions.

Speeds decrease and corridor travel times increase considerably during this recurring congestion. According to industry data for

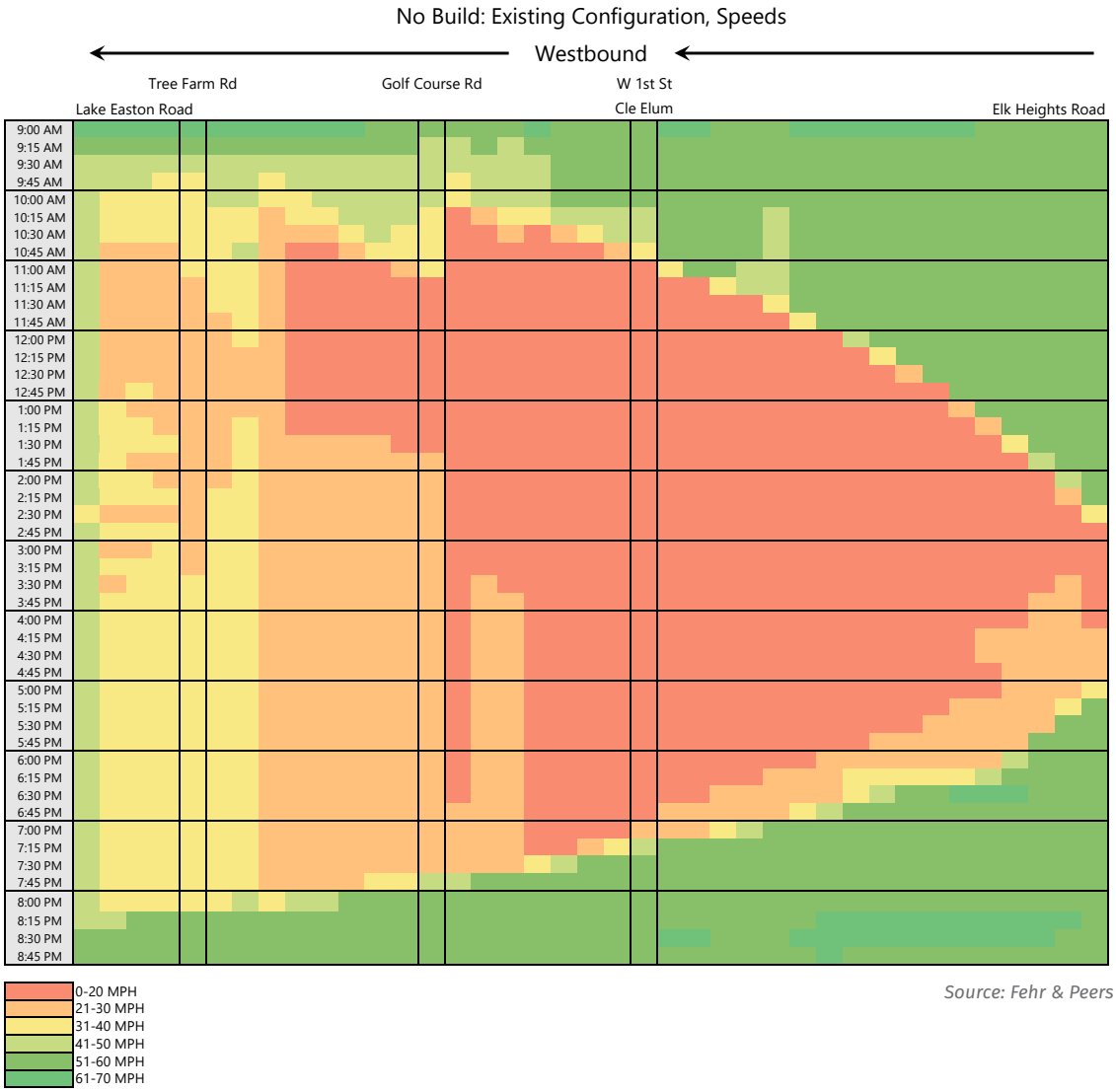
6 https://wsdot.wa.gov/construction-planning/search-projects/i-90-snoqualmie-pass-east-cabin-creek-interchange-west-easton-interchange-phase-3

Memorial Day 2018, average speeds along the corridor decrease from free flow (close to 70 mph) to under 10 mph for long periods of the day and large swaths of the corridor. Travel times from Elk Heights Road to Lake Easton Road increase from about 30 minutes to as much as 150 minutes at the most congested time of the day.

The 2018 model was updated and validated the model against current industry data. The model projected traffic for year 2040, which again reflected the heavy westbound congestion along the corridor with slow speeds through much of the day, as shown in Figure 3-2. The figure shows travel speeds in increments of 10 mph between Elk Heights Road (rightmost column) and Lake Easton Road (leftmost column) by time of day, with 9:00 a.m. to 9:15 a.m. at the top of the figure and 8:45 p.m. to 9:00 p.m. at the bottom.

As shown in Figure 3-2, the congestion begins early in the day near Lake Easton Road, and quickly builds back past Elk Heights Road. Slow speeds in the corridor span from about 10:00

Figure 3-2 Future Year 2040 No Build Modeled Travel Speeds by Time of Day and Location along I-90 in the Study Area on Memorial Day Monday



Source: Fehr & Peers

a.m. to 8:00 p.m., with the peak congestion from about 2:00 p.m. to 4:00 p.m.

3.2.2 Active Transportation Network

As defined by WSDOT, active transportation entails "a human-scale and often human-powered means of travel to get from one place to another"; this includes "walking, bicycling, using a mobility assistive or adaptive device such as a wheelchair or walker, using micromobility devices, and using electric-assist devices such as e-bikes and e-foot scooters."[7] Active transportation facilities in the study area include the Palouse to Cascades State Park Trail and numerous local and regional trails (see Section 3.4.5 and Figure 3-3 for additional detail). I-90 is not open to active travel modes with the exception of bicyclists who are permitted to operate in the right shoulder of the highway per RCW 46.61.160.[8]

Bicyclists regularly use many of the roads in Kittitas County; however, there are few routes that provide specialized facilities to improve conditions for bicyclists in the study area. County roads are generally narrow with deep ditches and small shoulders. Bicyclists appear to more often choose Kittitas County roads that offer wide shoulders and smoother pavement, including Bullfrog Road, Upper Peoh Point Road, and Westside Road in the study area. I-90 is not a designated U.S. Bicycle Route.

3.2.3 Transit Network

Kittitas County Connector

The Kittitas County Connector is a free bus service between Ellensburg and Upper Kittitas County operated by HopeSource and Central Transit. It operates seven days a week, with several departures per day.

7 https://wsdot.wa.gov/business-wsdot/support-local-programs/technical-assistance/active-transportation-services
8 https://app.leg.wa.gov/rcw/default.aspx?cite=46.61.160

HopeSource

HopeSource is a private, non-profit organization providing a wide range of human services, including low-cost transportation service, to all citizens of Kittitas County. It operates its door-to-door service Monday through Friday from 7:00 a.m. to 6:00 p.m.; rides must be scheduled 24 hours in advance. Service to Yakima is provided twice a month. Hope Source services are funded by a WSDOT grant; the organization provides 3,500 annual rides for Cle Elum, Roslyn, and Ronald seniors.

Wenatchee Valley Shuttle

The Wenatchee Valley Shuttle operates between Wenatchee and SeaTac several times a day, with scheduled departure times. Reservations are required for the shuttle. The shuttle runs seven days a week regardless of weather or pass conditions.[9]

Regional Transportation Providers

Greyhound and Flixbus provide limited access interstate and interregional transportation service along I-90 in the study area, with several routes per day traveling through the area. Both of these bus lines have only one stop in Kittitas County, at the intersection of US 97 and University Way in Ellensburg.

3.2.4 Local, Tribal, and State Planning

The following discusses state, tribal, and county plans for the study area, emphasizing transportation facilities.

WSDOT Plans and Studies

2040 and Beyond

WSDOT's State Transportation Policy Plan, *2040 and Beyond* (2020), outlines several key goals aimed at shaping the future of transportation in the state. These goals include:

- **Economic Vitality:** Promote and develop transportation systems that stimulate, support, and enhance the movement of people and goods to ensure a prosperous economy.
- **Preservation:** Maintain, preserve, and extend the life and utility of prior investments in transportation systems and services.
- **Safety:** Provide for and improve the safety and security of transportation customers and the transportation system.
- **Mobility:** Improve the predictable movement of goods and people throughout Washington state, including congestion relief and improved freight mobility.
- **Environment and Health:** Enhance Washington's quality of life through transportation investments that promote energy conservation, enhance healthy communities, and protect the environment.
- **Stewardship:** Continuously improve the quality, effectiveness, and efficiency of the transportation system.

These goals collectively aim to guide transportation planning, investment, and decision-making in Washington state towards a more sustainable, resilient, and equitable transportation system for the future.

Highway System Plan

WSDOT's *Highway System Plan* (2024) outlines the goals and priorities for the state's highway network. It recommends program funding levels for 20 years in preservation, maintenance, and the capacity and operational improvement of the highway system, including safety considerations.

9 https://www.wenatcheevalleyshuttle.com/

Primary emphases for the *Highway System Plan* include:

- Congestion relief
- Preservation of existing investments
- Improvement of traveler safety
- Efficient movement of freight and goods
- Improvement and integration of all transportation modes to create a seamless intermodal transportation system for people and goods

Washington State Freight System Plan

The *Washington State Freight System Plan* (WSDOT 2022) outlines strategies and priorities for managing and enhancing the state's freight transportation network. It aims to support the efficient movement of goods to and from Washington's ports, airports, railroads, and highways while addressing challenges such as congestion, safety, and environmental sustainability.

Washington State Rail Plan

The *Washington State Rail Plan 2019–2040* (WSDOT 2020) outlines strategies and priorities for managing and enhancing the state's passenger and freight rail transportation network. The purpose of the Plan is to identify future needs and strategies to:

- Meet the increasing demand for passenger and freight rail services in Washington in partnership with private rail carriers that own much of the network over which passenger and freight trains operate.
- Develop more efficient and effective connections between rail and other modes of transportation.
- Ensure the sustainability of Washington's public and private short line railroads that face infrastructure investment needs in order to preserve these important services to communities.

Kittitas County Plans

Kittitas County Long Range Transportation Plan

The County's *Long Range Transportation Plan* (Kittitas County 2008) identifies I-90 as the primary east-west freight facility in Washington State. The Plan acknowledges that regional container traffic relies on I-90 and the transportation system approaching I-90 to transport hay and other agricultural products to Puget Sound seaports. It also includes goals to preserve the corridor's carrying capacity and improve its performance.

Tribal Plans

Outreach to the Colville Tribes, Muckleshoot Indian Tribe, Snoqualmie Indian Tribe, and Confederated Tribes and Bands of the Yakama Nation took place during the study. The Yakama and Snoqualmie Tribes, per their request, have been kept updated on this study's progress and proposed alternatives. The project team will continue to request collaboration, provide updates, and solicit feedback from the tribes to ensure transparency on project recommendations that are consistent with their future plans.

3.3 Freight Mobility

Freight mobility refers to the ability to efficiently and effectively move goods from producers to consumers, businesses, and other destinations via various modes of transportation including trucks, trains, ships, and airplanes. It encompasses the entire supply chain process, from the point of production to distribution and delivery.

Washington's Freight and Goods Transportation System (FGTS) classifies freight corridors based on annual freight tonnage moved, with T-1 corridors moving the most tonnage and T-5 corridors moving the least. I-90 is classified as a T-1 corridor, meaning it moves more than 10 million tons per year. According to FGTS, this section of I-90 handles an annual truck tonnage of 42,780,000. The annual daily truck volume on this section of I-90 is 7,100, and trucks make up 21.6% of overall traffic.[10]

The segment of I-90 between Easton and Cle Elum plays a critical role in facilitating freight mobility for several reasons. It serves as a vital east-west corridor connecting major population centers, industrial hubs, and transportation gateways in Washington state. It links the metropolitan areas of Seattle and Spokane, as well as key ports, airports, and distribution centers in the region.

I-90 in Washington state plays a crucial role in facilitating freight mobility for several reasons. The segment of I-90 between Easton and Cle Elum traverses through central Washington and serves as a vital east-west corridor, linking the Puget Sound region with the eastern parts of the state and beyond. The I-90 corridor provides access to key ports along the Puget Sound, including the Port of Seattle and the Port of Tacoma, two of the busiest container

10 https://wsdot.wa.gov/sites/default/files/2024-01/fgts-appendices-2024.pdf

ports on the West Coast. Freight moving through these ports relies heavily on efficient transportation corridors like I-90 to reach distribution centers, warehouses, and markets across the state and beyond.

The efficient movement of freight along the I-90 corridor is essential for supporting regional and statewide economic activities. Industries such as manufacturing, agriculture, retail, and distribution rely on the timely delivery of goods to sustain operations and meet consumer demand – so any disruptions or congestion along this corridor can have significant implications for businesses and supply chains.

The existing traffic conditions as presented in Section 3.2.1 also affect the movement of freight along the I-90 corridor within the study area.

Truck parking is often described as an issue by the community members during public comment. Chapter 2 describes how this study acknowledges truck parking in the alternative review and other overlapping efforts in addressing truck parking concerns.

3.4 Environment

Environmental resources and existing conditions were identified within 500 feet of the alternative alignments to provide a high-level preliminary desktop environmental review for which potential opportunities, benefits and challenges for the proposed alternatives may occur. The 500-foot buffer comprises the environmental study area for each alternative. The preliminary desktop review was developed by qualitatively evaluating aquatic resources, wildlife connectivity, ecosystem resiliency, and Endangered Species Act (ESA) critical habitats in the vicinity of the proposed alignment of each alternative. Further studies and assessments will need to occur for each resource once the preferred alternative is selected to move forward for further evaluation.

Existing conditions for environmental resources in the study areas are described in the following sections and illustrated in Appendix B.

3.4.1 Aquatic Resources

Streams and Rivers

Streams and rivers identified within the study area of Alternatives 1 through 3 include the Yakima River, Cle Elum River, Big Creek, Little Creek, Tucker Creek, Crystal Creek, Nelson Creek, and Silver Creek, as well as three additional unnamed perennial and two unnamed intermittent streams (Appendix B, Map 1A). Streams mapped within the study area of Alternative 4A include Silver Creek, Domerie Creek, the Cle Elum River, and several unnamed perennial and intermittent streams (Appendix B, Map 1B). The study area of Alternative 4B includes Silver Creek, the Cle Elum River, and several unnamed perennial and intermittent streams (Appendix B, Map 1C). The Cle Elum River is adjacent to Alternative 4B. The study area for Alternative 5 includes the Yakima River, Big Creek, Little Creek, Nelson Creek, Peterson Creek, Silver Creek, Spex Arth Creek, Tillman Creek, Tucker Creek, the Kittitas Reclamation District Main Canal, and several unnamed intermittent and perennial streams (Appendix B, Map 1D).

Lakes and Ponds

Lake Easton is within the study areas for all alternatives. Lavendar Lake as well as several unnamed bodies of water are within the study area for Alternatives 1 through 3. No additional bodies of water are located within the study areas of Alternatives 4A or 4B. Hanson Ponds to the south of Cle Elum are within the study area for Alternatives 1 through 3 and Alternative 5.

Wetlands

The proposed alignment for Alternatives 1 through 3 is within or adjacent to wetland complexes associated with the Yakima and Cle Elum Rivers. The National Wetlands Inventory (NWI) maps several wetland complexes along these alternatives given the proximity to these rivers along the extent of the alignment. The proposed alignment for Alternative 4A appears to bypass NWI mapped wetland areas but crosses the Cle Elum River, which may include wetlands. The proposed alignment for Alternative 4B is within or adjacent to the Cle Elum River, which may include associated or adjacent wetlands. The proposed alignment for Alternative 5 is within or adjacent to the Yakima River, which may include adjacent and associated wetlands. NWI is a broadscale mapping tool for desktop review prior to fieldwork. There are likely wetlands along each alignment that are not mapped within NWI and wetlands that are mapped within NWI may not meet all three indicators (vegetation,

soils, hydrology) required to be classified as a wetland or may differ in size. Given the coarse scale of NWI it is important to note that it provides a general location of potential wetlands but cannot accurately predict how many wetlands or total acres of wetlands could be impacted by any of the alternatives.

Also, as presented in Appendix B, Map 2A, WSDOT environmental mitigation sites are located along and within the I-90 right of way, and will be impacted.

Fish Passage

The Washington Department of Fish and Wildlife (WDFW) Fish Passage Barrier dataset identifies one mapped partial fish passage barrier within the study area of each alternative.

3.4.2 Wildlife Connectivity

The study areas encompass a variety of habitats that support fish and wildlife species. Wildlife connectivity is currently fragmented by roadways within the study areas for each of the alternatives. The wildlife connectivity criteria assesses if the alternative has the potential to improve the availability of wildlife habitat and connectivity.

No existing wildlife fencing occurs within the study areas of Alternatives 1 through 5. WSDOT's Wildlife Crossing Structures dataset includes one wildlife crossing structure that occurs within the study area of Alternatives 1 through 3 near milepost 81 on I-90 at the Cle Elum River bridge.

WSDOT's Habitat Connectivity Investment Priorities dataset maps a 2-mile segment of I-90 within the study area of Alternatives 1 through 3 as low priority for habitat connectivity investment. The remaining 14 miles of Alternatives 1 through 3 are ranked as high priority. Roadways included in Alternatives 4A, 4B, and 5 are not ranked. The graphic in Appendix B, Map 4E, illustrates the severity of carcass removal in the study area.

The study area for Alternatives 1 through 3 borders or bisects WDFW Priority Habitat and Species areas including the Upper Yakima

Table 3-7 ESA Listed Species Potential Presence and Designated Critical Habitat Adjacent to Each Alternative

Common Name	Listing Status	Potential Presence			
		Alternatives 1-3	Alternative 4a	Alternative 4b	Alternative 5
Canada lynx	Threatened	Yes	Yes	Yes	No
Gray wolf	Endangered	Yes	Yes	Yes	Yes
North American wolverine	Proposed Threatened	Yes	Yes	Yes	Yes
Marbled murrelet	Threatened	Yes	Yes	Yes	Yes
Northern spotted owl	Threatened	Yes	Yes	Yes	Yes
Northern spotted owl – Critical Habitat	Threatened	No	Yes	Yes	No
Yellow-billed cuckoo	Threatened	Yes	Yes	Yes	Yes
Bull trout – Columbia River DPS	Threatened	Yes	Yes	Yes	Yes
Bull trout – DPS Critical Habitat	Threatened	Yes	Yes	Yes	Yes
Steelhead – MCR DPS	Threatened	Yes	Yes	Yes	Yes
Steelhead – MCR DPS Critical Habitat	Threatened	Yes	Yes	Yes	Yes

Species and critical habitat are from the U.S. Fish and Wildlife Service and National Marine Fisheries Service species lists based on a 500-foot buffer along each alignment.

Riparian Area, Domerie Flats Elk Winter Concentration Area, Bullfrog Mill Winter Elk Concentration Area, Bullfrog Mill/Cle Elum Wood Duck Nesting Area, and the Cle Elum River Riparian Area as well as several other wildlife migration corridors and winter use areas. Alternatives 4A and 4B both bisect the Domerie Flats Elk Winter Concentration Area. Alternative 5 borders the south side of the Domerie Flats Elk Winter Concentration Area.

3.4.3 Ecosystem Resiliency

The ecosystem resiliency criteria assesses whether the alternative has the potential to increase resiliency against the impacts of climate change, such as reducing risks associated with extreme flood events.

Channel Migration Zones (CMZ) are areas within the floodplain where a stream or river can be expected to move naturally over time due to hydrology and topography. Alternatives 1 through 3 are mostly in Tier 1 CMZ with one area of Tier 2 CMZ near milepost 75. Alternative

4A crosses the CMZ and 100-year floodplain of the Cle Elum River near the south end of Cle Elum Lake. Alternative 4A crosses the Cle Elum River 100-year floodplain near its eastern terminus. Alternative 5 is within the Yakima River floodplain and CMZ near Cle Elum.

3.4.4 Environmental Species Act (ESA) Listed Species and Critical Habitat

The endangered and threatened species and critical habitats criteria assess the alternatives for impacts to ESA listed species and critical habitats that may be impacted by the proposed alternatives. The potential presence of ESA listed species and designated critical habitat adjacent to each alternative is shown in Table 3-7.

All alternatives, with the exception of Alternative 6 (no build alternative), may affect bull trout and steelhead because there would likely be in-water work associated with construction in rivers and streams that support these species. Alternatives 4a and 5 would likely have the greatest potential for long term impacts to bull trout and steelhead because these alternatives require new bridge crossings over the Cle Elum River and Yakima River, respectively. Alternatives 1 through 3 provide the greatest potential for improving water crossings which could have long term beneficial effects for these species.

Construction noise may affect terrestrial species associated with these Alternatives; however, this cannot be analyzed until an action area is defined and field surveys occur to assess potential habitat for ESA listed species during future assessments.

Species

Species that are potentially present within or adjacent to the proposed alignment of each alternative are listed in Table 3-7. Additionally, sensitive areas such as breeding buffers occur for northern spotted owl within the study areas for Alternatives 1 through 4a.

Critical Habitat

Alternatives 1 through 3 cross the Yakima River, which is critical habitat for steelhead and bull trout (Appendix B, Map 4A). Alternative 4A passes through northern spotted owl critical habitat and terminates near the Cle Elum River (Appendix B, Map 4C). Alternative 4B also passes through northern spotted owl critical habitat and terminates near the Cle Elum River (Appendix B, Map 4C). Alternative 5 adds new crossings over the Yakima River but does not pass through northern spotted owl critical habitat.

3.4.5 Historical Sites, Parks, and Recreational Facilities

Figure 3-3 provides the general location for historical sites, as well as parks and recreational facilities. These resources are listed below. In addition to the following resources, a more in-depth analysis was performed which explores the geologic, historic, cultural, and ethnographic setting in the study area. This report is included in Appendix C.

Cultural Sites

A preliminary review of the Department of Archaeology and Historic Preservation's (DAHP) resources database revealed at least 60 previously recorded archaeological resources within 0.5 miles of the 15.5-mile segment of I-90. In addition, the DAHP's statewide predictive model indicates that the majority of the highway segment under study lies within an area with a very high risk of containing archaeological features and/or materials.

Historical Sites

Historical resources in the study area include:

Cle Elum

- Douglas Munro Burial Site at Laurel Hill Memorial Cemetery, listed on the Washington Heritage Register (resource ID 675496), Forest Ranger Road
- Vogue Theater, listed on the Washington Heritage Register (resource ID 675497), 210 Pennsylvania Avenue
- Kinney Building, listed on the Washington Heritage Register (resource ID 675498), 108-110 ½ East 1st Street
- Cle Elum-Roslyn Beneficial Association Hospital, listed on the National Register and Washington Heritage Register (resource ID 675481), 505 Power Street

South Cle Elum

- South Cle Elum Yard District, listed on the National Register and Washington Heritage Register, which historically served the Chicago, Milwaukee, St. Paul, and Pacific Railroad
- Milwaukee Road Bunkhouse, listed on the National Register and Washington Heritage Register (listing number 89000210), 526 Marie Avenue

Roslyn

- Roslyn Historic District, listed on the National Register and Washington Heritage Register (resource ID 674584)
- Northwestern Improvement Company Barn
- Northwestern Improvement Company Store
- Roslyn Riders Club House, Track, and Arena

Parks and Recreational Facilities

Parks and recreational resources in the study area include:

National and Regional Facilities

- Okanogan-Wenatchee National Forest
- Lake Easton State Park
- Palouse to Cascades State Park
- Washington State Horse Park

Local Facilities

- Cle Elum: Cle Elum City Park, Flag Pole Park, Centennial Park, Hanson Ponds Park, Cle Elum Fireman's Park, Cle Elum Memorial Park
- South Cle Elum: South Cle Elum Fireman's Park
- Roslyn: Roslyn Urban Forest, Roslyn Pioneer Park, Centennial Park
- Nelson: Sun Country Golf Course
- Suncadia: Prospector and Rope Rider Golf Courses
- Ronald: Tumble Creek Golf Course

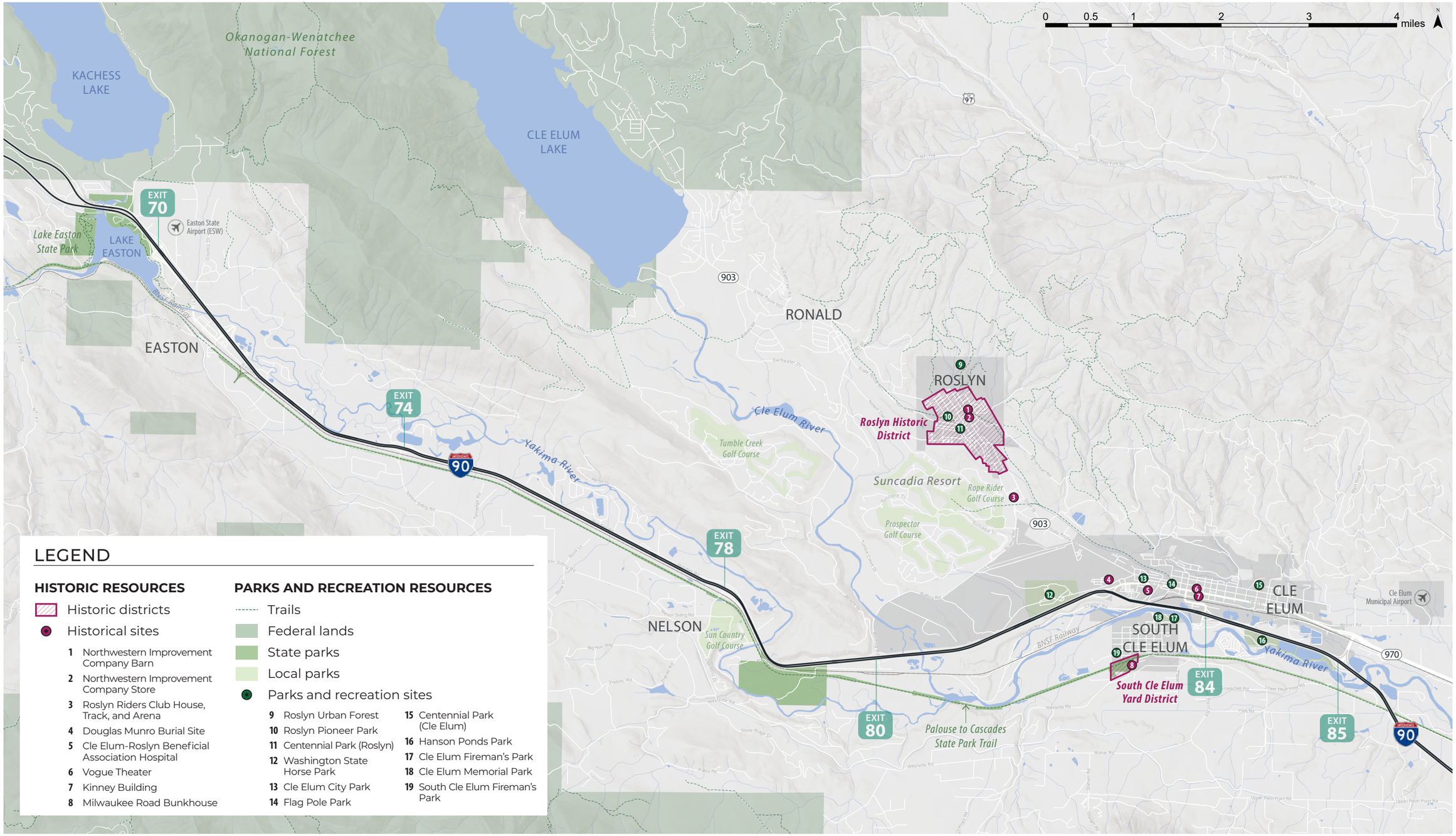


Figure 3-3 Cultural and Historic Sites, Parks, and Recreational Facilities in the Study Area

3.5 Resiliency

A resilient transportation system is one that can withstand and recover from disruptions, whether they are caused by natural disasters, technological failures, or human-caused incidents. Resiliency involves the ability of the system to maintain functionality and adapt to changing conditions while minimizing disruptions to people, goods, and services.

This section of I-90 can be susceptible to natural hazards such as wildfires and snowstorms. The highway's resiliency depends on its ability to withstand these hazards and recover quickly from any damage. Resiliency is also influenced by the maintenance and condition of the highway's infrastructure, including bridges and road surfaces. Regular maintenance and investments in infrastructure upgrades can enhance I-90's ability to withstand and recover from disruptions.

I-90's resiliency is also affected by the availability of alternative routes for evacuations and detours in case of closures or disruptions. In the study area, I-90 currently only has two lanes in each direction, so crashes or other causes for lane closures can cause a major disruption in the flow of traffic. Identifying and maintaining alternative routes can mitigate the impact of disruptions on the highway and ensure the continued flow of traffic during emergencies.

3.6 Environmental Justice and Equity

The environmental justice (EJ) and equity evaluation identifies whether there are communities with EJ concerns and evaluates whether the alternatives would equitably distribute project benefits and prevent disproportionate and adverse effects to human health.

The EJ study area is defined as the census tracts and block groups within 0.5 mile of the I-90 study corridor from South Cle Elum to Easton because it is the area most likely to experience socioeconomic effects from changes to the corridor. Federal guidance on EJ is transitioning from an analysis of impacts to minority and low-income populations (per the 1994 Executive Order 12898) to a broader analysis of environmental and health effects on "populations of concern" (per the 2023 Executive Order 14096)[11]. At the state level, WSDOT is responsible for incorporating environmental justice in its plans and programs because it is a covered agency under the Washington's Healthy Environment for All (HEAL) Act (RCW 70A.02). However, guidance on HEAL Act Environmental Justice Assessments is still underway (WSDOT 2024).

3.6.1 Demographic and Socioeconomic Indicators

The study area does not meet the definition of an EJ population or a Justice40 disadvantaged community[12] because the minority population is only 15% of the overall population and not meaningfully greater than the minority population of the comparison geographies of Kittitas County, Cle Elum, and Roslyn, which

11 The broader definition of "communities with environmental justice concerns" better integrates the discrimination protections under Title VI of the Civil Rights Act of 1964.

12 An "environmental justice population" described in Executive Order 12898 and EPA 2016; a "disadvantaged community" described in the CEJST Screening Tool methodology: https://screeningtool.geoplatform.gov/en/methodology.

Table 3-8 Select Socioeconomic Indicators

Indicators	Comparison Geographies				
	I-90 Study Area	Roslyn	Cle Elum	Kittitas County	WA
Demographics[a]					
Total Population	12,598	703	2,147	44,147	7,617,364
Minority Population	15%	15%	19%	19%	34%
White Alone, Not Hispanic or Latino	85%	85%	81%	81%	66%
Income					
People Below Poverty	10.5%	6.0%	16.8%	14.8%	10.0%
Limited English Proficiency					
Speak a Language Other than English[b]	4%	3%	6%	7%	20%

Source: U.S. Census 2021

a) U.S. Census American Community Survey 5-Year Estimates, 2018-2022 was not available until 2024, after the criteria for this evaluation were established.

b) People who reported to "speak a language other than English" at home is a greater percentage of the population than people who report to speak English "less than well" or "limited English proficiency".

each have a minority population between 15 and 19 percent (Table 3-8). The study area low-income population is smaller than the comparison geographies of Cle Elum and Kittitas Counties and similar to that of the state of Washington. The study area has a similar low limited-English speaking population compared to Roslyn. Cle Elum Roslyn Elementary School demographics on race, limited English proficiency, and low-income status also reflect the demographics of the study area provided in Table 3-8.

The WSDOT Limited English Proficiency (LEP) Accessibility Plan recommends that for a service area where LEP exceeds 5 percent of the population or >1,000 people, translation and other reasonable steps should be taken for successful outreach. The study area is smaller than the overall I-90 service area, but for context, it does not meet this threshold (WSDOT 2022).

Additional data about the study area from FHWA Screening Tool for Equity Analysis of Projects (STEAP) highlights the percentage of households without computers or internet access, the percentage of residents with disabilities, and the percent of people not in the labor force is higher than found within the County (see Appendix D).

Health Disparities

The Washington Tracking Network "Information by Location" (IBL) tool is a source for geospatial environmental and health data from the State of Washington Department of Health. Figure 3-4 is a screenshot of the study area using the Environmental Health Disparities IBL mapping tool and Table 3-9 summarizes some key data about the two census tracts composing the I-90 corridor study area. The U.S. Environmental Protection Agency EJScreen Tool provides a similar display of environmental exposure risk and socioeconomic indicators (see Appendix E).

Environmental Health Disparity ranking is a way to compare health and social factors (e.g., collections of environmental and

Table 3-9 Environmental Health Disparities Summary for the I-90 Corridor Study Area

Environmental Risk Factors	Census Tract 53037975200	Census Tract 53037975100
Environmental Health Disparities Overall Rank	**5**	**2**
Environmental Exposures Rank	**5**	**2**
Diesel exhaust PM2.5 emissions	4	3
Ozone concentration	8	9
PM2.5 concentration	10	2
Proximity to heavy traffic roadways	4	4
Toxic releases from facilities	1	1
Environmental Effects Rank	**1**	**1**
Lead risk from housing	5	7
Proximity to hazardous waste treatment storage and disposal facilities	2	1
Proximity to Superfund sites	1	1
Proximity to risk management plan facilities	4	1
Socioeconomic Factors Rank	**3**	**6**
Limited English Proficiency	1	1
No High School Diploma	5	7
People of color (race/ ethnicity)	1	1
Population Living in Poverty	3	8
Transportation Expense	10	10
Unaffordable Housing	2	6
Unemployed	8	6
Sensitive Populations Rank	**8**	**4**
Death from Cardiovascular Disease	6	2
Low birth weights	8	8

Source: Washington Department of Health 2023.
Note: Values are presented as deciles or ranks. They illustrate a difference in risk, but not how much risk.

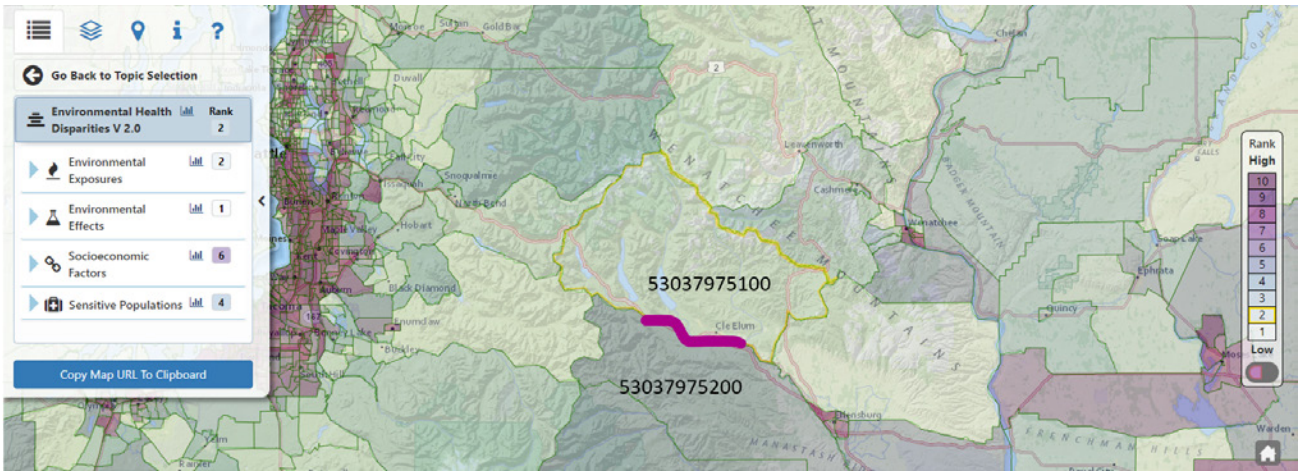


Figure 3-4 Environmental Health Disparities Map of I-90 Corridor Study Area

socioeconomic data) that may contribute to disparities in a community (i.e., census tract). Health and social factors that can contribute to disparities in environmental health include environmental exposures, environmental effects, socioeconomic factors, and sensitive populations. The tool organizes a collection of indicators into these four categories.

The two census tracts in the study area have an overall ranking of 2 and 5. Each number from 1 to 10 represents 10 percent of communities (or census tracts). For example, Census tract 5100 has a rank of 2 for Environmental Exposures. That means only 10% of communities in Washington State have a lower health disparity (or are less affected by environmental exposures) and 70% have a greater level of disparity (or are more affected by environmental exposures). The indicators are averaged within each theme or Environmental Health Risk Factor.

Although the overall rankings for the study area are low to moderate (indicating the area is not disproportionately burdened by environmental health risks), Table 3-9 highlights a few severe disparities within each risk factor that are present in the study area. For example, both census tracts have the highest rank (10) for transportation expense, and they share high ranks in ozone concentration (9, 8).

4 ALTERNATIVES EVALUATION CRITERIA

The evaluation criteria selected to evaluate the proposed alternatives were developed based on the ***project purpose and goal statements presented in Chapter One*** for this study. The alternatives evaluation was completed in two phases (tiers): Tier 1, an Initial Evaluation and a Revised Evaluation of all alternatives; and Tier 2, a Targeted Evaluation of the top ranked alternatives. For each goal statement, a number of evaluation criteria and measurements were developed.

The Tier 1 Evaluation consisted of the seven preliminary alternatives identified in Chapter 2. The Tier 1 Evaluation included two rounds of evaluation:

- An initial evaluation which was presented to the public for input; and
- A revised evaluation which incorporated public input.

Alternatives with better performance (represented by higher scores) were then advanced to the Tier 2 Targeted Evaluation, which provided a more comparative assessment of the remaining alternatives. Additional criteria were added to the Tier 2 evaluation to further distinguish the remaining alternatives.

The evaluation process drew upon insights from both Kittitas County (County) and Washington State Department of Transportation (WSDOT) staff, as well as input from the public and stakeholders. Feedback gathered on the alternatives and evaluation criteria through public webinars and an open house was incorporated into the evaluation process. Public surveys provided an additional opportunity for the public to provide input on the alternatives and evaluation process. For additional information about the public engagement process and comments received, please refer to Chapter 5.

Chapter Overview

- Evaluation criteria used during the Tier 1 Initial and Revised Evaluation
- Tier 2 Evaluation
- Criteria used for the Tier 2 Targeted Evaluation
- Alternatives to move forward

4.1 Evaluation Criteria

The evaluation methodology was developed to measure how well each alternative meets the project purpose and goals. The analysis was primarily qualitative with some quantitative data used to develop performance ratings.

The evaluation methodology included the development of:

- **Project Goals** (from Purpose and Need presented in Chapter 1) and total assigned points for each Goal;
- **Evaluation Criteria** for each Goal; and
- **Performance Measurements** (points) for each criterion ranging from 1 (alternative does not meet or improve the criterion) to 3 (alternative meets or exceeds goal of criterion).

Each Performance Measurement was assigned a Weight based on the Goal's assigned points and its number of criteria. For each Alternative, a total weighted score was determined by summing the total weighted scores for each Project Goal.

Weighted scoring is a method used to give different levels of importance, or weights, to different criterion when calculating a total score. For example, in a school project, if research is more important than creativity, you might assign a higher weight to the research score and a lower weight to the creativity score. The weighted scoring formula multiplies each factor by its weight, then adds up these points to get the total score.

Performance Rating Methodology

The **Performance Rating** for each criterion is based on the total Assigned Points for each Project Goal divided by the number of Evaluation Criteria for that Goal.

> For example, Freight Mobility was assigned 10 points, and has 3 criteria. Therefore, each criterion's maximum weight would be 3.3 points (10 divided by 3).

The **Weighted Score** for each Alternative's ability to meet the overall Goal was calculated as follows:

> Criterion's Performance Measurement Weight (1, 2, 3) times the Weight (based on the Goal's Assigned Points and number of Criteria).

Alternative Criteria Scoring Example:

1. If an Alternative was being scored on the Project Goal – **Freight Mobility**:

   Freight Mobility = Max 10 points out of 100 Total Goal points

2. There are 3 Evaluation Criteria for **Freight Mobility**:

   Freight Mobility 10 pts maximum divided by 3 categories =
   Max 3.3 pts per Performance Measurement

3. **Performance Measurement** '3' = Max Value, '2' = Moderate Value, '1' = Minimum/No Value
   - So if the **Performance Measurement** for this Alternative is "3 - Increases freight throughput", it would receive 3.3 pts (Max value).
   - If it is rated as a "2 – Moderately increase freight throughput", it would receive 1.7 pts (Moderate Value).
   - If it is rated as a "1 – Did not increase freight throughput", it would receive 0 pts (Minimum/No Value).

Table 4-1 Tier 1: Initial and Revised Evaluation – Project Goals, Criteria, Performance Measurements, and Weight

Project Goals	Evaluation Criteria	Performance Measurement	Maximum Weight
Safety Improve overall safety along I-90 and adjacent roadways **ASSIGNED POINTS: 30**	**Increase in Safety on I-90** Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Moderately increases existing condition safety 1 – Does not increase existing condition safety	6.0
	Evacuation/Emergency Routes Does the proposed alternative provide additional routes?	3 – Increases emergency/evacuation routes 2 – Moderately increases emergency/evacuation routes 1 – Does not increase emergency/evacuation routes	6.0
	Increase in Safety on Adjacent Roadways Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Moderately increases existing condition safety 1 – Does not increase existing condition safety	6.0
	Emergency Response Does the alternative decrease response times for emergency responders?	3 – Decreases emergency response times 2 – No impacts to emergency response times 1 – Increases emergency response times	6.0
	Public Level of Concern for Safety Does the alternative change conditions for residents along the proposed route?	3 – Increases safety along local roads 2 – Does not change existing condition safety 1 – Decreases safety due to increased traffic	6.0
Transportation Demand Enhance mobility and connectivity on I-90 for passenger vehicles, emergency vehicles, transit, and active modes and provide support for increased throughput **ASSIGNED POINTS: 10**	**Accommodates Active Transportation Modes** Does the Alternative accommodate active transportation?	3 – Includes low stress nonmotorized facilities 2 – Includes moderate stress nonmotorized facilities 1 – Includes high stress nonmotorized facilities	1.4
	Provides Congestion Relief for General Purpose (GP) Vehicles/Trucks Does the alternative provide congestion relief for GP vehicles and trucks?	3 – Congestion relief for GP vehicles/trucks (greater than 25%) 2 – Some congestion relief for GP vehicles/trucks (5-25%) 1 – No congestion relief (less than 5% or net increase in congestion)	1.4
	Provides Congestion Relief for Transit (Wenatchee Valley Shuttle, Kittitas County Connector, Hope Source)? Does the alternative provide congestion relief for transit	3 – Congestion relief for transit (greater than 15%) 2 – Some congestion relief for transit (1-15%) 1 – No congestion relief or net increase in congestion	1.4
	Effects on Adjacent Roadways Does the alternative improve vehicular mobility on County arterial roadways?	3 – Improves vehicular mobility on arterial streets 2 – Provides some vehicular mobility improvements on arterial streets 1 – Does not improve vehicular mobility on arterial streets	1.4
	Increases Person Throughput (Capacity Increase) Does the alternative increase person throughput?	3 – Increases person throughput 2 – Moderately increases person throughput 1 – Does not increase person throughput	1.4
	Complementary to Local and Tribal Planning Is the alternative complementary to local and tribal planning efforts, including land use plans and transportation plans?	3 – Complements local planning efforts 2 – Partially complements local planning efforts 1 – Does not complement local planning efforts	1.4
	Public Level of Concern Regarding Access to Driveways and Local Circulation Does the alternative improve local driveway and community access?	3 – Increases community access and circulation 2 – Does not affect current access and circulation 1 – Decreases community access and circulation	1.4

Table 4-1 Tier 1: Initial and Revised Evaluation – Project Goals, Criteria, Performance Measurements, and Weight (continued)

Project Goals	Evaluation Criteria	Performance Measurement	Maximum Weight
Freight Mobility Support economic vitality through reliable and efficient freight movement and access to major employers **ASSIGNED POINTS: 10**	**Increases Freight Throughput (West to East I-90)** Does the alternative increase freight throughput on I-90?	3 – Increases freight throughput 2 – Moderately increases freight throughput 1 – Does not increase freight throughput	3.3
	Provide additional Freight Management Options During Road Closures (freight parking, designated alternate routes) Does the alternative increase freight management options?	3 – Increases freight management options 2 – Moderately increases freight management options 1 – Does not increase freight management options	3.3
	Increase Freight Reliability (Localized Deliveries/Freight Options) Does the alternative increase freight reliability?	3 – Improves freight reliability 2 – Partially improves freight reliability 1 – Does not improve freight reliability	3.3
Environmental Enable environmental restoration and ecosystem resiliency along I-90 connecting habitats, hydrological features and animal populations **ASSIGNED POINTS: 15**	**Increases Aquatic Resources Restoration Potential** Does the alternative have the potential to improve environmental functions of aquatic resources (e.g., wetlands, rivers, streams) by improving fish passage, access to habitat, and reduce impacts to river hydraulics and geomorphology, etc.?	3 – Improves quality of all aquatic resources 2 – Improves quality of some aquatic resources 1 – Does not improve or restore any aquatic resources	3
	Improves Wildlife Connectivity Does the alternative improve the availability of wildlife habitat and connectivity?	3 – Improves wildlife connectivity 2 – Moderately improves wildlife connectivity 1 – Does not improve wildlife connectivity	3
	Increases Ecosystem Resiliency Does the alternative increase resiliency against the impacts of climate change?	3 – Increases resiliency by reducing risks associated with extreme river flood events as an impact of climate change 2 – Some improvements for resiliency by partially reducing risks associated with extreme river flood events as an impact of climate change 1 – Does not increase resiliency by not reducing risks the impacts associated with extreme river flood events as an impact of climate change	3
	Considers long term impacts to Endangered Species Act (ESA) Listed Species and designated critical habitats Does the alternative have long term impacts on ESA listed species or designated critical habitats?	3 – Improves conditions for ESA listed species and designated critical habitats 2 – Does not improve or have long term impacts to ESA listed species and designated critical habitats 1 – Has potential to long term impacts ESA listed species and designated critical habitats	3
	Risk of Cultural/Historical or Section 4(f)/6(f) Impacts Does the alternative have a higher risk of impacting cultural and/or historical sites or Section 4(f)/6(f) resources?	3 – Alternative has a high risk of impacting cultural/historic places or Section 4(f)/6(f) resources 2 – Alternative has a medium risk of impacting cultural/historic places or Section 4(f)/6(f) resources 1 – Alternative has a low risk of impacting cultural/historic places or Section 4(f)/(f) resources	3

Table 4-1 Tier 1: Initial and Revised Evaluation – Project Goals, Criteria, Performance Measurements, and Weight (continued)

Project Goals	Evaluation Criteria	Performance Measurement	Maximum Weight
Resiliency Improve local roads and I-90 system resiliency **ASSIGNED POINTS: 15**	**Reduces the Risk of Infrastructure Failures** Does the alternative reduce the risk of infrastructure failure by addressing erosion and channel migration?	3 – Removes risks from erosion/channel migration 2 – Reduces risks from erosion/channel migration 1 – Does not address erosion/channel migration	3.8
	Reduces the Risk of Infrastructure Failures due to changing climate? Does the alternative increase resiliency by enhancing the ability to withstand, respond to and recover from extreme weather events (i.e. flood risk and snow melt)?	3 – Improves risk from climate change 2 – Moderately improves risk from climate change 1 – Does not improve risk from climate change	3.8
	Susceptibility to Road Closures/Conditions Does the alternative decrease the susceptibility to road closures (snow, wildfires, crashes)?	3 – Significantly decreases roadway susceptibility 2 – Moderately decreases susceptibility 1 – Does not decrease susceptibility	3.8
	Reduces the Risk of Infrastructure Failures due to Seismic Activity Does the alternative increase resiliency of I-90 crossings by enhancing the ability to withstand seismic activity?	3 – Removes risk from seismic activity 2 – Reduces risk from seismic activity 1 – Does not address risk from seismic activity	3.8
Equity/Inclusion Support equitable outcomes **ASSIGNED POINTS: 10**	**Minimizes Business and Residential Impacts from Displacements** Does the alternative minimize the potential business and residential impacts and displacements, especially for environmental justice (EJ) populations?	3 – No impacts or displacements 2 – Minimal impacts and displacements (less than 5 residential structures) 1 – Moderate to high impacts and displacements (more than 5 residential structures, 1 or more multi-family, and 1 or more government service)	3.3
	Construction of Project Provides 40% Benefit to Disadvantaged Communities Project area is not defined as a Justice40 disadvantaged community, but does the alternative provide meaningful, direct benefit to DBE businesses and increase DBE workforce capacity?	3 – Greatest opportunity to disadvantaged communities (60%) 2 – Meets minimum opportunity to disadvantaged communities (40%) 1 – Does not provide benefit to disadvantaged communities (<40%)	3.3
	Minimizes Environmental Exposures Does the alternative contribute new environmental hazards or pollution sources?	3 – Improves/reduces environmental hazards or pollution sources 2 – Partially improves environmental hazards and/or contributes minimal new pollution 1 – Contributes new environmental hazards or pollution sources	3.3
Relative Cost of Alternatives **ASSIGNED POINTS: 10**	**Planning-level Cost Comparison** Does the alternative have higher planning-level costs compared to the other alternatives?	3 – Planning-level cost is lower (under $20 million) 2 – Planning-level cost is moderate ($20 - $100 million) 1 – Planning-level cost is higher (over $100 million)	3.3
	Preservation Cost Does the alternative have a higher preservation cost compared to the other alternatives?	3 – Preservation cost is lower 2 – Preservation cost is moderate 1 – Preservation cost is higher	3.3
	Maintenance and Operations Cost Does the alternative create a higher demand/response maintenance cost compared to other alternatives?	3 – Maintenance and operations cost is lower 2 – Maintenance and operations cost is moderate 1 – Maintenance and operations cost is higher	3.3

4.2 Tier 1 Evaluation Approach and Results

As presented in Chapter 3, existing conditions in the study area were identified based on each Evaluation Criterion topic (as appropriate). Alternatives were then evaluated, using baseline conditions, and were given a Performance Measurement rating. This initial evaluation was presented to the public at an open house in February 2024.

Based on public comments, scores were adjusted, and new criteria were added to two separate Project Goals – Safety and Transportation Demand.

Table 4-2 presents each alternative's revised Performance Measurement (rating) for the identified evaluation criteria.

Table 4-2 Tier 1 Evaluation Results – Non-Weighted

Project Goals	Evaluation Criteria	Performance Measurement	Alt 1	Alt 2	Alt 3	Alt 4a	Alt 4b	Alt 5	Alt 6
Safety Improve overall safety along I-90 and adjacent roadways	**Increase in Safety on I-90** Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Moderately increases existing condition safety 1 – Does not increase existing condition safety	2	2	2	1	1	2	1
	Evacuation/Emergency Routes Does the proposed alternative provide additional routes?	3 – Increases emergency/evacuation routes 2 – Moderately increases emergency/evacuation routes 1 – Does not increase emergency/evacuation routes	1	1	3	3	3	2	1
	Increase in Safety on Adjacent Roadways Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Moderately increases existing condition safety 1 – Does not increase existing condition safety	3	3	2	2	2	2	1
	Emergency Response Does the alternative decrease response times for emergency responders?	3 – Decreases emergency response times 2 – No impacts to emergency response times 1 – Increases emergency response times	3	3	3	3	3	2	1
	Public Level of Concern for Safety Does the alternative change conditions for residents along the proposed route?	3 – Increases safety along local roads 2 – Does not change existing condition safety 1 – Decreases safety due to increased traffic	3	3	3	2	2	1	1
Transportation Demand Enhance mobility and connectivity on I-90 for passenger vehicles, emergency vehicles, transit, and active modes and provide support for increased throughput	**Accommodates Active Transportation Modes** Does the alternative accommodate active transportation?	3 – Includes low stress nonmotorized facilities 2 – Includes moderate stress nonmotorized facilities 1 – Includes high stress nonmotorized facilities	1	1	1	2	2	2	1
	Provides Congestion Relief for General Purpose (GP) Vehicles/Trucks Does the alternative provide congestion relief for GP vehicles and trucks?	3 – Congestion relief for GP vehicles/trucks (greater than 25%) 2 – Some congestion relief for GP vehicles/trucks (5-25%) 1 – No congestion relief (less than 5% or net increase in congestion)	3	3	3	2	2	2	1
	Provides Congestion Relief for Transit (Wenatchee Valley Shuttle, Kittitas County Connector, Hope Source) Does the alternative provide congestion relief for transit?	3 – Congestion relief for transit (greater than 15%) 2 – Some congestion relief for transit (1-15%) 1 – No congestion relief or net increase in congestion	3	3	3	1	1	1	1
	Effects on Adjacent Roadways Does the alternative improve vehicular mobility on County arterial roadways?	3 – Improves vehicular mobility on arterial streets 2 – Provides some vehicular mobility improvements on arterial streets 1 – Does not improve vehicular mobility on arterial streets	3	3	3	2	2	1	1
	Increases Person Throughput (Capacity Increase) Does the alternative increase person throughput?	3 – Increases person throughput 2 – Moderately increases person throughput 1 – Does not increase person throughput	3	3	3	2	2	2	1
	Complementary to Local and Tribal Planning Is the alternative complementary to local and tribal planning efforts, including land use plans and transportation plans?	3 – Complements local planning efforts 2 – Partially complements local planning efforts 1 – Does not complement local planning efforts	3	3	3	2	2	2	1
	Public Level of Concern Regarding Access to Driveways and Local Circulation Does the alternative improve local driveway and community access?	3 – Increases community access and circulation 2 – Does not affect current access and circulation 1 – Decreases community access and circulation	3	3	3	2	2	1	1

Performance Measurement: Highest Performing (3) Moderate (2) Lowest Performing (1)

Table 4-2 Tier 1 Evaluation Results – Non-Weighted (continued)

Project Goals	Evaluation Criteria	Performance Measurement	Alt 1	Alt 2	Alt 3	Alt 4a	Alt 4b	Alt 5	Alt 6
Freight Mobility Support economic vitality through reliable and efficient freight movement and access to major employers	**Increases Freight Throughput (West to East I-90)** Does the alternative increase freight throughput on I-90?	3 – Increases freight throughput 2 – Moderately increases freight throughput 1 – Does not increase freight throughput	3	3	3	1	1	2	1
	Provides Additional Freight Management Options During Road Closures (Freight Parking, Designated Alternate Routes) Does the alternative increase freight management options?	3 – Increases freight management options 2 – Moderately increases freight management options 1 – Does not increase freight management options	1	1	1	1	1	2	1
	Increases Freight Reliability (Localized Deliveries/Freight Options) Does the alternative increase freight reliability?	3 – Improves freight reliability 2 – Partially improves freight reliability 1 – Does not improve freight reliability	3	3	3	2	2	2	1
Environmental Enable environmental restoration and ecosystem resiliency along I-90 connecting habitats, hydrological features and animal populations	**Increases Aquatic Resources Restoration Potential** Does the alternative have the potential to improve environmental functions of aquatic resources (e.g., wetlands, rivers, streams) by improving fish passage, access to habitat, and reduced impacts to river hydraulics and geomorphology, etc.?	3 – Improves quality of all aquatic resources 2 – Improves quality of some aquatic resources 1 – Does not improve or restore any aquatic resources	2	2	2	1	1	1	1
	Improves Wildlife Connectivity Does the alternative improve the availability of wildlife habitat and connectivity?	3 – Improves wildlife connectivity 2 – Moderately improves wildlife connectivity 1 – Does not improve wildlife connectivity	2	2	2	1	1	1	1
	Increases Ecosystem Resiliency Does the alternative increase resiliency against the impacts of climate change?	3 – Increases resiliency by reducing risks associated with extreme river flood events as an impact of climate change 2 – Some improvements for resiliency by partially reducing risks associated with extreme river flood events as an impact of climate change 1 – Does not increase resiliency by not reducing risks the impacts associated with extreme river flood events as an impact of climate change	2	2	2	1	1	1	1
	Considers Long Term Impacts to Endangered Species Act (ESA) Listed Species and Designated Critical Habitats Does the alternative have long term impacts on ESA listed species or designated critical habitats?	3 – Improves conditions for ESA listed species and designated critical habitats 2 – Does not improve or have long term impacts to ESA listed species and designated critical habitats 1 – Has potential for long term impacts to ESA listed species and designated critical habitats	1	2	2	1	1	1	2
	Risk of Cultural/Historical or Section 4(f)/6(f) Impacts Does the alternative have a risk of impacting cultural and/or historical sites or Section 4(f)/6(f) resources?	3 – Has a high risk of impacting cultural/historic places or Section 4(f)/6(f) resources 2 – Has a medium risk of impacting cultural/historic places or Section 4(f)/6(f) resources 1 – Has a low risk of impacting cultural/historic places or Section 4(f)/6(f) resources	2	3	3	2	2	1	1

Performance Measurement: Highest Performing (3) Moderate (2) Lowest Performing (1)

Table 4-2 Tier 1 Evaluation Results – Non-Weighted (continued)

Project Goals	Evaluation Criteria	Performance Measurement	Alt 1	Alt 2	Alt 3	Alt 4a	Alt 4b	Alt 5	Alt 6
Resiliency Improve local roads and I-90 system resiliency	**Reduces the Risk of Infrastructure Failures** Does the alternative reduce the risk of infrastructure failure by addressing erosion and channel migration?	3 – Removes risks from erosion/channel migration 2 – Reduces risks from erosion/channel migration 1 – Does not address erosion/channel migration	3	3	3	1	1	1	1
	Reduces the Risk of Infrastructure Failures due to changing climate? Does the alternative increase resiliency by enhancing the ability to withstand, respond to and recover from extreme weather events (i.e. flood risk and snow melt)?	3 – Improves risk from climate change 2 – Moderately improves risk from climate change 1 – Does not improve risk from climate change	2	2	2	1	1	1	1
	Susceptibility to Road Closures/Conditions Does the alternative decrease the susceptibility to road closures (snow, wildfires, crashes)?	3 – Significantly decreases roadway susceptibility 2 – Moderately decreases susceptibility 1 – Does not decrease susceptibility	1	1	1	2	2	2	1
	Reduces the Risk of Infrastructure Failures due to Seismic Activity Does the alternative increase resiliency of I-90 crossings by enhancing the ability to withstand seismic activity?	3 – Removes risk from seismic activity 2 – Reduces risk from seismic activity 1 – Does not address risk from seismic activity	3	3	3	1	1	1	1
Equity/Inclusion Support equitable outcomes	**Minimizes Business and Residential Impacts from Displacements** Does the alternative minimize the potential business and residential impacts and displacements, especially for environmental justice (EJ) populations?	3 – No impacts or displacements 2 – Minimal impacts and displacements (less than 5 residential structures) 1 – Moderate to high impacts and displacements (more than 5 residential structures, 1 or more multi-family, and 1 or more government service)	2	3	3	1	2	1	3
	Construction of Project Provides 40% Benefit to Disadvantaged Communities Project area is not defined as a Justice40 disadvantaged community, but does the alternative provide meaningful, direct benefit to DBE businesses and increase DBE workforce capacity?	3 – Greatest opportunity to disadvantaged communities (60%) 2 – Meets minimum opportunity to disadvantaged communities (40%) 1 – Does not provide benefit to disadvantaged communities (<40%)	3	3	3	3	3	3	1
	Minimizes Environmental Exposures Does the alternative contribute new environmental hazards or pollution sources?	3 – Improves/reduces environmental hazards or pollution sources 2 – Partially improves environmental hazards and/or contributes minimal new pollution 1 – Contributes new environmental hazards or pollution sources	2	2	2	2	2	2	3
Relative Cost of Alternatives	**Planning-Level Cost Comparison** Does the alternative have higher planning-level costs compared to the other alternatives?	3 – Planning-level cost is lower (under $20 million) 2 – Planning-level cost is moderate ($20 – $100 million) 1 – Planning-level cost is higher (over $100 million)	1	1	1	1	1	2	3
	Preservation Cost Does the alternative have a higher preservation cost compared to the other alternatives?	3 – Preservation cost is lower 2 – Preservation cost is moderate 1 – Preservation cost is higher	2	2	2	1	1	1	2
	Maintenance and Operations Cost Does the alternative create a higher demand/response maintenance cost compared to other alternatives?	3 – Maintenance and operations cost is lower 2 – Maintenance and operations cost is moderate 1 – Maintenance and operations cost is higher	2	2	2	1	1	1	2

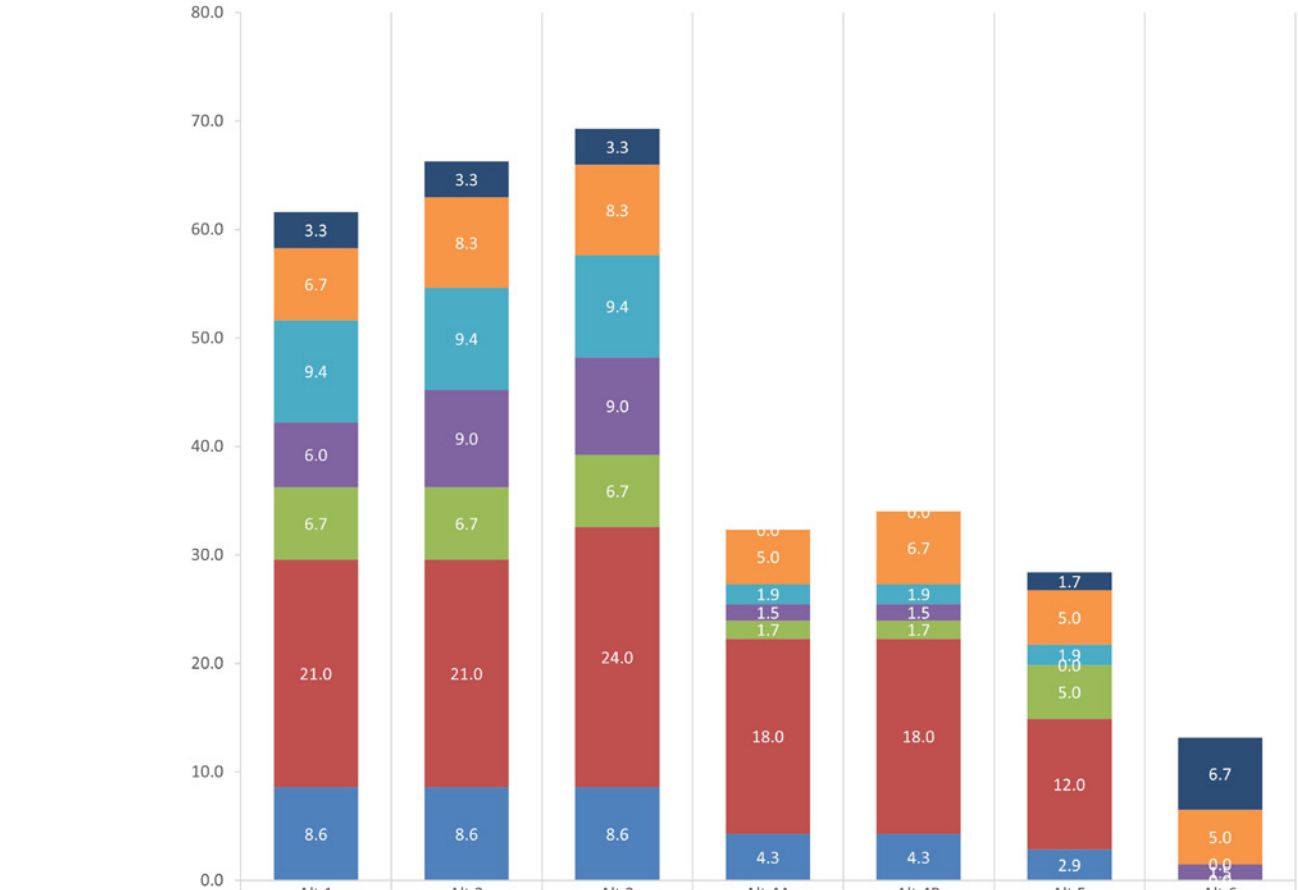
Performance Measurement: Highest Performing (3) Moderate (2) Lowest Performing (1)

Table 4-3 presents a summary of weighted scores for each alternative by Project Goal, and the diagram in Figure 4-1 illustrates how the alternatives compared to each other. Detailed evaluation worksheets, along with explanations for the scoring, are included in Appendix F. A comprehensive environmental evaluation was also performed, and findings are presented in Appendix G.

Table 4-3 Tier 1 Evaluation – Weighted Scores

	Alt 1 *I-90 Outside Widening*	**Alt 2** *I-90 Median Widening*	**Alt 3** *I-90 Reversible Lanes*	**Alt 4A** *North Route SR 903 Extension*	**Alt 4B** *North Route Bullfrog Road*	**Alt 5** *South Route*	**Alt 6** *No Build*
Safety	15.0	15.0	18.0	15.0	15.0	12.0	0.0
Transportation Demand	8.6	8.6	8.6	4.3	4.3	2.9	0.0
Freight Mobility	6.7	6.7	6.7	1.7	1.7	5.0	0.0
Environmental	6.0	9.0	9.0	1.5	1.5	0.0	1.5
Resiliency	9.4	9.4	9.4	1.9	1.9	1.9	0.0
Equity/Inclusion	6.7	8.3	8.3	5.0	6.7	5.0	6.7
Relative Cost of Alternatives	3.3	3.3	3.3	0.0	0.0	1.7	6.7
Total Score	**55.6**	**60.3**	**63.3**	**29.3**	**31.0**	**28.4**	**14.8**

Figure 4-1 Tier 1 Evaluation Summary by Alternative – Weighted Score



	Alt 1	Alt 2	Alt 3	Alt 4A	Alt 4B	Alt 5	Alt 6
Relative Cost of Alternatives	3.3	3.3	3.3	0.0	0.0	1.7	6.7
Equity/Inclusion	6.7	8.3	8.3	5.0	6.7	5.0	5.0
Resiliency	9.4	9.4	9.4	1.9	1.9	1.9	0.0
Environmental	6.0	9.0	9.0	1.5	1.5	0.0	1.5
Freight Mobility	6.7	6.7	6.7	1.7	1.7	5.0	0.0
Safety	21.0	21.0	24.0	18.0	18.0	12.0	0.0
Transportation Demand	8.6	8.6	8.6	4.3	4.3	2.9	0.0

4.3 Tier 2: Targeted Evaluation

The highest performing alternatives from the Tier 1: Initial and Revised Evaluation phase were advanced into the Tier 2 evaluation. The purpose of this second evaluation was to further explore the differences among the alternatives that had relatively close scores. Based on the evaluation as presented in Table 4-3 and Figure 4-1, three alternatives scored higher than the other alternatives, but were very close in their scoring:

- Alternative 1: I-90 Outside Widening
- Alternative 2: I-90 Median Widening
- Alternative 3: I-90 Median Widening, Reversible Lanes

To further differentiate between these alternatives, additional Evaluation Criteria were used to help distinguish potential differences. Since all three alternatives were modifications to I-90, WSDOT provided input into the additional criteria. The additional criteria used in the Tier 2 Targeted Evaluation are presented in Table 4-4.

Table 4-4 Tier 2: Targeted Evaluation – Additional Criteria and Rating Descriptions

Project Goals	Evaluation Criteria	Performance Measurement
Safety Improve overall safety along I-90 and adjacent roadways	**Safety Exposure during Incident Responses** Does the alternative provide an option for shifting traffic during emergencies, maintenance, and repairs on I-90?	3 – Increases opportunity for crew safety/traffic diversion 2 – Provides some opportunity for crew safety/traffic diversion 1 – No improved conditions for crew safety/traffic diversion
Transportation Demand Enhance mobility and connectivity on I-90 for passenger vehicles, emergency vehicles, transit, and active modes and provide support for increased throughput	No changes or additions	
Freight Mobility Support economic vitality through reliable and efficient freight movement and access to major employers	No changes or additions	
Environmental Enable environmental restoration and ecosystem resiliency along I-90 connecting habitats, hydrological features and animal populations	No changes or additions	
Resiliency Improve local roads and I-90 system resiliency	**Operations and Maintenance (O&M) Activities** Does the alternative affect operations and maintenance related to snow removal and other operational needs?	3 – Improves O&M activities 2 – Does not change O&M activities 1 – Impacts normal O&M activities
Equity/Inclusion Support equitable outcomes	No changes or additions	
Relative Cost of Alternatives	No changes or additions	

Using the same process used in the Tier 1 Evaluation, Table 4-5 presents the Tier 2 Targeted Evaluation for I-90 Alternatives' Performance Measurements (rating) for the identified criteria. Additional traffic modeling was also undertaken which compared the three alternatives. The results of this modeling exercise are presented at the end of Appendix A.

The public input via a survey and Open House was conducted in February 2024 (see Chapter 5). The public voted on one or more preferred alternatives. Alternative 2 received the most votes with Alternatives 3 and 1 almost tied (see Figure 5-3). The public heavily favored improvements that encroached upon the median over outside widening or outside of the I-90 corridor.

Table 4-6 below presents a summary of weighted scores for each alternative by Project Goal, as well as a diagram (Figure 4-2) showing how each alternative compared to the others. Detailed evaluation worksheets, along with explanations for the scoring, are included in Appendix H. A comprehensive environmental evaluation was also performed, and findings are presented in Appendix G.

4.4 Alternatives Selected to Move Forward

The Tier 1 Evaluation identified all three I-90 alternatives as the best-performing alternatives aligning with the Project Goals compared to alternatives outside of the I-90 right-of-way corridor. However, given the comparable scores for all three I-90 alternatives, the County and WSDOT conducted a Tier 2 Evaluation to further compare the top three alternatives to each other still based on the Project Goals.

Although the scores for all three I-90 alternatives were very close, the County and WSDOT concluded expansion in the median of I-90 would likely cause less disruption to traffic flow, and fewer physical impacts to the natural environment and surrounding communities.

Therefore, Alternatives 2 and 3 will move forward and be further evaluated in the next phases of this study. More information about next steps is presented in Chapter 6.

Table 4-5 Tier 2 Evaluation Results – Non-Weighted

Project Goals	Evaluation Criteria	Performance Measurement	Alt 1	Alt 2	Alt 3
Safety Improve overall safety along I-90 and adjacent roadways	**Increase in Safety on I-90** Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Moderately increases existing condition safety 1 – Does not increase existing condition safety	2	2	2
	Evacuation/Emergency Routes Does the proposed alternative provide additional routes?	3 – Increases emergency/evacuation routes 2 – Moderately increases emergency/evacuation routes 1 – Does not increase emergency/evacuation routes	1	1	3
	Increase in Safety on Adjacent Roadways Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Moderately increases existing condition safety 1 – Does not increase existing condition safety	3	3	2
	Safety Exposure during Incident Responses Does the alternative provide an option for shifting traffic during emergencies, maintenance and repairs on I-90?	3 – Increases opportunity for crew safety/traffic diversion 2 – Provides some opportunity for crew safety/traffic diversion 1 – No improved conditions for crew safety/traffic diversion	2	2	3
	Emergency Response Does the alternative decrease response times for emergency responders?	3 – Decreases emergency response times 2 – No impacts to emergency response times 1 – Increases emergency response times	3	3	3
	Public Level of Concern for Safety Does the alternative change conditions for residents along the proposed route?	3 – Increases safety along local roads 2 – Does not change existing condition safety 1 – Decreases safety due to increased traffic	3	3	2
Transportation Demand Enhance mobility and connectivity on I-90 for passenger vehicles, emergency vehicles, transit, and active modes and provide support for increased throughput	**Accommodates Active Transportation Modes** Does the Alternative accommodate active transportation?	3 – Includes low stress nonmotorized facilities 2 – Includes moderate stress nonmotorized facilities 1 – Includes high stress nonmotorized facilities	1	1	1
	Provides Congestion Relief for General Purpose (GP) Vehicles/Trucks Does the alternative provide congestion relief for GP vehicles and trucks?	3 – Congestion relief for GP vehicles/trucks (greater than 25%) 2 – Some congestion relief for GP vehicles/trucks (5-25%) 1 – No congestion relief (less than 5% or net increase in congestion)	3	3	3
	Provides Congestion Relief for Transit (Wenatchee Valley Shuttle, Kittitas County Connector, Hope Source)? Does the alternative provide congestion relief for transit	3 – Congestion relief for transit (greater than 15%) 2 – Some congestion relief for transit (1-15%) 1 – No congestion relief or net increase in congestion	3	3	3
	Effects on Adjacent Roadways Does the alternative improve vehicular mobility on County arterial roadways?	3 – Improves vehicular mobility on arterial streets 2 – Provides some vehicular mobility improvements on arterial streets 1 – Does not improve vehicular mobility on arterial streets	3	3	3
	Increases Person Throughput (Capacity Increase) Does the alternative increase person throughput?	3 – Increases person throughput 2 – Moderately increases person throughput 1 – Does not increase person throughput	3	3	3
	Complementary to Local and Tribal Planning Is the alternative complementary to local and tribal planning efforts, including land use plans and transportation plans?	3 – Complements local planning efforts 2 – Partially complements local planning efforts 1 – Does not complement local planning efforts	3	3	3
	Public Level of Concern Regarding Access to Driveways and Local Circulation Does the alternative improve local driveway and community access?	3 – Increases community access and circulation 2 – Does not affect current access and circulation 1 – Decreases community access and circulation	3	3	2

Performance Measurement: Highest Performing (3) Moderate (2) Lowest Performing (1)

Table 4-5 Tier 2 Evaluation Results – Non-Weighted (continued)

Project Goals	Evaluation Criteria	Performance Measurement	Alt 1	Alt 2	Alt 3
Freight Mobility Support economic vitality through reliable and efficient freight movement and access to major employers	**Increases Freight Throughput (West to East I-90)** Does the alternative increase freight throughput on I-90?	3 – Increases freight throughput 2 – Moderately increases freight throughput 1 – Does not increase freight throughput	3	3	3
	Provide additional Freight Management Options During Road Closures (freight parking, designated alternate routes) Does the alternative increase freight management options?	3 – Increases freight management options 2 – Moderately increases freight management options 1 – Does not increase freight management options	1	1	1
	Increase Freight Reliability (Localized Deliveries/Freight Options) Does the alternative increase freight reliability?	3 – Improves freight reliability 2 – Partially improves freight reliability 1 – Does not improve freight reliability	3	3	3
Environmental Enable environmental restoration and ecosystem resiliency along I-90 connecting habitats, hydrological features and animal populations	**Increases Aquatic Resources Restoration Potential** Does the alternative have the potential to improve environmental functions of aquatic resources (e.g., wetlands, rivers, streams) by improving fish passage, access to habitat, and reduce impacts to river hydraulics and geomorphology, etc.?	3 – Improves quality of all aquatic resources 2 – Improves quality of some aquatic resources 1 – Does not improve or restore any aquatic resources	2	2	2
	Improves Wildlife Connectivity Does the alternative improve the availability of wildlife habitat and connectivity?	3 – Improves wildlife connectivity 2 – Moderately improves wildlife connectivity 1 – Does not improve wildlife connectivity	2	2	2
	Increases Ecosystem Resiliency Does the alternative increase resiliency against the impacts of climate change?	3 – Increases resiliency by reducing risks associated with extreme river flood events as an impact of climate change 2 – Some improvements for resiliency by partially reducing risks associated with extreme river flood events as an impact of climate change 1 – Does not increase resiliency by not reducing risks the impacts associated with extreme river flood events as an impact of climate change	2	2	2
	Considers long term impacts to Endangered Species Act (ESA) Listed Species and designated critical habitats Does the alternative have long term impacts on ESA listed species or designated critical habitats?	3 – Improves conditions for ESA listed species and designated critical habitats 2 – Does not improve or have long term impacts to ESA listed species and designated critical habitats 1 – Has potential to long term impacts ESA listed species and designated critical habitats	1	2	2
	Risk of Cultural/Historical or Section 4(f)/6(f) Impacts Does the alternative have a higher risk of impacting cultural and/or historical sites or Section 4(f)/6(f) resources?	3 – Alternative has a high risk of impacting cultural/historic places or Section 4(f)/6(f) resources 2 – Alternative has a medium risk of impacting cultural/historic places or Section 4(f)/6(f) resources 1 – Alternative has a low risk of impacting cultural/historic places or Section 4(f)/(f) resources	2	1	1

Performance Measurement: Highest Performing (3) Moderate (2) Lowest Performing (1)

Table 4-5 Tier 2 Evaluation Results – Non-Weighted (continued)

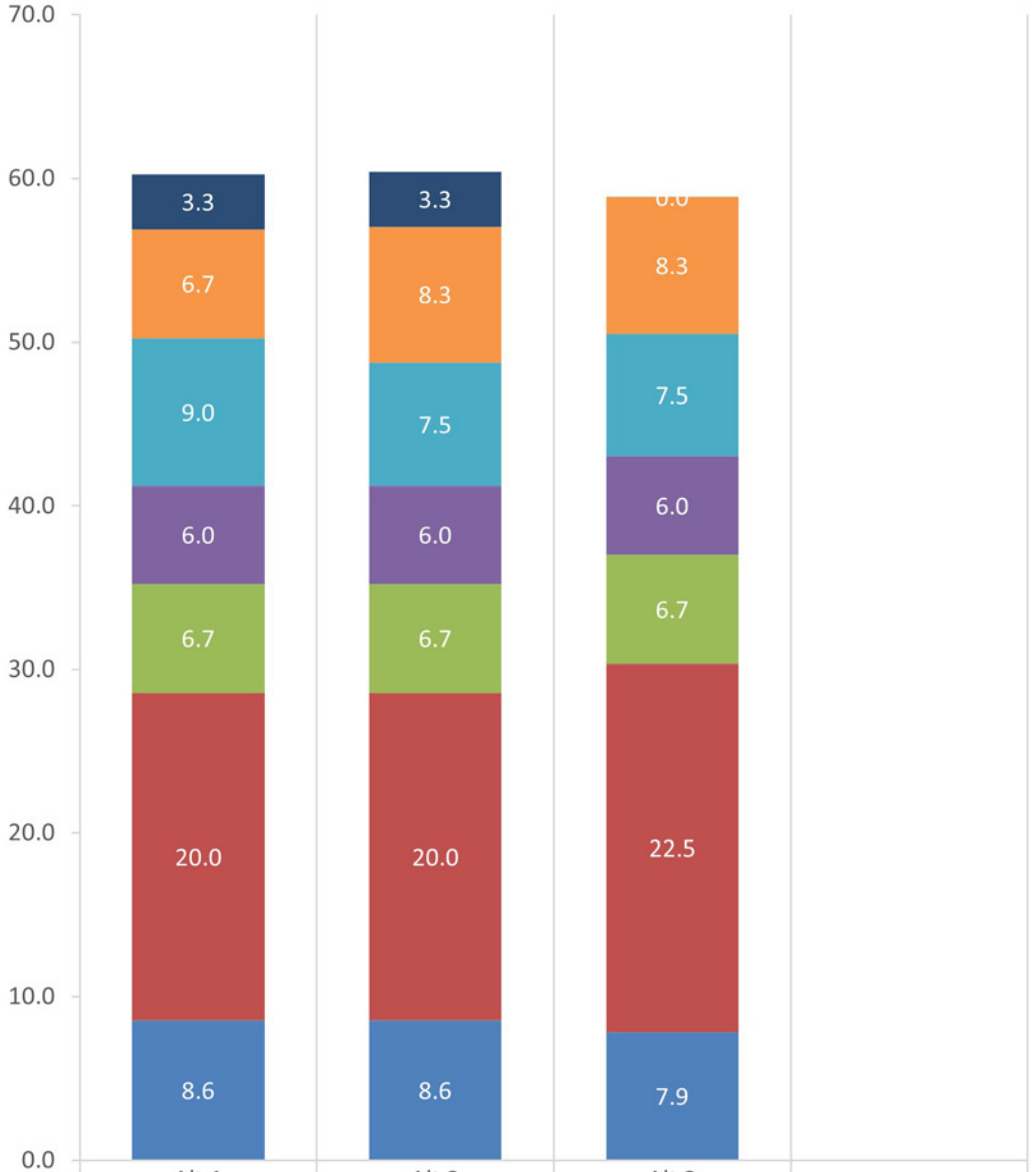
Project Goals	Evaluation Criteria	Performance Measurement	Alt 1	Alt 2	Alt 3
Resiliency Improve local roads and I-90 system resiliency	**Reduces the Risk of Infrastructure Failures** Does the alternative reduce the risk of infrastructure failure by addressing erosion and channel migration?	3 – Removes risks from erosion/channel migration 2 – Reduces risks from erosion/channel migration 1 – Does not address erosion/channel migration	3	3	3
	Reduces the Risk of Infrastructure Failures due to changing climate? Does the alternative increase resiliency by enhancing the ability to withstand, respond to and recover from extreme weather events (i.e. flood risk and snow melt)?	3 – Improves risk from climate change 2 – Moderately improves risk from climate change 1 – Does not improve risk from climate change	2	2	2
	Susceptibility to Road Closures/Conditions Does the alternative decrease the susceptibility to road closures (snow, wildfires, crashes)?	3 – Significantly decreases roadway susceptibility 2 – Moderately decreases susceptibility 1 – Does not decrease susceptibility	1	1	1
	Operations and Maintenance Activities Does the alternative affect operations and maintenance related to snow removal and other operational needs?	3 – Improves O&M activities 2 – Does not change O&M activities 1 – Impacts normal O&M activities	2	1	1
	Reduces the Risk of Infrastructure Failures due to Seismic Activity Does the alternative increase resiliency of I-90 crossings by enhancing the ability to withstand seismic activity?	3 – Removes risk from seismic activity 2 – Reduces risk from seismic activity 1 – Does not address risk from seismic activity	3	3	3
Equity/Inclusion Support equitable outcomes	**Minimizes Business and Residential Impacts from Displacements** Does the alternative minimize the potential business and residential impacts and displacements, especially for environmental justice (EJ) populations?	3 – No impacts or displacements 2 – Minimal impacts and displacements (less than 5 residential structures) 1 – Moderate to high impacts and displacements (more than 5 residential structures, 1 or more multi-family, and 1 or more government service)	2	3	3
	Construction of Project Provides 40% Benefit to Disadvantaged Communities Project area is not defined as a Justice40 disadvantaged community, but does the alternative provide meaningful, direct benefit to DBE businesses and increase DBE workforce capacity?	3 – Greatest opportunity to disadvantaged communities (60%) 2 – Meets minimum opportunity to disadvantaged communities (40%) 1 – Does not provide benefit to disadvantaged communities (<40%)	3	3	3
	Minimizes Environmental Exposures Does the alternative contribute new environmental hazards or pollution sources?	3 – Improves/reduces environmental hazards or pollution sources 2 – Partially improves environmental hazards and/or contributes minimal new pollution 1 – Contributes new environmental hazards or pollution sources	2	2	2
Relative Cost of Alternatives	**Planning-level Cost Comparison** Does the alternative have higher planning-level costs compared to the other alternatives?	3 – Planning-level cost is lower (under $20 million) 2 – Planning-level cost is moderate ($20 - $100 million) 1 – Planning-level cost is higher (over $100 million)	1	1	1
	Preservation Cost Does the alternative have a higher preservation cost compared to the other alternatives?	3 – Preservation cost is lower 2 – Preservation cost is moderate 1 – Preservation cost is higher	2	2	1
	Maintenance and Operations Cost Does the alternative create a higher demand/response maintenance cost compared to other alternatives?	3 – Maintenance and operations cost is lower 2 – Maintenance and operations cost is moderate 1 – Maintenance and operations cost is higher	2	2	1

Performance Measurement: Highest Performing (3) Moderate (2) Lowest Performing (1)

Table 4-6 Tier 2 Evaluation – I-90 Alternatives Weighted Scores

	Alt 1 *I-90 Outside Widening*	**Alt 2** *I-90 Median Widening*	**Alt 3** *I-90 Reversible Lanes*
Safety	20.0	20.0	22.5
Transportation Demand	8.6	8.6	7.9
Freight Mobility	6.7	6.7	6.7
Environmental	6.0	6.0	6.0
Resiliency	9.0	7.5	7.5
Equity/Inclusion	6.7	8.3	8.3
Relative Cost of Alternatives	3.3	3.3	0.0
Total Score	**60.2**	**60.4**	**58.9**

Figure 4-2 Tier 2 Evaluation Summary by Alternative – Weighted Score



	Alt 1	Alt 2	Alt 3	
Relative Cost of Alternatives	3.3	3.3	0.0	
Equity/Inclusion	6.7	8.3	8.3	
Resiliency	9.0	7.5	7.5	
Environmental	6.0	6.0	6.0	
Freight Mobility	6.7	6.7	6.7	
Safety	20.0	20.0	22.5	
Transportation Demand	8.6	8.6	7.9	

5 COMMUNITY AND STAKEHOLDER INVOLVEMENT

Public outreach is a critical part of any planning study. It harnesses the insights of roadway users and other members of the public who supply the local knowledge, context, and information necessary to make informed project decisions. Engagement of the residents, travelers, and other drivers who regularly use I-90 in Kittitas County is a key factor in this project's success.

