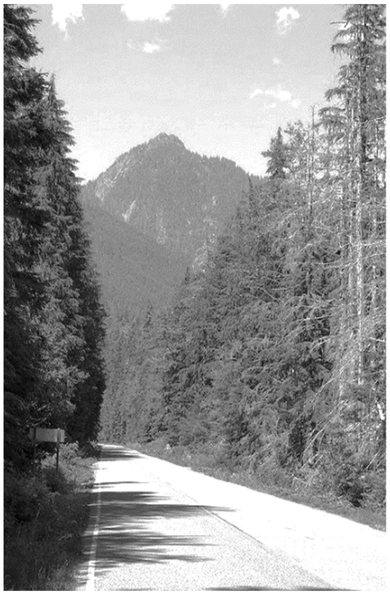
Appendix B:

Feasibility Study Documentation



PUBLIC INVOLVEMENT PLAN

Mountain Loop Highway Feasibility Study
WA SNOHOMISH 20(1)
IDIQ Contract No. DTFH70-15-D-00007
Task Order No. 69056718F000005

U.S. Department
of Transportation
Federal Highway
Administration

Prepared for:
WESTERN FEDERAL LANDS HIGHWAY DIVISION

February 28, 2018

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Parametrix

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ABBREVIATIONS/ACRONYMS

ADA	Americans with Disabilities Act
DARA	Darrington Area Resources Advocates
FHWA	Federal Highway Administration
MP	mile post
NCCC	North Cascades Conservation Council
NEPA	National Environmental Policy Act
PIP	Public Involvement Plan
RPA	Robert Peccia and Associates
SR	State Route
USFS	United States Forest Service – Mt. Baker - Snoqualmie National Forest
WFLHD	Western Federal Lands Highway Division
WTA	Washington Trails Association

PUBLIC INVOLVEMENT PLAN (PIP)

1.0 INTRODUCTION

The Federal Highway Administration (FHWA) is completing a feasibility study for potential corridor improvements to the Mountain Loop Highway in the Mount Baker National Forest. The study, referred to as the *Mountain Loop Highway Feasibility Study*, will identify feasible improvement options to address access, operational, and maintenance concerns within the study area based on needs identified by the public, the study partners, and resource agencies.

The Mountain Loop Highway provides access between the Town of Darrington and the City of Granite Falls as an alternative to SR 530. The *Mountain Loop Highway Feasibility Study* will include analysis of geometric characteristics (road widths, curves, approaches, etc.), collision history, and existing and projected operational characteristics of the corridor. An inventory of existing and projected land uses and environmental resources will also be developed.

The study will be a collaborative process between FHWA, the United States Forest Service (USFS), Snohomish County, the Town of Darrington, the City of Granite Falls, resource agencies, and the public meant to identify transportation needs and potential solutions. A key outcome of the study will be the development of a comprehensive package of short- and long-term recommendations intended to address the transportation needs of highway users over the next twenty years (i.e. planning horizon year 2040). Developing these recommendations will help the study partners define the most critical needs and allocate resources.

This document, called the *Public Involvement Plan* (PIP), describes the process for engaging the public, stakeholders, and other interested parties in the study. The purpose of the PIP is to establish a process that provides opportunities for interested parties to participate in all phases of the corridor planning process. Providing complete information, timely notices, and opportunities to comment, as well as ensuring full access to key decisions, will help achieve the PIP objectives.

1.1 CORRIDOR PLANNING PROCESS

FHWA will use a corridor planning process to investigate improvement options for the Mountain Loop Highway. The corridor planning process will inform any projects that may develop from improvement options identified in the study. The process will help advance viable options for use in potential future NEPA processes, while providing an opportunity for partner involvement at all stages.

The corridor study process will encourage early communication with interested parties to help identify needs, constraints, and opportunities to determine reasonable improvements given available resources and local support. Community, stakeholder, agency and other interested party involvement are important components in any successful planning process. For this study, several proposed involvement strategies will aid in reaching the most people possible to elicit meaningful participation. These opportunities will achieve the following goals:

- Educate corridor users regarding the planning process for evaluating corridors needs.
- Provide opportunity for input and to solicit comments throughout the corridor planning study.
- Present findings and recommendations.

1.2 Study Area

The study area, shown in Figure 1, is located in Snohomish County, Washington. The Mountain Loop Highway is 52 miles in length and connects the communities of the Town of Darrington and the City of Granite Falls. The study will encompass a 40-mile section of the Mountain Loop Highway, starting at Mile Post (MP) 10.76 and ending at MP 50.87.

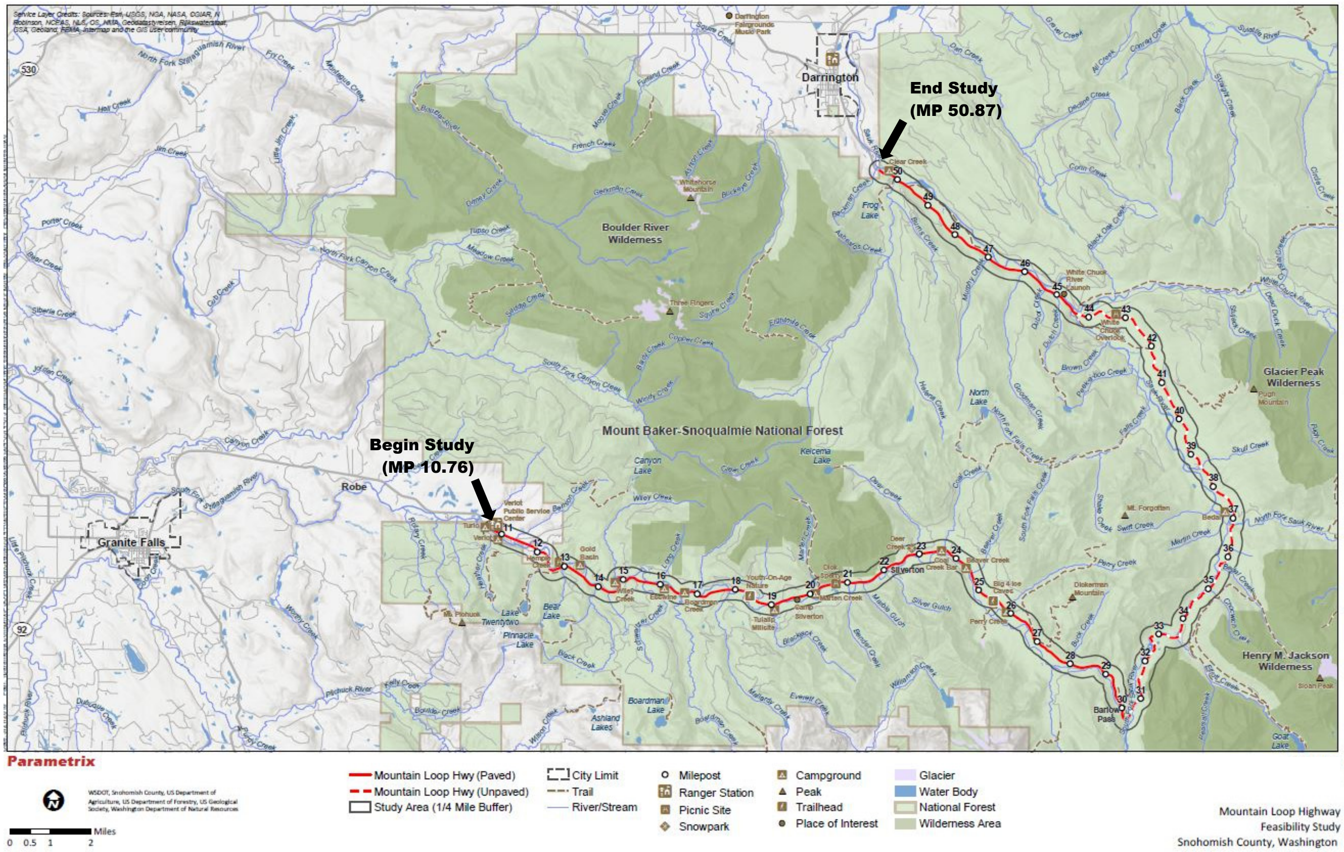


Figure 1: Study Area

1.3 Goals of Public and Agency Outreach Effort

The goal of the public outreach effort is to provide ongoing involvement opportunities for members of the public, stakeholders, and select agency representatives throughout the planning study process. Education and outreach are essential elements in successfully informing individuals about the planning study process and soliciting feedback on the study outcomes.

2.0 PARTICIPATION PROCEDURES

The PIP describes the information and input opportunities that will be provided while developing the *Mountain Loop Highway Feasibility Study*. This plan encourages active participation in identifying and commenting on study issues at every stage of the planning process. Participant involvement includes the following:

- The general public: residents of Snohomish County, the Town of Darrington, the City of Granite Falls, and adjacent areas
- Landowners and business owners within or near the study area boundary
- Tribes
- Stakeholders and other interested parties

This document contains descriptions of the notification process for informational meetings and other participation procedures. FHWA and the Consultants will provide information regarding all aspects of the planning study to the public and interested parties and will seek their input throughout the process.

2.1 STUDY CONTACTS

All information published regarding the *Mountain Loop Highway Feasibility Study* will have contact information for FHWA and Robert Peccia and Associates (RPA). This information is provided below.

PRIMARY STUDY CONTACT

- **Federal Highway Administration (FHWA)** – Western Federal Lands Division
  610 East Fifth Street, Vancouver, Washington 98661
  Contact: **Michael Traffalis**, FHWA Project Manager
  (360) 619-7787
  michael.traffalis@dot.gov

SECONDARY STUDY CONTACTS

- **Snohomish County** – Participating Agency
  300 Rockefeller, M/S 607, Everett, Washington 98661
  Contact: **Eric Nordstrom**, Special Projects Engineer
  (425) 388-3488
  eric.nordstrom@co.snohomish.wa.us

- **United States Forest Service (USFS)** – Participating Agency
  2930 Wetmore Avenue, Suite 3A, Everett, WA 98201
  Contact: **Felix Nishida** – Assistant Forest Engineer
  (425) 783-6081
  fnishida@fs.fed.us

- **Robert Peccia and Associates (RPA)** – Consultant
  825 Custer Avenue (PO Box 5653), Helena, MT 59604
  Contact: **Jeff Key, PE** – RPA Project Manager
  (406) 447-5000
  jkey@rpa-hln.com

2.2 OVERSIGHT COMMITTEE

An Oversight Committee has been established to provide feedback and guidance on the study process and outcomes. Oversight Committee members include representatives from the following governmental entities:

- FHWA – Western Federal Lands Highway Division
- USFS – Mt. Baker - Snoqualmie National Forest
- Snohomish County

- Town of Darrington
- City of Granite Falls

2.3 STAKEHOLDERS

Stakeholders include other agencies, individuals, tribes or groups with a direct presence, involvement or investment in the study. It is critical to engage stakeholders during the life of the study.

- Tribes (*to be engaged separately by USFS*)
- Economic Alliance of Snohomish County
- Sno-King Watershed Council
- Darrington Strong
- Darrington Area Resources Advocates (DARA)
- Reece's Hideout
- Forgotten Mountain Estates
- Washington Trails Association (WTA)
- The Mountaineers
- Washington Wild
- The Wilderness Society
- Backcountry Horsemen of Washington
- Mountain Loop Conservancy (formerly Stillaguamish Citizens Alliance)
- Pilchuck Audubon Society
- North Cascades Conservation Council (NCCC)

2.4 OTHER INTERESTED PARTIES

Stakeholders are often not the only people with an interest in the study. There are others who do not have a direct role or investment in the study, but are interested for varying reasons. All individuals who attend informational meetings or other events and provide email addresses on sign in sheets will be added to a study mailing list to keep track of those desiring notification of future study related activities. The mailing list of interested parties will include landowners within two miles of the study area and will be maintained for the duration of the study.

2.5 INFORMATION SHARING

Information sharing is a critical piece of public involvement and a key part of receiving valuable feedback. Throughout the *Mountain Loop Highway Feasibility Study*, information will be shared through the following methods: meeting notices, study website, email list, public postings, and social media outlets.

2.5.1 Publications

Newsletters will be developed prior to informational meetings. There will be three newsletters that will correspond with each informational meeting held during the development of the study. Newsletters will include the following information:

- Study updates or analysis findings
- Summary of public involvement activities
- Study schedules, and
- Feedback mechanisms to elicit comments from the recipients.

Final versions of the newsletters will be posted on the study website and hardcopies will be mailed to interested parties as included on the study mailing list.

2.5.2 Media Coordination

In addition to newsletters, news releases will be developed to inform the public of the status of the study. Newsletters will include information on key issues, potential impacts, and future concepts for the study.

News releases may be distributed via direct mail, newspaper articles, social media, study webpage updates on the WFLHD website, radio public safety announcements, or inserts in community newsletters.

2.5.3 Study Website

A study website will be developed at the following address - https://flh.fhwa.dot.gov/projects/wa/mountain-loop/ to increase public awareness of the study and to provide current study information. The site will include the following documents.

- Purpose of the study
- History of study data
- Study Schedule
- Study Newsletters
- Public Involvement Plan
- Map of study area
- Environmental Scan
- Existing and Projected Conditions Report
- Concept Development Memorandum
- Informational Meeting Presentations
- Draft Feasibility Study Report
- Final Feasibility Study Report

3.0 MEETINGS

Over the course of the study, various planning and informational meetings will occur to guide the study process and allow opportunities for input.

3.1 OVERSIGHT COMMITTEE MEETINGS

The Oversight Committee will provide feedback and guidance on the study process and outcomes. Oversight Committee members include representatives from:

- FHWA
- United States Forest Service (USFS)
- Snohomish County
- Town of Darrington
- City of Granite Falls

The Oversight Committee will convene every other month for the duration of the study.

3.2 INFORMATIONAL MEETINGS

Informational meetings will be held to provide educational and feedback opportunities during the study. There will be three sets of informational meetings to be held in both Darrington and Granite Falls. The sets of meetings in both Darrington and Granite Falls will have the same format and context; the duplicate meetings in two locations allow for easier attendance by interested parties at either end of the Mountain Loop Highway.

The first set of the three informational meetings will provide information about past projects and planning efforts for the Mountain Loop Highway, the planning process and policies that will affect the study, and initial findings.

The second set of informational meetings will provide information on the findings of the Environmental Scan and the Existing and Projected Conditions Report. This second informational meeting will also be a key point for collecting feedback on potential improvement options for the corridor.

The final set of informational meetings will provide information on the final set of improvement options and kick off the public comment period for the Feasibility Study Report.

Information for all informational meetings will be posted on the study website, in newsletters, and email.

3.3 PARTNER AGENCY PRESENTATIONS

A series of two partner agency presentations will occur over the duration of the *Mountain Loop Highway Feasibility Study*. Partner agency presentations will provide updates to local and partner agencies at major milestones in the study. The partner agency presentations will coincide with the second and third informational meetings.

The first partner agency presentation will provide information on the findings of the Environmental Scan and the Existing and Projected Conditions Report, and provide information on study progress.

The second partner agency presentation will provide information on the final set of improvement options and the draft Feasibility Study Report.

3.4 CONSIDERATIONS FOR TRADITIONALLY UNDERSERVED POPULATIONS

The need to involve traditionally underserved populations, such as minorities, persons with disabilities, and low-income persons, will require mindful planning. Contribution from these populations is needed to reflect all opinions, concerns, and needs along the corridor. To ensure diverse representation, the following steps are being taken:

- **Location of meetings:** informational meetings need to be accessible to all demographics. This requires that meetings be held in Americans with Disabilities Act (ADA) accessible locations and are scheduled to consider geographic equity. Specific populations may have less access to varying geographies based on a variety of reasons, and special consideration to plan meetings in accessible locations will be taken.
- **Help from community leaders and organizations**: Facilitating participation from traditionally underserved populations can prove challenging due to lasting stigmas and preconceived notions. To alleviate some of these deeply rooted beliefs, consultation with community leaders and organizations involved with the targeted audiences will likely be the most effective way to promote involvement.

- **Awareness of diverse audiences**: During informational meetings, study partners and consultants will work to communicate the message of the meeting as effectively as possible. Technical jargon shall be avoided and appropriate dress and common rules of conduct are expected to be followed.

3.5 ACCESSIBILITY

In attempts to provide accessible information and services to all individuals, the following measures for the study will be included:

- Meetings will be hosted in ADA-accessible locations.
- The study team will confer with community leaders and representative organizations about the best ways to involve traditionally underserved populations.

4.0 OVERALL STUDY COMMUNICATION

The following communication strategies and techniques will be used to distribute study information to the community, stakeholders, and interested parties and to seek a higher level of engagement:

- All deliverables in draft and final forms will be posted on the study website; this will include associated technical memorandums and study materials.
- Newsletters will be available one month prior to meetings.
- News Releases for the newspaper, social media, or other widely circulated publications will be developed.
- Hard copies of materials will be provided at the locations described in Section 2.5.4.

Questions and comments from interested parties concerning the participation process, drafted memorandums, study documents, and other work products will be included in an appendix to the actual documents.