Consistent with Kittitas County (County) and the Washington State Department of Transportation (WSDOT) community engagement practices, this feasibility study process included opportunities for the public and stakeholders to share their concerns, issues, and preferred solutions. Various forms of outreach were used to ensure the widest range of engagement within the study area and the County as a whole.

The general approach for public outreach included:

- Development of a Public Outreach Plan
- Creation of the STEER I-90 Coalition (discussed below) to share and disseminate information about the study
- Interviews with organizations, agencies, and businesses that use corridor roadways as part of their routine business, with a focus on freight mobility

Chapter Overview

- Provides an overview of the public outreach plan
- Discusses public and stakeholder engagement
- Summarizes public and stakeholder feedback

- Collection of broad public input on I-90 issues and potential improvements through virtual workshops, an open house, and surveys

The County and WSDOT reviewed public, stakeholder, and affected agencies' comments and concerns that were received during the public outreach activities. This feedback was used to help:

- Guide the development of project alternatives to address the ongoing traffic concerns along I-90 in the study area
- Develop evaluation criteria to accurately measure the ability of the proposed alternatives to address concerns
- Select the preferred alternative to move forward for further analysis, pending funding.

5.1 Public Outreach Plan

The Public Outreach Plan outlines a framework for stakeholder engagement and public involvement activities. The Plan was prepared to guide the approach for outreach to the public and stakeholders to learn about the project and the study, ask questions, and submit comments on their concerns and their favored alternatives. The following goals and objectives helped guide the public involvement and communications strategy.

- **Goal 1:** Promote an understanding of the purpose and need for the project and the study and the process leading to final decisions.
  - ***Objective:*** Ensure comprehensive information about the study and the decision process is available to the public and the media.
- **Goal 2:** Involve the stakeholders and public early on and throughout the process.
  - ***Objective:*** Involve new and existing stakeholders by providing a range of public input opportunities.
  - ***Objective:*** Provide continued communication and feedback to the public throughout the process.
  - ***Objective:*** Publicize meetings and activities through multiple and diverse communications vehicles.
  - ***Objective:*** Seek participation of all potentially affected and/or interested individuals, communities and organizations.
- **Goal 3:** Ensure that public input is incorporated into the decision-making process.
  - ***Objective:*** Involve the community and other stakeholders at key milestones and decision-making points throughout the environmental review and design process.
  - ***Objective:*** Solicit meaningful input from affected communities on the range of alternatives and potential impacts.
  - ***Objective:*** Respond to public comments in a timely and thorough manner.
  - ***Objective:*** Report back to the community on how their feedback has been considered and incorporated into the decision-making process.

These goals and strategies were implemented through various forms of communication, as presented in the following sections.

5.2 STEER I-90 Coalition

The County oversaw the funding and development of the STEER I-90 Coalition, comprised of stakeholders from a range of organizations engaged in improving this portion of the I-90 corridor. STEER I-90's website[1] serves as an online forum to disseminate information about the project and bring together community and regional stakeholders, including business owners, legislators, and industry leaders. STEER I-90 focuses on bringing attention to the need for I-90 improvements in the study area via lobbying, public outreach, and technical study. Utilizing STEER I-90's website, the County facilitated seamless communication with the public, enabling the dissemination of information through various channels including

1 https://steeri90.com/

webinars, the establishment of a mailing list, and the facilitation of online public surveys.

5.3 Tribal Coordination

In late 2022, the County and WSDOT reached out to Tribes deemed to have potential interest in the project and study process. Tribes contacted via email in December 2022 were:

- Colville Tribes
- Muckleshoot Indian Tribe
- Snoqualmie Indian Tribe
- Confederated Tribes and Bands of the Yakama Nation

An overview of the project and the study process, along with a map of the study area, was provided to each Tribe. In May 2023, the Snoqualmie Tribe requested a meeting with the project team. This online meeting was held on June 21, 2023. Also in May 2023, the Yakama Tribe contacted the project team and requested updates as the project moved forward. The Colville Tribe and the Muckleshoot Tribe did not wish to be involved at that time.

In January 2024, both the Snoqualmie and Yakama Tribes were provided graphics and descriptions of proposed alternatives, an evaluation summary, and were informed of upcoming opportunities for engagement, including a webinar and open house.

5.4 Public and Stakeholder Engagement

The following sections summarize public and stakeholder engagement efforts, beginning in June 2023. Activities listed below were primarily initiated at two key milestones:

- At the initial kick-off of the project to gather the public's thoughts and concerns about travel in the study area, and
- Prior to the release of this draft report, to gain insight into the public's thoughts on alternatives and their preference for a preferred alternative.

5.4.1 Information Distribution and Notices

The STEER I-90 website is the primary host for the project using links to other project platforms. The website provides information about the study, upcoming project milestones, and public involvement opportunities. It also serves as a point of access to collect public input and as a location where questions about the project can be addressed.

The website includes opportunities for the public and stakeholders to sign up to receive email communication and updates regarding the project.

5.4.2 Stakeholder Interviews

Stakeholder interviews were held in June and July 2023. The goal of the interviews was to obtain information and concerns regarding current travel conditions along the I-90 corridor in the study area. Most interviews took place via telephone, with some stakeholders opting to complete a questionnaire. A mix of industry, agency, and port representatives were included in the interview pool based on discussions with the STEER I-90 Coalition. A list of stakeholders contacted during the engagement process is presented in Table 5-1. Questions focused on:

- Gathering feedback regarding the purpose and need of the study
- Understanding how traffic and mobility affect the stakeholders' respective organizations
- Identifying current traffic mobility concerns in the study area

Table 5-1 Stakeholders Contacted and Interviewed

Stakeholders Contacted	Interviewed
Inland Port Authorities	
Washington State Port Authorities	X
Port of Quincy	X
Port of Warden	X
Port of Pasco	X
Port of Mattawa	X
Industry	
Private Farm Organizations (Quincy, Washington): BAM Farms, Alred Farms, Stahl Farms, Davis Farms	
Lamb Weston (Washington Plants)	X
PNW Veg Co. (Washington Plants)	
Amazon	
Microsoft	X
Agencies	
WSDOT Maintenance	X
Cle Elum Police Department	X
Cle Elum Fire Department	X
Cle Elum – Roslyn School District	X
Recreation	
Suncadia Resort	X
Sleeping Lady Mountain Resort	
Icicle Creek Center for the Arts	
Washington State Parks - Palouse to Cascade Trail	
US Forest Service District Ranger	

Key takeaways from these interviews included:

- Congestion is impeding freight mobility and emergency response
- Commuting to/from the general area is on the rise, thus increasing travel time
- Traffic congestion is contributing to an inability to attract new employees
- Environmental impacts and climate change should be considered as part of the study

Information gathered from these interviews contributed to the development of the project's alternatives, as well as criteria for the evaluation process.

5.4.3 Public Surveys

Two public surveys were conducted to received input from the public and stakeholders to identify:

- Community concerns, to assist with development of the Project Purpose.
- The community's preferred alternative(s).

In addition, voluntary demographic information was collected to provide the project team with an overview of the population profile of respondents.

Public Survey 1: Summer 2023

During the initial stages of the project, from July 13 through August 18, 2023, public opinion was sought via an online survey linked through the STEER I-90 Coalition's website and promoted through various stakeholders' social media accounts. The purpose of the public survey was to better understand how the public uses this portion of I-90. Survey questions are presented in Table 5-2 below. Over 900 survey responses were submitted to the County. Figures 5-1 and 5-2 provide a summary of concerns and priorities. Appendix I contains the Public Survey Summary.

Table 5-2 Public Survey 1, Summer 2023 – Survey Questions

Travel on I-90 in the Study Area
1. How do you travel on I-90 from Easton to Cle Elum?
2. How frequently do you use any portion of I-90 between Exit 70 (Easton) and Exit 85 (Cle Elum)?
3. What are the main reasons you travel on I-90 between Exit 70 (Easton) and Exit 85 (Cle Elum)?
Areas of Concern
4. What is your biggest concern related to this section of I-90? Please rank from 1 (biggest concern) to 5 (least concern).
5. In the vicinity of I-90 between Exit 70 (Easton) and Exit 85 (Cle Elum), which of the following roadways do you think is the biggest concern?
Potential Improvements
6. When considering alternative improvements on I-90 or the surrounding roads, what do you think should be the priority? Please rank the following in order of importance, from 1 (most important) to 4 (least important).
7. Which of the following do you consider to be the best solution to improve traffic on I-90?
Additional Comments – Open-Ended
8. Is there anything else you would like us to know about the section of I-90 between Exit 70 (Easton) and Exit 85 (Cle Elum)?
Respondent Information/Demographics
9. What is your annual household income?
10. What is your age?
11. How do you identify your race/ethnicity?
12. Do you identify as Hispanic and/or Latino?

Figure 5-1 Public Survey 1 Results Summary – Biggest Public Concerns

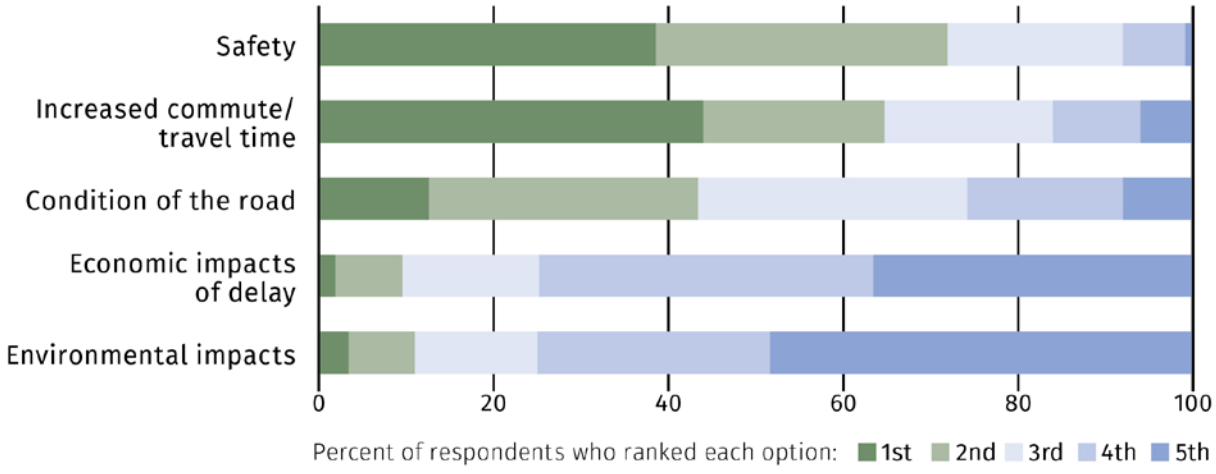
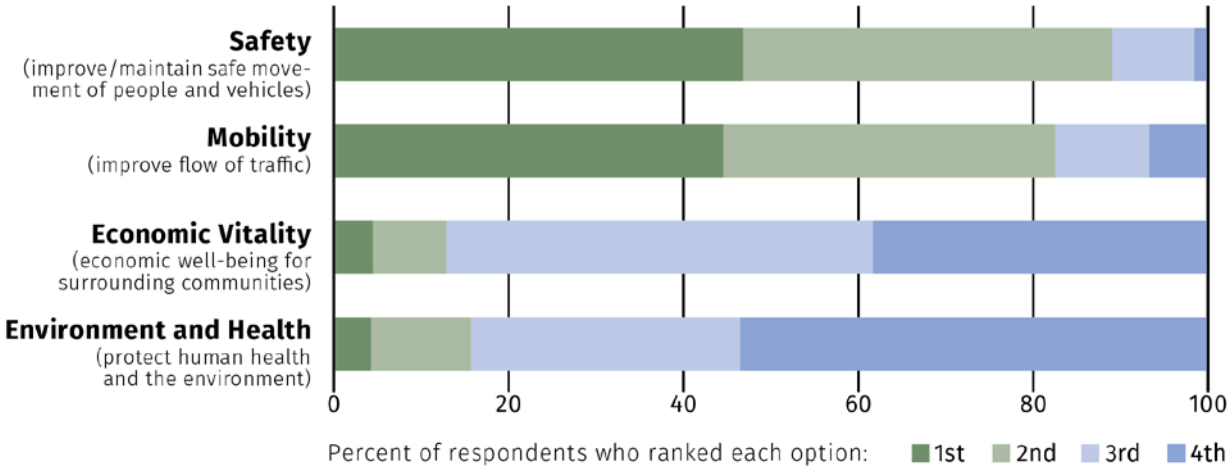


Figure 5-2 Public Survey 1 Results Summary – Prioritization of Improvements



Information gathered provided a foundation for development of the project's alternatives, as well as criteria for the evaluation process.

Public Survey 2: February 2024

A public survey was available both at the in-person Open House and online. The survey invited community members to identify their preferred alternative(s) and to share any additional insights with the County and WSDOT. As presented in Chapter 4, the majority of respondents indicated Alternative 2 as their preferred alternative (see Figure 5-3). Please refer to Table 5-3 for an overview of the survey results. A total of 74 respondents provided information about their preference and their reasoning. Appendix J provides more information about the survey methodology and results.

Figure 5-3 Public Survey 2 Results Summary – Preferred Alternative

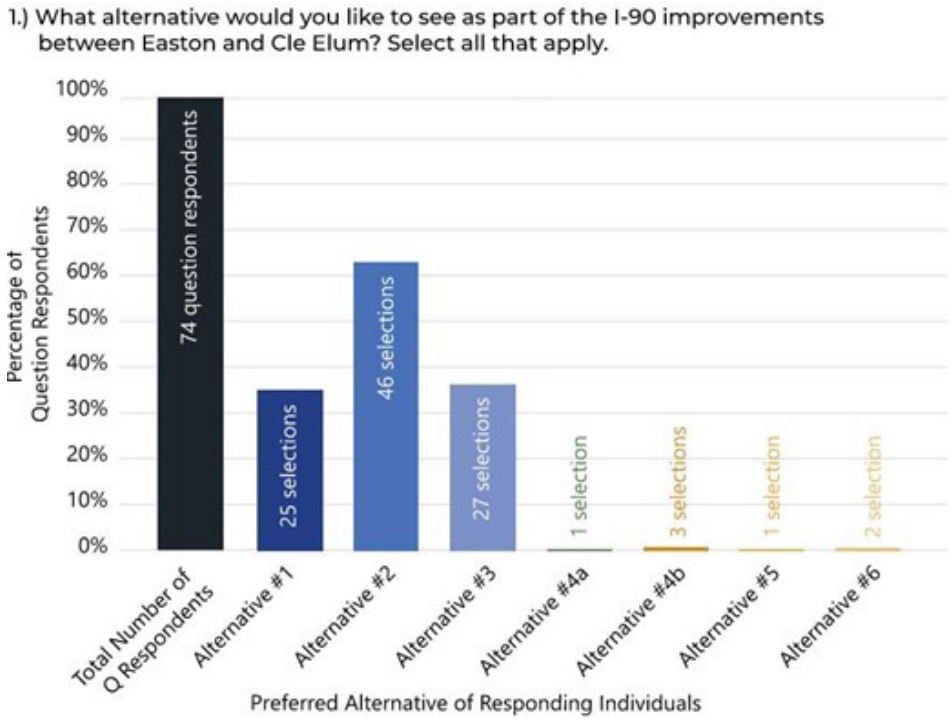


Table 5-3 Public Survey 2, February 2024 – Survey Results

Alternative	# Votes	Reasons
Alternative 1: Widen I-90 to the Outside	25	◆ Prioritize options that keep traffic on the freeway (I-90) ◆ Reasons include reducing congestion and improving emergency response times ◆ Avoid diverting traffic onto county roads to minimize hazards for residents ◆ Emphasize safety, environmental impact, and long-term solutions ◆ Preserve neighborhood integrity and minimize disruption to residents ◆ Considerations include minimizing costs, preserving private property, and reducing environmental impact
Alternative 2: Widen I-90 in the Median	46	◆ Advocacy for economical options to minimize congestion and hazards ◆ Prioritize keeping traffic on I-90 to aid emergency response and safety ◆ Utilization of existing freeway right of way for cost-effectiveness ◆ Support for widening I-90 to improve traffic flow and safety ◆ Preference for options minimizing impact on local roads and residents ◆ Consideration of snow removal efficiency and access management ◆ Proposal for inward expansion to minimize environmental impact ◆ Emphasis on maintaining safety, environmental impact, and property rights ◆ Support for expanding I-90 lanes to accommodate traffic and improve safety ◆ Recognition of cost-effectiveness and reduced habitat destruction ◆ Proposal for cost-saving measures such as utilizing existing median space ◆ Advocacy for additional lanes on I-90 in both directions for efficiency

Table 5-3 (continued) Public Survey 2, February 2024 – Survey Results

Alternative 3: Widen I-90 in the Median, Reversible Lanes	27	◆ Emphasize economical options for efficiency and effectiveness ◆ Advocate for keeping traffic on I-90 to avoid congestion and hazards ◆ Prioritize safety for residents, especially during emergencies ◆ Support for alternatives preserving neighborhood integrity ◆ Preference for options allowing traffic to remain on I-90 ◆ Consideration for construction impact on traffic and property ◆ Importance of durability and traffic management, especially during holidays ◆ Concerns about emergency access and traffic flow in case of incidents ◆ Advocacy for expanding lanes on I-90 to handle heavy traffic ◆ Emphasize cost-effectiveness and minimal disruption to resources ◆ Support for reversible lanes in the median to maximize flexibility ◆ Consideration of safety and adaptability in proposed solutions ◆ Proposal for separation of trucks from other vehicles for safety
Alternative 4a: SR 903 Extension	1	◆ Alternate 4A need second way out and not the dead end in case of a fire or high winds (downed trees)
Alternative 4b: Bullfrog Road Extension	3	◆ Emergency evacuation. ◆ Easy snow plowing. Move access from Bullfrog Rd to I-90. ◆ This choice, 4B may be the least impactful to surrounding area, i.e. short distance, no residential homes.
Alternative 5: South Route	1	◆ Easton to exit 74 first then widen to Nelson Siding westside Upper Peoh, don't go through south Cle Elum. Local traffic only.
Alternative 6: No Build	2	◆ All of these I-90 improvements wont happen for years. ◆ Highway expansions historically only offer temporary reductions in congestion (after temporarily impacting traffic during the ~10 year construction period). They are also extremely costly, particularly when current highway maintenance needs are severely underfunded, and have adverse environmental impacts. Likewise, scenarios 4A, 4B, and 5 would significantly impact the rural character of the immediate area without any clear benefit (other than apparently diverting traffic off I-90) and run counter to the County's own plan of "preservation of the existing and future transportation system should be a funding priority ahead of expanding the system." Alternative 6 should be further expanded to look at actual expansion alternatives such as permanent variable speeds, lower county road speeds, traffic speed cameras, increased State Patrol emphasis, etc.

5.4.4 Virtual Open Houses (Webinars)

Two virtual open houses were held as part of the outreach process – one at the onset of the study, and another prior to the release of the draft report. Both webinars were widely advertised two weeks prior to the events and recorded so they could be played for those not able to attend the live webinar. Advertisements were displayed between the communities of Easton and Cle Elum in the form of informational handouts and signs. Advertising methods included:

- Kittitas County and STEER I-90 website, interested party email list
- Announcements on agency websites
- Community bulletin boards and newsletters
- Press releases
- Social media announcements
- Mailings to neighborhood associations in adjacent communities

Webinar 1: August 10, 2023

Public Review of Study's Purpose and Need: An online open house was held to solicit feedback on the purpose and need of the study, including soliciting feedback regarding traffic and mobility concerns. Concurrent with the webinar, an online survey was posted on the Steer I-90 website soliciting public comments.

During the webinar, participants were asked to submit questions to the County for discussion during the webinar. Questions (and their answers) are presented in Table 5-4.

Information gathered during this webinar provided a foundation for development of the project's alternatives, as well as criteria for the evaluation process.

Webinar 2: February 20, 2024

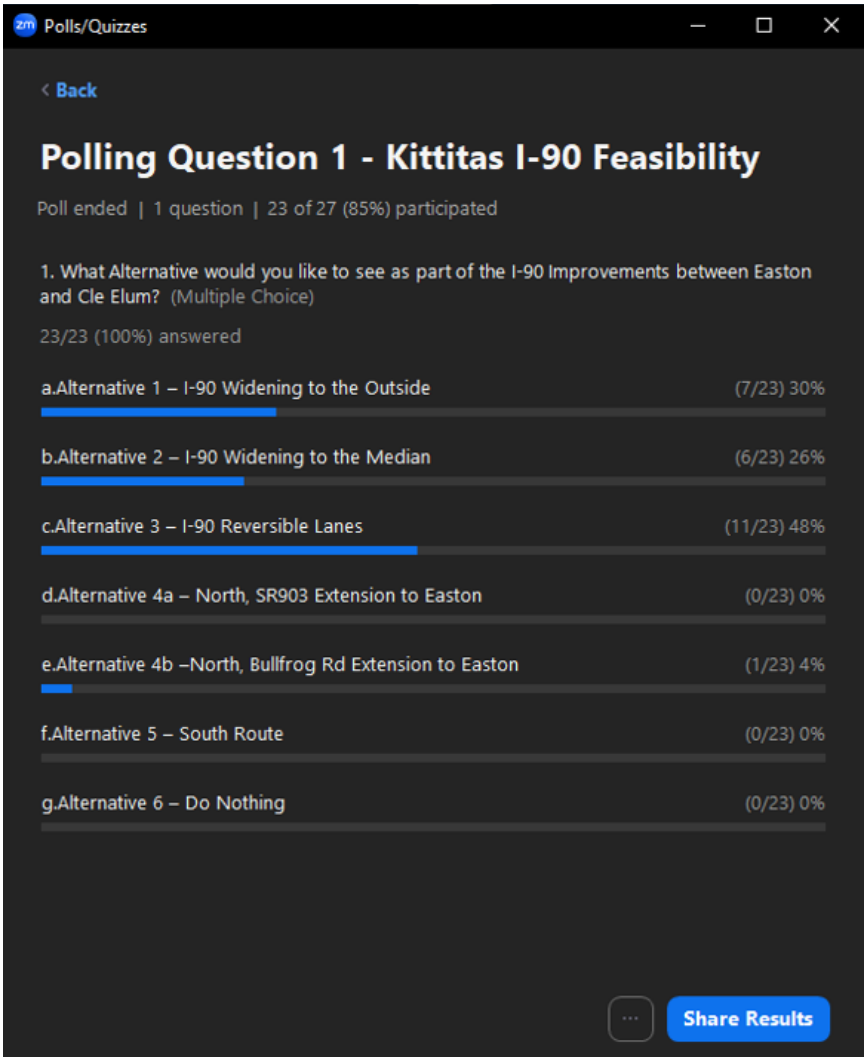
Public Review of Alternatives and Evaluation: An online open house was held to solicit feedback on alternatives and their evaluation. Approximately 40 people attended the webinar. Seven alternatives were presented, as well as

Table 5-4 Webinar 1, August 2023 – Questions and Answers

Question	Answer
What changes will be made to the I-90 corridor or on/off exits?	Not quite there yet. Currently right now we are identifying the issues.
When would construction season for this project begin?	We need to make sure our solution is identified and funding is available. No set construction timeline at this time. Pushing to shorten this timeline with federal funding. It took 16-years to get a project started in this area The Upper County Traffic Committee studied and proposed some traffic calming measures.
Will the County Public Works revisit those to relieve some safety issues on the county roads being used to bypass congestion on the interstate?	We are back revisiting what measures we could employ.

an overview of the evaluation process and scoring. A survey was posted on the STEER I-90 website for participants to complete, focused on ranking their three preferred alternatives. Figure 5-4 presents the participants' choices for a preferred alternative. Detailed polling results can be found in Appendix K.

Figure 5-4 Webinar 2, February 2024 – Sample Polling Question



5.4.5 Open House

An in-person open house was held at the Cle Elum Senior Center on February 28, 2024 to solicit feedback on alternatives and their evaluation. Approximately 100 residents attended the open house. Information boards were displayed and staff from the County, WSDOT, and the project team were available to answer questions. Following initial viewing, a question and answer period took place.

The seven alternatives were presented, as well as an overview of the evaluation process and scoring. A survey was available for attendees to complete, focused on ranking their three preferred alternatives. The public voted on one or more preferred alternatives. Alternative 2 received the most votes with Alternative 3 and 1 almost tied (see Figure 5-3 under the public survey summary in Section 5.4.3). The public heavily favored improvements that encroached upon the median over outside widening or outside of the I-90 corridor.

Community Feedback

During discussions with open house attendees, considerable attention was drawn not only to the public's preferred alternative(s), but also to existing alignment concerns that participants hope will be addressed within the scope of this project. A few attendees raised concerns regarding potential snow storage locations in Alternative 3. However, notable support was voiced for Alternative 3 due to its potential to mitigate disruption caused by lane closures in either the westbound or eastbound direction.

A recurring theme of discussion centered on safety concerns associated with the curve in the vicinity of the weigh station (near MP 80), with attendees expressing hopes that the project would address this issue. Additionally, there was a consensus within the community to prioritize keeping I-90 traffic on the interstate and discouraging the use of county roads as detours, rendering Alternatives 4A, 4B, and 5 as highly unfavorable. The majority of the attendees were very concerned about the inclusion of an alternative south of I-90 (Alternative 5) which, from their perspective, would only exacerbate the existing problems of unsafe conditions in front of their homes (speeding), and hindered access to their driveways due to drivers exiting I-90 and detouring through their neighborhoods.

Discussions also touched upon the realization that this project may take several years to complete and the potential for interim safety enhancements to county roads to deter traffic diversion. Suggestions included the implementation of traffic calming measures on county roads to improve safety in the meantime. While participants acknowledged the need for improvements on the county roads, they also recognized that these initiatives might constitute a separate project rather than being integrated into the I-90 solution.

Based on the public feedback from the activities held during February 2024, new criteria – focused on safety and mobility – were added to the evaluation criteria. The Tier 1 and Tier 2 evaluations were revisited and updated, based on what the County and WSDOT heard from the community. The County and WSDOT will continue to work closely with the community to ensure their voices are heard and included in the future analyses as the project progresses.

6 NEXT STEPS

This chapter outlines the steps necessary to move the I-90 Easton to Cle Elum project forward from a feasibility study to implementation.

Chapter Overview

- Outline of next steps to move forward with project development

6.1 Legislative Outreach and Funding

Kittitas County (County) and consultants have engaged with federal legislators to inform them of the scope of the project, its importance, and the region's need to improve capacity issues along I-90 in the study area. In March 2024, a delegation met with Washington State legislators in Washington, D.C. to begin this process.

Additionally, a list of prospective federal grants has been compiled to target facilitating further design, environmental analysis, and eventual implementation. The following U.S. Department of Transportation grant and funding opportunities are potentially available for this project:

- Better Utilizing Investments to Leverage Development (BUILD) Grant, Office of the Secretary for Transportation Policy
- Federal Lands Access Program (FLAP), Western Federal Lands Highway Division
- Infrastructure for Rebuilding America (INFRA) Grants, Office of the Secretary for Transportation Policy
- Nationally Significant Federal Lands and Tribal Projects (NSFLTP) Program, Federal Highway Administration
- Surface Transportation System Funding Alternatives, Federal Highway Administration
- Transportation Infrastructure Finance and Innovation Act (TIFIA) Program, Build America Bureau
- Transportation Infrastructure Finance and Innovation Act (TIFIA): Rural Project Initiative (RPI), Build America Bureau

The County will continue working closely with the Washington State Department of Transportation (WSDOT) to identify potential state and/or federal funding opportunities to help advance project planning and design.

Once funding is obtained, preliminary design and environmental analyses will be initiated. Current public engagement efforts will continue and be expanded through the STEER I-90 Coalition.

6.2 Preliminary Engineering

The selected alternatives (Alternatives 2 and 3) discussed in Chapter 4 of this document will need to be further developed at a preliminary design level to more accurately understand the project footprint and potential environmental impacts. As part of the preliminary design phase, a best-fit alignment and method of widening the corridor will be further evaluated. There are multiple areas along the I-90 corridor that will require interim alternative assessments to determine the best methods for reducing environmental impacts and minimizing interruptions to the traveling public. The overall goal is to identify an initial design footprint for the project to better analyze environmental and traffic outcomes.

The design footprint will show the locations of improvements in the corridor, including stormwater facilities, earthwork, and connection methods to the interstate. While no new access points to I-90 have been proposed during the feasibility study, modifying existing access to accommodate additional lanes will be required. Future design work will include plan and cross-section views of the improvements and construction staging schemes to identify staging areas within or adjacent to the WSDOT right-of-way.

Preliminary engineering, typically at the 5% to 10% level will be developed to determine potential environmental impacts, which is necessary in determining the level of environmental analysis and documentation that will be required for the project.

Once the level of environmental analysis and documentation is identified, engineering design (typically developed to the 15% to 30% level) will move forward concurrently with the environmental analysis.

6.3 Environmental Analysis and Documentation

I-90 is a federal facility and is maintained and operated by WSDOT. Because of this federal nexus (and potential federal funding) federal environmental regulations must be followed. As funding becomes available the County, in partnership with WSDOT and in consultation with the Federal Highway Administration (FHWA), will prepare environmental documentation pursuant to the National Environmental Policy Act (NEPA). In addition, because of state and county involvement, the Washington State Environmental Policy Act (SEPA) and Healthy Environment for All (HEAL) Act would also be part of the environmental and approval process.

WSDOT has determined a Planning and Environmental Linkages (PEL) study is not necessary for this project since the purpose of a PEL is to reduce the range of alternatives by identifying those that are not feasible (i.e., those that have fatal flaws) or do not meet the purpose and need for the project. Because this feasibility study narrowed down the alternatives and identified those that are not feasible and do not meet the purpose and need, preparation of a PEL would be a costly and unnecessary step. Therefore, the next step in environmental review is to identify the NEPA documentation (class of action) required for this project.

Preliminary engineering will be developed to help identify potential impacts for key environmental areas including, but not limited to: noise, wildlife connectivity, fish passage, and cultural resources.

Once preliminary design and environmental screening has occurred, the County will work with WSDOT to prepare information for FHWA regarding how to move forward with NEPA. Consultation with FHWA will be critical to determine the appropriate NEPA documentation. The necessary NEPA documentation can range from a Categorical Exclusion (CE) (a checklist which is often accompanied by technical studies) to an Environmental Assessment (EA) (more robust than a CE and requires a formal public comment period) to an Environmental Impact Statement (EIS). An EIS requires lengthy, in-depth analysis and formal public comment periods and hearings.

WSDOT will determine the level of documentation to comply with SEPA. If it is determined a SEPA Checklist will be completed (with technical studies), WSDOT may choose to adopt the NEPA documentation as part of their SEPA process.

6.4 Outreach and Engagement

This feasibility study will be widely available via the STEER I-90 website to the general public and stakeholders to review and provide comments. Comments received on this document will be compiled and reviewed and will be a key consideration when designing the scope of work and analysis approach for the NEPA/SEPA process.

It is the County's and WSDOT's intent to re-initiate and expand upon the community and stakeholder outreach that was completed as part of this feasibility study as the project moves into the NEPA/SEPA process.

Outreach activities during the environmental process may include:

- Compilation, review, and consideration of public comments received on this feasibility study.
- Continued coordination with the Yakama and Snoqualmie Tribes, as well as other interested Tribes.
- Outreach to disadvantaged and overburdened communities.
- Maintenance of the STEER I-90 Coalition website with up-to-date information and project materials.
- Online open houses to provide project progress updates to the surrounding communities and solicit input.
- Regular briefings with non-governmental, community organizations and other groups that have requested them.

6.5 NEPA Preferred Alternative, Final Design, and Implementation

Following completion of the NEPA and SEPA documents, and the identification of a Preferred Alternative, permit applications will be prepared and submitted to agencies with jurisdiction, and the final design will be completed.

Once funding, design, and approvals are in place, construction of the project can begin, pending local, state and federal funding. Construction phasing and timelines will be provided in the NEPA/SEPA documents and revised as needed once funding is secured. It is anticipated public engagement will continue through the construction phase.

6.6 Other Opportunities for I-90 in the Study Area

In addition to the proposed project, other short-term solutions can be investigated for implementation while environmental and design activities progress. These solutions are discussed in Chapter 2, and include:

- Intelligent Transportation System Infrastructure (ITS) updates to the corridor.
- Commercial Truck Parking Facilities (public or private) within or outside of the existing right of way.
- Road safety improvements on County roads outside of the I-90 Corridor study area.
- Continue collaborating with residents to identify short-term methods of managing/communicating surges of traffic on County roads.
- Work with online mapping services/sources to discourage traffic re-routing of interstate traffic onto County roads not sized or designed for large increases in traffic volumes.
- Passenger rail service to the area, although a longer-term solution, can also alleviate some traffic congestion along I-90 corridor in the study area.

6.7 Immediate Next Steps

In the coming months, following the release of this final document, the County will:

- Make this document available for public review and input. Comments received on this document will be reviewed and considered as part of the environmental scoping process.
- Continue to pursue funding opportunities to move this project forward into preliminary design and environmental analysis.
- Keep the public and stakeholders updated via the STEER I-90 website and periodic presentations to the STEER I-90 Coalition.
- Confer with WSDOT and FHWA to determine the level of NEPA documentation that will be required and whether a HEAL Act Environmental Justice Assessment will be required.
- Work with WSDOT to clarify roles to lead the future environmental/engineering efforts.

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May

I-90 CORRIDOR – EASTON TO CLE ELUM FEASIBILITY STUDY

VOLUME II: APPENDICES

KITTITAS COUNTY

June 2024

I-90 CORRIDOR – EASTON TO CLE ELUM FEASIBILITY STUDY

VOLUME II: APPENDICES

Prepared for: Kittitas County
Prepared by: SCJ Alliance

Subconsultants:

Jacobs – Environmental Inventory, Equity and Inclusion Inventory
Tierra Right of Way Services, Ltd. – Cultural Resources Review
Fehr & Peers, Inc. – Traffic Analysis and Modeling

June 2024

APPENDICES

A. Traffic Modeling Reports – 2019 and 2024
B. Environmental Maps – 2024
C. Cultural Resources Review – 2024
D. FHWA Screening Tool for Equity Analysis of Projects (STEAP) Data
E. EJ Screen Results
F. Detailed Evaluation Worksheets for Each Alternative
G. In-depth Environmental Evaluation by Alternative
H. Detailed Evaluation Worksheets for the I-90 Alternatives
I. Public Survey Results – Summer 2023
J. Public Survey Results – February 2024
K. Webinar Polling Results – February 2024

APPENDIX A

Traffic Modeling Reports - 2019 and 2024

FEHR PEERS

MEMORANDUM

Date: April 15, 2019

To: Mark Cook and Taylor Gustafson, Kittitas County

From: Daniel Dye & Kendra Breiland, Fehr & Peers

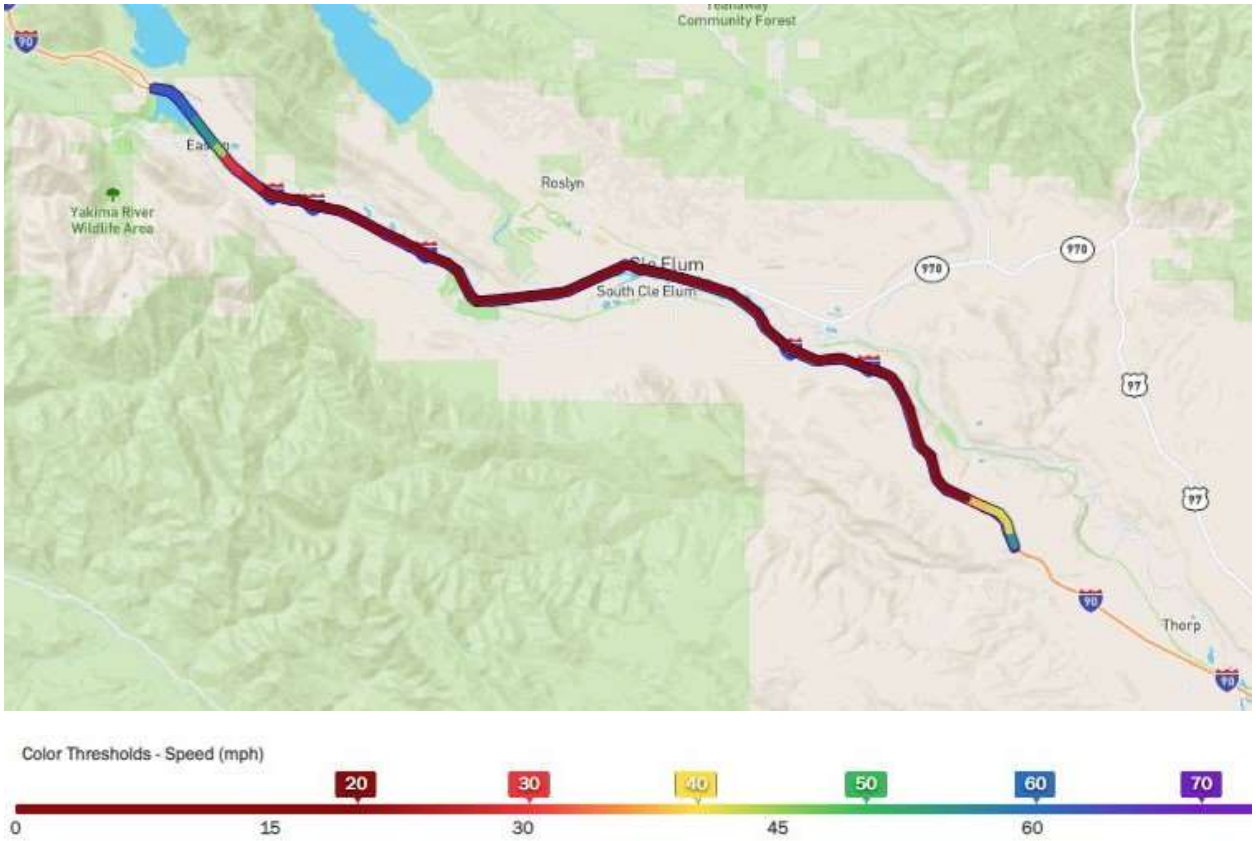
Subject: I-90 Seasonal Congestion (Mileposts 70-93)

SE19-0671

This memo reports the results of initial data collection and analysis regarding the seasonal recreational congestion that occurs on Interstate 90 in the Upper County portion of Kittitas County. The memo presents this analysis for use at the Upper County Task Force meeting in order to illuminate the severity and seasonal nature of the issue.

Congestion is heaviest during summer weekends and major holidays (Memorial Day, 4th of July, and Labor Day). In the westbound direction, this regularly occurs between mile markers 70 and 93 on Sundays in summer, with the most extreme congestion occurring on the Mondays of Memorial Day and Labor Day holiday weekends.

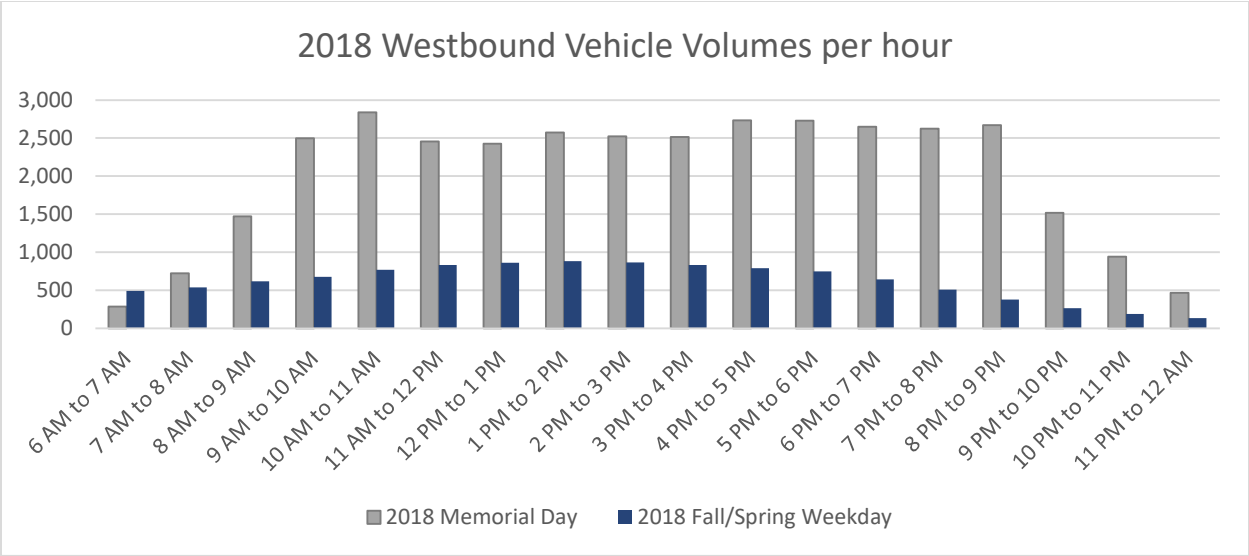
The average travel speed on I-90 at 1PM on Memorial Day 2018 is shown in **Figure 1**. For approximately 20 miles along the corridor, the average speed is less than 20mph. Based on the historical speed data, there is congestion along this corridor between 10AM and 9PM. Travel speeds increase past milepost 70 when the freeway widens from two to three lanes.



Source: INRIX Data

Figure 1: Memorial Day 2018 Average Traffic Speeds at 1PM

Compared with typical volumes on I-90 (mid-week during the fall and spring months) the volumes on summer and holiday weekends are significantly higher. **Figure 2** shows the westbound volume profile between 6AM and midnight on an average weekday in 2018 compared with Memorial Day 2018. On an average weekday, the hourly volume never exceeds 1,000 vehicles per hour. On Memorial Day, the hourly volumes exceed 2,500 vehicles per hour for 12 hours and the total daily demand is almost three times higher.



Source: WSDOT PTR Data for site S903. Calculations by Fehr & Peers, 2019.

Figure 2: Memorial Day and Average Fall/Spring Weekday Volumes

Table 1 shows a comparison of daily westbound traffic volumes and duration of congestion for four time periods. The I-90 corridor was considered congested speeds slower than freeflow occur. Although traffic volumes on a Sunday in spring/fall are almost double what is observed on a typical weekday, there is little congestion on I-90 since volumes have not reached a "tipping point." However, that tipping point is reached on summer Sundays when daily traffic volumes are 2.5 times higher than a typical weekday and the corridor is congested for 7 hours.

Table 1: Comparison of Westbound Traffic Volumes and Hours of Congestion

Day	Daily Vehicle Volume	Hours of Congestion
Spring/Fall Weekday	12,300	0
Spring/Fall Sunday	22,000	0
Summer Sunday	30,600	7
Memorial Day	34,400	11

Source: Volumes derived from WSDOT PTR Data for site S903. Congestion derived from INRIX Data for 2018 along the twenty-mile study corridor. Calculations by Fehr & Peers, 2019.

Data also confirms residents' observations that the slow travel speeds on I-90 during the busiest travel days of summer cause traffic to divert to county roads in order to bypass congestion on the freeway. The County is concerned that this diversion creates safety and access concerns for local residents and businesses. County roads such as Thorp Prairie Road, Westside Road, and Nelson Siding Road see westbound traffic volumes that are 50-100% higher than typical conditions on Labor Day.

This study will investigate the benefits of different strategies to reduce diversion from I-90 onto county roads.

FEHR PEERS

Memorandum

Date: August 1, 2019

To: Mark Cook and Taylor Gustafson, Kittitas County

From: Daniel Dye & Kendra Breiland, Fehr & Peers

Subject: Upper County Task Force Traffic Modeling

SE19-0671

Project Background

Kittitas County hired Fehr & Peers to complete an analysis of I-90 and county roads within the Upper County area, specifically evaluating how holiday traffic congestion on I-90 impacts the local road network. Fehr & Peers modeled several potential capital improvements that might address traffic congestion issues stemming from holiday traffic.

The results of our analysis were presented to the Upper County Task Force on June 20, 2019. The details in this memo and the attached presentation reflect what was presented to the Task Force, with the addition of one additional mitigation alternative, which is noted below.

Holiday Congestion

Congestion along I-90 is heaviest during summer weekends and major holidays (Memorial Day, 4th of July, and Labor Day). In the westbound direction, this regularly occurs between mile markers 70 and 93 on Sundays in summer, with the most extreme congestion occurring on the Mondays of Memorial Day and Labor Day holiday weekends. Holiday traffic volumes are approximately four times higher on I-90 and three times higher on county roads than typical days. Speeds drop from an average of 70 MPH to 15 MPH on I-90, and increase by approximately 5 MPH on county roads, reflecting that non-local travelers tend to speed along the local roads as

they avoid I-90 congestion. On those specific Mondays, congestion lasts for 12 hours on I-90, while diversion and increased speed lasts approximately 6 hours on the county roads.

Traffic Modeling

Fehr & Peers built a Dynamic Traffic Assignment model to better understand how changes to the transportation infrastructure could affect congestion, vehicle volumes and speeds, and travel time through the Upper County. This modeling method dynamically alters which routes vehicles will take depending on congestion and travel time along different paths, much the same as traffic behaves in the real world. Approximately 112 miles of I-90 and local roads were included in the model. Inputs to the modeling process included traffic counts for volumes and speeds, INRIX data to understand how speeds fluctuate on I-90 over specific dates and times, and data from Kittitas County's travel demand model.

Mitigation Alternatives

Fehr & Peers worked with Kittitas County staff to identify and develop potential congestion mitigations. These four alternatives were modeled to understand how traffic could change if each was implemented:

1. Widen I-90 to three lanes in each direction
2. Close interchanges at Nelson Siding Road and Golf Course Road
3. Limit access to local trips only at interstate interchanges
4. Widen Nelson Siding Road and Golf Course Road to two lanes in the westbound direction (additional scenario developed after the June 20 Task Force meeting)

Results

Widening I-90 to three lanes in each direction resulted in the largest change among the alternatives. I-90 can serve higher volumes with less congestion and faster speeds with the additional lanes, although there would still be congestion near the interchanges. The duration of congestion on I-90 would also shorten. Volumes and speeds on local roadways would be similar to what they are today, but congestion near I-90 would lessen.

Closing interchanges at Nelson Siding Road and Golf Course Road would have little overall affect on congestion. Even though congestion would be reduced in the vicinity of the closed interchanges, these closures would not markedly improve overall conditions on I-90, as congestion would shift to interchanges further east. The duration and magnitude of the congestion would not change. For local roads, volumes would be much lower on Nelson Siding Road and Golf Course Road. Cle Elum roads would likely be more congested as all traffic headed westbound on I-90 would be funneled into this interchange. Upper Peoh Point Road and Thorp Prairie Road would also be more congested.

Limiting access to local trips only at the Nelson Siding and Golf Course interchanges is unlikely to reduce holiday congestion levels in the area. This is due to the fact that only about 20% of trips accessing I-90 from these interchanges are regional through trips, while the remaining 80% of trips have local origins or destinations south of I-90.

Widening Nelson Siding Road and Golf Course Road to two lanes in the westbound direction does not result in significant changes to traffic patterns or congestion. Because Nelson Siding Road and Golf Course Road tend to not be congested under typical holiday conditions, there is little opportunity for congestion relief. Our modeling does not show that the additional local road capacity would change traffic patterns or attract more vehicles. While more extreme conditions may occasionally lead to congestion on these roadways, these situations are extremely infrequent, likely not warranting permanent capital investment.

Conclusions

Of the four alternatives modeled, only widening I-90 provides significant congestion relief across the entire study area. This is due to large volumes of regional trips headed westbound on I-90 following major holiday weekends. Changes to the local road network can affect congestion, but the effects are limited and localized.

FEHR PEERS

Memorandum

Date: February 12, 2024

To: Dan Ireland and Linda Amato, SCJ

From: Daniel Dye, Fehr & Peers

Subject: I-90 Widening Model Results

TC22-0057

As part of the Kittitas County I-90 Widening Feasibility Study, Fehr & Peers updated the Upper Kittitas County Transmodeler simulation model (See **Figure 1** for model extents). This model was used in 2019 to provide information to the Upper County Task Force on ways to reduce congestion and diversion off of I-90 and onto local county roadways. The updated model reflects Memorial Day 2018 traffic volumes and congestion conditions, as agreed upon by the I-90 Widening WSDOT and consultant study team. The model extents are from east of the Elk Heights Road interchange to west of the Lake Easton Road interchange.

Figure 1: Upper Kittitas County Simulation Model Extents

Existing Conditions

I-90 in upper Kittitas County experiences recurring seasonal congestion, particularly at the end of summer weekends and holiday weekends in the westbound direction. This congestion typically causes slower speeds and congestion as far as east of the Elk Heights Road interchange and dissipates when I-90 widens to three lanes in each direction. There is a current WSDOT construction project to widen I-90 from two lanes in each direction to three lanes in each direction from the Cabin Creek Interchange to the West Easton Interchange (scheduled for completion fall 2028)[1].

Average 2018 volumes were collected by a WSDOT permanent traffic recorder and are shown for different Mondays throughout the year in **Figure 2**. Memorial Day and Labor Day volumes peak and then decrease considerably in the late morning hours. This sudden decrease reflects the limited capacity of I-90 under congested conditions.

[1] https://wsdot.wa.gov/construction-planning/search-projects/i-90-snoqualmie-pass-east-cabin-creek-interchange-west-easton-interchange-phase-3

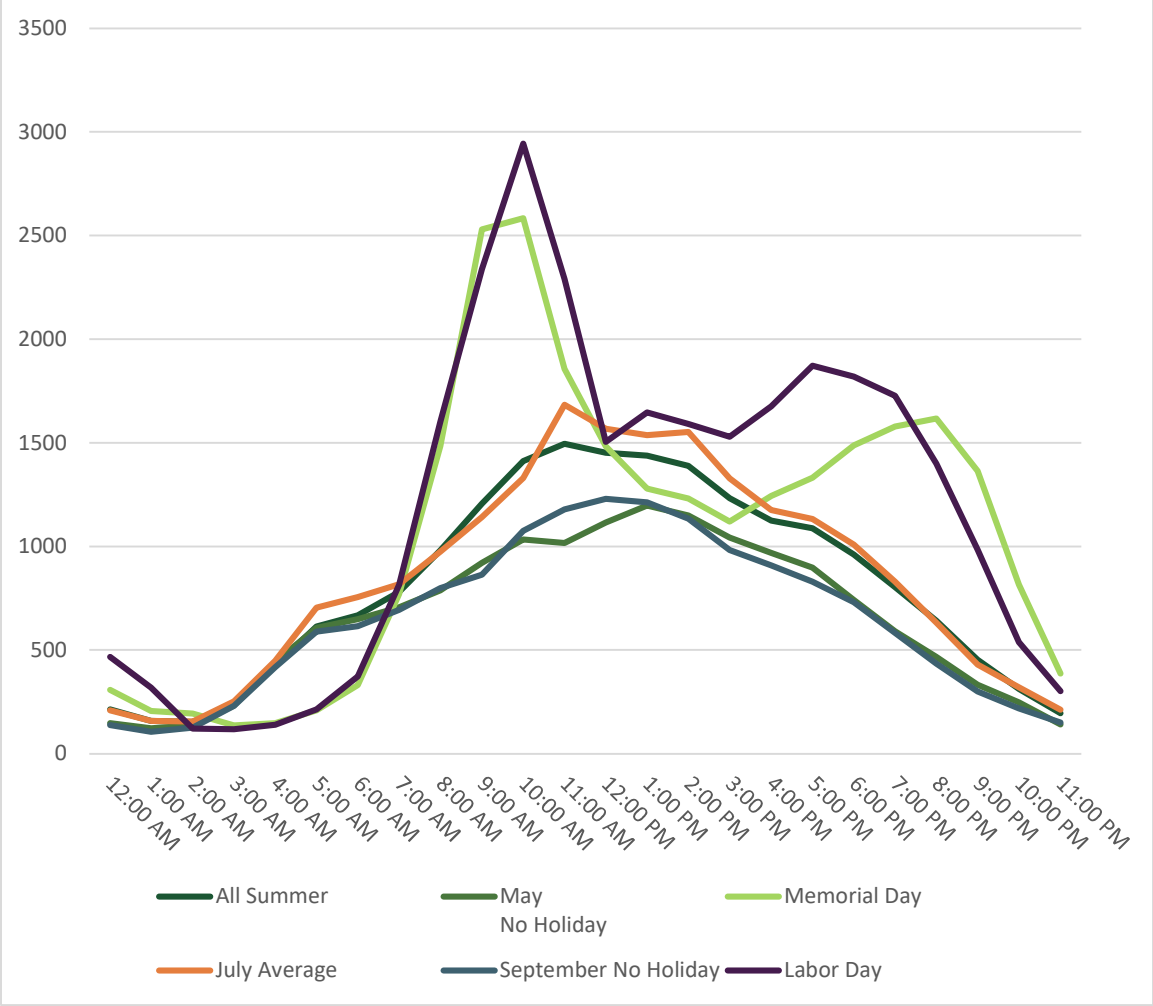


Figure 2: Monday Westbound Average Vehicle Volumes on I-90
Source: WSDOT PTR B04, 2018 data analyzed by Fehr & Peers

Speeds decrease and corridor travel time increase considerably during this recurring congestion. According to INRIX data for Memorial Day 2018, average speeds along the corridor decrease from free flow (close to 70 MPH) to under 10 MPH for long periods of the day and large swaths of the corridor. Travel times from Elk Heights Road to Lake Easton Road increase from about 30 minutes to as much as 150 minutes at the most congested time of the day.

No Build/Existing Configuration Model

Fehr & Peers updated the 2018 Memorial Day No Build model and validated the model against INRIX data. The model accurately reflects the heavy westbound congestion along the corridor with slow speeds through much of the day, as shown in **Figure 3**. The figure shows travel speeds

in increments of 10 MPH between Elk Heights Road (rightmost column) and Lake Easton Road (leftmost column) by time of day, with 9:00-9:15 AM at the top of the figure and 8:45-9:00 PM at the bottom.

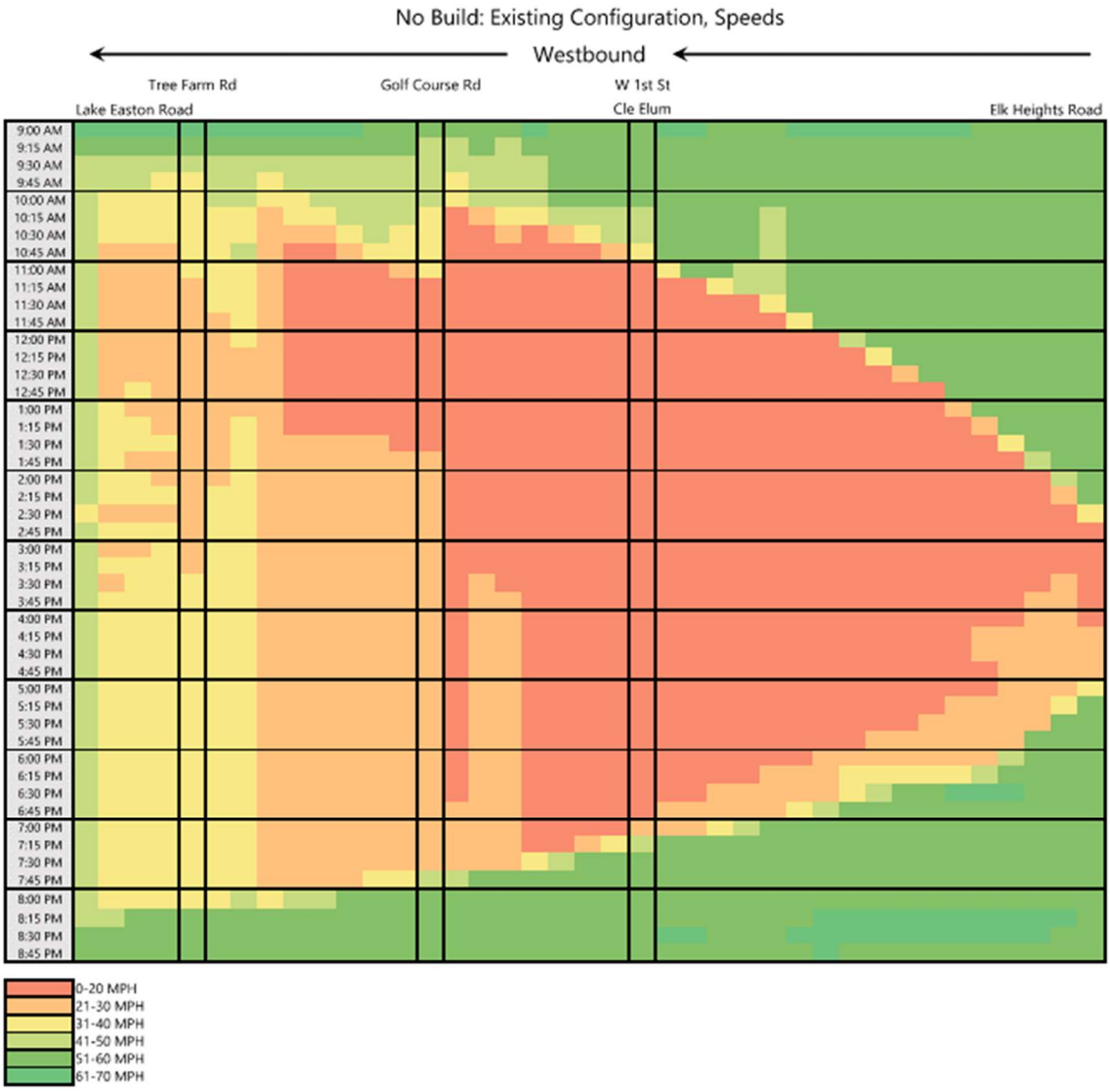


Figure 3: No Build Modeled Travel Speeds by Time of Day and Location Along Corridor
Source: Fehr & Peers

As shown above, the congestion begins early in the day near Lake Easton Road, and quickly builds back past Elk Heights Road. Slow speeds in the corridor span from about 10AM-8PM, with the peak congestion from about 2-4PM.

Alternatives 1 & 2: Outside and Median Widening Model

For purposes of traffic modeling, Alternative 1: Outside Widening and Alternative 2: Median Widening are identical (although environmental and civil engineering considerations may differ between these alternatives). For this reason, only one model was created which reflected widening one lane in each direction, for a total of three lanes in each direction. The widening was modeled beginning at the SR 970 Interchange and was carried through to the currently under construction widening at Easton, as shown in red in **Figure 4**. The modeled speeds for the westbound direction on Memorial Day are shown in **Figure 5**. Widening to three lanes almost entirely eliminates slowdowns below 50 MPH along the study corridor.

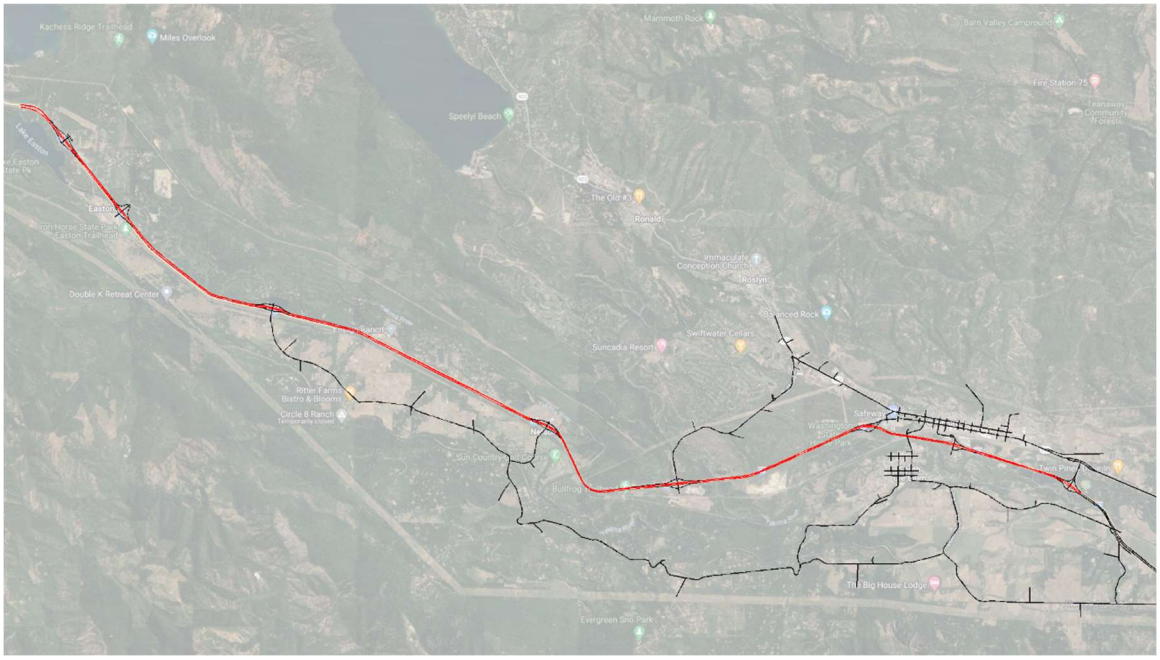


Figure 4: Extent of Widening in Alternatives 1 and 2

Figure 5: Alternatives 1 and 2 Modeled Travel Speeds by Time of Day and Location Along Corridor
Source: Fehr & Peers

Alternative 3: Reversible Lanes

The third alternative would provide reversible lanes for the same extents as the widening in Alternatives 1 & 2 (see **Figure 4** above). The reversible lanes would operate during peak travel periods in the peak direction (e.g. lanes would operate eastbound on summer Fridays and Westbound on summer Sundays or Monday holidays). The reversible lanes would act as an express lane separated from the general purpose lanes. Access to interchanges between the start

of the reversible lanes (SR 970 interchange) and the end (Lake Easton Road) would not be available for reversible lane drivers, essentially limiting their use to through trips on I-90. The reversible lanes operate at free flow speeds at all times of day for Memorial Day. However, the westbound general purpose lanes do exhibit some (although much less than No Build) congestion, as shown in **Figure 6**. Congestion is limited to west of Cle Elum and only lasts from about 10AM-4PM.

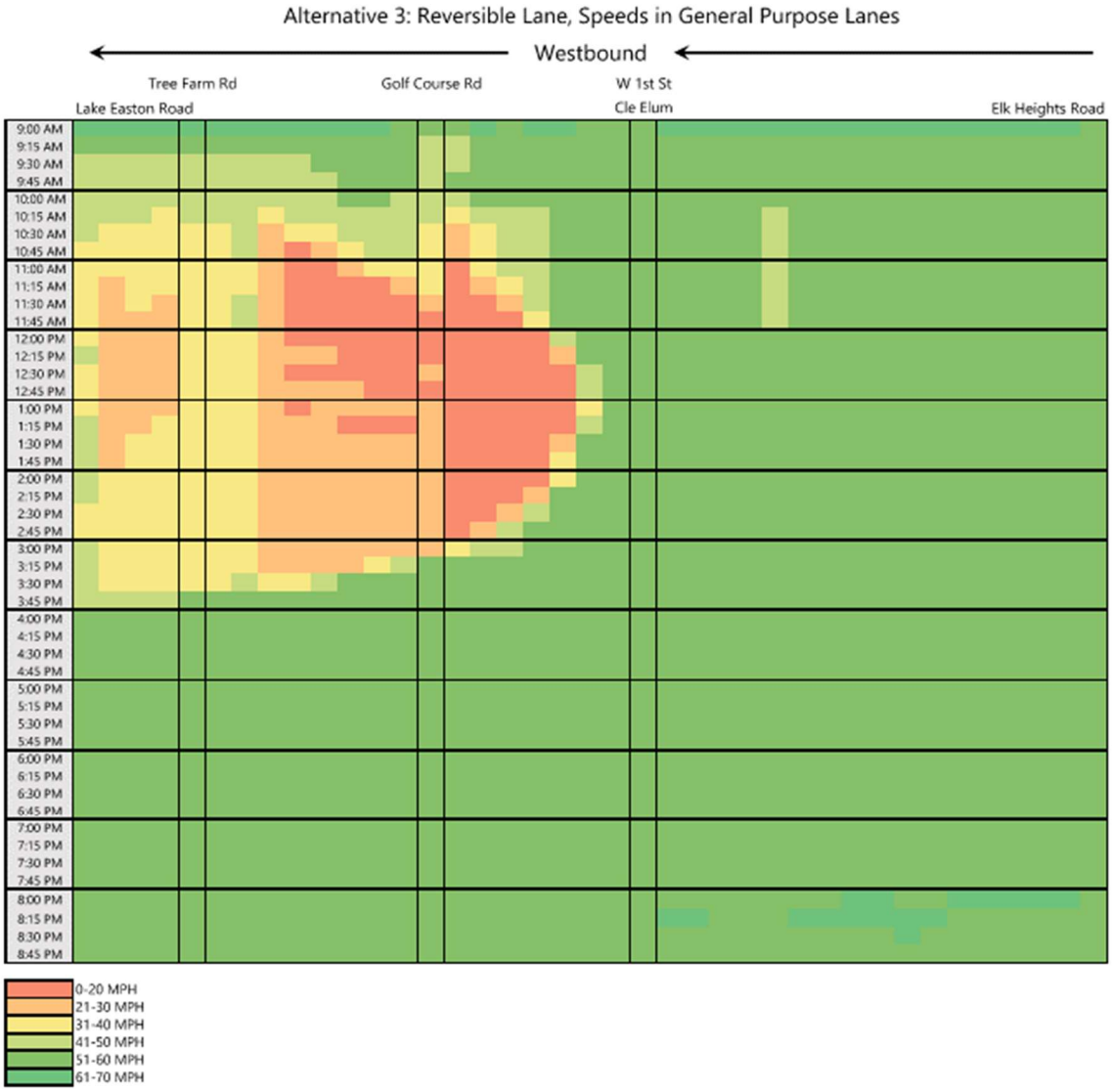


Figure 6: Alternative 3 Modeled Travel Speeds by Time of Day and Location Along Corridor
Source: Fehr & Peers

Model Travel Time

Memorial Day Westbound modeled travel time through the corridor is shown in **Figure 7**. As mentioned above, Alternatives 1 and 2 virtually eliminate congestion, while Alternative 3 experiences greatly reduced congestion for a shorter period of the day and no congestion for through trips in the reversible lanes.

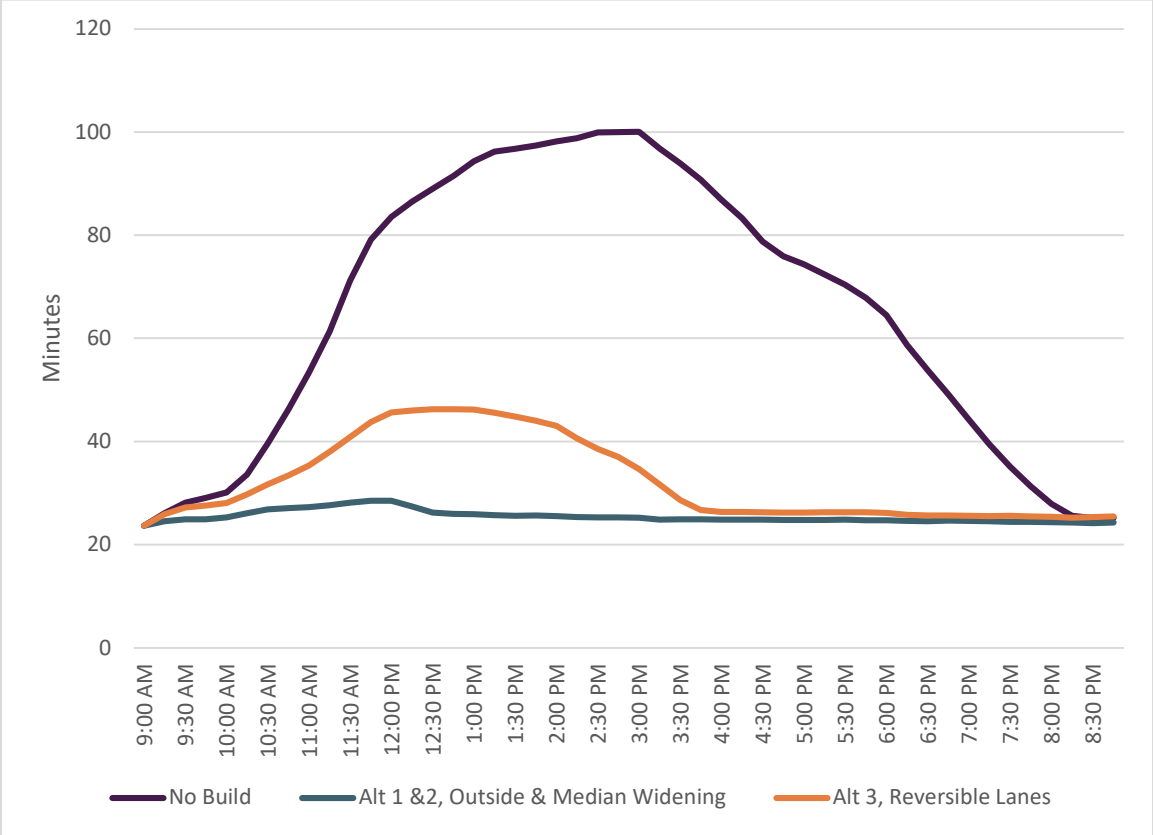


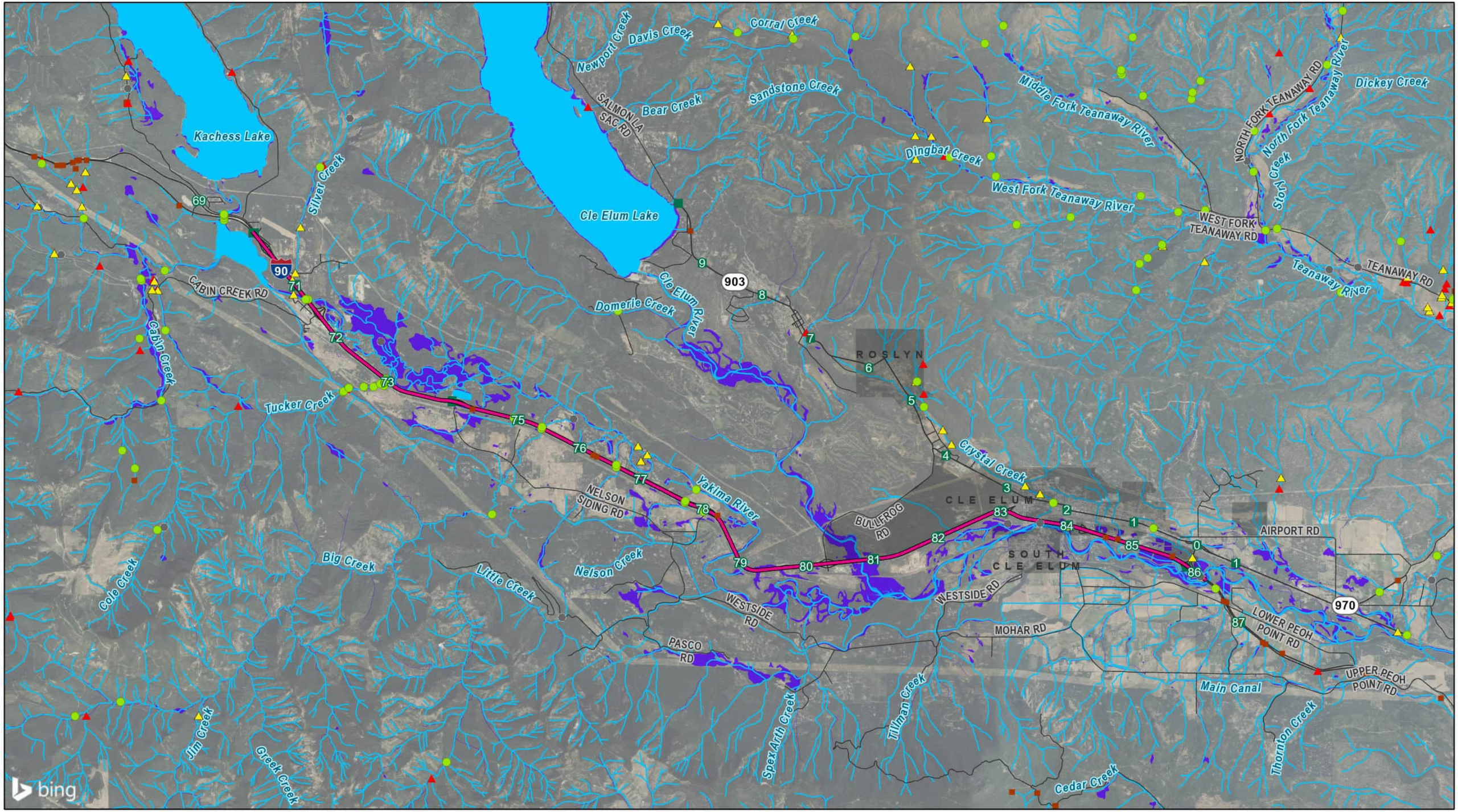
Figure 7: I-90 Westbound Corridor Travel Time Comparison, Memorial Day
Source: Fehr & Peers

Conclusions

Congestion is very high during recurring seasonal congestion in Upper Kittitas County. This congestion can be greatly reduced or eliminated by widening I-90, either to three lanes in each direction or by adding two reversible lanes that operate in the peak direction. Traffic operations are best under Alternative 1 or 2.

APPENDIX B

Environmental Maps – 2024



MAP 1A

AQUATIC RESOURCES RESTORATION POTENTIAL

Alternatives 1, 2, and 3: I-90 Widening

Alternatives Analysis

I-90 Corridor – Easton to Cle Elum Planning Study

Alternative Alignment

NWI Wetland

WDFW Fish Passage Barrier

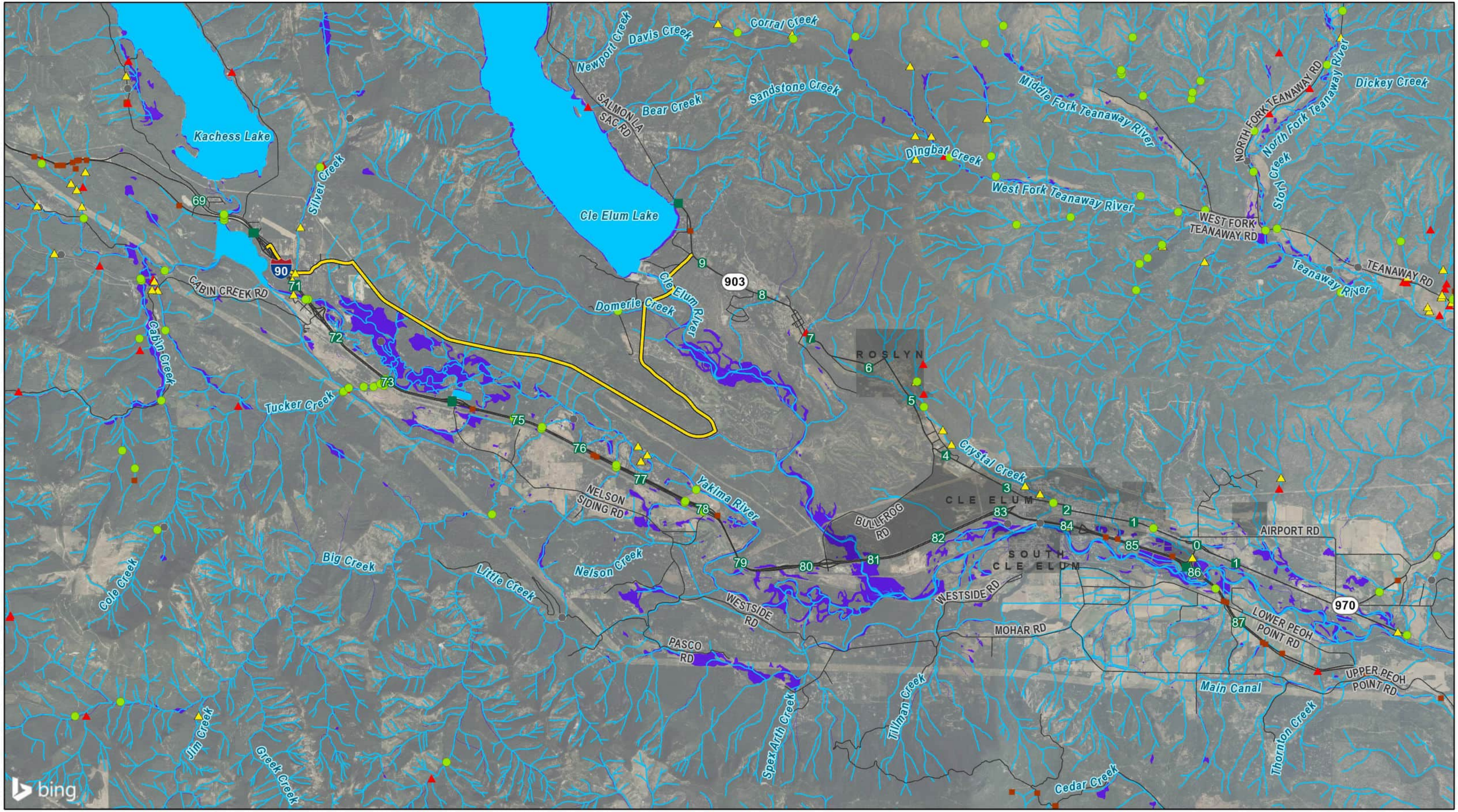
- Not a barrier
- Partial Fish Passage Barrier
- Total Fish Passage Barrier
- On a Non-Fish Bearing Stream
- Unknown

N

0 0.5 1 Miles

Jacobs

Data Sources: Kittitas County, USFWS, USGS, WDFW, WSDOT.
Basemap Source: © 2024 Microsoft Corporation Earthstar Geographics SIO.



MAP 1B

AQUATIC RESOURCES RESTORATION POTENTIAL

Alternative 4A: SR 903 North Route

Alternatives Analysis

I-90 Corridor – Easton to Cle Elum Planning Study

Alternative 4A

NWI Wetland

WDFW Fish Passage Barrier

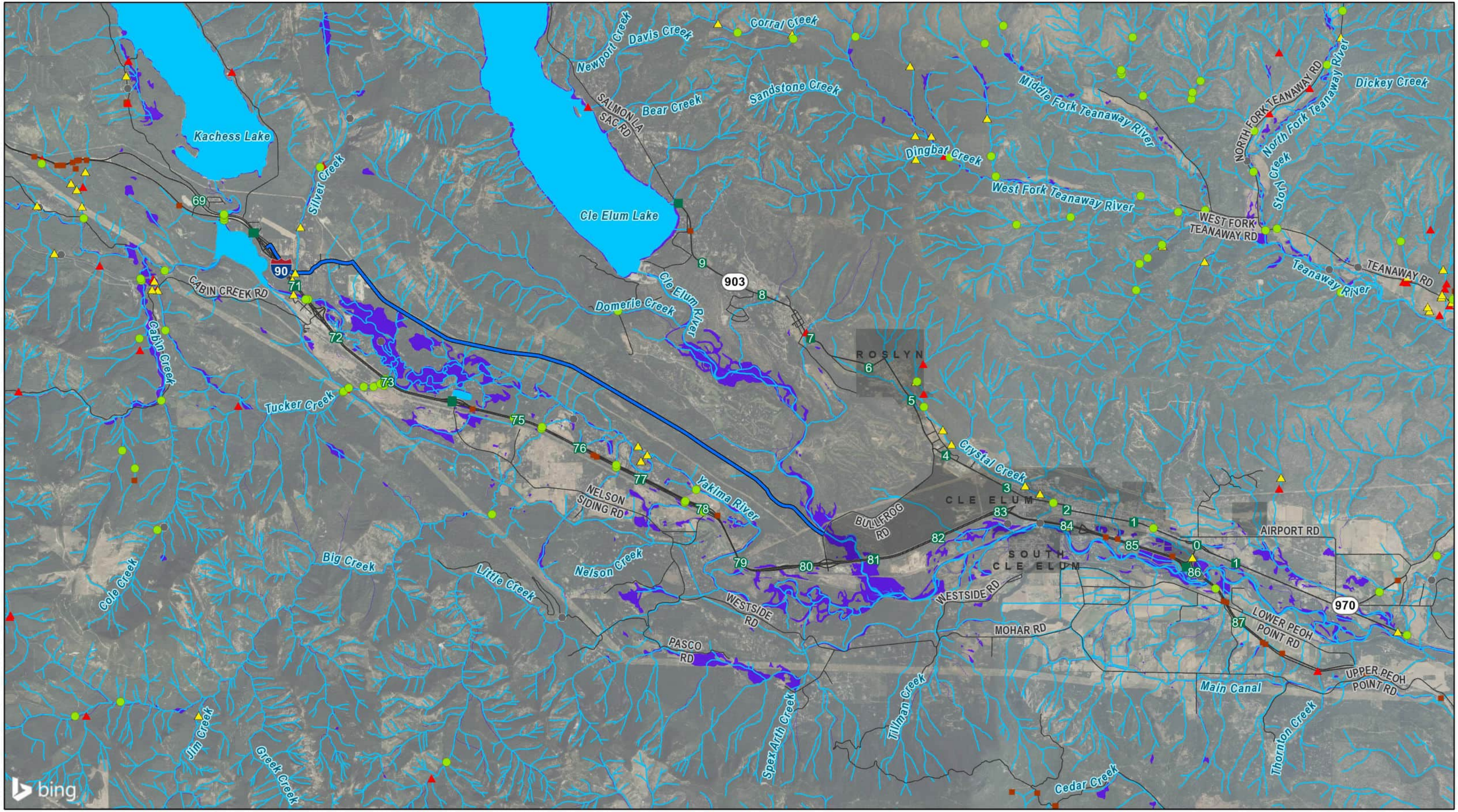
- Not a barrier
- Partial Fish Passage Blockage
- Total Fish Passage Blockage
- On a Non-Fish Bearing Stream
- Unknown

N

0 0.5 1 Miles

Jacobs

Data Sources: Kittitas County, USFWS, USGS, WDFW, WSDOT.
Basemap Source: © 2024 Microsoft Corporation Earthstar Geographics SIO.



MAP 1C

AQUATIC RESOURCES RESTORATION POTENTIAL

Alternative 4B: Bullfrog Road North Route

Alternatives Analysis

I-90 Corridor – Easton to Cle Elum Planning Study

Alternative 4B

NWI Wetland

WDFW Fish Passage Barrier

- Not a barrier
- Partial Fish Passage Barrier
- Total Fish Passage Barrier
- On a Non-Fish Bearing Stream
- Unknown

0 0.5 1 Miles

Jacobs

Data Sources: Kittitas County, USFWS, USGS, WDFW, WSDOT.
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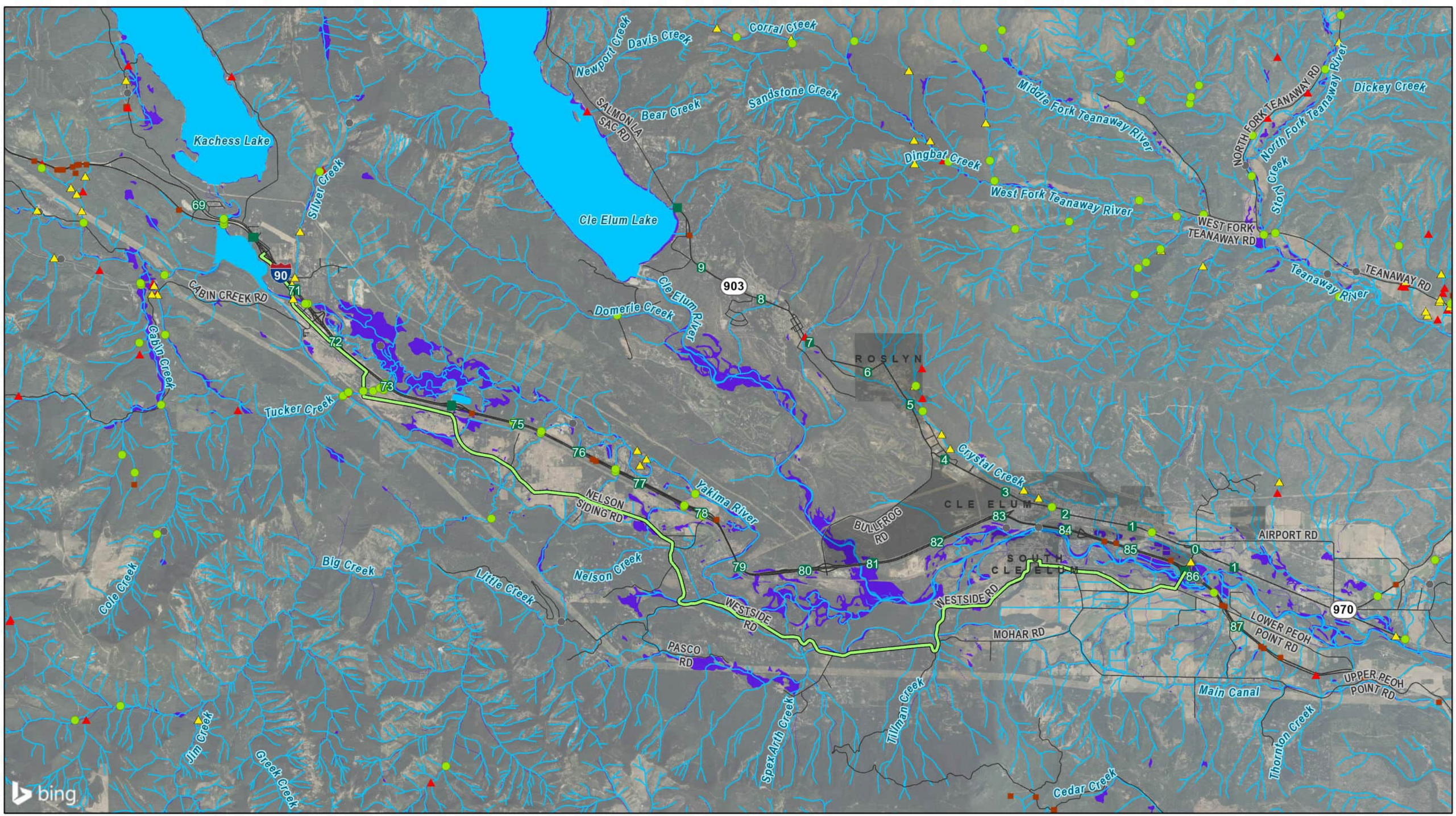

MAP 1D

AQUATIC RESOURCES RESTORATION POTENTIAL

Alternative 5: South Route

Alternatives Analysis

I-90 Corridor – Easton to Cle Elum Planning Study

Alternative 5

NWI Wetland

WDFW Fish Passage Barrier

- Not a barrier
- Partial Fish Passage Barrier
- Total Fish Passage Barrier
- On a Non-Fish Bearing Stream
- Unknown

N

0 0.5 1 Miles

Jacobs

Data Sources: Kittitas County, USFWS, USGS, WDFW, WSDOT.
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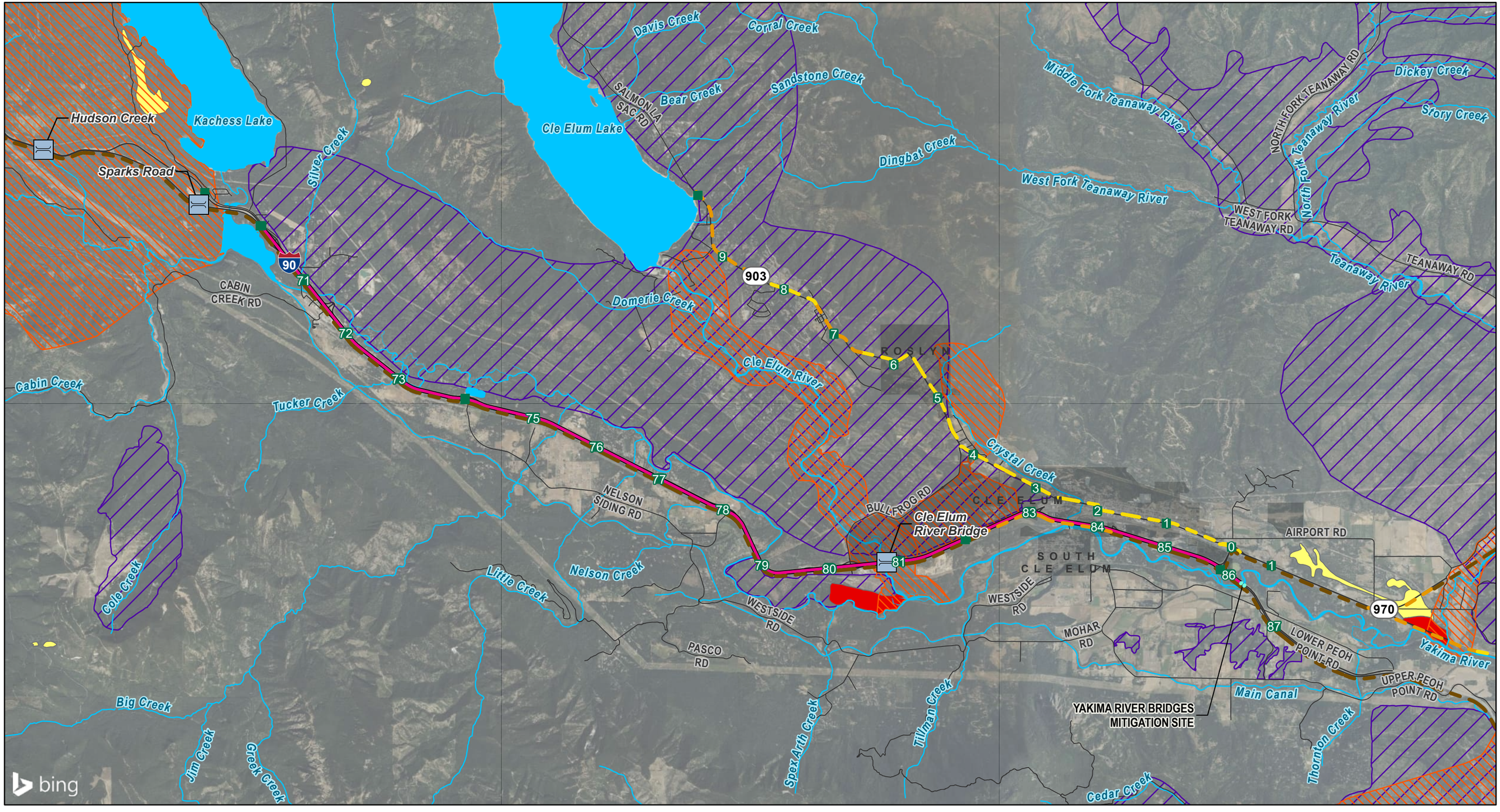


MAP 2A

WILDLIFE CONNECTIVITY

Alternatives 1, 2, and 3: I-90 Widening

Alternatives Analysis

I-90 Corridor – Easton to Cle Elum Planning Study

- Alternative Alignment
- Wildlife Crossing Structure
- Environmental Mitigation Site

WSDOT Habitat Connectivity Investment Priority

- High
- Medium
- Low

WDFW PHS Wildlife Areas

- Biodiversity Area And Corridor
- Elk, Mule Deer or Big Game
- Wetland
- Wood Duck

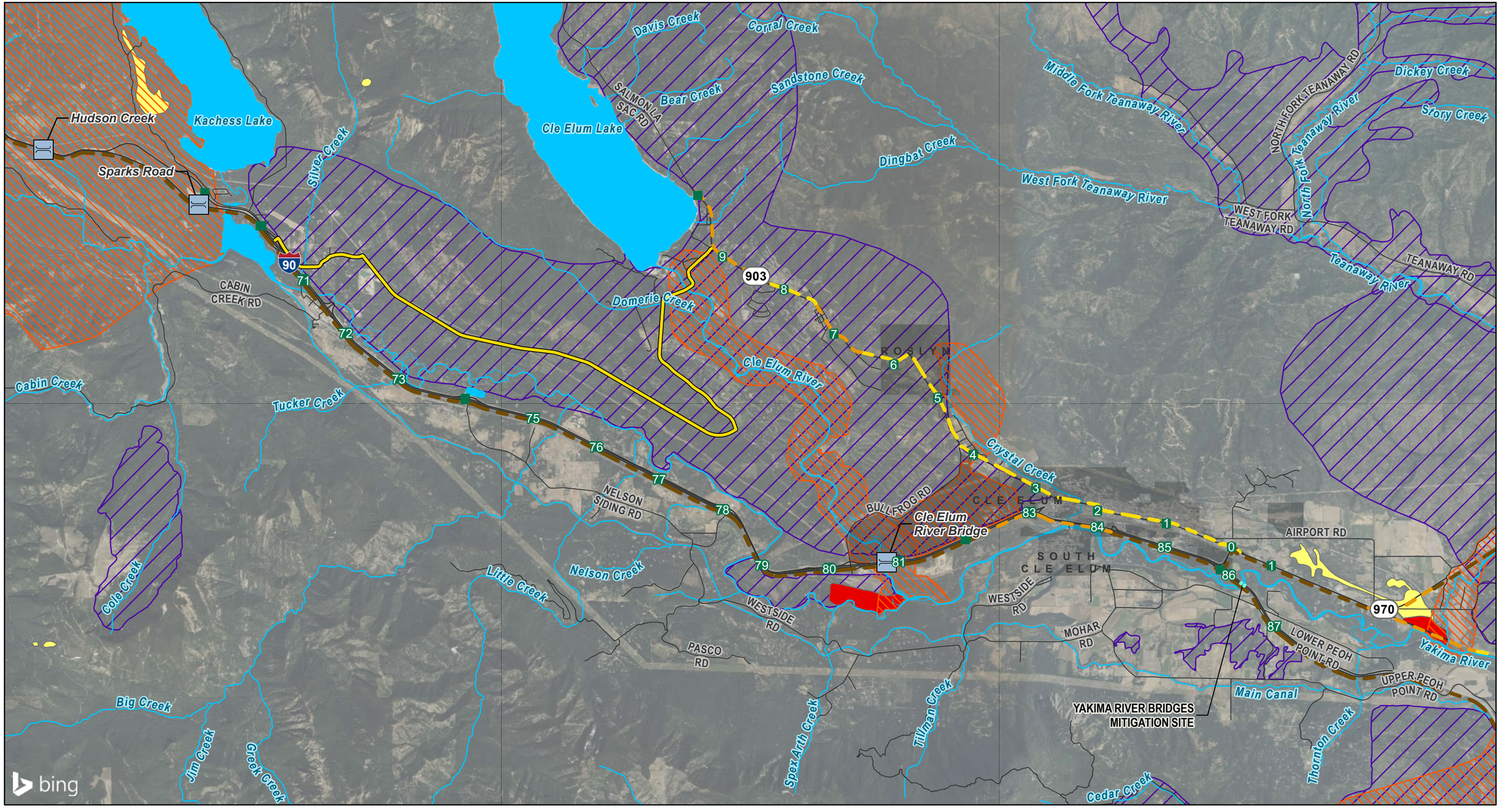
N

0 0.5 1

Miles

Jacobs

Data Sources: Kittitas County, USFWS, USGS, WDFW, WSDOT.
Basemap Source: © 2024 Microsoft Corporation Earthstar Geographics SIO.



MAP 2B

WILDLIFE CONNECTIVITY

Alternative 4A: SR 903 North Route

Alternatives Analysis

I-90 Corridor – Easton to Cle Elum Planning Study

- Alternative Alignment
- Wildlife Crossing Structure
- Environmental Mitigation Site

WSDOT Habitat Connectivity Investment Priority

- High
- Medium
- Low

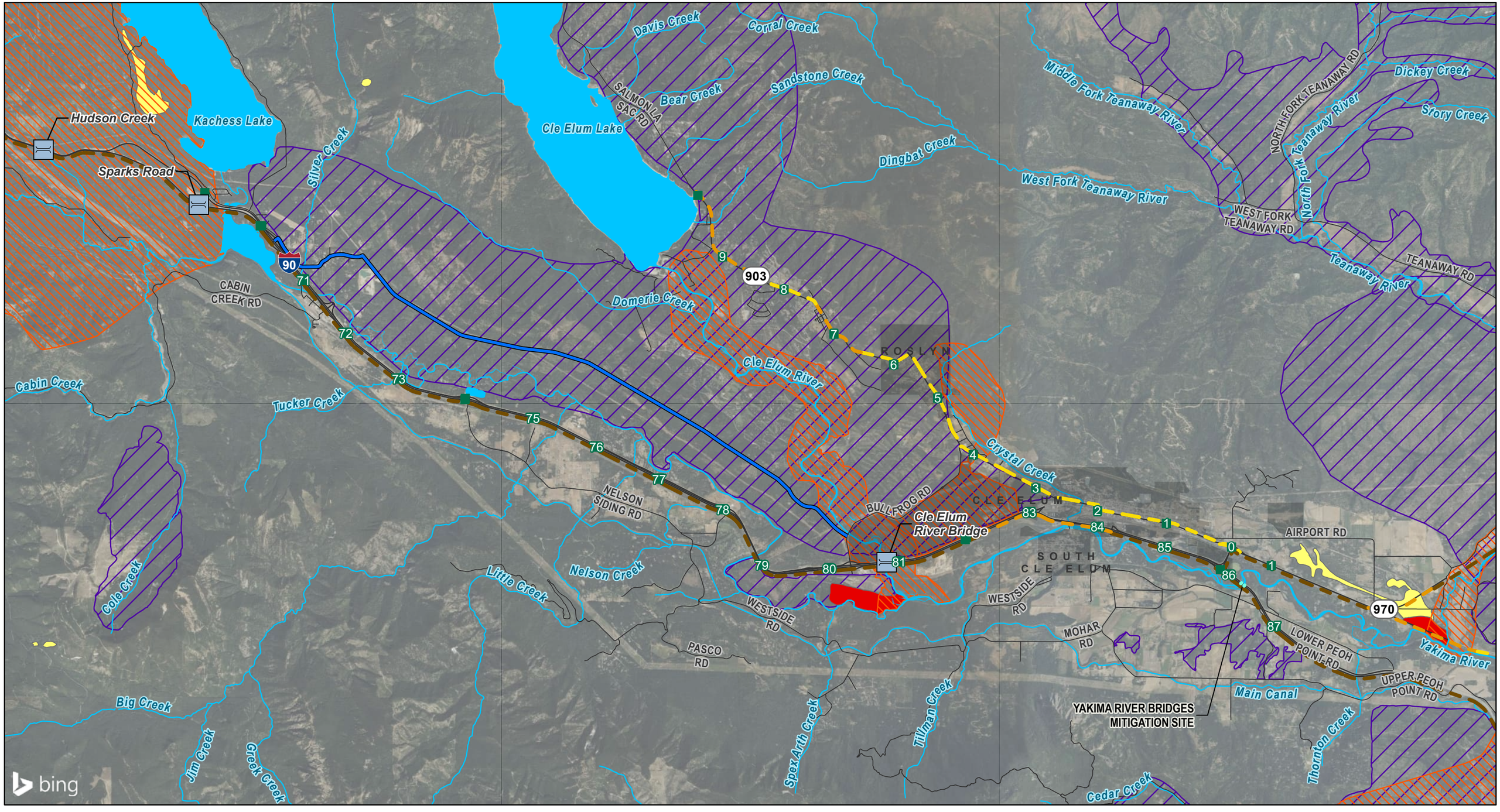
WDFW PHS Wildlife Areas

- Biodiversity Area And Corridor
- Elk, Mule Deer or Big Game
- Wetland
- Wood Duck

0 0.5 1 Miles

Jacobs

Data Sources: Kittitas County, USFWS, USGS, WDFW, WSDOT.
Basemap Source: © 2024 Microsoft Corporation Earthstar Geographics SIO.



MAP 2C

WILDLIFE CONNECTIVITY

Alternative 4B: Bullfrog Road North Route

Alternatives Analysis

I-90 Corridor – Easton to Cle Elum Planning Study

- Alternative Alignment
- Wildlife Crossing Structure
- Environmental Mitigation Site

WSDOT Habitat Connectivity Investment Priority

- High
- Medium
- Low

WDFW PHS Wildlife Areas

- Biodiversity Area And Corridor
- Elk, Mule Deer or Big Game
- Wetland
- Wood Duck

0 0.5 1 Miles

Jacobs

Data Sources: Kittitas County, USFWS, USGS, WDFW, WSDOT.
Basemap Source: © 2024 Microsoft Corporation Earthstar Geographics SIO.

MAP 2D

WILDLIFE CONNECTIVITY

Alternative 5: South Route

Alternatives Analysis

I-90 Corridor – Easton to Cle Elum Planning Study

- Alternative Alignment
- Wildlife Crossing Structure
- Environmental Mitigation Site

WSDOT Habitat Connectivity Investment Priority

- High
- Medium
- Low

WDFW PHS Wildlife Areas

- Biodiversity Area And Corridor
- Elk, Mule Deer or Big Game
- Wetland
- Wood Duck

0 0.5 1 Miles

Jacobs

Data Sources: Kittitas County, USFWS, USGS, WDFW, WSDOT.
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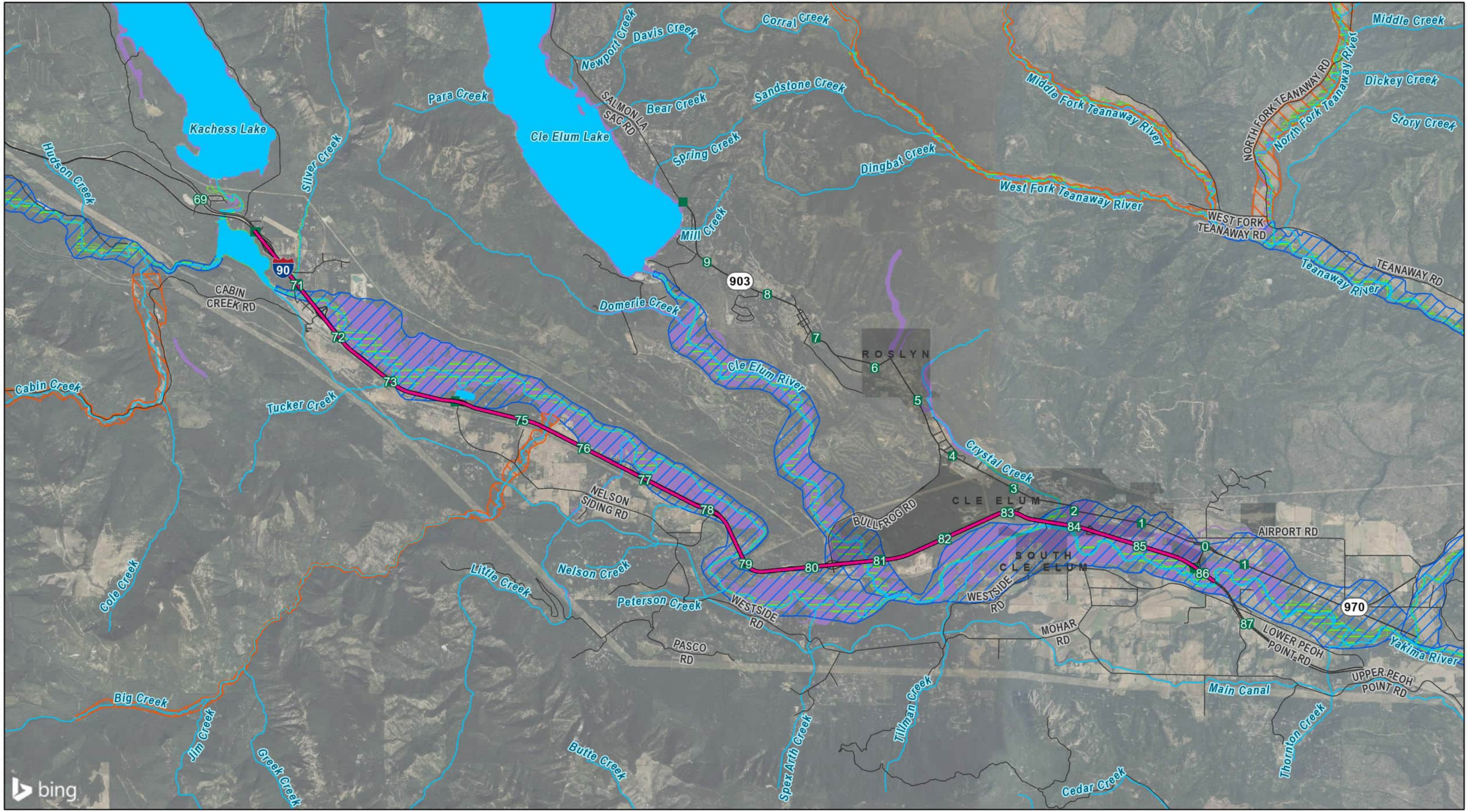

MAP 3A

ECOSYSTEM RESILIENCY

Alternatives 1, 2, and 3: I-90 Widening

Alternatives Analysis

I-90 Corridor – Easton to Cle Elum Planning Study

Alternative Alignment

100-Year Floodplain

Floodway

Channel Migration Zone

Tier 1

Tier 2

N

0 0.5 1

Miles

Jacobs

Data Sources: Kittitas County, USFWS, USGS, WSDOT.
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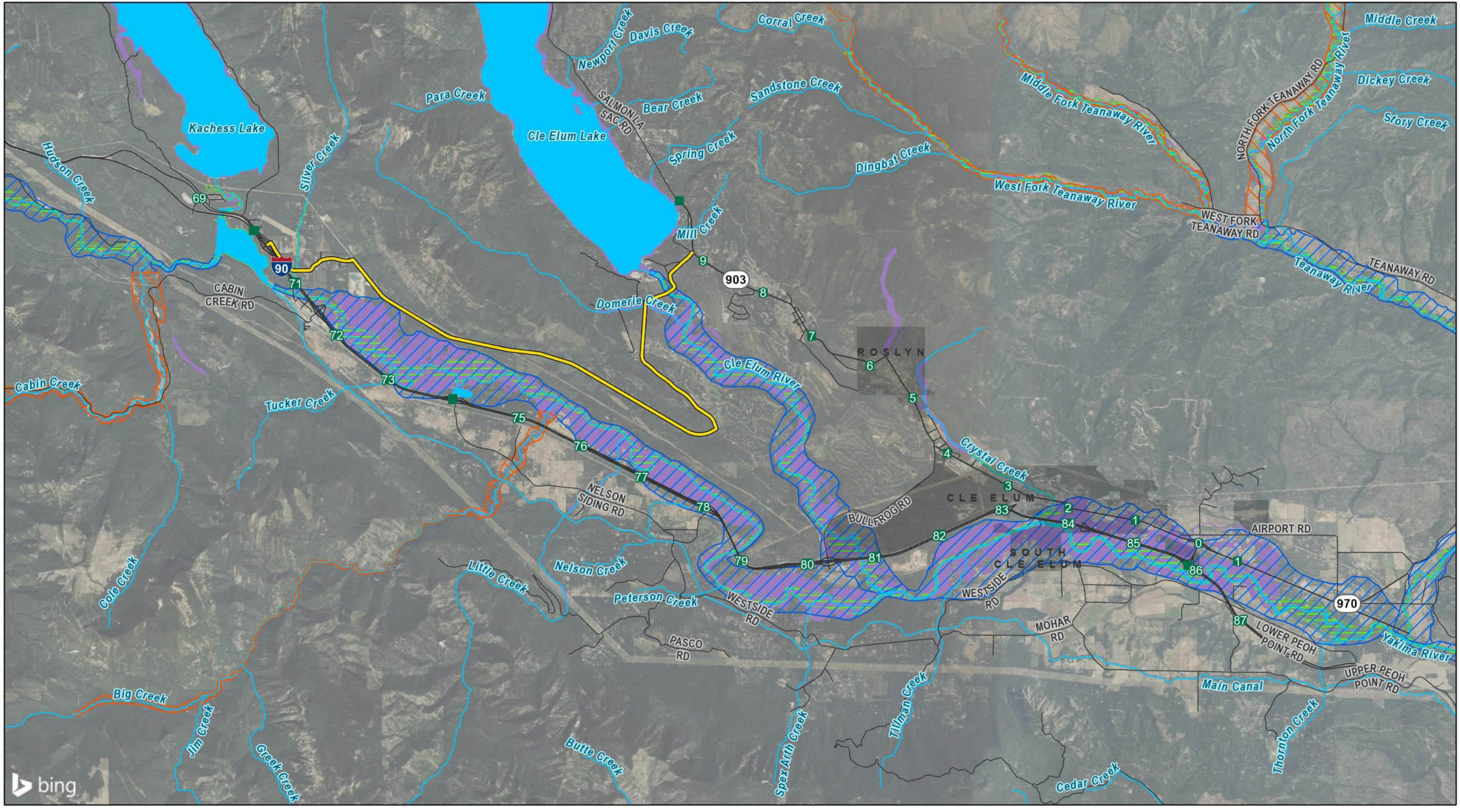


MAP 3B

ECOSYSTEM RESILIENCY

Alternative 4A: SR 903 North Route

Alternatives Analysis

I-90 Corridor – Easton to Cle Elum Planning Study

Alternative Alignment

100-Year Floodplain

Floodway

Channel Migration Zone

Tier 1

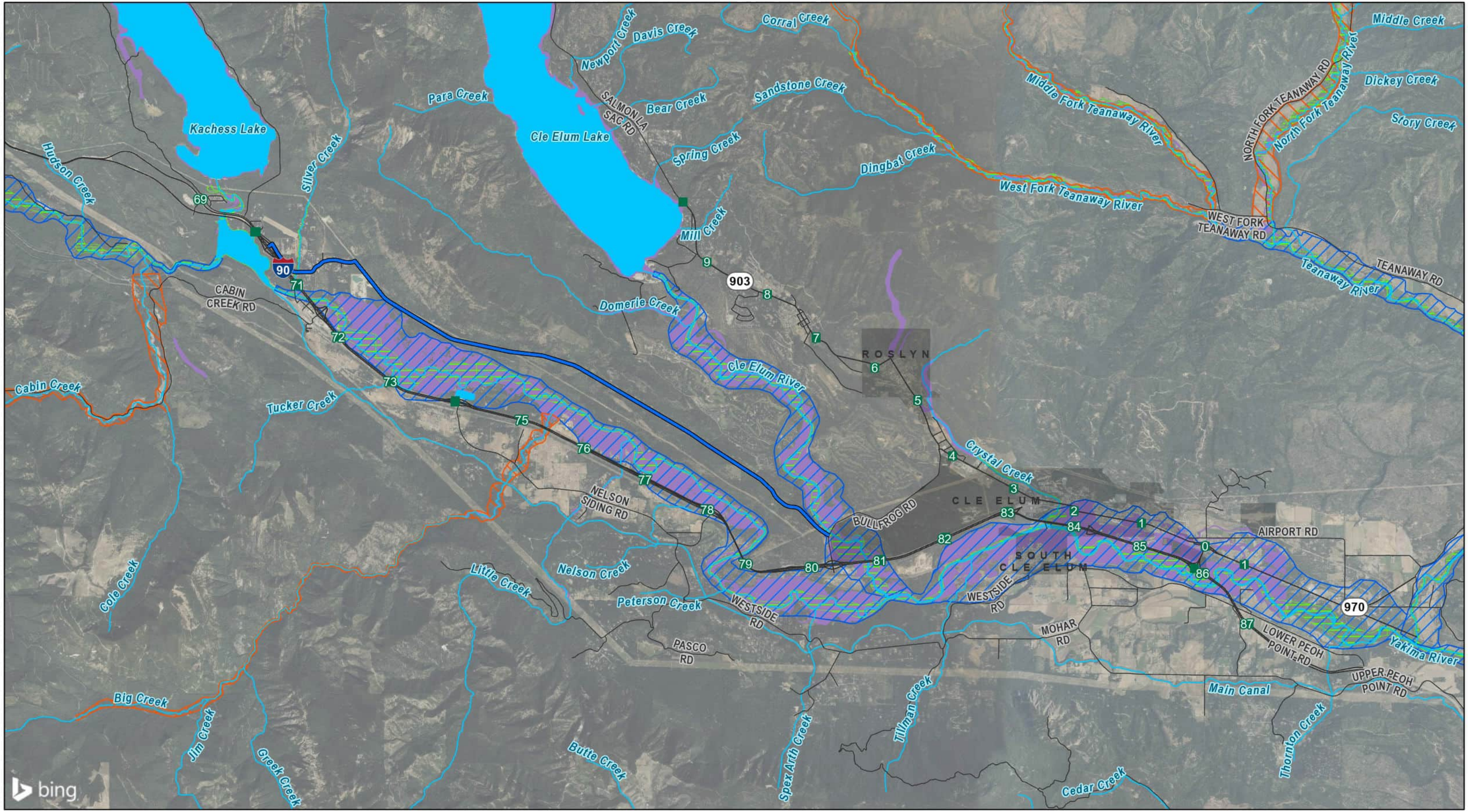
Tier 2

0 0.5 1

Miles

Jacobs

Data Sources: Kittitas County, USFWS, USGS, WSDOT.
Basemap Source: © 2024 Microsoft Corporation Earthstar Geographics SIO.



MAP 3C

ECOSYSTEM RESILIENCY

Alternative 4B: Bullfrog Road North Route

Alternatives Analysis

I-90 Corridor – Easton to Cle Elum Planning Study

Alternative Alignment

100-Year Floodplain

Floodway

Channel Migration Zone

Tier 1

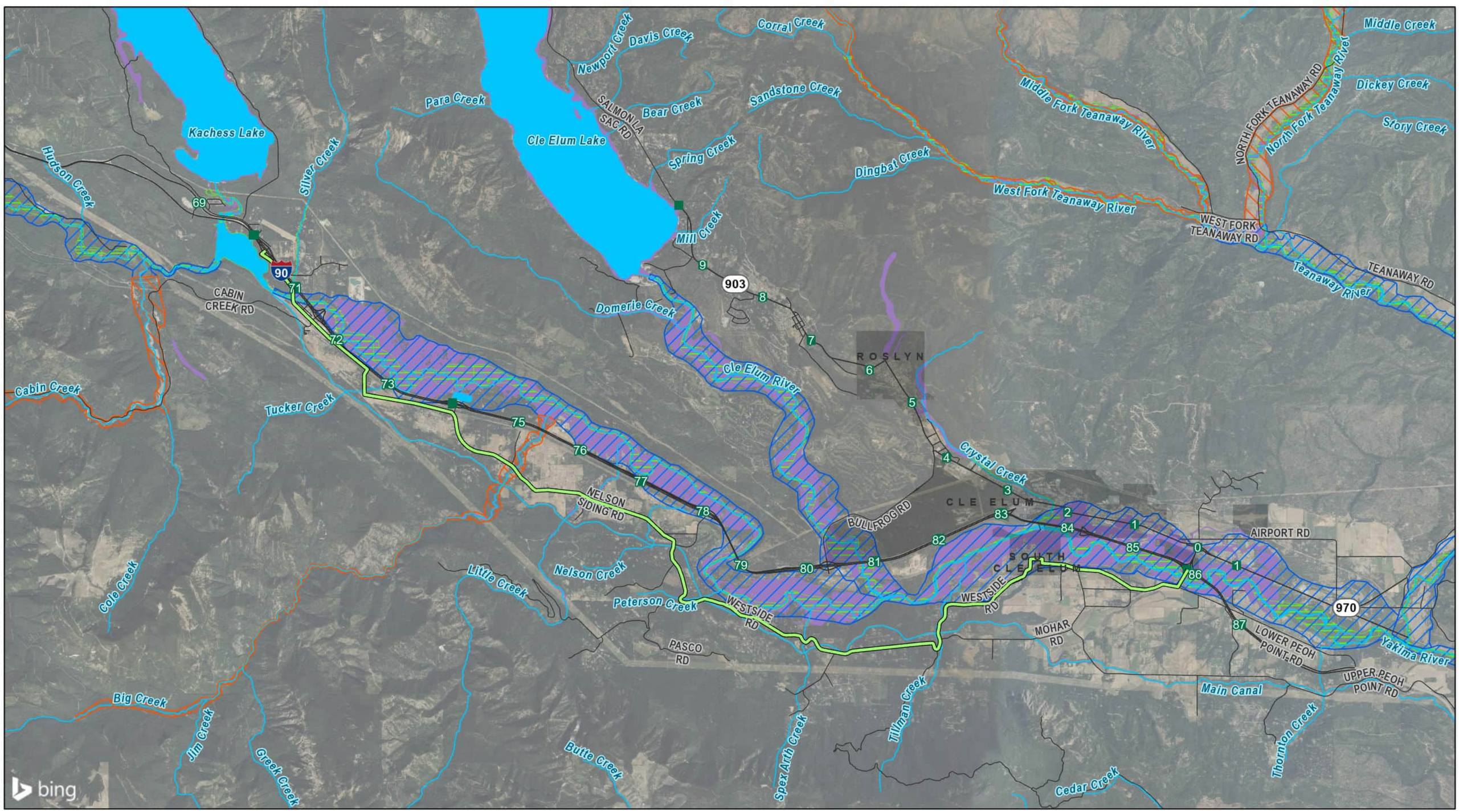
Tier 2

0 0.5 1

Miles

Jacobs

Data Sources: Kittitas County, USFWS, USGS, WSDOT.
Basemap Source: © 2024 Microsoft Corporation Earthstar Geographics SIO.



MAP 3D

ECOSYSTEM RESILIENCY

Alternative 5: South Route

Alternatives Analysis

I-90 Corridor – Easton to Cle Elum Planning Study

Alternative Alignment

100-Year Floodplain

Floodway

Channel Migration Zone

Tier 1

Tier 2

0 0.5 1

Miles

Jacobs

Data Sources: Kittitas County, USFWS, USGS, WSDOT.
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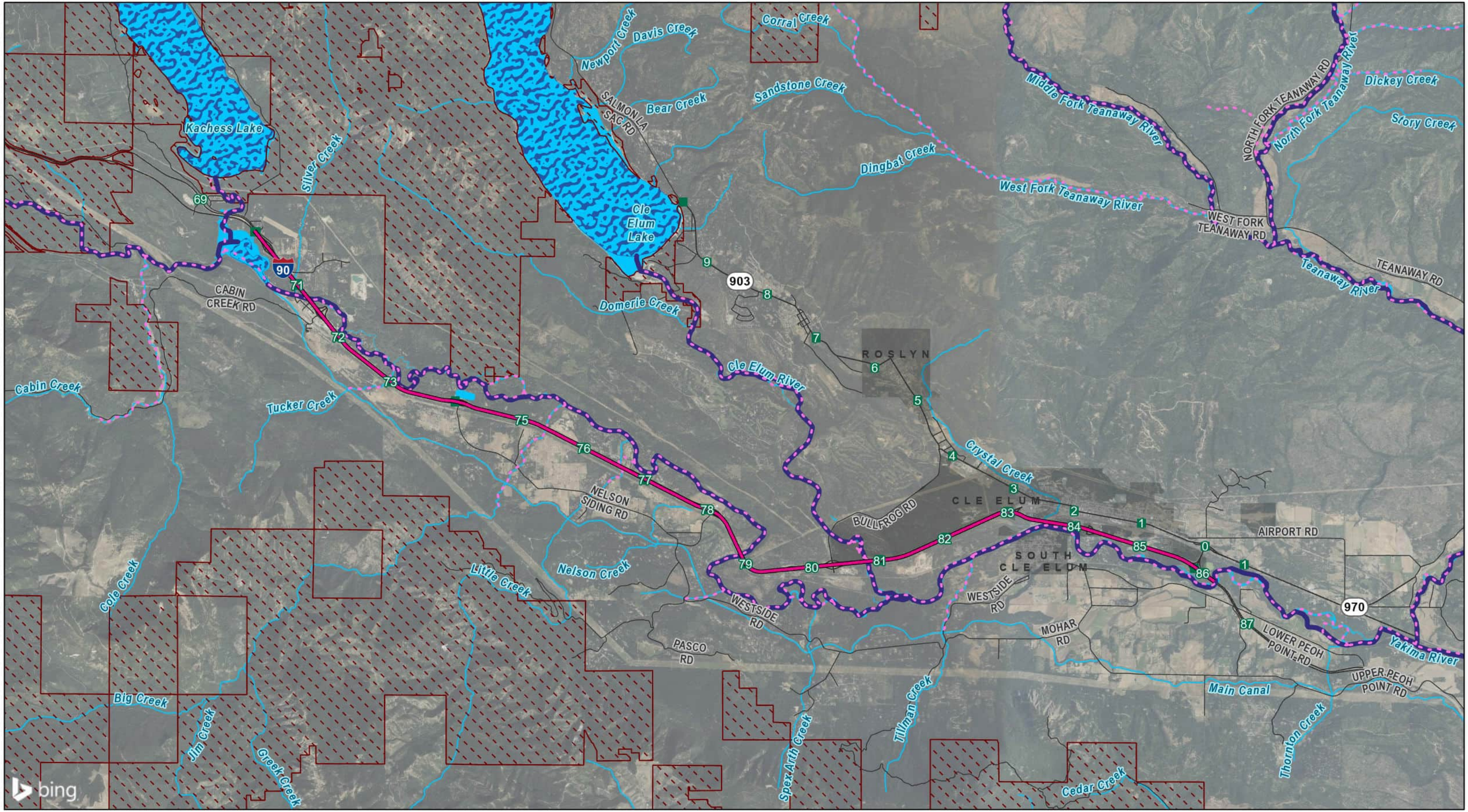


MAP 4A

CRITICAL HABITAT

Alternatives 1, 2, and 3: I-90 Widening

Alternatives Analysis

I-90 Corridor – Easton to Cle Elum Planning Study

Alternative Alignment

Critical Habitat

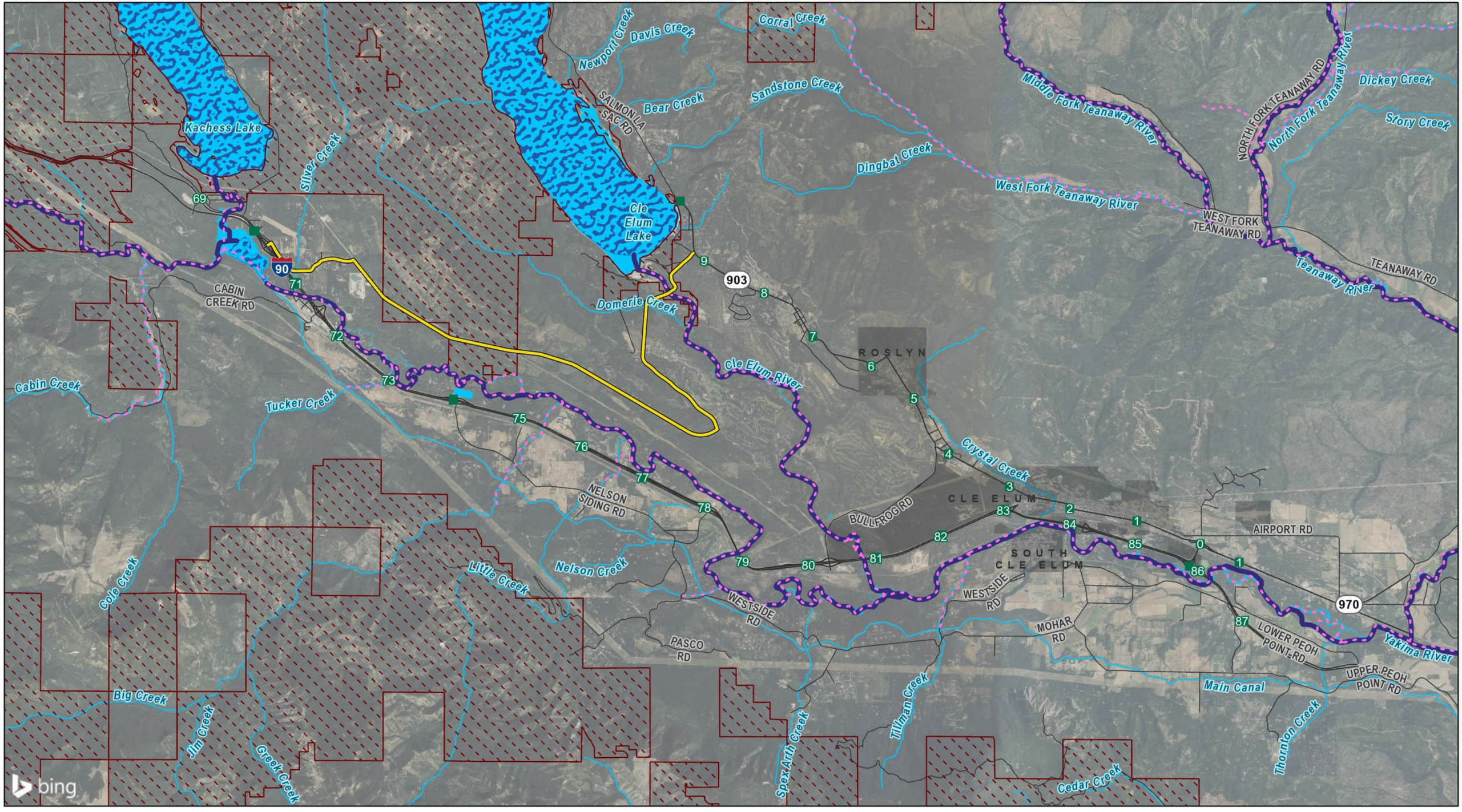
- Northern Spotted Owl
- Bull Trout

- Bull Trout
- Steelhead

0 0.5 1 Miles

Jacobs

Data Sources: Kittitas County, NMFS, USFWS, USGS, WSDOT.
Basemap Source: © 2024 Microsoft Corporation Earthstar Geographics SIO.



MAP 4B

CRITICAL HABITAT

Alternative 4A: SR 903 North Route

Alternatives Analysis

I-90 Corridor – Easton to Cle Elum Planning Study

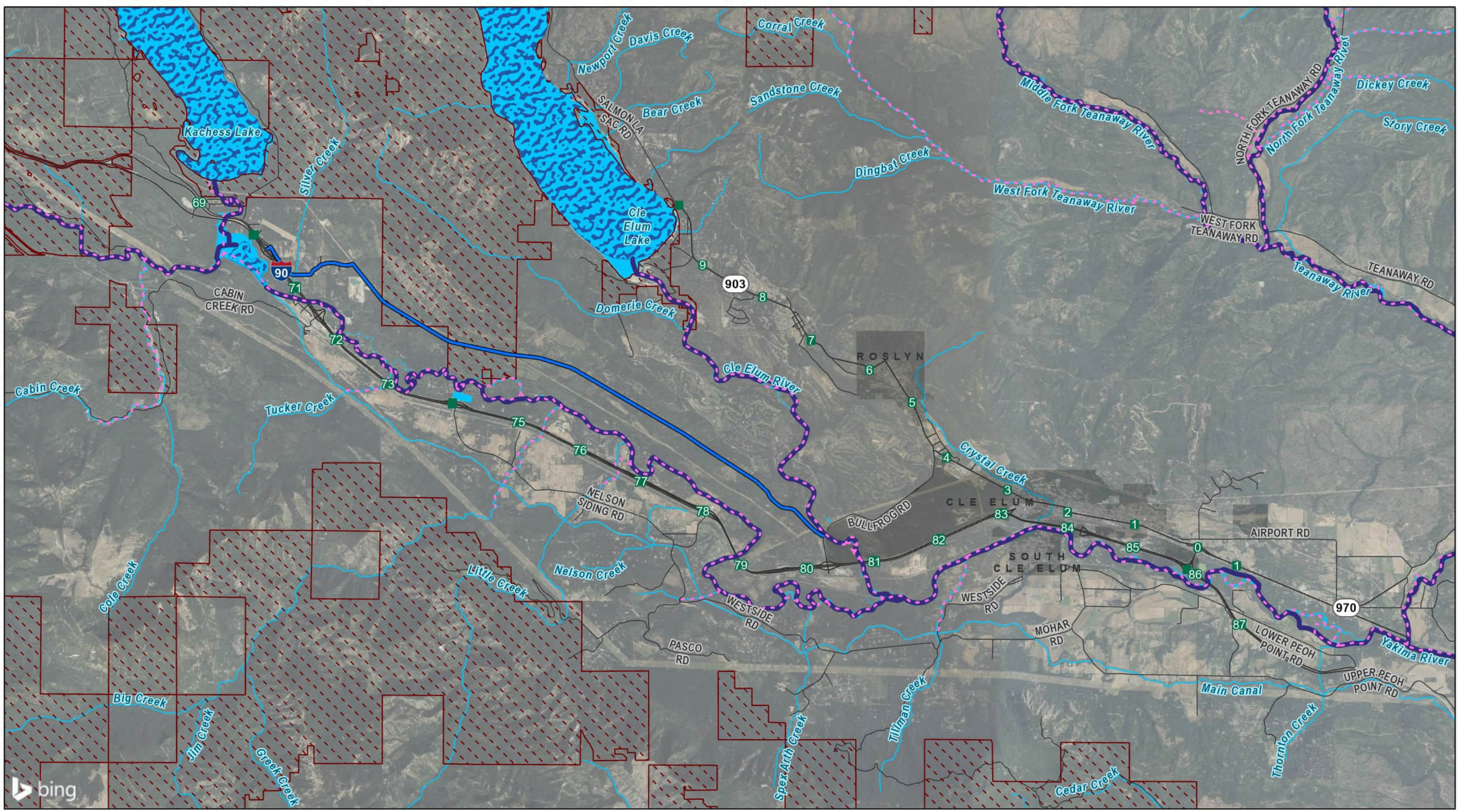
Alternative Alignment

Critical Habitat

- Northern Spotted Owl
- Bull Trout
- Bull Trout
- Steelhead

0 0.5 1 Miles

Jacobs



MAP 4C

CRITICAL HABITAT

Alternative 4B: Bullfrog Road North Route

Alternatives Analysis

I-90 Corridor – Easton to Cle Elum Planning Study

Alternative Alignment

Critical Habitat

- Northern Spotted Owl
- Bull Trout

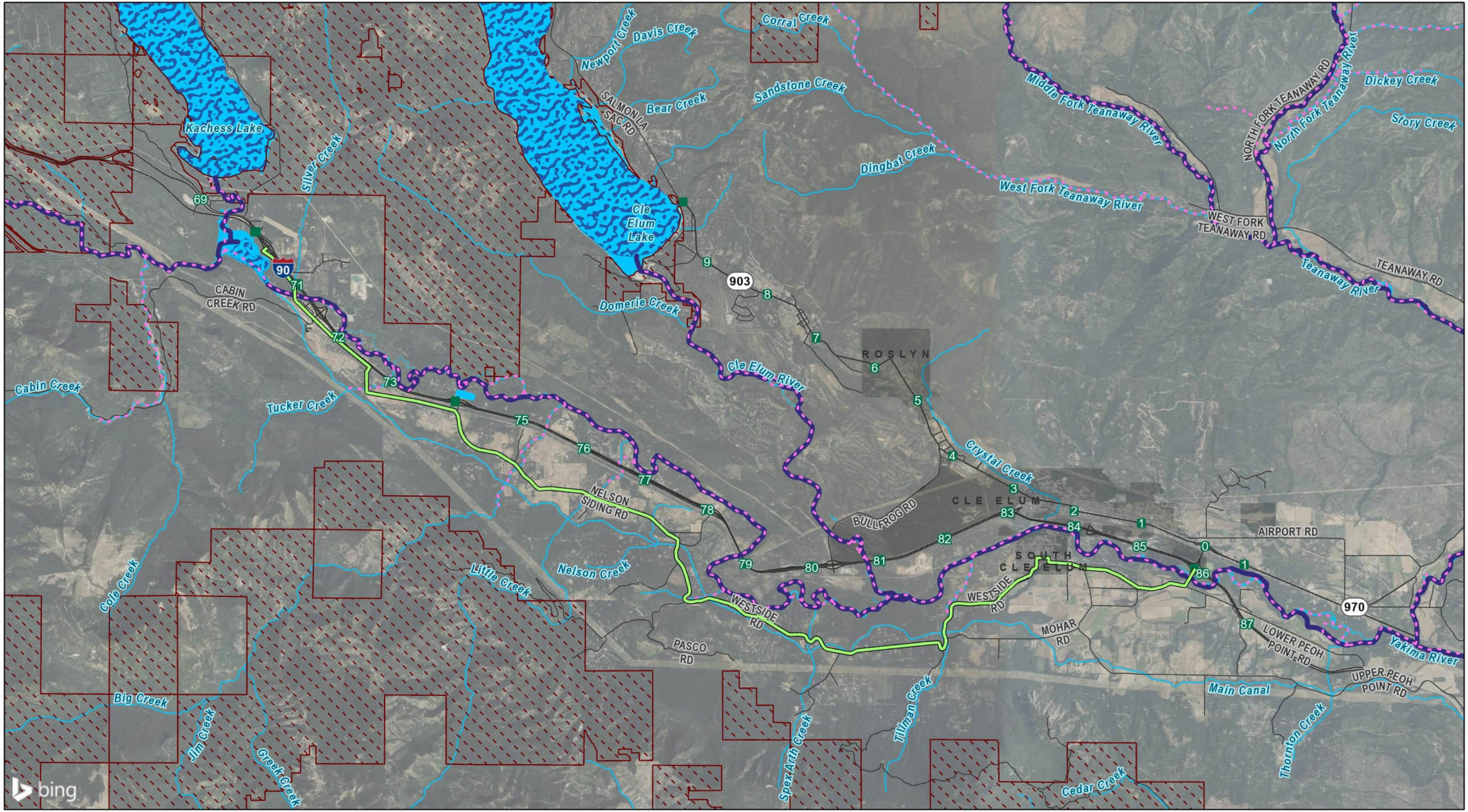
- Bull Trout
- Steelhead

N

0 0.5 1
Miles

Jacobs

Data Sources: Kittitas County, NMFS, USFWS, USGS, WSDOT.
Basemap Source: © 2024 Microsoft Corporation Earthstar Geographics SIO.



MAP 4D

CRITICAL HABITAT

Alternative 5: South Route

Alternatives Analysis

I-90 Corridor – Easton to Cle Elum Planning Study

Alternative Alignment

Critical Habitat

- Northern Spotted Owl
- Bull Trout

- Bull Trout
- Steelhead

N

0 0.5 1
Miles

Jacobs

Data Sources: Kittitas County, NMFS, USFWS, USGS, WSDOT.
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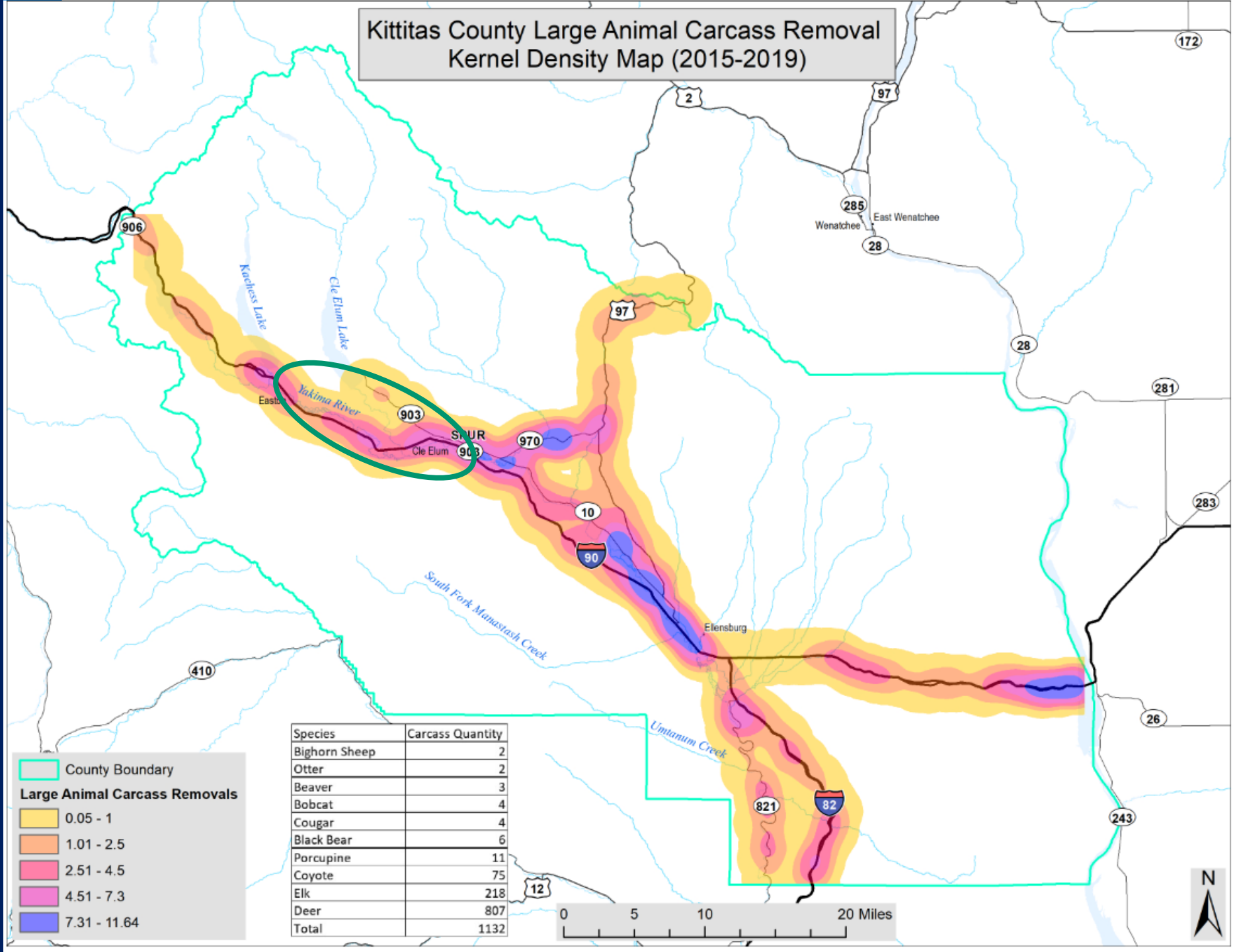

Species	Carcass Quantity
Bighorn Sheep	2
Otter	2
Beaver	3
Bobcat	4
Cougar	4
Black Bear	6
Porcupine	11
Coyote	75
Elk	218
Deer	807
Total	1132

Source: WSDOT and Washington Department of Fish and Wildlife, 2023

MAP 4E

APPENDIX C

Cultural Resources Review – 2024

Cultural Resources Review for the Interstate 90 Feasibility Study, Kittitas County, Washington

Prepared by:
Steven Dampf, M.S.
Ryan Rasmussen
Shawnee BearCub
Kevin Donald, Ph.D.

With Contributions by:
Jennifer Gorman, M.H.P.
Gorman Preservation Associates

Tierra Archaeological Report No. 2023-037
June 28, 2023

Tierra Right of Way Services, Ltd.
422 West Riverside Avenue, Suite 1330
Spokane, Washington 99201

Cultural Resources Review for the Interstate 90 Feasibility Study, Kittitas County, Washington

Contains Confidential Information—Not for Public Distribution

Prepared by:
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Submitted by:
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Spokane, Washington 99201

Tierra Archaeological Report No. 2023-037
June 28, 2023

TABLE OF CONTENTS

Executive Summary iv
Introduction 1
Project Description and Overview 1
Tribal Communication 1
Environmental Setting 1
Topography and Geology 3
Paleo-Climate and Vegetation Shifts 4
Faunal Resources 5
Cultural Setting 6
Precontact Period 6
Paleoindian Period (16,000–9000 B.P.) 6
Archaic Period (9000–5000 B.P.) 8
Pithouse–Winter Village Period (5000–500 B.P.) 9
Ethnographic/Protohistoric Period 11
Settlement and Subsistence 12
Population 15
Trade 16
Establishment of Reservations 16
Euroamerican/Postcontact/Historic Period 17
Explorers, Traders, and Missionaries 17
Early Settlers and Communities 19
Transportation 20
Early Irrigation and Agriculture 21
Literature Review 22
Previous Cultural Resource Investigations 22
Previously Recorded Archaeological Resources 31
KT01376 31
KT01376 31
KT02786 31
KT04380 32
Cemeteries 33
Historic Map Research 33
Built Environment Resources 40
Anticipated Finds 42
References 43

LIST OF FIGURES

Figure 1. Vicinity map and project location. 2
Figure 2. GLO map of the northwest portion of the API. 34
Figure 3. GLO map of the middle portion of the API. 35
Figure 4. GLO map of the south portion of the API. 36
Figure 5. 1901 USGS map of the northwest portion of the API. 37
Figure 6. 1901 USGS map of the middle portion of the API. 38
Figure 7. 1897 and 1901 USGS map of the south portion of the API. 39

LIST OF TABLES

Table 1. Summary of Precontact Chronology Across the Columbia Plateau[a] 7
Table 2. Previous Cultural Resources Studies within the Study Area 23
Table 3. Previously Recorded Cultural Resources Located within 0.8 km (0.5 Miles) of the API 26
Table 4. Previously Recorded Cemeteries within a 0.8-km (0.5-mile) Radius of the API 33
Table 5. Buildings within the Study Area 40
Table 5. Bridges within the Study Area 41

APPENDICES

Appendix A. Tribal Communication ..... A.**Error! Bookmark not defined.**
Appendix B. Built Environment Resources within and Adjacent to the API B.1

EXECUTIVE SUMMARY

Kittitas County Public Works (the County) is initiating a feasibility study for improving Interstate 90 (I-90) between Milepost (MP) 70.3 and MP 85.8, where traffic congestion has a direct impact on safety and regional freight mobility. The study is funded by Kittitas County and does not involve State or Federal funding; however, the County is coordinating with the Washington State Department of Transportation (WSDOT) over the course of the analysis, which will be the first step in identifying alternatives to improving safety, mobility, economic vitality, and environmental justice issues in the study corridor. SCJ Alliance is leading the study efforts on behalf of the County and has contracted with Tierra Right of Way Services, Ltd. (Tierra), to conduct the cultural resources review.

Tierra conducted the current study to identify cultural resources, including archaeological resources, the built environment, and historic properties of religious and cultural significance to Tribes, within 0.8 km (0.5 miles) of the 24.9-km (15.5-mile) segment of I-90 (the study area). Tierra investigated the study area by reviewing available literature and archival records, analyzing historic maps and aerial photography, and other pertinent environmental and historical sources. Tierra subcontracted with Gorman Preservation Associates to identify built environment resources within the study area.

Based on the results of the background research presented above, including the study area's proximity to the Yakima River and numerous drainages, the presence of multiple precontact and historic archaeological resources in the vicinity, and the Department of Archaeology and Historic Preservation's (DAHP's) predictive model, as well as consideration of historic and more recent disturbances that may have impacted cultural resources (e.g., road and bridge construction and maintenance, utility installation, and agricultural land use), Tierra anticipates a moderate to high potential (depending on which area in particular) for encountering precontact, Ethnographic period, historic Native American, and historic Euroamerican resources that may be Eligible for listing in the National Register of Historic Places. This contrasts with DAHP's categorization of almost the entire highway segment under the study as Very High Risk, which does not account for previous ground disturbances, including buried utilities, roads, and residential development. Tierra therefore recommends a more thorough cultural resources inventory once the County and WSDOT have prepared a design plan for the highway improvements and initiated formal consultation with the affected Tribes (Yakama, Confederated Tribes of the Colville Reservation, and Snoqualmie). The investigation should include fieldwork with subsurface survey in areas exhibiting minimal previous ground disturbance and on landforms with higher archaeological potential.

As a result of this preliminary study, 32 built environment resources constructed more than 45 years ago were identified adjacent to the highway and considered within the study area. These resources include eight buildings, one railroad, and 23 bridges. Because the exact configuration of the proposed highway widening has yet to be determined, it is unknown if and how the proposed project will impact any of these properties. If the future area of potential effects (APE) (to be determined by WSDOT and DAHP) includes all adjacent properties to the highway, then the 32 built environment resources that were constructed more than 45 years ago identified in this study will need to be recorded under compliance with Section 106 of the National Historic Preservation Act and implementing 36 Code of Federal Regulations 800, assuming Federal funding will be used for the proposed project. Additionally, any properties located adjacent to the future APE that have turned 45 years old or older at the time the proposed project begins will need to be recorded.

INTRODUCTION

Project Description and Overview

Kittitas County Public Works (the County) is initiating a feasibility study for improving Interstate 90 (I-90) between Milepost (MP) 70.3 and MP 85.8 (Figure 1), where traffic congestion has a direct impact on safety and regional freight mobility. The study is funded by Kittitas County and does not involve State or Federal funding; however, the County is coordinating with the Washington State Department of Transportation (WSDOT) over the course of the analysis, which will be the first step in identifying alternatives to improving safety, mobility, economic vitality, and environmental justice issues in the study corridor. SCJ Alliance (SCJ) is leading the study efforts on behalf of the County and has contracted with Tierra Right of Way Services, Ltd. (Tierra), to conduct the cultural resources review.

Tierra conducted the current study to identify cultural resources, including archaeological resources, the built environment, and historic properties of religious and cultural significance to Tribes. Tierra investigated the project vicinity by reviewing available literature and archival records, analyzing historic maps and aerial photography, and other pertinent environmental and historical sources. This report provides a discussion of the environmental and cultural context of the project vicinity, the methods and results of the background research, and concludes with the recommendations for future work.

Tribal Communication

On behalf of SCJ and the County, Tierra sent letters and maps, dated December 14, 2022, to the Confederated Tribes of the Colville Reservation (also known as the Colville Confederated Tribes or CCT), the Confederated Tribes and Bands of the Yakama Nation (the Yakama), and the Snoqualmie Indian Tribe (the Snoqualmie) describing the feasibility study and Tierra's investigation (Appendix A). Tierra also encouraged each Tribe to share any information that might be used in the assessment or share any concerns regarding the study area.

Comments were received via email on December 14, 2022, from Guy Moura, CCT Tribal Historic Preservation Officer, acknowledging that numerous archaeological investigations have been completed in the area, as have traditional studies.

ENVIRONMENTAL SETTING

This environmental section describes the depositional conditions that influence the likelihood of intact archaeological deposits being present in the project area and discusses features of the natural environment that would have encouraged or discouraged settlement of the project area by human populations in the past. Information regarding the physical environment of the project vicinity is provided, including a discussion of the changes in topography, geology, climate, vegetation, and the availability of floral and faunal resources that are relevant to assessing a location's sensitivity for containing cultural resources. Literature reviewed for this project included environmental data from the Washington State Department of Natural Resources, the Natural Resources Conservation Service online soil survey, and resources in Tierra's library related to the geology and land formation processes and the natural resources available in and around the project area.

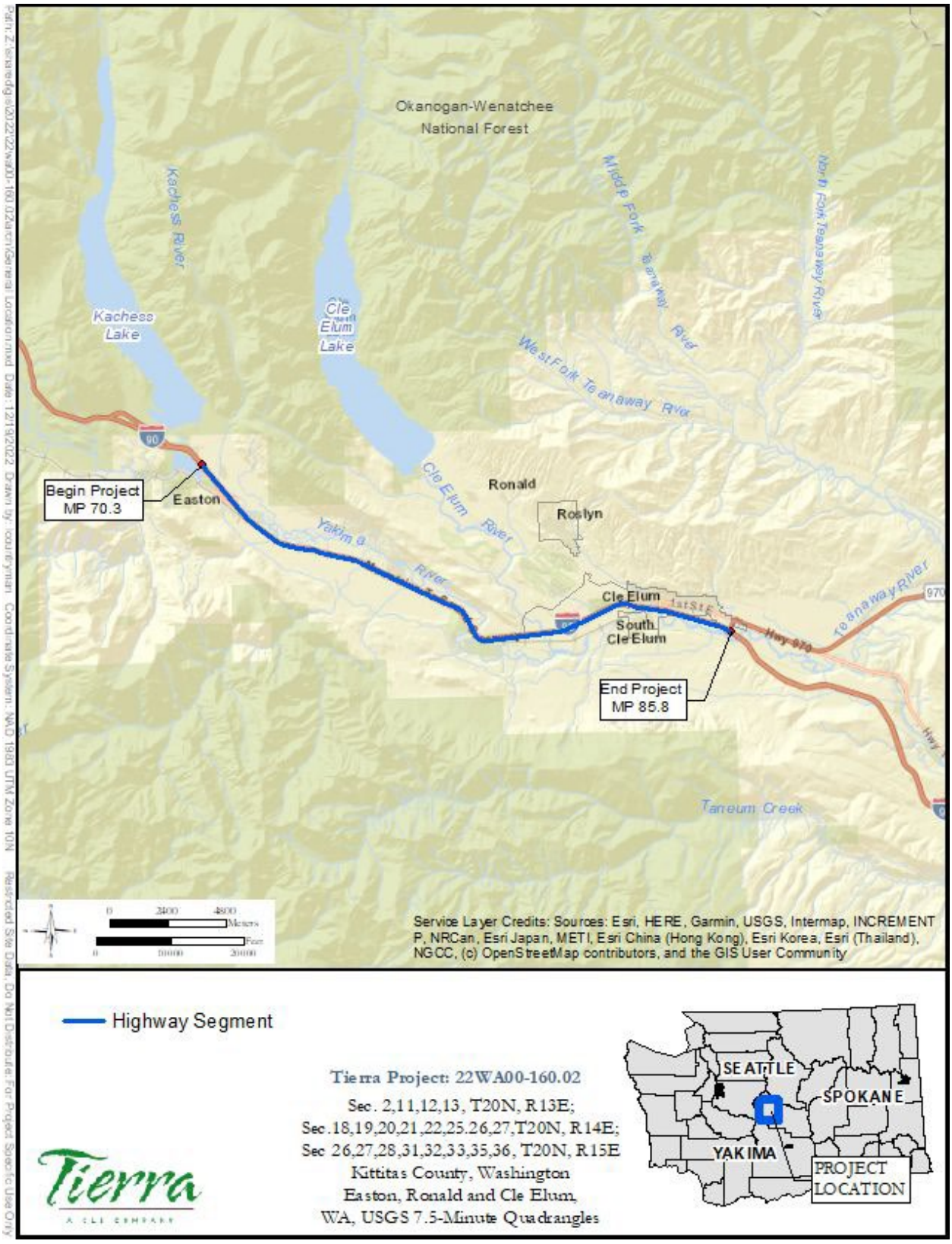

Figure 1. Vicinity map and project location.

Topography and Geology

The area of potential impacts (API) is situated in the eastern Cascade Mountain Range near Snoqualmie Pass, Washington, which occupies the Southern Cascades physiographic provinces (Franklin and and Dyrness 1973). The Southern Cascades physiographic province consists of more recent andesite and basalt flows in contrast to the older sedimentary, igneous, and volcanic rock located to the east of the API.

Surrounding the API to the west are U-shaped valleys formed as a result of receding glaciers during the Pleistocene. As glaciers receded, water dammed behind terminal moraines, creating Cle Elum Lake, Keechelus Lake, and Kachess Lake. The API occurs in the Yakima River Basin near the active floodplains of the Yakima River. Three reservoirs feed the Yakima River: Cle Elum Lake feed by the Cle Ellum River, Kachess Lake fed by the Kachess River, and Keechelus Lake fed by Gold Creek.