5.0 STUDY SCHEDULE

Adherence to the study schedule is important to stay on track and to keep all participating parties engaged. Figure 2 contains the study schedule:

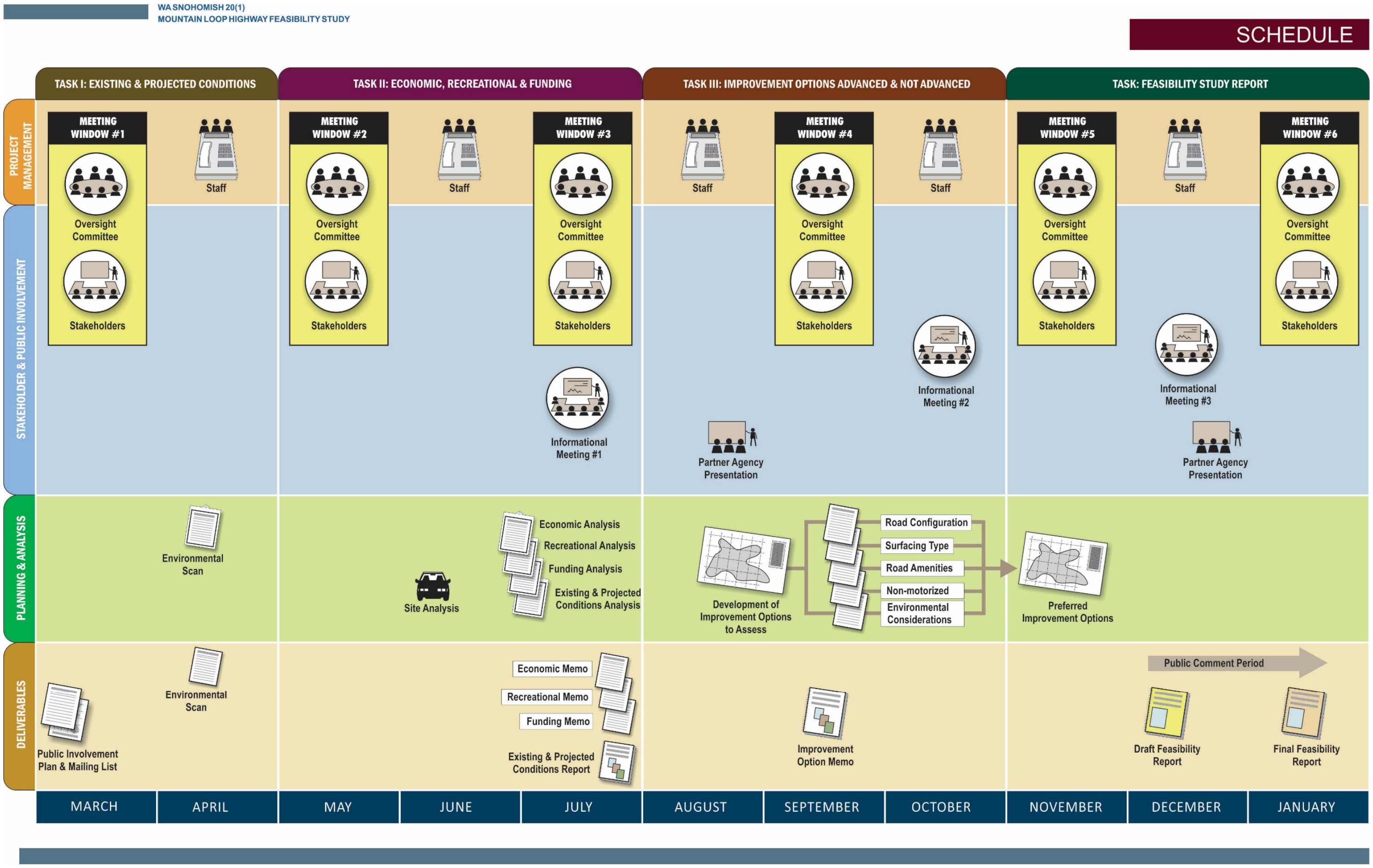
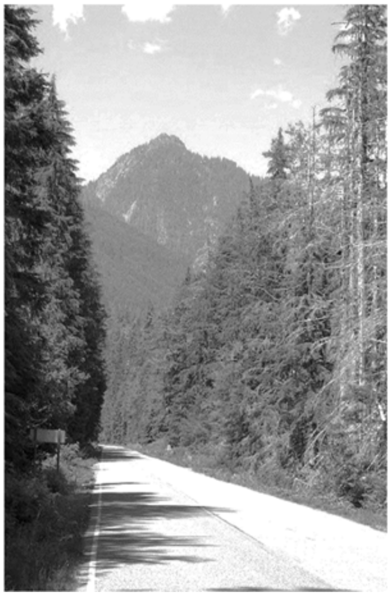


Figure 2: Study Schedule



ENVIRONMENTAL SCAN

Mountain Loop Highway Feasibility Study
WA SNOHOMISH 20(1)
IDIQ Contract No. DTFH70-15-D-00007
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Prepared for:
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June 2018

Prepared by:
ROBERT PECCIA &
ASSOCIATES
Helena, Montana

In association with:
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Seattle, Washington

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Figures

ABBREVIATIONS/ACRONYMS

Corps	U.S. Army Corps of Engineers
County	Snohomish County
CWA	Clean Water Act
DAHP	Washington State Department of Archaeology and Historic Preservation
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FHWA	Federal Highway Administration
Forest Plan	Mount Baker-Snoqualmie National Forest Land and Resource Management Plan
Forest Service	United States Forest Service—Mount Baker-Snoqualmie National Forest
GIS	geographic information system
HPA	Hydraulic Project Approval
HUC	Hydrologic Unit Code
LWCF	Land and Water Conservation Fund
MP	mile post
MSATs	mobile source air toxics
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
RCW	Revised Code of Washington
SCC	Snohomish County Code
SR	State Route
TMDL	Total Maximum Daily Load
USC	United States Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington State Department of Natural Resources
WRIA	Water Resource Inventory Area
WSDOT	Washington State Department of Transportation

ENVIRONMENTAL SCAN

1.0 INTRODUCTION

The Federal Highway Administration (FHWA), in partnership with Snohomish County and the United States Forest Service (Forest Service), is completing a feasibility study for potential corridor improvements to the Mountain Loop Highway in the Mount Baker-Snoqualmie National Forest. The study, referred to as the *Mountain Loop Highway Feasibility Study*, will identify feasible improvement options to improve recreational access and operational safety in the study corridor as well as reduce maintenance concerns based on needs identified by the study.

The Mountain Loop Highway provides access between the Town of Darrington and the City of Granite Falls as an alternative to State Route (SR) 530. The highway also offers spectacular views and access to trails, campgrounds, picnic areas, and a large amount of dispersed use recreational activities. The *Mountain Loop Highway Feasibility Study* will include analyses of access needs, recreational and economic opportunities, geometric characteristics (road widths, curves, approaches, etc.), collision history, erosion and mass wasting issues, and existing and projected traffic patterns of the corridor. An inventory of existing and projected land uses and environmental resources will also be developed.

The feasibility study will be a collaborative process among FHWA, the Forest Service, Snohomish County, the Town of Darrington, the City of Granite Falls, resource agencies, and the public, and it will identify transportation needs and potential solutions. A key outcome of the study will be the development of a comprehensive package of short-, mid-, and long-term recommendations intended to address the transportation and access needs of highway users over the next 20 years (i.e., planning horizon year 2040). Developing these recommendations will help the study partners define the most critical needs and allocate resources. The study aims to reduce planning time while considering environmental and social issues, and to minimize construction costs through the demonstration of feasible improvement opportunities.

This document, called the *Environmental Scan*, provides a planning-level overview of resources and identifies potential constraints and opportunities for the *Mountain Loop Highway Feasibility Study*. This scan report is not a detailed environmental investigation. If improvement options are forwarded from the feasibility study into project development, an analysis for compliance with the National Environmental Policy Act (NEPA) and other applicable federal and state regulations will be completed as part of the project development process. Information provided in this report may be forwarded into the NEPA process at that time.

1.1 BACKGROUND

The Mountain Loop Highway was designated a Forest Highway in 1961 and a National Forest Scenic Byway in 1990. The purpose of the National Forest Scenic Byways Program is to showcase driving routes on National Forest lands that provide access to outstanding scenic corridors and important natural, recreational, and historic features. The goals of the National Forest Scenic Byways Program are to:

- Support and enhance rural community economic development
- Showcase outstanding National Forest and Grassland scenery

- Increase public understanding of National Forests as a major provider of outdoor recreation
- Increase public awareness and understanding of National Forest activities and the importance of sustaining healthy, productive ecosystems
- Ensure that people remain socially connected to public lands so that they become better stewards of the nation's natural resources
- Meet the growing demand of driving for pleasure as a significant recreation use
- Increase use of National Forests by non-traditional users, including minorities and the elderly
- Contribute to the nation's overall scenic byways effort

The 52-mile-long highway is the only loop route of its kind on the Mount Baker-Snoqualmie National Forest. Just a 30- to 60-minute drive from the populous Seattle-Everett metropolitan area, the Mountain Loop Highway is a major recreational destination.

The Mountain Loop Highway offers scenic views of mountain peaks, rivers, streams, and waterfalls. A portion of the highway follows the South Fork Sauk River, part of the federally designated Skagit Wild and Scenic River system. In addition to serving many recreational visitors, the highway serves as a collector road for a few private residences and provides administrative and local access during snow-free periods.

Most of the Mountain Loop Highway is a paved, double-lane roadway managed by Snohomish County; the 14-mile segment between Barlow Pass and the White Chuck River Road is a single-lane, gravel-surface road with turnouts and is managed by the Forest Service. The *Mount Baker-Snoqualmie National Forest Land and Resource Management Plan* (Forest Plan; USDA Forest Service 1990) classified the unpaved segment as Traffic Service Level B with a desired Future Service Level of A[1]. The Forest Plan also called for creation of a paved, double-lane roadway between Barlow Pass and the White Chuck River Road. The Mount Baker-Snoqualmie National Forest classifies the road's current and proposed operational maintenance level as Level 4—usable by all vehicle types; constant or intermittent aggregate surface; user comfort and convenience a moderate priority.

The *Forest-wide Roads Analysis* (USDA Forest Service 2003) identified the Mountain Loop Highway as High-Need for recreation and for access to heritage resources and Late Successional Reserves. The analysis also rated the road as High-Risk for both aquatic and wildlife resources. The tension between these management goals is reflected in public comments on recent repair and improvements proposed on the Mountain Loop Highway. While some commenters have expressed support for improving the roadway, others have expressed a preference that the unpaved segment remain unpaved or even be closed to vehicular traffic.

Land use policy and regulation in the study area is governed principally by the 1990 Forest Plan, as amended. Outside of the National Forest boundary, Snohomish County land use policy and development regulations would apply to projects that may be brought forward from the feasibility study. Under some circumstances, County regulations could also apply to projects on County-maintained road segments within the National Forest boundary. Coordination among federal, state, and local agency staff would be an essential component of any projects that may arise from the feasibility study.

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[1] Traffic flow on a Service Level B road is influenced more strongly by topography than by speed and efficiency and may encounter congestion during heavy traffic (recreation or logging activities). Service Level A roads are free-flowing with adequate passing facilities.

1.2 STUDY AREA

The study area is located in Snohomish County, Washington. The Mountain Loop Highway is 52 miles in length and connects the communities of Darrington and Granite Falls. The feasibility study will encompass an approximately 40-mile section of the Mountain Loop Highway, starting at mile post (MP) 10.76 near the Verlot Public Service Center and ending at MP 50.87 near the National Forest boundary south of Darrington. The study area for this environmental scan is 0.5 mile wide, encompassing a 0.25-mile buffer from the centerline of the roadway along the 40-mile study section.

1.3 INFORMATION SOURCES

Numerous environmental studies have been conducted in the study area over the course of several decades. Some of these have addressed proposed improvements to the Mountain Loop Highway, while others have been concerned with larger-scale issues of land and resource management. The preparers of this document reviewed pertinent information from these studies and supplemented it with publicly available data from federal, state, and local agencies.

2.0 PHYSICAL ENVIRONMENT

2.1 SOIL RESOURCES AND PRIME FARMLAND

Most of the study area was not included in the Snohomish County soil survey area (NRCS 2018). Soil survey data are available for only the small areas outside of the National Forest boundary at the beginning and end of the project corridor. Some mapped soils near the Verlot end of the study area are classified as prime farmland or farmland of statewide importance. A mapping unit near the Darrington end of the study area is classified as “prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season.” Notably, however, the study area does not include any farmlands designated in the Snohomish County comprehensive plan or zoned by the County for agricultural uses. Moreover, no lands classified in the National Land Cover Database as cultivated crops are present in the study area.

To ensure compliance with the Farmland Protection Policy Act, any improvement options that are forwarded from the feasibility study should undergo additional review for the presence of farmlands in the anticipated project impact area.

2.2 GEOLOGIC HAZARDS

The study area is seismically active. The Mountain Loop Highway is less than 2 miles from two major fault systems—the Straight Creek Fault and the Darrington-Devils Mountain Fault—and numerous earthquakes have been recorded in the area (Czajkowski and Bowman 2014).

Segments of the highway near Verlot (MP 10.8 to 15.5), between Barlow Pass and Monte Cristo Lake (MP 30.4 to 32.7), and southeast of Darrington (MP 42.3 to 50.5) are mapped by Snohomish County as having a moderate to high risk of soil liquefaction during seismic events (Figure 1). Liquefaction occurs when water-saturated sandy soil loses strength during severe shaking and behaves like quicksand. Movement of liquefied soils can rupture pipelines and waterlines, move bridge abutments and road and railway alignments, and pull apart the foundations and walls of buildings (Palmer et al. 2004). The presence of such soils necessitates the implementation of special measures to ensure stability during earthquakes and other seismic events.

The northernmost 8 miles of the highway in the study area, from MP 42.5 to the Darrington city limits, are within a lahar hazard area mapped by Snohomish County (Figure 1). Lahars (rapidly flowing slurries of rock and mud formed during volcanic eruptions) can reroute rivers and damage roadways and bridges. Lahars associated with eruptions of Glacier Peak have inundated the Sauk River valley several times during the last 13,000 years (Mastin and Waitt 2000).

The highway passes through or alongside landslide hazard areas mapped by Snohomish County or the Washington State Department of Natural Resources (WDNR) at several locations, including near Schweitzer Creek and Boardman Creek (MP 16.5 to 16.9), at the base of Gordon Ridge (MP 19.3 to 19.6), near Palmer Creek west of Barlow Pass (MP 28.5 to 28.9), and between Barlow Pass and Monte Cristo Lake (MP 30.5 to 31.8) (Figure 2). Almost the entire highway corridor in the study area is classified by Snohomish County as having highly erodible surficial geology (i.e., any of the following geological mapping units: Alluvium, Mass Wasting, Vashon Recessional Outwash, Vashon Recessional Lacustrine). Signs of unstable soils, such as sunken or broken road beds, are evident at many locations along the Mountain Loop Highway.

Snohomish County requires development activities, actions requiring a project permit, or clearing of ground within erosion or landslide hazard areas minimize the risk of hazards by preventing the collection, concentration, or discharge of stormwater or groundwater within the hazard area by minimizing the creation of impervious surfaces, and by retaining vegetation (Snohomish County Code [SCC] 30.62B.320). Such activities are also not allowed to increase surface water discharge, sedimentation, slope instability, erosion, or landslide potential to adjacent or downstream and down-drift properties.

In addition, the County classifies the South Fork Stillaguamish River as far upstream as Silverton (approximately MP 22) and the Sauk River upstream to the junction of the North and South Forks (approximately MP 37) as having active channel migration zones. The County may require a channel migration zone study for development activities or actions requiring project permits in such areas.

Snohomish County critical areas regulations specify special requirements for actions proposed within 200 feet of mine hazard areas, which include areas underlain by or affected by underground mine workings such as tunnels but excluding any areas where the mine workings have been properly stabilized and closed and made safe consistent with all applicable federal, state, and local laws. Recommendations incorporated into permits for such actions may include buffers, setbacks, or reclamation plans for properly closing the mining facilities. Several active mine sites are mapped in the study area along the South Fork Stillaguamish River between Red Bridge Campground (MP 18.0) and Barlow Pass (MP 30.3) (Figure 3).

Improvements brought forward from the feasibility study would be subject to more detailed geotechnical analysis. Part of this detailed analysis may involve taking advance borings to evaluate soil characteristics at exact project locations. Compliance with Snohomish County critical areas regulations may also be necessary.

2.3 SURFACE WATERS

The study area lies within three different watersheds as delineated by the U.S. Geological Survey—South Fork Stillaguamish River (Hydrologic Unit Code [HUC] 1711000802), Upper Sauk River (HUC 1711000601), and Lower Sauk River (HUC 1711000604)—and within two Water Resource Inventory Areas (WRIAs) as defined by the Washington State Department of Ecology (Ecology)—WRIA 5 (Stillaguamish) and WRIA 4 (Upper Skagit). WRIAs define watershed areas monitored by Ecology for water quality impairments, contamination, and degradation.

The Mountain Loop Highway parallels the South Fork Stillaguamish River from the feasibility study start point to Barlow Pass (MP 30.3), at which point it crosses into the Sauk River basin. The road parallels the South Fork Sauk River for approximately 6.6 miles. After the North and South Forks join to form the Sauk River near MP 36.9, the road parallels the Sauk River all the way to the end of the study area.

Both the Sauk River watershed and the South Fork Stillaguamish watershed are designated Tier 1 Key Watersheds under the 1994 Northwest Forest Plan, meaning the entire study area falls within areas so designated. Tier 1 Key Watersheds were selected for their direct contributions to the conservation of anadromous salmonids, particularly by providing refugia for at-risk fish species (USDA and USDI 1994). Key Watersheds are a component of the Aquatic Conservation Strategy, which was developed “to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands” (USDA and USDI 1994). Northwest Forest Plan standards and guidelines for Key Watersheds specify that the mileage of existing system and non-system roads should be reduced.

In addition, the Northwest Forest Plan established Riparian Reserves along streams, wetlands, ponds, lakes, and unstable or potentially unstable areas on National Forest System lands; within these areas, the conservation of aquatic and riparian-dependent terrestrial resources receives primary emphasis (USDA and USDI 1994). Potentially pertinent standards and guidelines for road projects within Riparian Reserves include the following:

- Federal, state, and county agencies should cooperate to achieve consistency in road design, operation, and maintenance necessary to attain Aquatic Conservation Strategy objectives.
- For each existing or planned road, meet Aquatic Conservation Strategy objectives by a) minimizing road and landing locations in Riparian Reserves, b) minimizing disruption of natural hydrologic flow paths, including diversion of stream flow and interception of surface and subsurface flow, and c) restricting side-casting as necessary to prevent introduction of sediment to streams.
- Meet Aquatic Conservation Strategy objectives by a) reconstructing roads and associated drainage features that pose substantial risk, and b) prioritizing reconstruction based on current and potential impact to riparian resources and the ecological value of the riparian resources affected.
- Culverts, bridges, and other stream crossings…shall accommodate at least the 100-year flood, including associated bedload and debris…Crossings will be constructed and maintained to prevent diversion of stream flow out of the channel and down the road in the event of crossing failure (USDA and USDI 1994).

The Mountain Loop Highway crosses more than 89 streams that are mapped in the WDNR hydrography data layer for Washington (see Figure 8, Recreational Opportunities). Twenty-nine of these are named perennial, fish-bearing streams (Table 1). Unnamed streams in the study area include a mix of perennial and seasonal streams, both fish-bearing and non-fish-bearing, as well as streams that have not been classified. Note that these are just the streams that have been incorporated into the WDNR hydrography data layer. Additional streams, wetlands, and other waterbodies are likely present throughout the study area.

Table 1. Major streams crossed by the Mountain Loop Highway in the study area

Name	Approximate Location (MP)
South Fork Stillaguamish River Watershed	
Benson Creek	11.4
South Fork Stillaguamish River	11.7
Twentytwo Creek	12.4
Hempel Creek	12.9
Black Creek	14.0
Wisconsin Creek	14.3
Schweitzer Creek	15.6
Boardman Creek	16.6
South Fork Stillaguamish River	17.8
Eldredge Creek	18.5
Marten Creek	20.3
Deer Creek	23.0
Coal Creek	23.6
Beaver Creek	24.5
Perry Creek	25.8
Buck Creek	28.0
Upper Sauk River Watershed	
South Fork Sauk River	30.9
Elliott Creek	33.5
Chocwich Creek	35.0
Bedal Creek	35.6
Merry Brook	36.2
North Fork Sauk River	36.8
Skull Creek	38.6
Sauk River	44.4
Lower Sauk River Watershed	
Dutch Creek	45.3
Dubor Creek	45.3
Goodman Creek	46.0
Murphy Creek	47.0
Clear Creek	50.1

Source: WNDR hydrography geographic information system (GIS) data
Note: All streams listed in this table are perennial, fish-bearing watercourses.

Road construction and reconstruction activities such as culvert installation or replacement, placement of fill, or armoring of banks have the potential for impacts to surface waters. The U.S. Army Corps of Engineers (Corps) and Ecology regulate activities within or over surface waters. Coordination with federal, state, and local agencies would be necessary to determine the appropriate permits based on the choice of improvement options forwarded from this study. Impacts should be avoided and minimized to the maximum extent practicable. Impacts to streams and wetlands may trigger compensatory mitigation requirements.