The API is located in the eastern foothills of the Cascade Mountains. Neighboring wet forested areas border the API to the west, whereas the dry Columbia Plateau boarders the east. Vegetation within the API includes Douglas fir *(Pseudotsuga menziesii)*, grand fir *(Abies grandis)*, hemlock (*Tsuga* spp.), alder *(Alnus glutinosa)*, cottonwood (*Populus* spp.), vine maple *(Acer circinatum)*, western red cedar *(Thuja plicata)*, and lodgepole pine *(Pinus contorta)* (Franklin and Dyrness 1973). Yakama Nation Cultural Resource Program field observations of the project API locales indicate that ponderosa pine is also a predominant species. Major fauna observed in the region include elk *(Cervus elephus)*, deer (*Cervus* sp.), black bear *(Ursus americanus)*, raccoons *(Procyon lotor)*, mountain lions *(Puma concolor)*, bobcats *(Lynx rufus)*, and beavers *(Castor canadensis)*. Many species of fish, including several salmonid species, have been harvested in the area since precontact times.

The sediments currently mapped in the API are predominantly Xerofluvents, ashy sandy loams of the Kladnick series, and Patnish-Mippon-Myzell complex.

Xerofluvents are usually found at floodplains and stream terraces at an elevation around 152–762 m (500–2,500 feet) above mean sea level (AMSL). These deep, excessively drained soils are formed from flooding and melting of snow from slopes. The typical soil profile consists of moderately decomposed plant material to a depth of about 0–5 cm below ground surface (cmbs), overlaying a sandy loam to 50 cmbs, overlaying a loamy sand to about 58 cmbs, overlaying an extremely cobbly sand to about 152 cmbs.

The Kladnick series consists of deep, well-drained or somewhat excessively drained soils formed in glacial outwash with a mantle of volcanic ash. Kladnick soils are usually found on terraces and have slopes of 0–30% at 610–914 m (2,000 to 3,000 feet) AMSL. The typical soil profile consists of moderately decomposed plant material to a depth of 2.5 cmbs, overlaying ashy sandy loam to a depth of about 22.9 cmbs, overlaying a gravelly sandy loam to a depth of 38.1 cmbs, overlaying a very gravelly sandy loam to a depth of about 61 cmbs, overlaying an extremely gravelly sand to a depth of 152 cmbs.

Racker ashy sandy loam is formed from glacial outwash and a mantle of volcanic ash. These deep, well-drained soils are usually found on terraces at 549–762 m (1,800–2,500 feet) AMSL. The typical soil profile consists of moderately decomposed plant material to a depth of 2.5 cmbs, overlaying an ashy sandy loam to depth of 12.7 cmbs, overlaying a gravelly ashy sandy loam to a depth of 30.48

cmbs, overlaying a very cobbly loamy sand to a depth of 78.7 cmbs, overlaying a very cobbly loamy sand to a depth of 152 cmbs.

The Patnish-Mippon-Myzell complex is alluvium mixed with volcanic ash. These moderately well-drained soils are usually found in floodplains at an elevation of 549–1,463 m (1,800–4,800 feet) AMSL. The typical soil profile consists of ashy loam to a depth of about 17.7 cmbs, overlaying another ashy loam to a depth of 35.5 cmbs, overlaying a loam to a depth of 68.6 cmbs, overlaying very gravelly sandy loam to a depth of 88.9 cmbs, overlaying an extremely cobbly loamy sand to a depth of 152 cmbs.

Roslyn ashy sandy loam is formed by glacial drift with a mantle of loess and volcanic ash. These well-drained soils are usually found on terraces on an elevation of 579–732m (1,900–2,400 feet) AMSL. The typical soil profile consists of moderately decomposed plant material to a depth of 2.5 cmbs, overlying an ashy sandy loam to a depth of 20.3 cmbs, overlaying another ashy sandy loam to a depth of 38.1 cmbs, overlaying a loam to a depth of 93.9 cmbs, overlaying a gravelly loam to a depth of 124.4 cmbs, overlaying another gravelly loam to a depth of 152 cmbs (NRCS 2023).

Paleo-Climate and Vegetation Shifts

The climate and vegetation in the vicinity of the API have undergone changes since the end of the last ice age, approximately 11,000 years ago. These transitions provided a fluid and dynamic environment for the inhabitants of the API vicinity during the Holocene. By roughly 11,000–10,000 years ago, all but the highest and most northern glaciers had retreated, leaving the environment warm and moist during the spring and summer, and cold and dry over the winter. Grasses, sagebrush, and chenopods flourished in the steppe region surrounding the API (Chatters 1998:43–44). After about 9,500–9,000 years ago, precipitation increased in the Pacific Northwest as a whole, while conditions within the lower Columbia Basin became increasingly arid. Former grasslands around the API were gradually replaced by higher proportions of drought-adapted sagebrushes and other open-ground plants (i.e., ragweed, *Ambrosia* spp.), while wind-blown loess sediments collected in local rock shelters (Mehringer 1991, cited in Chatters 1998:44).

Between about 6,500 and 6,300 years ago, another cooling period began, bringing higher levels of moisture to the semiarid lower Columbia Basin. Vegetation levels increased in areas surrounding the Columbia and Yakima Rivers, creating a paleosol on the adjacent floodplains (Chatters 1998; Hammatt 1997). Increasing episodes of flooding, with higher river water temperatures, are also characteristic of this period (Chatters 1998:45). Between 4,500 and 2,100 years ago, an abrupt decrease in temperature, along with continued high moisture levels (over the wintertime), wrought a relatively dramatic environmental change in the Columbia Plateau as a whole, increasing the amount of forested areas in the Okanagan Highlands and extending a steppe-shrub-grassland into the vicinity of the API. Rivers and streams were colder, clearer, and gravel-bottomed (wonderful for salmonid reproduction); however, the spring thaw was later, condensing the collection of many riverine resources (including mussels and anadromous fish species) into a few summer months (Chatters 1998:46).

After roughly 2,800 years ago, average temperatures in the API vicinity warmed again, creating the modern *Artemisia tridentate/Agropyron spicatum* (big sagebrush/bluebunch wheatgrass) vegetation association (Chatters 1998:46; Franklin and Dyrness 1973:216). This association is, ideally, composed of four levels of vegetation. Level one includes the dominant big sagebrush along with rabbitbrush (*Chrysothamnus* sp.), threetip sagebrush *(Artemisia tripartita)*, and potentially spiny hopsage *(Grayia*

spinosa). Level two may include perennial grasses such as bluebunch wheatgrass, needlegrasses (*Stipa* sp.), and Cusick bluegrass *(Poa cusickii)*. Additionally, smaller species are found in the third level, roughly 10.2 cm (4.0 inches) or less from the ground surface, and these include Sandberg's bluegrass *(P. sandbergii)*, western stickseed *(Lappula redowskii)*, and cheatgrass brome *(Bromus tectorum)*. Cheatgrass brome, however, is not native to the Pacific Northwest; it was introduced into Washington around 1890 and has since become a hardy competitor within shrub and grasslands (especially grazed pasture and abandoned farmlands). The lowest level, forming a crust on the ground surface, consists of lichens and mosses (e.g., *Tortula* sp. and *Aloina rigida*) (Franklin and Dyrness 1973:206–217, 231–233).

Neither grazing by indigenous species (deer, elk, and antelope) nor deliberate landscape management (e.g., through fire) by Native American groups is thought to have had a significant impact on the steppe vegetation prior to early settlement by Europeans. Livestock was introduced in the steppe in the early 1800s and, along with agriculture and reclamation practices, has significantly impacted the vegetation (Franklin and Dyrness 1973). A large portion of the region is currently under cultivation.

Faunal Resources

The shrub-steppe habitats and associated modern climatic conditions have probably persisted in the area for approximately the past 2,300 years and have influenced the distribution of xeric-adapted meat-producing fauna. The species included bison *(Bison bison)* mule deer *(Odocoileus hemionus)*, elk, pronghorn *(Antilocapra americana)*, mountain sheep *(Ovis canadensis)*, jackrabbits *(Lepus californicus)*, cottontail rabbits (*Sylvilagus* spp.), marmot *(Marmota flaviventris)*, and ground squirrels (*Spermophilus* spp.) (Chatters 1998). Beaver and muskrat (*Ondatra zibethicus*) could be found in streams, lakes, and marshes.

While the Columbia Basin is generally not known as an area of significant waterfowl migration or breeding, it is an important wintering area, especially for Canada goose *(Branta canadensis)* and American wigeon *(Anas americana)*. Upland birds in the area include sage grouse *(Centrocercus urophasianus)*, sharp-tailed grouse *(Tymponuchus phasianellus)*, and California quail *(Callipepla californica)*. The gregarious breeding behavior of the first two species at the same grounds or leks each year likely made them a reliable subsistence resource for Native American people (Chatters 1998).

The Columbia and Yakima Rivers support a variety of anadromous fish, a major part of the indigenous diet, such as chinook *(Oncorhynchus tschawytscha)*, sockeye *(O. nerka)*, and coho salmon *(O. kisutch)*; steelhead trout *(O. mykiss)*, Dolly Varden trout *(Salvelinus malma)*, white sturgeon *(Acipenser transmontanus)*, and Pacific lamprey *(Entosphenus tridentatus)*. Most anadromous fish runs varied from one, sometimes over several months, to three from spring to fall, with steelhead also having a winter run. Resident fish species include: bridgelip sucker *(Catostomus columbianus)*, largescale sucker *(C. macrocheilus)*, northern pikeminnow (formerly squawfish) *(Ptychocheilus oregonensis)*, peamouth *(Meilocheilus caurinus)*, chiselmouth *(Acrocheilus alutaceus)*, mountain whitefish *(Prosopium williamsoni)*, burbot *(Lota lota)*, bull trout *(Salvelinus confluentus)*, and cutthroat trout *(Oncorhynchus clarki)* (Chatters 1998). Crustaceans, abundant at least in the past in some of the drainages, are the freshwater pearl mussels *Margaritifera falcata* and *Gonidea angulata*, and species of the thin-shelled mussel *Andota* (Chatters 1998). Both the Columbia and Yakima drainages are known to have been important to indigenous peoples in ethnohistoric times as sources of fish and crustacean resources. Fishing-related sites and artifacts are frequently found along these rivers.

CULTURAL SETTING

Precontact Period

Broad environmental changes on the Columbia Plateau over time have influenced its faunal and human inhabitants and, as a result, contributed to changes in cultural material assemblages. These environmental conditions are extremely broad and often do not consider particularistic, local climatic shifts and conditions. Studies have shown that each area of the plateau developed individualized shifts within its cultural chronology catalyzed by localized environmental and cultural factors (Table 1). Evidence of human occupation of the Americas in the Pleistocene-Holocene (i.e., pre-Clovis) transitional period in the region is rare, but such sites have been found across North America (Montaigne 2020; Pringle 2011). Locally, there is evidence of Native settlement along the lower Salmon River in modern-day Idaho dated to the 16,500–15,500 B.P. range (Davis et al. 2019).

Paleoindian Period (16,000–9000 B.P.)

The Paleoindian period (ca. 16,000–9000 B.P.) encompasses the first human populations in the study area. It is associated with the Pleistocene-Holocene transition. This period is divided into a pre-Clovis period and a "Clovis/Western Stemmed Tradition" time period characterized by the manufacture and use of Clovis, Western Stemmed, Windust, Haskett, and (at the eastern extent of the study area) Folsom projectile points. Grouping these point types into a single period is based on chronological considerations. The level of relatedness between the technologies and the people using them can be debated (e.g., Willig and Aikens 1988). However, in the aggregate, this period is commonly referred to as the Clovis/Western Stemmed period, indicative of large-game hunting at the end of the Pleistocene. Some have speculated that Western Stemmed points may be more prevalent in the western states, including the plateau (Wade 2017). Lanceolate (a.k.a. Cascade) points, although diagnostic of the subsequent Archaic period, also occur in the earlier assemblages in minor percentages (Davis et al. 2014).

Formal tools during the Clovis period were crafted with high levels of flintknapping skill. On a continental scale, the subsistence practiced by these people is thought to be that of migratory broad-spectrum foragers chasing large game (Pleistocene megafauna), while simultaneously engaging in generalized opportunistic foraging of available plant and riverine resources (Dillehay 2000). The relative importance of large game to the people of this period in the Pacific Northwest can be debated (Davis et al. 2012). These were fast-moving, wide-ranging populations that expanded rapidly across the Americas.

Clovis and Western Stemmed assemblages include hide-working tools. Edge-ground cobbles and cobble tools may have been used for plant processing. Also found in the assemblages are specimens representing well-developed bone and antler technology, including awls, needles, and atlatl spurs. Native people probably engaged in woodworking and plant-fiber working, but evidence is scant in the assemblages. Shell artifacts of adornment, specifically *Olivella* beads and mussel shell pendants, have been found (for example) at Marmes Rockshelter (45FR50; Hicks 2004), located approximately 134 km (215 miles) east-southeast of the study area.

Archaeologists believe settlement patterns included two types of sites: lower-elevation grasslands and valleys and upland hunting camps, including rock shelters and open campsites (Bense 1972).

Table 1. Summary of Precontact Chronology Across the Columbia Plateau[a]

Period	Phase Names and Diagnostic Artifacts	Settlement Patterns	Additional Observations
Paleoindian 16,000–9,000 B.P.	Pre-Clovis and Clovis/Folsom/Western Stemmed (Windust, Lind Coulee, Haskett) occupations. The latter is characterized by large, well-made spear and dart points. Oldest regional site identified in Cooper's Ferry, Idaho.	Settlement patterns included two types of sites: lower-elevation grasslands and valleys and upland hunting camps, including rock shelters and open campsites. A seasonal division may have existed between the winter shelter camp and a summer upland base camp.	Social organization is thought to have been small-band egalitarian. The presence of *Olivella* shell beads may indicate coastal contact; however, these beads may have been directly collected as part of a wide seasonal or semiannual round, rather than indicating trade with coastal populations. Cremation was a common mortuary practice at sites dating to this era.
Archaic A & B 9000–5000 B.P.	Cascade I and II: pre- and post-Mazama eruption. Cascade I subperiod (9000–7000 B.P.) assemblages are characterized by Cascade point types A, B, and C (lanceolate or lanceolate with some basal constriction or partial stem). Cascade II subperiod (7000–4000 B.P.) is distinguished by the occurrence of large side-notched points (e.g., Cold Springs type).	Subsistence strategies were diverse and included hunting medium and large game with an increasing emphasis over time on salmon, river mussels, and seeds. People settled in small-scale surface encampments dispersed around the confluence of rivers and tributaries. Generalized residential sites were not differentiated by specialized uses.	Social organization postulated to have been of a small-band, egalitarian nature. Seasonal rounds may have been wide enough to include direct access to the coast, or the marine shell may have been exchanged through familial networks. Burials were flexed inhumations with associated grave goods, particularly beads of marine shell.
Initial Pithouse–Regional Resource Specialization 5000–2000 B.P.	Initial Pithouse subperiod is marked by the appearance of semisubterranean pit houses in the archaeological record. More densely occupied pit house settlements were present across the plateau by 3800 B.P. More intensive use of regional resources, which included large, medium, and small game; seeds; root crops; and fish. Roasting ovens appear ca. 4150 B.P., also an increase in quantity of net weights. Cascade points giving way to contracting stemmed and corner notched/expanding stemmed points (Rabbit Island Stemmed), hopper mortars and pestles; preference for cryptocrystalline silicate raw material over basalt.	Hiatus in pit house construction hypothesized between 3000 and 2000 B.P. Settlement patterns show extensive exploitation of uplands, including the appearance nonportable site "furniture," such as large mortars, that indicate a greater investment in specific residential locations and perhaps longer-term occupations. Start of a delayed-return collector adaptation. Settlement and subsistence strategies were moving in a more sedentary direction, although Archaic adaptive strategies continued for some time despite the introduction of this residential structure type.	Archaeologists understand the Initial Pithouse period to have been multifaceted, containing transitional, intermediate, and locally unique manifestations of the optimal forager or collector adaptation. A variety of intermediate forms and degrees of optimal foraging, population aggregation, delayed return, and logistical organization occurred locally and over time. Burials continue to be flexed inhumations with associated grave goods.
Regional Development – Winter Village Pattern 2000–500 B.P.	Aggregated pit house villages; longhouses; mat lodges; arrow points in various forms (i.e., small corner notched and side-notched points, "pin stem" points, and small lanceolate points); net weights; end scrapers; a variety of ground stone (pestles, mortars, manos, and hopper mortars); cobble tools; weaving and wood technologies; cordage; stone and bone awls; fire starters; arrow foreshafts; pipes; shamanic materials, such as loon bones, shell beads, nephrite, and dentalium pendants; defensive earthworks after 800 B.P. A demonstrable population increase occurred during this period, probably because the climate had reached stable (approximate to the mid-twentieth century) conditions.	Semi-settled seasonal adaptation making use of aggregates pit houses in winter, intensive storage technologies, and specialized spring, summer, and fall resource-procurement locations to support relatively large populations. Winter villages along rivers with temporary camps at strategic locations characterized the settlement pattern. Increasing logistical organization and aggregated settlement. Prestige items became more common. Site specialization became pronounced based on an increased percentage of logistical sites. Subsistence focused on a seasonal round of available resources following a collector strategy focused on salmon (where available) and intensive camas root gathering and processing in upriver areas (e.g., Albeni Falls region) where salmon runs were not present.	Social organization became a mix of achieved and ascribed status, including some taking of slaves, and there appears to have been continued coastal interaction. Burial practices became more diverse, including flexed burials and burials associated with prominent landscape features, such as in dunes and beneath talus slopes; rock cairns and cist burials.
Protohistoric 500–210 B.P.	Continuity with Winter Village period with introduction of down-the-line trade items, including the introduction of the horse, iron, and glass. An epidemiological analysis of historic census records indicates that there were waves of epidemic diseases.	The settlement pattern was the same as the Winter Village pattern with horse-grazing elements added, including evidence of pasturage locations. The subsistence strategy included logistical organization along the collector pattern, with a focus on salmon and delayed-return strategies, but with an increase in the prominence and social importance of raiding.	Social inequality increased, which can be seen in practices associated with both achieved and ascribed status. Burial practices show continuity with the Winter Village period but also included mass cremation and inhumation, possibly related to epidemic disease.
Contact 210–150 B.P.	Movement away from traditional lifeways to the adoption of agriculture, ranching, and consumer culture. Diagnostic artifacts of this period include projectile points made of glass and other hybrid forms.	A period of warfare from 1855 to 1858 marked the end of traditional settlement and subsistence patterns, followed by population movement to reservations.	Incorporation into the economic and social system of the United States.

[a] After Ames 2000; Andrefsky 2004; Bense 1972; Boyd 1999; Campbell 1985; Cannon 1992; Chance and Chance 1985; Chatters 1986, 1995; Davis 2001; Davis et al. 2019; Dumond and Minor 1983; Fryxell and Daugherty 1963; Goodale et al. 2004; Hayden 2000; Hayden and Cousins 2004; Leonhardy and Rice 1970; Miss and Hudson 1987; Pettigrew 1981; Pouley 2010; Roll 1982; Rousseau 2004; Schalk and Cleveland 1983; Solimano and Gilmour 2014.

A seasonal division may have existed between the winter shelter camp and a summer upland base camp. This is perhaps reflected in Marmes Rockshelter as a winter camp and the Lind Coulee Site (45GR97; located approximately 146 km [91 miles] east-southeast of the study area) as an upland summer camp (Hicks 2004; Irwin and Moody 1978). Habitations were surface dwellings. Social organization is thought to have been small-band egalitarian. The presence of *Olivella* shell beads may indicate coastal contact; however, these beads may have been directly collected as part of a wide seasonal or semiannual round, rather than indicating trade with coastal populations. Cremation was a common mortuary practice at sites dating to this era.

Archaic Period (9000–5000 B.P.)

By the mid-Holocene Archaic period (9000–5000 B.P.), environmental conditions had become warm and dry. The largest of the game, the Pleistocene megafauna, had gone extinct, and Archaic period peoples appear to have settled into a less wide-ranging, but still highly mobile, subsistence and settlement pattern that targeted the most locally abundant resources. Environmentally, the Archaic is marked by the eruption of Mount Mazama (currently Crater Lake) ca. 7,600 years ago (Zdanowicz et al. 1999). This event deposited a thick tephra lens across most of the Pacific Northwest, creating an identifiable chronological marker in the archaeological record. The eruption and deposition have been used as the dividing point between early and late Archaic phases (here termed Cascade I and Cascade II). The Clovis-era period point types are no longer found in the archaeological record but are replaced by laurel leaf-shaped ("lanceolate") points. These points, including serrated varieties, were made across the Americas during the Archaic period. These are locally called Cascade points, and at least three types have been defined.

Cascade I period (9000–7000 B.P.) assemblages are characterized by Cascade point types A, B, and C (lanceolate or lanceolate with some basal constriction or partial stem). Assemblages also include bifaces, a microblade technology, and Levallois-like reduction of cores. Plant processing is inferred from the presence of edge-ground cobbles, other cobble implements, and ground stone (Bense 1972:54). Bone implements persist, including awls, needles, and atlatl spurs, and the continued presence of *Olivella* shell beads indicates continued coastal contact. Notched-rock net weights are also present, as well as bola stones with a groove carved around the stone's circumference.

Subsistence strategies during this period were diverse and included hunting medium and large game with an increasing emphasis over time on salmon, river mussels, and seeds. People settled in small-scale surface encampments dispersed around the confluence of rivers and tributaries. Generalized residential sites were not differentiated by specialized uses. Burials were flexed inhumations with associated grave goods, particularly beads of marine shell. Archaeologists postulate that the social organization was of a small-band, egalitarian nature. Seasonal rounds may have been wide enough to include direct access to the coast, or the marine shell may have been exchanged through familial networks.

After the Mazama ashfall, an Archaic pattern continued into the Cascade II subperiod (7000–4000 B.P.). This subperiod is distinguished by the occurrence of large side-notched (locally called Cold Springs) points in the assemblage that may have originated to the south. Otherwise, the subsistence and settlement pattern remained largely the same. Slightly more grinding and pounding implements in assemblages suggest an increase in plant processing, particularly seeds. Emphasis on larger game (deer, elk, with bison in the southeast plateau) continued, as did an increasing use of salmon and river mussels. The numbers of bones found in assemblages seem to indicate that people were using a

varying mix of resources at the local level; for example, faunal assemblages in Hatwai include greater proportions of deer bones, while the same time period at the Chief Joseph Project indicates a greater emphasis on minnow, salmon, and marmot (Ames 2000). The social organization, coastal contacts, and preferred manner of burial remained the same as that seen in the earlier Cascade I subperiod.

Pithouse–Winter Village Period (5000–500 B.P.)

The Pithouse period (5000–500 B.P.) begins with the Initial Pithouse subperiod (5000–2000 or 3000 B.P.), which is marked by the appearance of semisubterranean pit houses in the archaeological record; however, several other assemblage-level changes coincide with the new periodization. The first pit structures in the mid-Columbia Plateau date from at least as early as 4400 or 5100 B.P. at sites like Hatwai and Alpowa, with an extremely early example at the Paulina Lake Site dating 6,000–7,000 years ago (Ames 2000; Campbell 1985:481; Chatters 1995). More densely occupied pit house settlements were present across the plateau by 3800 B.P., which indicates that settlement and subsistence strategies were moving in a more sedentary direction, but Archaic adaptive strategies continued for some time despite the introduction of this residential structure type (Solimano and Gilmour 2014). Archaeologists hypothesize that an initial sedentary adaptation around 4000–4500 B.P. was associated with broad-spectrum foraging, and that a collector adaptation replaced foraging sometime after 3500 B.P. (Prentiss and Kuijt 2004).

Climatic conditions during the Pithouse period became cooler, moister, and more balanced (mesic). The archaeological record indicates that Native people increasingly tailored their subsistence strategy to more intensive use of regional resources, which included large, medium, and small game; seeds; root crops; and fish. The first known roasting ovens (for meat or roots) date from as early as 4150 B.P. in the southern plateau but not until 2360 B.P. in the Canadian Plateau (Hayden and Cousins 2004). Settlement patterns show extensive exploitation of uplands, including the appearance of nonportable site "furniture," such as large mortars, that indicate a greater investment in specific residential locations and perhaps longer-term occupations. The upland sites are paired with smaller, aggregated pit house sites in riparian settings. Cascade points are less prominent in lithic tool assemblages, replaced by contracting stemmed (Rabbit Island Stemmed) and corner notched or expanding stemmed points. Overall, the quality of the manufacturing in specimens from this period is less sophisticated as more informal lithic technologies apparently came to predominate. There appears to have been a general move away from the use of basalts to cherts and petrified wood. Assemblages also contain bifaces, scrapers, burins, and drills. The appearance of hopper mortars and pestles indicates that people were incorporating new types of plant processing into their subsistence routine. An increase in numbers of net weights indicates additional emphasis on fishing. It is inferred that the use of plant-fiber technologies continues along with bone, shell, and woodworking technologies. Flexed inhumation with personal burial goods remains the preferred burial practice (Ames 2000; Bense 1972; Galm et al. 1981).

Archaeologists understand the Initial Pithouse period to have been multifaceted, containing transitional, intermediate, and locally unique manifestations of the optimal forager or collector adaptation. The first indication of a winter village residential pattern occurs during this period. A variety of intermediate forms and degrees of optimal foraging, population aggregation, delayed return, and logistical organization occurred locally and over time.

A hiatus of approximately 500 years occurred between 3000 and 2000 B.P., during which it appears pit houses were not built. Some archaeologists think that people at this time returned to an Archaic

lifeway, after which pit house use recurred and became a central aspect of the settlement regime (Ames 2000; Chatters 1995). This hiatus marks the break between Chatters' (1995) hypothesized "Pithouse I" and "Pithouse II" periods. Chatters described Pithouse I as the period from 5100 to 3000 B.P., characterized by dispersed pit houses but otherwise a continuation of a mobile forager adaptation. After the hiatus, ca. 2500 B.P., he defined the emergence of Pithouse II as entailing the use of single or small clusters of pit houses along major waterways paired with short-term occupation sites at hunting, fishing, or gathering locations—in other words, the onset of the delayed-return collector adaptation. After 2000 B.P., the size of these pit house villages increased.

The trajectory from the Initial Pithouse to the Winter Village subperiod (ca. 2000–500 B.P.) was not linear, and specific forms may have dropped out only to recur when environmental conditions again incentivized their use. Such intermediate forms are only identifiable at a subregional level. Existing syntheses of this time frame mark ca. 3500 B.P. as the general period when subsistence and settlement strategies moved toward logistical organization strategies (Prentiss et al. 2005:57; Solimano and Gilmour 2014). Synthesizing work done in The Dalles, Solimano and Gilmour (2014) presented a post-3500 B.P. chronology that shows increasing logistical organization and aggregated settlement. Prestige items became more common. Site specialization became pronounced based on an increased percentage of logistical sites. For example, 35WS5 contains a lithic workshop, and approximately three-quarters of the sites studied had functions unrelated to fish processing (Solimano and Gilmour 2014:139).

The Winter Village subperiod (2000–500 B.P.) is epitomized by a delayed-return, logistically organized collector strategy, as described by Ray (1936). The period was characterized by a semi-settled seasonal adaptation making use of aggregated pit houses in winter, intensive storage technologies, and specialized spring, summer, and fall resource-procurement locations to support relatively large populations. Winter villages along rivers with temporary camps at strategic locations characterized the settlement pattern. A demonstrable population increase occurred during this period, probably because the climate had reached stable (approximate to the mid-twentieth century) conditions. Subsistence focused on a seasonal round of available resources following a collector strategy focused on salmon (where available) and intensive camas (*Camassia* sp.) root gathering and processing in upriver areas (e.g., Albeni Falls region) where salmon runs were not present. Diagnostic artifacts and features include aggregated pit house villages, longhouses, and mat lodges, as well as the introduction of arrow points in various forms (i.e., small corner notched and side-notched points, "pin stem" points, and small lanceolate points), which may indicate regional specialization and diversification among specific local cultures. Resource intensification occurred throughout the region, in which the most prominent local resources were used most heavily. Artifacts reflect this regional diversity.

Assemblages from the Winter Village period also include net weights, end scrapers, a variety of ground stone (pestles, mortars, manos, and hopper mortars), cobble tools, weaving and wood technologies, cordage, stone and bone awls, fire starters, arrow foreshafts, pipes, and shamanic materials—such as loon bones, shell beads, nephrite, and dentalium pendants (Hayden 2000). Social organization also became a mix of achieved and ascribed status, including some taking of slaves (Cannon 1992). There appears to have been continued coastal interaction. People began to construct defensive earthworks after 800 B.P. in some regions (Goodale et al. 2004:40). Kent (1980) argued that there was endemic warfare in this period. Burial practices became more diverse, including flexed burials and burials associated with prominent landscape features, such as in dunes and beneath talus slopes; rock cairns and cist burials were also used (Galm et al. 1981).

Ethnographic/Protohistoric Period

The Ethnographic period (500–150 B.P.) is here divided into Protocontact (500–210 B.P.) and Contact (210–150 B.P.) periods. This is in recognition of the significant impact that European activities had in the region prior to actual person-to-person interaction. These Protocontact impacts included disease and trade goods (both of which could have been introduced well ahead of the earliest European trappers and traders) (e.g., Ames et al. 1999). The Winter Village settlement and subsistence pattern and its associated tool kit continued as the core adaptive pattern. However, this period saw the introduction of down-the-line trade items, including the introduction of the horse, iron, and glass. The settlement pattern was the same as the Winter Village pattern, with horse-grazing elements, including evidence of pasturage locations, added. The subsistence strategy included logistical organization along the collector pattern with a focus on salmon and delayed-return strategies, but with an increase in the prominence and social importance of raiding. Prentiss et al. (2005:98) noted a sharp decline in camas processing at this time, possibly as a result of a drier climate and an overall decreasing population. Due to the increasing wealth represented by horse herds and the increased opportunity for slave taking, social inequality also increased, which can be seen in practices associated with both achieved and ascribed status. Burial practices show continuity with the Winter Village period but also included mass cremation and inhumation, possibly related to epidemic disease (Galm et al. 1981).

The following paragraphs provide a summary of the ethnographic and ethnohistoric information available for the people occupying, traveling through, or seasonally frequenting the study area. Areas of traditional usage attributed to a particular group or groups were not utilized to the exclusion of other groups. Rather, "the common Plateau custom of multi-tribal use of fisheries, root grounds, and other rich and important natural resources tended to make Tribal lines less meaningful and more obscure" (Smith 1982:152). The repeated use of locations by multiple bands resulted in an overlapping of traditional use areas. In his discussion of territorial identification in the Columbia Basin, Ray (1936:117) observed:

> Almost all villages were located on waterways, resulting in boundaries being most definite at points where streams or rivers were crossed. The greater the distance from population centers, the more vague the lines of demarcation grew. Thus, far back in hunting territory or far out in desert root digging grounds, boundaries sometimes completely faded out.

The upper Yakima Valley is in the traditional territory of the Kittitas band of Sahaptin speakers, who occupied the areas drained by the upper Yakima River from Keechelus Lake and Snoqualmie Pass, downriver to Selah Creek and the northern edge of Yakama traditional territory.

Areas of traditional usage attributed to a particular group or groups were not utilized to the exclusion of other groups. Rather, "the common Plateau custom of multitribal use of fisheries, root grounds, and other rich and important natural resources tended to make tribal lines less meaningful and more obscure" (Smith 1982:152). The repeated use of locations by multiple bands resulted in an overlapping of traditional use areas. These neighboring populations also had extensive interactions regarding marriage and trade (Ray 1939:135). As a result of amicable relations with these neighbors, the Sinkayuse had access directly or through trade to additional resources as far as the Cascade Range or in the Okanogan Highlands. Among the Middle Columbia Salish, the Sinkayuse and the Wenatchi were the best-known traders, following long-used routes through what became Yakama territory to the major trading center at The Dalles and carrying goods in both directions (Teit 1928:121). The

interactions between these groups are evident in the shared languages. The Salish-speaking Wenatchi shared fishing locations with the Kittitas, and intermarriage between the groups was so common that, in the 1850s, a faction of Salish-speaking Wenatchi groups adopted the Sahaptin (or *Ichishkíin Sínwit*) dialect, then moved to the Yakama Reservation and became known as the Wenatshapan (Ray 1936:124; Schuster 1998). By the late 1800s and the establishment of reservations, bands of the Wenatchi and Sinkayuse became closely associated, band distinctions were misidentified, and ethnographers collectively identified both groups as the "Moses-Columbia" band (Miller 1998:253). This error was likely due to these two distinct groups sharing the same language (Interior Salish, or *nxa'amxcin*), which is separate from other Interior Salish dialects. However, in pre-reservation times, this designation applied to a single Columbia band based near Rock Island that was under direct influence of Chief Moses (Chalfant 1974:245).

Settlement and Subsistence

Winter village settlement areas centered on major rivers, tributaries, and confluences; a variety of environments served as temporary campsites at seasonal resource areas. Sheltered areas and plentiful firewood or driftwood resources were traits in selecting village locations (Wapato 1974–1975, in Hollenbeck and Carter 1986:115). The largest villages were centered on the Columbia River, with smaller villages and settlement areas in upland and upriver areas. Dwellings consisted of semisubterranean pit houses and mat lodges lined with planks, stone slabs, or mats. Trash was collected in baskets and emptied daily, far from the living area. Dwellings became more portable in the later years, especially after horse use became popular, and they were made of a rectangular pole frame with tule mat coverings (Gardner 1935:3; Hollenbeck and Carter 1986:116; Smith 1947:258).

Village locations of the Sinkayuse (i.e., Moses-Columbia or Middle Columbia) and Wenatchi along the Columbia River have been documented by several sources. Curtis (1911:66–67) noted that the *Skoáhchnuh*, living at Rock Island rapids, opposite the mouth of Moses Coulee (at least 11 km [7 miles] upriver from the current API), "were at one time the most important of the Columbia group, because of their chief *Sŭkŭtăhlkósuɱ*, who was practically head-chief of all the bands, as well as very influential among the Salishan tribes west of the Columbia."

Ray (1936:142–143; 1974:427–428) described the locations of Columbia and Wenatchi villages, many of which were in relatively close proximity to the API. Villages or known campsites along this stretch of the Columbia River included the following (from north to south):

- *kawa'xtɑn* ("living on the banks"), an "important" Columbia village along the left (northeast) bank of the river, at the mouth of Rock Island Creek (approximately 16.8 km [10.5 miles] north-northwest of the API). Ray (1936:143) stated that the last chief of this group was "Half Moon."
- *ßuwa'tɑan*, likely situated across the Columbia from the previous settlement, was a "village of semi-subterranean houses … occupied in winter only" with a population of around 200. "There are many pictographs and petroglyphs here" (Ray 1974:428).
- *tapi'skɪn*, a permanent Wenatchi village of around 50 people, located across the Columbia River from the mouth of Moses Coulee at the mouth of Colockum Creek (approximately 11 km [7 miles] northwest of the API) (Ray 1936:142).
- *nta'ßlauc*, a "populous winter village on the … lower end of Moses Coulee" (east side of the Columbia River). The population was decimated in 1847 by one of the measles epidemics (Ray 1974:427).

- *tapi'sqɬn* was a winter village "of about fifty persons" at the mouth of Tarpiscan Creek, on the west side of the Columbia. This location is approximately 6.84 km (4.25 miles) west-northwest of the API (Ray 1936:142).

In the late 1950s, the Ephrata historian Nat Washington, Jr., interviewed and took trips to various portions of "Big Bend Country" with Billy Curlew, "an old-time Sinkiuse Indian" (Sinkaiuse or Columbia) living on the Colville Reservation. According to Curlew, "the Sinkiuse had smaller winter camps on almost every flat river bar on both sides of the river from Wenatchee south to Beverly" (Washington 1956, cited in Anglin 1995:29). Miller (1998:254) mapped several of these settlements, including *tapi'sqɬn* (mentioned above) and *nxəl'kúxl'ku* ("cove in the hills"), located along Babcock Bench above the east bank of the Columbia River, approximately 8 km (5 miles) south of the API.

The uneven distribution of resources in the Middle Columbia Plateau produced a seasonal land use pattern during the Historic period (Schuster 1998:331). Although the Columbia River along the margin of the plateau contained the most important resources, including salmon and other riverine resources, residential locations along the river represented only a portion of the settlement patterns reflected in the archaeological record. Tule mat house residential villages along the floodplains and terraces of the river, usually situated at the base of the ridges and bluffs, afforded shelter from the high winds and provided ready access to various riverine resources. The rectangular, flat-roofed summer houses were up to 2.7 m (9.0 feet) wide with an open front facing the river and exterior hearths. In addition to sleeping areas, the upwind portion of each house held drying racks for fish (Miller 1998:258–259). Winter villages were located at places where root, berry, and meat resources had been stockpiled during the year as well as areas of firewood, water, and shelter from snow and wind. While semisubterranean pit houses were common in precontact times, the historic Middle Columbia Salishan winter villages contained communal longhouses. The open-peaked frames were 4.9 m (16.0 feet) wide by up to 18.3 m (60.0 feet) long, with an entrance at one of the rounded ends, central hearths or fire pits, and capacity for up to eight families. Side poles lashed parallel to the ground held mats to the upper frame and grass covered with soil against the lower frame; in later years, canvas supplemented or replaced tule mats. Other structures traditionally used by the Middle Columbia Salishans included sweat lodges, menstrual huts, and vision quest sites (Miller 1998:255–259; Teit 1928:114).

The best detailed source of traditional subsistence practices for the Middle Columbia Salishans is the information gathered from the Sanpoil and Nespelem (Ray 1933). As spring began, families and bands moved into camps near the winter houses for fresh air and less crowded surroundings. Men would gather shellfish and hunt rabbits, marmots, other small game, and fowl, while women gathered early roots and prickly pear cactus. Winter houses were dismantled, and some items were cached for the following winter (Ray 1933:27). Ray (1974:429–435) presented names and discussions of villages or settlements connected with plant gathering, fishing, and summer hunting across the plateau.

Throughout the growing and harvesting season, First Food rites were held before harvesting each plant or animal species. As the large winter villages moved to a series of camps of smaller bands of four or five families, ceremonies were small and held by each band's chief or an elder. Bitterroot and several varieties of camas were among the most important plant foods and were the main sources of starch in the plateau culture diet. These plant foods are still honored today during the First Foods ceremonies. The extensive, treeless areas south of the Columbia River were the gathering grounds, from late March to early May, for the Sinkayuse, the Sanpoil, and likely other Middle Columbia Tribes. Camas in this area grew in smaller fields than in other parts of the plateau, but they were numerous

across the basin. Optimum bitterroot gathering conditions occur in May, when the distinctive basal leaves are out, but the flowers are not in bloom on their lithosol ridge locations. At this time, the roots contain the highest quantity of starch, and the bitter taste is less pronounced. This coincides with the time when the bark easily peels away from the root (DeSanto 1993:3). After the root was dug and peeled, it was dried in the sun. The roots were then stored until needed for stews, or were steamed and eaten alone, and sometimes sweetened with berries or camas (DeSanto 1993:8). Roots were also pounded into small cakes after boiling or roasting and sometimes mixed with salmon (Schuster 1998:333). Other identifiable roots, including wild onions, wild carrots, and common sunflowers, were also gathered by the women of the group and dried for winter use; damaged roots were cooked and eaten upon harvesting (Miller 1998:255; Ray 1933:27, 97–101).

Following root harvesting and movement of the dried food to caches near winter villages, intensive fishing began at camps strategically located on the river. Sturgeon and small fish were caught starting in early May, followed by runs of salmon and trout. In the Columbia River, Chinook salmon were available from May through July. There were spring and fall runs of coho, pink, and chum salmon from May through November, sockeye were caught in the Wenatchee or Okanogan Rivers, and steelhead trout ran from March to July. The salmon season was also acknowledged with a first salmon ceremony. While the main salmon season was over at the end of August, some families continued to fish the smaller runs into the fall. Other fish caught along the rivers included eels and suckers. Fishing technologies included the fish weir, funnel trap, basket trap, spear, dip net, seine, and gill net. The largest fish traps of the Middle Columbia Salishans were at the mouths of the Sanpoil and Spokane Rivers and at Kettle Falls, where people from many other Tribes gathered. Fishing scaffolds and platforms were frequently used to place the fishers directly over the migrating salmon. While the men fished, women gathered mollusks and filleted and dried the salmon in the sun. The families that fished into the fall constructed conical mat huts to both live in and dry their fish (Miller 1998:255–257; Ray 1933:28, 57–96; Teit 1928:114).

In late August or early September, smaller family groups moved to higher elevations, where men hunted bighorn sheep, mountain goats, and elk, and women gathered various nuts, seeds, roots, and berries. Those without access to the mountains hunted antelope in the areas around Grand Coulee, perhaps as communal drives, or small mammals north of the Columbia. Short-term field camps were established at strategic locations; these can be observed archaeologically by the presence of hearth features, earth ovens, metates or milling stones, and formed tools and lithic debris associated with tool maintenance and manufacture. Chert and petrified wood quarrying activities were probably an embedded aspect of the hunting and gathering trips and can be observed archaeologically by the presence of cores, broken tools, debitage, and other tool production artifacts at these sites. Brief trips back to the riverine villages were periodically required for caching the collected roots and other foods. These trips, which likely involved the transport of several hundred pounds of plant or animal resources, were made easier after the adoption of the horse (Benson et al. 1989:3–5; Miller 1998:255–257; Ray 1933:28, 57–96; Teit 1928:114).

Camas, a dietary staple, was plentiful in the area, leading to the establishment of numerous summer villages and trade gatherings. Additionally, the area was said to support large numbers of horses and large game (Ray 1975:212). Chief Moses and his people harvested duck and goose eggs at both Moses Lake and Kartar Lakes (Teit 1928:118, in Shannon 2007).

Teit (1928:128) noted that "the religious ideas of the Columbia appear to have been similar to those of other interior Salish tribes." He did, however, describe some of the burial practices of the Columbia,

including burials in earthen graves and in rockslides. Earthen burials were reported in "knolls, low mounds, edges of sandy terraces" or any location where it was easy to dig. Rockslide burial involved piling rocks on top of the burial pits (Teit 1928:127).

Population

The first introduction of Euroamericans to Columbia Plateau groups probably came in the form of trade goods or disease, dispersed through groups in the surrounding regions, perhaps from interactions with groups in the Puget Sound or Plains areas. Walker and Sprague (1998:138) contended that the most dramatic influences in the Ethnographic era were the epidemic diseases that ravaged Native populations in the Columbia Plateau region. Euroamerican diseases included smallpox, yellow fever, measles, influenza, typhus, bubonic plague, typhoid fever, cholera, and others (Creighton 2001:6.3). The epidemics decimated populations prior to the arrival of the Lewis and Clark Expedition and other ethnographic sources. Dates for the introduction of epidemics have been speculative. Boyd (1985:78) stated that the first epidemic in the Columbia Plateau occurred approximately in the 1770s, which could be linked to the pandemic smallpox outbreak in the Plains, and throughout western North America, around the same time (Creighton 2001:6.1–6.2). Teit (1928:97), however, stated that the first smallpox epidemic did not occur until 1801. The first signs of Euroamerican diseases in the Columbia Plateau could have started with fur trade explorations via ships that visited to the northern Pacific coast, rather than the epidemic that swept the Plains populations in the 1780s (Boyd 1985:81–90; Gibbs 1855:408). Epidemics continued to sweep through plateau groups throughout the 1800s, particularly "successive waves of smallpox and measles" in the first half of the century. Native groups on the plateau were quickly infected with diseases due to close intergroup relationships and interactions (Mooney 1928:14; Teit 1928:97; Walker and Sprague 1998:138).

Population counts of Ethnographic period groups are estimates at best. Early epidemics, such as the 1801 smallpox epidemic, may have eradicated entire groups of people and are estimated to have generally cut population counts in half (Boyd 1985; Walker and Sprague 1998:138). Creighton (2001:6.3) stated it succinctly:

> Because of the scourge of disease prior to contact it is difficult to establish solid demographic population data for the Columbia group, or any other group for that matter. ... Disease, fluctuating village/camp disbursement, and infiltration of other groups make this process speculative at best.

Estimates of populations for the Columbia group, prior to the outbreak of epidemics, range from 10,000 to as low as 2,200 (Creighton 2001:6.2; Mooney 1928; Teit 1928:98). Opting for a more moderate number, Smith (1982:67) chose a figure of 4,000 individuals, which "would be a reasonable round figure for the aboriginal Columbia population." Boyd (1985:334) indicated that mortality rates in the Columbia River area were approximately 45% between 1775 and 1802 "from smallpox alone." Again, this is all speculation based on assumptions and extrapolations of numbers of populations during census counts, etc. Hollenbeck and Carter (1986) brought an interesting point to mind: population counts were different depending on the time of year, as task groups would have been out procuring resources at certain times of the year; at other times, they would have been present in the villages, thus making the population count higher. Additionally, census takers typically only spoke with one or two representatives for the groups, rather than relying on personal observations (Hollenbeck and Carter 1986:114).

Epidemic disease spread rapidly in Plains groups, facilitated by use of the horse. Plateau groups most likely caught the diseases while hunting with Plains groups, and the spread of disease could have been replicated in the plateau region via use of the horse. The horse was introduced to the plateau area sometime after 1730, possibly through interactions with Snake and Shoshone groups to the east and south (Creighton 2001:6.2, 6.18; Haines 1938). Use of the horse allowed long-range hunting, expanded trade areas and seasonal round resource areas, and for heavier loads to be carried (Campbell 1989:19; Chalfant 1974:54–55; Teit 1928:118–119; Walker and Sprague 1998:139). The horse soon became a staple of life for Columbia Plateau groups; in fact, the Moses-Columbia group was known at one point as great horse people, and Chief Moses's father was reported to have owned between 500 and 1,000 horses. Horse thievery was also common among Columbia Plateau groups, which is not surprising given the cultural value ascribed to these animals (Creighton 2001:6.18; Teit 1928:120).

Trade

According to the ethnographic evidence provided by Teit, the Columbia were prolific traders. Large numbers of people traveled annually along the west side of the Columbia River and through Yakima County to The Dalles to conduct trade with the Wasco and Wishram. Items traded at The Dalles included "skins, fur, fish, oil, roots, pemmican, feathers, robes, clothing, shells, slaves, and horses" (Teit 1928:121). The Columbia also reportedly traded with groups to the east and first acquired horses from the Cayuse–Walla Walla and Spokane. Pacific coast goods, such as shells and shell and bone beads, were exchanged between the Columbia Plateau groups (Teit 1928:122).

The use of the horse expanded the seasonal round opportunities for Columbia Plateau groups. Hunters were able to go farther afield, even to the Plains area, to hunt bison, and the ability to transport heavier loads was also beneficial (Walker and Sprague 1998:139). During ethnographic times, Columbia Plateau groups continued the traditional seasonal round that developed in the previous millennia. The yearly cycle centered on the Columbia River, though upland locations were also well used. Native groups gathered and processed root foods, such as camas *(quamash)*, bitterroot *(piahe)*, and "skolkul" (*Lomatium* sp.), starting in the first vestiges of spring. The *Sinkaiuse* gathered *Lomatium canbyi*—referred to as *tsuka-lo-tsa*—in the hills to the north of the city of Quincy, northwest of the project area (Anglin 1995:30). Harvesting plants was a time for social gathering, sharing resources, and ceremonies (Hunn 1981, 1990). Plants were harvested for medicinal purposes as well as for general consumption. Creighton (2001:6.16–6.17) provided an extensive list of natural medicine plants and their uses, such as grand fir for colds and fevers and false yarrow *(Chaenactis douglasii)* for burns, wounds, rashes, and spider bites.

The Contact period (210–150 B.P.) is represented in the ethnographic record and marks a transition from Native and traditional lifeways to the adoption of agriculture, ranching, and consumer culture. A period of warfare from 1855 to 1858 marked the end of traditional settlement and subsistence patterns and was followed by population movement to reservations. Diagnostic artifacts of this period include projectile points made of glass and other hybrid technologies.

Establishment of Reservations

The U.S. government exerted pressure in the mid-1850s as Territorial Governor Isaac Stevens was ordered to conduct treaty negotiations with Native American Tribes and to place them onto reservations to free up land for settlers heading west. Through these treaties, Native Americans ceded territory to the U.S. government in exchange for reservations, where residents were expected to adopt Christianity and sedentary agricultural lifestyles. They also received promises of funding and education

to help reservation residents develop that agricultural lifestyle (Beckham 1998; Harrison 2021; Meinig 1995; White 1991).

In May of 1855, the Walla Walla Council was held, and Native Americans from several areas on the Interior Plateau convened. On June 9, the Yakama Treaty was signed, ceding almost 11 million acres and establishing the Confederated Tribes and Bands of the Yakama Nation (Schuster 1998:343). The project API is situated within these ceded lands. Fourteen independent "Tribes and Bands," who spoke three languages and had occupied this territory, were relocated to the Yakama Reservation, which consisted of 1,200,000 acres of the ceded lands. Tensions ran high between the indigenous populations and the Euroamerican settlers, and war erupted in the late 1850s (Kennedy and Bouchard 1998:251).

Representatives of the groups that would come to be known as the Confederated Tribes of the Colville Reservation (also known as the CCT) attended Governor Stevens's treaty negotiations in 1855 but did not sign a treaty. The original Colville Indian Reservation, created by an executive order of President Ulysses S. Grant on April 19, 1872, covered an area of 2.8 million acres east of the Columbia River. Within three months of the first executive order, President Grant moved the Colville Indian Reservation to a smaller territory along the west bank of the Columbia River. Further reductions to the reservation occurred in the 1890s, when the northern half was removed by the U.S. Congress. The resulting 1.4-million-acre southern half represents the current Colville Indian Reservation, on which 12 Tribes and Bands ultimately have been placed, including the Wenatchi, Nespelem, Moses-Columbia (Sinkayuse), Methow, Colville, Okanogan, Palus, Sanpoil, Entiat, Chelan, and Lakes Tribes. In 1885, approximately 150 Sahaptin-speaking Nez Percé, under Chief Joseph, arrived in Colville after eight years of exile in Oklahoma Territory. These same 12 Tribes still constitute the CCT today (Miller 1998:255).

In 1879, the "Columbia Reservation" was established for the Columbia Salish that covered a large portion of north-central Washington State (Chalfant 1974:244–245). A few years later, Congress restored the reservation to the public domain due to the potential mineral wealth of the area, in exchange for square-mile allotments to heads of families. Chief Moses and the Middle Columbians were removed to the Colville Reservation (Miller 1998:267).

Euroamerican/Postcontact/Historic Period

Explorers, Traders, and Missionaries

U.S. government explorers and trappers are the two primary groups responsible for Euroamerican advances into the plateau region. In 1803, President Thomas Jefferson directed Captains Meriwether Lewis and William Clark to lead a "corps of volunteers for North Western Discovery" up the Missouri River, where he hoped they would find a water route to the Pacific Ocean. The Corps of Discovery reached the Columbia River and passed near the project area on both its westbound and return trips. Although trade goods, guns, and disease infiltrated the region prior to their arrival, the Lewis and Clark Expedition was the first documented encounter between Euroamericans and the landscape and peoples along the interior Columbia River Basin. During their travels from 1804 to 1806, they observed and reported on the Native inhabitants and the environmental conditions of the region, which contributed greatly to the nation's interest in and knowledge of the Pacific Northwest. While the expedition camped at the confluence of the Columbia and Snake Rivers, approximately 50 km (31 miles) south-southeast of the project area, Clark wrote that the "natives showed me the entrance

of a large Westerly fork which they Called Tapetet…" (Tapteal or today's Yakima River) (Moulton 1988:287). Clark described the landscape as covered with "the whins," or sagebrush, and there was "no wood to be seen in any direction" (Kubik 1994; Moulton 1988:286).

Less than a decade after the Lewis and Clark Expedition made the return trip east, other exploration parties traversed the region, many seeking furs for trade. Representing the North West Company and attempting to strengthen British claims to the area already being infiltrated by Americans representing John Jacob Astor's Pacific Fur Company, David Thompson was the first Euroamerican to explore the upper Columbia River in what would become Washington State (Fuller 1931:78–80, 83). In 1811, Thompson passed the mouth of the Yakima River while exploring the mid-Columbia River and seeking fur trade with local Tribes (Kubik 1994:4). During this period, reportedly over "200 Indians lived … near [the mouth of the Yakima River] in a village called Chemna" (Parker 1986:26). The early explorers and traders recorded numerous observations of the Chemna Indian village, located just upstream from the confluence of the Yakima and Columbia Rivers.

Although these were the first Euroamericans to directly encounter the peoples of the project vicinity, the influence of non-Native traders and trappers was felt much earlier. The disease epidemics introduced by European explorers, to which indigenous people had no resistance, had dire consequences. Campbell's (1989) work suggested that estimated populations in the Pacific Northwest declined abruptly as early as the A.D. 1500s, a hypothesized result of the first North American smallpox epidemic in A.D. 1520 (Campbell 1989:186). Although populations appear to have recuperated in the intervening period, conservative estimates suggest that the total middle Columbia population was significantly reduced again because of the local area's first recorded smallpox epidemic in 1780 (Hunn 1990:241; Schuster 1998:343). Year after year, Europeans traveling through the Columbia River valley carried new diseases, including measles, "intermittent fever," "virus influenza," "ague," and "pestilence" (Schuster 1982:21). These devastating epidemics had a profound impact on the plateau societies, wiping out many of the elders who were more susceptible to disease and subsequently severing the flow of wisdom and traditional cultural practices. Shifts in both population distribution (including massive migrations) and the focus of subsistence activities likely also occurred to varying extents in the regions affected by these epidemics (Campbell 1989:187–188).

After traders, the next permanent, non-Indian settlement was not attempted on the mid-Columbia until 1847. A small group of Roman Catholic missionaries from France, by way of Fort Walla Walla, established the Mission Saint Rose, or Ste. Rose of Chemna, on the north side of the mouth of the Yakima River at Columbia Point (approximately 121 km [75 miles] south-southeast of the API), near the Native village of Chemna (Greger 1993). Nelson (1928) describeds the location of the mission as situated one league above the junction of the Columbia and Yakima Rivers. However, the interaction between the newcomers and local Native Americans ultimately led to increased tensions (Walker and Sprague 1998). As mentioned above, the United States negotiated treaties with many of the Native peoples of Oregon and Washington as the non-Native population grew, resulting in the Tribal cession of vast territory in eastern Washington, including the mid-Columbia River Basin, which was opened to non-Native settlement. Later in the 1850s, because of dissatisfaction with the treaty's implementation, Native groups throughout the plateau region fought against American volunteer and regular army forces (Beckham 1998).

Early Settlers and Communities

By the 1850s, the U.S. government had established a new system of transfer and ownership of land by survey, mapping, payment, and government title. In 1850, Congress passed the Donation Land Law (also known as the Oregon Donation Act) as further incentive for occupying the Oregon Territory. Under the new law, each settler could claim a 320-acre tract (married couples could claim 640 acres) of land not yet legally acquired by the U.S. government (Beckham 1998; Karson 2006; Meinig 1995; Rochester 1998; White 1991). American settlers north of the Columbia River petitioned for a separate territory in November 1852. Despite the low American population density north of the river, Congress created the Washington Territory in March 1853.

Vast portions of the newly formed Washington Territory were designated "public land" under Federal ownership. Gaining title to public land was accomplished through a variety of methods, including squatting, cash sales, railroad land grants, and claims made under the various homesteading acts. The original 1862 Homestead Act allowed U.S. citizens, or those who were intending to become citizens, who were either a head of a family or single and over 21 years old to claim 160 acres of public land available for entry for a modest filing fee. By carrying out certain "improvements" and living on the land for at least five years, a claimant that was judged by the General Land Office (GLO) to have "proved up" gained title to the property after payment of a final "proof" fee. Through the Homestead Act and its many variants, some 270 million acres across 30 states passed from public to private hands by the end of the twentieth century (Bruce 2001; Church and Clark 2007). Through its effect on demographic and settlement patterns alone, homesteading proved one of the most influential Federal land policies passed in the nineteenth century.

The Federal land programs provided incentive for the development and growth of early communities along the mid-Columbia. Yet their success was largely tied to improvements in river transportation systems. Due to the primitive condition of most roads east of the Cascades, ferries, and later steamboats, provided the most reliable transportation links between local communities on the mid-Columbia (Harvey 1989). Steamboat transportation reached The Dalles by 1853, and steamboat service was established above The Dalles by 1860. The steamboat improved the regional economy by providing more reliable service for developing commercial enterprises and a faster vehicle for the exportation of commodities (Fuller 1947:313).

Early homesteaders on the mid-Columbia were mainly cattle and sheep ranchers. With the Civil War's end, stockmen populated the region and brought large numbers of cattle and horses to the Yakima and Columbia River valleys. Cattle and sheep ranching remained the dominant occupations in eastern Washington until the introduction of sophisticated and widespread irrigation systems. Ben Snipes, who reportedly visited the mouth of the Yakima River during the mid-1850s, operated one of the first and largest cattle holdings in eastern Washington. Early ranchers had to endure the valley's severe, arid environmental conditions, low prices for their stock, difficulties transporting their cattle to distant markets, and opposition from local Tribes (Gilpin et al. 2008).

While cattle ranching remained viable on the mid-Columbia well into the twentieth century, the treacherous winter of 1880–1881 dealt a sharp blow to the cattle industry in eastern Washington. Prolonged blizzards, freezing temperatures, and lack of feed caused the loss of upward of 80% of the cattle herd. This calamity forced many cattlemen to switch to farming and establish irrigation systems to grow alfalfa and rye. Early farmers on the mid-Columbia and lower Yakima Rivers grew alfalfa and

rye grasses and experimented with vegetables and fruit trees. Early irrigation systems were primarily small family ventures (Gilpin et al. 2008).

Ranching and stock raising remained the most viable occupations and way of life in the mid-Columbia and lower Yakima River valleys until the arrival of a transcontinental railroad at the confluence of the Snake and Columbia Rivers in 1883 (Fuller 1947:320). Railroad spur lines provided access to markets by connecting the region's communities to the transcontinental railroad. Likewise, the railroads made substantial profits by transporting farmers and other settlers to the mid-Columbia, selling them land, and shipping their crops and other produce to distant markets. There were lavish promotions that celebrated the region's bounty to attract farmers and settlers with the promise of large amounts of irrigation water. Railroads like Northern Pacific and the Great Northern had their own real estate and irrigation companies to promote settlement and agricultural development. These railroads had to promote settlement throughout the area, while simultaneously building the actual lines, to provide enough traffic to make the railroads successful. Yet the conditions that many of the new settlers encountered proved far more difficult than anticipated. The region's farmers, much like the ranchers who worked the lands before them, faced frequent challenges presented by the arid landscape. Dust storms, floods, grass fires, and weeds all threatened crops, while early irrigation ditches had difficulty holding water (Gerber 1992:18–21).

Transportation

Another primary beneficiary of public land distribution in Washington was the Northern Pacific Railway Company. The Northern Pacific obtained a massive block of land in the area from the Federal government under the terms of the 1864 Northern Pacific Railroad Act (GLO 2023). The railroad acts provided Federal funding for the construction of transcontinental railroads, primarily through land grants of every other section within a 64-km (40-mile) corridor on either side of the planned path of the railroad.

When the act was passed, much of the western lands proposed for the transcontinental railways were still territories and the routes had yet to be surveyed, but the railway companies could count on the large land allotments for future financing. Topography, opposition by Native American Tribes, and financial difficulties slowed progress, but the Northern Pacific finally completed its rail connection between east and west in 1883. An 1881 map showed a proposed route through central Washington that crossed the Columbia River at its confluence with the Wenatchee River, but ultimately the company decided on a more southerly path through Ainsworth near present-day Pasco, along the south bank of the Colombia to connect with the Oregon Railroad and Navigation Company line that ran to Portland (Rand McNally and Company 1881). While the Northern Pacific weighed potential branch line routes to north-central Washington, other competitors, including the Seattle, Lake Shore, and Eastern Railway Company and the Great Northern Railway Company, pressed forward with lines west from Spokane toward Wenatchee in the late 1880s and early 1890s (Meinig 1995:372–374).

Talk of the impending rail connections spurred boosterism and land speculation in central Washington. The small town of Wenatchee relocated to meet the railway's proposed path, and, anticipating an economic and population boom, incorporated in 1891. Development companies platted the city and surrounding area and sold lots. Ultimately, the Great Northern rather than the Northern Pacific succeeded in completing a rail line through Wenatchee in 1892, but the Northern Pacific still managed to acquire 396,245 acres along a potential rail route that followed the Columbia River north toward the Okanogan in November 1895, through its original 1864 charter (GLO 2023).

Although the Wenatchee Valley and surrounding areas were sparsely populated at the turn of the century, the region possessed relatively good transportation access by virtue of its connections to railroads, the Columbia River, and two of the better wagon roads in north central Washington. Rapids at various points on the Columbia had defeated most attempts to use the river as a long-distance transportation waterway, but various types of river craft provided travel for shorter distances and ferry crossings. Many of the early ferries on the Columbia were operated by Native Americans (Ruby and Brown 1974:11). Later Euroamericans began with rowboats, and as demand for ferry service increased, moved to larger boats with wide oars, wood-plank sweeps, and sails. Some operators used treadmills and horses to power their boats, or overhead cables to help control the path. Steam-powered boats began to appear on the river in the 1850s and dominated the ferry business until 1900, when gasoline-powered engines became more popular. None of these technological developments eliminated each other, and some ferrymen continued to utilize current, sails, or steam. Ferries continued to operate on the Columbia into the 1950s (Ruby and Brown 1974:11–18).

In 1893, the Great Northern Railway Company completed its line between Spokane and Wenatchee, passing through Ephrata, Quincy, and Trinidad (passing within 1.3 km [0.8 miles] north-northwest of the API), now operated by the present-day Burlington Northern Santa Fe Railroad. The Great Northern also constructed the first bridge over the Columbia near Rock Island, ending the monopoly of watercraft on crossings. Fifteen years later, the Great Northern also helped fund the first vehicular and pedestrian bridge to span the Columbia at Wenatchee. Roads and bridges suddenly took on new importance as the popularity of the automobiles swept across the nation in the early twentieth century. Washington's Good Roads Association was particularly effective in lobbying for legislation to improve and hard-surface the State's roads. The cause also benefited from Federal commitment between 1916 and 1921 to fund farm-to-market and rural post roads (Dorpat and McCoy 1998:81).

Early Irrigation and Agriculture

As historians Dorpat and McCoy noted, the arrival of the railroad and irrigation projects often went hand in hand. Such was the case in the Wenatchee Valley and surrounding areas, where railroad money supported the enlargement of existing irrigation ditches and canals, and investors capitalizing on rising land prices funded construction of the Highland Canal in 1903. The Great Northern helped finance construction of the first bridge—a bridge as important for the irrigation pipeline as the traffic it carried—across the Columbia 10 years earlier, hoping to benefit from increased agricultural production in the area. Ready sources of irrigation and rail access in turn attracted more settlers to the area to purchase railway company land (Dorpat and McCoy 1998:227).

Large-scale irrigation systems were expensive, were not always easy to construct and maintain, and were often the victim of flooding and soil mineralization. With pressure mounting on the Federal government to invest in large-scale irrigation projects, Congress passed the Reclamation Act in 1902. This legislation established the U.S. Reclamation Service (later named the Bureau of Reclamation) and committed the government to build and maintain large-scale networks of irrigation features for the arid lands of the western states. The Reclamation Act also established a "reclamation fund" to finance the construction of the necessary dams and canals, which would be paid for by the sale of public lands (BOR 2018; Fuller 1947:326; Gerber 1992:19; NPS 2015). Despite the challenges of farming the arid plateau region, irrigation and rail infrastructure developed during the early twentieth century led to population growth. The onset of World War I enabled the region's economy to expand. Farmers received high prices for their agricultural produce, which was desperately needed in war-torn Europe.

Land speculators, farmers, and ranchers took advantage of a revived irrigation land boom as development of a large network of irrigation canals brought water to the fields.

Around 1920, farming conditions in the region began to suffer from drought and devastating frosts. The ravages of weather were compounded by market decline. Despite regional crop scarcity, the prices of agricultural commodities fell drastically after World War I in response to increased production in other parts of the United States and the world. Though the war had slowed food production in Europe, inflated wartime prices led farmers in the United States to produce more commodities than a postwar world could consume. The price of agricultural products plummeted, as did farm income and land values (Schwantes 1996:364).

Environmental realities also became apparent. By the early 1920s, the era of infinite land and railroad expansion was over in the west. Large tracts of semiarid, marginal lands in central and eastern Washington had been abused by poor agricultural practices, with more farmsteads than the land could support (Meinig 1995). The "wet years" that dominated the arid west during the first two decades of the twentieth century were followed by years of dry climatic conditions (PNNL 2003). Environmental degradation and depressed post–World War I prices for agricultural produce led to two decades of economic hardship and foreclosures throughout the mid-Columbia (Lindeman and Williams 1985). Empty land contributed to severe dust storms, which exacerbated an already difficult situation (Gerber 1992:22). Although many rural families were able to supplement their livelihoods with barter methods and non-farm employment, the mid-Columbia economy continued to decline throughout the 1930s (PNNL 2003).

LITERATURE REVIEW

Prior to fieldwork, Tierra staff reviewed the Washington State Department of Archaeology and Historic Preservation's (DAHP) Washington Information System for Architectural and Archaeological Records Data (WISAARD) for archaeological site records and cultural resources survey reports located within a 0.8-km (0.5-mile) buffer surrounding the API. Tierra also examined online resources, such as the Bureau of Land Management's GLO survey records database, HistoryLink, Historic Map Works, Washington State University's Early Washington Maps Collection, and Spokane Public Library's Northwest Digital Collections.

Previous Cultural Resource Investigations

Within the study area (i.e., within 0.8 km [0.5 miles] of the 24.9-km [15.5-mile] segment of I-90), an online records search of WISAARD documented 58 previous cultural resources investigations (Table 2) and 63 previously recorded archaeological sites and isolated occurrences (Table 3). Most of the archaeological research completed in the study area has been associated with development-oriented projects, 23 of which resulted in the identification of archaeological resources within the study area. Two of these resources (45KT1376 and 45KT2146) are located in very close proximity to I-90, either overlapping with or within 15 m (50 feet) of the highway segment.

Site 45KT1376 lies approximately 15 m (50 feet) north of I-90 and was originally recorded as an isolated biface fragment on a terrace above the Yakima River during surveys for the proposed Mountainstar-Suncadia Master Planned Resort development. However, subsurface investigations in the vicinity of the original find recovered a uniface, a battered cobble (pestle), and a sparse scatter of lithic debitage from 20–40 cmbs (Griffin and Churchill 1998b).

Table 2. Previous Cultural Resources Studies within the Study Area

NADB No.	Reference	Title	Cultural Resources Identified within the Study Area
1334666	Regan and Emerson 1995	*Cultural Resources Surveys for Fish Acclimation Ponds Along the North Fork Teanaway River and Near Easton*	45KT1087, 45KT1088, and 45KT1089
1340270	Fagan 1999	*Cultural Resources Survey of Level 3's Proposed Fiber Optic Line from Seattle to Boise: Washington Segment, Non Federal Lands*	45KT1020
1340871	Schablitsky et al. 1999	*Cultural Resources Survey of Route Modifications and Shovel Testing of Sites for Level 3's Proposed Fiber Optic Line from Seattle to Boise: Washington Segment, Non-Federal Lands ADDENDUM*	45KT1719
1341891	Wilt and Roulette 2001a	*Results of a Cultural Resources Survey of the Bonneville Power Administration's Yakima River Side Channel Project Area*	none
1341896	Wilt and Roulette 2001b	*Letter to Yvonne Boss Regarding Cultural Resources Study of the Lamphere Properties*	none
1341897	Hamilton et al. 2001	*Results of a Cultural Resources Survey of the Bonneville Power Administration's Scatter Creek Project Area*	none
1341898	Wilt 2001	*Letter to Yvonne Boss Regarding Results of a Cultural Resource Survey of the Dalle Property*	none
1341906	Chapman and Fagan 2000	*Evaluation of Six Bridges in Kittitas County Between Easton and Cle Elum for the Proposed Level 3 Fiber Optic Project*	none
1341963	Miller 1998	*1998 Cultural Resource Surveys of Plum Creek Timber Company, L.P.'s Proposed Timber Harvests, Kittitas County, Washington*	none
1341967	Churchill and Griffin 1999a	*Completion of the Cultural Resource Survey of Trendwest Resort's Inc.'s Proposed Mountainstar Resort Project Area and the Subsurface Probing of a Proposed Culvert Area Along Domerie Flats Road*	45KT1376, 45KT1484
1341969	Churchill and Griffin 1999b	*Cultural Resource Investigations of the Proposed Mountainstar Resort/City of Cle Elum Water Treatment Facility Project Areas*	45KT2146
1341980	Griffin and Churchill 1998a	*Cultural Resource Survey of the Slash Pile Burn Area in T20N-R15E-S28 & 29, Kittitas County, Washington*	45KT1361
1341990	Griffin and Churchill 1998b	*A Land-Use History of the Proposed Mountainstar Resort: The Results of a Cultural Resource Survey Along the Lower Cle Elum River, Vol. 1*	45KT1376, 45KT1484
1341994	Holstine 1997	*A Cultural Resource Survey of Washington State Department of Transportation's SR 90: Cle Elum Weigh Station Expansion Project*	none
1341999	Miller 1997	*1997 Cultural Resource Surveys of Plum Creek Timber Company, L.P.'s Proposed Timber Harvests*	none

NADB No.	Reference	Title	Cultural Resources Identified within the Study Area
1342146	Powell 2003	*Yakima River South Bank in the Vicinity of Proposed Rock Drop Construction Associated with Yakama Nation Hanson Ponds Fisheries Habitat Restoration Project and City of Cle Elum Replacement Outfall Project*	none
1342649	Stilson 2003	*Turtle Pole Timber Sale Agreement #30-055760 Cultural Resource Survey*	none
1346248	Beidl 2005	*Cle Elum Pilot Disposal Project: Heritage Resource Consultation Report*	Cle Elum Ranger Station ranger's residence and garage
1348734	Robinson 1996	*Letter to Gary Beeman RE: SR 90: Cle Elum Weigh Station- EB & WB*	none
1350166	Lentz 2002	*Inventory of Historic Resources in the Historic Downtown Core Cle Elum*	none
1350919	Ferguson et al. 2008	*Cultural Resources Survey of the Oakes Avenue Improvement Project, Cle Elum*	Hilstad House 1, RR2007-28; Hilstad House 2, RR2007-29; Steiner House, RR2007-30; BNSF Railroad, RR2007-34
1351542	Root and Ferguson 2008	*Cultural Resources Survey of the Progress Pathway Project, Cle Elum*	none
1352549	Lally et al. 2009	*Kittitas County Fire and Rescue, Fire Distirct 7 Stations Project, Cle Elum and Ronald, WA*	none
1352684	Landreau 2009a	*A Section 106 Archaeological Review and Inventory of a Proposed Water Line Replacement for the Sun Country Development, Cle Elum*	none
1353945	Komen and Ives 2010	*Cultural Resources Survey for the Proposed Washington State Horse Park*	none
1354288	Landreau 2009	*Archaeological Review and Inventory of the City Heights Development Project, Cle Elum, Kittitas County, Washington*	No. 5 Slag
1354408	Luttrell et al. 2003	*Cultural Resources Investigation for the Washington State Department of Transportation's I-90: Snoqualmie Pass East Project, Kittitas County, Washington, Volume 1 & 2*	none
1354973	Emerson 2010	*Cultural Resources Survey for King Horn Slough Boat Access Improvement Project*	none
1680765	Landreau and Schroeder 2013	*Archaeological Review and Inventory of the Railroad Street Extension Project, Cle Elum, Kittitas County, Washington*	none
1682024	Kelley 2012	*Cultural Resources Monitoring of the Installation of Utilities to the Equipment Shop Building at Lake Easton State Park*	none
168246	Luttrell and McMurry 2012	*Iron Horse State Park/John Wayne Pioneer Trail – Tunnel Repair and Maintenance Project Letter Report, Kittitas County, Washington*	45KT2195
1682498	Luttrell 2012	*Lake Easton State Park - Forest Health Project Letter Report*	45KT3472

NADB No.	Reference	Title	Cultural Resources Identified within the Study Area
1682658	Schultze and Tarman 2012	*Archaeological Resources Inventory for the PSE Cascade Substation Project*	45KT3483
1684564	Ives and Gough 2010	*Cultural Resources Survey for the Washington State Horse Park Authority's Cross Country Event Area Project*	45KT1376, 45KT1484, 45KT2146, 45KT2625
1685004	Schroeder and Landreau 2012	*An Archaeological Review and Inventory of the Cle Elum Pines West Development Project, Roslyn, Kittitas County, Washington*	KT03486, KT03487, KT03488, KT03489, KT03490, KT03491, KT03492, KT03493, KT03494, KT03495, KT03054
1685500	Woody 2014	*Cultural Resources Identification Survey of the Cabin Mountain LLC 2013 NRCS EQIP Project.*	none
1685690	Luttrell 2014	*Lake Easton State Park - Two Comfort Stations Project*	none
1685730	Gray and Shellenberger 2014	*Cultural Resources Survey for the Big Creek Fish Passage Project*	none
1685818	Oliver and Camuso 2014	*Yakima River "Edge" Habitat Restoration and Timber Harvest Project*	45KT3735, 45KT3736, 45KT2073
1686428	Lally et al. 2014	*Yakama Nation Cultural Resources Program Cultural Resources Investigation of the Yakima Basin Integrated Plan: Keechelus Lake, Kachess Lake, Cle Elum Lake*	45KT1014
1686455	Landreau and Geffen 2006	*A Section 106 Archaeological Review and Inventory at the Proposed Marian Meadows Development, Easton, Kittitas County, Washington*	none
1686699	Orvald 2010	*Cultural Resource Inventory for the Nelson Siding Road Improvement Project, Kittitas County, Washington*	none
1687441	Luttrell 2015	*Lake Easton State Park- Camp Host Site Project*	none
1687559	Oliver et al. 2015	*Cultural Resources Investigation of the Lake Kachess Geotechnical Bore Hole Testing, Kittitas County, Washington*	45KT1014
1688757	Amara 2016	*NRCS Hundley Family Limited Partnership EQIP 2016 Cultural Resources Site Identification Survey in Kittitas County, Washington*	none
1688873	Luttrell 2016	*Lake Easton State Park – RV Electrical Replacement Project Monitoring, Kittitas County, Washington Letter Report*	none
1689093	Luttrell 2017	*Lake Easton State Park - Forest Health Project (East Campground Area)*	45KT3794
1690341	Davis et al. 2018	*Cultural Resource Investigations for BPA's Olympia-Grand Coulee No. 1 Insulator Replacement Project, Phase II and III, Kittitas and King Counties, Washington*	45KT2625

NADB No.	Reference	Title	Cultural Resources Identified within the Study Area
1692131	Becker 2019	*A Cultural Resources Survey of BPA's Proposed Schultz-Echo Lake No. 1 Impairment Project, Kittitas County, Washington*	none
1692212	Camuso and Oliver 2018	*Cultural Resources Evaluation of the Upper Yakima River Restoration Project*	45KT4238, 45KT4239, 45KT4240, 45KT4241, 45KT4242
1692952	Oliver and Camuso 2017	*Cultural Resources Evaluations of Howard Carlin Trailhead Park, City of Cle Elum, Kittitas County, Washington*	45KT2021, 45KT2022
1693261	Camuso et al. 2017	*Cultural Resources Investigation of the Kachess Drought Relief Pumping Plant and Lake Keechelus to Lake Kachess Conveyance Project for the Yakima Basin Integrated Plan, Kittitas County, Washington*	none
1694032	Oliver and Camuso 2020	*Cultural Resources Evaluations of Hanson Ponds Improvements, Kittitas County, Washington*	none
1694344	Trost and Boersema 2020	*A Cultural Resources Assessment for the WSPRC/WDFW Bullfrog Weigh Station Restoration and Thinning Project, Kittitas County, Washington*	45KT4377, 45KT4378
1695153	Oliver 2019	*Cultural Resources Phase I. Survey Evaluation of the Laurel Hill Memorial Park Expansion, City of Cle Elum, Kittitas County, Washington*	45KT3086
1695980	Finley 2016	*Yakima River Edge 3 Habitat Restoration and Timber Harvest Project Addendum*	none
1695894	Camuso et al. 2017	*Cultural Resource Survey for the Tumbling Ridge Communication Tower, Kittitas County, Washington*	none
1695995	Oliver and Camuso 2021	*Cultural Resources Investigations of the Upper Yakima River Floodplain Acquisition, Kittitas County, Washington*	45KT4505, 45KT4507, 45KT4508, 45KT4509

Key: BNSF = Burlington Northern Santa Fe; NADB = National Archaeologic Database.