The South Fork Stillaguamish River, the South Fork Sauk River, and the Sauk River are all designated shorelines of the state under the Shoreline Management Act (90.58 Revised Code of Washington [RCW]). Shoreline areas in Snohomish County that are subject to the provisions of the Act include rivers or streams with a mean annual flow greater than 20 cubic feet per second, areas within 200 feet of these waters and their floodplains, and associated wetlands. Proposed land uses, modifications, and development activities are subject to permitting requirements and must be designed and conducted to achieve no net loss of shoreline ecological functions.

2.3.1 Water Quality

The Clean Water Act (CWA), administered by the Corps and U.S. Environmental Protection Agency (EPA), is the principal federal legislation directed at protecting water quality. The Corps is responsible for ensuring compliance with Section 404 of the CWA, regarding issuance of permits to place dredge or fill materials into waters of the United States. Examples of projects that require such permits include road widening projects that entail the extension of existing culverts, or the placement of armoring on stream banks. Under Section 401 of the CWA, Ecology has the authority (as delegated by EPA) to approve, deny, or condition any project requiring a Section 404 permit and to ensure that the work will meet state water quality standards. Ecology establishes the standards and regulations, subject to approval by EPA, under which waters of the state must be managed to meet federal requirements. The State of Washington recognizes the Forest Service as the designated management agency for meeting CWA requirements on National Forest System lands.

CWA Section 303(d) requires the State of Washington to periodically prepare a list of all surface waters where pollutants have impaired the beneficial uses of water (for drinking, recreation, aquatic habitats, etc.). Types of pollutants included high temperatures, fecal coliform bacteria, excess nutrients, low levels of dissolved oxygen, and toxic substances. Ecology and Region 6 of the Forest Service meet this management mandate through a Memorandum of Agreement that emphasizes reducing the effects of roads on water quality.

The CWA requires the development and implementation of cleanup plans for waterbodies that fail to meet state water quality standards. This typically involves the development of a Total Maximum Daily Load (TMDL) in which Ecology determines the sources of pollutants and sets the maximum amount of pollutants that each source can discharge to a waterbody. Ecology (2007) has developed a TMDL and Implementation Plan to address water quality violations for fecal coliform, dissolved oxygen, pH, mercury, and temperature in the North and South Forks of the Stillaguamish River. One segment of the South Fork Stillaguamish River in the study area, between Heather Creek and Twentytwo Creek near Verlot, is included in the TMDL based on elevated temperatures (Ecology 2018a). The TMDL calls for improvements to riparian areas, stabilization and decommissioning of roads to reduce sediment, and reduction of timber harvest activities that alter peak flow and stream temperature. Primary concerns identified in the TMDL study include the maintenance of shade over streams and the reduction of sediment loads in streams to create deeper, cooler streams that provide quality aquatic habitat (Ecology 2007). All other segments addressed by the TMDL study are outside the study area.

While a TMDL has not been established for sediment, sedimentation in the South Fork Stillaguamish River has played a role in the degradation of habitat, geomorphic structure, and hydraulic function needed to maintain a diverse aquatic ecosystem. Sedimentation and temperature are directly tied in the ecosystem, and the need to reduce sedimentation from roads and reduce numbers of road crossings has been addressed in watershed analyses prepared by the Forest Service. Increased fine sediment input has been identified as one of the biggest drivers limiting the survival of Chinook salmon in the Stillaguamish watershed (Shared Strategy Development Committee 2007). A landslide on the opposite side of the river from the Gold Basin Campground has been identified as one of the largest contributors of fine sediment in the South Fork Basin (Benda and Collins 1992; Purser et al. 2009).

A segment of the Sauk River near Darrington, immediately downstream of the study area, is on the current CWA 303(d) list of impaired waters, based on elevated temperatures (Ecology 2018a). A TMDL has not yet been developed for this waterbody.

In 2016, the EPA determined that National Pollutant Discharge Elimination System (NPDES) permits are not required for stormwater discharges from forest roads. The decision means that stormwater runoff from forestry roads on National Forest System lands does not require a federal discharge permit under the CWA. The applicability of this determination to the Mountain Loop Highway would need to be reviewed for any projects that may be brought forward from the feasibility study.

All federally funded transportation projects must meet applicable standards for stormwater management. Federal-aid projects managed by FHWA in Washington must comply with WSDOT's Highway Runoff Manual (WSDOT 2010), which has been determined by Ecology to be equivalent to Ecology's Stormwater Manual (Ecology 2014).

2.3.2 Wild and Scenic Rivers

The Sauk River and a portion of the South Fork Sauk River (downstream of the Elliott Creek confluence) in the study area are part of the National Wild and Scenic Rivers System, designated by Congress to safeguard fisheries, wildlife, and scenic qualities for generations to come. The National Wild and Scenic Rivers designation is intended to balance demands among uses and protect some of the nation's most outstanding rivers in a natural and free-flowing state. Designated rivers are classified as wild, scenic, and recreational depending on the type and intensity of development. The designated river segments in the study area are classified as scenic, which is defined as "free of impoundments, with shorelines or watersheds still largely primitive and largely undeveloped, but accessible by road in places."

Section 7 of the Wild and Scenic Rivers Act provides authority to the Secretary of Agriculture to evaluate and make a determination on water resource projects that affect wild and scenic rivers. Section 7(a) prohibits departments and agencies of the United States from assisting in the construction of any water resources project that "...would have a direct and adverse effect on the values for which such a river was established." Water resources projects are those proposed activities that are federally assisted and within the bed and bank of a wild and scenic river.

The South Fork Stillaguamish River within the study area has been recommended for inclusion in the National Wild and Scenic Rivers System, with a classification of scenic (USDA Forest Service 1990). The river was so designated in part because it retains outstandingly remarkable values associated with scenic, recreation, fisheries, wildlife, historic/cultural, and ecological resources. Recommended Wild and Scenic Rivers are to be managed to protect those characteristics that contribute to their eligibility until formally designated by Congress. No substantial evidence of human activity should be present, although the river may be accessible by roads that may occasionally bridge the river. Lands should appear natural when viewed from the river banks.

A Section 7(a) review would be needed if any improvement options forwarded from the feasibility study have the potential to adversely affect the scenic qualities of the Sauk River or the South Fork Sauk River. Similarly, any improvement options with the potential to affect the scenic qualities of the South Fork

Stillaguamish River would be subject to review to ensure they do not adversely affect the river's eligibility for inclusion in the National Wild and Scenic Rivers System.

2.4 GROUNDWATER

Groundwater is water that is found in interconnected pores or fractures in a saturated zone or stratum located beneath the surface of the earth or below a surface waterbody. In addition to providing drinking water, groundwater is an important source of water for rivers, streams, lakes, and wetlands, as well as for plants that grow near those waterbodies (Winter et al. 1998). Protection of groundwater quality and quantity in Snohomish County is accomplished primarily through the management of critical aquifer recharge areas, which are identified as critical areas (SCC 30.62C).

Snohomish County has established the following three categories of critical aquifer recharge areas:

- Sole source aquifers designated by EPA in accordance with the Safe Drinking Water Act of 1974
- Areas within the 10-year travel zones of wellhead protection areas for public water systems with 15 or more service connections
- Areas of high, medium, and low sensitivity to groundwater contamination within the Snohomish County Ground Water Management Area designated by Ecology

No EPA-designated sole source aquifers are present in the study area, and only the western edge of the study area (MP 10.5 to 12.5, west of Twentytwo Creek) falls within the Snohomish County Ground Water Management Area. For these reasons, the primary concern for this discussion is areas within the 10-year travel zones of wellhead protection areas.

Ecology (2018b) has documented more than 17,000 domestic water wells in Snohomish County; fewer than 100 of these are within the study area. For wells that serve 15 or more connections, Washington requires the delineation of wellhead protection areas within which source water is assessed for sensitivity and vulnerability to contamination. The Washington State Department of Health (2018) has identified one such public water system in the study area, serving the Verlot Public Service Center. Snohomish County also indicates the presence of a wellhead protection area at that location, along with another serving the Gold Basin Campground approximately 2 miles east of the public service center. The Mountain Loop Highway bisects the 10-year travel zones of both of those wellhead protection areas. Neither the Washington State Department of Health nor Snohomish County has identified any other wellhead protection areas in the study area.

Wells can be a costly item to mitigate if they are not avoided. Mitigation of a well usually involves drilling a new well for the owner in a new location that is not affected by the potential project. Well costs are based on per foot price; a deeper and higher volume needed would result in a higher cost.

In any future roadway improvements on the corridor, FHWA and the cooperating agencies would take measures to avoid adverse impacts on public water supply wells. Impacts on existing domestic wells would also be considered if improvement options are forwarded from the feasibility study. Compliance with Snohomish County critical areas regulations may also be necessary.

2.5 WETLANDS

Wetlands receive substantial protection through federal, state, and local policies and statutes. Among these are the CWA and the Forest Service Aquatic Conservation Strategy, both of which discussed in Section 2.3, above. At the state level, projects that require federal licenses or permits and that may involve the discharge of dredge or fill material into wetlands are subject to a water quality certification by Ecology. In addition to federal and state regulatory reviews, development projects (including road projects) may be subject to regulatory review and permitting at the local level. Proposed developments and land use activities may be subject to review by local governments to ensure consistency with regulations established for the protection of critical areas pursuant to the Growth Management Act (36.70A RCW) and, where applicable, the Shoreline Management Act. All of these review and permitting processes typically result in the implementation of measures designed to avoid, minimize, and mitigate adverse effects on wetlands.

National Wetlands Inventory mapping data from the U.S. Fish and Wildlife Service (USFWS) indicates that wetlands are present throughout the study area, particularly in the river valley bottoms where the Mountain Loop Highway is located (Figure 4). National Wetlands Inventory maps are prepared from the analysis of high-altitude imagery and are not sufficiently accurate or detailed for project-level wetland determination and/or delineation. Detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis, as well as the identification of previously unmapped wetlands.

Wetland delineations would be required if improvement options are forwarded from the feasibility study that could potentially affect wetlands. Future projects in the study area would need to incorporate project design features to avoid and minimize adverse impacts on wetlands to the maximum extent practicable. Unavoidable impacts to wetlands must be compensated through mitigation in accordance with applicable federal, state, and local regulatory requirements.

2.6 Floodplains and Floodways

Many sections of the Mountain Loop Highway have suffered flood damage in the past. Prominent among these are four sites between Bedal Creek and Monte Cristo Lake (MP 33.1, 33.6, 34.8, and 35.6). Because of the natural topography—a valley with steep sideslopes and a narrow floodplain—and the alignment of the road on a narrow terrace of alluvium adjacent to the valley wall, the site at MP 33.6 in particular is a persistent high-risk location. During flood events in 1990 and 1995-96, the South Fork Sauk River encroached on the road at this site. Record-setting rainfall in October 2003 led to extremely high flows, severely damaging numerous bridges, trails, and roads, including the Mountain Loop Highway at that location. The Bedal Creek bridge was damaged during another major flood event in November 2007. The bridges at Chocwich Creek and Skull Creek were damaged during flood events in November and December 2015.

Modeling of future regional climate patterns indicates that flood-related damage to bridges and other infrastructure is likely to become more frequent and severe. The flood risk in the northern Cascades of Washington is projected to increase in the coming decades (Hamlet and Lettenmaier 2007; Elsner et al. 2010). Many components of the transportation system are sensitive to increased peak runoff, which can affect the stability of road and trail prisms and embankments, the condition of road surfaces, the structural integrity of bridges, and the functionality of culverts (DeLorto 2012). The increasing risk of flood-related damage may amplify the need for drainage improvements and storm-proofing along the Mountain Loop Highway in the future.

Presidential Executive Order 11988, dated May 24, 1977, directs federal agencies to avoid to the extent possible adverse impacts associated with floodplains and to avoid direct or indirect support of development in the floodplain.

In addition, projects within the 100-year floodplain are subject to Snohomish County flood hazard permit requirements. Among other requirements, development authorized by a flood hazard permit must not:

a) Significantly increase the level of flooding on any lands;

b) Threaten the preservation of those natural conditions which are conducive to the maintenance of constant rates of water flow throughout the year by:

    i. creating or exacerbating rapid water runoff conditions which contribute to increased downstream flooding; and

    ii. eliminating natural groundwater absorption areas essential for reducing surface flood flows downstream. In-kind on-site mitigation may be used to achieve this requirement; or

c) Materially pollute or contribute to the turbidity of flood waters (SCC 30.43C.100).

Several segments of the Mountain Loop Highway cross or lie within the mapped 100-year floodplains of the South Fork Stillaguamish River, South Fork Sauk River, or Sauk River (Figure 5). If any improvement options forwarded from the feasibility study would involve the placement of fill within the regulatory floodplain, it will be necessary to obtain permits from agencies with permitting authority; the specific agencies and permits would depend on the location and nature of the project.

2.7 AIR QUALITY

Agencies responsible for transportation projects funded or approved by FHWA must consider potential project-related impacts on air quality. This requirement applies, however, only within areas that currently do not meet air quality standards for certain pollutants (ozone, carbon monoxide, particulate matter, or nitrogen dioxide), or where those standards have not been met in the past. No such areas are present in or near the study area; therefore, any projects that may be forwarded from the feasibility study would not be required to undergo quantitative project-level analysis of potential air quality impacts. Ecology has identified Darrington as an area at risk of violating standards for particulate matter. This designation does not generate any specific analysis requirements or restrictions on project-related activities, however.

Depending on the scope of any improvements that may be forwarded from the feasibility study, an evaluation of mobile source air toxics (MSATs) may be required. MSATs are compounds emitted from highway vehicles and off-road equipment, and which are known or suspected to cause cancer or other serious health and environmental effects.

The Clean Air Act Amendments of 1977 give federal land managers an affirmative responsibility to protect the values related to air quality (including visibility) within Class I areas. Wilderness areas are designated as Class I areas for air quality protection. Visibility is a value that is protected primarily within the boundaries of a Class I area, although the Clean Air Act includes provisions for defining vistas integral to a visitor's experience, even if these vistas extend beyond the boundaries of the Class I area. The Glacier Peak Wilderness, east of the study area, is a Class I area for air quality protection. Visibility is a value that is protected primarily within the boundaries of the Glacier Peak Wilderness Class I area.

Environmental analyses of any projects forwarded from the feasibility study may also be required to address anticipated greenhouse gas emissions that may result from project construction, operation, and maintenance. Emission modeling tools available from EPA and FHWA can be used for a quantitative analysis.

2.8 HAZARDOUS SUBSTANCES

Ecology works to clean up contaminated properties throughout the state. Cleanup projects vary greatly in size and complexity, from routine cleanup of contamination from leaking underground storage tanks, to large, complex projects that require engineered solutions. Ecology also regulates underground storage tanks on properties owned by private businesses and public entities, ensuring that the tanks are installed, managed, and monitored in a manner that prevents releases into the environment.

Ecology (2018c) reports no active underground storage tanks or leaking underground storage tank sites in the study area. The nearest underground storage tanks are in Granite Falls, approximately 14 miles west of the study area. Two underground storage tanks at the Verlot Public Service Center were removed in the 1990s and would thus be unlikely to affect any improvement options that may be forwarded from the feasibility study. The nearest leaking underground storage tank site is at the Green Gables Gas Stop (Ecology cleanup site number 11047), approximately 0.8 mile west of the southwestern starting point (MP 10.76) for the feasibility study. Based on this information, it is not anticipated that leaking underground storage tank sites would adversely affect any improvement options that may be forwarded from the feasibility study.

According to Ecology (2018c), the study area includes one site currently in the state cleanup process under the Model Toxics Control Act. This is the Silverton Concentrator Site near the former mining area of Silverton (MP 22), where arsenic and metallic pollutants have been found to exceed levels that trigger cleanup actions. Cleanup has not been implemented at this site. The site is across the South Fork Stillaguamish River from the Mountain Loop Highway, and thus would be unlikely to affect any improvement options that may be forwarded from the feasibility study. If an option were to overlap this site, a soil investigation should occur. If contaminated soils are present, a special provision regarding handling of contaminated soils is recommended for inclusion in project documentation.

WDNR has not identified any inactive or abandoned mines in the study area. Notably, WDNR’s inventory of inactive and abandoned mines has thus far been limited to mines with more than 2,000 feet of underground development, more than 10,000 tons of production, or a known mill site or smelter. Inactive or abandoned mines too small to meet those criteria could be present in the study area, but unmapped.

The site of the Monte Cristo mining area is approximately 4 miles southeast of the study area, at the headwaters of the South Fork Sauk River. The river carries contaminants downstream from the site and into the study area. Sampling studies have found concentrations of arsenic in Monte Cristo Lake (near MP 32.6) as high as 190 micrograms per liter, more than 10,000 times the level established by Ecology for the protection of human health (Cascade Earth Sciences 2017). If any projects forwarded from the feasibility study involve work within Monte Cristo Lake or the South Fork Sauk River, additional coordination with the Forest Service and Ecology will be necessary, and special measures may need to be implemented for the protection of human health in work areas.

3.0 BIOLOGICAL RESOURCES

3.1 VEGETATION

Native vegetation in the study area is typical for the western slopes of the North Cascades. Coniferous forest is the dominant vegetation type, with stand conditions ranging from recently clearcut areas to old-growth stands. Historically, infrequent, large, stand-replacing fires were the primary agent of vegetation disturbance. More recently, timber management has been the primary agent of change. Clearcut logging was the primary method for managing timber in the study area until the 1990s; since then, other methods, such as commercial thinning, have become more widespread. Other distinctive vegetation types are found in riparian and wetland areas (where deciduous trees, shrubs, and forbs are more common), as well as residential areas near Verlot (where maintained lawns and ornamental plantings are found).

GIS data from the 2011 National Land Cover Database indicate that forested areas are the predominant land cover type in the study area (Figure 6). More than 80 percent of the study area consists of evergreen forest, deciduous forest, or a mix of the two (Table 2). Deciduous and mixed evergreen/deciduous forest types are more common in the lower-elevation valley bottoms, while evergreen forest is more common on mountain slopes. Developed areas, including the surface of the Mountain Loop Highway and other roadways, comprise another 8.6 percent of the study area. Most of the rest of the study area consists of open water (such as lakes and rivers) or shrub/scrub cover. At the lower elevations, the shrub/scrub land cover type commonly indicates residential areas and sites of relatively recent intensive forest management activity. At higher elevations and away from roaded areas, the shrub/scrub cover type is more indicative of avalanche chutes and subalpine shrublands. Such areas are largely absent from the study area, which lies along river valley bottoms. Any projects forwarded from the feasibility study would need to comply with Forest Service management policies, as well as applicable state and county requirements.

Table 2. Land cover in the study area

Land Cover Type	Percent of Study Area
Evergreen Forest	61.0
Mixed Forest	18.8
Deciduous Forest	2.7
Shrub/Scrub	2.5
Grassland/Herbaceous	0.2
Woody Wetlands	1.0
Emergent Herbaceous Wetlands	0.1
Developed, Open Space	6.8
Developed, Low Intensity	1.7
Developed, Medium Intensity	0.1
Open Water	4.6
Barren Land (Rock/Sand/Clay)	0.6

Source: National Land Cover Database (Homer et al. 2015)

Department of Agriculture Regulation 9500-4 directs the Forest Service to manage habitats for all existing native and desired non-native species of plants to maintain viable populations of these species.