Table 3. Previously Recorded Cultural Resources Located within 0.8 km (0.5 Miles) of the API

Resource No.	Site Type and Description	Distance and Direction from I-90	NRHP Eligibility
45KT801	precontact lithic material	0.78 km (0.49 miles) south	Not Eligible
45KT802	precontact lithic material: 2 FMR concentrations, FMR scatter, lithic flakes, 1 broken projectile point	0.73 km (0.45 miles) south	Not Eligible
45KT803	precontact lithic material: FMR, hearth, lithic flakes	0.39 km (0.24 miles) south	Eligible

Resource No.	Site Type and Description	Distance and Direction from I-90	NRHP Eligibility
45KT823	precontact lithic material: high density lithic scatter, broken cobbles (possible FMR)	0.70 km (0.44 miles) south-southwest	survey/inventory
45KT913	precontact lithic material; precontact camp: one pit house depression, FMR	0.29 km (0.18 miles) southwest	survey/inventory
45KT1014	precontact lithic material; historic logging; historic hydroelectric: FMR, rock alignment (possible fish weir), possible hearths	0.28 km (0.17 miles) north-northwest	Eligible
45KT1020	historic railroad property: Chinese camp with historic debris scatter including ceramic and glass fragments, opium tin, and 2 depressions	0.24 km (0.15 miles) north	potentially Eligible
45KT1361	precontact isolate: chert flake	0.17 km (0.11 miles) north	Not Eligible
45KT1367	precontact depression	0.35 km (0.22 miles) north	Eligible
45KT1368	precontact lithic material; precontact burial: low-density lithic scatter, projectile points, human remains	0.35 km (0.22 miles) north	Eligible
45KT1376	precontact lithic material: flakes, biface, core flakes, shatter, battered cobbles	15 m (50 feet) north	Eligible
45KT1484	precontact and historic components: historic debris scatter, chert flake	0.25 km (0.15 miles) north	Not Eligible
45KT1719	precontact isolate: chert flake	0.39 km (0.24 miles) southwest	survey/inventory
45KT1743	historic debris scatter; historic depressions – scatter of 30+ artifacts and two depressions	0.57 km (0.35 miles) south-southeast	potentially Eligible
45KT1745	precontact house pit; precontact lithic material: possible pit house depression and two flakes	0.78 km (0.49 miles) south-southeast	survey/inventory
45KT1746	precontact isolate: chert flake fragment	0.37 km (0.23 miles) south-southeast	survey/inventory
45KT2073	historic railroad property: possible railroad work camp with railroad grades, road segment, and debris scatter	0.55 km (0.34 miles) southeast	potentially Eligible
45KT2079	historic debris-scatter burning pyre, 360 by 460 feet, 1880s–1960s	0.17 km (0.11 miles) northwest	Not Eligible
45KT2080	historic debris scatter: stoneware, hole-in-cap tin cans, glass fragments	0.41 km (0.25 miles) northwest	Not Eligible
45KT2081	historic debris scatter: hole-in-top tin cans, metal fuel and oil cans, zinc light bulb bases, galvanized bucket	0.22 km (0.14 miles) northwest	Not Eligible
45KT2092	historic debris scatter: cans vent hole, can scatter	0.46 km (0.31 miles) north	Not Eligible

Resource No.	Site Type and Description	Distance and Direction from I-90	NRHP Eligibility
45KT2093	historic debris scatter: metal cans, iron stove parts, bucket, bottle glass fragments	150 m (500 feet) northwest	Not Eligible
45KT2097	historic debris scatter: metal wreath frames, tin cans, glass and ceramic fragments	24 m (80 feet) northwest	Not Eligible
45KT2098	historic debris scatter: tin cans, glass and ceramic fragments	0.29 km (0.18 miles) northwest	Not Eligible
45KT2099	historic debris scatter: six sanitary and vent hole cans	0.78 km (0.49 miles) northwest	Not Eligible
45KT2135	historic bridge: concrete two-lane bridge	0.78 km (0.49 miles) north	Not Eligible
45KT2146	historic public works: remnants of 4 water lines	intersects at 2 points along I-90	Not Eligible
45KT2195	precontact and historic components: subsurface scatter of concrete chunks, nails, container glass fragments, 100+ pieces of debitage, FMR fragments	46 m (150 feet) south	Not Eligible
45KT2618	historic isolate: ceramic insulator	0.45 km (0.28 miles) north-northeast	potentially Eligible
45KT2625	historic road: segment of original State Road No. 7/ Sunset Highway alignment	0.16 km (0.10 miles) northwest	Not Eligible
45KT2786	historic railroad property: segment of former Northern Pacific Railroad	122 m (400 feet) north	potentially Eligible
45KT2898	historic irrigation: irrigation ditch	137 m (450 feet) west-southwest	potentially Eligible
45KT2899	historic public works: drainage system remnants including two cement structures with ditches	85 m (280 feet) west-southwest	potentially Eligible
45KT3086	historic cemetery: Laurel Hill Memorial Park established in 1900	37 m (120 feet) west-north	potentially Eligible
45KT3332	historic debris scatter: metal cans and glass jars	0.22 km (0.14 miles) north	Not Eligible
45KT3343	historic isolate: glass mason jar	0.27 km (0.17 miles) north-northwest	Not Eligible
45KT3472	precontact lithic material: low-density scatter of flakes, 1 utilized flake and 1 projectile point	0.32 km (0.22 miles) west-northwest	survey/inventory
45KT3487	historic debris scatter: 2 sanitary cans and 1 beer can	0.60 km (0.38 miles) north	Not Eligible
45KT3488	historic debris scatter-cans, brick, glass 200 by 70 M, 1894–1955	0.60 km (0.38 miles) north	Not Eligible

Resource No.	Site Type and Description	Distance and Direction from I-90	NRHP Eligibility
45KT3489	historic debris scatter: metal cans and containers, glass and brick fragments	0.79 km (0.49 miles) north-northwest	Not Eligible
45KT3495	historic isolate: crimp-sealed can	0.59 km (0.37 miles) north	survey/inventory
45KT3735	historic debris scatter: vehicle parts, barbed wire, lumber	145 m (475 feet) south	potentially Eligible
45KT3736	historic debris scatter: metal cans and pail, clay pipe	160 m (525 feet) southwest	potentially Eligible
45KT3794	precontact lithic material: 3 flakes	0.20 km (0.12 miles) southwest	survey/inventory
45KT4021	historic railroad property: segment of former Northern Pacific Railroad	0.51 km (0.32 miles) north	Eligible; survey/ inventory
45KT4022	historic public works: open ditch with culvert	0.49 km (0.31 miles) north	Not Eligible
45KT4238	historic agriculture; historic objects: barbed wire wrapped around charred tree	0.43 km (0.26 miles) northeast	Not Eligible
45KT4239	historic cabin; historic debris scatter	0.40 km (0.25 miles) northeast	survey/inventory
45KT4240	historic bridge; historic debris scatter	0.26 km (0.16 miles) northeast	Not Eligible
45KT4241	historic agriculture: steel tank, amethyst glass, lumber	0.44 km (0.27 miles) northeast	Not Eligible
45KT4242	historic agriculture: historic fence, ditch, and associated debris	0.20 km (0.12 miles) northeast	Not Eligible
45KT4331	historic road	0.40 km (0.25 miles) northeast	Not Eligible
45KT4373	precontact isolate: CCS tertiary flake	122 m (400 feet) east-northeast	survey/inventory
45KT4377	precontact isolate: CCS biface fragment	0.21 km (0.13 miles) north	survey/inventory
45KT4378	historic camp; historic debris scatter; historic logging property: glass bottles, metal cans, metal equipment parts	0.54 km (0.33 miles) northeast	potentially Eligible
45KT4379	historic debris scatter: depression, metal cans and containers, glass fragments	0.24 km (0.15 miles) north-northeast	potentially Eligible
45KT4380	historic debris scatter: depression, metal cans and containers, glass fragments	0.16 km (0.10 miles) north-northeast	potentially Eligible

Resource No.	Site Type and Description	Distance and Direction from I-90	NRHP Eligibility
45KT4382	precontact and historic components: lithic flakes, steel door, miscellaneous metal, metal anchored to rock	0.45 km (0.28 miles) southwest	survey/inventory
45KT4383	historic camp: remnants of playground	0.38 km (0.23 miles) southwest	potentially Eligible
45KT4384	precontact isolate: single lithic flake	0.60 km (0.31 miles) northeast	unknown
45KT4426	historic debris scatter: low-density scatter of clay brick, glass, milk glass, and metal fragments	53 m (175 feet) north	potentially Eligible
45KT4505	precontact lithic material: 2 flakes	0.50 km (0.31 miles) southwest	survey/inventory
45KT4507	historic object: cast-iron wood-burning stove	0.36 km (0.22 miles) southwest	Not Eligible
45KT4508	historic object: cast-iron and white enamel wood-burning stove	0.36 km (0.22 miles) southwest	Not Eligible
45KT4509	historic railroad property; historic road: 2 linear berms, telegraph pole with insulator, amethyst glass	0.50 km (0.31 miles) southwest	potentially Eligible

Key: API = area of potential impacts; CCS = cryptocrystalline silicate; FMR = fire-modified rock; NRHP = National Register of Historic Places.

The site was subsequently determined Eligible for listing in the National Register of Historic Places (NRHP). Ives and Gough (2010) revisited the site during survey for the Washington State Horse Park Authority and excavated 46 shovel test probes, resulting in the identification of a single tertiary flake fragment. Based on the low density of artifacts, a shallow and unstratified depositional context, as well as the absence of faunal materials, temporally diagnostic lithic implements, datable materials, or cultural features, Ives and Gough (2010:9) concluded that 45KT1376 retains "very little research potential to enhance our understanding of the upper Yakima River drainage basin, and very little merit would be derived from additional investigations at this site."

Previously Recorded Archaeological Resources

KT01376

KT01376, originally recorded by Dennis Griffin in 1998 as an isolated biface fragment (clear translucent chert), was located along the river terrace north of Interstate 90 and a private property fence to south. A large gully (highway related?) is located directly southeast of the site along a flat line (15 m [50 feet] to the southeast). Due to testing, the isolate has been enlarged. A series of lithic debitage exists, as well as a series of bifaces. Due to the complex cultural material, Thomas E. Churchill recommended the site to be Eligible for the NRHP, which DAHP concurred with on January 27, 1999.

KT01376

KT01376 was revisited by Ryan Ives in 2010, during which none of the cultural material previously recorded was observed. A single flake was observed after conducting 46 shovel tests. Ives described the site as an extremely low-density lithic scatter. Ives also stated, "KT1376 does not contain faunal materials, temporally diagnostic lithic implements, datable materials, or cultural features. The cultural materials present occur in a very low density and in a shallow and unstratified depositional context. The low density and poor context of artifacts recovered from site KT1376 indicate that there is very little research potential to enhance our understanding of the upper Yakima River drainage basin, and very little merit would be derived from additional investigations at this site."

KT02786

KT02786 was originally recorded by Rain Shadow Research by D. E. Ferguson and M. J. Root in 2007 as Northern Pacific/Burlington Northern Santa Fe Railroad. Only two sections of rail remain that were observed by Ferguson and Root. Structures which were mapped by Sanborn Fire Insurance Co. in 1925 are noted to no longer exist.

KT02898

KT02898 was originally observed by Regan and Stolp in 1989 as an irrigation ditch. Not much information was provided other than the length, 200 feet [61 m], and no other cultural material was observed.

KT02899

KT02899 was originally recorded by Regan and Stolp in 1989 as two cement structures. Each structure is burmed on the east and west wall, which run parallel to the John Wayne Trail and have ditches running perpendicular to the John Wayne Trail. The northernmost (A) structure has a ditch running to the north. The southernmost (B) structure has a ditch extending to the south. Each of the cement structures is 92 cm (36 inches) square with 15.0-cm-thick (5.9-inch-thick) walls. These structures

protrude approximately 62.0 cm (24.4 inches) from the ground surface and extend 78.0 cm (30.7 inches) beneath the ground surface. These two structures are identical except for the southernmost structure having a wooden screen. A culvert connects the two. No other information is provided.

KT03086

KT03086 is known as Laurel Hill Memorial Cemetery (also known as Cle Elum Cemetery). It is an in-use cemetery that is located in the City of Cle Elum. Historic records indicate Nearby Greenwood Cemetery was established in 1893, but was later abandoned due to water seepage in 1923 (Oliver 2019). Many burials from this cemetery were also relocated to Laurel Hill Cemetery (Oliver 2019). According to the Kittitas County Genealogical Society (2019), the Cle Elum City Clerk has stated that the earliest recorded interment in the cemetery dates to 1902. It is unclear whether this is an intact, primary interment and not a secondary relocation from another cemetery. Burials within the cemetery have also been moved around in response to highway and railway development (Oliver 2019). A County cemetery to the south of Laurel Hill (Kroll 1932–1936) may have had burials relocated here, as well; however, Kittitas County reportedly has no records of this cemetery (Oliver 2019).

KT04380

Corrine Camuso originally recorded KT04380 in 2019 as a "a large excavated, roughly circular depression" extending 150 feet (46 m) in length north–south and 120 feet (37 m) in width east–west. It is 20 feet (6 m) west of Kachess Dam Road and extends approximately 15.0 feet (4.6 m) in depth. The southern half of the depression has subtle east–west-oriented grades or terraces. There is a faint access route on the southern extent from the Lake Kachess Dam Road into the depression. Historic artifacts were generally observed within the southern extent while a significant amount of modern refuse has filled the northern half. The resource is located in proximity to the gravel pits depicted on the 1912 Kachess Dam Construction Map that are approximately 470 feet (143 m) to the north. This may have been a gravel pit that subsequently was used as a dumping ground.

Historic artifacts within the depression include hole-in-top cans, hole-in-cap cans, sanitary cans, ceramic fragments, SAE20 and SAE30 motor oil cans, prescription glass bottle fragment, clear glass shards, brown glass shards, amethyst glass, and aquamarine glass. Modern refuse including miscellaneous metal, tires, and stove are located generally at the north end of the depression. Temporally diagnostic artifacts include hole-in-cap cans, hole-in-top cans, aquamarine glass, amethyst glass, and a milk bottle. The hole-in-cap cans date sometime between 1810, when these cans were first introduced, and the late 1930s, while the hole-in-top cans date post-1900 (Rock 1984; 1989). Aquamarine glass shards date through the 1930s but were largely replaced by colorless glass after the 1920s (Lindsey 2019). Machine-made cylindrical milk bottles were produced as early as 1900 and as late as the early 1960s (Lindsey 2019). Lydia Caudill determined KT04380 to be potentially Eligible for the NRHP on February 13, 2020.

KT04426

Corrine Camuso originally recorded KT04426 in 2020 as a low-density historic debris scatter covering a 1,203 m^2 (12,949 $feet^2$) area. The scatter is situated 85 m (280 feet) south of the Burlington Northern Santa Fe railway (former Northern Pacific circa 1886) and 57.9 m (190.0 feet) north of Interstate 90. A pond within the approximate location of the historic river channel lies 15 m (50 feet) to the east. Artifacts span the late 1800s to the early 1950s and are associated with domestic uses. Given early maps indicate that the project area is both within and north of the Yakima River channel and that

post-highway construction has shifted the river to its present-day position, it is likely this assemblage represents re-deposition of historic era artifacts.

Some surface artifacts include clay bricks, milk glass shards, brown bottle glass, aquamarine glass insulator glass fragments, cobalt glass shards, green glass shards. One of the brick fragments exhibits the recessed block letters RENT, which likely once read RENTON. It was likely manufactured by Denny-Renton Clay and Coal Company (1892–1927), which was one of the largest producers of paving bricks in the early 1900s. Subsurface artifacts included glass shards of various colors (milk, clear, brown, amber, green), white stoneware sherds, one brick fragment, one clear screw-top glass bottle top, one white porcelain sherd with applied floral motif, and clinker. Artifacts appear to be a mixture of both modern and historic era items. Alluvial sediments are consistent with the floodplain environment and the location of the former river channel, with some intermixed imported angular gravels. Corrine Camuso also conducted five shovel test probes. Lydia Caudill determined KT04426 was potentially Eligible for the NRHP on July 23, 2020.

Cemeteries

Three cemeteries have been recorded within a 0.8-km (0.5-mile) radius of API (Table 4).

Table 4. Previously Recorded Cemeteries within a 0.8-km (0.5-mile) Radius of the API

Site No.	Resource Name	Address	Relation to API
KT03086	Laurel Hill Memorial Cemetery, unrestricted access, well maintained.	119 West First Street Cle Elum, Washington 98922	0.06 km (0.04 miles) north
KT01014	FCR, rock alignment may be fish weir, possible hearths. Site also dam construction camp. No structures remain. Human remains.	intentionally left blank	0.8 km (0.50 miles) northwest
KT01368	Peare-A-Dice lithic scatter, 50 x 30 m, date of use: 3000 years to contact. Site consists of sparse flake scatter, points, flakes, and human remains.	intentionally left blank	0.35 km (0.22 miles) north

Key: API = area of potential impacts; FCR = fire-cracked rock.

Historic Map Research

The GLO survey plats for Township 20 North, Range 13 East; Township 20 North, Range 14 East; and Township 20 North, Range 15 East, Willamette Meridian, show numerous features within and around the study area, most notably the Northern Pacific Railroad near the API (Figures 2–4; GLO 1881, 1892, 1893). A review of the 1897 and 1901 U.S. Geological Survey (USGS) topographic maps and subsequent historic maps revealed a more extensive road network and further areas under private ownership, as additional homesteaders claimed more public land for farms and ranches (Figure 5–7). The Metsker Kittitas County maps notably show the Northern Pacific Railroad and U.S. Highway 10 (Metsker 1956, 1961).

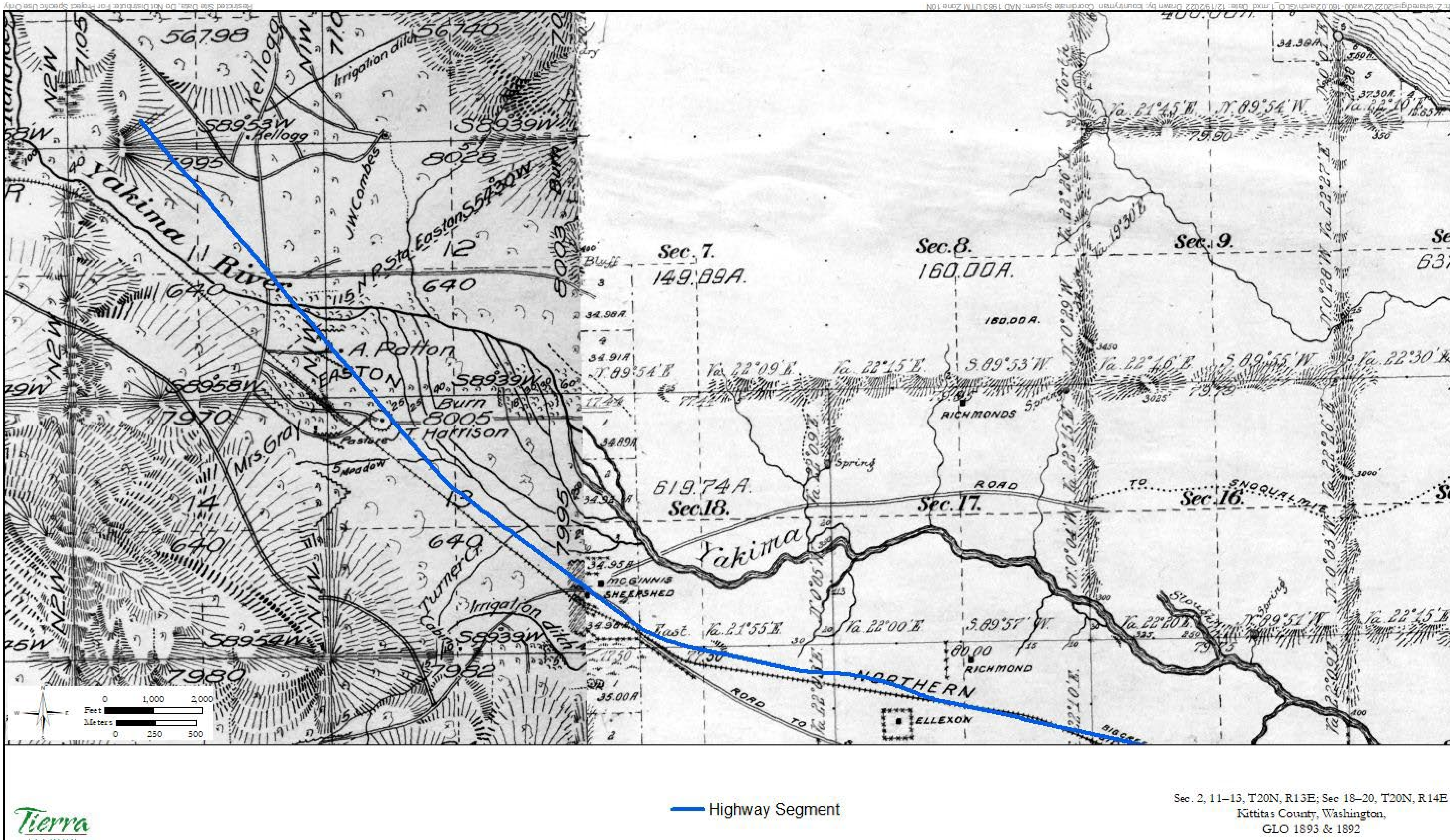

Figure 2. GLO map of the northwest portion of the API.

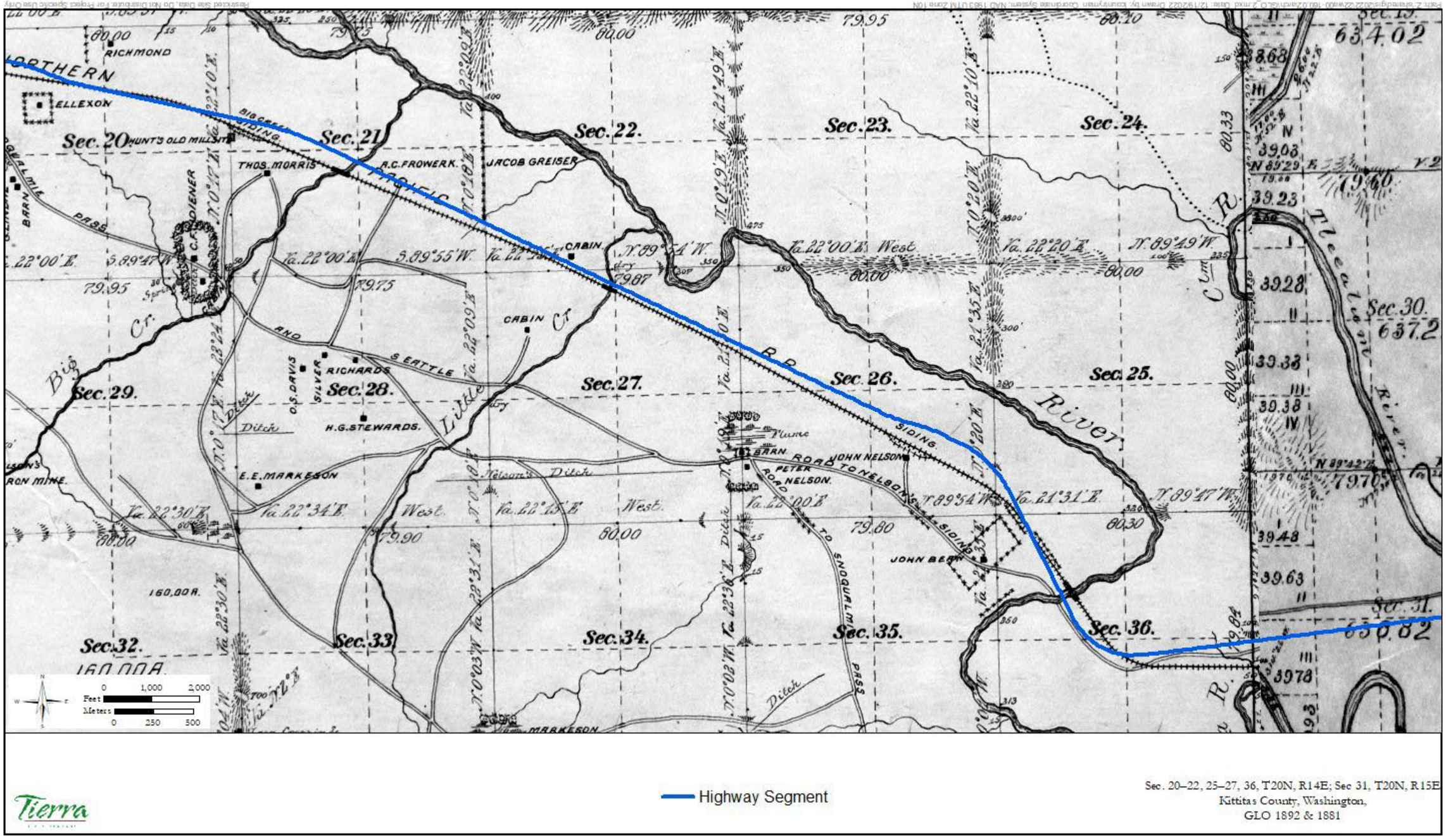

Figure 3. GLO map of the middle portion of the API.

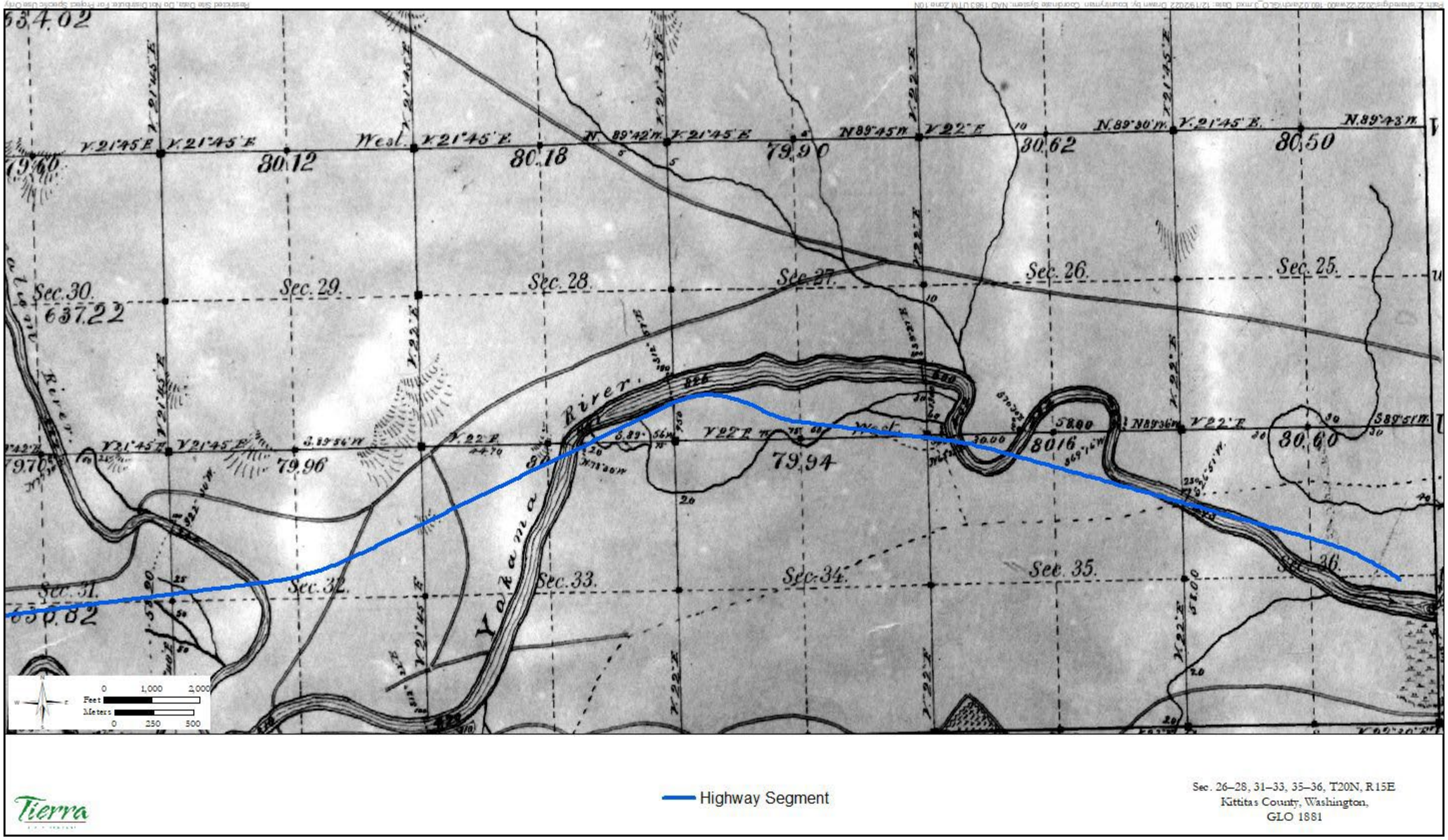

Figure 4. GLO map of the south portion of the API.

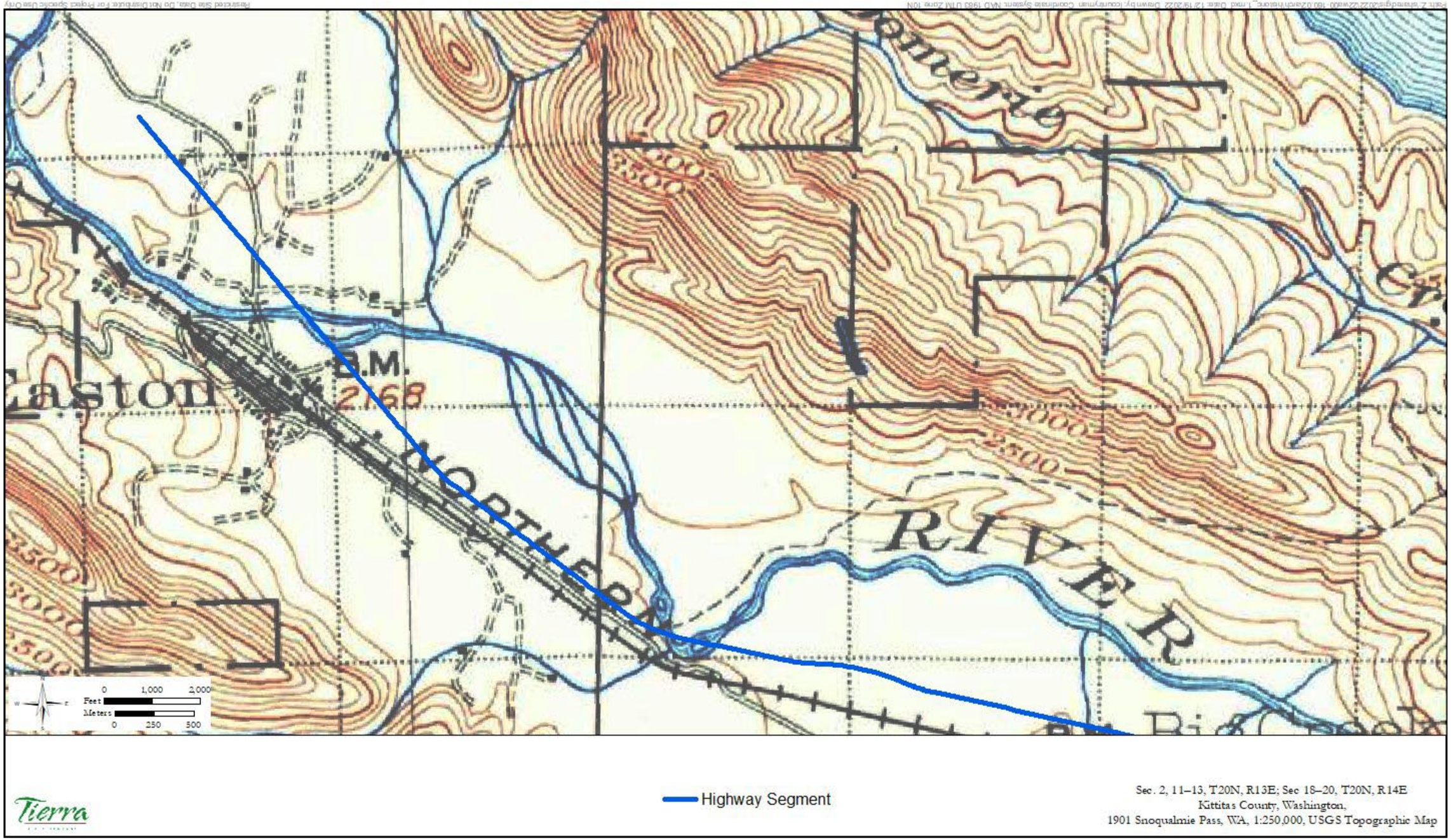

Figure 5. 1901 USGS map of the northwest portion of the API.

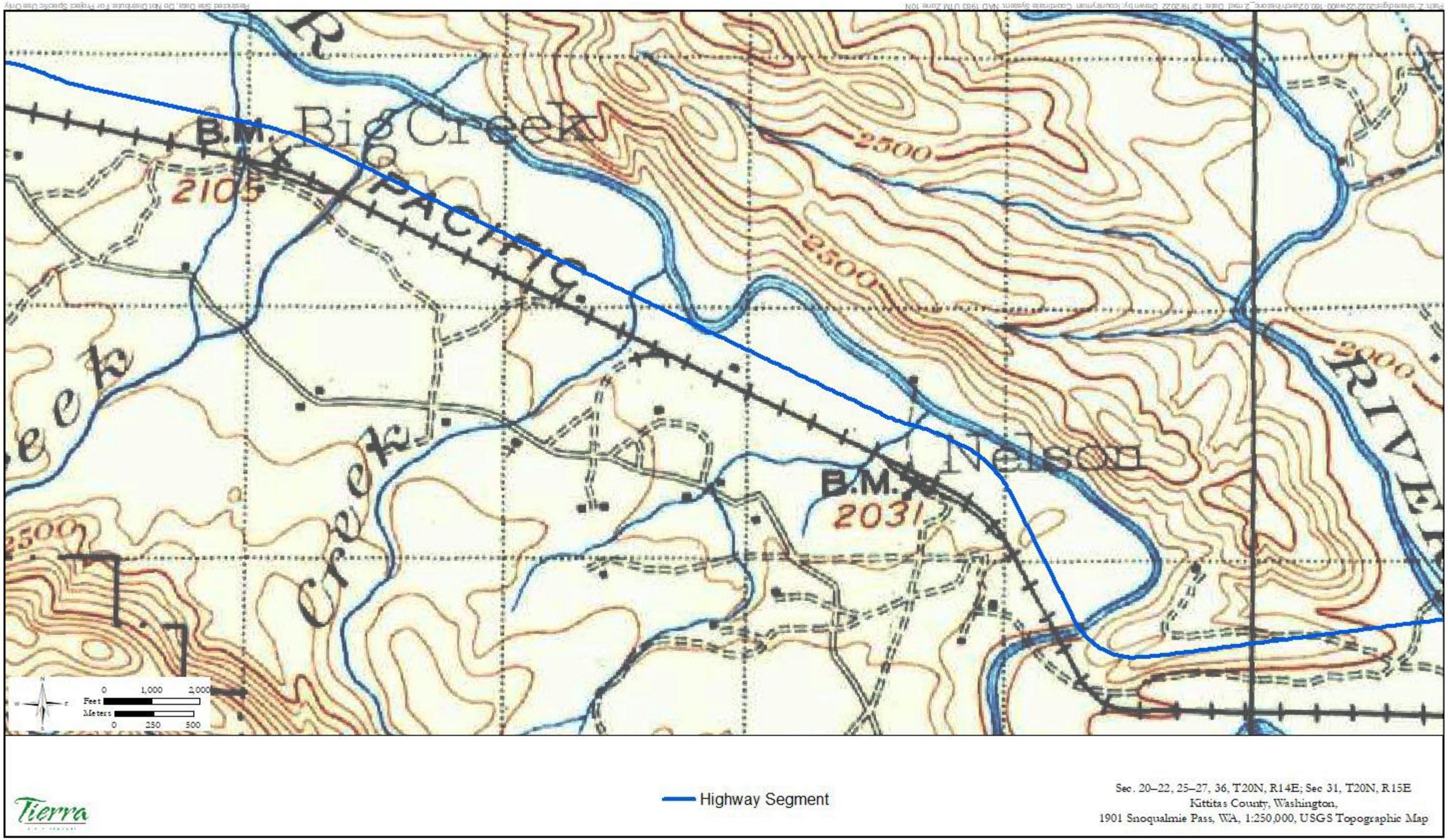

Figure 6. 1901 USGS map of the middle portion of the API.

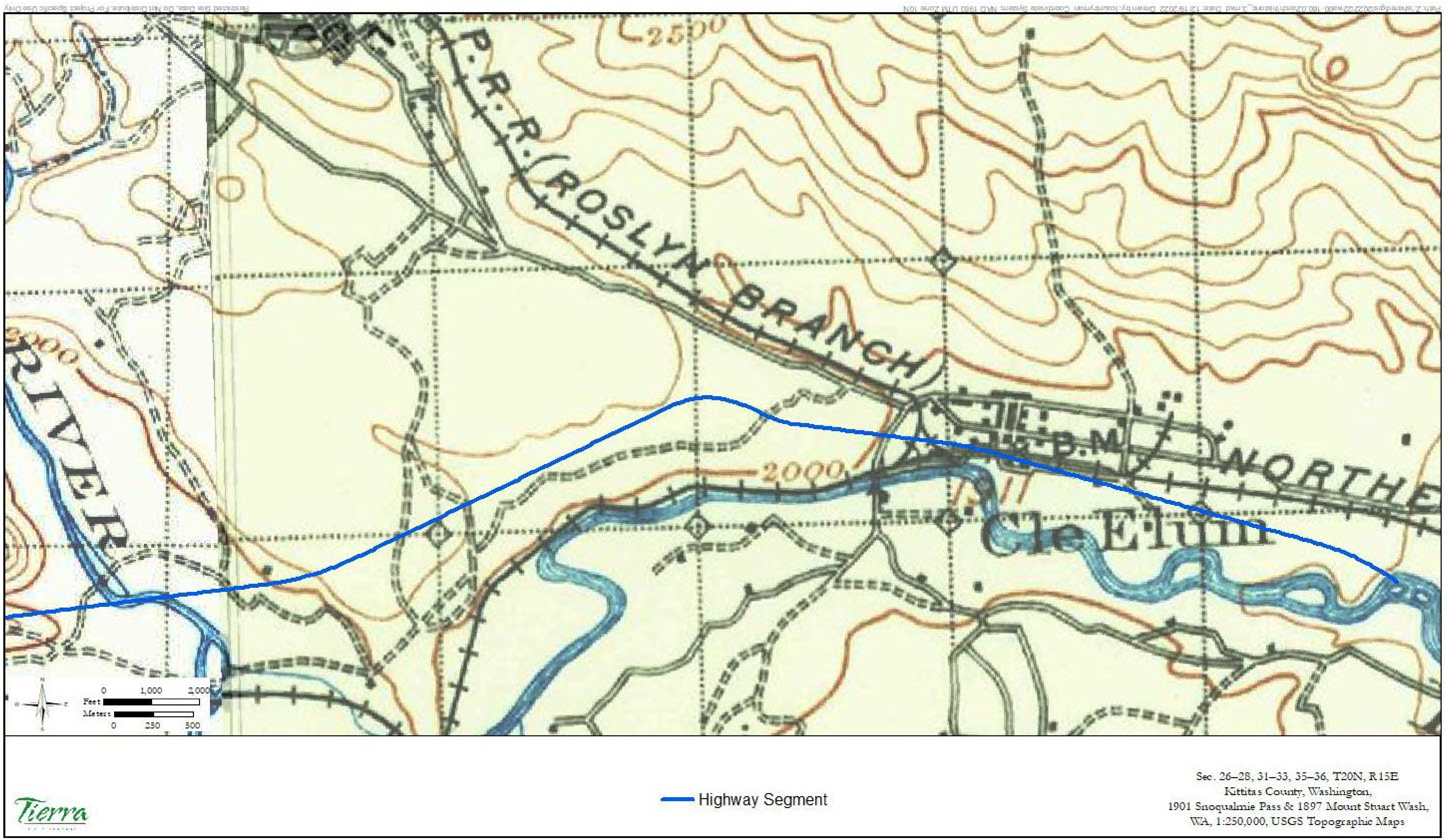

Figure 7. 1897 and 1901 USGS map of the south portion of the API.

Built Environment Resources

A total of 52 built environment resources were found within the study area. Of these, 27 are commercial, residential, or State-owned buildings. One resource is a linear resource, Burlington Northern Santa Fe Railroad, which runs south of the highway, formerly known as the Northern Pacific Railroad. The remaining resources are 24 bridges along I-90.

Of these 52 built environment resources, 32 were constructed more than 45 years ago (from 2022), including: 8 buildings, 1 railroad, and 23 bridges. One resource was previously determined Eligible for the NRHP and includes the Cle Elum Eastbound #52 Scale. Tables 5 and 6 below show the list of resources, their property types, and years constructed. Maps provided in Appendix C show all built environment resources that are more than 45 years old, including the NRHP-Eligible resource, Cle Elum Eastbound #52 Scale.

Table 5. Buildings within the Study Area

APN	Property Address	Property Type	Year Built
14424	812 E Davis Street, Cle Elum	commercial	2002
14425	811 W Davis Street, Cle Elum	commercial	2002
14429	805 W Davis Street, Cle Elum	commercial	2005
14430	803 W Davis Street, Cle Elum	commercial	2006
18428	1100 Chepoda Road, Cle Elum	residential	2017
61634	2141 Railroad Street, Easton	commercial	1974
93736	3551 Hundley Road, Cle Elum	Church of Latter-Day Saints	ca. 1983
123134	400 Swiftwater Boulevard, Cle Elum	commercial	1999
153835	210 Reed Street, Cle Elum	residential	1920
161634	81 Hawthorn Lane, Easton	residential	1995
171634	2941 E Sparks Rd, Easton	commercial	1998
279034	41 Depot Street, Easton	residential	1920
281634	2591 E Railroad St, Easton	commercial	1993
303134	exempt: City of Cle Elum	exempt	N/A
341734	2761 E Railroad St, Easton	residential	1970
344835	220 Owens Road, Cle Elum	commercial	1969
361734	2821 E Railroad St, Easton	Upper County Community Church	ca. 2006
391734	2931 E Railroad St, Easton	residential	1920
584135	309 W Alpha Way, Cle Elum	residential	1981
611634	2453 Railroad St, Easton	residential	2021
344835	220 Owens Road, Cle Elum	commercial	1969
361734	2821 E Railroad St, Easton	Upper County Community Church	ca. 2006

APN	Property Address	Property Type	Year Built
391734	2931 E Railroad Street, Easton	residential	1920
584135	309 W Alpha Way, Cle Elum	residential	1981
611634	2453 Railroad Street, Easton	residential	2021
644735	500 Dalle Road, Cle Elum	residential	1990
738934	1301 W Railroad Steet, Easton	residential	2004
891634	450 Hawthorn Lane, Easton	residential	1999
WISAARD Property ID: 729293	Cle Elum Eastbound #52 Scale	State-owned property (no address found)	1977
N/A	truck weigh station	State-owned property (no address found)	ca. 2006
N/A	Washington State Patrol Building	State-owned property (no address found)	ca. 2006
N/A	WSDOT facilities	151 S Bulldog Road, Cle Elum	1971

Key: APN = Assessor's Parcel Number; WISAARD = Washington Information System for Architectural and Archaeological Records Data; WSDOT = Washington State Department of Transportation.

Table 5. Bridges within the Study Area

Milepost	Bridge No.	Crossing Name	Location	Structure ID	Year Built
70.28	90/119	I-90 under W Easton Rd	17.7 E King Co.	0009806E	1975
71.26	90/120S	Yakima River	18.8 E King Co.	0005872A	1975
71.26	90/120N	Yakima River	18.8 E King Co.	0005872B	1976
71.56	90/121	I-90 under Easton Rd	19.1 E King Co.	0005872C	1959
74.05	90/124S	I-90 over W Nelson Siding Rd	21.6 E King Co.	0006883A	1962
74.05	90/124N	I-90 over W Nelson Siding Rd	21.6 E King Co.	0006883B	1962
74.90	90/125CN	Drainage Ditch (WB only)	22.4 E King Co.	00200019	1972
75.36	90/126S	Big Creek	22.9 E King Co.	0009428A	1973
75.36	90/126N	Big Creek	22.9 E King Co.	0007016A	1962
76.60	90/128S	Little Creek	24.1 E King Co.	0009428B	1973
76.60	90/128N	Little Creek	24.1 E King Co.	0006883C	1962
78.06	90/130S	I-90 over Golf Course Rd	25.6 E King Co.	0006883D	1962
78.06	90/130N	I-90 over Golf Course Rd	25.6 E King Co.	0006883E	1962
78.81	90/132S	Yakima River	26.3 E King Co.	0000267A	1930
78.81	90/132N	Yakima River	26.3 E King Co.	0006868A	2000
80.31	90/133	I-90 under Bullfrog Rd	27.8 E King Co.	0007062A	1963
80.79	90/134S	Cle Elum River	28.2 E King Co.	0006868B	1962
80.79	90/134N	Cle Elum River	28.2 E King Co.	0003527A	1949

Milepost	Bridge No.	Crossing Name	Location	Structure ID	Year Built
83.12	90/135E-N	I-90 under E-N Ramp	30.5 E King Co.	0007752A	1965
Eastbound I-90 to West Cle Elum	90/135E-N	E-N Ramp over I-90		0007752A	1965
83.53	90/136S	I-90 over S Cle Elum Rd & RR	30.9 E King Co.	0007664A	1966
83.53	90/136N	I-90 over S Cle Elum Rd & RR	30.9 E King Co.	0007664B	1966
84.20	90/137	I-90 under Oakes Ave	31.6 E King Co.	0007582A	1965
85.86	970/1	I-90 under State Route 970	33.2 E King Co.	0007752B	1966

ANTICIPATED FINDS

Tierra also reviewed the DAHP's statewide predictive model layer for probability estimates of precontact cultural resources. Model probabilities are calculated using information from two general sources—data derived from archaeological surveys conducted prior to model development and a consideration of the relationship between these recorded sites and various environmental factors (Kauhi 2009). The DAHP model indicates that the API lies within an area of Very High Risk for encountering archaeological artifacts or deposits, primarily due to the project's proximity to the Columbia River.

Based on a review of the background information presented above, including consideration of historic and more recent disturbances that may have impacted cultural resources (e.g., agricultural land use, road construction, residential development, utility installation), Tierra anticipates that the API still has a high probability for intact archaeological deposits that may be Eligible for listing in the NRHP to be beneath disturbed soils. Cultural materials or features associated with hunter-fisher-gatherer, ethnographic, or historic Native American hunting groups include stone or bone tools related to hunting or processing activities; lithic debris associated with the manufacture and maintenance of these tools; processing features, such as hearths, identified by the presence of fire-modified rocks, charcoal, charcoal-stained soils, or possibly faunal and floral remains; and larger symbolic features, such as rock or boulder cairns.

Ethnographic and historic Native American cultural materials could include similar kinds of archaeological materials. Historic Euroamerican cultural materials would likely be deposits and features associated with agriculture and homesteads, including household dumps containing ceramics, glass, and other domestic items. Cultural materials could also be related to farming practices (including personal items and metal fragments or machinery pieces) or, perhaps, to early industry in the area (including, again, personal items and metal fragments).

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APPENDIX A. TRIBAL COMMUNICATION

Tierra
A CLS COMPANY

December 14, 2022

The Honorable Andy Joseph, Jr.
Colville Confederated Tribes
P.O. Box 150
Nespelem, WA 99155

RE: Cultural Resources Review for the Interstate 90 Feasibility Study, Kittitas County, Washington

Dear Chairperson Joseph:

Kittitas County Public Works (the County) is initiating a feasibility study for improving Interstate 90 between Mile Post (MP) 70.3 and MP 85.8 (Figure 1), where traffic congestion has a direct impact on safety and regional freight mobility. The study is funded by Kittitas County and does not involve state or federal funding; however, the County is coordinating with the Washington State Department of Transportation (WSDOT) over the course of the analysis, which will be the first step in identifying alternatives to improving safety, mobility, economic vitality, and environmental justice issues in the study corridor. SCJ Alliance (SCJ) is leading the study efforts on behalf of the County and has contracted with Tierra Right of Way Services, Ltd. (Tierra) to conduct the cultural resources review.

A preliminary review of the Department of Archaeology and Historic Preservation's (DAHP) cultural resources database revealed at least 60 previously recorded archaeological resources within 0.5 miles of the 15.5-mile segment of I-90. In addition, the DAHP's statewide predictive model indicates that the majority of the highway segment under study lies within an area with a very high risk of containing archaeological features and/or materials.

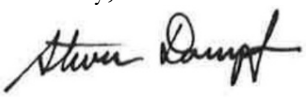
Tierra's assessment consists of reviewing soils and geomorphological information, the development history of the study corridor, historical maps (e.g., General Land Office [GLO], Metsker, Sanborn, etc.), DAHP's online database for previous sites and surveys within 0.8 km (0.5 miles) of the highway segment, and other pertinent environmental and historical sources. An architectural historian will also review the online database and conduct archival research at the County, Kittitas County Historical Society, and other local and regional archives, as necessary. Tierra will prepare a technical report summarizing the results of the work that reflects the professional standards for format and content as expressed in the guidelines prepared by DAHP.

Tierra is also gathering existing archaeological, ethnographic, and historical data from DAHP, the Spokane Public Library, and the Joel E. Ferris Research Archives. We are aware that the Colville Confederated Tribes (CCT) may have information gathered from elders regarding the study area and/or the CCT may currently use areas for traditional cultural activities near the proposed study area. We encourage you to contact us if the CCT has information that might be useful in the assessment,

or if the CCT has comments or concerns regarding the study area. We are in the infant steps of studying this area and it is important to understand the Tribes' perspective on developing improvements in this area.

Your response to this letter is greatly appreciated. Please contact me at (509) 655-7447 at your earliest convenience if you have any questions or need additional information.

Sincerely,



Steven Dampf, M.S.
Project Manager/Principal Investigator, Cultural Resources Division

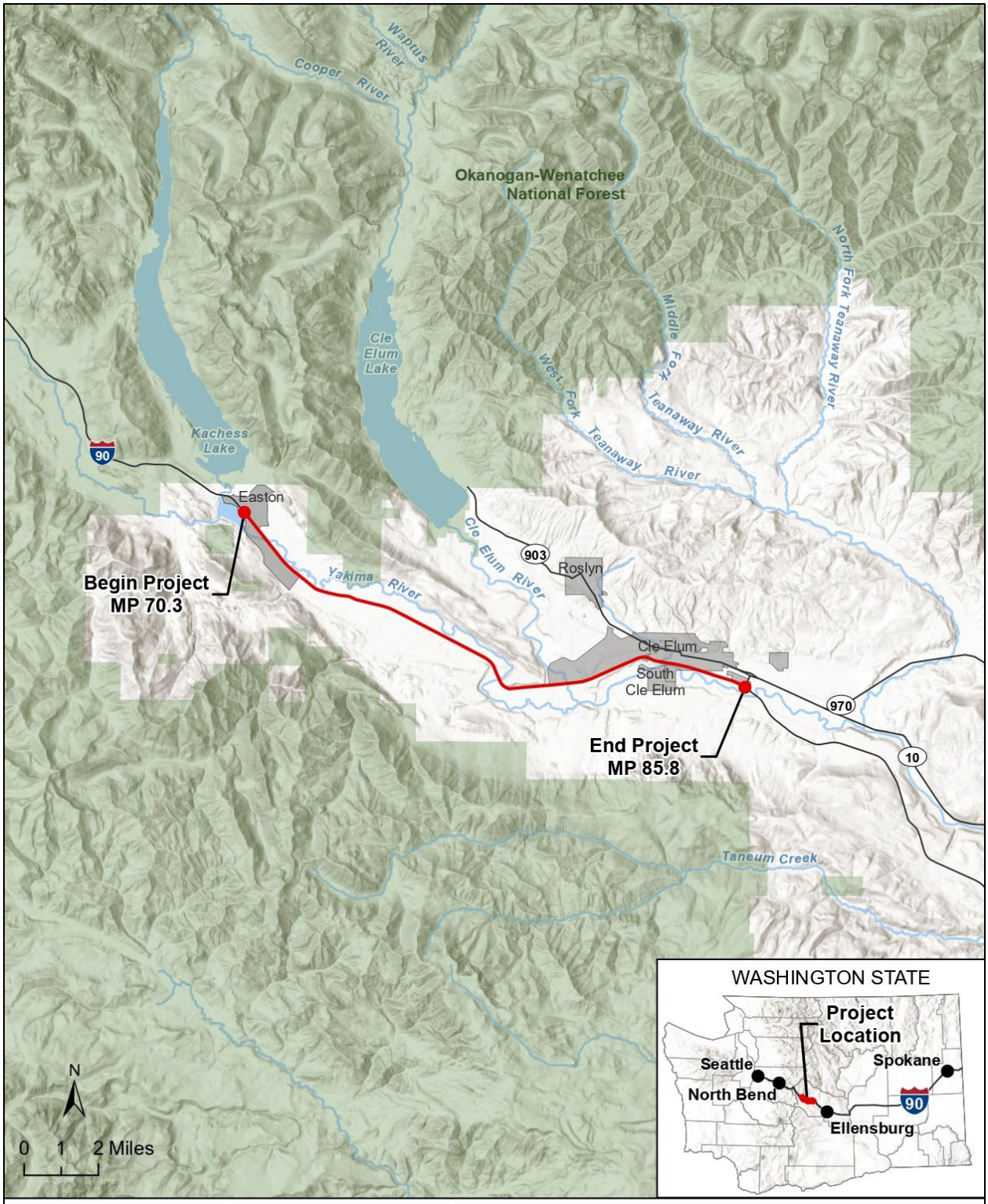
Cc: Guy Moura, CCT Tribal Historic Preservation Officer

Cody Desautel, CCT Natural Resources

Mark Cook, P.E., Kittitas County Public Works

Dan Ireland, P.E., SCJ Alliance

Trent de Boer, WSDOT



Data Sources: Kittitas County, USFWS, USGS, WSDOT. Basemap Sources: Esri, NASA, NGA, USGS.
Date: November 18, 2022

Figure 1. Location of the segment along Interstate 90 between MP 70.3 and MP 85.8.

Tierra
A CLS COMPANY

December 14, 2022

The Honorable Robert de los Angeles
Snoqualmie Indian Tribe
P.O. Box 969
Snoqualmie, WA 98065

RE: Cultural Resources Review for the Interstate 90 Feasibility Study, Kittitas County, Washington

Dear Chairperson de los Angeles:

Kittitas County Public Works (the County) is initiating a feasibility study for improving Interstate 90 between Mile Post (MP) 70.3 and MP 85.8 (Figure 1), where traffic congestion has a direct impact on safety and regional freight mobility. The study is funded by Kittitas County and does not involve state or federal funding; however, the County is coordinating with the Washington State Department of Transportation (WSDOT) over the course of the analysis, which will be the first step in identifying alternatives to improving safety, mobility, economic vitality, and environmental justice issues in the study corridor. SCJ Alliance (SCJ) is leading the study efforts on behalf of the County and has contracted with Tierra Right of Way Services, Ltd. (Tierra) to conduct the cultural resources review.

A preliminary review of the Department of Archaeology and Historic Preservation's (DAHP) cultural resources database revealed at least 60 previously recorded archaeological resources within 0.5 miles of the 15.5-mile segment of I-90. In addition, the DAHP's statewide predictive model indicates that the majority of the highway segment under study lies within an area with a very high risk of containing archaeological features and/or materials.

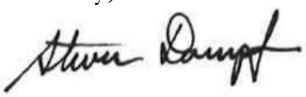
Tierra's assessment consists of reviewing soils and geomorphological information, the development history of the study corridor, historical maps (e.g., General Land Office [GLO], Metsker, Sanborn, etc.), DAHP's online database for previous sites and surveys within 0.8 km (0.5 miles) of the highway segment, and other pertinent environmental and historical sources. An architectural historian will also review the online database and conduct archival research at the County, Kittitas County Historical Society, and other local and regional archives, as necessary. Tierra will prepare a technical report summarizing the results of the work that reflects the professional standards for format and content as expressed in the guidelines prepared by DAHP.

Tierra is also gathering existing archaeological, ethnographic, and historical data from DAHP, the Spokane Public Library, and the Joel E. Ferris Research Archives. We are aware that the Snoqualmie Indian Tribe (Snoqualmie) may have information gathered from elders regarding the study area and/or the Snoqualmie may currently use areas for traditional cultural activities near the proposed study area. We encourage you to contact us if the Snoqualmie has information that might be useful in the

assessment, or if the Snoqualmie has comments or concerns regarding the study area. We are in the infant steps of studying this area and it is important to understand the Tribe's perspective on developing improvements in this area.

Your response to this letter is greatly appreciated. Please contact me at (509) 655-7447 at your earliest convenience if you have any questions or need additional information.

Sincerely,



Steven Dampf, M.S.
Project Manager/Principal Investigator, Cultural Resources Division

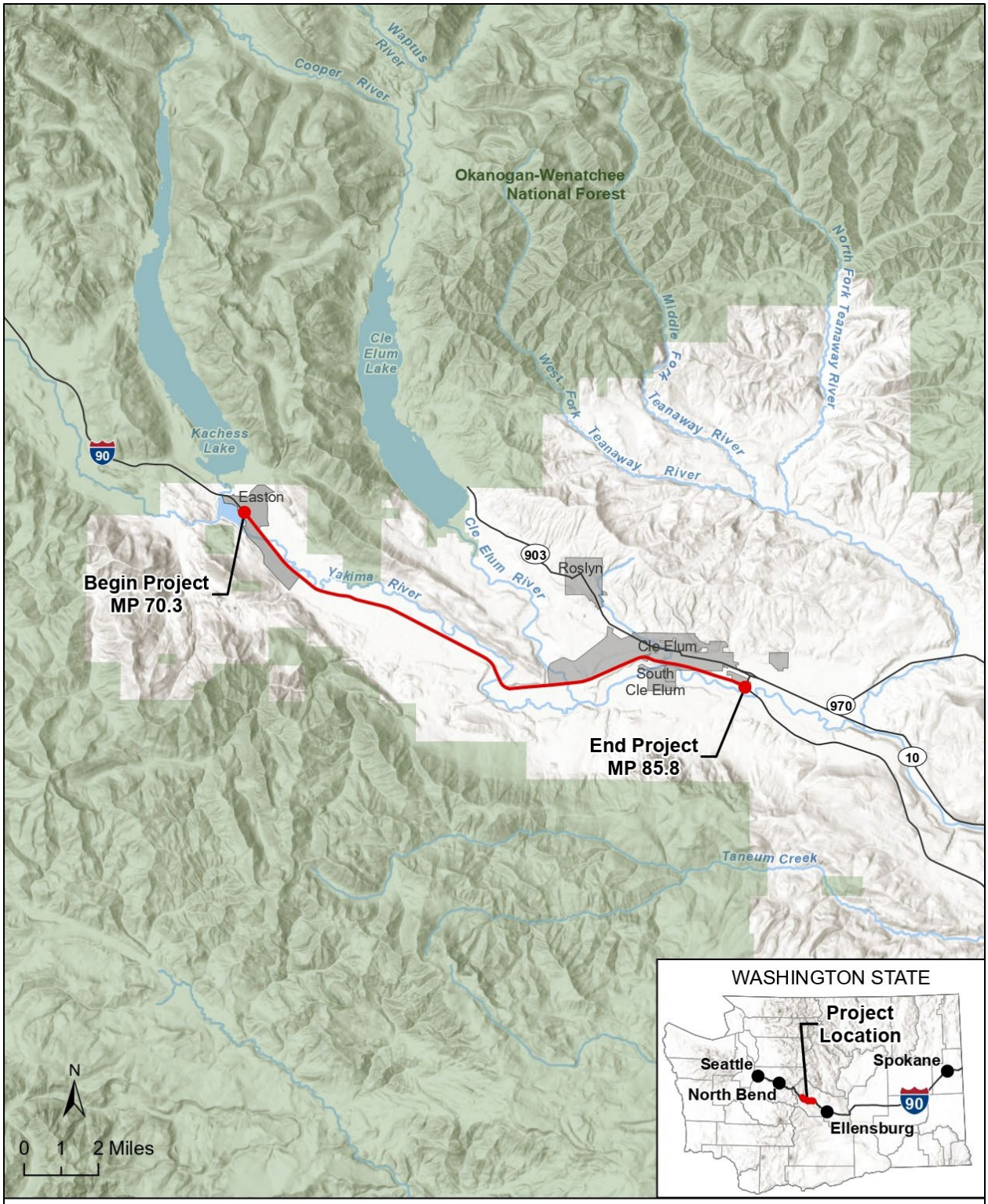
Cc: Steve Moses, Snoqualmie Cultural Resources

Cindy Spiry, Snoqualmie Natural Resources

Mark Cook, P.E., Kittitas County Public Works

Dan Ireland, P.E., SCJ Alliance

Trent de Boer, WSDOT



Data Sources: Kittitas County, USFWS, USGS, WSDOT. Basemap Sources: Esri, NASA, NGA, USGS.
Date: November 18, 2022

Figure 1. Location of the segment along Interstate 90 between MP 70.3 and MP 85.8.

Tierra
A CLS COMPANY

December 14, 2022

The Honorable Delano Saluskin
Confederated Tribes and Bands of the Yakama Nation
P.O. Box 151
Toppenish, WA 98948

RE: Cultural Resources Review for the Interstate 90 Feasibility Study, Kittitas County, Washington

Dear Chairperson Saluskin:

Kittitas County Public Works (the County) is initiating a feasibility study for improving Interstate 90 between Mile Post (MP) 70.3 and MP 85.8 (Figure 1), where traffic congestion has a direct impact on safety and regional freight mobility. The study is funded by Kittitas County and does not involve state or federal funding; however, the County is coordinating with the Washington State Department of Transportation (WSDOT) over the course of the analysis, which will be the first step in identifying alternatives to improving safety, mobility, economic vitality, and environmental justice issues in the study corridor. SCJ Alliance (SCJ) is leading the study efforts on behalf of the County and has contracted with Tierra Right of Way Services, Ltd. (Tierra) to conduct the cultural resources review.

A preliminary review of the Department of Archaeology and Historic Preservation's (DAHP) cultural resources database revealed at least 60 previously recorded archaeological resources within 0.5 miles of the 15.5-mile segment of I-90. In addition, the DAHP's statewide predictive model indicates that the majority of the highway segment under study lies within an area with a very high risk of containing archaeological features and/or materials.

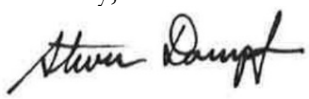
Tierra's assessment consists of reviewing soils and geomorphological information, the development history of the study corridor, historical maps (e.g., General Land Office [GLO], Metsker, Sanborn, etc.), DAHP's online database for previous sites and surveys within 0.8 km (0.5 miles) of the highway segment, and other pertinent environmental and historical sources. An architectural historian will also review the online database and conduct archival research at the County, Kittitas County Historical Society, and other local and regional archives, as necessary. Tierra will prepare a technical report summarizing the results of the work that reflects the professional standards for format and content as expressed in the guidelines prepared by DAHP.

Tierra is also gathering existing archaeological, ethnographic, and historical data from DAHP, the Spokane Public Library, and the Joel E. Ferris Research Archives. We are aware that the Confederated Tribes and Bands of the Yakama Nation (Yakama) may have information gathered from elders regarding the study area and/or the Yakama may currently use areas for traditional cultural activities

near the proposed study area. We encourage you to contact us if the Yakama has information that might be useful in the assessment, or if the Yakama has comments or concerns regarding the study area. We are in the infant steps of studying this area and it is important to understand the Tribes' perspective on developing improvements in this area.

Your response to this letter is greatly appreciated. Please contact me at (509) 655-7447 at your earliest convenience if you have any questions or need additional information.

Sincerely,



Steven Dampf, M.S.
Project Manager/Principal Investigator, Cultural Resources Division

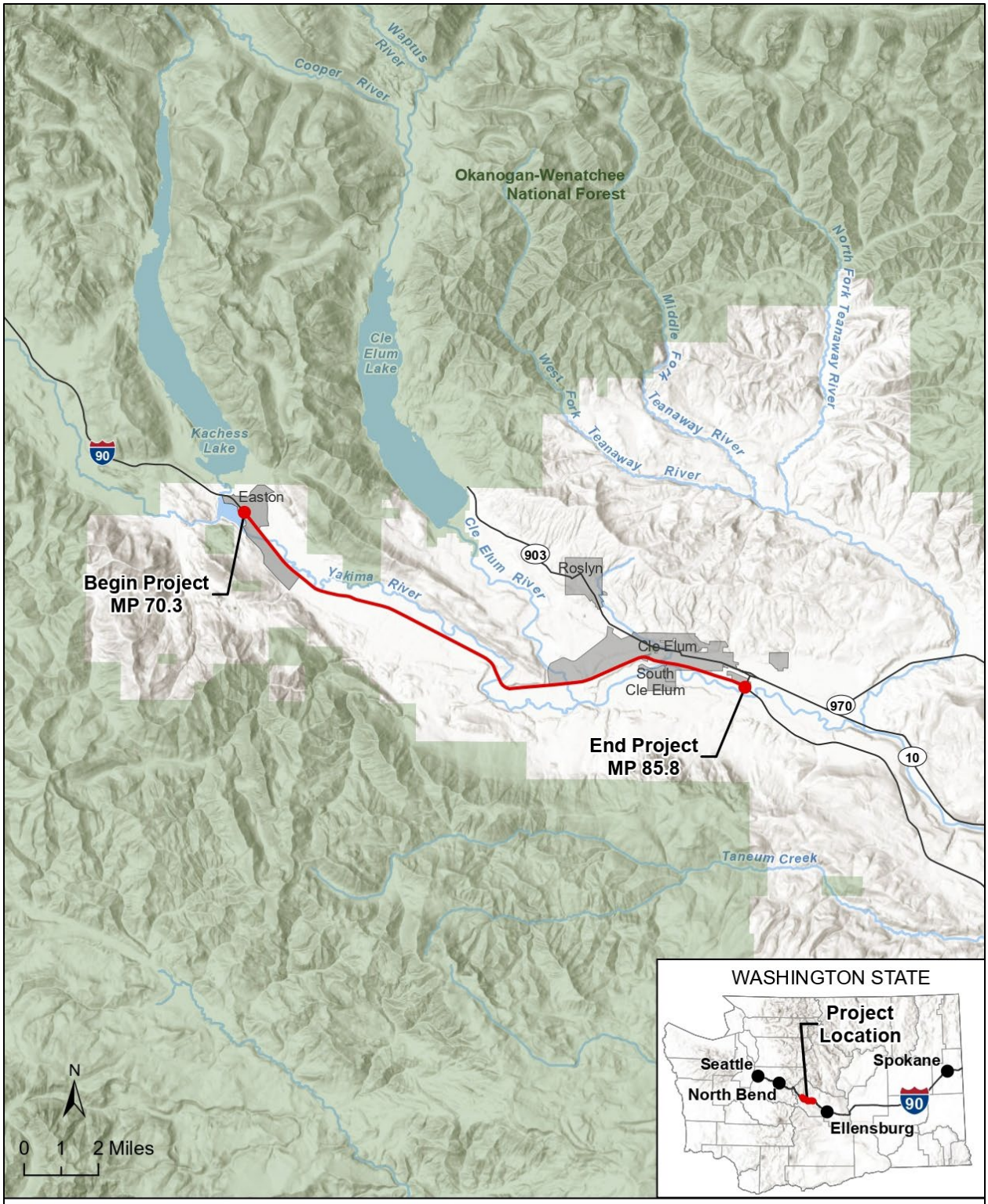
Cc: Casey Barney, Yakama Cultural Resources

Phillip Rigdon, Yakama Natural Resources

Mark Cook, P.E., Kittitas County Public Works

Dan Ireland, P.E., SCJ Alliance

Trent de Boer, WSDOT



Data Sources: Kittitas County, USFWS, USGS, WSDOT. Basemap Sources: Esri, NASA, NGA, USGS.
Date: November 18, 2022

Figure 1. Location of the segment along Interstate 90 between MP 70.3 and MP 85.8.

APPENDIX B. BUILT ENVIRONMENT RESOURCES WITHIN AND ADJACENT TO THE API

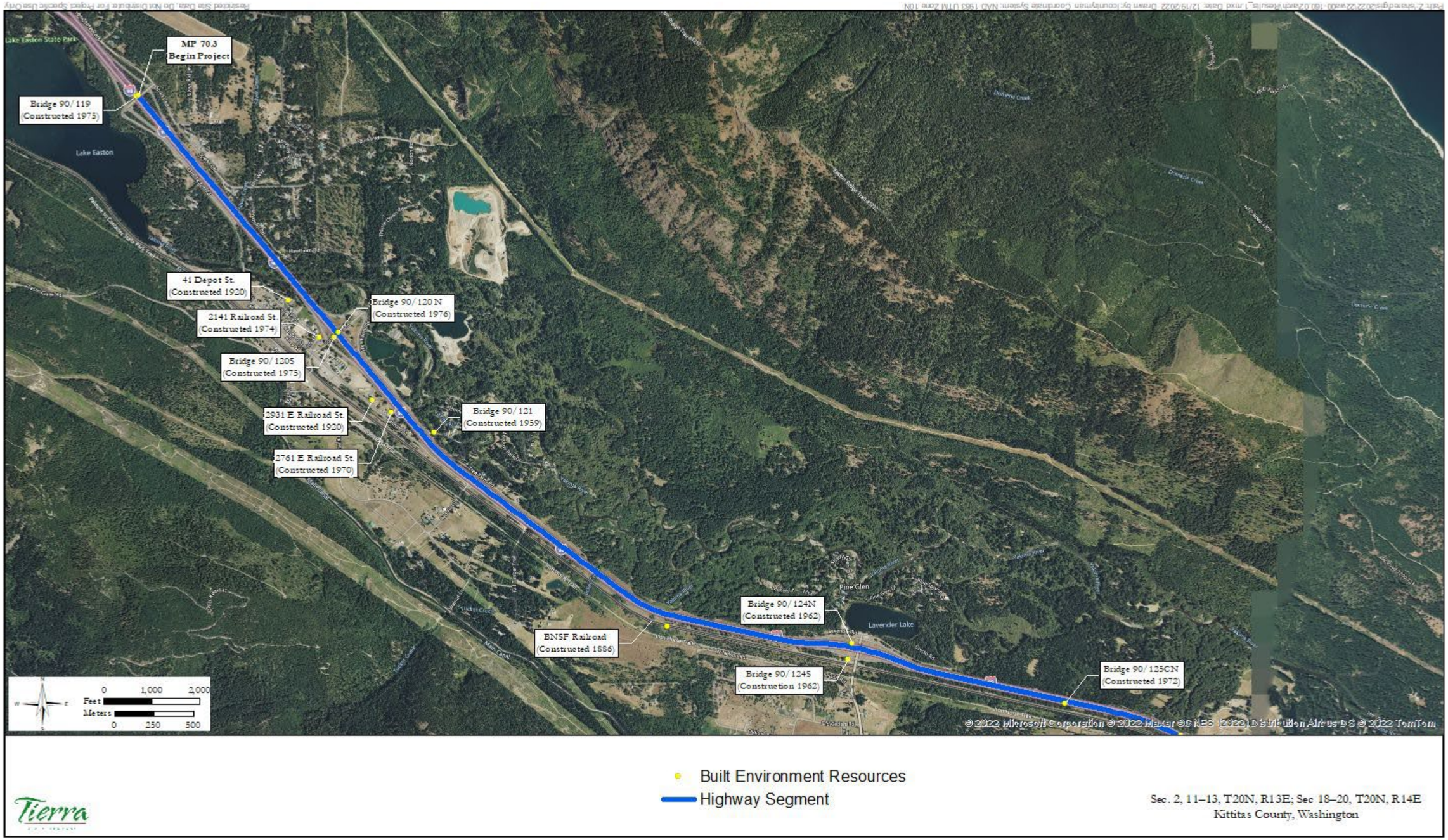


Figure B.1. Listing of historic properties associated with the API, segment 1.

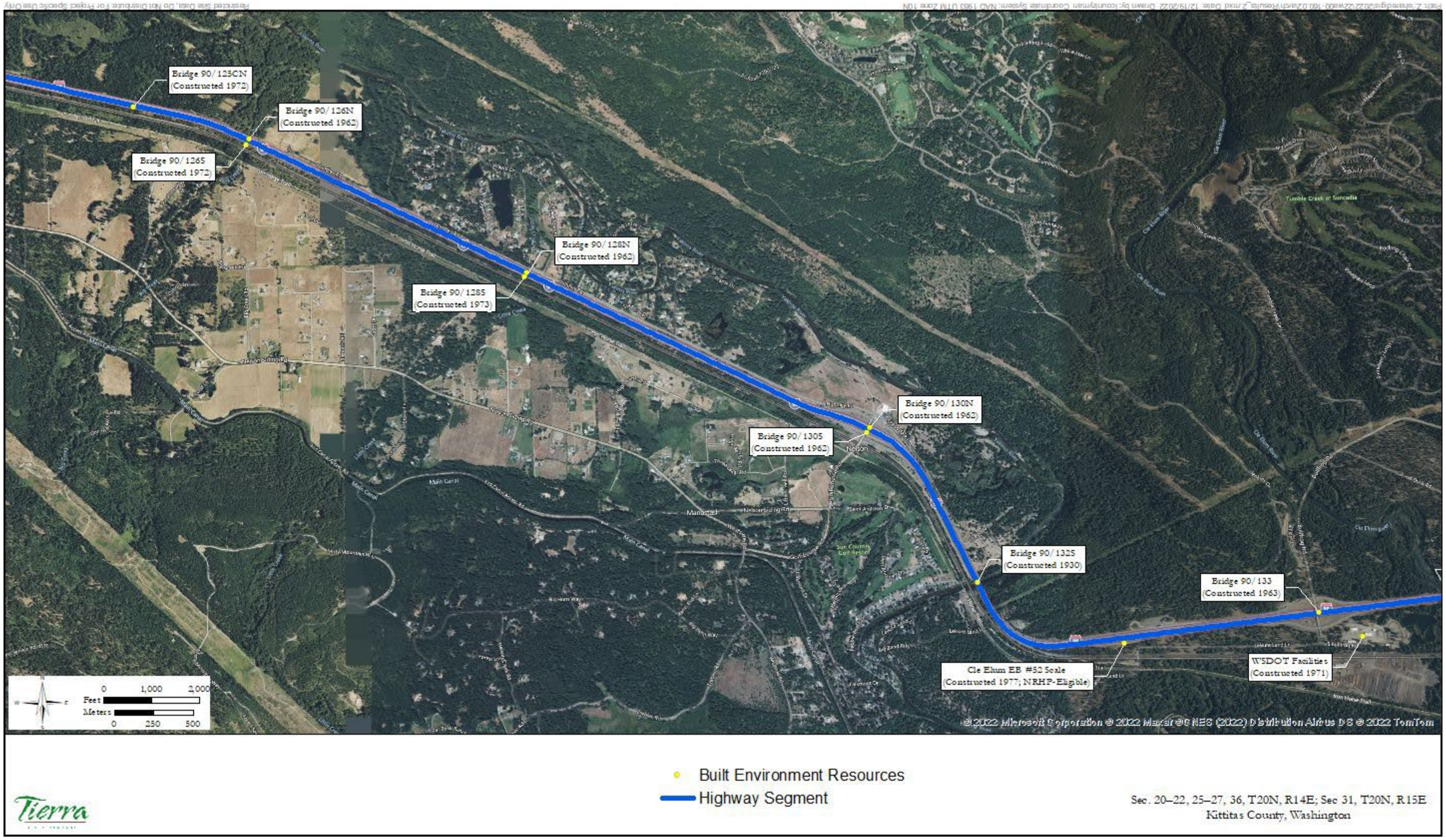


Figure B.2. Listing of historic properties associated with the API, segment 2.

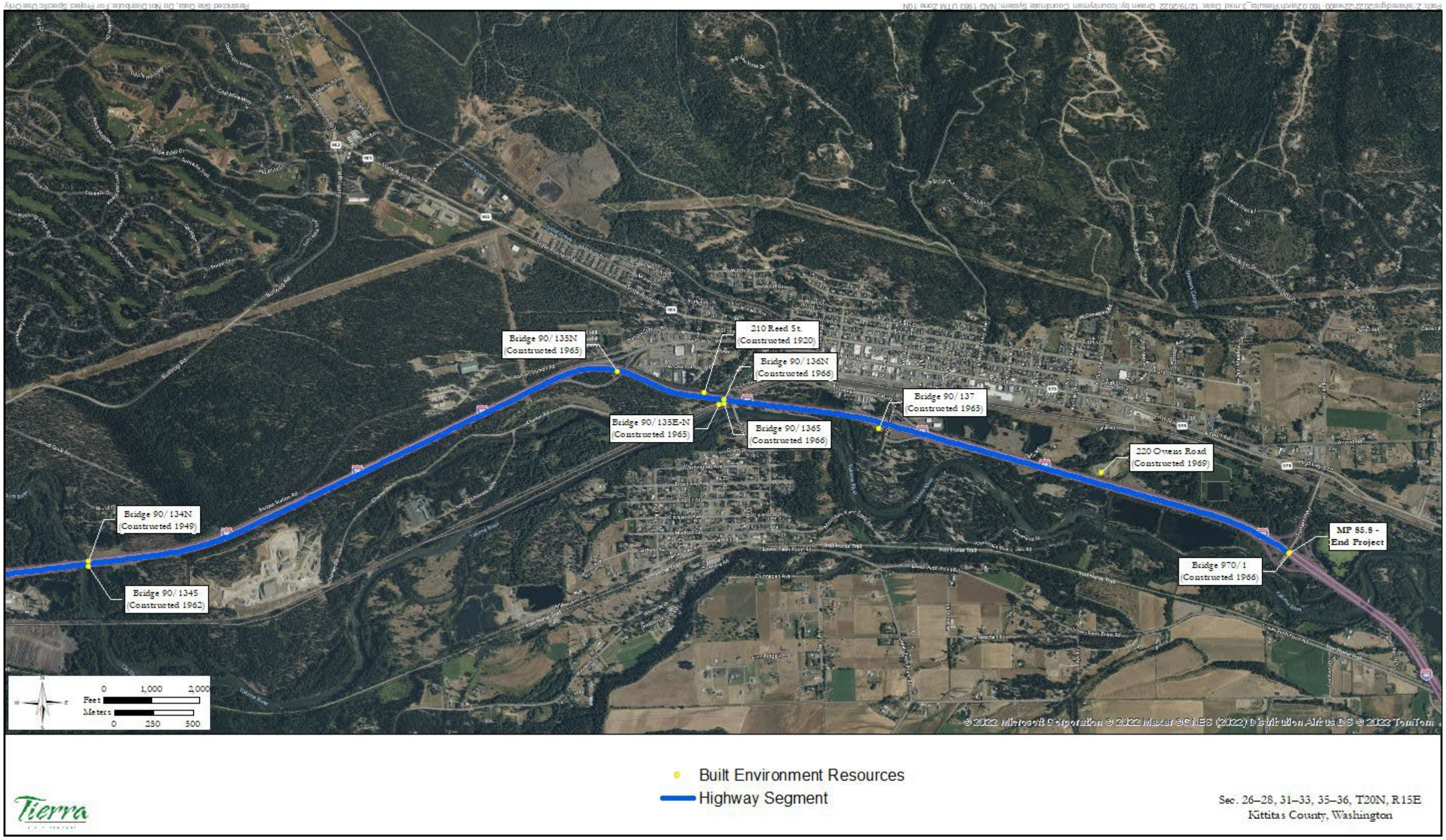


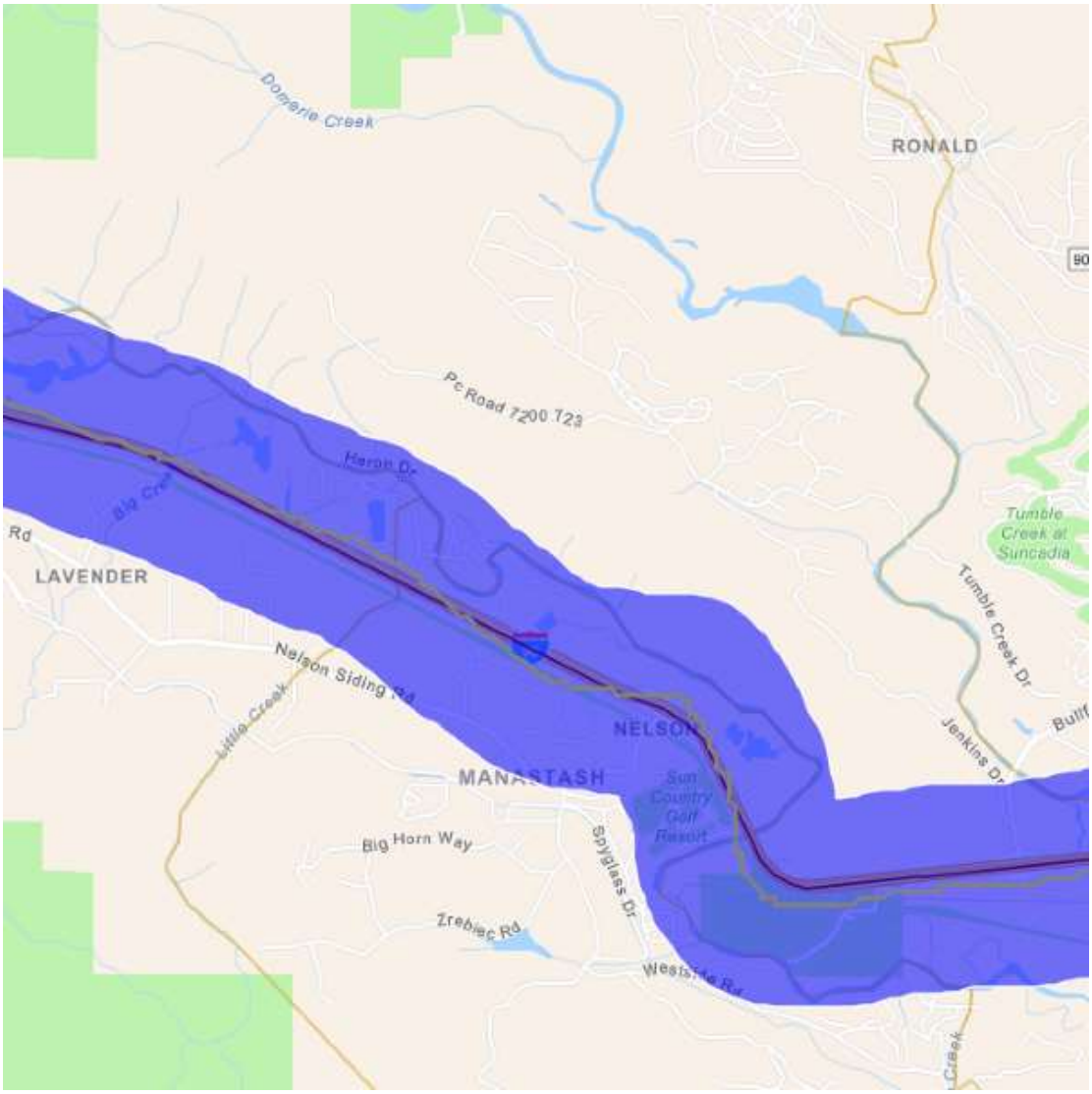
Figure B.3 Listing of historic properties associated with the API, segment 3.