Forest Service policy (Forest Service Manual 2670.3) requires the protection of habitat for Forest Service sensitive species from adverse modification or destruction, as well as the protection of individual organisms from harm or harassment as appropriate.

Projects on National Forest System lands in the study area are subject to additional standards and guidelines for the management of certain rare or uncommon species, called survey and manage species, that are associated with late-successional forests. These standards and guidelines specify the protection of sites known to support such species, as well as requiring pre-disturbance surveys for some species.

Data from the Washington State Natural Heritage Program (WDNR 2018) include records of populations of four species of rare vascular or non-vascular plants in the study area (Table 3). Natural Heritage Program data do not reflect exhaustive surveys of the study area, and not all species that may be of concern for project planning are included in the database. For example, populations of Forest Service sensitive species and survey and manage species have been documented during site-specific surveys conducted for Forest Service projects in the study area but are not listed in Table 3. If any projects are forwarded from the feasibility study, botanical surveys would need to be completed for each project.

If improvement options are forwarded from the feasibility study, field surveys for noxious weeds should take place before any ground disturbance occurs. Proposed projects should incorporate applicable practices outlined by the Forest Service and the Snohomish County Noxious Weed Control Board.

Table 3. Rare plants documented in the study area

Name	State Ranking / Listing Status[1]
Spleenwort-leaved goldthread (*Coptis aspleniifolia*)	S2 / S
Black lily (*Fritillaria camschatcensis*)	S2 / T
Rainier pseudocyphellaria lichen (*Pseudocyphellaria rainierensis*)	S4 / S
Beard lichen (*Usnea longissima*)	S4 / S

Source: Washington State Natural Heritage Program (WDNR 2018)

[1] **State rankings:** S2 = Imperiled; S4 = Widespread but of long-term concern; **State listing status:** S = Sensitive; T = Threatened.

No plant species that have been listed as endangered or threatened under the Endangered Species Act (ESA) are known to occur in the Mount Baker-Snoqualmie National Forest. The WDNR Natural Heritage Program does not report any observations any ESA-listed species in the study area (WDNR 2018).

Executive Order 13112 of February 3, 1999 (Invasive Species) directs federal agencies to prevent the introduction and spread of invasive species, and to support efforts to eradicate and control invasive species that are established. The Mount Baker-Snoqualmie National Forest adopted Forest Plan amendments in 2005 and 2015 that provide specific direction for the management of invasive species in the study area. Any projects on National Forest System lands would be required to implement measures to prevent the establishment and control the spread of invasive species. Areas with a history of disturbance, such as highway rights-of-way, are at particular risk of weed encroachment.

3.2 Fish and Wildlife

The study area provides breeding, resting, foraging, and migratory habitat for many species of fish and wildlife. This section provides general descriptions of fish and wildlife species and habitat in the study area, along with regulatory provisions that are not directed at individual species. Species listed as threatened or endangered under the ESA are addressed in Section 3.3; other species of concern are addressed in Section 3.4.

The mosaic of vegetation cover types in the study area provides habitat for a diverse array of wildlife species associated with forested communities in western Washington. The diversity of wildlife habitat is enhanced by the presence of riparian and wetland habitats and special habitat features such as snags, logs, and rocky outcrops. The relatively low level of human development in the study area also enhances the quality of habitat for many wildlife species. Streams and other waterbodies in the study area provide habitat for many species of fish, both resident and migratory.

The National Forest Management Act of 1976 specifies that projects, activities, permits, contracts, and uses of National Forest System lands must provide for the diversity of plant and animal communities based on the suitability and capability of the specific land area. Department of Agriculture Regulation 9500-4 directs the Forest Service to manage habitats for all existing native and desired non-native species of fish and wildlife to maintain viable populations of these species.

The Magnuson-Stevens Fishery Conservation and Management Act, as amended, requires federal action agencies to consult with the National Marine Fisheries Service regarding certain actions. Consultation is required for any action or proposed action authorized, funded, or undertaken by the agency that may adversely affect essential fish habitat for species included for management in federal Fishery Management Plans. Streams and other watercourses in the study area provide essential fish habitat for Pacific salmon species. As such, essential fish habitat consultation would be required if any improvement projects brought forward from the feasibility study entail ground-disturbing work in or near fish-bearing streams.

Under the Washington State Hydraulic Code (77.55 RCW), a Hydraulic Project Approval (HPA) from the Washington Department of Fish and Wildlife (WDFW) may be required for construction activities occurring in or near state waters that will affect fish life. An HPA may also be required for performance of other work that would use, divert, obstruct, or change the natural flow or bed of any waters of the state, including some wetlands. Activities commonly requiring HPAs include construction or repair of bridges, culvert installation, and culvert removal. Through issuance of an HPA, WDFW may place conditions on activities to protect fish and aquatic habitats. If improvement options are forwarded from the feasibility study, the lead agency would need to coordinate with WDFW concerning permitting requirements and the implementation of appropriate measures to avoid or minimize adverse effects on aquatic resources.

Collisions with wildlife do not appear to be a significant hazard in the study area. WSDOT maintains a database of vehicle collisions involving wildlife on federal, state, and local roads throughout Washington (WSDOT 2018). Of nearly 500 incidents involving wildlife in Snohomish County between 2010 (the first year for which geographic data were available) and 2017, none were documented in the study area.

If any improvement projects are brought forward from the feasibility study, project planners should coordinate with fish and wildlife biologists from WDFW and the Forest Service to gain further insight into issues related to the management of these species, as well as measures for avoiding, minimizing, and mitigating adverse effects on species and habitat.

3.3 THREATENED AND ENDANGERED SPECIES

Section 7(a)(2) of the ESA of 1973, as amended, requires federal agencies to review actions they authorize, fund, or carry out, and to ensure such actions do not jeopardize the continued existence of federally listed species, or result in the destruction or adverse modification of designated critical habitat. Several species of fish and wildlife that are known or expected to use habitats in the study area are listed or proposed for listing under the ESA (Table 4). Designated critical habitat for several of these species is also present in the study area. Any improvements forwarded from the feasibility study would need to undergo review for compliance with the provisions of the ESA. The listing status of species and critical habitat can change over time; therefore, an up-to-date list of potentially affected species and critical habitats should be reviewed for each project.

Table 4. Threatened and endangered species and critical habitat that may be present in the study area

Species	Listing Status	Critical Habitat Status
Chinook salmon (*Oncorhynchus tshawytscha*), Puget Sound evolutionarily significant unit	Threatened	Designated; present in study area
Steelhead trout (*O. mykiss*), Puget Sound distinct population segment	Threatened	Designated; present in study area
Bull trout (*Salvelinus confluentus*)	Threatened	Designated; present in study area
Northern spotted owl (*Strix occidentalis caurina*)	Threatened	Designated; present in study area
Marbled murrelet (*Brachyramphus marmoratus*)	Threatened	Designated; present in study area
Yellow-billed cuckoo (*Coccyzus americanus*)	Threatened	Proposed; none in study area
Gray wolf (*Canis lupus*)	Endangered	Designated; none in study area
Grizzly bear (*Ursus arctos horribilis*)	Threatened	Proposed in 1973 but rendered stale by 1978 amendments to the Endangered Species Act
North American wolverine (*Gulo gulo luscus*)	Proposed Threatened	None designated or proposed

Sources: U.S. Fish and Wildlife Service, National Marine Fisheries Service

3.4 OTHER SPECIES OF CONCERN

In addition to meeting requirements relating to ESA-listed species and designated critical habitat, any projects brought forward from the feasibility study would need to comply with Forest Service management policies and, where applicable, with Snohomish County critical areas regulations.

Projects on National Forest System lands in the study area must also comply with the standards and guidelines for the management of certain rare or uncommon species, called survey and manage species, that are associated with late-successional forests. These standards and guidelines specify the protection of sites known to support these species, as well as requiring pre-disturbance surveys for some species.

Forest Service policy (Forest Service Manual 2670.3) requires the protection of habitat for USFWS species of concern, Forest Service sensitive species, and management indicator species[2] from adverse modification or destruction, as well as the protection of individual animals from harm or harassment as appropriate.

Federal lands in the study area are managed for no net loss of core area for grizzly bears; core areas are defined as areas larger than 24 acres and more than 0.31 mile from open roads, motorized trails, or high-use trails. Projects that reduce core habitat are required to offset these reductions through the creation of new core area nearby—that is, by closing roads, motorized trails, or high-use trails. The new core area

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[2] National Forest planning regulations require each National Forest to identify and monitor management indicator species whose population changes may indicate the effects of management activity. Management indicator species include threatened, endangered, or sensitive species; species commonly hunted, fished, or trapped; non-game species of special interest; and species that represent certain habitats or habitat elements. Management indicator species for the Mount Baker-Snoqualmie National Forest include spotted owl, pine marten, pileated woodpecker, bald eagle, peregrine falcon, grizzly bear, gray wolf, primary excavators, mountain goat, black-tailed deer, and Rocky Mountain elk.

must be of equal or greater size and must contain seasonal foraging components of equal or greater value compared to the area where core habitat was lost.

Presidential Executive Order 13186, dated January 17, 2001, directs federal agencies to avoid or minimize negative impacts of their actions on migratory birds, and to take active steps to protect birds and their habitat. In response to this order, the Forest Service has implemented management guidelines specifying that migratory birds must be addressed in NEPA reviews of actions with the potential to affect migratory birds. The Forest Service must evaluate the effects of agency actions on migratory birds, focusing first on species of management concern along with their priority habitats and key risk factors.

Snohomish County critical area rules (SCC 30.62A) place restrictions on project activities within or near fish and wildlife habitat conservation areas, as well as requiring projects to be designed and conducted to achieve no net loss of critical area functions and values. These restrictions apply to streams, wetlands, other waterbodies, and primary association areas for species listed by the state or federal government as endangered or threatened.

Data from the WDFW Priority Habitats and Species program indicate that observations of 18 species of fish or wildlife on the state's list of priority species have been documented in the study area (Table 5). Several of these are also Forest Service sensitive species or Mount Baker-Snoqualmie National Forest management indicator species. Priority Habitats and Species data do not reflect exhaustive surveys of the study area, and not all species that may be of concern for project planning are included in the database. For example, populations of Forest Service sensitive species and survey and manage species have been documented during surveys conducted for Forest Service projects in the study area but are not listed in Table 5. The need for site-specific surveys would need to be evaluated for any projects forwarded from the feasibility study.

If any projects are brought forward from the feasibility study, a thorough review of the Forest Service wildlife sightings database should be conducted, and habitats near any proposed project sites should be evaluated to determine their suitability for any species of concern. Measures to avoid or minimize disturbance of these species or their habitat should be incorporated into project design and implementation.

Table 5. Washington Department of Fish and Wildlife priority species documented in the study area

Species	Federal Status	State Status	Forest Service Status
Fish			
Bull trout *Salvelinus confluentus*	Threatened	Candidate	Management Indicator Species
Chinook salmon *Oncorhynchus tshawytscha*	Threatened	Candidate	Management Indicator Species
Chum salmon *Oncorhynchus keta*	none	Candidate	Management Indicator Species
Coastal resident cutthroat trout *Oncorhynchus clarki clarki*	none	none	Management Indicator Species
Coho salmon *Oncorhynchus kisutch*	none	none	Management Indicator Species
Pink salmon *Oncorhynchus gorbuscha*	none	none	Management Indicator Species
Rainbow trout *Oncorhynchus mykiss*	none	none	Management Indicator Species

Species	Federal Status	State Status	Forest Service Status
Fish (continued)			
Sockeye salmon *Oncorhynchus nerka*	none	none	none
Steelhead *Oncorhynchus mykiss*	Threatened	Candidate	Management Indicator Species
Mammals			
Townsend's big-eared bat *Corynorhinus townsendii*	Species of Concern	Candidate	Sensitive
Big brown bat *Eptesicus fuscus*	none	none	none
Yuma myotis *Myotis yumanensis*	none	none	none
Grizzly bear *Ursus arctos horribilis*	Threatened	none	Management Indicator Species
Birds			
Harlequin duck *Histrionicus histrionicus*	none	none	Sensitive
Marbled murrelet *Brachyramphus marmoratus*	Threatened	Threatened	none
Northern goshawk *Accipiter gentilis*	Species of Concern	Candidate	Sensitive
Vaux's swift *Chaetura vauxi*	none	Candidate	none
Amphibians and Reptiles			
Western toad *Anaxyrus boreas*	Species of Concern	Candidate	none

Source: WDFW 2018

4.0 SOCIAL AND CULTURAL RESOURCES

4.1 DEMOGRAPHIC AND ECONOMIC CONDITIONS

Implementing regulations for NEPA require federal agencies to assess potential social and economic impacts resulting from proposed actions. FHWA guidelines recommend consideration of impacts to neighborhoods and community cohesion, social groups including minority populations, and local and/or regional economies, as well as growth and development that may be induced by transportation improvements. Demographic and economic information presented in this section is intended to assist in identifying populations that might be affected by improvements in the study area.

Title VI of the United States Civil Rights Act of 1964 and Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations) both require that projects receiving federal funds must not result in disproportionately high and adverse effects on minority or low-income populations. For transportation projects, this means that minority or low-income populations must not be disproportionately isolated, displaced, or otherwise subjected to adverse effects.

If improvement options are forwarded from the feasibility study into project development, environmental justice would need to be further evaluated during the project development process.

Table 6 summarizes recent population and demographic data for the two communities near the study area and includes data for Snohomish County and Washington for comparison.

Table 6. U.S. Census demographic data for communities near the study area

		Granite Falls	Darrington	Snohomish County	Washington
Population (2016)		3,458	1,301	787,620	7,288,000
Racial/Ethnic Characteristics	White (not Hispanic or Latino)	90.5%	89.9%	70.9%	69.5%
	Hispanic or Latino	5.3%	0.7%	9.9%	12.4%
	Black or African American	1.2%	3.7%	3.3%	4.1%
	American Indian or Alaska Native	0.6%	6.7%	1.6%	1.9%
	Asian	1.6%	1.3%	10.7%	8.6%
	Two or more races	2.0%	7.8%	4.6%	4.6%
Economic Characteristics	Median household income, 2012-2016	$58,698	$45,313	$73,528	$62,848
	Persons below poverty level, 2016	3.3%	15.9%	8.0%	11.3%
	Unemployment rate, 2016	2.9%	9.1%	6.2%	6.8%

Sources: U.S. Census Bureau 2018a, 2018b

In general, racial and ethnic diversity in the communities near the study area are lower than countywide and statewide levels. Persons identifying as White make up approximately 90 percent of the population in Granite Falls and Darrington, compared to approximately 70 percent in Snohomish County and Washington (Table 6). In most cases, racial and ethnic minorities make up a smaller percentage of the population in the communities near the study area than at broader geographic scales. The notable exception is persons identifying as American Indian/Alaska Native, who make up almost 7 percent of the population in Darrington, compared to levels below 2 percent in other geographies. This difference may be attributable to the people of the Sauk-Suiattle Indian Tribe, whose homelands and reservation are located near Darrington.

Median household incomes in Granite Falls and Darrington are both below County and state median values. Darrington's economic condition stands in stark contrast to that of Granite Falls, however. The median income in Granite Falls is approximately 93 percent of the statewide median, while that in Darrington is 72 percent of the statewide median. More notably, the poverty rate in Darrington is nearly double the countywide rate, while the poverty rate in Granite Falls is less than half the countywide rate (Table 6). In addition, the unemployment rates in Darrington and Granite Falls are substantially lower and higher, respectively, than the countywide and statewide rates.

In the past, the economies of the Darrington and Granite Falls areas were heavily dependent on logging and lumber manufacturing. The communities have been trying to diversify their local economies to increase tourism and recreation. Access to recreational sites is an important part of the desired recreational experience for both local residents and visitors. Recreationists spend money to acquire equipment related to their recreation activities; they also purchase food, transportation, lodging, and other services for travel to and from recreation sites. Although much of this money is spent in the recreationists' areas of origin, some spending takes place closer to the destination site. These expenditures contribute to personal income and to the creation and maintenance of jobs in the affected economic sectors (e.g., dining, lodging, gas, groceries, restaurants, auto repair, etc.).

The following paragraphs provide an overview of economic conditions in Snohomish County, as summarized by Vance-Sherman (2015).

Because of its proximity to and shared labor market with King County, Snohomish County is incorporated into the Seattle-Bellevue-Everett Metropolitan Division and the Seattle-Tacoma-Bellevue Metropolitan Statistical Area, as designated by the Bureau of Labor Statistics.

The geographic distribution of population, economic activity, and land use in Snohomish County is diverse, with a mix of rural and urban zones. For the most part, population centers in the County are oriented south in proximity to the border with King County and west along Interstate 5. By contrast, northern and eastern Snohomish County (including the study area) are characterized by smaller cities, farms, and reservations.

Snohomish County’s early industrial economy was based on the availability of abundant natural resources, primarily timber and farming. In the late 1960s, the Boeing aircraft manufacturing company established a major manufacturing plant at Paine Field near Everett. Subsequent development of other high-technology industries in Snohomish County brought population increases and a shift from an economy based on logging and agriculture to one rooted in manufacturing and an expanding service sector.

Manufacturing continues to be a major economic driver in Snohomish County. Just over 63,000 jobs (23.1 percent of total Snohomish County non-farm employment) in 2014 were in manufacturing industries. This is proportionally higher than any other county in Washington and above the national average. The manufacturing base, coupled with proximity to a major urban center, provides the foundation for a diverse local economy.

Other major industry sectors in 2014 included government (38,200 jobs), retail trade (33,300 jobs), educational and health services (32,900 jobs), leisure and hospitality (24,100 jobs), professional and business services (23,700 jobs), and construction (17,500 jobs).

During the recent period of recession and recovery, unemployment rates in Snohomish County peaked at 11.2 percent in early 2010. The average unemployment rate for 2010 was 10.7 percent. Since 2010, the unemployment rate has been on a consistent downward trend. In July 2015, the unemployment rate was 4.3 percent.

In general, employment patterns in Darrington and Granite Falls are not substantially different from countywide patterns. Similar to Snohomish County, major industry sectors in both communities include manufacturing, government, retail trade, educational and health services, and leisure and hospitality (U.S. Census Bureau 2018b). One noticeable difference is that less than 1 percent of the workforce in Darrington is employed in professional and business service industries, compared to 9 percent countywide and 7 percent in Granite Falls.

4.2 LAND OWNERSHIP AND LAND USE

Almost all land in the study area is publicly held. Nearly 90 percent of the study area consists of National Forest System lands managed by the Mount Baker-Snoqualmie National Forest (Figure 7, Table 7). The predominant land uses are forestry and recreation. Near the western end of the study area, the Mountain Loop Highway crosses several parcels of private land outside of the National Forest boundary. These parcels are zoned for residential uses or commercial forestry. The road also crosses several private inholdings within the National Forest boundary, zoned for commercial forestry, residential, or recreational uses. Two parcels crossed by the road between Silverton and Barlow Pass are owned by the Granite Falls School District. Land ownership data from Snohomish County indicate that a quarter-section parcel near Bedal is owned by Washington State Parks.

Table 7. Land ownership in the study area

Landowner Type	Percent of Study Area
Federal (National Forest)	88.6
State	1.8
County	> 0.1
City	3.4
Private	6.1

Source: Snohomish County GIS data

If any improvement options are forwarded from the feasibility study, additional research and coordination would be needed to ascertain the specific encumbrances that may be attached to each parcel of land.

The 1990 Forest Plan, as amended, provides management direction for National Forest System lands within the study area. Direction is provided in the form of goals and objectives, standards and guidelines, and Management Area prescriptions. Any improvement projects brought forward from the feasibility study would need to demonstrate consistency with applicable direction.

The portions of the study area from MP 12.5 to MP 37 (approximately) lie within the bounds of Late-Successional Reserves designated under the 1994 Northwest Forest Plan to provide habitat for species associated with old-growth forests. Management activities, including road improvements, are allowed within Late-Successional Reserves, provided the activities are neutral or beneficial to the creation and maintenance of late-successional habitat.

The federal Coastal Zone Management Act provides additional management direction for lands in the study area. Snohomish County is one of 15 counties that are designated as the coastal zone in Washington. The Washington State Coastal Zone Management Program requires federal activities that affect any land use, water use, or natural resource of the coastal zone to comply with the enforceable policies of the following four statutes:

- Shoreline Management Act
- State Water Pollution Control Act
- Washington State Clean Air Act
- State Environmental Policy Act (if applicable)

To ensure compliance with the Coastal Zone Management Act, any improvement options forwarded from the feasibility study would need to be reviewed for consistency with the requirements of these statutes.

4.3 RECREATIONAL RESOURCES

This Mountain Loop Highway is readily accessible to more than 3 million residents of the central Puget Sound area. The highway provides access to more than a dozen campgrounds, 30 trailheads, 2 public boat launches, numerous interpretive sites, 3 wilderness areas, 3 Research Natural Areas, 5 picnic areas, 2 National Historic Register sites, the historic mining town of Monte Cristo, and over 200 miles of trail, including the Pacific Crest National Scenic Trail (Figure 8). Most recreational use occurs on the South Fork Stillaguamish side of the loop. The highest use occurs between May and September, when the corridor receives 17,000 to 20,000 visitors per month, on average. Recreational visitation decreases during the winter months, when Snohomish County typically plows the road from Verlot to Deer Creek (approximately MP 23) and from Darrington to the White Chuck River (approximately MP 44).

Dispersed recreational activities comprise a large portion of the recreation in the study area. Seasonal and traditional dispersed uses include camping (dispersed, non-fee), picnicking, driving for pleasure, hiking, birding, mushroom gathering, berry picking, hunting, target shooting, fishing, and trapping. Kayaking and canoeing are popular water-based activities; several firms have special use permits from the Forest Service for outfitting and guiding rafting trips on the Sauk River. Snowmobiling, cross-country skiing, and snowshoeing are popular winter activities. During summer and especially on holidays, every wide spot in the road and every turn-out may be used for camping and/or picnicking. Most users of the area are residents of local communities such as Darrington, Granite Falls, Marysville, Everett, and Lake Stevens, as well as the greater Puget Sound metropolitan area and southern British Columbia.

While dispersed recreation has not been an active management focus within the corridor, issues and user conflicts are not uncommon. Site closures or user conflicts between private landowners and the visiting public can limit recreational access. Visitors excluded from areas closed to the public may travel farther up the highway corridor and along Forest Service spur roads in search of legally accessible sites. Evidence of pressure from these displaced users includes recreational use conflicts, human waste, increased trash dumping, and other illegal activities in many areas.

Use of all types of recreation sites in the study area has shifted or expanded over the last few decades. Regional population growth, combined with a sharp increase in the proportion of the population participating in outdoor activities such as hiking, has contributed to increased demand for recreation on National Forest System lands. Despite this increase, the development or reconstruction of recreation opportunities and facilities (e.g., campgrounds, trails, picnic areas, trailheads) within the study area has remained somewhat static. Many trailheads, such as those for Heather Lake, Sunrise Mine, and Lake 22, currently do not provide sufficient parking spaces to accommodate the visitation they receive. As a result, visitors park along nearby roadways, constricting traffic, and causing unsafe highway crossing conditions.

The Forest Service recently completed an environmental assessment for the proposed commercial thinning of approximately 2,100 to 3,600 acres of forest stands in the South Fork Stillaguamish River drainage that had been clearcut between the 1940s and the 1990s. The proposed project, if approved, would result in a substantial increase in the volume of truck traffic on the Mountain Loop Highway for several years. Additional project actions would include toilet facility upgrades at two trailheads, relocation and/or expansion of three trailheads, and the removal of replacement of culverts that present barriers to the passage of fish and other aquatic organisms. The Forest Service is also currently exploring options for the management of the Monte Cristo mining area near Barlow Pass, including issues related to trail maintenance, parking, toilet facilities, and road access.

Representatives of local communities have expressed interest in expanding the capacity to accommodate overnight visitors in the area. The Forest Service recently conducted a study to identify potential locations for a new campground on National Forest System lands in the South Fork Stillaguamish River drainage. The study concluded that no such locations are available. The Forest Service is exploring options for converting a site previously owned by the Everett School District (Camp Silverton, near MP 20.5) into a public campground. The potential for new campground development on National Forest System lands in the Sauk River drainage is under consideration.

Recreational areas may be protected under Section 4(f) of the U.S. Department of Transportation Act of 1966. Recreation facilities qualify as Section 4(f) properties if they are publicly owned, open to the public during normal hours of operation, and serve recreation activities as a major purpose as stated in adopted planning documents. Historic properties listed or eligible for listing on the National Register of Historic Places also qualify as Section 4(f) properties. Before funding or approving a project that occupies or adversely affects a Section 4(f) property, FHWA must determine that there is no prudent or feasible alternative that completely avoids the resource. As discussed above, numerous recreational facilities are present in the study area. Historical properties are discussed in Section 4.4 of this document. If improvement options are forwarded from the feasibility study, potential effects on recreational use would need to be considered in accordance with Section 4(f).

Section 6(f) of the Land and Water Conservation Fund (LWCF) Act was enacted to preserve, develop, and ensure the quality and quantity of outdoor recreation resources. Section 6(f) protection applies to all projects that affect recreational lands purchased or improved with LWCF funds. The Secretary of the Interior must approve any conversion of LWCF property, in whole or in part, to a use other than public outdoor recreation. Based on a review of a list of all projects funded by LWCF grants within Snohomish County (Washington State Recreation and Conservation Office 2018), no projects qualifying for protection under Section 6(f) are present in the study area.

4.4 CULTURAL RESOURCES

The National Historic Preservation Act (16 United States Code [USC] 470) is the primary federal law governing the preservation of cultural and historic resources in the United States. This Act established a national preservation program and the basic structure for encouraging the identification and protection of cultural and historic resources of national, state, tribal, and local significance. A key element of the preservation program is the National Register of Historic Places, which is the federal list of historic, archaeological, and other cultural resources deemed worthy of preservation. In Washington, the National Register is administered by the Washington State Department of Archaeology and Historic Preservation (DAHP). Resources listed, or determined eligible for listing, are considered historic properties. Such properties are also generally afforded protection under Section 4(f) of the Transportation Act. Section 106 of the National Historic Preservation Act requires federal agencies to consider the effects of their undertakings (including funding, licensing, or permitting the undertakings of other entities) on historic properties and stipulates that affected American Indian tribes must be consulted. The implementing regulations of Section 106 also require agencies to seek ways of avoiding, minimizing, or mitigating any adverse effects on historic properties.

To comply with these regulations and with NEPA, agencies must consider the effects of proposed projects on previously identified resources as well as resources not yet identified. In addition, in accordance with the Archaeological Sites and Resources Act (RCW 27.53) and the Indian Graves and Records Act (RCW 27.44), a permit must be obtained from DAHP before any excavation that will alter, dig into, deface, or remove archaeological resources; including American Indian graves, cairns, or glyptic records. The State Historic Preservation Officer reviews and comments on archaeological surveys performed on site and makes determinations regarding eligibility and effect.

In addition, U.S. Government agencies have a permanent legal obligation to exercise statutory and other legal authorities to protect tribal land, assets, resources, and treaty rights, as well as a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes. The study area is within the usual and accustomed lands of several American Indian tribes, including the Lummi Nation, Samish Tribe, Sauk-Suiattle Indian Tribe, Stillaguamish Tribe, Swinomish Tribal Community, Tulalip

Tribes, and Upper Skagit Tribe. Members of local tribes use the Mountain Loop Highway for access to traditional hunting, fishing, and gathering areas.

Additional statutes, regulations, and policies aimed at protecting cultural resources include the following:

- The American Indian Religious Freedom Act protects the inherent rights of American Indian tribes to the free exercise of their traditional religions. Agencies are required to consult with tribes if an anticipated action is expected to affect their practice of traditional religions or their access to religious sites. In addition, under Executive Order 13007, federal agencies are required to avoid physical damage as much as possible to American Indian sacred sites located on federal and American Indian lands. The agencies are further directed to ensure that reasonable notice is provided of proposed land actions or policies that may restrict future access to, or ceremonial use of, or adversely affect the physical integrity of sacred sites. A site need not be a historic property to merit protection under this Executive Order.
- The Antiquities Act of 1906 prohibits the unauthorized excavation, removal, and defacement of objects of antiquity on public lands. The Archaeological Resources Protection Act of 1979 strengthens the Antiquities Act by prohibiting the unauthorized excavation, removal, and damage of archaeological resources on federal and tribal lands.
- The Native American Graves Protection and Repatriation Act of 1990 establishes the rights of lineal descendants and members of Indian tribes to certain human remains and precisely defined cultural items recovered from federal or Indian lands. The Act also establishes procedures and consultation requirements for intentional excavation or accidental discovery of American Indian remains or cultural items on federal or tribal lands.
- Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, requires federal agencies to develop an accountable process to ensure the meaningful and timely input by tribal officials in the development of regulatory policies that have substantial direct effects on one or more Indian tribes, on the relationship between the federal government and the Indian tribes, or on the distribution of power and responsibilities between the federal government and Indian tribes.
- Executive Order 11593, Protection and Enhancement of the Cultural Environment, directs federal agencies to inventory cultural resources under their jurisdiction, nominate all federally owned properties that meet the criteria of the National Register, use due caution until the inventory and nomination processes are completed, and ensure that federal plans and programs contribute to preservation and enhancement of non-federally owned properties.

DAHP maintains a GIS database of buildings, structures, and sites that have been evaluated for inclusion in the National Register or its State of Washington equivalent, the Washington Heritage Register, as well as all above-ground resources that have been surveyed. Access to archaeological data is redacted from public viewing in accordance with state law. According to Washington DAHP (2018), two properties in the study area are on the state and/or national registers, and a third has been determined to be eligible for inclusion.

The Verlot Public Service Center, built in 1936, is on the National Register of Historic Places and the Washington Heritage Register. The site is managed under a programmatic agreement between the Forest Service, the Oregon and Washington State Historic Preservation Offices, and the Advisory Council on Historic Preservation.

Also on the Washington Heritage Register is South Fork Stillaguamish Bridge #537 (MP 17.8), known as the Red Bridge. The bridge has been characterized as eligible for listing in the National Register of Historic Places for its association with bridge building in Washington in the 1950s and for its association with the history of the site. The Red Bridge is one of the few unaltered examples of riveted steel Pratt/Parker through-truss bridges in Washington.

South Fork Stillaguamish River Bridge #538 (MP 11.7), known as the Blue Bridge, is also eligible for listing in the National Register of Historic Places as an excellent example of a riveted steel Pratt/Parker through-truss bridge. The Red Bridge and Blue Bridge were some of the last Pratt/Parker through trusses constructed in the state.

If any projects are brought forward from the feasibility study, a cultural resource survey for unrecorded historic and archaeological properties would need to be completed within the area of potential effect defined for each project. Direct and indirect impacts (such as visual, noise, and access impacts) to eligible or listed properties would need to be considered if improvements options are carried forward.

4.5 NOISE

Traffic noise may need to be evaluated for any future improvements in the study area. A noise analysis is required for projects that include a substantial shift in the horizontal or vertical alignments, increasing the number of through lanes, providing passing lanes, or increasing traffic speed and volume. Such an analysis includes measuring ambient noise levels at selected receivers and modeling design year noise levels using projected traffic volumes. If noise levels approach or substantially exceed noise abatement criteria for the project, noise abatement measures may be necessary. Possible abatement measures available for consideration include, but are not limited to, the following:

- Alternating the horizontal or vertical alignment;
- Constructing noise barriers such as sound walls or earthen berms; and/or
- Decreasing traffic speed limits.

Noise abatement measures must be considered reasonable and feasible and be supported by the affected public.

Construction activities associated with any improvements forwarded from the feasibility study may cause localized, short-duration noise impacts. These impacts can be minimized by using standard WSDOT specifications for the control of noise sources during construction.

4.6 VISUAL RESOURCES

Scenic quality is a fundamental element of recreation experiences. Driving to enjoy the scenery has been a top national recreational activity for over a decade. The appreciation of scenic views has long been a highly valued activity for visitors to the Mount Baker-Snoqualmie National Forest.

As discussed in Section 2.3.2 of this document, the Sauk River and a portion of the South Fork Sauk River in the study area are part of the National Wild and Scenic Rivers System, with a classification of Scenic. In addition, the South Fork Stillaguamish River has been recommended for similar designation. Also, as noted in Section 1.1, the Mountain Loop Highway is a National Forest Scenic Byway.

The Forest Plan, as amended, has identified the Mountain Loop Highway as a Primary Corridor, having “visually sensitive landscapes as viewed from major highway corridors and use areas. Lands within this corridor are to be managed for scenic quality level on both foreground (visible areas from 300 feet to 0.25 mile) and middleground (visible areas from 0.25 mile to 2.0 miles)" (USDA Forest Service 1990). Objectives for visual quality within the study area include "retention" and "partial retention." Retention means that management activities should not be visible to the casual forest visitor. Partial retention means that management activities are to remain subordinate to the natural environment (USDA Forest Service 1990).

Evaluation of the potential effects on visual resources would need to be conducted if improvement options are forwarded from the feasibility study.

5.0 CONCLUSION

This environmental scan report identifies physical, biological, social, and cultural resources within the study area that may be affected by potential future improvements arising from the Mountain Loop Highway Feasibility Study. Project-level environmental analysis would be required for any improvements forwarded from this study. Information contained in this report may be used to support future environmental documentation for compliance with NEPA.

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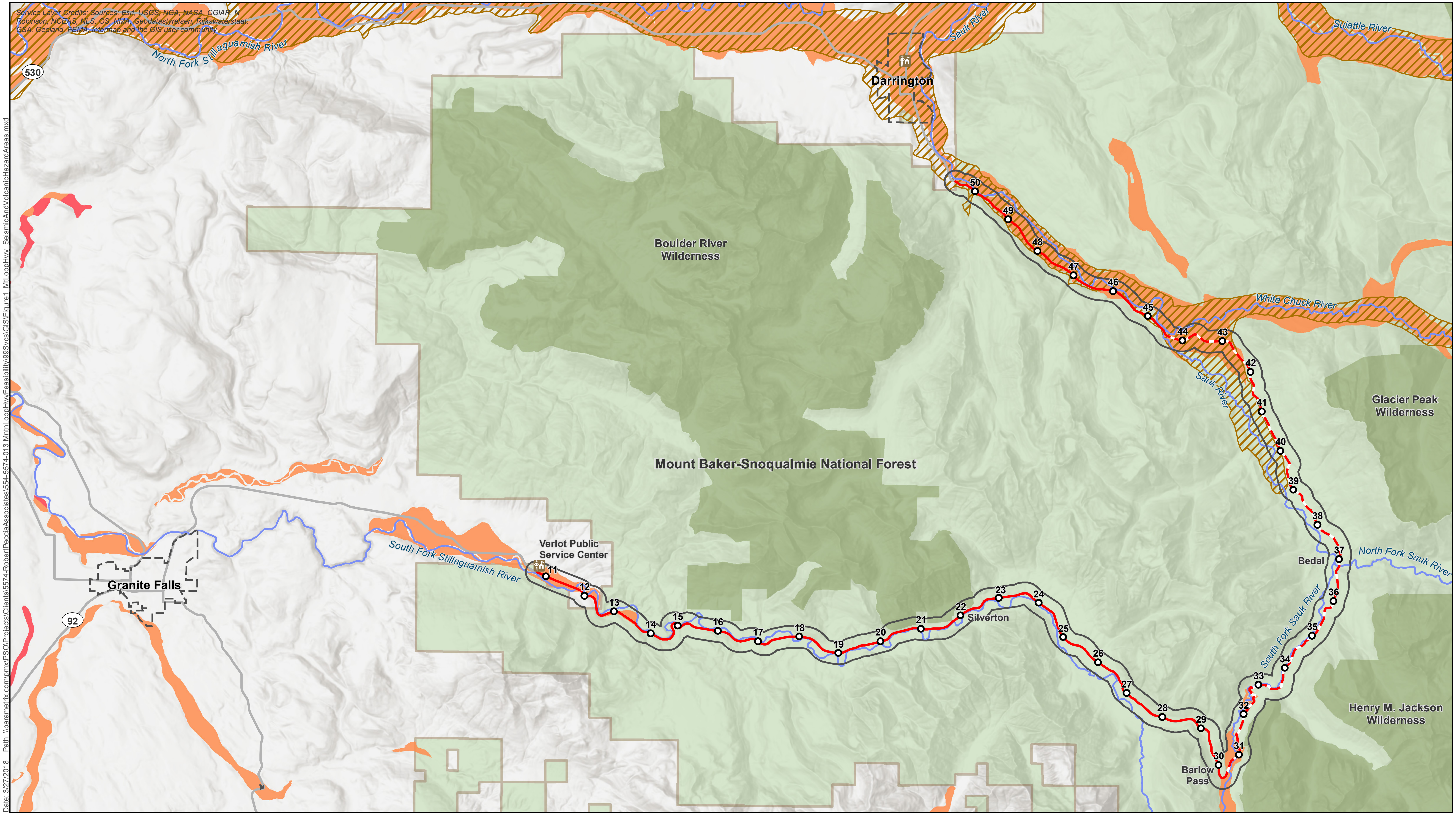
Figures