APPENDIX D

FHWA Screening Tool for Equity Analysis of Projects (STEAP) Data

Screening Tool for Equity Analysis of Projects (STEAP)
Project Buffer Analysis Profile Report

Data Source: American Community Survey 2017-2021
Prepared by FHWA Office of Planning



Buffer Area: 12.19 square miles

Disadvantaged Area: 0.0 square miles

Percent Area Disadvantaged: 0.0%

Estimated Disadvantaged Population: 0

** The variables marked with an asterisk are estimated from Census Tract level data because the variables are not available at the Block Group level.*

12.19 Sq Mile Buffer Analysis Summary Report

Due to rounding, counts may not add up exactly to 100%

	Buffer Estimates	Percent
Sex		
Total:	1,019	100.0%
Male:	552	54.1%
Female:	468	45.9%
Race		
Total:	1,019	100.0%
White alone	872	85.5%
Black or African American alone	< 5	0.0%
American Indian and Alaska Native alone	< 5	0.4%
Asian alone	6	0.6%
Native Hawaiian and Other Pacific Islander alone	0	0.0%
Some other race alone	25	2.4%
Two or more races:	113	11.1%
Two races including Some other race	98	86.9%
Two races excluding Some other race, and three or more races	15	13.1%
American Indian And Alaska Native Alone Or In Combination With One Or More Other Races		
Total:	6	100.0%
American Indian And Alaska Native (Aian) Alone Or In Any Combination By Selected Tribal Groupings*		
Total Groups Tallied:	7	100.0%
American Indian tribes, specified:	7	94.8%
Cherokee	< 5	4.7%
Chippewa	0	0.0%
Navajo	0	0.0%
Sioux	0	0.0%
Hispanic Or Latino Origin By Specific Origin*		
Total:	1,019	100.0%
Not Hispanic or Latino	884	86.7%
Hispanic or Latino:	135	13.3%
Mexican	132	97.6%
Puerto Rican	< 5	0.1%

** The variables marked with an asterisk are estimated from Census Tract level data because the variables are not available at the Block Group level.*

	Buffer Estimates	Percent
Cuban	0	0.0%
Dominican (Dominican Republic)	0	0.0%
Central American:	0	0.0%
South American:	< 5	0.0%
Other Hispanic or Latino:	< 5	2.3%
Hispanic Or Latino Origin By Race		
Total:	1,019	100.0%
Not Hispanic or Latino:	884	86.7%
White alone	770	87.1%
Black or African American alone	< 5	0.0%
American Indian and Alaska Native alone	< 5	0.1%
Asian alone	6	0.7%
Native Hawaiian and Other Pacific Islander alone	0	0.0%
Some other race alone	9	1.0%
Two or more races:	98	11.1%
Hispanic or Latino:	135	13.3%
White alone	101	74.9%
Black or African American alone	0	0.0%
American Indian and Alaska Native alone	< 5	1.8%
Asian alone	0	0.0%
Native Hawaiian and Other Pacific Islander alone	0	0.0%
Some other race alone	16	11.8%
Two or more races:	16	11.5%
Nativity*		
Total:	1,019	100.0%
Native:	1,001	98.2%
Foreign born:	18	1.8%
Vehicle Availability*		
Total:	418	100.0%
No vehicle available	< 5	0.8%
1 vehicle available	63	15.0%
2 vehicles available	156	37.4%
3 vehicles available	82	19.5%
4 or more vehicles available	114	27.2%

** The variables marked with an asterisk are estimated from Census Tract level data because the variables are not available at the Block Group level.*

	Buffer Estimates	Percent
Household Type For Children Under 18 Years In Households (Excluding Householders, Spouses, And Unmarried Partners)*		
Total:	203	100.0%
Married-couple household	171	84.0%
Cohabiting couple household	17	8.2%
In male householder, no spouse/partner present household	5	2.6%
In female householder, no spouse/partner present household	10	5.1%
Household Type (Including Living Alone)		
Total:	418	100.0%
Family households:	297	71.1%
Married-couple family	253	85.1%
Other family:	44	14.9%
Nonfamily households:	121	28.9%
Householder living alone	100	83.0%
Householder not living alone	20	17.0%
Household Type By Household Size		
Total:	418	100.0%
Family households:	297	71.1%
2-person household	110	37.1%
3-person household	64	21.6%
4-person household	96	32.1%
5-person household	11	3.6%
6-person household	14	4.7%
7-or-more person household	< 5	0.8%
Nonfamily households:	121	28.9%
1-person household	100	83.0%
2-person household	18	14.8%
3-person household	< 5	2.1%
4-person household	< 5	0.0%
5-person household	0	0.0%
6-person household	0	0.0%
7-or-more person household	0	0.0%
Educational Attainment For The Population 25 Years And Over		
Total:	716	100.0%

** The variables marked with an asterisk are estimated from Census Tract level data because the variables are not available at the Block Group level.*

	Buffer Estimates	Percent
No schooling completed	< 5	0.1%
Nursery school	0	0.0%
Kindergarten	0	0.0%
1st grade	0	0.0%
2nd grade	0	0.0%
3rd grade	0	0.0%
4th grade	0	0.0%
5th grade	0	0.0%
6th grade	0	0.0%
7th grade	0	0.0%
8th grade	< 5	0.4%
9th grade	15	2.1%
10th grade	13	1.8%
11th grade	29	4.1%
12th grade, no diploma	13	1.8%
Regular high school diploma	138	19.2%
GED or alternative credential	38	5.3%
Some college, less than 1 year	51	7.1%
Some college, 1 or more years, no degree	105	14.7%
Associate's degree	82	11.5%
Bachelor's degree	189	26.5%
Master's degree	22	3.1%
Professional school degree	15	2.1%
Doctorate degree	< 5	0.4%
Poverty Status In The Past 12 Months By Sex*		
Total:	1,019	100.0%
Income in the past 12 months below poverty level:	110	10.8%
Male:	46	41.7%
Female:	64	58.3%
Income in the past 12 months at or above poverty level:	909	89.2%
Male:	502	55.2%
Female:	407	44.8%
Poverty Status In The Past 12 Months By Age*		
Total:	1,019	100.0%
Income in the past 12 months below poverty level:	110	10.8%

** The variables marked with an asterisk are estimated from Census Tract level data because the variables are not available at the Block Group level.*

	Buffer Estimates	Percent
Under 6 years	20	18.2%
6 to 11 years	9	8.4%
12 to 17 years	7	6.6%
18 to 59 years	64	57.6%
60 to 74 years	8	6.8%
75 to 84 years	< 5	2.6%
85 years and over	0	0.0%
Income in the past 12 months at or above poverty level:	909	89.2%
Under 6 years	49	5.3%
6 to 11 years	59	6.5%
12 to 17 years	59	6.5%
18 to 59 years	502	55.2%
60 to 74 years	189	20.8%
75 to 84 years	42	4.6%
85 years and over	9	1.0%
Population in Poverty by Race*		
Total:	1,019	100.0%
People in Poverty - White alone	88	8.6%
People in Poverty - Black or African American alone	< 5	0.0%
People in Poverty - American Indian and Alaska Native alone	0	0.0%
People in Poverty - Asian alone	0	0.0%
People in Poverty - Native Hawaiian and Other Pacific Islander alone	0	0.0%
People in Poverty - Some other race alone	0	0.0%
People in Poverty - Two or more races	28	2.7%
Age By Disability Status*		
Total:	1,019	100.0%
Under 19 years:	218	21.4%
With a disability:	9	4.2%
No disability:	209	96.0%
19 to 64 years:	618	60.7%
With a disability:	80	12.9%
No disability:	538	87.0%
65 years and over:	183	18.0%
With a disability:	77	42.2%
No disability:	106	57.7%

** The variables marked with an asterisk are estimated from Census Tract level data because the variables are not available at the Block Group level.*

	Buffer Estimates	Percent
Household Income In The Past 12 Months (In 2021 Inflation-Adjusted Dollars)		
Total:	418	100.0%
Less than $10,000	26	6.3%
$10,000 to $14,999	15	3.5%
$15,000 to $19,999	6	1.5%
$20,000 to $24,999	8	1.8%
$25,000 to $29,999	25	5.9%
$30,000 to $34,999	56	13.5%
$35,000 to $39,999	8	1.9%
$40,000 to $44,999	16	3.8%
$45,000 to $49,999	8	2.0%
$50,000 to $59,999	13	3.2%
$60,000 to $74,999	54	12.9%
$75,000 to $99,999	43	10.3%
$100,000 to $124,999	54	12.9%
$125,000 to $149,999	48	11.4%
$150,000 to $199,999	22	5.2%
$200,000 or more	17	4.0%
Veteran Status For The Civilian Population 18 Years And Over*		
Total:	816	100.0%
Veteran	63	7.7%
Nonveteran	753	92.3%
Employment Status For The Population 16 Years And Over		
Total:	852	100.0%
In labor force:	481	56.4%
Civilian labor force:	481	100.0%
Armed Forces	0	0.0%
Not in labor force	372	43.6%
Gross Rent As A Percentage Of Household Income In The Past 12 Months		
Total:	84	100.0%
Less than 10.0 percent	< 5	0.1%
10.0 to 14.9 percent	< 5	4.3%
15.0 to 19.9 percent	22	26.5%
20.0 to 24.9 percent	< 5	0.1%

** The variables marked with an asterisk are estimated from Census Tract level data because the variables are not available at the Block Group level.*

	Buffer Estimates	Percent
25.0 to 29.9 percent	8	9.8%
30.0 to 34.9 percent	6	6.8%
35.0 to 39.9 percent	< 5	1.1%
40.0 to 49.9 percent	< 5	5.7%
50.0 percent or more	13	16.0%
Not computed	25	29.5%
Mortgage Status By Selected Monthly Owner Costs As A Percentage Of Household Income In The Past 12 Months		
Total:	334	100.0%
Housing units with a mortgage:	222	66.6%
Less than 10.0 percent	22	9.8%
10.0 to 14.9 percent	13	5.9%
15.0 to 19.9 percent	56	25.2%
20.0 to 24.9 percent	9	4.1%
25.0 to 29.9 percent	51	23.0%
30.0 to 34.9 percent	6	2.6%
35.0 to 39.9 percent	5	2.3%
40.0 to 49.9 percent	< 5	0.5%
50.0 percent or more	59	26.6%
Not computed	0	0.0%
Housing units without a mortgage:	112	33.4%
Less than 10.0 percent	44	39.5%
10.0 to 14.9 percent	19	16.6%
15.0 to 19.9 percent	10	8.7%
20.0 to 24.9 percent	21	18.8%
25.0 to 29.9 percent	< 5	3.1%
30.0 to 34.9 percent	< 5	2.6%
35.0 to 39.9 percent	< 5	3.8%
40.0 to 49.9 percent	< 5	1.6%
50.0 percent or more	6	5.4%
Not computed	0	0.0%
Monthly Housing Costs*		
Total:	438	100.0%
Less than $100	< 5	0.5%
$100 to $199	< 5	0.5%

** The variables marked with an asterisk are estimated from Census Tract level data because the variables are not available at the Block Group level.*

	Buffer Estimates	Percent
$200 to $299	20	4.5%
$300 to $399	13	2.9%
$400 to $499	25	5.7%
$500 to $599	25	5.7%
$600 to $699	9	2.1%
$700 to $799	22	5.0%
$800 to $899	10	2.2%
$900 to $999	15	3.4%
$1,000 to $1,499	106	24.3%
$1,500 to $1,999	64	14.7%
$2,000 to $2,499	32	7.4%
$2,500 to $2,999	12	2.7%
$3,000 or more	69	15.8%
No cash rent	12	2.6%
Computers In Household		
Total:	418	100.0%
Has one or more types of computing devices:	397	95.1%
Desktop or laptop	366	92.0%
Smartphone, tablet or other portable wireless computer or other computer	386	97.2%
No Computer	21	4.9%
Internet Subscriptions In Household		
Total:	418	100.0%
With an Internet subscription	349	83.6%
Dial-up alone	0	0.0%
Broadband such as cable, fiber optic, or DSL	229	65.5%
Satellite Internet service	76	21.7%
Other service	< 5	0.1%
Internet access without a subscription	13	3.2%
No Internet access	55	13.2%
Household Language By Household Limited English Speaking Status		
Total:	418	100.0%
English only	408	97.6%
Spanish:	9	2.1%
Limited English speaking household	0	0.0%

** The variables marked with an asterisk are estimated from Census Tract level data because the variables are not available at the Block Group level.*

	Buffer Estimates	Percent
Not a limited English speaking household	9	100.0%
Other Indo-European languages:	< 5	0.3%
Limited English speaking household	< 5	3.3%
Not a limited English speaking household	< 5	96.7%
Asian and Pacific Island languages:	0	0.0%
Limited English speaking household	0	0.0%
Not a limited English speaking household	0	0.0%
Other languages:	0	0.0%
Limited English speaking household	0	0.0%
Not a limited English speaking household	0	0.0%

** The variables marked with an asterisk are estimated from Census Tract level data because the variables are not available at the Block Group level.*

APPENDIX E

EJ Screen Results

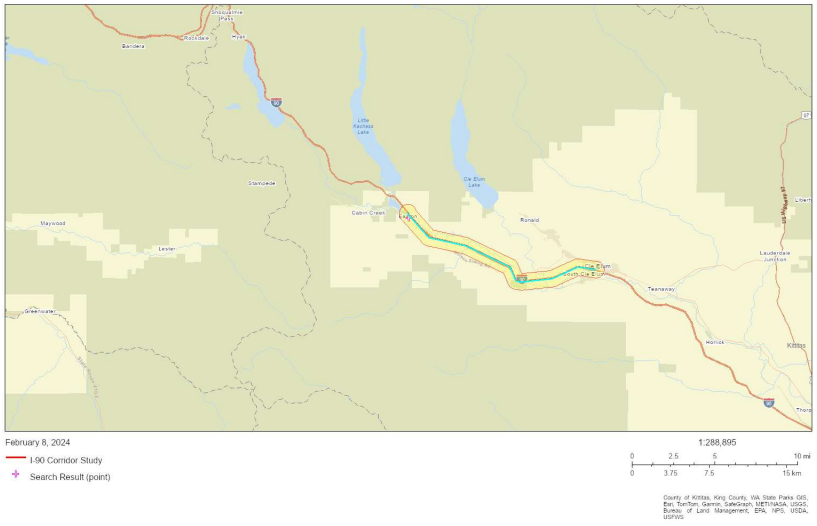
EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Kittitas County, WA

.5 miles Ring around the Corridor
Population: 3,205
Area in square miles: 13.97

A3 Landscape



LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
No language data available.	

COMMUNITY INFORMATION

- Low income: 35 percent
- People of color: 18 percent
- Less than high school education: 15 percent
- Limited English households: 0 percent
- Unemployment: 4 percent
- Persons with disabilities: 20 percent
- Male: 52 percent
- Female: 48 percent
- 83 years — Average life expectancy
- $39,419 — Per capita income
- Number of households: 1,374
- Owner occupied: 72 percent

BREAKDOWN BY RACE

- White: 82%
- Black: 0%
- American Indian: 0%
- Asian: 0%
- Hawaiian/Pacific Islander: 0%
- Other race: 4%
- Two or more races: 6%
- Hispanic: 8%

BREAKDOWN BY AGE

From Ages 1 to 4	3%
From Ages 1 to 18	19%
From Ages 18 and up	81%
From Ages 65 and up	18%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	0%
Speak Other Indo-European Languages	100%
Speak Asian-Pacific Island Languages	0%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

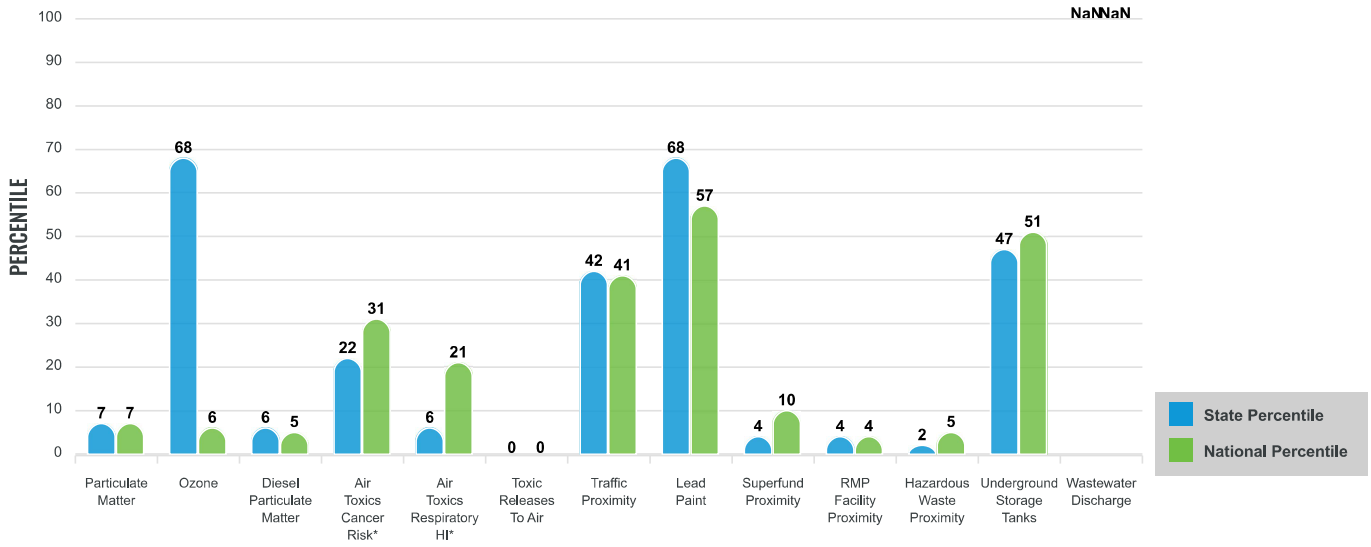
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

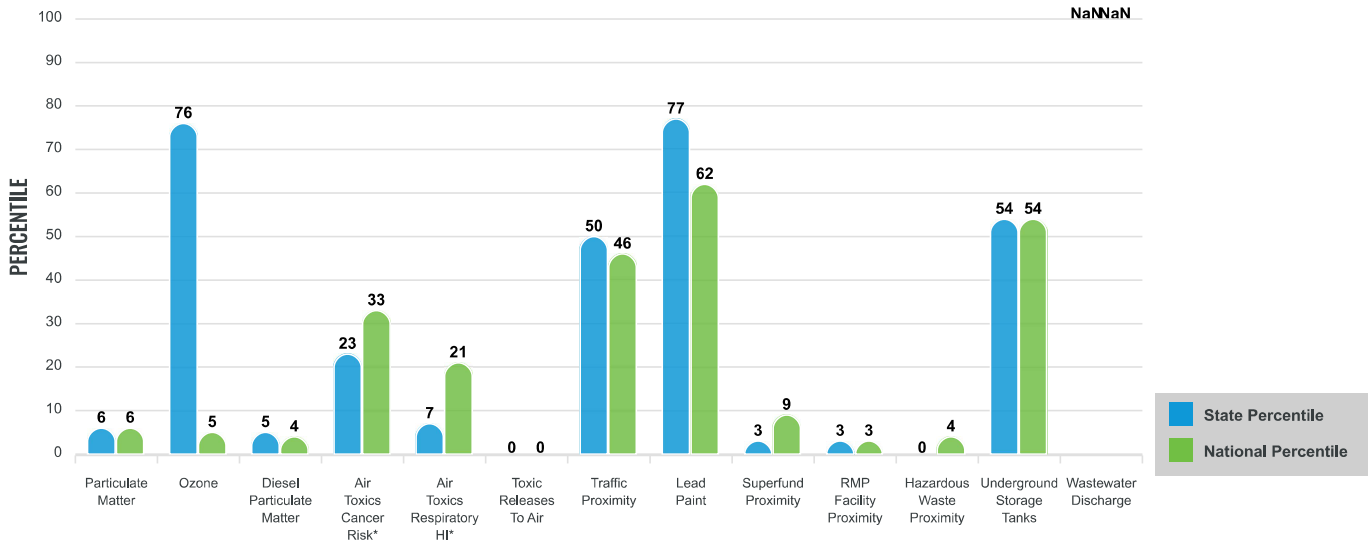
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for .5 miles Ring around the Corridor

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter (µg/m^3)	5.11	7.02	3	8.08	3
Ozone (ppb)	51.5	49.8	65	61.6	3
Diesel Particulate Matter (µg/m^3)	0.0437	0.355	4	0.261	3
Air Toxics Cancer Risk* (lifetime risk per million)	20	27	2	25	5
Air Toxics Respiratory HI*	0.2	0.39	1	0.31	4
Toxic Releases to Air	0.001	1,800	2	4,600	1
Traffic Proximity (daily traffic count/distance to road)	38	190	33	210	34
Lead Paint (% Pre-1960 Housing)	0.31	0.23	70	0.3	58
Superfund Proximity (site count/km distance)	0.013	0.18	3	0.13	7
RMP Facility Proximity (facility count/km distance)	0.025	0.4	2	0.43	2
Hazardous Waste Proximity (facility count/km distance)	0.027	1.6	1	1.9	3
Underground Storage Tanks (count/km^2)	1.4	6.3	47	3.9	53
Wastewater Discharge (toxicity-weighted concentration/m distance)	N/A	0.024	N/A	22	N/A
SOCIOECONOMIC INDICATORS					
Demographic Index	27%	28%	54	35%	45
Supplemental Demographic Index	14%	12%	70	14%	56
People of Color	18%	32%	30	39%	35
Low Income	35%	24%	76	31%	63
Unemployment Rate	4%	5%	52	6%	51
Limited English Speaking Households	0%	4%	0	5%	0
Less Than High School Education	15%	8%	84	12%	72
Under Age 5	3%	6%	32	6%	34
Over Age 64	18%	16%	64	17%	61
Low Life Expectancy	15%	18%	16	20%	12

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund	0
Hazardous Waste, Treatment, Storage, and Disposal Facilities	0
Water Dischargers	16
Air Pollution	0
Brownfields	1
Toxic Release Inventory	0

Other community features within defined area:

Schools	2
Hospitals	1
Places of Worship	0

Other environmental data:

Air Non-attainment	No
Impaired Waters	Yes

Selected location contains American Indian Reservation Lands*	No
Selected location contains a "Justice40 (CEJST)" disadvantaged community	No
Selected location contains an EPA IRA disadvantaged community	Yes

Report for .5 miles Ring around the Corridor

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	15%	18%	16	20%	12
Heart Disease	7	5.3	84	6.1	67
Asthma	10.8	10.5	60	10	75
Cancer	7.7	6.3	82	6.1	82
Persons with Disabilities	19.2%	13.1%	86	13.4%	83

CLIMATE INDICATORS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	36%	11%	93	12%	93
Wildfire Risk	36%	12%	86	14%	84

CRITICAL SERVICE GAPS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	16%	9%	82	14%	65
Lack of Health Insurance	9%	6%	76	9%	61
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	Yes	N/A	N/A	N/A	N/A

Report for .5 miles Ring around the Corridor

APPENDIX F

Detailed Evaluation Worksheets for Each Alternative

Alternative 1 - Widen I-90 on outside

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Safety Improve overall safety along I-90 and adjacent roadways	**Increase in Safety on I-90** -Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Moderately increases existing condition safety 1 – Does not increase existing condition safety	2	Provides an opportunity to update existing road to current design standards
	Evacuation/Emergency Routes -Does the proposed alternative provide additional routes?	3 – Increases emergency/evacuation routes 2 – Moderately increases emergency/evacuation routes 1 – Does not increase emergency/evacuation routes	1	Same routes will be used
	Increase in Safety on Adjacent Roadways -Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Does not increase existing condition safety 1 – Decreases safety along adjacent roads	3	May divert traffic currently using local roads as bypass, potentially increasing safety
	Emergency Response -Does the alternative decrease response times for emergency responders?	3 – Decreases emergency response times 2 – No impacts to emergency response times 1 – Increases emergency response times	3	More lanes allow additional space for vehicles to pull over to make way for emergency vehicles
	Public Level of Concern for Safety - Does the alternative change conditions for residents along the proposed route?	3 – Increases safety along local roads 2 – Does not change existing condition safety 1 – Decreases safety due to increased traffic	3	Increased capacity on I-90 may divert current bypass traffic on local roadways thus providing a safer environment for residents
Transportation Demand Enhance mobility and connectivity on I-90 for passenger vehicles, emergency vehicles, transit, and active modes and provide support for increased throughput	**Accommodates Active Transportation Modes** -Does the alternative accommodate active transportation?	3 – Includes low stress nonmotorized facilities 2 – Includes moderate stress nonmotorized facilities 1 – Includes high stress nonmotorized facilities	1	High speed, high stress environment
	Provides Congestion Relief for General Purpose (GP) Vehicles/Trucks -Does the alternative provide congestion relief for GP vehicles and trucks?	3 – Congestion relief for GP vehicles/trucks (greater than 25%) 2 – Some congestion relief for GP vehicles/trucks (5-25%) 1 – No congestion relief (less than 5% or net increase in congestion)	3	50% more capacity
	Provides Congestion Relief for Transit (Wenatchee Valley Shuttle, Kittitas County Connector, Hope Source)? -Does the alternative provide congestion relief for transit	3 – Congestion relief for HOV/transit (greater than 15%) 2 – Some congestion relief for HOV/transit (1-15%) 1 – No congestion relief or net increase in congestion	3	50% more capacity
	Effects on Adjacent Roadways -Does the alternative improve vehicular mobility on County arterial roadways?	3 – Improves vehicular mobility on arterial streets 2 – Provides some vehicular mobility improvements on arterial streets 1 – Does not improve vehicular mobility on arterial streets	3	Large benefit by reducing diverted traffic on City/County parallel bypass routes
	Increases Person Throughput (Capacity Increase) -Does the alternative increase person throughput?	3 – Increases person throughput 2 – Moderately increases person throughput 1 – Does not increase person throughput	3	50% more capacity
	Complimentary to Local and Tribal Planning -Is the alternative complementary to local and tribal planning efforts, including land use plans and transportation plans?	3 – Complements local planning efforts 2 – Partially complements local planning efforts 1 – Does not complement local planning efforts	3	Compatible with local planning efforts/desire from Upper County constituents to reduce diverted traffic off I-90
	Public Level of Concern Regarding Access to Driveways and Local Circulation -Does the alternative improve local driveway and community access?	3 – Increases community access and circulation 2 – Does not affect current access and circulation 1 – Decreases community access and circulation	3	Increased capacity on I-90 will divert current bypass traffic on local roadways thus providing easier access for residents
Freight Mobility Support economic vitality through reliable and efficient freight movement and access to major employers	**Increases Freight Throughput (West to East I-90)** -Does the alternative increase freight throughput on I-90?	3 – Increases freight throughput 2 – Moderately increases freight throughput 1 – Does not increase freight throughput	3	50% more capacity will provide increased truck movement
	Provide Additional Freight Management Options During Road Closures (freight parking, designated alternate routes) -Does the alternative increase freight management options?	3 – Increases freight management options 2 – Moderately increases freight management options 1 – Does not increase freight management options	1	Does not provide alternative options for freight
	Increase Freight Reliability (Localized Deliveries/Freight Options) -Does the alternative increase freight reliability?	3 – Improves freight reliability 2 – Partially improves freight reliability 1 – Does not improve freight reliability	3	Greater throughput allows for less delay in local freight access

Alternative 1 - Widen I-90 on outside

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Environmental Enable environmental restoration and ecosystem resiliency along I-90 connecting habitats, hydrological features and animal populations	**Increases Aquatic Resources Restoration Potential** -Does the alternative have the potential to improve environmental functions of aquatic resources (e.g., wetlands, rivers, streams) by improving fish passage, access to habitat, and reduce impacts to river hydraulics and geomorphology, etc.?	3 – Improves quality of all aquatic resources 2 – Improves quality of some aquatic resources 1 – Does not restore any aquatic resources	2	Has the potential to correct fish passage barriers. Likely impacts aquatic resources within construction limits
	Improves Wildlife Connectivity -Does the alternative improve the availability of wildlife habitat and connectivity?	3- Improves wildlife connectivity 2- Moderately improves wildlife connectivity 1 - Does not improve wildlife connectivity	2	Has the potential to create wildlife connectivity structures
	Increases Ecosystem Resiliency -Does the alternative increase resiliency against the impacts of climate change?	3 – Increases resiliency by reducing risks associated with extreme river flood events as an impact of climate change 2 – Some improvements for resiliency by partially reducing risks associated with extreme river flood events as an impact of climate change 1 – Does not increase resiliency by not reducing risks the impacts associated with extreme river flood events as an impact of climate change	2	Infrastructure improvements have the potential to correct any undersized drainage structures which may contribute to flooding events
	Considers Long Term Impacts to Endangered Species Act (ESA) Listed Species and Designated Critical Habitats -Does the alternative have long term impacts on ESA listed species or designated critical habitats?	3 - Improves conditions for ESA listed species and designated critical habitats 2 - Does not improve or have long term impacts to ESA listed species and designated critical habitats 1 - Has potential to long term impacts ESA listed species and designated critical habitats	1	Has potential for short term impacts during construction (in-water work) to ESA listed fish species and may require timing restrictions for northern spotted owls (PHS buffer for pair overlaps I-90 buffer) and marbled murrelet habitat has not been assessed. Widening could result in needing to clear lands that may support ESA listed species. This desktop assessment assumes no additional impacts to terrestrial species during construction; however, further assessment will be required if this alternative moves forward to confirm this.
	Risk to Cultural/Historical Sites and/or Park and Recreational Facilities -Does the alternative have a higher risk of impacting cultural and/or historical sites or park and recreational resources?	3 - Alternative has a low risk of impacting cultural/historic places or park/recreational facilities 2- Alternative has a medium risk of impacting cultural/historic places or park/recreational facilities 1 - Alternative has a high risk of impacting cultural/historic places or park/recreational facilities	2	Trails and potential historic sites are located within close proximity to the existing right of way
Resiliency Improve local roads and I-90 system resiliency	**Reduces the Risk of Infrastructure Failures** -Does the alternative reduce the risk of infrastructure failure by addressing erosion and channel migration?	3 – Removes risks from erosion/channel migration 2 – Reduces risks from erosion/channel migration 1 – Does not address erosion/channel migration	3	New structures and culverts would be required and built to minimize/reduce risk
	Reduces the Risk of Infrastructure Failures due to Changing Climate? -Does the alternative increase resiliency by enhancing the ability to withstand, respond to and recover from extreme weather events (i.e. flood risk and snow melt)?	3 – Improves risk from climate change 2 – Moderately improves risk from climate change 1 – Does not improves risk from climate change	2	Provides the opportunity to widen existing pipes and structures to rain events
	Susceptibility to Road Closures/Conditions -Does the alternative decrease the susceptibility to road closures (snow, wildfires, crashes)?	3 – Significantly decreases roadway susceptibility 2 – Moderately decreases susceptibility 1 – Does not decrease susceptibility	1	Current roadway will be susceptible to natural and human disruptions
	Reduces the Risk of Infrastructure Failures due to Seismic Activity -Does the alternative increase resiliency of I-90 crossings by enhancing the ability to withstand seismic activity?	3 – Removes risk from seismic activity 2 – Reduces risk from seismic activity 1 – Does not address risk from seismic activity	3	Provides an opportunity to update existing structures to meet current seismic requirements
	Minimizes Business and Residential Impacts from Displacements -Does the alternative minimize the potential business and residential impacts and displacements, especially for environmental justice (EJ) populations?	3 – No impacts or displacements 2 – Minimal impacts and displacements (less than 5 residential structures) 1 – Moderate to high impacts and displacements (more than 5 residential structures, 1 or more multi-family, and 1 or more government service)	2	One residential parcel may be impacted, no displacements

Alternative 1 - Widen I-90 on outside

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Equity/Inclusion Support Equitable Outcomes	**Construction of Project Provides 40% Benefit to Disadvantaged Communities** -Project area is not defined as a Justice40 disadvantaged community, but does the alternative provide meaningful, direct benefit to DBE businesses and increase DBE workforce capacity?	3 - Greatest opportunity to disadvantaged communities (60%) 2 - Meets minimum opportunity to disadvantaged communities (40%) 1 - Does not provide benefit to disadvantaged communities (<40%)	3	Assumes DBE-centric construction contracts and collaborations with Community Colleges and Trade Schools to train local workers. Provides benefit to EJ population in Ellensburg that commutes through corridor
	Minimizes Environmental Exposures -Does the alternative contribute new environmental hazards or pollution sources?	3 – Improves/reduces environmental hazards or pollution sources 2 – Partially improves environmental hazards and/or contributes minimal new pollution 1 – Contributes new environmental hazards or pollution sources	2	Despite an increase in vehicles over time, air quality improvements would occur from technology improvements and reduced idling/congestion
Relative Cost of Alternatives	**Planning-Level Cost Comparison** -Does the alternative have higher planning-level costs compared to the other alternatives?	3 – Planning-level cost is lower (under $20 million) 2 – Planning-level cost is moderate ($20 to $100 million) 1 – Planning-level cost is higher (over $100 million)	1	Interstate construction with 20+ structures
	Preservation Cost (for WSDOT or County) -Does the alternative create a higher demand/response maintenance cost compared to other alternatives?	3 – Maintenance & Operations cost is lower 2 – Maintenance & Operations cost is moderate 1 – Maintenance & Operations cost is higher	2	This would extend the life of the roadway (Reset to the overall roadway life cycle)
	Maintenance and Operations Cost -Does the alternative require additional maintenance and operational coordination compared to the other alternatives?	3 – Maintenance & Operations cost is lower 2 – Maintenance & Operations cost is moderate 1 – Maintenance & Operations cost is higher	2	This is an extension of an existing service area, in lieu of a whole new roadway

Alternative 2 - Add new lane (each direction) within existing median

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Safety Improve overall safety along I-90 and adjacent roadways	**Increase in Safety on I-90** -Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Moderately increases existing condition safety 1 – Does not increase existing condition safety	2	Provides an opportunity to update existing roadways to current design standards
	Evacuation/Emergency Routes -Does the proposed alternative provide additional routes?	3 – Increases emergency/evacuation routes 2 – Moderately increases emergency/evacuation routes 1 – Does not increase emergency/evacuation routes	1	Same routes will be used
	Increase in Safety on Adjacent Roadways -Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Does not increase existing condition safety 1 – Decreases safety along adjacent roads	3	Will divert traffic currently using local roads as bypass, potentially increasing safety
	Emergency Response -Does the alternative decrease response times for emergency responders?	3 – Decreases emergency response times 2 – No impacts to emergency response times 1 – Increases emergency response times	3	More lanes allow additional space for vehicles to pull over to make way for emergency vehicles
	Public Level of Concern for Safety - Does the alternative change conditions for residents along the proposed route?	3 – Increases safety along local roads 2 – Does not change existing condition safety 1 – Decreases safety due to increased traffic	3	Increased capacity on I-90 may divert current bypass traffic on local roadways thus providing a safer environment for residents
Transportation Demand Enhance mobility and connectivity on I-90 for passenger vehicles, emergency vehicles, transit, and active modes and provide support for increased throughput	**Accommodates Active Transportation Modes** -Does the alternative accommodate active transportation?	3 – Includes low stress nonmotorized facilities 2 – Includes moderate stress nonmotorized facilities 1 – Includes high stress nonmotorized facilities	1	High speed, high stress environment
	Provides Congestion Relief for General Purpose (GP) Vehicles/Trucks -Does the alternative provide congestion relief for GP vehicles and trucks?	3 – Congestion relief for GP vehicles/trucks (greater than 25%) 2 – Some congestion relief for GP vehicles/trucks (5-25%) 1 – No congestion relief (less than 5% or net increase in congestion)	3	50% more capacity
	Provides Congestion Relief for Transit (Wenatchee Valley Shuttle, Kittitas County Connector, Hope Source)? -Does the alternative provide congestion relief for transit	3 – Congestion relief for HOV/transit (greater than 15%) 2 – Some congestion relief for HOV/transit (1-15%) 1 – No congestion relief or net increase in congestion	3	50% more capacity
	Effects on Adjacent Roadways -Does the alternative improve vehicular mobility on County arterial roadways?	3 – Improves vehicular mobility on arterial streets 2 – Provides some vehicular mobility improvements on arterial streets 1 – Does not improve vehicular mobility on arterial streets	3	Large benefit by reducing diverted traffic on City/County parallel bypass routes
	Increases Person Throughput (Capacity Increase) -Does the alternative increase person throughput?	3 – Increases person throughput 2 – Moderately increases person throughput 1 – Does not increase person throughput	3	50% more capacity
	Complimentary to Local and Tribal Planning -Is the alternative complementary to local and tribal planning efforts, including land use plans and transportation plans?	3 – Complements local planning efforts 2 – Partially complements local planning efforts 1 – Does not complement local planning efforts	3	Compatible with local planning efforts/desire from Upper County constituents to reduce diverted traffic off I-90
	Public Level of Concern Regarding Access to Driveways and Local Circulation -Does the alternative improve local driveway and community access?	3 – Increases community access and circulation 2 – Does not affect current access and circulation 1 – Decreases community access and circulation	3	Increased capacity on I-90 will divert current bypass traffic on local roadways thus providing easier access for residents
Freight Mobility Support economic vitality through reliable and efficient freight movement and access to major employers	**Increases Freight Throughput (West to East I-90)** -Does the alternative increase freight throughput on I-90?	3 – Increases freight throughput 2 – Moderately increases freight throughput 1 – Does not increase freight throughput	3	50% more capacity will provide increased truck movement
	Provide Additional Freight Management Options During Road Closures (freight parking, designated alternate routes) -Does the alternative increase freight management options?	3 – Increases freight management options 2 – Moderately increases freight management options 1 – Does not increase freight management options	1	Does not provide alternative options for freight

Alternative 2 - Add new lane (each direction) within existing median

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
	Increase Freight Reliability (Localized Deliveries/Freight Options) -Does the alternative increase freight reliability?	3 – Improves freight reliability 2 – Partially improves freight reliability 1 – Does not improve freight reliability	3	Greater throughput allows for less delay in local freight access

Alternative 2 - Add new lane (each direction) within existing median

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Environmental Enable environmental restoration and ecosystem resiliency along I-90 connecting habitats, hydrological features and animal populations	**Increases Aquatic Resources Restoration Potential** -Does the alternative have the potential to improve environmental functions of aquatic resources (e.g., wetlands, rivers, streams) by improving fish passage, access to habitat, and reduce impacts to river hydraulics and geomorphology, etc.?	3 – Improves quality of all aquatic resources 2 – Improves quality of some aquatic resources 1 – Does not restore any aquatic resources	2	Has the potential to correct fish passage barriers. Likely impacts aquatic resources within construction limits
	Improves Wildlife Connectivity -Does the alternative improve the availability of wildlife habitat and connectivity?	3- Improves wildlife connectivity 2- Moderately improves wildlife connectivity 1 - Does not improve wildlife connectivity	2	Has the potential to create wildlife connectivity structures
	Increases Ecosystem Resiliency -Does the alternative increase resiliency against the impacts of climate change?	3 – Increases resiliency by reducing risks associated with extreme river flood events as an impact of climate change 2 – Some improvements for resiliency by partially reducing risks associated with extreme river flood events as an impact of climate change 1 – Does not increase resiliency by not reducing risks the impacts associated with extreme river flood events as an impact of climate change	2	Infrastructure improvements have the potential to correct any undersized drainage structures which may contribute to flooding events
	Considers Long Term Impacts to Endangered Species Act (ESA) Listed Species and Designated Critical Habitats -Does the alternative have long term impacts on ESA listed species or designated critical habitats?	3 - Improves conditions for ESA listed species and designated critical habitats 2 - Does not improve or have long term impacts to ESA listed species and designated critical habitats 1 - Has potential to long term impacts ESA listed species and designated critical habitats	2	Has potential for short term impacts during construction (in-water work) to ESA listed fish species and may require timing restrictions for northern spotted owls (PHS buffer for pair overlaps I-90 buffer) and marbled murrelet habitat has not been assessed. This desktop assessment assumes no additional impacts to terrestrial species during construction; however, further assessment will be required if this alternative moves forward to confirm this.
	Risk to Cultural/Historical Sites and/or Park and Recreational Facilities -Does the alternative have a higher risk of impacting cultural and/or historical sites or park and recreational resources?	3 - Alternative has a low risk of impacting cultural/historic places or park/recreational facilities 2- Alternative has a medium risk of impacting cultural/historic places or park/recreational facilities 1 - Alternative has a high risk of impacting cultural/historic places or park/recreational facilities	3	No impacts, within median
Resiliency Improve local roads and I-90 system resiliency	**Reduces the Risk of Infrastructure Failures** -Does the alternative reduce the risk of infrastructure failure by addressing erosion and channel migration?	3 – Removes risks from erosion/channel migration 2 – Reduces risks from erosion/channel migration 1 – Does not address erosion/channel migration	3	New structures and culverts would be required and built to minimize/reduce risk
	Reduces the Risk of Infrastructure Failures due to Changing Climate? -Does the alternative increase resiliency by enhancing the ability to withstand, respond to and recover from extreme weather events (i.e. flood risk and snow melt)?	3 – Improves risk from climate change 2 – Moderately improves risk from climate change 1 – Does not improves risk from climate change	2	Provides the opportunity to widen existing pipes and structures to rain events
	Susceptibility to Road Closures/Conditions -Does the alternative decrease the susceptibility to road closures (snow, wildfires, crashes)?	3 – Significantly decreases roadway susceptibility 2 – Moderately decreases susceptibility 1 – Does not decrease susceptibility	1	Current roadway will be susceptible to natural and human disruptions
	Reduces the Risk of Infrastructure Failures due to Seismic Activity -Does the alternative increase resiliency of I-90 crossings by enhancing the ability to withstand seismic activity?	3 – Removes risk from seismic activity 2 – Reduces risk from seismic activity 1 – Does not address risk from seismic activity	3	Provides an opportunity to update existing structures to meet current seismic requirements
	Minimizes Business and Residential Impacts from Displacements -Does the alternative minimize the potential business and residential impacts and displacements, especially for environmental justice (EJ) populations?	3 – No impacts or displacements 2 – Minimal impacts and displacements (less than 5 residential structures) 1 – Moderate to high impacts and displacements (more than 5 residential structures, 1 or more multi-family, and 1 or more government service)	3	Assumes no displacements

Alternative 2 - Add new lane (each direction) within existing median

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Equity/Inclusion Support Equitable Outcomes	**Construction of Project Provides 40% Benefit to Disadvantaged Communities** -Project area is not defined as a Justice40 disadvantaged community, but does the alternative provide meaningful, direct benefit to DBE businesses and increase DBE workforce capacity?	3 - Greatest opportunity to disadvantaged communities (60%) 2 - Meets minimum opportunity to disadvantaged communities (40%) 1 - Does not provide benefit to disadvantaged communities (<40%)	3	Assumes DBE-centric construction contracts and collaborations with Community Colleges and Trade Schools to train local workers. Provides benefit to EJ population in Ellensburg that commutes through corridor
	Minimizes Environmental Exposures -Does the alternative contribute new environmental hazards or pollution sources?	3 – Improves/reduces environmental hazards or pollution sources 2 – Partially improves environmental hazards and/or contributes minimal new pollution 1 – Contributes new environmental hazards or pollution sources	2	Despite an increase in vehicles over time, air quality improvements would occur from technology improvements and reduced idling/congestion
Relative Cost of Alternatives	**Planning-Level Cost Comparison** -Does the alternative have higher planning-level costs compared to the other alternatives?	3 – Planning-level cost is lower (under $20 million) 2 – Planning-level cost is moderate ($20 to $100 million) 1 – Planning-level cost is higher (over $100 million)	1	Interstate construction with 20+ structures
	Preservation Cost (for WSDOT or County) -Does the alternative create a higher demand/response maintenance cost compared to other alternatives?	3 – Maintenance & Operations cost is lower 2 – Maintenance & Operations cost is moderate 1 – Maintenance & Operations cost is higher	2	This would extend the life of the roadway (Reset to the overall roadway life cycle)
	Maintenance and Operations Cost -Does the alternative require additional maintenance and operational coordination compared to the other alternatives?	3 – Maintenance & Operations cost is lower 2 – Maintenance & Operations cost is moderate 1 – Maintenance & Operations cost is higher	2	This is an extension of an existing service area, in lieu of a whole new roadway

Alternative 3 - Add two new lanes within existing media (direction of two lanes would change based on peak demand)

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Safety Improve overall safety along I-90 and adjacent roadways	**Increase in Safety on I-90** -Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Moderately increases existing condition safety 1 – Does not increase existing condition safety	2	Provides an opportunity to update existing roadways to current design standards
	Evacuation/Emergency Routes -Does the proposed alternative provide additional routes?	3 – Increases emergency/evacuation routes 2 – Moderately increases emergency/evacuation routes 1 – Does not increase emergency/evacuation routes	3	Provides flexibility during emergency events
	Increase in Safety on Adjacent Roadways -Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Does not increase existing condition safety 1 – Decreases safety along adjacent roads	2	May divert traffic currently using local roads as bypass, potentially increasing safety
	Emergency Response -Does the alternative decrease response times for emergency responders?	3 – Decreases emergency response times 2 – No impacts to emergency response times 1 – Increases emergency response times	3	Allows for traffic diversion when emergency is in primary through lanes, thereby creating better response times for emergency vehicles
	Public Level of Concern for Safety - Does the alternative change conditions for residents along the proposed route?	3 – Increases safety along local roads 2 – Does not change existing condition safety 1 – Decreases safety due to increased traffic	3	May reduce vehicles using local access roads as a bypass since reversible lanes will accommodate peak traffic. May reduce speeds on local access roads
Transportation Demand Enhance mobility and connectivity on I-90 for passenger vehicles, emergency vehicles, transit, and active modes and provide support for increased throughput	**Accommodates Active Transportation Modes** -Does the alternative accommodate active transportation?	3 – Includes low stress nonmotorized facilities 2 – Includes moderate stress nonmotorized facilities 1 – Includes high stress nonmotorized facilities	1	High speed, high stress environment
	Provides Congestion Relief for General Purpose (GP) Vehicles/Trucks -Does the alternative provide congestion relief for GP vehicles and trucks?	3 – Congestion relief for GP vehicles/trucks (greater than 25%) 2 – Some congestion relief for GP vehicles/trucks (5-25%) 1 – No congestion relief (less than 5% or net increase in congestion)	3	100% more capacity in peak direction
	Provides Congestion Relief for Transit (Wenatchee Valley Shuttle, Kittitas County Connector, Hope Source)? -Does the alternative provide congestion relief for transit	3 – Congestion relief for HOV/transit (greater than 15%) 2 – Some congestion relief for HOV/transit (1-15%) 1 – No congestion relief or net increase in congestion	3	50% more capacity
	Effects on Adjacent Roadways -Does the alternative improve vehicular mobility on County arterial roadways?	3 – Improves vehicular mobility on arterial streets 2 – Provides some vehicular mobility improvements on arterial streets 1 – Does not improve vehicular mobility on arterial streets	3	Large benefit by reducing diverted traffic on City/County parallel by pass routes
	Increases Person Throughput (Capacity Increase) -Does the alternative increase person throughput?	3 – Increases person throughput 2 – Moderately increases person throughput 1 – Does not increase person throughput	3	100% more capacity in peak direction
	Complimentary to Local and Tribal Planning -Is the alternative complementary to local and tribal planning efforts, including land use plans and transportation plans?	3 – Complements local planning efforts 2 – Partially complements local planning efforts 1 – Does not complement local planning efforts	3	Compatible with local planning efforts/desire from Upper County constituents to reduce diverted traffic off I-90
	Public Level of Concern Regarding Access to Driveways and Local Circulation -Does the alternative improve local driveway and community access?	3 – Increases community access and circulation 2 – Does not affect current access and circulation 1 – Decreases community access and circulation	3	Increased capacity on I-90 will divert current bypass traffic on local roadways thus providing easier access for residents
Freight Mobility Support economic vitality through reliable and efficient freight movement and access to major employers	**Increases Freight Throughput (West to East I-90)** -Does the alternative increase freight throughput on I-90?	3 – Increases freight throughput 2 – Moderately increases freight throughput 1 – Does not increase freight throughput	3	Increases freight throughput during peak hours/peak direction
	Provide Additional Freight Management Options During Road Closures (freight parking, designated alternate routes) -Does the alternative increase freight management options?	3 – Increases freight management options 2 – Moderately increases freight management options 1 – Does not increase freight management options	1	Does not provide alternative options for freight

Alternative 3 - Add two new lanes within existing media (direction of two lanes would change based on peak demand)

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
	Increase Freight Reliability (Localized Deliveries/Freight Options) -Does the alternative increase freight reliability?	3 – Improves freight reliability 2 – Partially improves freight reliability 1 – Does not improve freight reliability	3	Greater throughput during peak times allows for less delay in local freight access

Alternative 3 - Add two new lanes within existing media (direction of two lanes would change based on peak demand)

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Environmental Enable environmental restoration and ecosystem resiliency along I-90 connecting habitats, hydrological features and animal populations	**Increases Aquatic Resources Restoration Potential** -Does the alternative have the potential to improve environmental functions of aquatic resources (e.g., wetlands, rivers, streams) by improving fish passage, access to habitat, and reduce impacts to river hydraulics and geomorphology, etc.?	3 – Improves quality of all aquatic resources 2 – Improves quality of some aquatic resources 1 – Does not restore any aquatic resources	2	Has the potential to correct fish passage barriers. Likely impacts aquatic resources within construction limits
	Improves Wildlife Connectivity -Does the alternative improve the availability of wildlife habitat and connectivity?	3- Improves wildlife connectivity 2- Moderately improves wildlife connectivity 1 - Does not improve wildlife connectivity	2	Has the potential to create wildlife connectivity structures
	Increases Ecosystem Resiliency -Does the alternative increase resiliency against the impacts of climate change?	3 – Increases resiliency by reducing risks associated with extreme river flood events as an impact of climate change 2 – Some improvements for resiliency by partially reducing risks associated with extreme river flood events as an impact of climate change 1 – Does not increase resiliency by not reducing risks the impacts associated with extreme river flood events as an impact of climate change	2	Infrastructure improvements have the potential to correct any undersized drainage structures which may contribute to flooding events
	Considers Long Term Impacts to Endangered Species Act (ESA) Listed Species and Designated Critical Habitats -Does the alternative have long term impacts on ESA listed species or designated critical habitats?	3 - Improves conditions for ESA listed species and designated critical habitats 2 - Does not improve or have long term impacts to ESA listed species and designated critical habitats 1 - Has potential to long term impacts ESA listed species and designated critical habitats	2	Has potential for short term impacts during construction (in-water work) to ESA listed fish species and may require timing restrictions for northern spotted owls (PHS buffer for pair overlaps I-90 buffer) and marbled murrelet habitat has not been assessed. This desktop assessment assumes no additional impacts to terrestrial species during construction; however, further assessment will be required if this alternative moves forward to confirm this.
	Risk to Cultural/Historical Sites and/or Park and Recreational Facilities -Does the alternative have a higher risk of impacting cultural and/or historical sites or park and recreational resources?	3 - Alternative has a low risk of impacting cultural/historic places or park/recreational facilities 2- Alternative has a medium risk of impacting cultural/historic places or park/recreational facilities 1 - Alternative has a high risk of impacting cultural/historic places or park/recreational facilities	3	No impacts, within median
Resiliency Improve local roads and I-90 system resiliency	**Reduces the Risk of Infrastructure Failures** -Does the alternative reduce the risk of infrastructure failure by addressing erosion and channel migration?	3 – Removes risks from erosion/channel migration 2 – Reduces risks from erosion/channel migration 1 – Does not address erosion/channel migration	3	New structures and culverts would be required and built to minimize/reduce risk
	Reduces the Risk of Infrastructure Failures due to Changing Climate? -Does the alternative increase resiliency by enhancing the ability to withstand, respond to and recover from extreme weather events (i.e. flood risk and snow melt)?	3 – Improves risk from climate change 2 – Moderately improves risk from climate change 1 – Does not improves risk from climate change	2	Provides the opportunity to widen existing pipes and structures to rain events
	Susceptibility to Road Closures/Conditions -Does the alternative decrease the susceptibility to road closures (snow, wildfires, crashes)?	3 – Significantly decreases roadway susceptibility 2 – Moderately decreases susceptibility 1 – Does not decrease susceptibility	1	Current roadway will be susceptible to natural and human disruptions
	Reduces the Risk of Infrastructure Failures due to Seismic Activity -Does the alternative increase resiliency of I-90 crossings by enhancing the ability to withstand seismic activity?	3 – Removes risk from seismic activity 2 – Reduces risk from seismic activity 1 – Does not address risk from seismic activity	3	Provides an opportunity to update existing structures to meet current seismic requirements
	Minimizes Business and Residential Impacts from Displacements -Does the alternative minimize the potential business and residential impacts and displacements, especially for environmental justice (EJ) populations?	3 – No impacts or displacements 2 – Minimal impacts and displacements (less than 5 residential structures) 1 – Moderate to high impacts and displacements (more than 5 residential structures, 1 or more multi-family, and 1 or more government service)	3	Assumes no displacements

Alternative 3 - Add two new lanes within existing media (direction of two lanes would change based on peak demand)

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Equity/Inclusion Support Equitable Outcomes	**Construction of Project Provides 40% Benefit to Disadvantaged Communities** -Project area is not defined as a Justice40 disadvantaged community, but does the alternative provide meaningful, direct benefit to DBE businesses and increase DBE workforce capacity?	3 - Greatest opportunity to disadvantaged communities (60%) 2 - Meets minimum opportunity to disadvantaged communities (40%) 1 - Does not provide benefit to disadvantaged communities (<40%)	3	Assumes DBE-centric construction contracts and collaborations with Community Colleges and Trade Schools to train local workers. Provides benefit to EJ population in Ellensburg that commutes through corridor
	Minimizes Environmental Exposures -Does the alternative contribute new environmental hazards or pollution sources?	3 – Improves/reduces environmental hazards or pollution sources 2 – Partially improves environmental hazards and/or contributes minimal new pollution 1 – Contributes new environmental hazards or pollution sources	2	Despite an increase in vehicles over time, air quality improvements would occur from technology improvements and reduced idling/congestion
Relative Cost of Alternatives	**Planning-Level Cost Comparison** -Does the alternative have higher planning-level costs compared to the other alternatives?	3 – Planning-level cost is lower (under $20 million) 2 – Planning-level cost is moderate ($20 to $100 million) 1 – Planning-level cost is higher (over $100 million)	1	Interstate construction with 20+ structures
	Preservation Cost (for WSDOT or County) -Does the alternative create a higher demand/response maintenance cost compared to other alternatives?	3 – Maintenance & Operations cost is lower 2 – Maintenance & Operations cost is moderate 1 – Maintenance & Operations cost is higher	2	This would extend the life of the roadway (Reset to the overall roadway life cycle)
	Maintenance and Operations Cost -Does the alternative require additional maintenance and operational coordination compared to the other alternatives?	3 – Maintenance & Operations cost is lower 2 – Maintenance & Operations cost is moderate 1 – Maintenance & Operations cost is higher	2	This is an extension of an existing service area, in lieu of a whole new roadway

Alternative 4a - North SR 903 (approx. 12 miles of new roadway)

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Safety Improve overall safety along I-90 and adjacent roadways	**Increase in Safety on I-90** -Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Moderately increases existing condition safety 1 – Does not increase existing condition safety	1	Does not have an effect on I-90
	Evacuation/Emergency Routes -Does the proposed alternative provide additional routes?	3 – Increases emergency/evacuation routes 2 – Moderately increases emergency/evacuation routes 1 – Does not increase emergency/evacuation routes	3	Provides additional access for Ronald residents
	Increase in Safety on Adjacent Roadways -Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Does not increase existing condition safety 1 – Decreases safety along adjacent roads	2	Increased traffic may result in increased crashes and other safety issues
	Emergency Response -Does the alternative decrease response times for emergency responders?	3 – Decreases emergency response times 2 – No impacts to emergency response times 1 – Increases emergency response times	3	May provide alternative access to Ronald residents
	Public Level of Concern for Safety - Does the alternative change conditions for residents along the proposed route?	3 – Increases safety along local roads 2 – Does not change existing condition safety 1 – Decreases safety due to increased traffic	2	Does not impact safety of local residents
Transportation Demand Enhance mobility and connectivity on I-90 for passenger vehicles, emergency vehicles, transit, and active modes and provide support for increased throughput	**Accommodates Active Transportation Modes** -Does the alternative accommodate active transportation?	3 – Includes low stress nonmotorized facilities 2 – Includes moderate stress nonmotorized facilities 1 – Includes high stress nonmotorized facilities	2	- New roadway is assumed to have standard County shoulders. This type of roadway would provide an opportunity to have active transportation features on a lower speed/volume roadway. - This could provide a connection from SR903 to Easton to the Palouse to Cascade Trail system not on I-90
	Provides Congestion Relief for General Purpose (GP) Vehicles/Trucks -Does the alternative provide congestion relief for GP vehicles and trucks?	3 – Congestion relief for GP vehicles/trucks (greater than 25%) 2 – Some congestion relief for GP vehicles/trucks (5-25%) 1 – No congestion relief (less than 5% or net increase in congestion)	2	While great increase in capacity, less I-90 related congestion relief due to routing away from I-90 (not easy to divert, but would likely capture much of the Salmon La Sac, Ronald, Roslyn, and perhaps Cle Elum/Suncadia traffic)
	Provides Congestion Relief for Transit (Wenatchee Valley Shuttle, Kittitas County Connector, Hope Source)? -Does the alternative provide congestion relief for transit	3 – Congestion relief for HOV/transit (greater than 15%) 2 – Some congestion relief for HOV/transit (1-15%) 1 – No congestion relief or net increase in congestion	1	Similar to above, but likely less transit benefit than I-90 capacity since there are very few transit options away from I-90
	Effects on Adjacent Roadways -Does the alternative improve vehicular mobility on County arterial roadways?	3 – Improves vehicular mobility on arterial streets 2 – Provides some vehicular mobility improvements on arterial streets 1 – Does not improve vehicular mobility on arterial streets	2	Some improvements, but may not capture I-90 diversion if congestion still occurs with this new route due to distance off of I-90 corridor
	Increases Person Throughput (Capacity Increase) -Does the alternative increase person throughput?	3 – Increases person throughput 2 – Moderately increases person throughput 1 – Does not increase person throughput	2	Some improvements, but may not capture I-90 diversion if congestion still occurs with this new route due to distance off of I-90 corridor
	Complimentary to Local and Tribal Planning -Is the alternative complementary to local and tribal planning efforts, including land use plans and transportation plans?	3 – Complements local planning efforts 2 – Partially complements local planning efforts 1 – Does not complement local planning efforts	2	May not be compatible with current planning but could provide needed alternative evacuation routes for Salmon La Sac/Ronald/Roslyn areas
	Public Level of Concern Regarding Access to Driveways and Local Circulation -Does the alternative improve local driveway and community access?	3 – Increases community access and circulation 2 – Does not affect current access and circulation 1 – Decreases community access and circulation	2	Current conditions do not indicate local residents will be impacted
Freight Mobility	**Increases Freight Throughput (West to East I-90)** -Does the alternative increase freight throughput on I-90?	3 – Increases freight throughput 2 – Moderately increases freight throughput 1 – Does not increase freight throughput	1	This is a large detour for I-90 freight mobility and a low probability of being used

Alternative 4a - North SR 903 (approx. 12 miles of new roadway)

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Freight Mobility Support economic vitality through reliable and efficient freight movement and access to major employers	**Provide Additional Freight Management Options During Road Closures (freight parking, designated alternate routes)** -Does the alternative increase freight management options?	3 – Increases freight management options 2 – Moderately increases freight management options 1 – Does not increase freight management options	1	Does not provide additional management options
	Increase Freight Reliability (Localized Deliveries/Freight Options) -Does the alternative increase freight reliability?	3 – Improves freight reliability 2 – Partially improves freight reliability 1 – Does not improve freight reliability	2	This allows local delivery access during congestion. Is a partial as it only impacts smaller community/economic areas of Ronald and Roslyn

Alternative 4a - North SR 903 (approx. 12 miles of new roadway)

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Environmental Enable environmental restoration and ecosystem resiliency along I-90 connecting habitats, hydrological features and animal populations	**Increases Aquatic Resources Restoration Potential** -Does the alternative have the potential to improve environmental functions of aquatic resources (e.g., wetlands, rivers, streams) by improving fish passage, access to habitat, and reduce impacts to river hydraulics and geomorphology, etc.?	3 – Improves quality of all aquatic resources 2 – Improves quality of some aquatic resources 1 – Does not restore any aquatic resources	1	The project allows for potential correction of one fish passage partial blockage. The project creates more disturbance in vegetated areas and the creation of a bridge over the Cle Elum River
	Improves Wildlife Connectivity -Does the alternative improve the availability of wildlife habitat and connectivity?	3- Improves wildlife connectivity 2- Moderately improves wildlife connectivity 1 - Does not improve wildlife connectivity	1	The Project does not improve wildlife connectivity and instead impacts it by constructing a road through designated wildlife corridors
	Increases Ecosystem Resiliency -Does the alternative increase resiliency against the impacts of climate change?	3 – Increases resiliency by reducing risks associated with extreme river flood events as an impact of climate change 2 – Some improvements for resiliency by partially reducing risks associated with extreme river flood events as an impact of climate change 1 – Does not increase resiliency by not reducing risks the impacts associated with extreme river flood events as an impact of climate change	1	The project would create additional PGIS in previously undisturbed areas
	Considers Long Term Impacts to Endangered Species Act (ESA) Listed Species and Designated Critical Habitats -Does the alternative have long term impacts on ESA listed species or designated critical habitats?	3 - Improves conditions for ESA listed species and designated critical habitats 2 - Does not improve or have long term impacts to ESA listed species and designated critical habitats 1 - Has potential to long term impacts ESA listed species and designated critical habitats	1	Has potential for short term impacts during construction (in-water work) to ESA listed fish species and may require timing restrictions for northern spotted owls and marbled murrelet. Widening could result in needing to clear lands that may support ESA listed species. Increased traffic noise may impact ESA listed species. This desktop assessment assumes no additional impacts to terrestrial species during construction; however, further assessment will be required if this alternative moves forward to confirm this.
	Risk to Cultural/Historical Sites and/or Park and Recreational Facilities -Does the alternative have a higher risk of impacting cultural and/or historical sites or park and recreational resources?	3 - Alternative has a low risk of impacting cultural/historic places or park/recreational facilities 2- Alternative has a medium risk of impacting cultural/historic places or park/recreational facilities 1 - Alternative has a high risk of impacting cultural/historic places or park/recreational facilities	2	A number of trails are located in the general area, depending on the exact corridor, they may be impacted
Resiliency Improve local roads and I-90 system resiliency	**Reduces the Risk of Infrastructure Failures** -Does the alternative reduce the risk of infrastructure failure by addressing erosion and channel migration?	3 – Removes risks from erosion/channel migration 2 – Reduces risks from erosion/channel migration 1 – Does not address erosion/channel migration	1	This new corridor would not have an affect on existing I-90 stream issues
	Reduces the Risk of Infrastructure Failures due to Changing Climate? -Does the alternative increase resiliency by enhancing the ability to withstand, respond to and recover from extreme weather events (i.e. flood risk and snow melt)?	3 – Improves risk from climate change 2 – Moderately improves risk from climate change 1 – Does not improves risk from climate change	1	No improvements identified
	Susceptibility to Road Closures/Conditions -Does the alternative decrease the susceptibility to road closures (snow, wildfires, crashes)?	3 – Significantly decreases roadway susceptibility 2 – Moderately decreases susceptibility 1 – Does not decrease susceptibility	2	Improves local access from North Cle Elum and Ronald if accidents occur on SR 903
	Reduces the Risk of Infrastructure Failures due to Seismic Activity -Does the alternative increase resiliency of I-90 crossings by enhancing the ability to withstand seismic activity?	3 – Removes risk from seismic activity 2 – Reduces risk from seismic activity 1 – Does not address risk from seismic activity	1	Does not have an effect on I-90 existing structures
	Minimizes Business and Residential Impacts from Displacements -Does the alternative minimize the potential business and residential impacts and displacements, especially for environmental justice (EJ) populations?	3 – No impacts or displacements 2 – Minimal impacts and displacements (less than 5 residential structures) 1 – Moderate to high impacts and displacements (more than 5 residential structures, 1 or more multi-family, and 1 or more government service)	1	Potential displacement of approx. 5 single-family structure impacts, 27 parcels, and 1 mobile home park. Some recreational businesses and governmental service properties impacts. Exact displacement numbers not available at this time

Alternative 4a - North SR 903 (approx. 12 miles of new roadway)

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Equity/Inclusion Support Equitable Outcomes	**Construction of Project Provides 40% Benefit to Disadvantaged Communities** -Project area is not defined as a Justice40 disadvantaged community, but does the alternative provide meaningful, direct benefit to DBE businesses and increase DBE workforce capacity?	3 - Greatest opportunity to disadvantaged communities (60%) 2 - Meets minimum opportunity to disadvantaged communities (40%) 1 - Does not provide benefit to disadvantaged communities (<40%)	3	Assumes DBE-centric construction contracts and collaborations with Community Colleges and Trade Schools to train local workers. Provides benefit to EJ population in Ellensburg that commutes through corridor
	Minimizes Environmental Exposures -Does the alternative contribute new environmental hazards or pollution sources?	3 – Improves/reduces environmental hazards or pollution sources 2 – Partially improves environmental hazards and/or contributes minimal new pollution 1 – Contributes new environmental hazards or pollution sources	2	Air quality improvements from traffic will decrease regardless of I-90 improvements due to technology improvements. New environmental hazards from new roadways will be introduced to a non-EJ population
Relative Cost of Alternatives	**Planning-Level Cost Comparison** -Does the alternative have higher planning-level costs compared to the other alternatives?	3 – Planning-level cost is lower (under $20 million) 2 – Planning-level cost is moderate ($20 to $100 million) 1 – Planning-level cost is higher (over $100 million)	1	Construction of new roadway and improvements to existing proposed route as well as surrounding local roads
	Preservation Cost (for WSDOT or County) -Does the alternative create a higher demand/response maintenance cost compared to other alternatives?	3 – Maintenance & Operations cost is lower 2 – Maintenance & Operations cost is moderate 1 – Maintenance & Operations cost is higher	1	it is a new roadway therefore would require all new maintenance plan and costs
	Maintenance and Operations Cost -Does the alternative require additional maintenance and operational coordination compared to the other alternatives?	3 – Maintenance & Operations cost is lower 2 – Maintenance & Operations cost is moderate 1 – Maintenance & Operations cost is higher	1	it is a new roadway therefore would require all new maintenance plan and costs

Alternative 4b - North Bullfrog Rd (approx. 10 miles of primarily new roadway)

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Safety Improve overall safety along I-90 and adjacent roadways	**Increase in Safety on I-90** -Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Moderately increases existing condition safety 1 – Does not increase existing condition safety	1	Does not have an effect on I-90
	Evacuation/Emergency Routes -Does the proposed alternative provide additional routes?	3 – Increases emergency/evacuation routes 2 – Moderately increases emergency/evacuation routes 1 – Does not increase emergency/evacuation routes	3	Provides additional access for Roslyn residents
	Increase in Safety on Adjacent Roadways -Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Does not increase existing condition safety 1 – Decreases safety along adjacent roads	2	Increased traffic may result in increased crashes and other safety issues
	Emergency Response -Does the alternative decrease response times for emergency responders?	3 – Decreases emergency response times 2 – No impacts to emergency response times 1 – Increases emergency response times	3	Provides an alternative route to the Roslyn community
	Public Level of Concern for Safety - Does the alternative change conditions for residents along the proposed route?	3 – Increases safety along local roads 2 – Does not change existing condition safety 1 – Decreases safety due to increased traffic	2	Does not impact safety of local residents
Transportation Demand Enhance mobility and connectivity on I-90 for passenger vehicles, emergency vehicles, transit, and active modes and provide support for increased throughput	**Accommodates Active Transportation Modes** -Does the alternative accommodate active transportation?	3 – Includes low stress nonmotorized facilities 2 – Includes moderate stress nonmotorized facilities 1 – Includes high stress nonmotorized facilities	2	New roadway is assumed to have standard County shoulders. This type of roadway would provide an opportunity to have active transportation features on a lower speed/volume roadway This could provide a connection from SR 903 to Easton to the Palouse to Cascade Trail system not on I-90
	Provides Congestion Relief for General Purpose (GP) Vehicles/Trucks -Does the alternative provide congestion relief for GP vehicles and trucks?	3 – Congestion relief for GP vehicles/trucks (greater than 25%) 2 – Some congestion relief for GP vehicles/trucks (5-25%) 1 – No congestion relief (less than 5% or net increase in congestion)	2	While great increase in capacity, less I-90 related congestion relief due to routing away from I-90 (not easy to divert, but would likely capture much of the Salmon La Sac, Ronald, Roslyn, and perhaps Cle Elum/Suncadia traffic)
	Provides Congestion Relief for Transit (Wenatchee Valley Shuttle, Kittitas County Connector, Hope Source)? -Does the alternative provide congestion relief for transit	3 – Congestion relief for HOV/transit (greater than 15%) 2 – Some congestion relief for HOV/transit (1-15%) 1 – No congestion relief or net increase in congestion	1	Similar to above, but likely less transit benefit than I-90 capacity since there are very few transit options away from I-90
	Effects on Adjacent Roadways -Does the alternative improve vehicular mobility on County arterial roadways?	3 – Improves vehicular mobility on arterial streets 2 – Provides some vehicular mobility improvements on arterial streets 1 – Does not improve vehicular mobility on arterial streets	2	Some improvements, but may not capture I-90 diversion if congestion still occurs with this new route due to distance off of I-90 corridor
	Increases Person Throughput (Capacity Increase) -Does the alternative increase person throughput?	3 – Increases person throughput 2 – Moderately increases person throughput 1 – Does not increase person throughput	2	Some improvements, but may not capture I-90 diversion if congestion still occurs with this new route due to distance off of I-90 corridor
	Complimentary to Local and Tribal Planning -Is the alternative complementary to local and tribal planning efforts, including land use plans and transportation plans?	3 – Complements local planning efforts 2 – Partially complements local planning efforts 1 – Does not complement local planning efforts	2	May not be compatible with current planning but could provide needed alternative evacuation routes for Salmon La Sac/Ronald/Roslyn areas
	Public Level of Concern Regarding Access to Driveways and Local Circulation -Does the alternative improve local driveway and community access?	3 – Increases community access and circulation 2 – Does not affect current access and circulation 1 – Decreases community access and circulation	2	Current conditions do not indicate local residents will be impacted
	Increases Freight Throughput (West to East I-90) -Does the alternative increase freight throughput on I-90?	3 – Increases freight throughput 2 – Moderately increases freight throughput 1 – Does not increase freight throughput	1	This is a large detour for I-90 Freight mobility and a low probability of being used

Alternative 4b - North Bullfrog Rd (approx. 10 miles of primarily new roadway)

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Freight Mobility Support economic vitality through reliable and efficient freight movement and access to major employers	**Provide Additional Freight Management Options During Road Closures (freight parking, designated alternate routes)** -Does the alternative increase freight management options?	3 – Increases freight management options 2 – Moderately increases freight management options 1 – Does not increase freight management options	1	Does not provide additional freight management options
	Increase Freight Reliability (Localized Deliveries/Freight Options) -Does the alternative increase freight reliability?	3 – Improves freight reliability 2 – Partially improves freight reliability 1 – Does not improve freight reliability	2	This allows local delivery access during congestion. Is a partial as it only impacts smaller community/economic areas of Ronald and Roslyn

Alternative 4b - North Bullfrog Rd (approx. 10 miles of primarily new roadway)

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Environmental Enable environmental restoration and ecosystem resiliency along I-90 connecting habitats, hydrological features and animal populations	**Increases Aquatic Resources Restoration Potential** -Does the alternative have the potential to improve environmental functions of aquatic resources (e.g., wetlands, rivers, streams) by improving fish passage, access to habitat, and reduce impacts to river hydraulics and geomorphology, etc.?	3 – Improves quality of all aquatic resources 2 – Improves quality of some aquatic resources 1 – Does not restore any aquatic resources	1	The project allows for potential correction of one fish passage partial blockage. The project creates more disturbance in vegetated areas, likely impacts wetlands, requires work directly adjacent and within the floodplain of the Cle Elum River
	Improves Wildlife Connectivity -Does the alternative improve the availability of wildlife habitat and connectivity?	3- Improves wildlife connectivity 2- Moderately improves wildlife connectivity 1 - Does not improve wildlife connectivity	1	The Project does not improve wildlife connectivity but builds road through designated wildlife corridors
	Increases Ecosystem Resiliency -Does the alternative increase resiliency against the impacts of climate change?	3 – Increases resiliency by reducing risks associated with extreme river flood events as an impact of climate change 2 – Some improvements for resiliency by partially reducing risks associated with extreme river flood events as an impact of climate change 1 – Does not increase resiliency by not reducing risks the impacts associated with extreme river flood events as an impact of climate change	1	The project would create additional PGIS in previously undisturbed areas
	Considers Long Term Impacts to Endangered Species Act (ESA) Listed Species and Designated Critical Habitats -Does the alternative have long term impacts on ESA listed species or designated critical habitats?	3 - Improves conditions for ESA listed species and designated critical habitats 2 - Does not improve or have long term impacts to ESA listed species and designated critical habitats 1 - Has potential to long term impacts ESA listed species and designated critical habitats	1	Has potential for short term impacts during construction (in-water work) to ESA listed fish species and may require timing restrictions for northern spotted owls and marbled murrelet. Widening could result in needing to clear lands that may support ESA listed species. Increased traffic noise may impact ESA listed species. This desktop assessment assumes no additional impacts to terrestrial species during construction; however, further assessment will be required if this alternative moves forward to confirm this.
	Risk to Cultural/Historical Sites and/or Park and Recreational Facilities -Does the alternative have a higher risk of impacting cultural and/or historical sites or park and recreational resources?	3 - Alternative has a low risk of impacting cultural/historic places or park/recreational facilities 2- Alternative has a medium risk of impacting cultural/historic places or park/recreational facilities 1 - Alternative has a high risk of impacting cultural/historic places or park/recreational facilities	2	A number of trails are located in the general area, depending on the exact corridor, they may be impacted
Resiliency Improve local roads and I-90 system resiliency	**Reduces the Risk of Infrastructure Failures** -Does the alternative reduce the risk of infrastructure failure by addressing erosion and channel migration?	3 – Removes risks from erosion/channel migration 2 – Reduces risks from erosion/channel migration 1 – Does not address erosion/channel migration	1	This new corridor would not have an affect on existing I-90 stream issues
	Reduces the Risk of Infrastructure Failures due to Changing Climate? -Does the alternative increase resiliency by enhancing the ability to withstand, respond to and recover from extreme weather events (i.e. flood risk and snow melt)?	3 – Improves risk from climate change 2 – Moderately improves risk from climate change 1 – Does not improves risk from climate change	1	No improvements identified
	Susceptibility to Road Closures/Conditions -Does the alternative decrease the susceptibility to road closures (snow, wildfires, crashes)?	3 – Significantly decreases roadway susceptibility 2 – Moderately decreases susceptibility 1 – Does not decrease susceptibility	2	Improves local access from North Cle Elum and Ronald if accidents occur on SR 903
	Reduces the Risk of Infrastructure Failures due to Seismic Activity -Does the alternative increase resiliency of I-90 crossings by enhancing the ability to withstand seismic activity?	3 – Removes risk from seismic activity 2 – Reduces risk from seismic activity 1 – Does not address risk from seismic activity	1	Does not have an effect on I-90 existing structures
	Minimizes Business and Residential Impacts from Displacements -Does the alternative minimize the potential business and residential impacts and displacements, especially for environmental justice (EJ) populations?	3 – No impacts or displacements 2 – Minimal impacts and displacements (less than 5 residential structures) 1 – Moderate to high impacts and displacements (more than 5 residential structures, 1 or more multi-family, and 1 or more government service)	2	Potential displacements of approx. 1 single-family structure impact, 33 parcels, and 1 mobile home park. Some recreational businesses and governmental service properties impacts. Exact displacement numbers not available at this time

Alternative 4b - North Bullfrog Rd (approx. 10 miles of primarily new roadway)

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Equity/Inclusion Support Equitable Outcomes	**Construction of Project Provides 40% Benefit to Disadvantaged Communities** -Project area is not defined as a Justice40 disadvantaged community, but does the alternative provide meaningful, direct benefit to DBE businesses and increase DBE workforce capacity?	3 - Greatest opportunity to disadvantaged communities (60%) 2 - Meets minimum opportunity to disadvantaged communities (40%) 1 - Does not provide benefit to disadvantaged communities (<40%)	3	Assumes DBE-centric construction contracts and collaborations with Community Colleges and Trade Schools to train local workers. Provides benefit to EJ population in Ellensburg that commutes through corridor
	Minimizes Environmental Exposures -Does the alternative contribute new environmental hazards or pollution sources?	3 – Improves/reduces environmental hazards or pollution sources 2 – Partially improves environmental hazards and/or contributes minimal new pollution 1 – Contributes new environmental hazards or pollution sources	2	Air quality improvements from traffic will decrease due to technology improvements, regardless of I-90 improvements. New environmental hazards from new roadways will be introduced to a non-EJ population
Relative Cost of Alternatives	**Planning-Level Cost Comparison** -Does the alternative have higher planning-level costs compared to the other alternatives?	3 – Planning-level cost is lower (under $20 million) 2 – Planning-level cost is moderate ($20 to $100 million) 1 – Planning-level cost is higher (over $100 million)	1	Construction of new roadway and improvements to existing proposed route as well as surrounding local roads
	Preservation Cost (for WSDOT or County) -Does the alternative create a higher demand/response maintenance cost compared to other alternatives?	3 – Maintenance & Operations cost is lower 2 – Maintenance & Operations cost is moderate 1 – Maintenance & Operations cost is higher	1	It is a new roadway therefore would require all new maintenance plan and costs
	Maintenance and Operations Cost -Does the alternative require additional maintenance and operational coordination compared to the other alternatives?	3 – Maintenance & Operations cost is lower 2 – Maintenance & Operations cost is moderate 1 – Maintenance & Operations cost is higher	1	It is a new roadway therefore would require all new maintenance plan and costs

Alternative 5 - Buildout existing roadways to better facilitate capacity

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Safety Improve overall safety along I-90 and adjacent roadways	**Increase in Safety on I-90** -Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Moderately increases existing condition safety 1 – Does not increase existing condition safety	2	Does not have an effect on I-90
	Evacuation/Emergency Routes -Does the proposed alternative provide additional routes?	3 – Increases emergency/evacuation routes 2 – Moderately increases emergency/evacuation routes 1 – Does not increase emergency/evacuation routes	2	Route is currently used when I-90 is congested, no change
	Increase in Safety on Adjacent Roadways -Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Does not increase existing condition safety 1 – Decreases safety along adjacent roads	2	New road would be designed to meet current safety standards but would further increase volume and frequency of vehicles on connected roads
	Emergency Response -Does the alternative decrease response times for emergency responders?	3 – Decreases emergency response times 2 – No impacts to emergency response times 1 – Increases emergency response times	2	Route is currently used when I-90 is congested, no change
	Public Level of Concern for Safety - Does the alternative change conditions for residents along the proposed route?	3 – Increases safety along local roads 2 – Does not change existing condition safety 1 – Decreases safety due to increased traffic	1	Numerous driveways and businesses along route will experience increased traffic and potentially less safe conditions
Transportation Demand Enhance mobility and connectivity on I-90 for passenger vehicles, emergency vehicles, transit, and active modes and provide support for increased throughput	**Accommodates Active Transportation Modes** -Does the alternative accommodate active transportation?	3 – Includes low stress nonmotorized facilities 2 – Includes moderate stress nonmotorized facilities 1 – Includes high stress nonmotorized facilities	2	New roadway is assumed to have standard County shoulders. This type of roadway would provide an opportunity to have active transportation features on a lower speed/volume roadway. Adjacent to two existing trails, so connections can be made for a larger system
	Provides Congestion Relief for General Purpose (GP) Vehicles/Trucks -Does the alternative provide congestion relief for GP vehicles and trucks?	3 – Congestion relief for GP vehicles/trucks (greater than 25%) 2 – Some congestion relief for GP vehicles/trucks (5-25%) 1 – No congestion relief (less than 5% or net increase in congestion)	2	While great increase in capacity, less I-90 related congestion relief due to need to divert off I-90 or have origin/destination near route
	Provides Congestion Relief for Transit (Wenatchee Valley Shuttle, Kittitas County Connector, Hope Source)? -Does the alternative provide congestion relief for transit	3 – Congestion relief for HOV/transit (greater than 15%) 2 – Some congestion relief for HOV/transit (1-15%) 1 – No congestion relief or net increase in congestion	1	Similar to above, but likely less transit benefit than I-90 capacity since there are very few transit options away from I-90
	Effects on Adjacent Roadways -Does the alternative improve vehicular mobility on County arterial roadways?	3 – Improves vehicular mobility on arterial streets 2 – Provides some vehicular mobility improvements on arterial streets 1 – Does not improve vehicular mobility on arterial streets	1	Same volume of traffic from I-90 overflow therefore still backed up at merge points, and side roads leading to Alt 5 will be backed up
	Increases Person Throughput (Capacity Increase) -Does the alternative increase person throughput?	3 – Increases person throughput 2 – Moderately increases person throughput 1 – Does not increase person throughput	2	Some improvements, but may not capture I-90 diversion
	Complimentary to Local and Tribal Planning -Is the alternative complementary to local and tribal planning efforts, including land use plans and transportation plans?	3 – Complements local planning efforts 2 – Partially complements local planning efforts 1 – Does not complement local planning efforts	2	May not be compatible with current planning but could provide needed capacity for areas south of I-90
	Public Level of Concern Regarding Access to Driveways and Local Circulation -Does the alternative improve local driveway and community access?	3 – Increases community access and circulation 2 – Does not affect current access and circulation 1 – Decreases community access and circulation	1	Some improvements, but may not capture I-90 diversion. May impact local neighborhoods and access
Freight Mobility Support economic vitality through reliable and efficient freight movement and access to major employers	**Increases Freight Throughput (West to East I-90)** -Does the alternative increase freight throughput on I-90?	3 – Increases freight throughput 2 – Moderately increases freight throughput 1 – Does not increase freight throughput	2	Potentially can provide an alternative to I-90
	Provide Additional Freight Management Options During Road Closures (freight parking, designated alternate routes) -Does the alternative increase freight management options?	3 – Increases freight management options 2 – Moderately increases freight management options 1 – Does not increase freight management options	2	Parallels I-90, may provide additional options

Alternative 5 - Buildout existing roadways to better facilitate capacity

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
	Increase Freight Reliability (Localized Deliveries/Freight Options) -Does the alternative increase freight reliability?	3 – Improves freight reliability 2 – Partially improves freight reliability 1 – Does not improve freight reliability	2	This allows local delivery access during congestion to the communities south of I-90

Alternative 5 - Buildout existing roadways to better facilitate capacity

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Environmental Enable environmental restoration and ecosystem resiliency along I-90 connecting habitats, hydrological features and animal populations	**Increases Aquatic Resources Restoration Potential** -Does the alternative have the potential to improve environmental functions of aquatic resources (e.g., wetlands, rivers, streams) by improving fish passage, access to habitat, and reduce impacts to river hydraulics and geomorphology, etc.?	3 – Improves quality of all aquatic resources 2 – Improves quality of some aquatic resources 1 – Does not restore any aquatic resources	1	The project allows for potential correction of one fish passage barrier; however, a new bridge over the Yakima River adjacent to a proposed restoration site that is trying to reclaim floodplain and improve fish habitat will cause more impacts than any improvements that could be associated with this project
	Improves Wildlife Connectivity -Does the alternative improve the availability of wildlife habitat and connectivity?	3- Improves wildlife connectivity 2- Moderately improves wildlife connectivity 1 - Does not improve wildlife connectivity	1	The project does not improve wildlife connectivity
	Increases Ecosystem Resiliency -Does the alternative increase resiliency against the impacts of climate change?	3 – Increases resiliency by reducing risks associated with extreme river flood events as an impact of climate change 2 – Some improvements for resiliency by partially reducing risks associated with extreme river flood events as an impact of climate change 1 – Does not increase resiliency by not reducing risks the impacts associated with extreme river flood events as an impact of climate change	1	The project would increase PGIS in undisturbed areas. Potential for improvements of existing infrastructure that support aquatic resources. Building a new bridge over the Yakima River has the potential to decrease resiliency
	Considers Long Term Impacts to Endangered Species Act (ESA) Listed Species and Designated Critical Habitats -Does the alternative have long term impacts on ESA listed species or designated critical habitats?	3 - Improves conditions for ESA listed species and designated critical habitats 2 - Does not improve or have long term impacts to ESA listed species and designated critical habitats 1 - Has potential to long term impacts ESA listed species and designated critical habitats	1	Has potential for short term impacts during construction (in-water work) to ESA listed fish species and may require timing restrictions for northern spotted owls and marbled murrelet. Widening could result in needing to clear lands that may support ESA listed species. Increased traffic noise may impact ESA listed species. The biggest concern here is the impacts to listed fish species associated with building a new bridge over the Yakima River. This desktop assessment assumes no additional impacts to terrestrial species during construction; however, further assessment will be required if this alternative moves forward to confirm this.
	Risk to Cultural/Historical Sites and/or Park and Recreational Facilities -Does the alternative have a higher risk of impacting cultural and/or historical sites or park and recreational resources?	3 - Alternative has a low risk of impacting cultural/historic places or park/recreational facilities 2- Alternative has a medium risk of impacting cultural/historic places or park/recreational facilities 1 - Alternative has a high risk of impacting cultural/historic places or park/recreational facilities	1	County roads are located close to existing structures, possible impacts. However, much of the land has been disturbed and is likely within County right of way. Crosses Iron Horse Trail
Resiliency Improve local roads and I-90 system resiliency	**Reduces the Risk of Infrastructure Failures** -Does the alternative reduce the risk of infrastructure failure by addressing erosion and channel migration?	3 – Removes risks from erosion/channel migration 2 – Reduces risks from erosion/channel migration 1 – Does not address erosion/channel migration	1	This new corridor would not have an affect on existing I-90 stream issues
	Reduces the Risk of Infrastructure Failures due to Changing Climate? -Does the alternative increase resiliency by enhancing the ability to withstand, respond to and recover from extreme weather events (i.e. flood risk and snow melt)?	3 – Improves risk from climate change 2 – Moderately improves risk from climate change 1 – Does not improves risk from climate change	1	No improvements identified
	Susceptibility to Road Closures/Conditions -Does the alternative decrease the susceptibility to road closures (snow, wildfires, crashes)?	3 – Significantly decreases roadway susceptibility 2 – Moderately decreases susceptibility 1 – Does not decrease susceptibility	2	Improves local access for communities south of I-90 (South Cle Elum and Nelson)
	Reduces the Risk of Infrastructure Failures due to Seismic Activity -Does the alternative increase resiliency of I-90 crossings by enhancing the ability to withstand seismic activity?	3 – Removes risk from seismic activity 2 – Reduces risk from seismic activity 1 – Does not address risk from seismic activity	1	Does not have an effect on I-90 existing structures
	Minimizes Business and Residential Impacts from Displacements -Does the alternative minimize the potential business and residential impacts and displacements, especially for environmental justice (EJ) populations?	3 – No impacts or displacements 2 – Minimal impacts and displacements (less than 5 residential structures) 1 – Moderate to high impacts and displacements (more than 5 residential structures, 1 or more multi-family, and 1 or more government service)	1	Greatest number of residential property impacts. Over 20 single-family structures, 230 residential parcels, and some public services and recreational businesses. Exact displacement numbers not available at this time. However, this is not an EJ population

Alternative 5 - Buildout existing roadways to better facilitate capacity

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Equity/Inclusion Support Equitable Outcomes	**Construction of Project Provides 40% Benefit to Disadvantaged Communities** -Project area is not defined as a Justice40 disadvantaged community, but does the alternative provide meaningful, direct benefit to DBE businesses and increase DBE workforce capacity?	3 - Greatest opportunity to disadvantaged communities (60%) 2 - Meets minimum opportunity to disadvantaged communities (40%) 1 - Does not provide benefit to disadvantaged communities (<40%)	3	Assumes DBE-centric construction contracts and collaborations with Community Colleges and Trade Schools to train local workers. Provides benefit to EJ population in Ellensburg that commutes through corridor
	Minimizes Environmental Exposures -Does the alternative contribute new environmental hazards or pollution sources?	3 – Improves/reduces environmental hazards or pollution sources 2 – Partially improves environmental hazards and/or contributes minimal new pollution 1 – Contributes new environmental hazards or pollution sources	2	Air quality improvements from traffic will decrease due to technology improvements, regardless of I-90 improvements. New environmental hazards from new roadways will be introduced to a non-EJ population
Relative Cost of Alternatives	**Planning-Level Cost Comparison** -Does the alternative have higher planning-level costs compared to the other alternatives?	3 – Planning-level cost is lower (under $20 million) 2 – Planning-level cost is moderate ($20 to $100 million) 1 – Planning-level cost is higher (over $100 million)	2	The proposed route follows existing County roads and will require expansion/improvements, and not new roadways
	Preservation Cost (for WSDOT or County) -Does the alternative create a higher demand/response maintenance cost compared to other alternatives?	3 – Maintenance & Operations cost is lower 2 – Maintenance & Operations cost is moderate 1 – Maintenance & Operations cost is higher	1	it is a new roadway therefore would require all new maintenance plan and costs
	Maintenance and Operations Cost -Does the alternative require additional maintenance and operational coordination compared to the other alternatives?	3 – Maintenance & Operations cost is lower 2 – Maintenance & Operations cost is moderate 1 – Maintenance & Operations cost is higher	1	it is a new roadway therefore would require all new maintenance plan and costs

Alternative 6 - No Build

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Safety Improve overall safety along I-90 and adjacent roadways	**Increase in Safety on I-90** -Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Moderately increases existing condition safety 1 – Does not increase existing condition safety	1	Does not increase safety
	Evacuation/Emergency Routes -Does the proposed alternative provide additional routes?	3 – Increases emergency/evacuation routes 2 – Moderately increases emergency/evacuation routes 1 – Does not increase emergency/evacuation routes	1	No change to existing conditions
	Increase in Safety on Adjacent Roadways -Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Does not increase existing condition safety 1 – Decreases safety along adjacent roads	1	Does not increase safety
	Emergency Response -Does the alternative decrease response times for emergency responders?	3 – Decreases emergency response times 2 – No impacts to emergency response times 1 – Increases emergency response times	1	Continued traffic growth and congestion will continue to impede emergency response times
	Public Level of Concern for Safety - Does the alternative change conditions for residents along the proposed route?	3 – Increases safety along local roads 2 – Does not change existing condition safety 1 – Decreases safety due to increased traffic	1	Existing congestion and diversion to local roads will continue
Transportation Demand Enhance mobility and connectivity on I-90 for passenger vehicles, emergency vehicles, transit, and active modes and provide support for increased throughput	**Accommodates Active Transportation Modes** -Does the alternative accommodate active transportation?	3 – Includes low stress nonmotorized facilities 2 – Includes moderate stress nonmotorized facilities 1 – Includes high stress nonmotorized facilities	1	No change to existing conditions
	Provides Congestion Relief for General Purpose (GP) Vehicles/Trucks -Does the alternative provide congestion relief for GP vehicles and trucks?	3 – Congestion relief for GP vehicles/trucks (greater than 25%) 2 – Some congestion relief for GP vehicles/trucks (5-25%) 1 – No congestion relief (less than 5% or net increase in congestion)	1	No change to existing conditions
	Provides Congestion Relief for Transit (Wenatchee Valley Shuttle, Kittitas County Connector, Hope Source)? -Does the alternative provide congestion relief for transit	3 – Congestion relief for HOV/transit (greater than 15%) 2 – Some congestion relief for HOV/transit (1-15%) 1 – No congestion relief or net increase in congestion	1	No change to existing conditions
	Effects on Adjacent Roadways -Does the alternative improve vehicular mobility on County arterial roadways?	3 – Improves vehicular mobility on arterial streets 2 – Provides some vehicular mobility improvements on arterial streets 1 – Does not improve vehicular mobility on arterial streets	1	No change to existing conditions
	Increases Person Throughput (Capacity Increase) -Does the alternative increase person throughput?	3 – Increases person throughput 2 – Moderately increases person throughput 1 – Does not increase person throughput	1	No change to existing conditions
	Complimentary to Local and Tribal Planning -Is the alternative complementary to local and tribal planning efforts, including land use plans and transportation plans?	3 – Complements local planning efforts 2 – Partially complements local planning efforts 1 – Does not complement local planning efforts	1	No change to existing conditions
	Public Level of Concern Regarding Access to Driveways and Local Circulation -Does the alternative improve local driveway and community access?	3 – Increases community access and circulation 2 – Does not affect current access and circulation 1 – Decreases community access and circulation	1	No change to existing conditions
Freight Mobility Support economic vitality through reliable and efficient freight movement and access to major employers	**Increases Freight Throughput (West to East I-90)** -Does the alternative increase freight throughput on I-90?	3 – Increases freight throughput 2 – Moderately increases freight throughput 1 – Does not increase freight throughput	1	No change to existing conditions
	Provide Additional Freight Management Options During Road Closures (freight parking, designated alternate routes) -Does the alternative increase freight management options?	3 – Increases freight management options 2 – Moderately increases freight management options 1 – Does not increase freight management options	1	No change to existing conditions
	Increase Freight Reliability (Localized Deliveries/Freight Options) -Does the alternative increase freight reliability?	3 – Improves freight reliability 2 – Partially improves freight reliability 1 – Does not improve freight reliability	1	No change to existing conditions

Alternative 6 - No Build

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Environmental Enable environmental restoration and ecosystem resiliency along I-90 connecting habitats, hydrological features and animal populations	**Increases Aquatic Resources Restoration Potential** -Does the alternative have the potential to improve environmental functions of aquatic resources (e.g., wetlands, rivers, streams) by improving fish passage, access to habitat, and reduce impacts to river hydraulics and geomorphology, etc.?	3 – Improves quality of all aquatic resources 2 – Improves quality of some aquatic resources 1 – Does not restore any aquatic resources	1	No changes to existing environmental function
	Improves Wildlife Connectivity -Does the alternative improve the availability of wildlife habitat and connectivity?	3- Improves wildlife connectivity 2- Moderately improves wildlife connectivity 1 - Does not improve wildlife connectivity	1	No changes to existing wildlife connectivity
	Increases Ecosystem Resiliency -Does the alternative increase resiliency against the impacts of climate change?	3 – Increases resiliency by reducing risks associated with extreme river flood events as an impact of climate change 2 – Some improvements for resiliency by partially reducing risks associated with extreme river flood events as an impact of climate change 1 – Does not increase resiliency by not reducing risks the impacts associated with extreme river flood events as an impact of climate change	1	No changes to potential resiliency to climate change
	Considers Long Term Impacts to Endangered Species Act (ESA) Listed Species and Designated Critical Habitats -Does the alternative have long term impacts on ESA listed species or designated critical habitats?	3 - Improves conditions for ESA listed species and designated critical habitats 2 - Does not improve or have long term impacts to ESA listed species and designated critical habitats 1 - Has potential to long term impacts ESA listed species and designated critical habitats	2	No changes to ESA listed species and designated critical habitats
	Risk to Cultural/Historical Sites and/or Park and Recreational Facilities -Does the alternative have a higher risk of impacting cultural and/or historical sites or park and recreational resources?	3 - Alternative has a low risk of impacting cultural/historic places or park/recreational facilities 2- Alternative has a medium risk of impacting cultural/historic places or park/recreational facilities 1 - Alternative has a high risk of impacting cultural/historic places or park/recreational facilities	1	No changes to existing corridor
Resiliency Improve local roads and I-90 system resiliency	**Reduces the Risk of Infrastructure Failures** -Does the alternative reduce the risk of infrastructure failure by addressing erosion and channel migration?	3 – Removes risks from erosion/channel migration 2 – Reduces risks from erosion/channel migration 1 – Does not address erosion/channel migration	1	No changes to existing infrastructure, only continued maintenance
	Reduces the Risk of Infrastructure Failures due to Changing Climate? -Does the alternative increase resiliency by enhancing the ability to withstand, respond to and recover from extreme weather events (i.e. flood risk and snow melt)?	3 – Improves risk from climate change 2 – Moderately improves risk from climate change 1 – Does not improves risk from climate change	1	No changes to existing infrastructure, only continued maintenance
	Susceptibility to Road Closures/Conditions -Does the alternative decrease the susceptibility to road closures (snow, wildfires, crashes)?	3 – Significantly decreases roadway susceptibility 2 – Moderately decreases susceptibility 1 – Does not decrease susceptibility	1	No changes to existing infrastructure, only continued maintenance
	Reduces the Risk of Infrastructure Failures due to Seismic Activity -Does the alternative increase resiliency of I-90 crossings by enhancing the ability to withstand seismic activity?	3 – Removes risk from seismic activity 2 – Reduces risk from seismic activity 1 – Does not address risk from seismic activity	1	No changes to existing infrastructure, only continued maintenance
Equity/Inclusion Support Equitable Outcomes	**Minimizes Business and Residential Impacts from Displacements** -Does the alternative minimize the potential business and residential impacts and displacements, especially for environmental justice (EJ) populations?	3 – No impacts or displacements 2 – Minimal impacts and displacements (less than 5 residential structures) 1 – Moderate to high impacts and displacements (more than 5 residential structures, 1 or more multi-family, and 1 or more government service)	3	No residential or business displacements
	Construction of Project Provides 40% Benefit to Disadvantaged Communities -Project area is not defined as a Justice40 disadvantaged community, but does the alternative provide meaningful, direct benefit to DBE businesses and increase DBE workforce capacity?	3 - Greatest opportunity to disadvantaged communities (60%) 2 - Meets minimum opportunity to disadvantaged communities (40%) 1 - Does not provide benefit to disadvantaged communities (<40%)	1	Provides no new benefit to DBE-centric construction contracts, workforce development, or EJ population commuters
	Minimizes Environmental Exposures -Does the alternative contribute new environmental hazards or pollution sources?	3 – Improves/reduces environmental hazards or pollution sources 2 – Partially improves environmental hazards and/or contributes minimal new pollution 1 – Contributes new environmental hazards or pollution sources	2	No new environmental hazards or pollution sources. No opportunity to clean-up existing spills. Increased idling/congestion over time could contribute to greater sources of air pollutions
	Planning-Level Cost Comparison -Does the alternative have higher planning-level costs compared to the other alternatives?	3 – Planning-level cost is lower (under $20 million) 2 – Planning-level cost is moderate ($20 to $100 million) 1 – Planning-level cost is higher (over $100 million)	3	No changes to existing infrastructure

Alternative 6 - No Build

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Relative Cost of Alternatives	**Preservation Cost (for WSDOT or County)** -Does the alternative create a higher demand/response maintenance cost compared to other alternatives?	3 – Maintenance & Operations cost is lower 2 – Maintenance & Operations cost is moderate 1 – Maintenance & Operations cost is higher	2	As more vehicles use existing roadway, potential for increased maintenance
	Maintenance and Operations Cost -Does the alternative require additional maintenance and operational coordination compared to the other alternatives?	3 – Maintenance & Operations cost is lower 2 – Maintenance & Operations cost is moderate 1 – Maintenance & Operations cost is higher	2	As more vehicles use existing roadway, potential for increased maintenance

APPENDIX G

In-depth Environmental Evaluation by Alternative

Environmental Evaluation: Potential Impacts and Benefits of Each Alternative

2/7/2024

Acronyms and Abbreviations

CMZ	Channel migration zone
ESA	Endangered Species Act
PHS	Priority Habitats and Species
NWI	National Wetland Inventory
WDFW	Washington Department of Fish and Wildlife
WSDOT	Washington State Department of Transportation

Table 1. Potential Environmental Effects and Benefits of Alternatives 1-3

Environmental Criteria	Potential Effects	Potential Benefits
Aquatic Resources (Wetlands and Surface Waters)	Construction activities such as removal or addition of fill could cause turbidity. Increased pollution-generating impervious surface from road widening could contribute stormwater runoff to waterbodies including those that are currently on the 303(d) list. Temporary and potentially permanent (if restoration does not improve conditions) effects to wetlands and streams would occur. In-water work and stream isolation will be required.	Stormwater runoff from all roadway surfaces within the study area (I-90 mainline and interchanges) would be treated before discharge, with the potential for significant improvements to water quality. Mitigation associated with the project could improve crossings and potentially increase and improve aquatic habitat, wetland, and riparian areas along these alternatives. The potential for removal of I-90 embankment fill associated with longer spanning structures would allow for the creation of acres of new wetlands and improve the hydrology, functions, and habitat value of existing wetlands. Fill removal would allow reconnection of historic channels and restore more natural flow patterns.
Fish Passage	Construction activities associated with crossings or fish passage barrier corrections could cause turbidity. Increased pollution-generating impervious surface from road widening could contribute stormwater runoff to waterbodies that are currently on the 303(d) list.	Road improvements such as water crossing structures that are replaced or created have the potential to correct fish passage barriers and increase the availability of aquatic habitat.
Wildlife and Habitat Connectivity	Noise disturbance during construction may temporarily deter wildlife species from using available habitat within and adjacent to the project area. New or widened roadway surfaces may reduce the quantity of available habitat.	The potential for creating wildlife crossing structures as a roadway improvement increases the mobility and habitat connectivity for wildlife. The potential to install wildlife fencing along I-90 may reduce wildlife collisions.
Floodzones and CMZs	The project could result in changes to flood levels in the immediate vicinity. The extent of frequently flooded areas could increase due to the removal of fill, both in the near term and in the future as base flood elevations and peak stream flows increase.	Restoration elements that could be incorporated into the project have the potential for I-90 to be more resilient to climate change and to the effects of channel migration.
ESA Listed Species and Critical Habitats	In-water work could impact ESA-listed species and habitats. Temporary and permanent effects to wetlands and streams would occur, and some habitat is likely to be removed. Noise disturbance during construction may deter owl species from nesting and roosting sites. Vegetation removal for roadways may decrease suitable nesting habitat. Additional analysis if these alternative(s) move forward may result in additional ESA species having potential effects associated with the project.	The potential for restoration of natural drainage patterns including rivers and streams would restore ecosystem functions and improve habitat for fish and wildlife species.

Table 2. Potential Environmental Effects and Benefits of Alternative 4a

Environmental Criteria	Potential Effects	Potential Benefits
Aquatic Resources (Wetlands and Surface Waters)	Increased pollution-generating impervious surface from road creation could contribute stormwater runoff to waterbodies including those that are currently on the 303(d) list. Construction activities the construction of a bridge spanning the Cle Elum River could affect aquatic resources. Fill and excavation within aquatic resources would occur in aquatic resources that are currently are not impacted by roads. Stormwater runoff from roadway surfaces would require treatment. Temporary and permanent effects to wetlands and streams would occur. Wetlands will be converted to road prism in areas where roads currently do not occur. Crossings (either bridges or culverts) will be installed in areas where new roads are installed. In-water work will be required.	No benefits to aquatic resources such as wetlands or surface waters have been identified with the widening and construction of new roadways or construction of a new bridge over the Cle Elum River. This alternative will also bisect other aquatic resources along the alignment which are currently assumed to be intact and undisturbed.
Fish Passage	Construction activities could cause turbidity. Increased pollution-generating impervious surface from roadway and bridge creation could contribute stormwater runoff to waterbodies that are currently on the 303(d) list. Crossings will occur on drainages that are currently not impacted by roads requiring future maintenance and potential for fish passage concerns.	Road improvements such as water crossing structures that are replaced along sections of this alignment where existing roads occur have the potential to correct fish passage barriers and increase the availability of aquatic habitat.
Wildlife and Habitat Connectivity	Noise disturbance during construction may temporarily deter wildlife species from using available habitat within and adjacent to the project area. Newly created roadway surfaces may reduce the quantity of available habitat. The creation of new roadways may fragment available wildlife habitat and current connectivity.	No benefits o wildlife habitats and connectivity have been identified with the widening and construction of new roadways or the construction of a new bridge over the Cle Elum River.
Floodzones and CMZs	The project could result in changes to flood levels in the immediate vicinity. The extent of frequently flooded areas could increase due to the removal of fill, both in the near term and in the future as base flood elevations and peak stream flows increase.	No benefits to floodzones or CMZs have been identified with the widening and construction of new roadways or the construction of a new bridge over the Cle Elum River.
ESA Listed Species and Critical Habitats	In-water work associated with bridge construction could impact ESA-listed species and critical habitats. Temporary and permanent effects to wetlands and streams would occur, and some habitat is likely to be removed or inaccessible. Noise	No benefits to ESA listed species or critical habitats have been identified with the widening and construction of new roadways or the construction of a new bridge over the Cle Elum River.

	disturbance during construction may deter owl species from nesting and roosting sites. Vegetation removal for roadways may decrease suitable nesting habitat. Additional analysis if these alternative(s) move forward may result in additional ESA species having potential effects associated with the project.	

Table 3. Potential Environmental Effects and Benefits of Alternative 4b

Environmental Criteria	Potential Effects	Potential Benefits
Aquatic Resources (Wetlands and Surface Waters)	Construction activities such as removal or addition of fill could cause turbidity. Increased pollution-generating impervious surface from road widening could contribute stormwater runoff to waterbodies including those that are currently on the 303(d) list. Stormwater runoff from all roadway surfaces within the study area would require treatment before discharge. Temporary and permanent effects to wetlands and streams would likely occur with roadway construction.	No benefits to aquatic resources such as wetlands or surface waters have been identified with the widening and construction of new roadways which will bisect other aquatic resources along the alignment which are currently assumed to be intact and undisturbed.
Fish Passage	Construction activities could cause turbidity. Increased pollution-generating impervious surface from road widening could contribute stormwater runoff to waterbodies that are currently on the 303(d) list. Crossings will occur on drainages that are currently not impacted by roads requiring future maintenance and potential for fish passage concerns.	Road improvements such as water crossing structures that are replaced along sections of this alignment where existing roads occur have to potential to correct fish passage barriers and increase the availability of aquatic habitat.
Wildlife and Habitat Connectivity	Noise disturbance during construction may temporarily deter wildlife species from using available habitat within and adjacent to the project area. Newly created roadway surfaces may reduce the quantity of available habitat. The creation of new roadways may fragment available wildlife habitat and current connectivity.	No benefits to wildlife habitats and connectivity have been identified with the widening and construction of new roadways.
Floodzones and CMZs	The project could result in changes to flood levels in the immediate vicinity. The extent of frequently flooded areas could increase due to the removal of fill, both in the near term and in the future as base flood elevations and peak stream flows increase.	No benefits to floodzones or CMZs have been identified with the widening and construction of new roadways.
ESA Listed Species and Critical Habitats	If required, in-water work could impact ESA-listed species and critical habitats. Temporary and permanent effects to streams would occur, and some habitat is likely to be removed. Noise	No benefits to ESA listed species or critical habitats have been identified with the widening and construction of new roadways.

	disturbance during construction may deter owl species from nesting and roosting sites. Vegetation removal for roadways may decrease suitable nesting habitat. Additional analysis if these alternative(s) move forward may result in additional ESA species having potential effects associated with the project.	

Table 4. Potential Environmental Effects and Benefits of Alternatives 5

Environmental Criteria	Potential Effects	Potential Benefits
Aquatic Resources (Wetlands and Surface Waters)	Construction activities such as removal or addition of fill could cause turbidity. Increased pollution-generating impervious surface from road widening and the creation of a new bridge spanning the Yakima River could contribute stormwater runoff to waterbodies including those that are currently on the 303(d) list. Stormwater runoff from all roadway surfaces within the study area would require treatment before discharge. Temporary and permanent effects to wetlands and streams would occur. In-water work will be required. A new crossing over the Yakima River would be needed which would further restrict the floodplain in an area where Kittitas Conservation Trust is working to restore and expand the floodplain through the Hanson Ponds Restoration Project that is supported by the City of Cle Elum, NMFS, USFWS, WDFW, Ecology, and other agency partners to restore aquatic habitat along this section of the Yakima River.	No benefits to aquatic resources such as wetlands or surface waters have been identified with the widening and construction of new roadways.
Fish Passage	Construction activities could cause turbidity. Increased pollution-generating impervious surface from road widening and bridge construction, which could contribute stormwater runoff to waterbodies that are currently on the 303(d) list. The construction of a new bridge over the Yakima River has the potential to impact fish passage during construction.	Road improvements such as water crossing structures that are replaced have the potential to correct fish passage barriers and increase the availability of aquatic habitat.
Wildlife and Habitat Connectivity	Noise disturbance during construction may temporarily deter wildlife species from using available habitat within the action area. New roadway surfaces and a new bridge over the Yakima River may reduce the quantity of	The potential for creating wildlife crossing structures as a roadway improvement increases the mobility and habitat connectivity for wildlife. The potential to install wildlife fencing along existing or widened roadways may reduce wildlife collisions.

	available habitat.	
Floodzones and CMZs	The project could result in changes to flood levels in the immediate vicinity. The extent of frequently flooded areas could increase due to the removal of fill, both in the near term and in the future as base flood elevations and peak stream flows increase.	No benefits to floodzones and CMZs have been identified with the widening and construction of new roadways or the construction of a new bridge over the Yakima River.
ESA Listed Species and Critical Habitats	In-water work could impact ESA-listed species and habitats. Temporary and permanent effects to wetlands and streams (especially the Yakima River at the proposed crossing site) would occur, and some habitat is likely to be removed. Additional analysis if these alternative(s) move forward may result in additional ESA species having potential effects associated with the project.	No benefits to ESA listed species or critical habitats have been identified with the widening of existing roadways or the construction of a new bridge over the Yakima River.

APPENDIX H

Detailed Evaluation Worksheets for the I-90 Alternatives

Alternative 1 - Widen I-90 on outside

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Safety Improve overall safety along I-90 and adjacent roadways	**Increase in Safety on I-90** -Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Moderately increases existing condition safety 1 – Does not increase existing condition safety	2	Provides an opportunity to update existing roadways to current design standards
	Evacuation/Emergency Routes -Does the proposed alternative provide additional routes?	3 – Increases emergency/evacuation routes 2 – Moderately increases emergency/evacuation routes 1 – Does not increase emergency/evacuation routes	1	Increases general purpose lanes, does not provide additional flexibility regarding emergency routes
	Increase in Safety on Adjacent Roadways -Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Moderately increases existing condition safety 1 – Does not increase existing condition safety	3	Will divert traffic currently using local roads as bypass, potentially increasing safety
	Safety Exposure during Incident Responses -Does the alternative provide an option for shifting traffic during emergencies, maintenance and repairs on I-90?	3 – Increases opportunity for crew safety/traffic diversion 2 – Provides some opportunity for crew safety/traffic diversion 1 – No improved conditions for crew safety/traffic diversion	2	Crews and emergency responders are still located within traffic area
	Emergency Response -Does the alternative decrease response times for emergency responders?	3 – Decreases emergency response times 2 – No impacts to emergency response times 1 – Increases emergency response times	3	More lanes allow more space for vehicles to pull over to make way for emergency vehicles
	Public Level of Concern for Safety - Does the alternative change conditions for residents along the proposed route?	3 – Increases safety along local roads 2 – Does not change existing condition safety 1 – Decreases safety due to increased traffic	3	Increased capacity on I-90 in both directions may divert current bypass traffic on local roadways thus providing a safer environment for residents
Transportation Demand Enhance mobility and connectivity on I-90 for passenger vehicles, emergency vehicles, transit, and active modes and provide support for increased throughput	**Accommodates Active Transportation Modes** -Does the Alternative accommodate active transportation?	3 – Includes low stress nonmotorized facilities 2 – Includes moderate stress nonmotorized facilities 1 – Includes high stress nonmotorized facilities	1	High speed, high stress environment
	Provides Congestion Relief for General Purpose (GP) Vehicles/Trucks -Does the alternative provide congestion relief for GP vehicles and trucks?	3 – Congestion relief for GP vehicles/trucks (greater than 25%) 2 – Some congestion relief for GP vehicles/trucks (5-25%) 1 – No congestion relief (less than 5% or net increase in congestion)	3	50% more capacity
	Provides Congestion Relief for Transit (Wenatchee Valley Shuttle, Kittitas County Connector, Hope Source)? -Does the alternative provide congestion relief for transit	3 – Congestion relief for HOV/transit (greater than 15%) 2 – Some congestion relief for HOV/transit (1-15%) 1 – No congestion relief or net increase in congestion	3	50% more capacity
	Effects on Adjacent Roadways -Does the alternative improve vehicular mobility on County arterial roadways?	3 – Improves vehicular mobility on arterial streets 2 – Provides some vehicular mobility improvements on arterial streets 1 – Does not improve vehicular mobility on arterial streets	3	Large benefit by reducing diverted traffic on City/County parallel bypass routes
	Increases Person Throughput (Capacity Increase) -Does the alternative increase person throughput)	3 – Increases person throughput 2 – Moderately increases person throughput 1 – Does not increase person throughput	3	50% more capacity
	Complimentary to Local and Tribal Planning -Is the alternative complementary to local and tribal planning efforts, including land use plans and transportation plans?	3 – Complements local planning efforts 2 – Partially complements local planning efforts 1 – Does not complement local planning efforts	3	Compatible with local planning efforts/desire from Upper County constituents to reduce diverted traffic off I-90
	Public Level of Concern Regarding Access to Driveways and Local Circulation -Does the alternative improve local driveway and community access?	3 – Increases community access and circulation 2 – Does not affect current access and circulation 1 – Decreases community access and circulation	3	Increased capacity on I-90 in both directions may divert current bypass traffic on local roadways thus providing a safer environment for residents
Freight Mobility Support economic vitality through reliable and efficient freight movement and access to major employers	**Increases Freight Throughput (West to East I-90)** -Does the alternative increase freight throughput on I-90?	3 – Increases freight throughput 2 – Moderately increases freight throughput 1 – Does not increase freight throughput	3	50% more capacity will provide increased truck movement
	Provide additional Freight Management Options During Road Closures (freight parking, designated alternate routes) -Does the alternative increase freight management options?	3 – Increases freight management options 2 – Moderately increases freight management options 1 – Does not increase freight management options	1	Does not provide alternative options for freight
	Increase Freight Reliability (Localized Deliveries/Freight Options) -Does the alternative increase freight management options?	3 – Improves freight reliability 2 – Partially improves freight reliability 1 – Does not improve freight reliability	3	Greater throughput allows for less delay in local freight access

Alternative 1 - Widen I-90 on outside

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Environmental Enable environmental restoration and ecosystem resiliency along I-90 connecting habitats, hydrological features and animal populations	**Increases Aquatic Resources Restoration Potential** -Does the alternative have the potential to improve environmental functions of aquatic resources (e.g., wetlands, rivers, streams) by improving fish passage, access to habitat, and reduce impacts to river hydraulics and geomorphology, etc.?	3 – Improves quality of all aquatic resources 2 – Improves quality of some aquatic resources 1 – Does not restore any aquatic resources	2	Has the potential to correct fish passage barriers. Likely impacts aquatic resources within construction limits
	Improves Wildlife Connectivity -Does the alternative improve the availability of wildlife habitat and connectivity?	3 - Improves wildlife connectivity 2 - Moderately improves wildlife connectivity 1 - Does not improve wildlife connectivity	2	Has the potential to create wildlife connectivity structures
	Increases Ecosystem Resiliency -Does the alternative increase resiliency against the impacts of climate change?	3 – Increases resiliency by reducing risks associated with extreme river flood events as an impact of climate change 2 – Some improvements for resiliency by partially reducing risks associated with extreme river flood events as an impact of climate change 1 – Does not increase resiliency by not reducing risks the impacts associated with extreme river flood events as an impact of climate change	2	Infrastructure improvements have the potential to correct any undersized drainage structures which may contribute to flooding events
	Considers long term impacts to Endangered Species Act (ESA) Listed Species and designated critical habitats -Does the alternative have long term impacts on ESA listed species or designated critical habitats?	3 - Improves conditions for ESA listed species and designated critical habitats 2 - Does not improve or have long term impacts to ESA listed species and designated critical habitats 1 - Has potential to long term impacts ESA listed species and designated critical habitats	1	Has potential for short term impacts during construction (in-water work) to ESA listed fish species and may require timing restrictions for northern spotted owls (PHS buffer for pair overlaps I-90 buffer) and marbled murrelet habitat has not been assessed. Widening could result in needing to clear lands that may support ESA listed species. This desktop assessment assumes no additional impacts to terrestrial species during construction; however, further assessment will be required if this alternative moves forward to confirm this.
	Risk to Cultural/Historical Sites and/or Park and Recreational Facilities -Does the alternative have a higher risk of impacting cultural and/or historical sites or park and recreational resources?	3 - Alternative has a low risk of impacting cultural/historic places or park/recreational facilities 2 - Alternative has a medium risk of impacting cultural/historic places or park/recreational facilities 1 - Alternative has a high risk of impacting cultural/historic places or park/recreational facilities	2	Trails and potential historic sites are located within close proximity to the existing right of way
Resiliency Improve local roads and I-90 system resiliency	**Reduces the Risk of Infrastructure Failures** -Does the alternative reduce the risk of infrastructure failure by addressing erosion and channel migration?	3 – Removes risks from erosion/channel migration 2 – Reduces risks from erosion/channel migration 1 – Does not address erosion/channel migration	3	New structures and culverts would be required and built to minimize/reduce risk
	Reduces the Risk of Infrastructure Failures due to changing climate? -Does the alternative increase resiliency of by enhancing the ability to withstand, respond to and recover from extreme weather events (i.e. flood risk and snow melt)?	3 – Improves risk from climate change 2 – Moderately improves risk from climate change 1 – Does not improves risk from climate change	2	Provides the opportunity to widen existing pipes and structures to rain events
	Susceptibility to Road Closures/Conditions -Does the alternative decrease the susceptibility to road closures (snow, wildfires, crashes)?	3 – Significantly decreases roadway susceptibility 2 – Moderately decreases susceptibility 1 – Does not decrease susceptibility	1	No changes to current conditions
	Operations and Maintenance Activities -Does the alternative affect operations and maintenance related to snow removal and other operational needs?	3 – Improves O&M activities 2 – Does not change O&M activities 1 – Impacts normal O&M activities	2	Median stays intact, allowing for snow storage and emergency parking, if required
	Reduces the Risk of Infrastructure Failures due to Seismic Activity -Does the alternative increase resiliency of I-90 crossings by enhancing the ability to withstand seismic activity?	3 – Removes risk from seismic activity 2 – Reduces risk from seismic activity 1 – Does not address risk from seismic activity	3	Provides an opportunity to update existing structures to meet current seismic requirements
Equity/Inclusion Support Equitable Outcomes	**Minimizes Business and Residential Impacts from Displacements** -Does the alternative minimize the potential business and residential impacts and displacements, especially for environmental justice (EJ) populations?	3 – No impacts or displacements 2 – Minimal impacts and displacements (less than 5 residential structures) 1 – Moderate to high impacts and displacements (more than 5 residential structures, 1 or more multi-family, and 1 or more government service)	2	One residential parcel may be impacted, no displacements
	Construction of project provides 40% benefit to disadvantaged communities -Project area is not defined as a Justice40 disadvantaged community, but does the alternative provide meaningful, direct benefit to DBE businesses and increase DBE workforce capacity?	3 - Greatest opportunity to disadvantaged communities (60%) 2 - Meets minimum opportunity to disadvantaged communities (40%) 1 - Does not provide benefit to disadvantaged communities (<40%)	3	Assumes DBE-centric construction contracts and collaborations with Community Colleges and Trade Schools to train local workers. Provides benefit to EJ population in Ellensburg that commutes through corridor
	Minimizes Environmental Exposures -Does the alternative contribute new environmental hazards or pollution sources?	3 – Improves/reduces environmental hazards or pollution sources 2 – Partially improves environmental hazards and/or contributes minimal new pollution 1 – Contributes new environmental hazards or pollution sources	2	Despite an increase in vehicles over time, air quality improvements would occur from technology improvements and reduced idling/congestion

Alternative 1 - Widen I-90 on outside

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Relative Cost of Alternatives	**Planning-level Cost Comparison** -Does the alternative have higher planning-level costs compared to the other alternatives?	3 – Planning-level cost is lower (under $20 million) 2 – Planning-level cost is moderate ($20 - $100 million) 1 – Planning-level cost is higher (over $100 million)	1	Interstate construction with 20+ structures
	Preservation Cost -Does the alternative have a higher demand/response maintenance cost compared to other alternatives?	3 – Maintenance & Operations cost is lower 2 – Maintenance & Operations cost is moderate 1 – Maintenance & Operations cost is higher	2	This would extend the life of the roadway (Reset to the overall roadway life cycle)
	Maintenance and Operations Cost -Does the alternative require additional maintenance and operational coordination compared to the other I-90 alternatives?	3 – Maintenance & Operations cost is lower 2 – Maintenance & Operations cost is moderate 1 – Maintenance & Operations cost is higher	2	This is an extension of an existing service area, in lieu of a whole new roadway

Alternative 2 - Add new lane (each direction) within existing median

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Safety Improve overall safety along I-90 and adjacent roadways	**Increase in Safety on I-90** -Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Moderately increases existing condition safety 1 – Does not increase existing condition safety	2	Provides an opportunity to update existing roadways to current design standards
	Evacuation/Emergency Routes -Does the proposed alternative provide additional routes?	3 – Increases emergency/evacuation routes 2 – Moderately increases emergency/evacuation routes 1 – Does not increase emergency/evacuation routes	1	Increases general purpose lanes, does not provide additional flexibility regarding emergency routes
	Increase in Safety on Adjacent Roadways -Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Moderately increases existing condition safety 1 – Does not increase existing condition safety	3	Will divert traffic currently using local roads as bypass, potentially increasing safety
	Safety Exposure during Incident Responses -Does the alternative provide an option for shifting traffic during emergencies, maintenance and repairs on I-90?	3 – Increases opportunity for crew safety/traffic diversion 2 – Provides some opportunity for crew safety/traffic diversion 1 – No improved conditions for crew safety/traffic diversion	2	Crews and emergency responders are still located within traffic area
	Emergency Response -Does the alternative decrease response times for emergency responders?	3 – Decreases emergency response times 2 – No impacts to emergency response times 1 – Increases emergency response times	3	More lanes allow more space for vehicles to pull over to make way for emergency vehicles
	Public Level of Concern for Safety - Does the alternative change conditions for residents along the proposed route?	3 – Increases safety along local roads 2 – Does not change existing condition safety 1 – Decreases safety due to increased traffic	3	Increased capacity on I-90 in both directions may divert current bypass traffic on local roadways thus providing a safer environment for residents
Transportation Demand Enhance mobility and connectivity on I-90 for passenger vehicles, emergency vehicles, transit, and active modes and provide support for increased throughput	**Accommodates Active Transportation Modes** -Does the Alternative accommodate active transportation?	3 – Includes low stress nonmotorized facilities 2 – Includes moderate stress nonmotorized facilities 1 – Includes high stress nonmotorized facilities	1	High speed, high stress environment
	Provides Congestion Relief for General Purpose (GP) Vehicles/Trucks -Does the alternative provide congestion relief for GP vehicles and trucks?	3 – Congestion relief for GP vehicles/trucks (greater than 25%) 2 – Some congestion relief for GP vehicles/trucks (5-25%) 1 – No congestion relief (less than 5% or net increase in congestion)	3	50% more capacity
	Provides Congestion Relief for Transit (Wenatchee Valley Shuttle, Kittitas County Connector, Hope Source)? -Does the alternative provide congestion relief for transit	3 – Congestion relief for HOV/transit (greater than 15%) 2 – Some congestion relief for HOV/transit (1-15%) 1 – No congestion relief or net increase in congestion	3	50% more capacity
	Effects on Adjacent Roadways -Does the alternative improve vehicular mobility on County arterial roadways?	3 – Improves vehicular mobility on arterial streets 2 – Provides some vehicular mobility improvements on arterial streets 1 – Does not improve vehicular mobility on arterial streets	3	Large benefit by reducing diverted traffic on City/County parallel bypass routes
	Increases Person Throughput (Capacity Increase) -Does the alternative increase person throughput)	3 – Increases person throughput 2 – Moderately increases person throughput 1 – Does not increase person throughput	3	50% more capacity
	Complimentary to Local and Tribal Planning -Is the alternative complementary to local and tribal planning efforts, including land use plans and transportation plans?	3 – Complements local planning efforts 2 – Partially complements local planning efforts 1 – Does not complement local planning efforts	3	Compatible with local planning efforts/desire from Upper County constituents to reduce diverted traffic off I-90
	Public Level of Concern Regarding Access to Driveways and Local Circulation -Does the alternative improve local driveway and community access?	3 – Increases community access and circulation 2 – Does not affect current access and circulation 1 – Decreases community access and circulation	3	Increased capacity on I-90 in both directions may divert current bypass traffic on local roadways thus providing a safer environment for residents
Freight Mobility Support economic vitality through reliable and efficient freight movement and access to major employers	**Increases Freight Throughput (West to East I-90)** -Does the alternative increase freight throughput on I-90?	3 – Increases freight throughput 2 – Moderately increases freight throughput 1 – Does not increase freight throughput	3	50% more capacity will provide increased truck movement
	Provide additional Freight Management Options During Road Closures (freight parking, designated alternate routes) -Does the alternative increase freight management options?	3 – Increases freight management options 2 – Moderately increases freight management options 1 – Does not increase freight management options	1	Does not provide alternative options for freight
	Increase Freight Reliability (Localized Deliveries/Freight Options) -Does the alternative increase freight management options?	3 – Improves freight reliability 2 – Partially improves freight reliability 1 – Does not improve freight reliability	3	Greater throughput allows for less delay in local freight access

Alternative 2 - Add new lane (each direction) within existing median

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Environmental Enable environmental restoration and ecosystem resiliency along I-90 connecting habitats, hydrological features and animal populations	**Increases Aquatic Resources Restoration Potential** -Does the alternative have the potential to improve environmental functions of aquatic resources (e.g., wetlands, rivers, streams) by improving fish passage, access to habitat, and reduce impacts to river hydraulics and geomorphology, etc.?	3 – Improves quality of all aquatic resources 2 – Improves quality of some aquatic resources 1 – Does not restore any aquatic resources	2	Has the potential to correct fish passage barriers. Likely impacts aquatic resources within construction limits
	Improves Wildlife Connectivity -Does the alternative improve the availability of wildlife habitat and connectivity?	3 - Improves wildlife connectivity 2 - Moderately improves wildlife connectivity 1 - Does not improve wildlife connectivity	2	Has the potential to create wildlife connectivity structures
	Increases Ecosystem Resiliency -Does the alternative increase resiliency against the impacts of climate change?	3 – Increases resiliency by reducing risks associated with extreme river flood events as an impact of climate change 2 – Some improvements for resiliency by partially reducing risks associated with extreme river flood events as an impact of climate change 1 – Does not increase resiliency by not reducing risks the impacts associated with extreme river flood events as an impact of climate change	2	Infrastructure improvements have the potential to correct any undersized drainage structures which may contribute to flooding events
	Considers long term impacts to Endangered Species Act (ESA) Listed Species and designated critical habitats -Does the alternative have long term impacts on ESA listed species or designated critical habitats?	3 - Improves conditions for ESA listed species and designated critical habitats 2 - Does not improve or have long term impacts to ESA listed species and designated critical habitats 1 - Has potential to long term impacts ESA listed species and designated critical habitats	2	Has potential for short term impacts during construction (in-water work) to ESA listed fish species and may require timing restrictions for northern spotted owls (PHS buffer for pair overlaps I-90 buffer) and marbled murrelet habitat has not been assessed. This desktop assessment assumes no additional impacts to terrestrial species during construction; however, further assessment will be required if this alternative moves forward to confirm this.
	Risk to Cultural/Historical Sites and/or Park and Recreational Facilities -Does the alternative have a higher risk of impacting cultural and/or historical sites or park and recreational resources?	3 - Alternative has a low risk of impacting cultural/historic places or park/recreational facilities 2 - Alternative has a medium risk of impacting cultural/historic places or park/recreational facilities 1 - Alternative has a high risk of impacting cultural/historic places or park/recreational facilities	1	Construction would be within existing right of way, land previously disturbed
Resiliency Improve local roads and I-90 system resiliency	**Reduces the Risk of Infrastructure Failures** -Does the alternative reduce the risk of infrastructure failure by addressing erosion and channel migration?	3 – Removes risks from erosion/channel migration 2 – Reduces risks from erosion/channel migration 1 – Does not address erosion/channel migration	3	New structures and culverts would be required and built to minimize/reduce risk
	Reduces the Risk of Infrastructure Failures due to changing climate? -Does the alternative increase resiliency of by enhancing the ability to withstand, respond to and recover from extreme weather events (i.e. flood risk and snow melt)?	3 – Improves risk from climate change 2 – Moderately improves risk from climate change 1 – Does not improves risk from climate change	2	Provides the opportunity to widen existing pipes and structures to rain events
	Susceptibility to Road Closures/Conditions -Does the alternative decrease the susceptibility to road closures (snow, wildfires, crashes)?	3 – Significantly decreases roadway susceptibility 2 – Moderately decreases susceptibility 1 – Does not decrease susceptibility	1	No changes to current conditions
	Operations and Maintenance Activities -Does the alternative affect operations and maintenance related to snow removal and other operational needs?	3 – Improves O&M activities 2 – Does not change O&M activities 1 – Impacts normal O&M activities	1	Eliminates snow removal and storage during major event
	Reduces the Risk of Infrastructure Failures due to Seismic Activity -Does the alternative increase resiliency of I-90 crossings by enhancing the ability to withstand seismic activity?	3 – Removes risk from seismic activity 2 – Reduces risk from seismic activity 1 – Does not address risk from seismic activity	3	Provides an opportunity to update existing structures to meet current seismic requirements
Equity/Inclusion Support Equitable Outcomes	**Minimizes Business and Residential Impacts from Displacements** -Does the alternative minimize the potential business and residential impacts and displacements, especially for environmental justice (EJ) populations?	3 – No impacts or displacements 2 – Minimal impacts and displacements (less than 5 residential structures) 1 – Moderate to high impacts and displacements (more than 5 residential structures, 1 or more multi-family, and 1 or more government service)	3	Assumes no displacements
	Construction of project provides 40% benefit to disadvantaged communities -Project area is not defined as a Justice40 disadvantaged community, but does the alternative provide meaningful, direct benefit to DBE businesses and increase DBE workforce capacity?	3 - Greatest opportunity to disadvantaged communities (60%) 2 - Meets minimum opportunity to disadvantaged communities (40%) 1 - Does not provide benefit to disadvantaged communities (<40%)	3	Assumes DBE-centric construction contracts and collaborations with Community Colleges and Trade Schools to train local workers. Provides benefit to EJ population in Ellensburg that commutes through corridor
	Minimizes Environmental Exposures -Does the alternative contribute new environmental hazards or pollution sources?	3 – Improves/reduces environmental hazards or pollution sources 2 – Partially improves environmental hazards and/or contributes minimal new pollution 1 – Contributes new environmental hazards or pollution sources	2	Despite an increase in vehicles over time, air quality improvements would occur from technology improvements and reduced idling/congestion

Alternative 2 - Add new lane (each direction) within existing median

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Relative Cost of Alternatives	**Planning-level Cost Comparison** -Does the alternative have higher planning-level costs compared to the other alternatives?	3 – Planning-level cost is lower (under $20 million) 2 – Planning-level cost is moderate ($20 - $100 million) 1 – Planning-level cost is higher (over $100 million)	1	Interstate construction with 20+ structures
	Preservation Cost -Does the alternative have a higher demand/response maintenance cost compared to other alternatives?	3 – Maintenance & Operations cost is lower 2 – Maintenance & Operations cost is moderate 1 – Maintenance & Operations cost is higher	2	This would extend the life of the roadway (Reset to the overall roadway life cycle)
	Maintenance and Operations Cost -Does the alternative require additional maintenance and operational coordination compared to the other I-90 alternatives?	3 – Maintenance & Operations cost is lower 2 – Maintenance & Operations cost is moderate 1 – Maintenance & Operations cost is higher	2	This is an extension of an existing service area, in lieu of a whole new roadway

Alternative 3 - Add two new lanes within existing median (direction of two lanes would change based on peak demand)

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Safety Improve overall safety along I-90 and adjacent roadways	**Increase in Safety on I-90** -Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Moderately increases existing condition safety 1 – Does not increase existing condition safety	2	Provides an opportunity to update existing roadways to current design standards
	Evacuation/Emergency Routes -Does the proposed alternative provide additional routes?	3 – Increases emergency/evacuation routes 2 – Moderately increases emergency/evacuation routes 1 – Does not increase emergency/evacuation routes	3	Provides flexibility during emergency events
	Increase in Safety on Adjacent Roadways -Does the proposed alternative change safety from existing conditions?	3 – Increases existing condition safety 2 – Moderately increases existing condition safety 1 – Does not increase existing condition safety	2	May reduce vehicles using local access roads as a bypass since reversible lanes will accommodate peak traffic. May reduce speeds on local access roads PENDING traffic results
	Safety Exposure during Incident Responses -Does the alternative provide an option for shifting traffic during emergencies, maintenance and repairs on I-90?	3 – Increases opportunity for crew safety/traffic diversion 2 – Provides some opportunity for crew safety/traffic diversion 1 – No improved conditions for crew safety/traffic diversion	3	Provides maintenance crews with the opportunity to shift all traffic to reversible lanes during maintenance on the mainline, thus increasing their safety
	Emergency Response -Does the alternative decrease response times for emergency responders?	3 – Decreases emergency response times 2 – No impacts to emergency response times 1 – Increases emergency response times	3	Allows for traffic diversion when emergency is in primary through lanes, thereby creating better response times for emergency vehicles
	Public Level of Concern for Safety - Does the alternative change conditions for residents along the proposed route?	3 – Increases safety along local roads 2 – Does not change existing condition safety 1 – Decreases safety due to increased traffic	2	Limited access along I-90 may still result in diverted traffic to local roadways for travelers wishing to access locations between Cle Elum and Easton
Transportation Demand Enhance mobility and connectivity on I-90 for passenger vehicles, emergency vehicles, transit, and active modes and provide support for increased throughput	**Accommodates Active Transportation Modes** -Does the Alternative accommodate active transportation?	3 – Includes low stress nonmotorized facilities 2 – Includes moderate stress nonmotorized facilities 1 – Includes high stress nonmotorized facilities	1	High speed, high stress environment
	Provides Congestion Relief for General Purpose (GP) Vehicles/Trucks -Does the alternative provide congestion relief for GP vehicles and trucks?	3 – Congestion relief for GP vehicles/trucks (greater than 25%) 2 – Some congestion relief for GP vehicles/trucks (5-25%) 1 – No congestion relief (less than 5% or net increase in congestion)	3	100% more capacity in peak direction
	Provides Congestion Relief for Transit (Wenatchee Valley Shuttle, Kittitas County Connector, Hope Source)? -Does the alternative provide congestion relief for transit	3 – Congestion relief for HOV/transit (greater than 15%) 2 – Some congestion relief for HOV/transit (1-15%) 1 – No congestion relief or net increase in congestion	3	100% more capacity in peak direction, but no specific HOV/transit capacity so ranked as 2. Could argue it should be 3. Potential tweak to this alternative, could be limited to transit/HOV 3+, but at peak congestion times, majority of vehicles will be HOV 2+ or HOV 3+
	Effects on Adjacent Roadways -Does the alternative improve vehicular mobility on County arterial roadways?	3 – Improves vehicular mobility on arterial streets 2 – Provides some vehicular mobility improvements on arterial streets 1 – Does not improve vehicular mobility on arterial streets	3	Large benefit by reducing diverted traffic on City/County parallel bypass routes
	Increases Person Throughput (Capacity Increase) -Does the alternative increase person throughput)	3 – Increases person throughput 2 – Moderately increases person throughput 1 – Does not increase person throughput	3	100% more capacity in peak direction
	Complimentary to Local and Tribal Planning -Is the alternative complementary to local and tribal planning efforts, including land use plans and transportation plans?	3 – Complements local planning efforts 2 – Partially complements local planning efforts 1 – Does not complement local planning efforts	3	Compatible with local planning efforts/desire from Upper County constituents to reduce diverted traffic off I-90
	Public Level of Concern Regarding Access to Driveways and Local Circulation -Does the alternative improve local driveway and community access?	3 – Increases community access and circulation 2 – Does not affect current access and circulation 1 – Decreases community access and circulation	2	Limited access along I-90 may still result in diverted traffic to local roadways for travelers wishing to access locations between Cle Elum and Easton
Freight Mobility Support economic vitality through reliable and efficient freight movement and access to major employers	**Increases Freight Throughput (West to East I-90)** -Does the alternative increase freight throughput on I-90?	3 – Increases freight throughput 2 – Moderately increases freight throughput 1 – Does not increase freight throughput	3	50% more capacity will provide increased truck movement
	Provide additional Freight Management Options During Road Closures (freight parking, designated alternate routes) -Does the alternative increase freight management options?	3 – Increases freight management options 2 – Moderately increases freight management options 1 – Does not increase freight management options	1	Does not provide alternative options for freight
	Increase Freight Reliability (Localized Deliveries/Freight Options) -Does the alternative increase freight management options?	3 – Improves freight reliability 2 – Partially improves freight reliability 1 – Does not improve freight reliability	3	Greater throughput during peak times allows for less delay in local freight access

Alternative 3 - Add two new lanes within existing median (direction of two lanes would change based on peak demand)

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Environmental Enable environmental restoration and ecosystem resiliency along I-90 connecting habitats, hydrological features and animal populations	**Increases Aquatic Resources Restoration Potential** -Does the alternative have the potential to improve environmental functions of aquatic resources (e.g., wetlands, rivers, streams) by improving fish passage, access to habitat, and reduce impacts to river hydraulics and geomorphology, etc.?	3 – Improves quality of all aquatic resources 2 – Improves quality of some aquatic resources 1 – Does not restore any aquatic resources	2	Has the potential to correct fish passage barriers. Likely impacts aquatic resources within construction limits
	Improves Wildlife Connectivity -Does the alternative improve the availability of wildlife habitat and connectivity?	3 - Improves wildlife connectivity 2 - Moderately improves wildlife connectivity 1 - Does not improve wildlife connectivity	2	Has the potential to create wildlife connectivity structures
	Increases Ecosystem Resiliency -Does the alternative increase resiliency against the impacts of climate change?	3 – Increases resiliency by reducing risks associated with extreme river flood events as an impact of climate change 2 – Some improvements for resiliency by partially reducing risks associated with extreme river flood events as an impact of climate change 1 – Does not increase resiliency by not reducing risks the impacts associated with extreme river flood events as an impact of climate change	2	Infrastructure improvements have the potential to correct any undersized drainage structures which may contribute to flooding events
	Considers long term impacts to Endangered Species Act (ESA) Listed Species and designated critical habitats -Does the alternative have long term impacts on ESA listed species or designated critical habitats?	3 - Improves conditions for ESA listed species and designated critical habitats 2 - Does not improve or have long term impacts to ESA listed species and designated critical habitats 1 - Has potential to long term impacts ESA listed species and designated critical habitats	2	Has potential for short term impacts during construction (in-water work) to ESA listed fish species and may require timing restrictions for northern spotted owls (PHS buffer for pair overlaps I-90 buffer) and marbled murrelet habitat has not been assessed. This desktop assessment assumes no additional impacts to terrestrial species during construction; however, further assessment will be required if this alternative moves forward to confirm this.
	Risk to Cultural/Historical Sites and/or Park and Recreational Facilities -Does the alternative have a higher risk of impacting cultural and/or historical sites or park and recreational resources?	3 - Alternative has a low risk of impacting cultural/historic places or park/recreational facilities 2 - Alternative has a medium risk of impacting cultural/historic places or park/recreational facilities 1 - Alternative has a high risk of impacting cultural/historic places or park/recreational facilities	1	Construction would be within existing right of way, land previously disturbed
Resiliency Improve local roads and I-90 system resiliency	**Reduces the Risk of Infrastructure Failures** -Does the alternative reduce the risk of infrastructure failure by addressing erosion and channel migration?	3 – Removes risks from erosion/channel migration 2 – Reduces risks from erosion/channel migration 1 – Does not address erosion/channel migration	3	New structures and culverts would be required and built to minimize/reduce risk
	Reduces the Risk of Infrastructure Failures due to changing climate? -Does the alternative increase resiliency of by enhancing the ability to withstand, respond to and recover from extreme weather events (i.e. flood risk and snow melt)?	3 – Improves risk from climate change 2 – Moderately improves risk from climate change 1 – Does not improves risk from climate change	2	Provides the opportunity to widen existing pipes and structures to rain events
	Susceptibility to Road Closures/Conditions -Does the alternative decrease the susceptibility to road closures (snow, wildfires, crashes)?	3 – Significantly decreases roadway susceptibility 2 – Moderately decreases susceptibility 1 – Does not decrease susceptibility	1	No changes to current conditions
	Operations and Maintenance Activities -Does the alternative affect operations and maintenance related to snow removal and other operational needs?	3 – Improves O&M activities 2 – Does not change O&M activities 1 – Impacts normal O&M activities	1	Eliminates snow removal and storage during major event
	Reduces the Risk of Infrastructure Failures due to Seismic Activity -Does the alternative increase resiliency of I-90 crossings by enhancing the ability to withstand seismic activity?	3 – Removes risk from seismic activity 2 – Reduces risk from seismic activity 1 – Does not address risk from seismic activity	3	Provides an opportunity to update existing structures to meet current seismic requirements
Equity/Inclusion Support Equitable Outcomes	**Minimizes Business and Residential Impacts from Displacements** -Does the alternative minimize the potential business and residential impacts and displacements, especially for environmental justice (EJ) populations?	3 – No impacts or displacements 2 – Minimal impacts and displacements (less than 5 residential structures) 1 – Moderate to high impacts and displacements (more than 5 residential structures, 1 or more multi-family, and 1 or more government service)	3	Assumes no displacements
	Construction of project provides 40% benefit to disadvantaged communities -Project area is not defined as a Justice40 disadvantaged community, but does the alternative provide meaningful, direct benefit to DBE businesses and increase DBE workforce capacity?	3 - Greatest opportunity to disadvantaged communities (60%) 2 - Meets minimum opportunity to disadvantaged communities (40%) 1 - Does not provide benefit to disadvantaged communities (<40%)	3	Assumes DBE-centric construction contracts and collaborations with Community Colleges and Trade Schools to train local workers. Provides benefit to EJ population in Ellensburg that commutes through corridor
	Minimizes Environmental Exposures -Does the alternative contribute new environmental hazards or pollution sources?	3 – Improves/reduces environmental hazards or pollution sources 2 – Partially improves environmental hazards and/or contributes minimal new pollution 1 – Contributes new environmental hazards or pollution sources	2	Despite an increase in vehicles over time, air quality improvements would occur from technology improvements and reduced idling/congestion

Alternative 3 - Add two new lanes within existing median (direction of two lanes would change based on peak demand)

Project Objectives	Evaluation Criteria	Performance Measurement	Rating	Rationale for Rating
Relative Cost of Alternatives	**Planning-level Cost Comparison** -Does the alternative have higher planning-level costs compared to the other alternatives?	3 – Planning-level cost is lower (under $20 million) 2 – Planning-level cost is moderate ($20 - $100 million) 1 – Planning-level cost is higher (over $100 million)	1	Interstate construction with 20+ structures
	Preservation Cost -Does the alternative have a higher demand/response maintenance cost compared to other alternatives?	3 – Maintenance & Operations cost is lower 2 – Maintenance & Operations cost is moderate 1 – Maintenance & Operations cost is higher	1	Requires additional operations (labor) and more roadside barriers to maintain and replace
	Maintenance and Operations Cost -Does the alternative require additional maintenance and operational coordination compared to the other I-90 alternatives?	3 – Maintenance & Operations cost is lower 2 – Maintenance & Operations cost is moderate 1 – Maintenance & Operations cost is higher	1	Requires additional operations (labor) and more roadside barriers to maintain and replace

APPENDIX I

Public Survey Results – Summer 2023

I-90 CORRIDOR – EASTON TO CLE ELUM PLANNING STUDY

SUMMER 2023 PUBLIC SURVEY RESULTS AND SUMMARY

KITTITAS COUNTY

November 2023

PROJECT BACKGROUND

In response to citizen-led task forces such as the Upper Kittitas County Traffic Committee, working groups, and public comment, Kittitas County Public Works has initiated the **I-90 Corridor – Easton to Cle Elum Planning Study** in partnership with corridor stakeholders including the Washington State Department of Transportation (WSDOT) and the Safety, Transportation, Environment, Equity, and Resiliency on I-90 (STEER I-90) Coalition.

Study Area

Interstate 90 (I-90) spans 300 miles in Washington State from the Port of Seattle to the Idaho state line, continuing east across the United States. I-90 is the major east-west transportation corridor in Washington State and is vital to commerce, economy, and recreation statewide. Passing through Kittitas County it is a scenic highway identified as the Mountain to Sound Greenway (National Heritage Area). Residents, tourists, and businesses have long commented on transportation inefficiencies between Easton and Cle Elum impacting safety, freight, and mobility.

The area of study is located **along the I-90 corridor from Easton to Cle Elum**, a 15-mile portion in upper Kittitas County beginning at the West Easton Interchange at **milepost (MP) 70.3** and ending at the I-90/State Route 970/903 interchange at **MP 85** within WSDOT's South Central Region, and the upper Kittitas County surrounding communities.

Purpose

The planning study aims to investigate concerns from stakeholders by engaging agencies and the public to identify and describe issues related to transportation demand, safety, freight mobility, environmental, resiliency, and equity/inclusion issues within the study area to identify possible solutions.

PUBLIC OUTREACH OVERVIEW

Public outreach is a critical part of any planning study. It harnesses the insights of roadway users and other members of the public who supply the local knowledge, context, and information necessary to make informed project decisions. Engagement of the residents, travelers, and other drivers who regularly use I-90 in Kittitas County will be a key factor in this project's success.

As part of this outreach process, the project team hosted a virtual public workshop and collected public feedback via an online survey linked through the STEER I-90 Coalition's website and promoted through various stakeholders' social media accounts. The purpose of the public survey was to better understand how the public uses this portion of I-90.

This report is intended to communicate and summarize the results of the public survey. The project team will use the collected input to inform and drive project tasks.

Online Survey

The survey consisted of both multiple-choice and open-ended questions focusing on how people use the highway and the issues they have experienced in the study area. The survey was open for two months (July 13 through August 18, 2023) and a total of 949 surveys were completed. The survey questions are listed below, with a summary of the responses to each question provided on the following pages.

TRAVEL ON I-90 IN THE STUDY AREA

1. How do you travel on I-90 from Easton to Cle Elum?
2. How frequently do you use any portion of I-90 between Exit 70 (Easton) and Exit 85 (Cle Elum)?
3. What are the main reasons you travel on I-90 between Exit 70 (Easton) and Exit 85 (Cle Elum)?

AREAS OF CONCERN

4. What is your biggest concern related to this section of I-90? Please rank from 1 (biggest concern) to 5 (least concern).
5. In the vicinity of I-90 between Exit 70 (Easton) and Exit 85 (Cle Elum), which of the following roadways do you think is the biggest concern?

POTENTIAL IMPROVEMENTS

6. When considering alternative improvements on I-90 or the surrounding roads, what do you think should be the priority? Please rank the following in order of importance, from 1 (most important) to 4 (least important).
7. Which of the following do you consider to be the best solution to improve traffic on I-90?

ADDITIONAL COMMENTS – OPEN-ENDED

8. Is there anything else you would like us to know about the section of I-90 between Exit 70 (Easton) and Exit 85 (Cle Elum)?

RESPONDENT INFORMATION/DEMOGRAPHICS

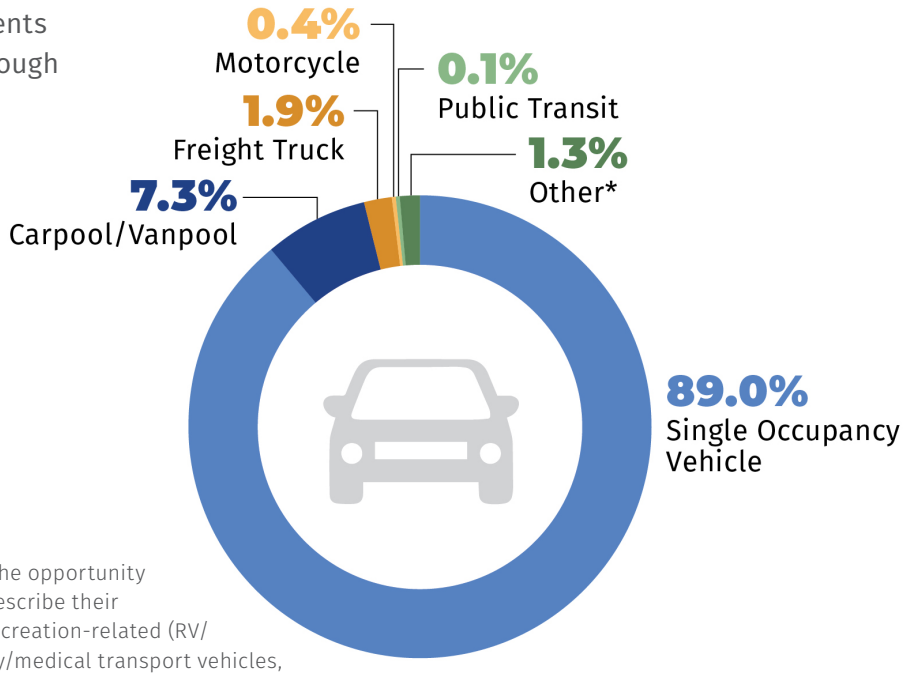
9. What is your annual household income?
10. What is your age?
11. How do you identify your race/ethnicity?
12. Do you identify as Hispanic and/or Latino?

TRAVEL ON I-90 IN THE STUDY AREA

1. Mode of Travel

How do you travel on I-90 from Easton to Cle Elum?

An overwhelming majority of respondents (89%) indicated they travel on I-90 through the study area in a **single occupancy vehicle**, while only 7.3% indicated they travel in a carpool or vanpool.

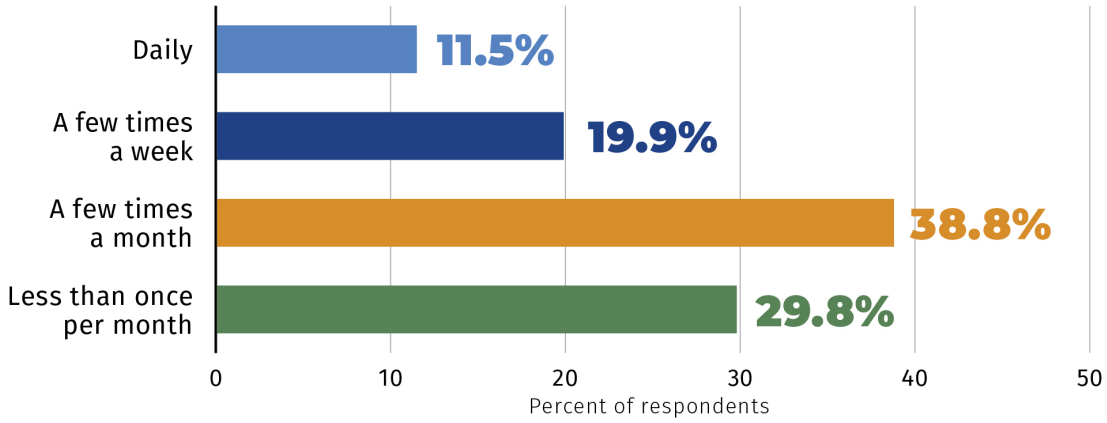


* Respondents who selected "Other" were given the opportunity to provide their own open-ended response to describe their mode of travel. Of those 13 responses, 8 were recreation-related (RV/motorhomes), 4 were work-related (public safety/medical transport vehicles, motorcoach driver), and one person said they don't travel on this section of I-90.

2. Frequency of Travel

How frequently do you use any portion of I-90 between Exit 70 (Easton) and Exit 85 (Cle Elum)?

The largest percentage of respondents (38.8%) indicated they use I-90 in the study area **a few times a month**, while another 30% indicated they use it less than once per month. Only 11.5% of respondents said they use this section of I-90 daily.

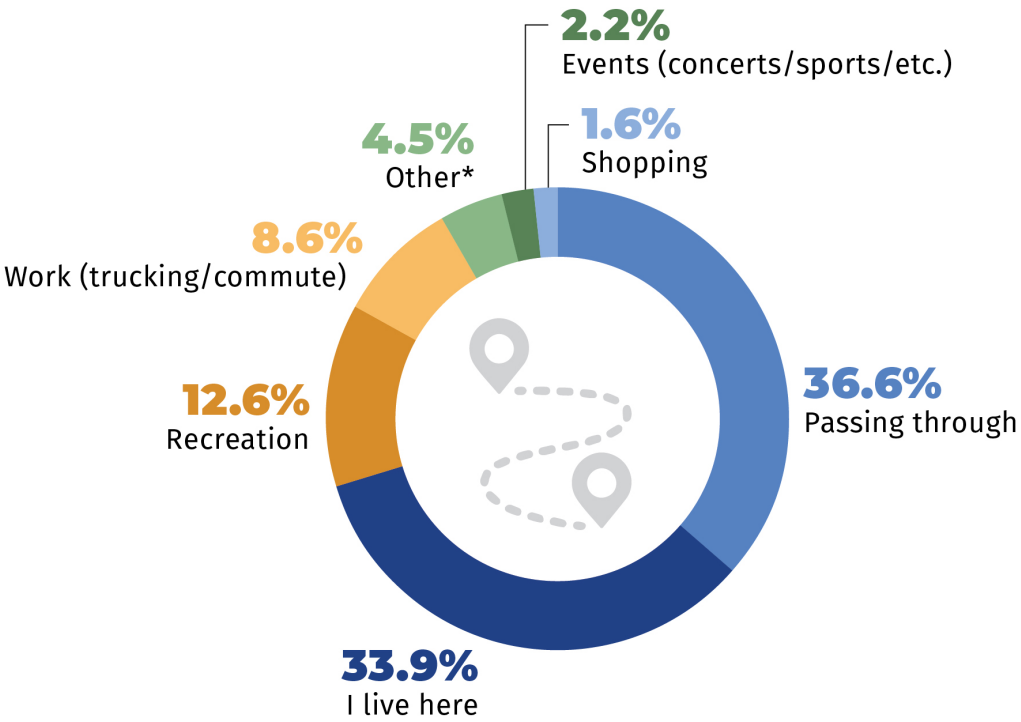


TRAVEL ON I-90 IN THE STUDY AREA

3. Reasons for Travel

What are the main reasons you travel on I-90 between Exit 70 (Easton) and Exit 85 (Cle Elum)?