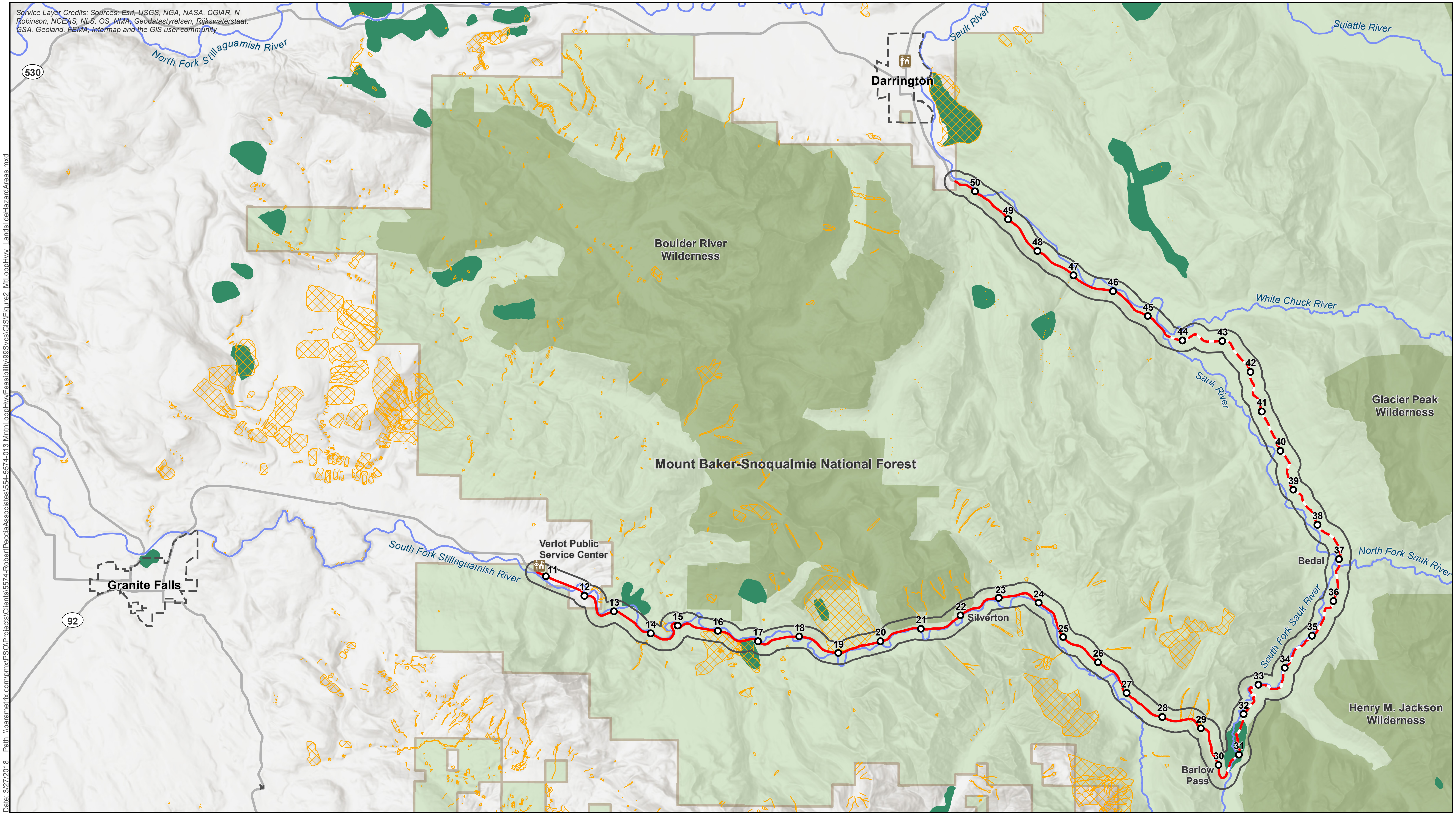


Parametrix

WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources,

Figure 1
Seismic and Volcanic Hazard Areas

Mountain Loop Highway
Feasibility Study
Snohomish County, Washington



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Parametrix

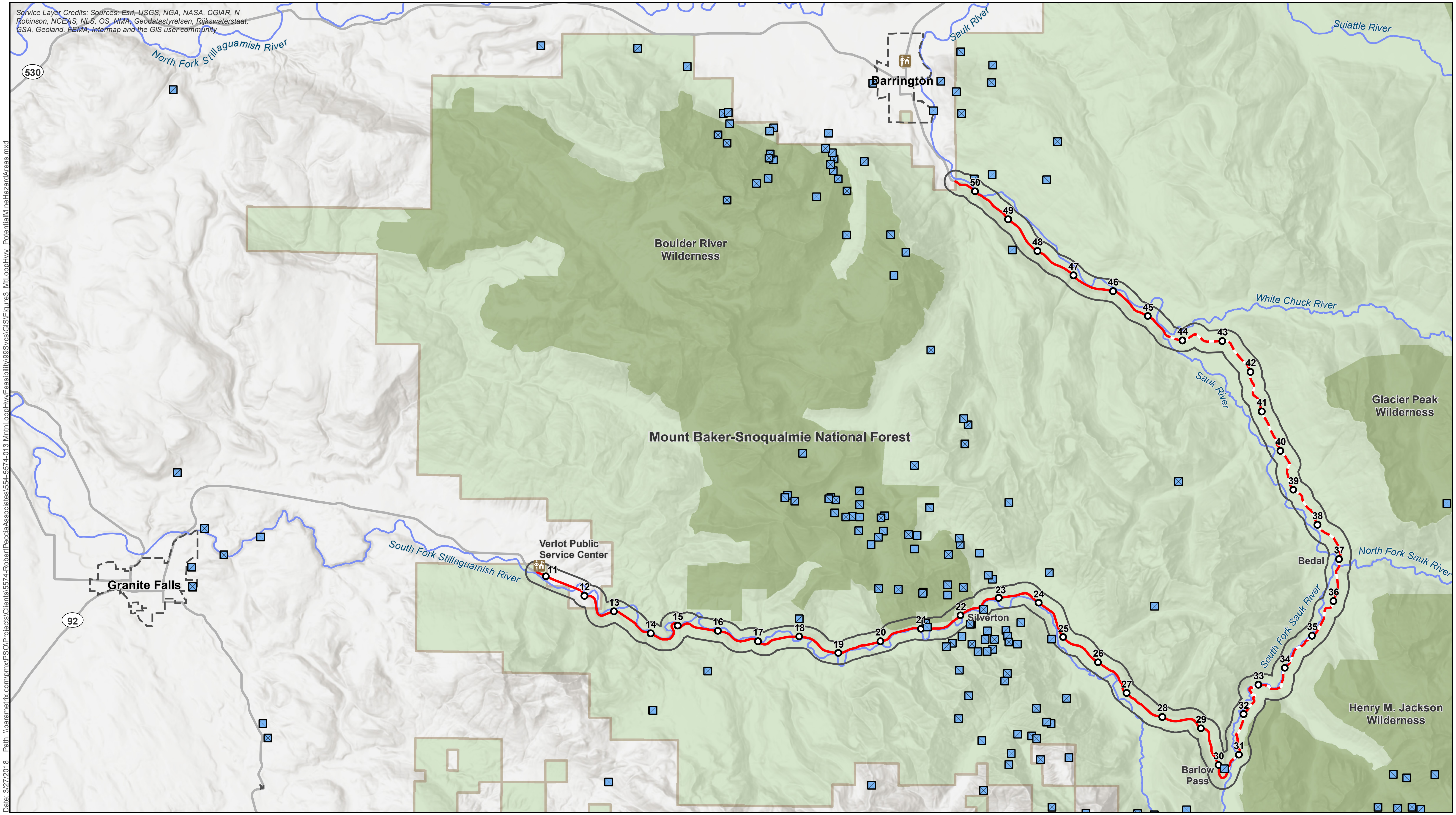
WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources

Miles
0 0.5 1 2

- Mountain Loop Hwy (Paved)
- Mountain Loop Hwy (Unpaved)
- Study Area (1/4 Mile Buffer)
- ○ Milepost
- City Limit
- River/Stream
- 🟩 National Forest
- 🟩 Wilderness Area
- ▨ WDNR-Inventoried Landslides
- 🟩 Landslides Identified through Geologic Mapping

Figure 2
Landslide Hazard Areas

Mountain Loop Highway
Feasibility Study
Snohomish County, Washington



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Parametrix

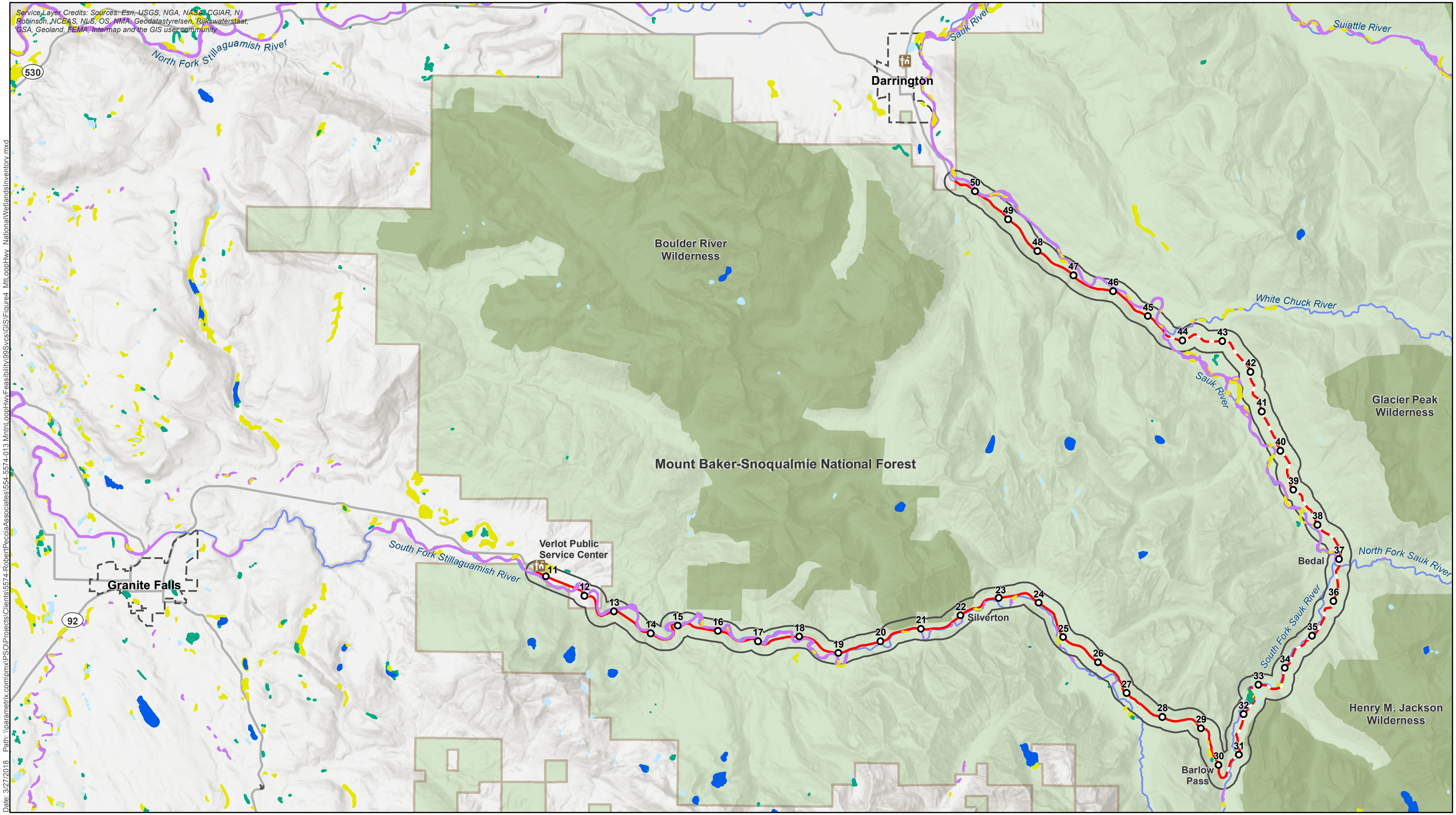
WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources

Miles
0 0.5 1 2

Mountain Loop Hwy (Paved)
Mountain Loop Hwy (Unpaved)
Study Area (1/4 Mile Buffer)
○ Milepost
City Limit
River/Stream
National Forest
Wilderness Area
☒ Active Metal Mines

Figure 3
Potential Mine Hazard Areas

Mountain Loop Highway
Feasibility Study
Snohomish County, Washington



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Parametrix

WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources, US Department of Fish and Wildlife (National Wetlands Inventory)

Miles
0 0.5 1 2

- Mountain Loop Hwy (Paved)
- Mountain Loop Hwy (Unpaved)
- Study Area (1/4 Mile Buffer)
- ○ Milepost
- City Limit
- River/Stream
- National Forest
- Wilderness Area

National Wetlands Inventory Wetland Type

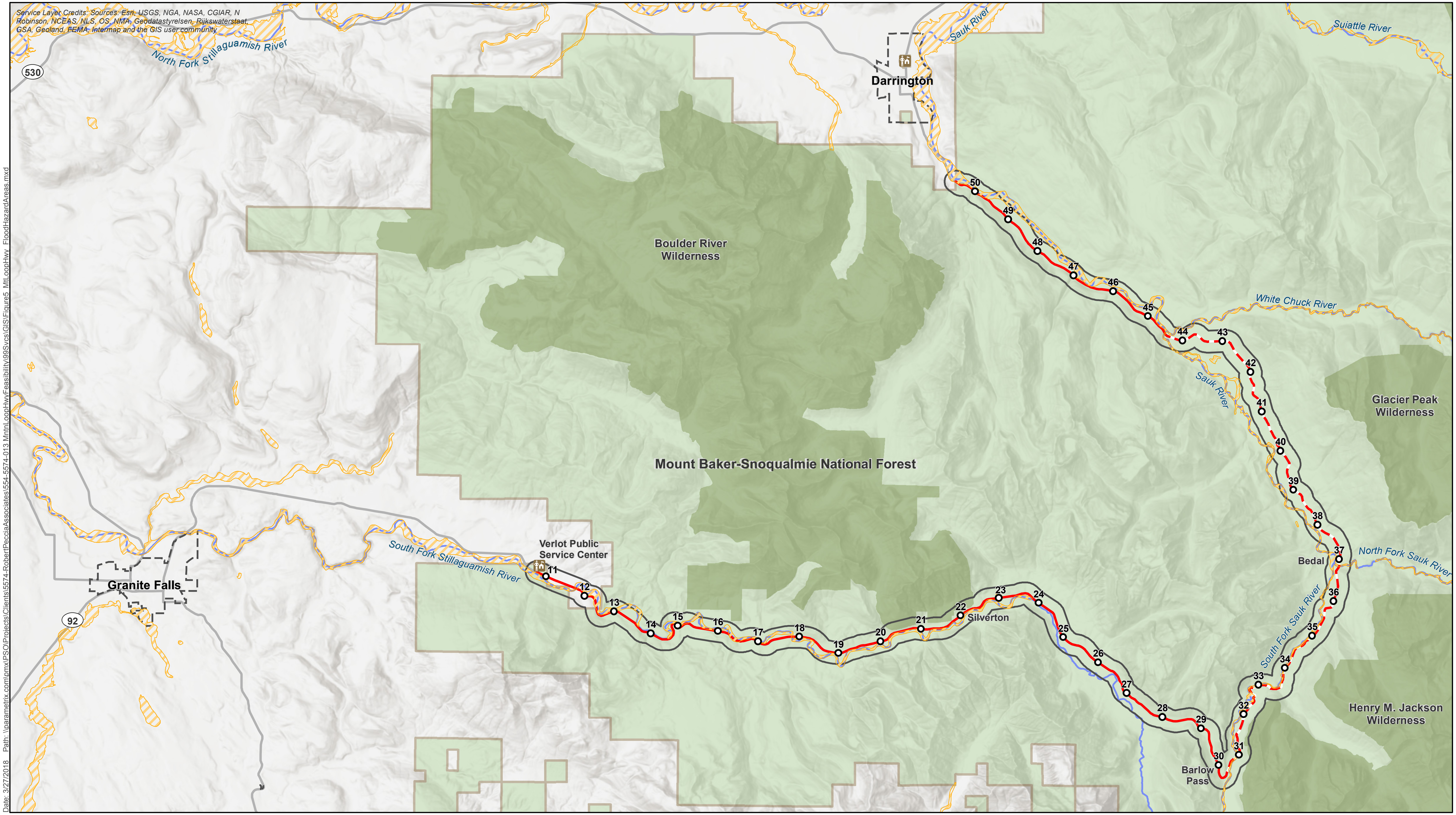
- Freshwater Emergent
- Freshwater Forested/Shrub
- Freshwater Pond
- Riverine
- Lacustrine (Lake)

Figure 4

National Wetlands Inventory

Mountain Loop Highway
Feasibility Study
Snohomish County, Washington

Date: 3/27/2018 Path: \\parametrix.com\pmx\PSO\Projects\Clients\5574-RobertPecciaAssociates\554-5574-013 MntnLoopHwyFeasibility\99Svcs\GIS\Figure5_MtLoopHwy_FloodHazardAreas.mxd



Parametrix

WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources, Federal Emergency Management Agency

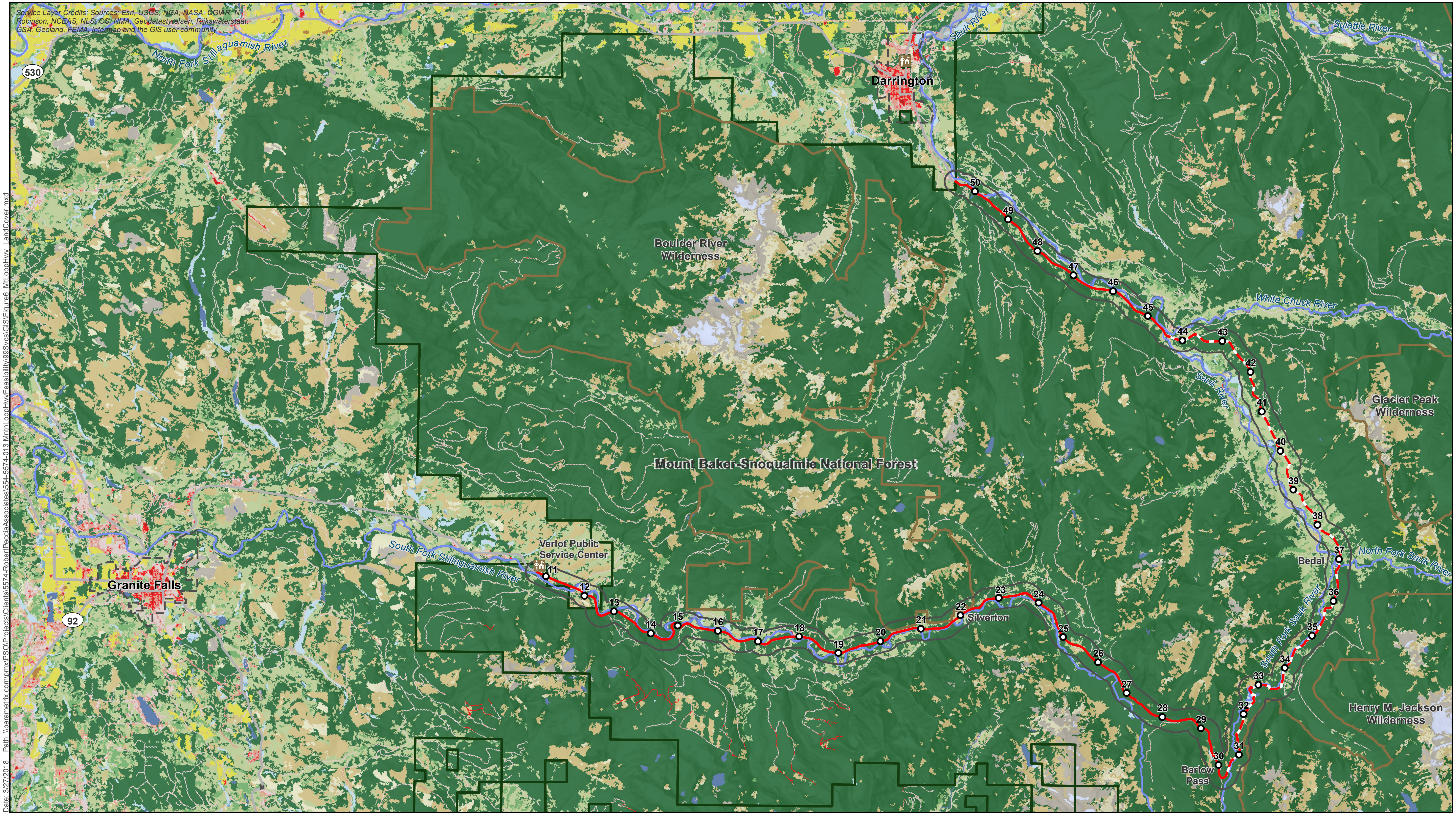
Miles
0 0.5 1 2

- Mountain Loop Hwy (Paved)
- Mountain Loop Hwy (Unpaved)
- Study Area (1/4 Mile Buffer)
- ○ Milepost
- City Limit
- River/Stream
- National Forest
- Wilderness Area
- ▨ Mapped 100-Year Floodplain

Note: This figure depicts preliminary flood hazard data from the Federal Emergency Management Agency. Preliminary data are for review and guidance purposes only and are subject to change.

Figure 5
Flood Hazard Areas

Mountain Loop Highway
Feasibility Study
Snohomish County, Washington



Date: 3/27/2018 Path: \\parametrix.com\pmx\PSO\Projects\Clients\5574-RobertPecciaAssociates\554-5574-013 MntnLoopHwyFeasibility\99Svcs\GIS\Figure6_MtLoopHwy_LandCover.mxd

Parametrix

WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources, Multi-Resolution Land Characteristics Consortium (National Land Cover Database 2011)

0 0.5 1 2 Miles

- ━ Mountain Loop Hwy (Paved)
- ╍ Mountain Loop Hwy (Unpaved)
- ▭ Study Area (1/4 Mile Buffer)
- ○ Milepost
- ╌ City Limit
- ━ River/Stream
- ▭ National Forest
- ▭ Wilderness Area

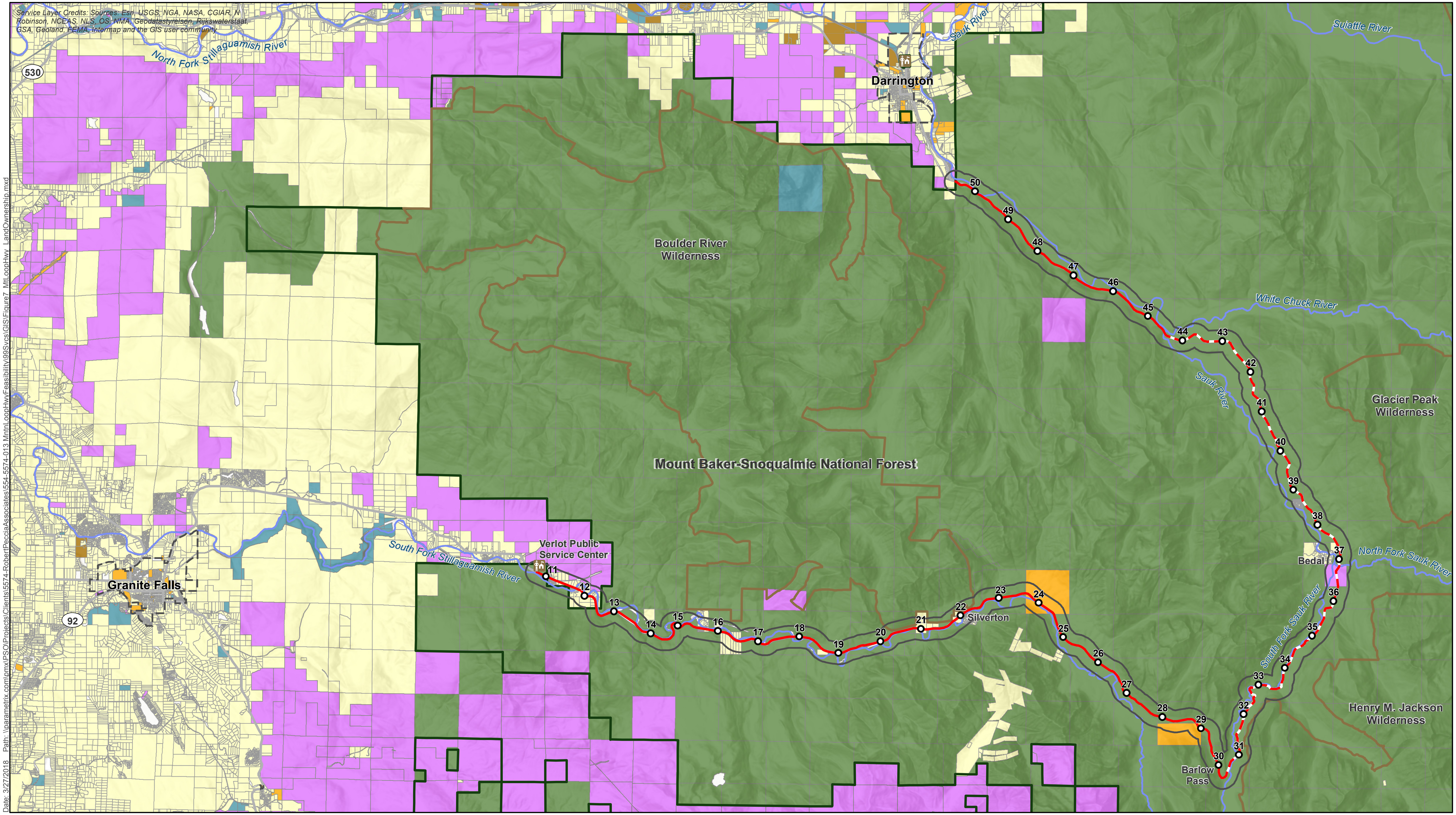
Land Cover (2011 NLCD)

- 🟦 Open Water
- ⬜ Perennial Ice/Snow
- ⬜ Developed, Open Space
- 🟧 Developed, Low Intensity
- 🟥 Developed, Medium Intensity
- 🟥 Developed High Intensity
- ⬜ Barren Land (Rock/Sand/Clay)
- 🟩 Deciduous Forest
- 🟩 Evergreen Forest
- 🟩 Mixed Forest
- 🟫 Shrub/Scrub
- ⬜ Grassland/Herbaceous
- 🟨 Pasture/Hay
- 🟫 Cultivated Crops
- 🟦 Woody Wetlands
- 🟦 Emergent Herbaceous Wetlands

Figure 6
Land Cover

Mountain Loop Highway
Feasibility Study
Snohomish County, Washington

Date: 3/27/2018   Path: \\parametrix.com\pmx\PSO\Projects\Clients\5574-RobertPecciaAssociates\554-5574-013 MntnLoopHwyFeasibility\99Svcs\GIS\Figure7_MtLoopHwy_LandOwnership.mxd

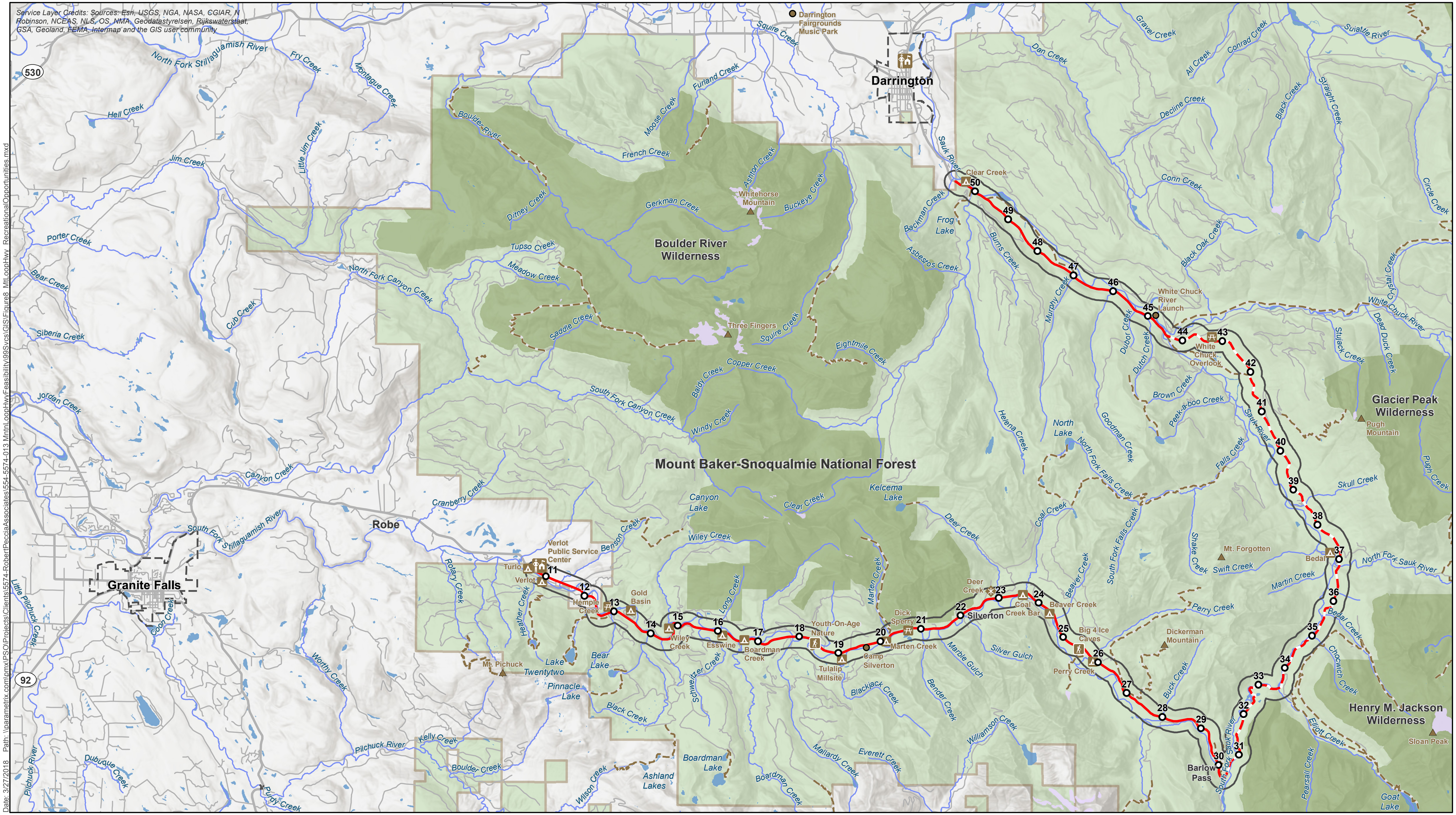

Service Layer Credits: Sources: Esri, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

Parametrix

Source: WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources

Figure 7
Land Ownership

Mountain Loop Highway
Feasibility Study
Snohomish County, Washington



Date: 3/27/2018   Path: \\parametrix.com\pmx\PSO\Projects\Clients\5574-RobertPecciaAssociates\554-5574-013 MtnLoopHwyFeasibility\99Svcs\GIS\Figure8_MtLoopHwy_RecreationalOpportunities.mxd

Parametrix

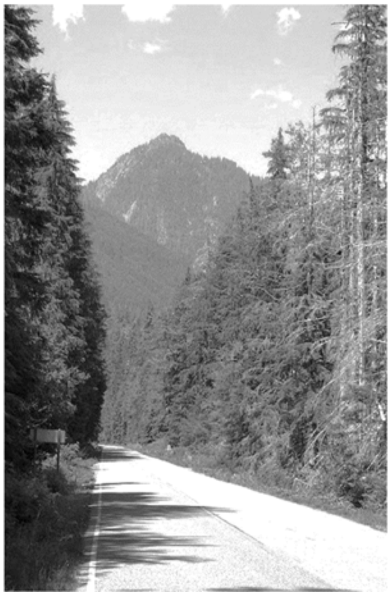
WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources

Miles
0 0.5 1 2

- Mountain Loop Hwy (Paved)
- Mountain Loop Hwy (Unpaved)
- Study Area (1/4 Mile Buffer)
- City Limit
- Trail
- River/Stream
- Milepost
- Ranger Station
- Picnic Site
- Snowpark
- Campground
- Peak
- Trailhead
- Place of Interest
- Glacier
- Water Body
- National Forest
- Wilderness Area

Figure 8
Recreational Opportunities

Mountain Loop Highway
Feasibility Study
Snohomish County, Washington



ECONOMIC OPPORTUNITIES MEMORANDUM

Mountain Loop Highway Feasibility Study
WA SNOHOMISH 20(1)
IDIQ Contract No. DTFH70-15-D-00007
Task Order No. 69056718F000005

U.S. Department of Transportation
Federal Highway Administration

Prepared for:
WESTERN FEDERAL LANDS HIGHWAY DIVISION

July 2018

Prepared by:
ROBERT PECCIA & ASSOCIATES
Helena, Montana

In association with:
PARAMETRIX
Seattle, Washington

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ABBREVIATIONS/ACRONYMS

FHWA	Federal Highway Administration
Forest Service	United States Forest Service—Mount Baker-Snoqualmie National Forest
GIS	geographic information system
SR	State Route

ECONOMIC OPPORTUNITIES MEMORANDUM

1.0 INTRODUCTION

The Federal Highway Administration (FHWA), in partnership with Snohomish County and the U.S. Forest Service (Forest Service), is completing a feasibility study for potential corridor improvements to the Mountain Loop Highway in the Mount Baker-Snoqualmie National Forest. The study, referred to as the *Mountain Loop Highway Feasibility Study*, will identify feasible improvement options to improve recreational access and operational safety in the study corridor as well as reduce maintenance concerns based on needs identified by the feasibility study.

The Mountain Loop Highway provides access between the Town of Darrington and the City of Granite Falls as an alternative to State Route (SR) 530. The highway also offers spectacular views and access to trails, campgrounds, picnic areas, and a large amount of dispersed use recreational activities. The *Mountain Loop Highway Feasibility Study* will include analyses of access needs, recreational and economic opportunities, geometric characteristics (road widths, curves, approaches, etc.), collision history, erosion and mass wasting issues, and existing and projected traffic patterns of the corridor. An inventory of existing and projected land uses and environmental resources will also be developed.

The feasibility study will be a collaborative process among FHWA, the Forest Service, Snohomish County, the Town of Darrington, the City of Granite Falls, resource agencies, and the public, and it will identify transportation needs and potential solutions. A key outcome of the study will be the development of a comprehensive package of short, mid-, and long-term recommendations intended to address the transportation and access needs of highway users over the next 20 years (i.e., planning horizon year 2040). Developing these recommendations will help the feasibility study partners define the most critical needs and allocate resources. The study aims to reduce planning time while considering environmental and social issues, and to minimize construction costs through the demonstration of feasible improvement opportunities.

This document, the *Economic Opportunities Memorandum*, provides a planning-level overview of economic development efforts and conditions near the Mountain Loop Highway. This document also identifies the potential economic benefits of the Mountain Loop Highway to the regional economy. This memorandum is not a detailed economic analysis; it is meant to summarize readily available economic information and policy that can be used to establish context for potential improvement options that may be forwarded from the feasibility study.

2.0 DEMOGRAPHIC AND ECONOMIC CONDITIONS

Racial and ethnic diversity in the communities near the study area are lower than countywide and statewide levels. Persons identifying as White comprise approximately 90 percent of the population in Granite Falls and Darrington, compared to approximately 70 percent in Snohomish County and Washington (Table 1). In most cases, racial and ethnic minorities make up a smaller percentage of the population in the communities near the study area than at broader geographic scales. The notable exception is persons identifying as American Indian/Alaska Native, who comprise almost 7 percent of the population in Darrington, compared to levels below 2 percent in other geographies. This difference may be attributable to the people of the Sauk-Suiattle Indian Tribe, whose homelands and reservation are located near Darrington.

Table 1. U.S. Census Demographic Data for Communities near the Study Area

		Granite Falls	Darrington	Snohomish County	Washington
Population (2016)		3,458	1,301	787,620	7,288,000
Racial/Ethnic Characteristics	White (not Hispanic or Latino)	90.5%	89.9%	70.9%	69.5%
	Hispanic or Latino	5.3%	0.7%	9.9%	12.4%
	Black or African American	1.2%	3.7%	3.3%	4.1%
	American Indian or Alaska Native	0.6%	6.7%	1.6%	1.9%
	Asian	1.6%	1.3%	10.7%	8.6%
	Two or more races	2.0%	7.8%	4.6%	4.6%
Economic Characteristics	Median household income, 2012-2016	$58,698	$45,313	$73,528	$62,848
	Persons below poverty level, 2016	3.3%	15.9%	8.0%	11.3%
	Unemployment rate, 2016	2.9%	9.1%	6.2%	6.8%

Sources: U.S. Census Bureau 2018a, 2018b

Median household incomes in Granite Falls and Darrington are both below county and state median values. Darrington's economic condition stands in stark contrast to that of Granite Falls, however. The median income in Granite Falls is approximately 93 percent of the statewide median, while that in Darrington is 72 percent of the statewide median. More notably, the poverty rate in Darrington is nearly double the countywide rate, while the poverty rate in Granite Falls is less than half the countywide rate (Table 1). In addition, the unemployment rates in Darrington and Granite Falls are substantially lower and higher, respectively, than the countywide and statewide rates.

In the past, the economies of the Darrington and Granite Falls areas were heavily dependent on logging and lumber manufacturing. The communities have been trying to diversify their local economies to increase tourism and recreation. Access to recreational sites is an important part of the desired recreational experience for both local residents and visitors. Recreationists spend money to acquire equipment related to their recreation activities; they also purchase food, transportation, lodging, and other services for travel to and from recreation sites. Although much of this money is spent in the recreationists' areas of origin, some spending takes place closer to the destination site. These expenditures contribute to personal income and to the creation and maintenance of jobs in the affected economic sectors (e.g., dining, lodging, gas, groceries, restaurants, auto repair, etc.).

The following paragraphs provide an overview of economic conditions in Snohomish County, as summarized by Vance-Sherman (2015).

Because of its proximity to and shared labor market with King County, Snohomish County is incorporated into the Seattle-Bellevue-Everett Metropolitan Division and the Seattle-Tacoma-Bellevue Metropolitan Statistical Area, as designated by the Bureau of Labor Statistics.

The geographic distribution of population, economic activity, and land use in Snohomish County is diverse, with a mix of rural and urban zones. For the most part, population centers in Snohomish County are oriented south in proximity to the border with King County and west along Interstate 5. By contrast, northern and eastern Snohomish County (including the study area) are characterized by smaller cities, farms, and reservations.

Snohomish County's early industrial economy was based on the availability of abundant natural resources, primarily timber and farming. In the late 1960s, the Boeing aircraft manufacturing company established a major manufacturing plant at Paine Field near Everett. Subsequent development of other high-technology industries in Snohomish County brought population increases and a shift from an economy based on logging and agriculture to one rooted in manufacturing and an expanding service sector.

Manufacturing continues to be a major economic driver in Snohomish County. Nearly 83,000 jobs (28.2 percent of total Snohomish County non-farm employment) in June 2018 were in manufacturing industries (Washington State Department of Employment Security 2018). This is proportionally higher than most other counties in Washington and above the national average. The manufacturing base, coupled with proximity to a major urban center, provides the foundation for a diverse local economy.