Over a third of respondents (36.6%) said the main reason they travel on I-90 in the study area is **passing through**, with another third (33.9%) indicating they live in the area. Recreation was the third most popular reason for traveling on I-90 in the study area, as selected by 12.6% of respondents.



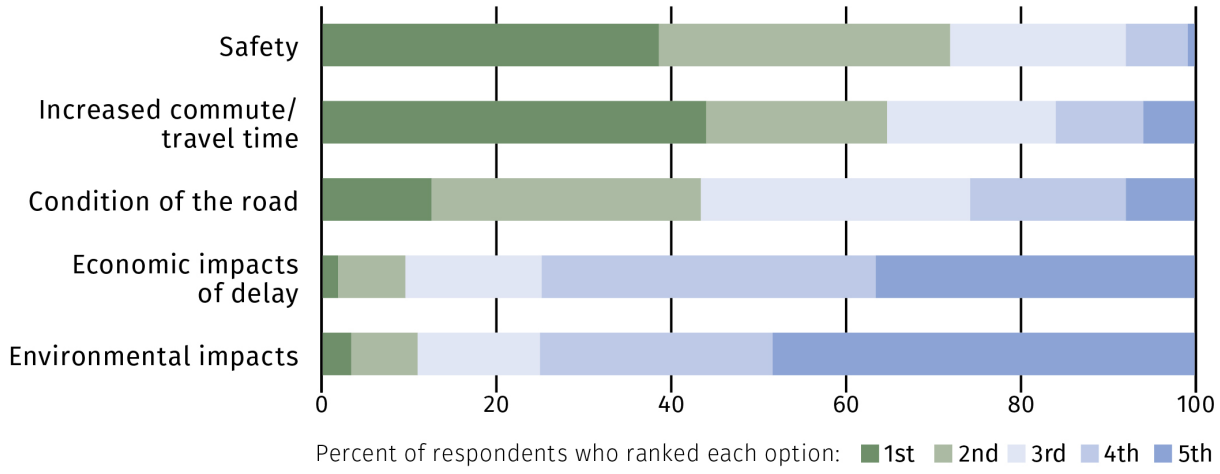
* Respondents who selected "Other" were given the opportunity to provide their own open-ended response to describe their reason for travel. Of those 44 responses, 26 were related to visiting friends/family, 17 were related to visiting a second/vacation home, and one person said they don't travel on this section of I-90.

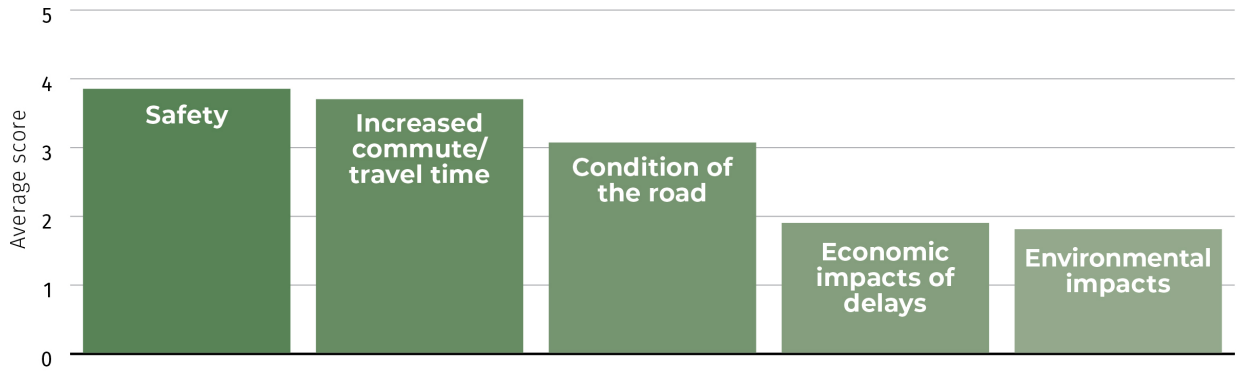
AREAS OF CONCERN

4. Biggest Concern Overall

What is your biggest concern related to this section of I-90? Please rank from 1 (biggest concern) to 5 (least concern).

The top chart below illustrates how respondents ranked each of the five options, while the bottom chart assigns an average score to each option based on their overall rankings. While increased commute/travel time received the highest percentage of #1 rankings, **safety** received the highest average score based on all rankings as the biggest concern overall. Increased commute/travel time received the second highest score, with condition of the road following fairly close behind.



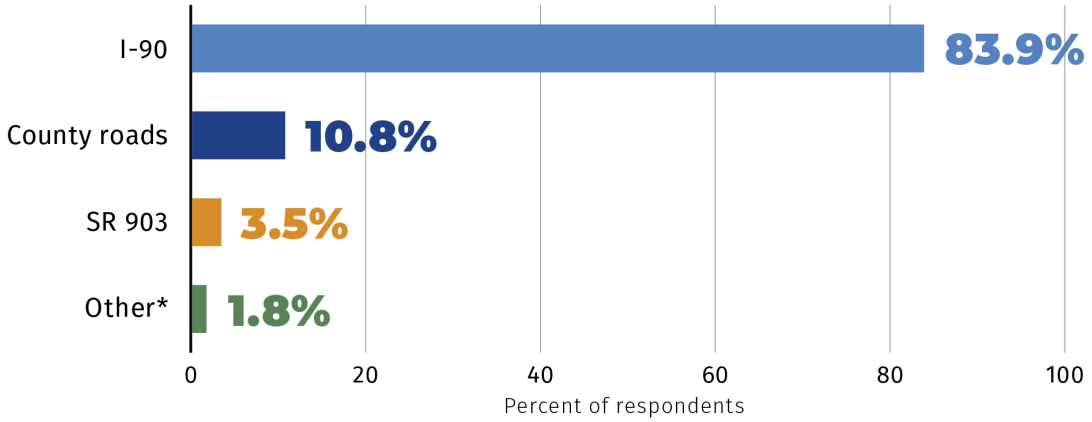


AREAS OF CONCERN

5. Roadways of Greatest Concern

In the vicinity of I-90 between Exit 70 (Easton) and Exit 85 (Cle Elum), which of the following roadways do you think is the biggest concern?

The largest percentage of respondents (83.9%) indicated **I-90** is the roadway of biggest concern in the study area, followed by county roads at 10.8%.



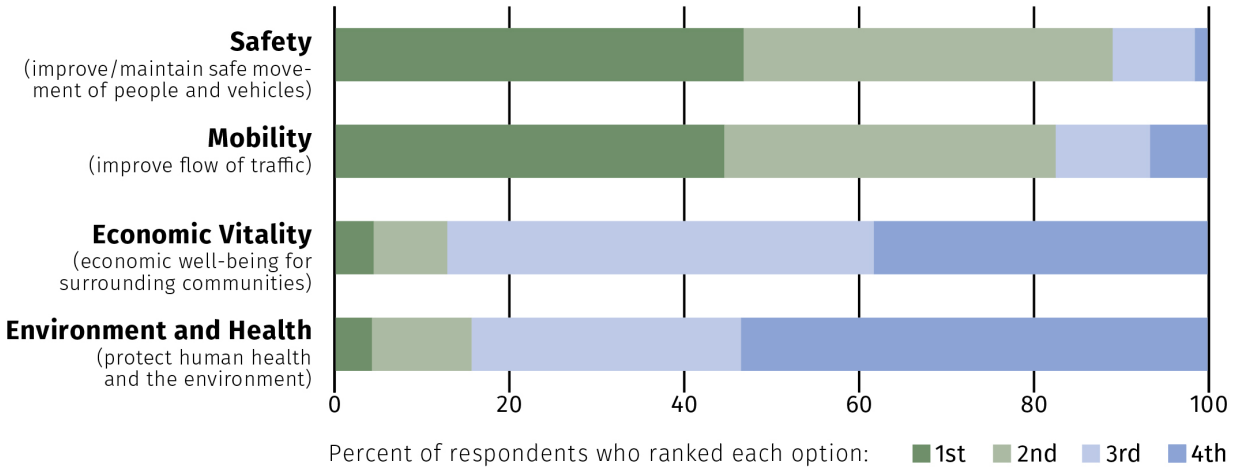
* Respondents who selected "Other" were given the opportunity to provide their own open-ended response to indicate the roadways of greatest concern to them. Of those 17 responses, 7 said they didn't know or were unsure, 4 indicated local roads get overwhelmed with weekend traffic overflow, one said all of the roads are bottlenecked, and the remainder had suggestions for specific areas of I-90.

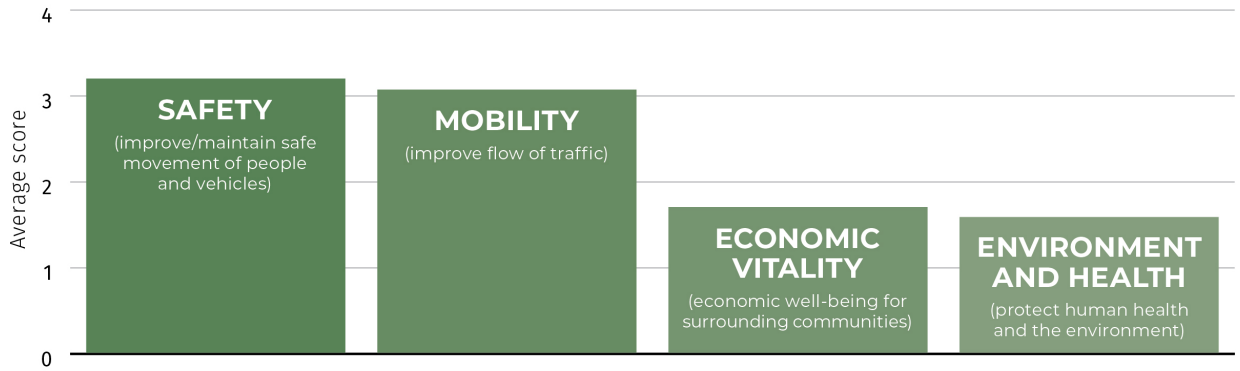
POTENTIAL IMPROVEMENTS

6. Prioritization of Improvements

When considering alternative improvements on I-90 or the surrounding roads, what do you think should be the priority? Please rank the following in order of importance, from 1 (most important) to 4 (least important).

The top chart below illustrates how respondents ranked each of the four options, while the bottom chart assigns an average score to each option based on their overall rankings. **Safety** was the most highly ranked priority, followed closely by mobility. Economic vitality and environment and health both received relatively low overall scores.



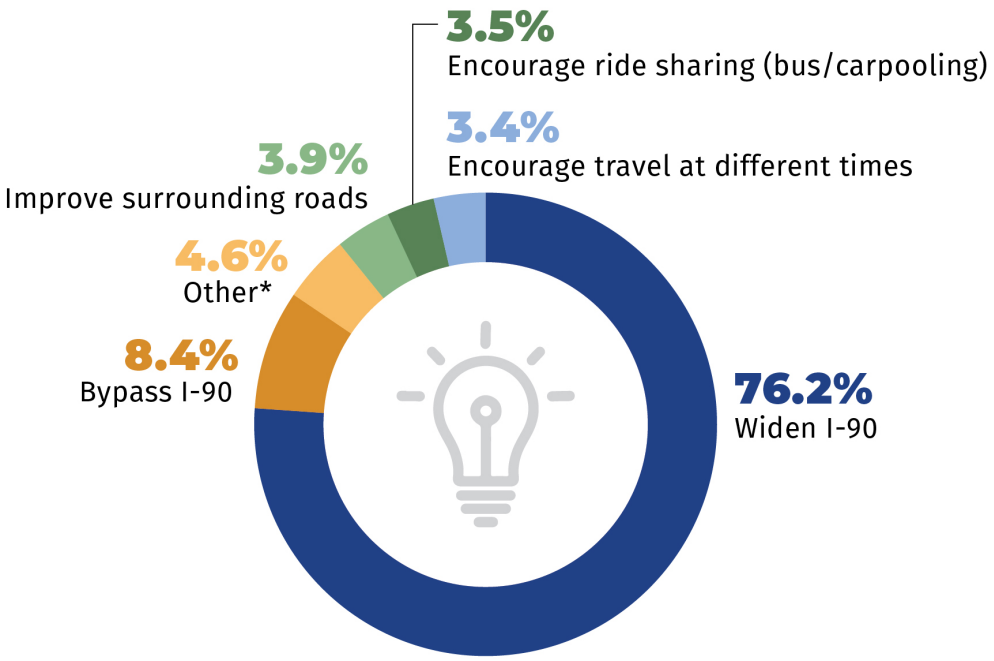


POTENTIAL IMPROVEMENTS

7. Best Solution

Which of the following do you consider to be the best solution to improve traffic on I-90?

Widen I-90 was the most preferred solution by far; it was selected by 76.2% of respondents. Bypass I-90 was the next most common response, as selected by 8.4% of respondents.



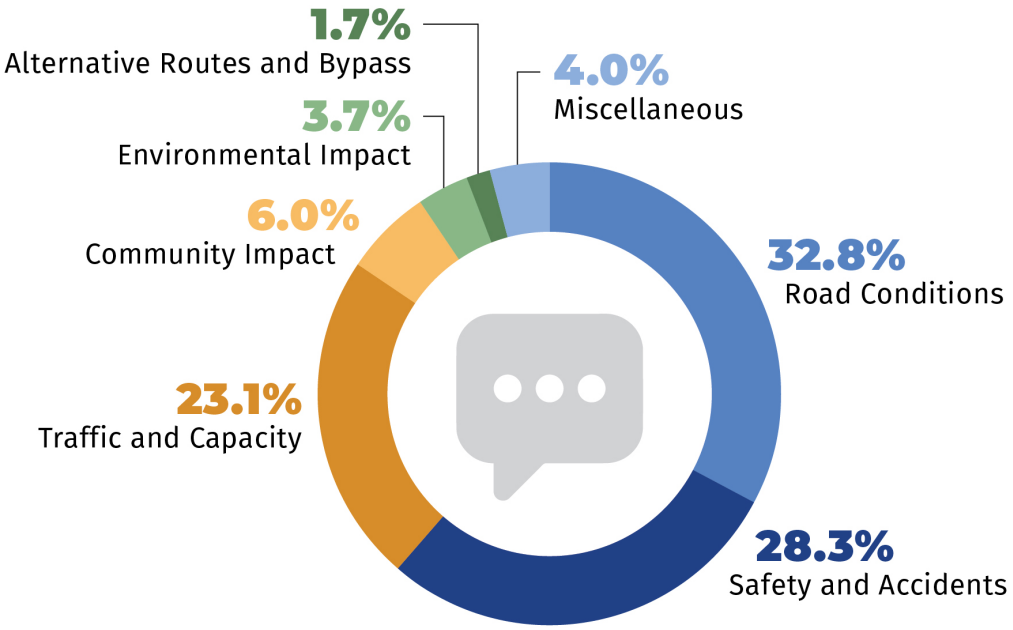
* Respondents who selected "Other" were given the opportunity to provide their own open-ended response to identify their top solution. Of those 44 responses, 9 were related to lane configuration/traffic management, 9 were related to rail and public transit, 7 were related to infrastructure improvements/road expansion, 3 were related to law enforcement or tolling, and the remainder indicated they were uncertain.

ADDITIONAL COMMENTS

8. Additional Comments – Open-Ended

Is there anything else you would like us to know about the section of I-90 between Exit 70 (Easton) and Exit 85 (Cle Elum)?

Respondents provided their answers to Question 8 in an open-ended format; 422 open-ended responses were received. The responses can be roughly categorized into a number of themes, as illustrated in the chart below. A third of comments received were related to **road conditions on I-90**, and nearly another third were related to safety and accidents. Just under a quarter of responses were related to traffic and capacity. The responses summarized in greater detail on the following page.



ADDITIONAL COMMENTS

8. Additional Comments – Open-Ended *(continued)*

The 422 open-ended responses to Question 8 can be roughly categorized into the following themes:

ROAD CONDITIONS (32.8%):

- **Pavement Quality (12.1%):** Numerous mentions of poor road conditions, including rough pavement, potholes, and wear.
- **Narrow Lanes (8.5%):** Widespread perception that lanes on this section of I-90 are too narrow and dangerous.
- **Drainage Issues (6.2%):** Highlighted dangers caused by poor water drainage, leading to visibility issues and icy conditions.
- **Lane Markings (4.0%):** Concerns about faded or unclear lane markings, especially in inclement weather.
- **Shoulder Conditions (2.1%):** Requests to improve and maintain shoulders, particularly for safety with trucks.

SAFETY AND ACCIDENTS (28.7%):

- **Enforcement and Driver Behavior/Speeding (9.1%):** Strong calls for increased law enforcement to address speeding and reckless/aggressive driving.
- **Truck Traffic (8.3%):** Concerns about the behavior of semi-trucks, including speeding and blocking lanes.
- **Dangerous Conditions (6.2%):** Overall sentiment that the road is dangerous, with accidents and road rage being common.
- **Accident Hotspots (5.1%):** Questions about specific accident-prone areas, especially between certain mileposts.

TRAFFIC AND CAPACITY (23.1%):

- **Lane Additions (9.0%):** Numerous requests to add lanes in each direction to accommodate increasing traffic.
- **Congestion (7.5%):** Frequent complaints about traffic congestion, especially during weekends and holidays.
- **Truck Traffic Management (3.3%):** Suggestions to separate truck traffic or enforce specific lanes for trucks.
- **Law Enforcement Presence (3.3%):** Calls for more law enforcement to manage traffic and enforce speed limits.

COMMUNITY IMPACT (6.0%):

- **Local Impact (2.8%):** Concerns about the impact on local communities, particularly during weekends and holidays.
- **Local Road Safety (1.9%):** Impacts on safety and access for residents using local roads during peak I-90 congestion.
- **Emergency Response (1.3%):** Worries about delays for emergency services due to traffic congestion and road conditions.

ENVIRONMENTAL IMPACT (3.7%):

- **Environmental Concerns (3.3%):** Acknowledgment of environmental impact concerns but with a strong emphasis on road improvements.
- **Wildlife Crossings (0.4%):** Suggestions for wildlife crossings and concerns about animal accidents.

ALTERNATIVE ROUTES AND BYPASS (1.7%):

- **Bypass Consideration (1.0%):** Discussion on the need for a bypass or alternative route, especially for trucks.
- **Back Road Usage (0.7%):** Complaints about increased traffic on local roads due to I-90 congestion, affecting residents.

MISCELLANEOUS (4.0%):

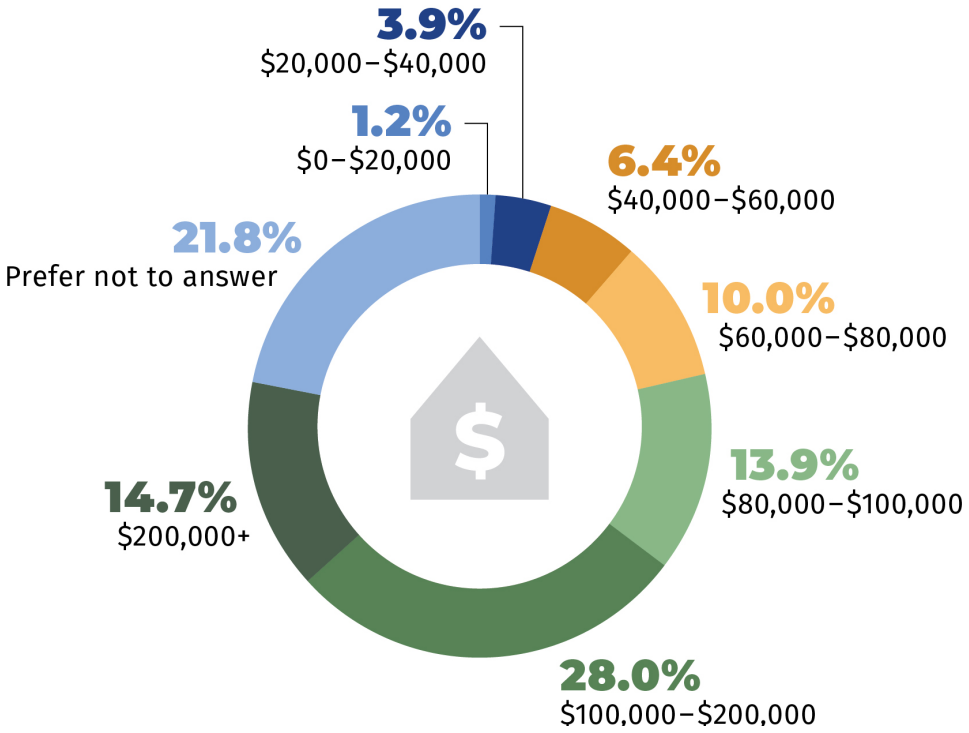
- **Project Specific Feedback (1.2%):** Comments regarding specific construction projects, including areas of concern and impacts.
- **Public Communication (1.2%):** Suggestions for improved communication of road conditions, closures, and delays.
- **Community Involvement (1.2%):** Some responses expressing gratitude for WSDOT's work and acknowledging community involvement.
- **Transportation Alternatives (0.4%):** Interest in and acknowledgment of the importance of alternative transportation options.

RESPONDENT INFO/DEMOGRAPHICS

Finally, demographic information was collected to help ensure responses are representative of the overall community. Responses received for each of these four questions were generally in line with demographics for the state of Washington overall.

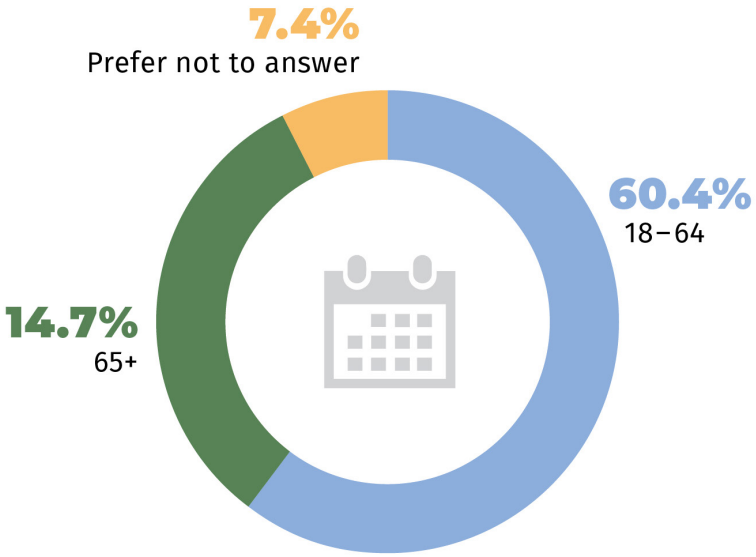
9. Household Income

What is your annual household income?



10. Age Range

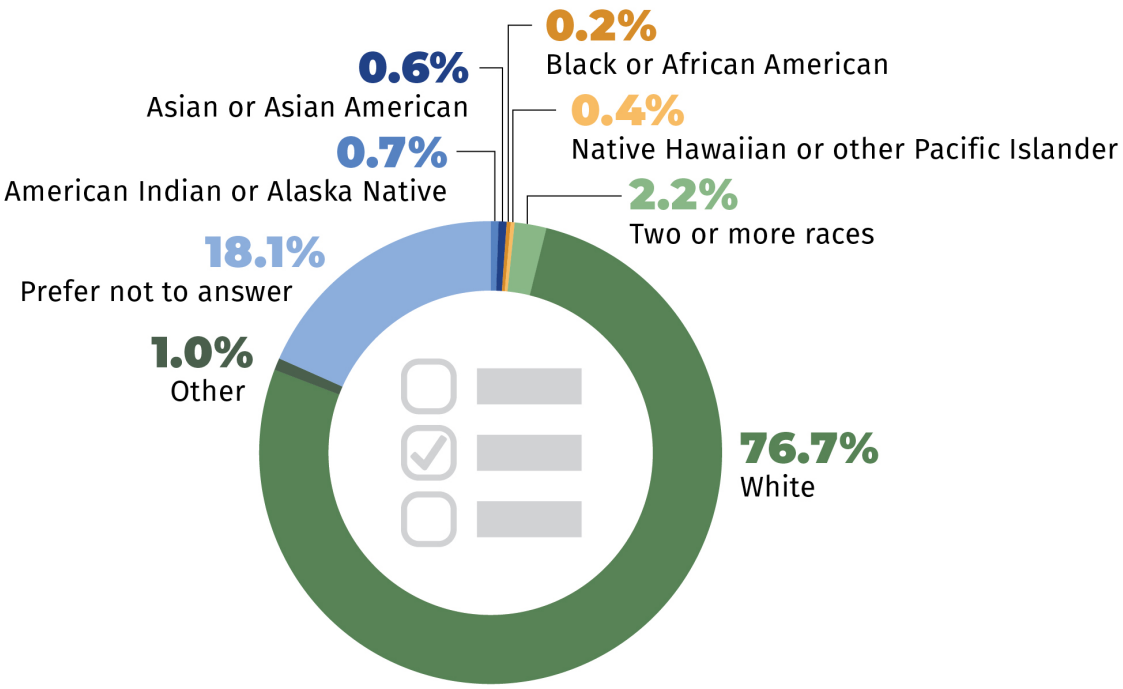
What is your age?



RESPONDENT INFO/DEMOGRAPHICS

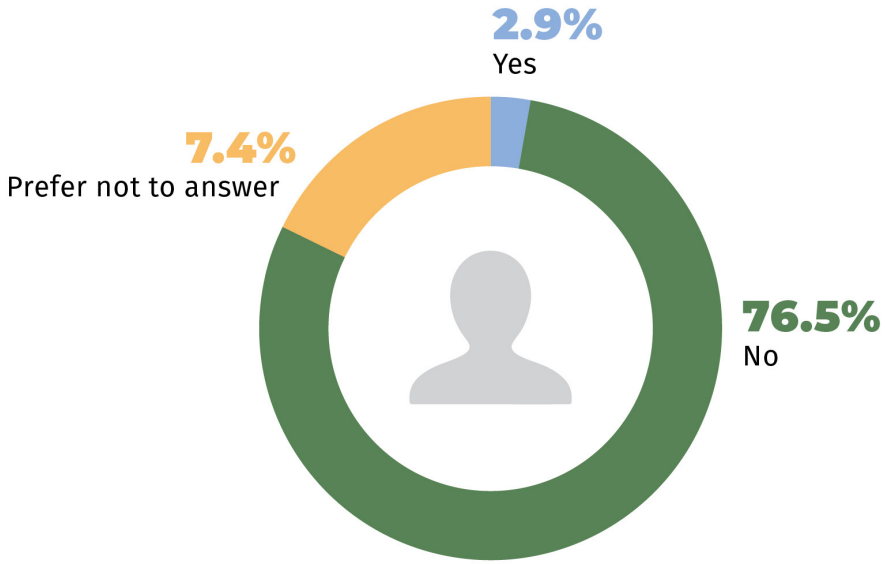
11. Race/Ethnicity

How do you identify your race/ethnicity?



12. Hispanic/Latino Ethnicity

Do you identify as Hispanic and/or Latino?



KEY TAKEAWAYS

- **Single occupancy vehicles represent the most common mode of travel by far on this section of I-90,** as indicated by 89% of respondents. Only about 7% of respondents indicated they travel via carpool/vanpool, and only 2% indicated they travel in a freight truck.
- Based on survey responses, a **large portion of the traffic on this section of I-90 is pass-through traffic** – e.g., travelers heading from the west side of the state to the east side or vice-versa (37% of respondents). About a third of respondents (34%) indicated they use this section of I-90 because they live in the area. Those traveling for recreation, work (e.g. trucking, commute, etc.), events, and shopping represented much smaller segments of the travelers in the area among survey respondents.
- About a third of respondents indicated they use this section of I-90 a few times a week or more – roughly commensurate with the percentage of respondents who live in the area – with 12% of respondents indicating they use it daily. **More than half of survey respondents indicated they use I-90 in the study area few times a month or less.**
- **Safety was respondents' biggest concern related to this section of I-90, followed closely by increased commute/travel time.** While not as strongly represented as the top two concerns, road condition was also a significant concern. Comparatively, economic and environmental impacts were ranked quite low as areas of concern among survey respondents.
- Mirroring respondents' areas of biggest concern, **when asked about their priorities when considering alternative improvements on I-90 or surrounding roads, safety was respondents' highest priority, followed closely by mobility.** Accordingly, economic vitality and environment and health both received relatively low overall scores.
- **I-90** is overwhelmingly the roadway in the study area that is of biggest concern to respondents.
- **Respondents largely considered widening I-90 to be the best solution to improve traffic** on I-90 (as indicated by 76.2% of respondents). Bypassing I-90 was only seen as the best solution by 8.4% of respondents. Relatively few respondents considered improving surrounding roads, encouraging ride sharing, or encouraging travel at different times to be the optimal solution.
- In open-ended comments, concerns about environmental and community impact largely took a back seat to those about **I-90 road conditions, safety, and traffic/capacity.** Open-ended response themes generally mirrored respondents' areas of concern in terms of how frequently they were mentioned. The most popular open-ended response themes included:
  - **Road quality and poor surface conditions** were frequently mentioned, with concerns about slippery surfaces in winter. Some respondents also indicated that narrow lanes on this section of I-90 create dangerous conditions. Safety measures like better road markings, signage, and lighting were suggested.
  - Many respondents called for **increased law enforcement,** particularly for speeding violations and reckless/aggressive driving behavior.
  - A high volume of truck traffic was perceived as a safety issue and a cause of congestion; some called for **designated truck lanes or a dedicated truck route.**
  - The desire to **add lanes in each direction to accommodate increasing traffic** was a recurring theme.
  - Many respondents expressed concerns about **traffic congestion and frequent accidents** in the area – both on I-90 and on local roads – especially during weekends and holidays.

APPENDIX J

Public Survey Results – February 2024

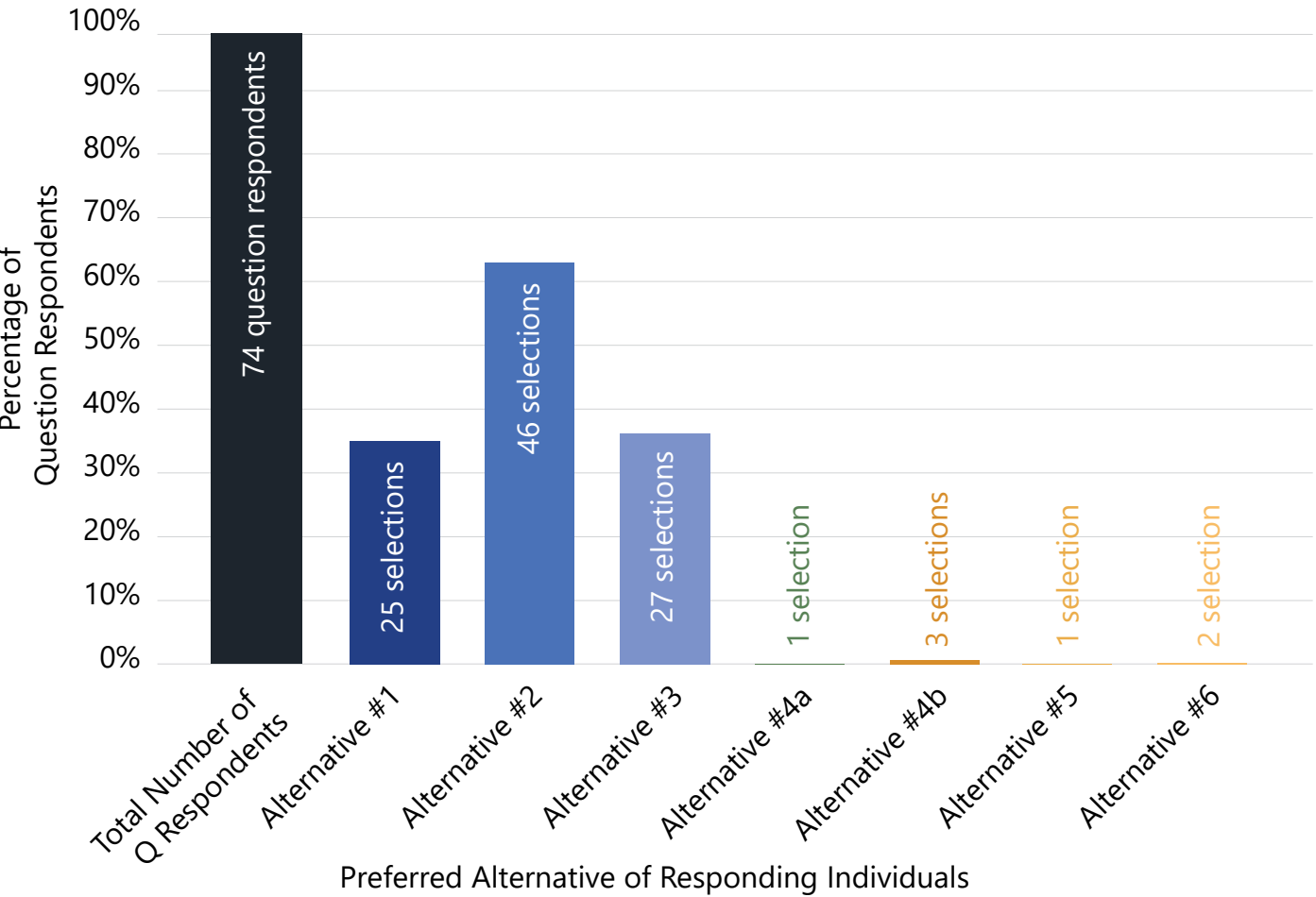
PUBLIC SURVEY 2
FEBRUARY 2024

A public survey was available both at the in-person Open House and online.

During the in-person Open House, attendees were invited to complete a survey, which was available during the open house. Writing implements, as well as locations to sit and fill out the survey, were made available. Completed surveys were collected during the open house. Attendees were also asked to take copies of the survey and share with interested neighbors and family members. A mailing address was given. Additionally, the survey was also available for completion on the STEER I-90 website during February 2024.

Results were collected and tabulated. The following information summarizes the findings.

1.) What alternative would you like to see as part of the I-90 improvements between Easton and Cle Elum? Select all that apply.



QUESTION: Tell us why you selected this alternative.

25 Votes

Summary of Responses for Alternative 1 Widen I-90 to the Outside:

Prioritize options that keep traffic on the freeway (I-90)

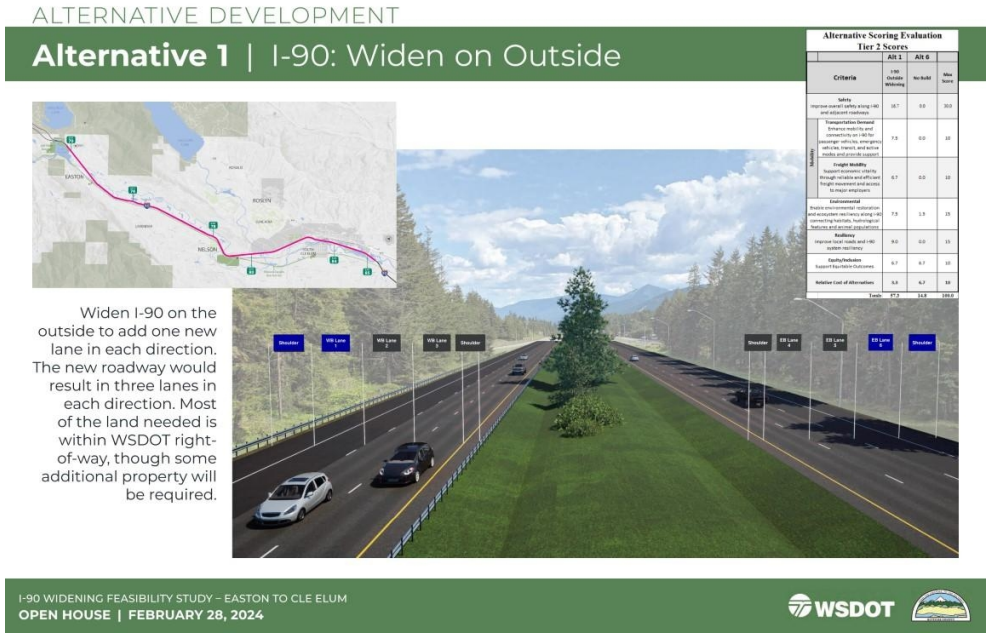
Reasons include reducing congestion and improving emergency response times

Avoid diverting traffic onto county roads to minimize hazards for residents

Emphasize safety, environmental impact, and long-term solutions

Preserve neighborhood integrity and minimize disruption to residents

Considerations include minimizing costs, preserving private property, and reducing environmental impact



QUESTION: Tell us why you selected this alternative.

46 Votes

Summary of Responses for Alternative 2 Widen I-90 to the Median:

Advocacy for economical options to minimize congestion and hazards

Prioritize keeping traffic on I-90 to aid emergency response and safety

Utilization of existing freeway right of way for cost-effectiveness

Support for widening I-90 to improve traffic flow and safety

Preference for options minimizing impact on local roads and residents

Consideration of snow removal efficiency and access management

Proposal for inward expansion to minimize environmental impact

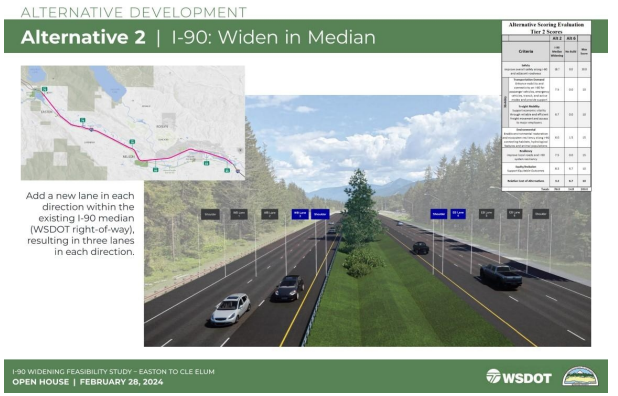
Emphasis on maintaining safety, environmental impact, and property rights

Support for expanding I-90 lanes to accommodate traffic and improve safety

Recognition of cost-effectiveness and reduced habitat destruction

Proposal for cost-saving measures such as utilizing existing median space

Advocacy for additional lanes on I-90 in both directions for efficiency



QUESTION: Tell us why you selected this alternative.

27 Votes

Summary of Responses for Alternative 3 I-90 Reversible Lanes:

Emphasize economical options for efficiency and effectiveness

Advocate for keeping traffic on I-90 to avoid congestion and hazards

Prioritize safety for residents, especially during emergencies

Support for alternatives preserving neighborhood integrity

Preference for options allowing traffic to remain on I-90

Consideration for construction impact on traffic and property

Importance of durability and traffic management, especially during holidays

Concerns about emergency access and traffic flow in case of incidents

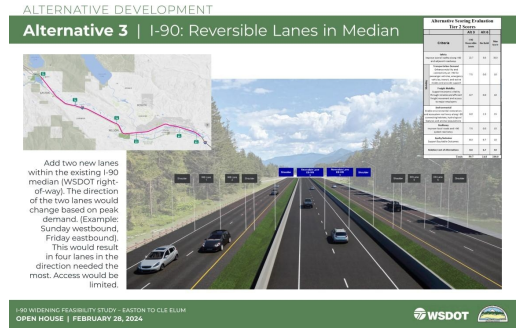
Advocacy for expanding lanes on I-90 to handle heavy traffic

Emphasize cost-effectiveness and minimal disruption to resources

Support for reversible lanes in the median to maximize flexibility

Consideration of safety and adaptability in proposed solutions

Proposal for separation of trucks from other vehicles for safety

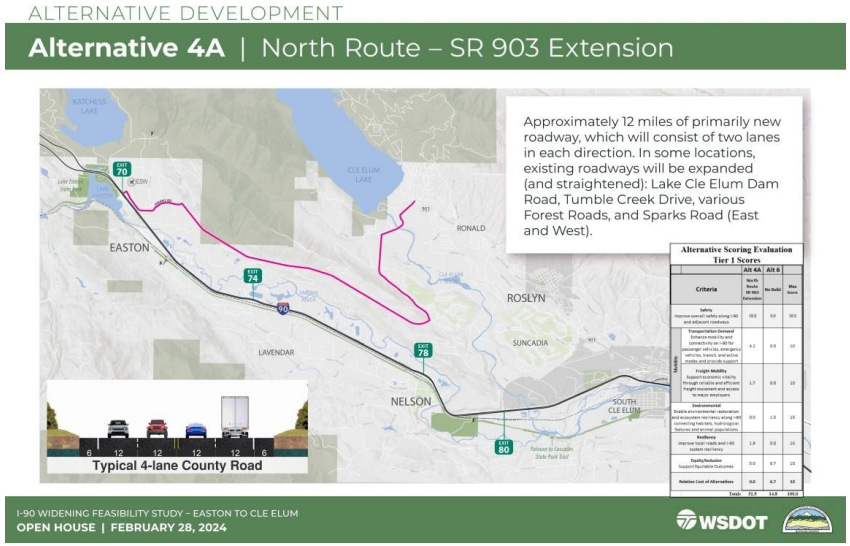


QUESTION: Tell us why you selected this alternative.

1 Vote

Summary of Responses for Alternative 4a SR 903 Extension

Alternate 4A need second way out and not the dead end incase of a fire or high winds (downed trees).



QUESTION: Tell us why you selected this alternative.

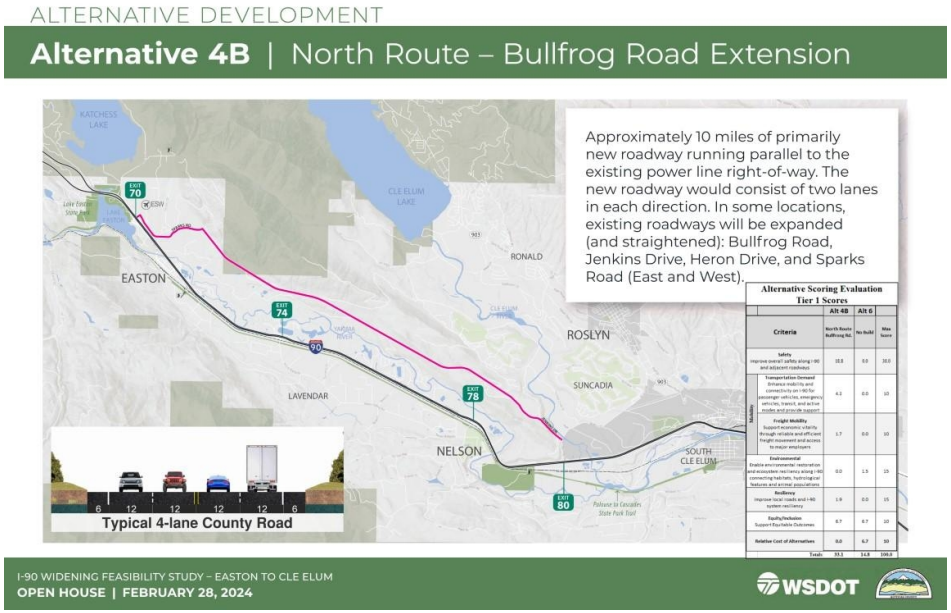
3 Votes

Summary of Responses for Alternative 4b Bullfrog Road Extension

Emergency evacuation.

Easy snow plowing. Move access from Bullfrog Rd to I-90.

This choice, 4B may be the least impactful to surrounding area, i.e. short distance, no residential homes.



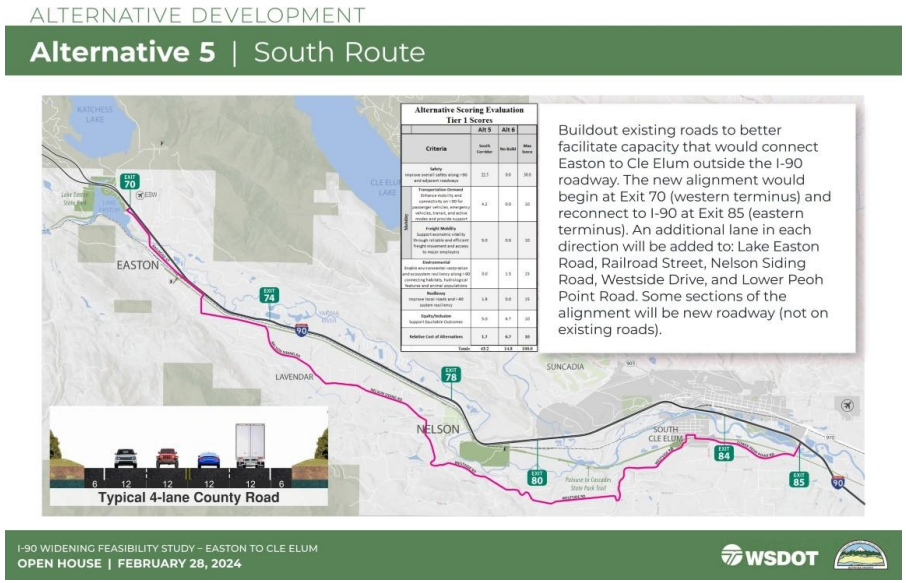
QUESTION: Tell us why you selected this alternative.

1 Vote

Summary of Responses for Alternative 5 South Route

Easton to exit 74 first then widen to Nelson Siding westside Upper Peoh, don't go through south Cle Elum.

Local traffic only.



QUESTION: Tell us why you selected this alternative.

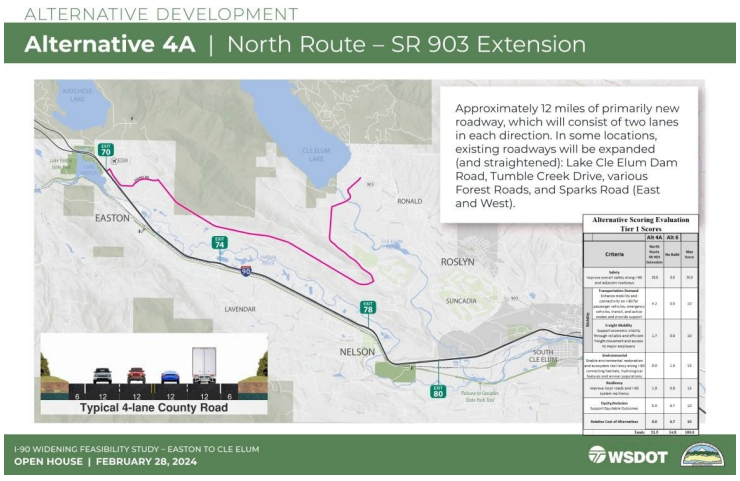
2 Votes

Summary of Responses for Alternative 6 No Build

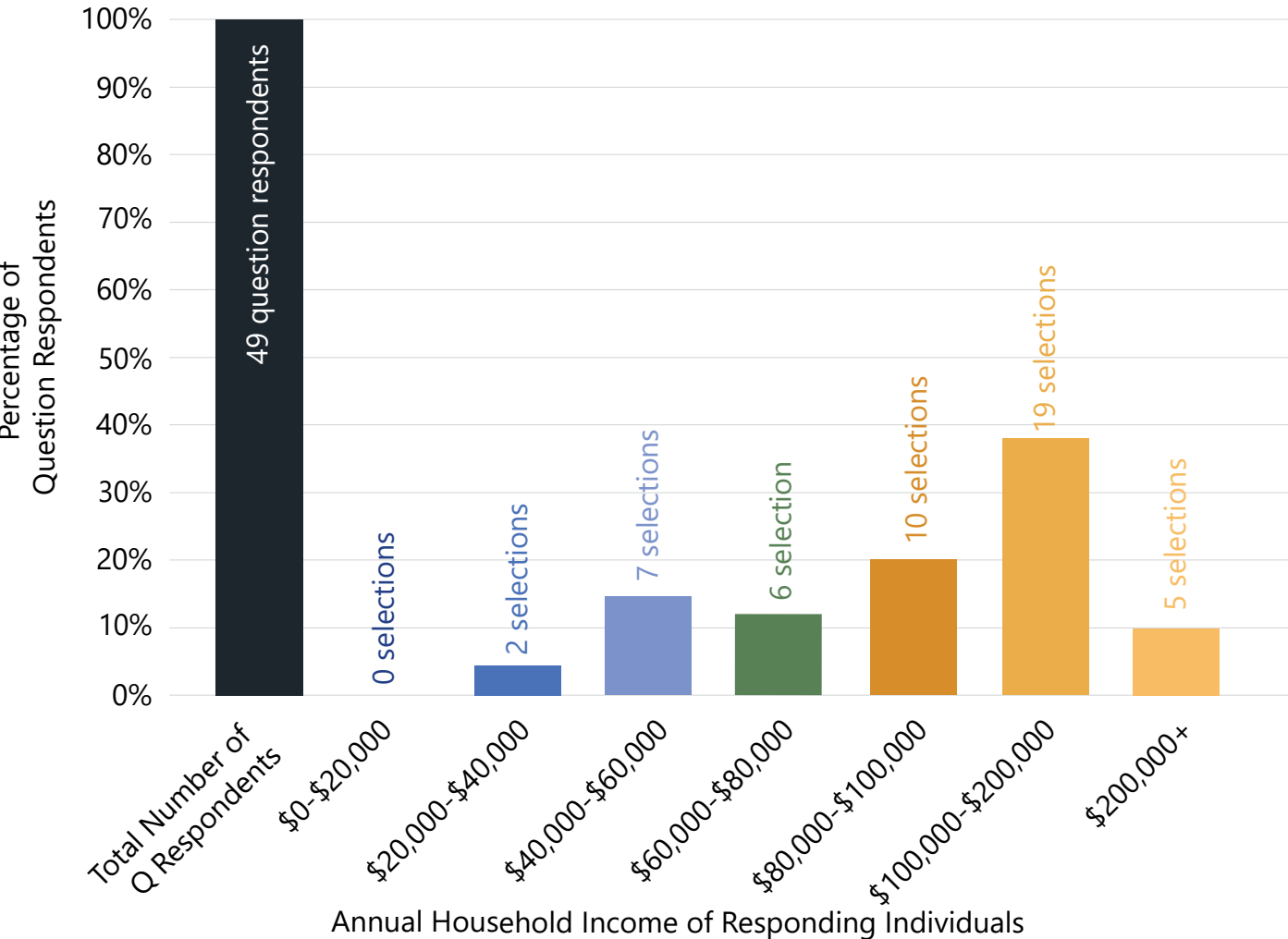
All of these I-90 improvements wont happen for years.

Highway expansions historically only offer temporary reductions in congestion (after temporarily impacting traffic during the ~10 year construction period). They are also extremely costly, particularly when current highway maintenance needs are severely underfunded, and have adverse environmental impacts.

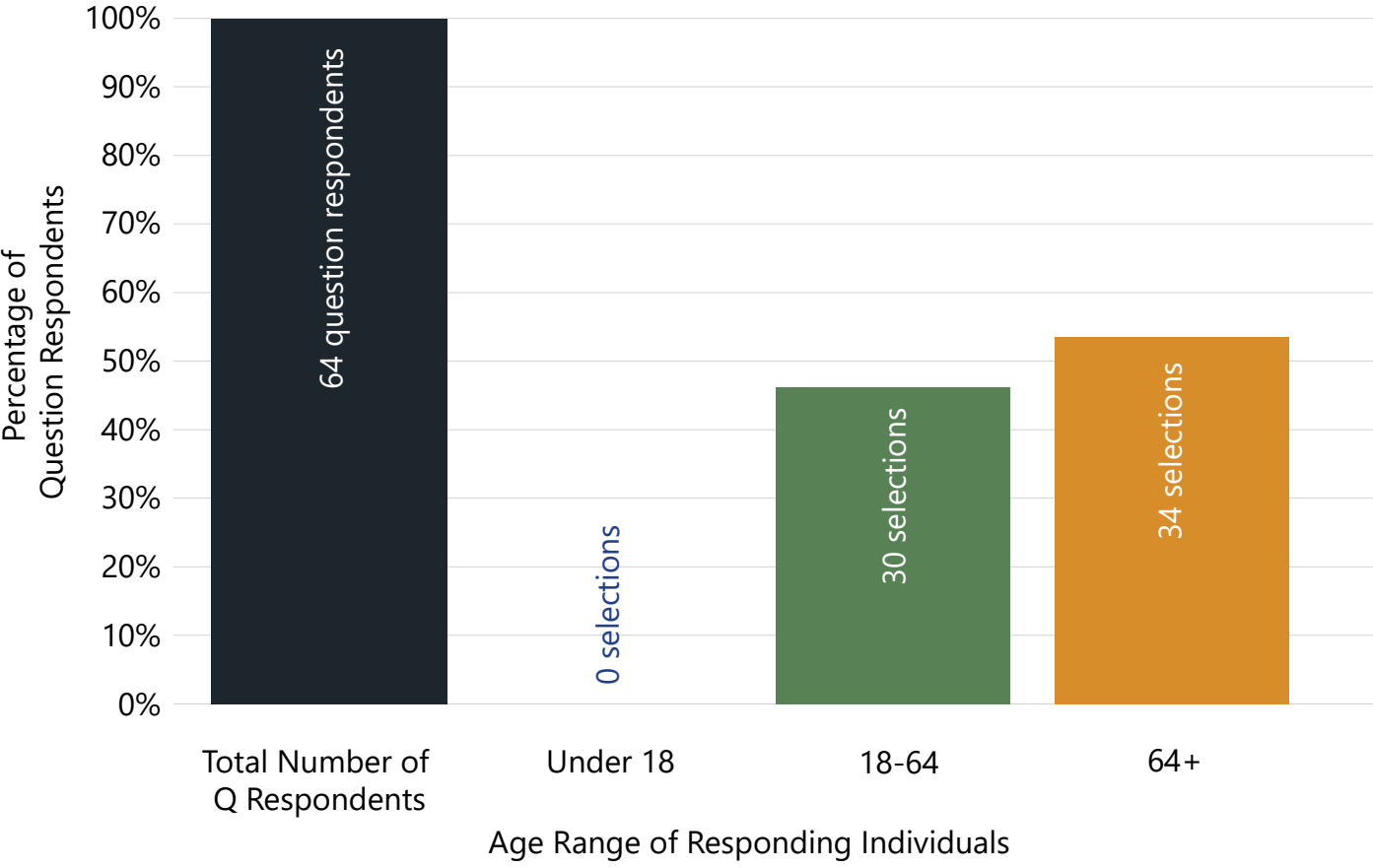
Likewise, scenarios 4A, 4B, and 5 would significantly impact the rural character of the immediate area without any clear benefit (other than apparently diverting traffic off I-90) and run counter to the County's own plan of "preservation of the existing and future transportation system should be a funding priority ahead of expanding the system." Alternative 6 should be further expanded to look at actual expansion alternatives such as permanent variable speeds, lower county road speeds, traffic speed cameras, increased State Patrol emphasis, etc.



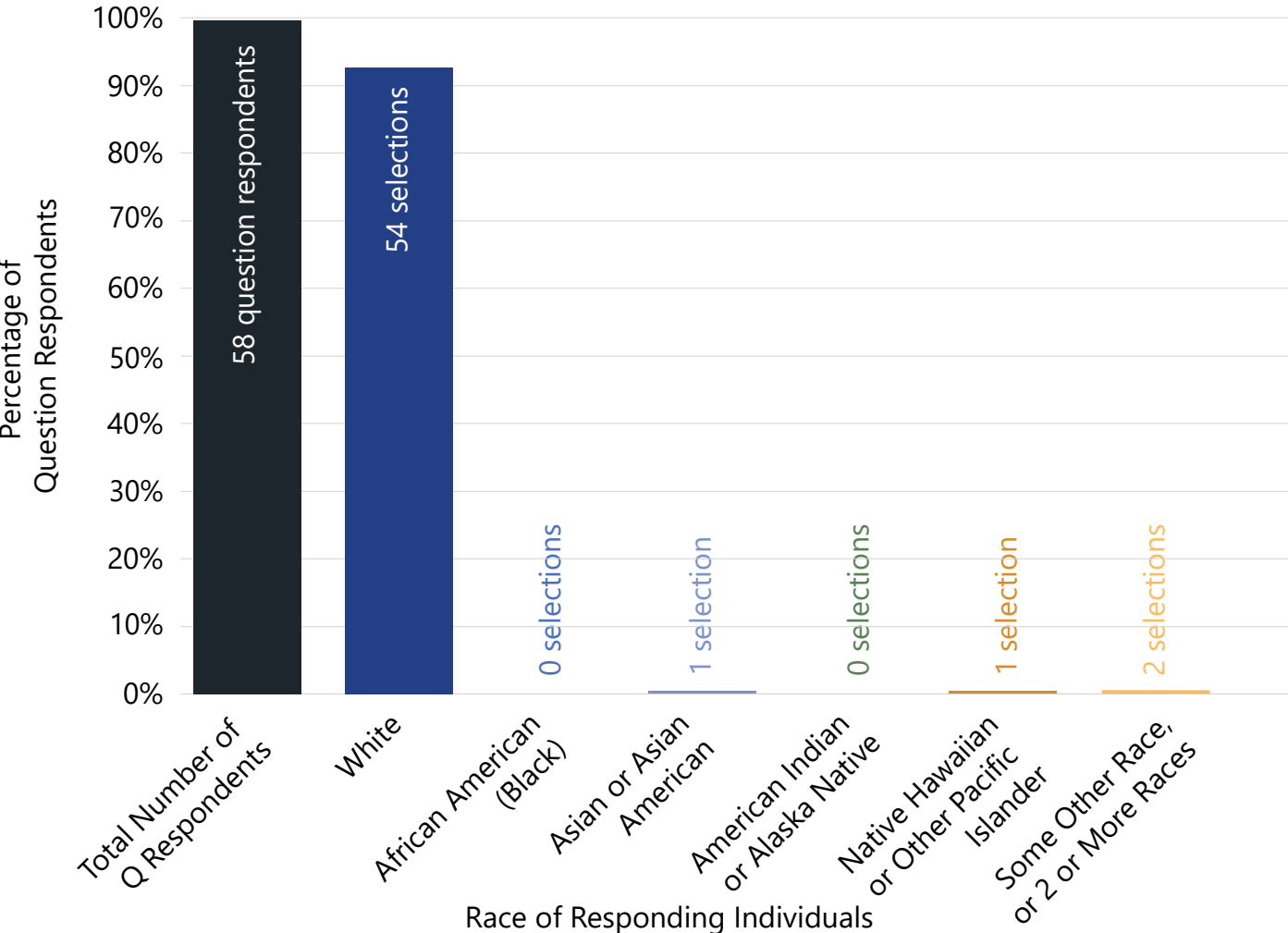
4.) What is your annual household income?



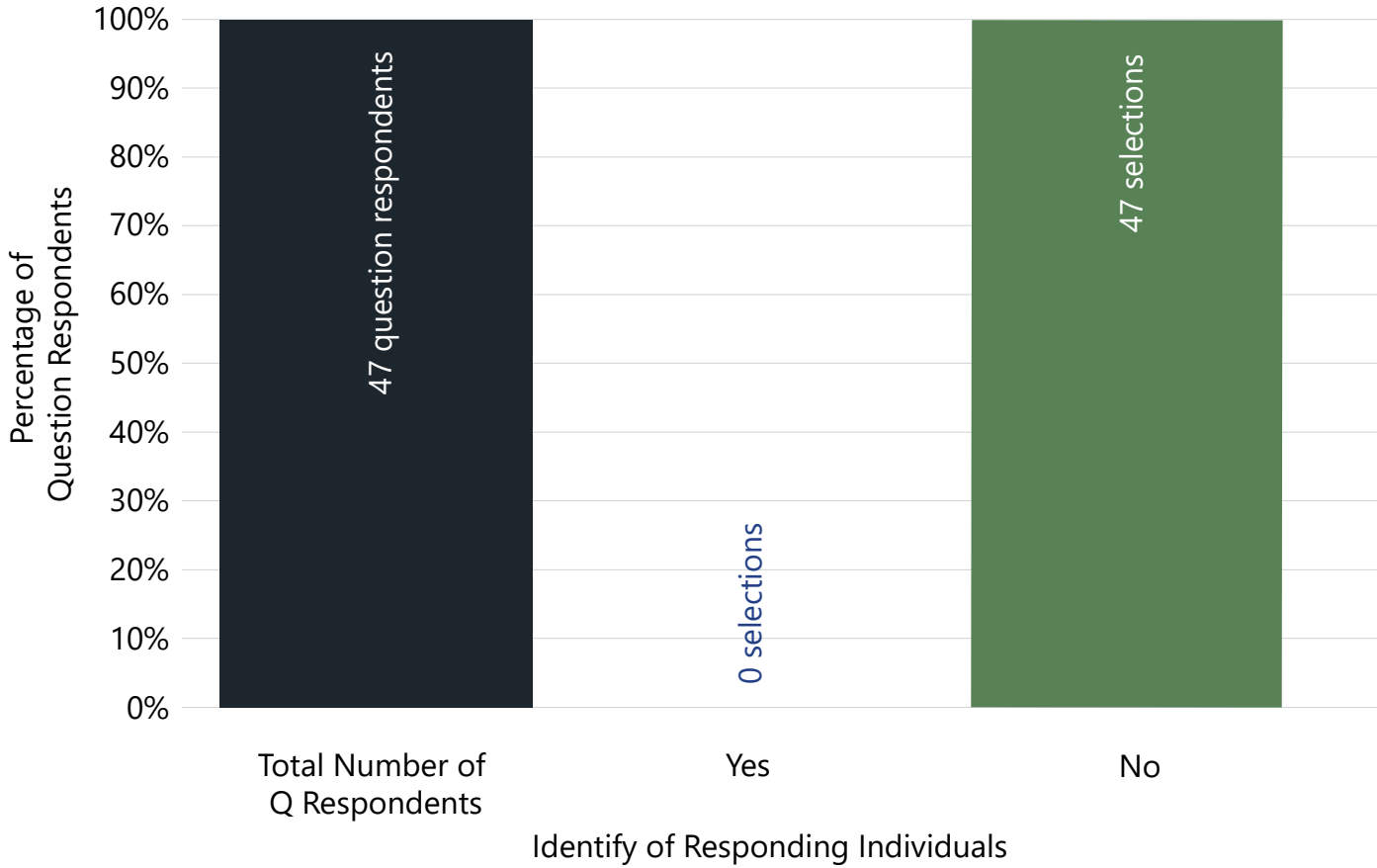
5.) What is your age?



6.) How do you identify your race?



7.) Do you identify as Hispanic and/or Latino?

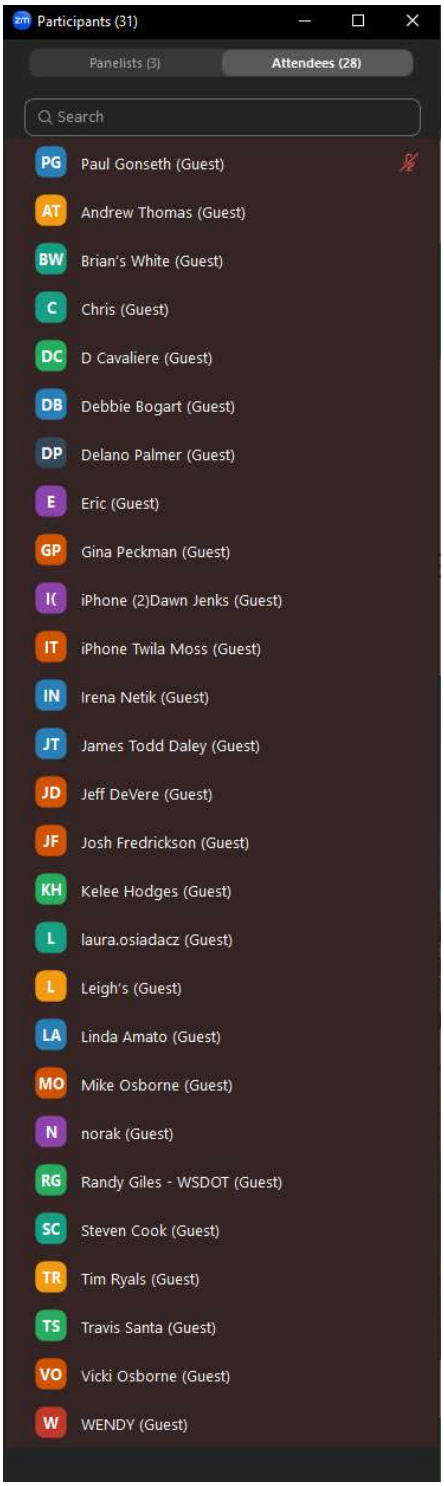


APPENDIX K

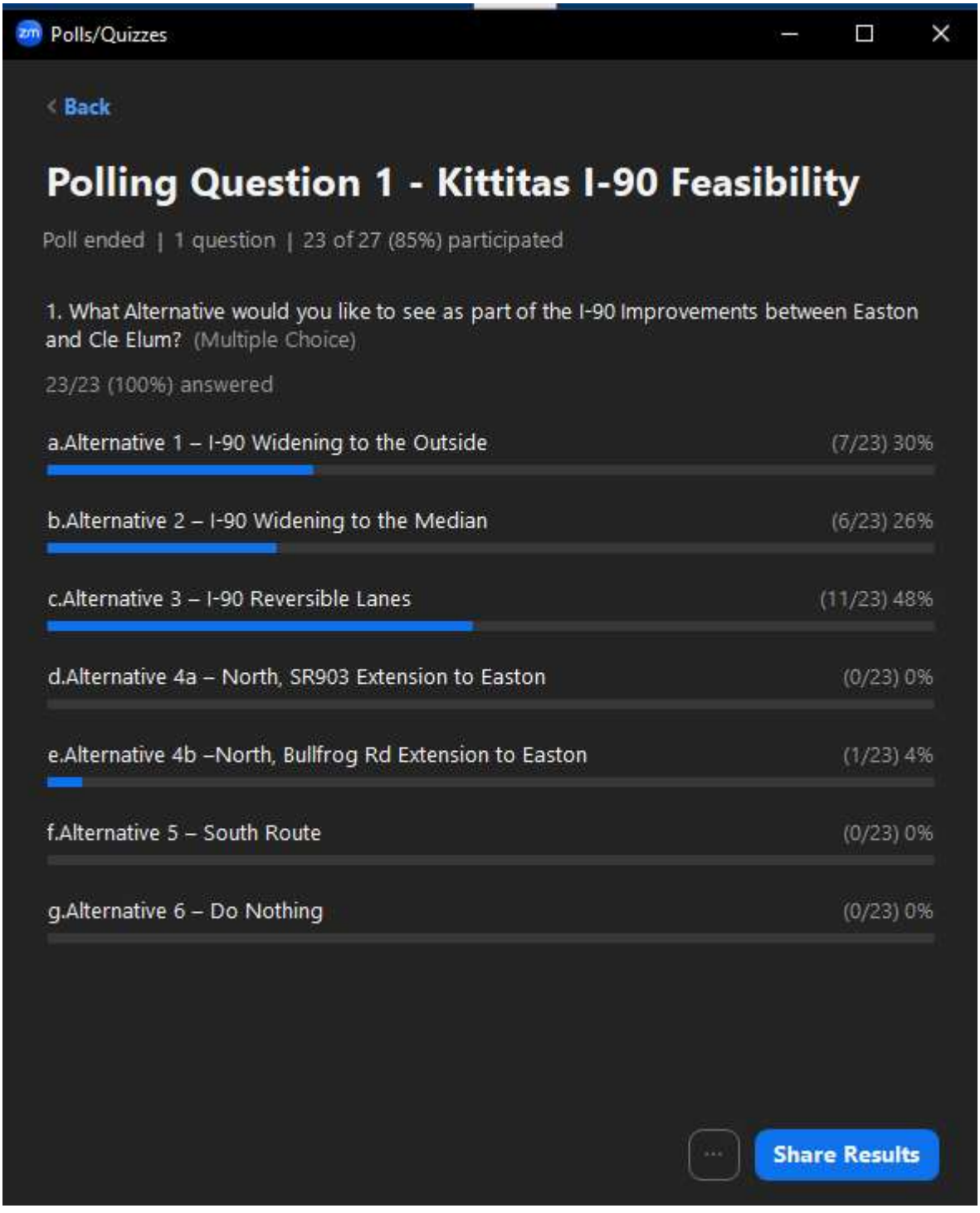
Webinar Polling Results – February 2024

Public Webinar (February 20, 2024)

Participant List



Polling question 1 – What alternative would you like to see as part of the I-90 Improvements between Easton and Cle Elum?



Polling questions 2 - Tell us why you selected this alternative.

1. Tell us why you selected this alternative (Long Answer)

21/21 (100)% answered

dustycavaliere@msn.com
Why is the Environmental rating higher for Alt 1 vs Alt 2 & 3? I will vote for whichever option will help the environment the most.

dabogart@outlook.com
Alternativr 1 or 2 make the most sense, reversible lanes are such a foreign idea for local folks. I envision people driving over the medians to get to a lane that lets them get off the road.

kirkland98033@hotmail.com
Alternatives 4a, 4b and 5 do not make sense from a safety and environmental point of view or for most of the extended criteria. I agree with the Tier 1 evaluation and find Reversible Altern 3 best

chris@madronaelectric.com
Reversible provides flexibility. I see a lot of truck traffic in the center lanes.

gonsetp@wsdot.wa.gov
need an alternate to get emergency vehicle and local traffic to Easton without getting on Freeway

1. Tell us why you selected this alternative (Long Answer)

21/21 (100)% answered

wgdarcy@yahoo.com
It seems to be the best use of existing highway infrastructure and would double lane capacity (based on current two lanes) in each direction versus just adding a lane in each direction.

browndog577@gmail.com
Seems easiest and have a quicker result. I90 Traffic needs to be kept OFF of the county roads.

josh.fredrickson@co.kittitas.wa.us
Reduced time for travel. Able to adjust driving destination as opposed to the reversable lanes.

brenda.sargent@outlook.com
This is an Interstate issue and the solution needs to be in fixing the Interstate. Not altering County roads. The congestion on county roads is a consequence of the Interstate issue.

mdavidson@casey.org
I see alternative 1 and 2 as interchangable and when agregated they scored more than the reversable lanes. I I generally like the idea of reversable lanes IF there would be alternatives to exit.

1. Tell us why you selected this alternative (Long Answer)

21/21 (100)% answered

wilsonjkr@comcast.net
I live off Nelson Siding and absolutely do not see any benefit to pushing traffic out to this route. Huge negative impact of having additional traffic through this area, especially large trucks.

s.cook.mail@gmail.com
I chose the reversible lanes. Similar to the express lanes in Seattle, which I've used. Good for keeping local traffic separate from those just passing through in a hurry.

osborne.michael1@outlook.com
Maintaining a reversable lane from a cost standpoint didn't appear to be considered as well as the safety during periods of snow. Expanding to the outside of the freeway would allow us to manage snow

jeff@deveregov.com
With the limited amount of specifics regarding option C, option A is more "known." I would be interested to hear of the added maintenance costs (plowing), safety (wrong way), and amount of separation

kelee.hodges.pw@co.kittitas.wa.us
Allows through traffic to bypass congestion from on and off ramps throughout the project area. The safety of this option was higher than other alternatives. Use for emergency vehicles if needed.

1. Tell us why you selected this alternative (Long Answer)

21/21 (100)% answered

athomas@kvhealthcare.org
Future proofing the design for growth

Realestateseattle@yahoo.com
Reversible might help segregate more accident prone trucks to use reversible instead of being with autos. Especially in winter.

nora.kantwill@gmail.com
It seems to be the best and easiest COA to implement while keeping traffic on the highway proper.

daleyt@wsdot.wa.gov
Matches what is built up higher on the pass.

Dncjenks@aol.com
It makes the most sense. Fridays during summer traffic is heavy Eastbound. Sunday or Monday it is heavy Westbound.

1. Tell us why you selected this alternative (Long Answer)

21/21 (100)% answered

irenanetik@gmail.com
Highest value from the analysis shown and it does not increase the I-90 footprint.

Polling 3- Are there any other alternatives you were hoping to see but were not presented?

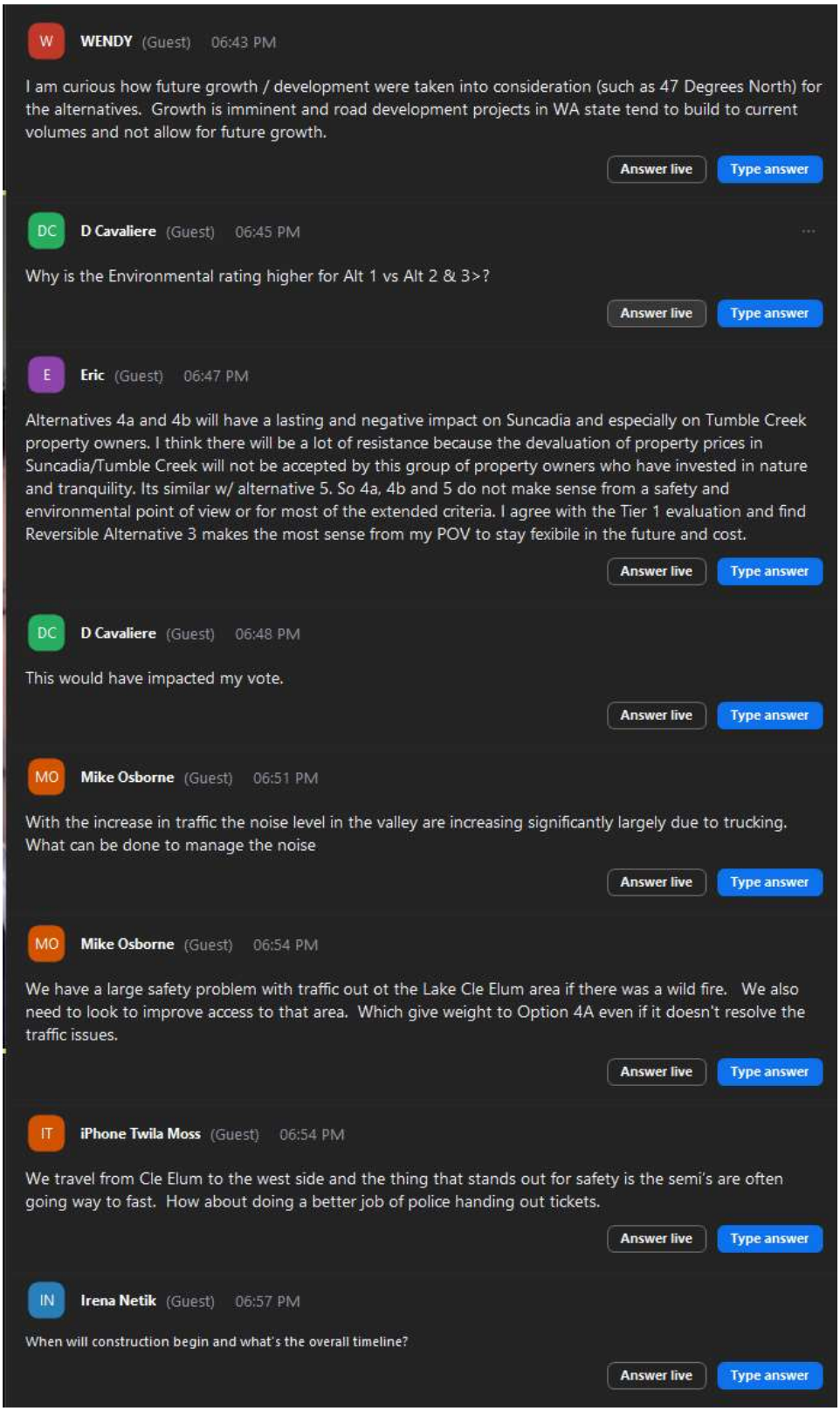
3 - yes

18 – no

Comments:

- If there are other alternatives please describe them to us.
- anything to prevent gridlock for eis service to Easton
- The concern is more about when will there be a conversation regarding the impact being made on communities like Easton during and after the construction
- Truck only lanes
- A tunnel? Kidding! These are great choices!
- No I Love the reversible lane alternative.
- The alternatives seem thorough, good job!
- Widening the inside or outside as necessary to create three lanes on I-90. Each direction.

Q&A


W WENDY (Guest) 06:43 PM
I am curious how future growth / development were taken into consideration (such as 47 Degrees North) for the alternatives. Growth is imminent and road development projects in WA state tend to build to current volumes and not allow for future growth.
Answer live
Type answer
DC D Cavaliere (Guest) 06:45 PM
Why is the Environmental rating higher for Alt 1 vs Alt 2 & 3>?
Answer live
Type answer
E Eric (Guest) 06:47 PM
Alternatives 4a and 4b will have a lasting and negative impact on Suncadia and especially on Tumble Creek property owners. I think there will be a lot of resistance because the devaluation of property prices in Suncadia/Tumble Creek will not be accepted by this group of property owners who have invested in nature and tranquility. Its similar w/ alternative 5. So 4a, 4b and 5 do not make sense from a safety and environmental point of view or for most of the extended criteria. I agree with the Tier 1 evaluation and find Reversible Alternative 3 makes the most sense from my POV to stay fexibile in the future and cost.
Answer live
Type answer
DC D Cavaliere (Guest) 06:48 PM
This would have impacted my vote.
Answer live
Type answer
MO Mike Osborne (Guest) 06:51 PM
With the increase in traffic the noise level in the valley are increasing significantly largely due to trucking. What can be done to manage the noise
Answer live
Type answer
MO Mike Osborne (Guest) 06:54 PM
We have a large safety problem with traffic out ot the Lake Cle Elum area if there was a wild fire. We also need to look to improve access to that area. Which give weight to Option 4A even if it doesn't resolve the traffic issues.
Answer live
Type answer
IT iPhone Twila Moss (Guest) 06:54 PM
We travel from Cle Elum to the west side and the thing that stands out for safety is the semi's are often going way to fast. How about doing a better job of police handing out tickets.
Answer live
Type answer
IN Irena Netik (Guest) 06:57 PM
When will construction begin and what's the overall timeline?
Answer live
Type answer


Anonymous Attendee 07:02 PM
When do you feel that this next phase might begin?
Answer live
Type answer
Anonymous Attendee 07:04 PM
Can you explain why the County is so involved, isn't 1-90 a federal / state highway project?
Answer live
Type answer
KW
kimberli wilson (Guest) 07:06 PM
Thank you for all the information.
Answer live
Type answer
MD
Mike Davidson (Guest) 07:06 PM
Thank you
Answer live
Type answer