Other major industry sectors in June 2018 included government (41,100 jobs), retail trade (35,000 jobs), educational and health services (36,200 jobs), leisure and hospitality (27,300 jobs), professional and business services (29,700 jobs), and construction (24,500 jobs).

During the recent period of recession and recovery, unemployment rates in Snohomish County peaked at 11.2 percent in early 2010. The average unemployment rate for 2010 was 10.7 percent. Since 2010, the unemployment rate has been on a consistent downward trend. In July 2018, the unemployment rate was 4.0 percent (Washington State Department of Employment Security 2018).

In general, employment patterns in Darrington and Granite Falls are not substantially different from countywide patterns. Like Snohomish County, major industry sectors in both communities include manufacturing, government, retail trade, educational and health services, and leisure and hospitality (U.S. Census Bureau 2018b). One noticeable difference is that less than 1 percent of the workforce in Darrington is employed in professional and business service industries, compared to 9 percent countywide and 7 percent in Granite Falls. In total, Darrington supported approximately 500 jobs in 2011, which is approximately 12 percent of capacity, as indicated in the Town of Darrington Comprehensive Plan (Town of Darrington 2015). Darrington has a 2025 employment growth target of 535 jobs. In 2013, there were approximately 970 jobs in Granite Falls. By 2035, the City anticipates that there will be a total of 2,275 jobs within Granite Falls, as indicated in its Comprehensive Plan (Granite Falls 2015).

3.0 ECONOMIC DEVELOPMENT IN SNOHOMISH COUNTY

This section summarizes the economic development planning efforts and policies of local communities near the Mountain Loop Highway, including Snohomish County, Granite Falls, and Darrington.

3.1 SNOHOMISH COUNTY

Snohomish County's *2035 Comprehensive Plan* was adopted in 2015 and includes a chapter summarizing the county's goals and policies for economic development (Snohomish County 2015). Forecasts project significant future job growth in the service sector in Snohomish County. In addition to the service sector, Snohomish County sees industrial and commercial development as an important part of the county's economic future. However, Snohomish County recognizes that there are barriers to commercial and industrial development, which include the need for substantial infrastructure required for this type of development and the potential for impacts on the environment. Snohomish County will continue to support industrial and commercial development while balancing the preservation of the environment, minimization of impacts on infrastructure, and the pricing out of industrial and commercial development.

Snohomish County's economic development policies are also closely tied to recreation and tourism in the county. The county encourages opportunities for economic activities in resource lands, including the forest. Snohomish County also recognizes the importance of a healthy natural environment in attracting recreation and tourism dollars. The Mountain Loop Highway is an important asset that helps to attract this type of spending in the county and nearby communities.

Relevant goals and objectives from the Snohomish County *2035 Comprehensive Plan* include:

- **GOAL ED 1** Maintain and enhance a healthy economy.
    - **Objective ED 1.B** Snohomish County shall balance economic and environmental concerns recognizing that a healthy environment is essential to quality of life.
- **GOAL ED 6** Encourage sustainable use of resource areas for economic development.
    - **Objective ED 6.A** Provide policies and programs to help ensure the sustainable use of timber, agricultural and mineral resources, as well as recycled resources.
        - **Policy 6.A.1** Snohomish County shall seek financial assistance through grants and loans to encourage research and development into the production of value-added wood products and provide opportunities and incentives for small businesses and cottage industries that manufacture value-added wood products and products using regional forestry commodities.
    - **Objective ED 6.B** Promote the growth of tourism resources as a clean, nonpolluting, and sustainable source of jobs and economic opportunities in Snohomish County.
        - **Policy 6.B.1** Snohomish County shall update and implement the strategic tourism work plan to strengthen the county's tourism development and promotion initiatives.
        - **Policy 6.B.2** Snohomish County shall support ventures in resource tourism and outdoor recreation that are financially viable and environmentally responsible.
- **GOAL PR 1** Provide recreation services to Snohomish County's residents in the most effective and efficient way possible.
    - **Objective PR 1.A** Promote coordination among recreation providers outside Snohomish County to efficiently deliver parks and recreation services and to collaborate on issues of shared concern.
        - **Policy 1.B.2** Coordinate with state and federal entities to promote integration of park and recreational facilities and ensure continued public access to parks and recreational facilities.

In tandem with the county's economic development policies included in the Comprehensive Plan, the *Snohomish County Strategic Tourism Plan 2018-2022* outlines priorities for attracting recreation and tourism dollars to Snohomish County. The plan is the county's guiding document for making continued and future strategic investments in assets, infrastructure, and services that support and enhance the county's visitor industry.

The Strategic Tourism Plan highlights the importance of tourism to Snohomish County's economy: overnight and day-trippers generated approximately $1 billion of spending, creating 20,000 direct and indirect jobs, and $100 million of state and local revenue (Resonance Consultancy and Berk Consulting

2018). A major category of targeted visitors to the county include Active Adventurers[1] who globally spent more than $345 billion in 2012. Snohomish County recognizes that it must prepare to attract this type of visitor with infrastructure, products, services, and marketing to capitalize on the county's abundant natural environment and recreation tourism assets. However, it will also be important to balance increased tourism and recreation activities in the county's open space and natural areas with the environmental preservation of these assets.

The Mountain Loop Highway provides critical access to some of Snohomish County's natural areas and recreational sites, and the Strategic Tourism Plan calls for the Snohomish County Department of Parks, Recreation and Tourism to engage with the U.S. Forest Service and other county, state, and federal officials as they research and study possible improvements along the corridor. Snohomish County has highlighted that providing increased access along the Mountain Loop Highway would likely result in increased tourism activity and economic contribution. Paving the remainder of the Mountain Loop Highway has been identified as a potential opportunity for taking advantage of sightseeing tourism to the county—three of every 10 visitors to Snohomish County come to engage in sightseeing, including from their vehicles (Resonance Consultancy and Berk Consulting 2018).

3.2 TOWN OF DARRINGTON

Darrington adopted the Darrington Comprehensive Plan in 2015, which highlights the importance of the Mountain Loop Highway to the Town's vision and economic development goals. Included in the Town's vision are the following statements:

- Preserve the small-town atmosphere while continuing to recognize and value its history.
- Respect the quality of its natural environment when considering new development by:
    - Recognizing the importance of natural critical areas.
- Increase the economic base of the town to create and support local jobs and to become a model of a localized sustainable rural community by:
    - Recognizing the importance of Natural Resource jobs in the surrounding community by cultivating, supporting, and promoting local markets for resource products.
    - Encouraging and preparing for tourism based both on Darrington as a destination and on Darrington as a primary tourist stopover location.
    - Encouraging and preparing for Darrington to be used increasingly as a recreational and adventure venue.

Darrington is a primary access point to the Mountain Loop Highway. Darrington's Economic Development chapter of the Comprehensive Plan includes forestland stewardship, tourism, and timber partnerships along the Mountain Loop Highway as central to employment growth and economic development. The Town hopes to support employment growth in tourism and forestry through participation in Snohomish County tourism campaigns and regional recreation roundtables, by supporting major infrastructure improvement campaigns such as Pave the Mountain Loop, by supporting public-private forestland stewardship projects, and by encouraging the efforts of collaborative timber partnerships and organizations.

---

[1] Adventure travel includes two of three criteria: first, connection with nature; second interaction with culture; and third, a physical activity. Soft adventure options include hiking, kayaking, rafting, snorkeling, volunteer tourism, and archaeological expeditions, while hard adventure options include caving, climbing, heli-skiing, kite surfing, trekking, and paragliding.

Relevant goals and policies from the Darrington Comprehensive Plan include the following:

- **GOAL LU-8** Cultivate commercial land use development that will attract and provide quality services to both destination and stopover visitors, thereby increasing Darrington's economic base.
    - **Policy LU-8B** Darrington shall work closely with Snohomish County, Skagit County, the state Department of Transportation and other agencies to assure that the efforts the county, state, and federal agencies are placing toward tourism development include Darrington as a destination; a sports, adventure, and recreation area; and a destination stop-over on the Mountain Loop Highway.
- **GOAL ED-2** Promote the creation of family-wage jobs that will serve the residents of Darrington.
    - **Policy ED-2G** Support the efforts of major regional infrastructure improvement projects such as Pave the Mountain Loop to increase tourism opportunities in the area.
    - **Policy ED-2H** Support the efforts of public-private partnerships to increase the opportunity for forestland stewardship projects and the efforts of collaborative timber partnerships and organizations to work with the Forest Service to find new and innovative ways to harvest timber.
- **GOAL ED-3** Encourage economic sectors that will pay higher-than-average wages; bring new capital into the local economy; can be sustainable within the town; utilize sound environmental practices; and diversify the economic base of the town.
    - **Policy ED-3C** Encourage the creation of and support existing recreation, adventure, and tourism jobs.
    - **Policy ED-3D** Encourage the creation of and support existing natural resource jobs.
- **GOAL ED-6** The Town shall maintain public capital facilities, infrastructure, and regulatory incentives that will support existing businesses and foster new business development.
    - **Policy ED-6A** Seek funding opportunities to develop tourism infrastructure in the town, which will catalyze overnight stays and encourage visitors to stay longer and spend more dollars, including RV parking and dump stations, event parking, and pedestrian and bicycle trails that connect visitors to surrounding recreational areas.

3.3 GRANITE FALLS

The *City of Granite Falls 2015-2035 Comprehensive Plan* was adopted in November 2015. The city of Granite Falls is self-described as the “Gateway to the Mountain Loop,” and the policies included in the Comprehensive Plan reflect the importance of the corridor to the city’s economic development and community goals (Granite Falls 2018). Similar to Darrington, the geographic location of Granite Falls provides an opportunity to attract recreational tourists from throughout the region or farther beyond to the Mountain Loop Highway. One of the two primary economic development goals is to capture more tourism dollars to the city and tie city development directly to the Mountain Loop Recreation Area.

Relevant goals and policies from the Granite Falls Comprehensive Plan include:

- **GOAL ED-1** To use the location of Granite Falls as an economic incentive to attract and encourage tourist trade as well as commercial and industrial development.

  - **ED-1.4** Coordinate and cooperate with the Snohomish County Tourism Bureau, Snohomish County Office of Economic Development, and the Cities of Arlington and Darrington in the promotion of the Mountain Loop Recreation Area travel and year-round tourism.

- **Goal LU-8** To provide a viable, convenient, thriving commercial district for residents, neighboring communities, and tourist trade.

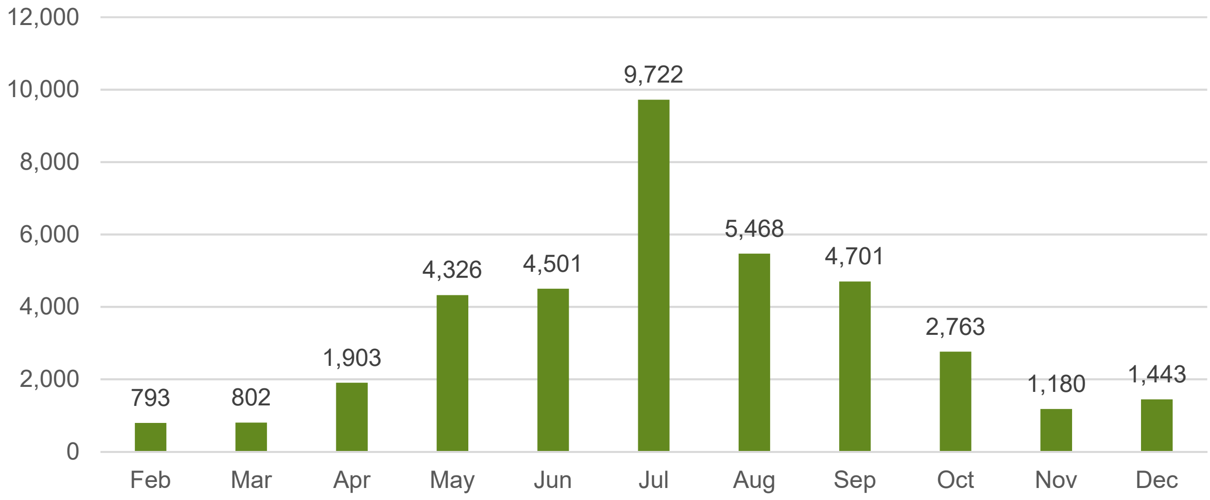
4.0 MOUNT BAKER-SNOQUALMIE NATIONAL FOREST

This section summarizes economic information for the Mount Baker-Snoqualmie National Forest.

4.1 Verlot Public Service Center

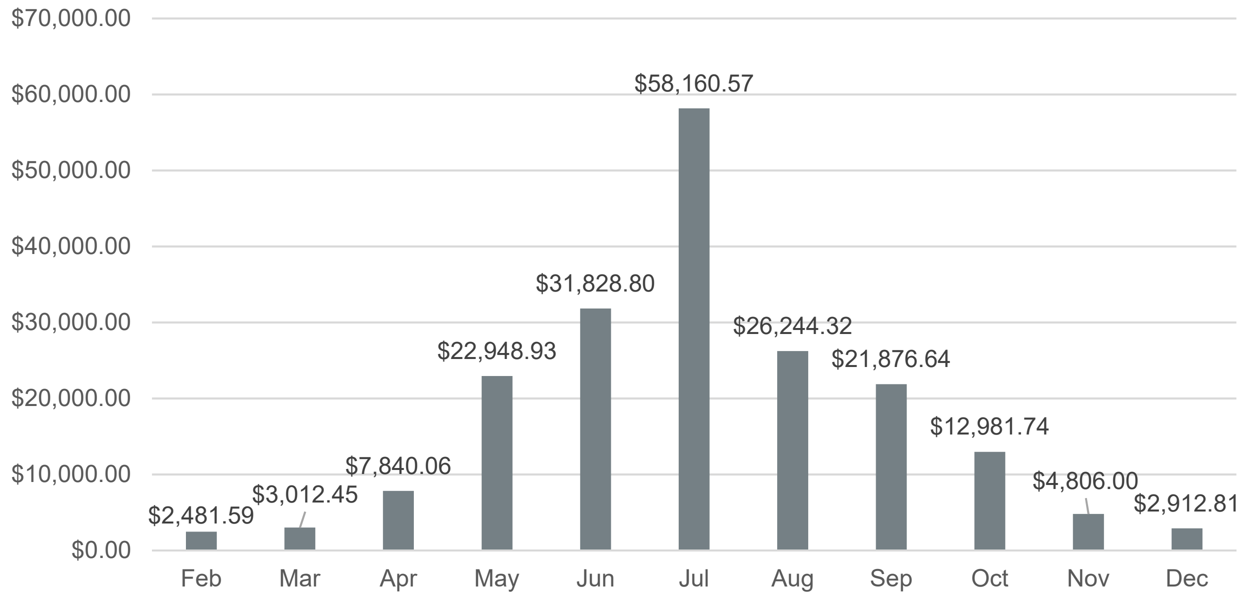
The Verlot Public Service Center is located approximately 11 miles east of the Granite Falls town center on the Mountain Loop Highway. The Verlot Public Service Center provides information about hikes, camping, hunting, and fishing, and the center has maps, books, and park passes for sale (USDA Forest Service 2018a). The Verlot Public Service Center received $195,093 in revenue and over 37,600 visitors in 2017 (USDA Forest Service 2018b). Figures 1 and 2 summarize visitors and revenues by month at the Verlot Public Service Center. The busiest months were July and August with 40 percent of all visitors and 43 percent of all revenue occurring during those months. The two busiest weeks were the weeks of Memorial Day and July Fourth. The Verlot Public Service Center was open a total of 160 days in 2017. Most of the revenue collected at the Verlot Public Service Center is from Forest Pass sales ($145,015 in 2017), followed by merchandise sales ($27,698 in 2017). Other revenue streams included iron ranger sales, pass machine sales, snowshoe donations, and Christmas tree permits.

Figure 1. 2017 Visitors to Verlot Public Service Center by Month



Source: USDA Forest Service 2018b

Figure 2. 2017 Sales at Verlot Public Service Center by Month



Source: USDA Forest Service 2018b

The *Gem of the Emerald Corridor: Nature's Value in the Mt. Baker-Snoqualmie National Forest* report also provides estimates of visitors and expenditures by ranger district to the national forest (Earth Economics 2018). In the Darrington Ranger District in 2015, there were a total of 228,817 visitors with expenditures of approximately $7.3 million contributing to the regional economy. The report also summarizes the importance of visitors to the Mount Baker-Snoqualmie National Forest to gateway communities, such as Darrington and Granite Falls. Trip-related expenditures associated with national forest recreation support economic development, jobs, income, and taxes. Table 2 summarizes the regional jobs supported by visitors to the Darrington Ranger District.

Table 2. Darrington Ranger District Expenditures and Employment Supported by Outdoor Recreation

	Annual Jobs Supported by Outdoor Recreation Spending				
Expenditures	Direct	Indirect	Induced	Total	Visits per Job
$7,277,672	26	3	4	34	6,815

Source: Earth Economics 2018

4.2 TIMBER SALES

The 1990 *Land and Resource Management Plan, Mount Baker-Snoqualmie National Forest* explains the timber management strategy as a balance between jobs, demand for wood and wood products, income to the treasury, and protecting the various "non-market values" of other forest users (USDA Forest Service 1990). Snohomish County, Granite Falls, and Darrington generally express a need for a similar balance as described in their Comprehensive Plans. Timber sales provide employment opportunities and income, particularly to nearby rural communities. The *Gem of the Emerald Corridor: Nature's Value in the Mt. Baker-Snoqualmie National Forest* report summarizes that across the Mount Baker-Snoqualmie National Forest, 2016 timber sales contributed $454,396. Timber extraction jobs are both labor and resource intensive; therefore, the rural jobs it supports tend to offer higher wages than other rural jobs.

A review of geographic information system (GIS) data provided by the Forest Service found thousands of instances of timber-harvesting activity near the study area dating back to 1886 (Figure 3). Since 2001, there have been a total of approximately 1,057 planned acres and approximately 875 accomplished acres of timber harvest near the study area (USDA Forest Service 2018C). For all these acres, the type of timber harvest was commercial thinning[2].

5.0 CONCLUSION

In the past, the economies of the Darrington and Granite Falls areas were heavily dependent on logging and lumber manufacturing. The communities have been trying to diversify their local economies to increase tourism and recreation. Access to recreational sites is an important part of the desired recreational experience for both local residents and visitors. The Mountain Loop Highway will continue to be central to the economic goals of Snohomish County, Granite Falls, and Darrington. Job creation, tourism, recreational opportunities, timber harvest, and infrastructure improvements have and will continue to be tied to these communities that are geographically situated to take advantage of the corridor.

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[2] An intermediate harvest with the objective of reducing stand density primarily to improve growth, enhance forest health, and other resource objectives. Treatment can recover potential mortality while producing merchantable material. Thinning includes the following: chemical (killing of unwanted trees by herbicide application); crown (removal of trees from dominant and co-dominant strata); free (no consideration to crown position); low (removal of trees from lower crown classes); mechanical or row (removal of trees either in row, strips by using a fixed spacing interval); and selection (removal of the crown class to favor those in the lower crown classes.) This activity code is in the Timber and Silviculture grouping.

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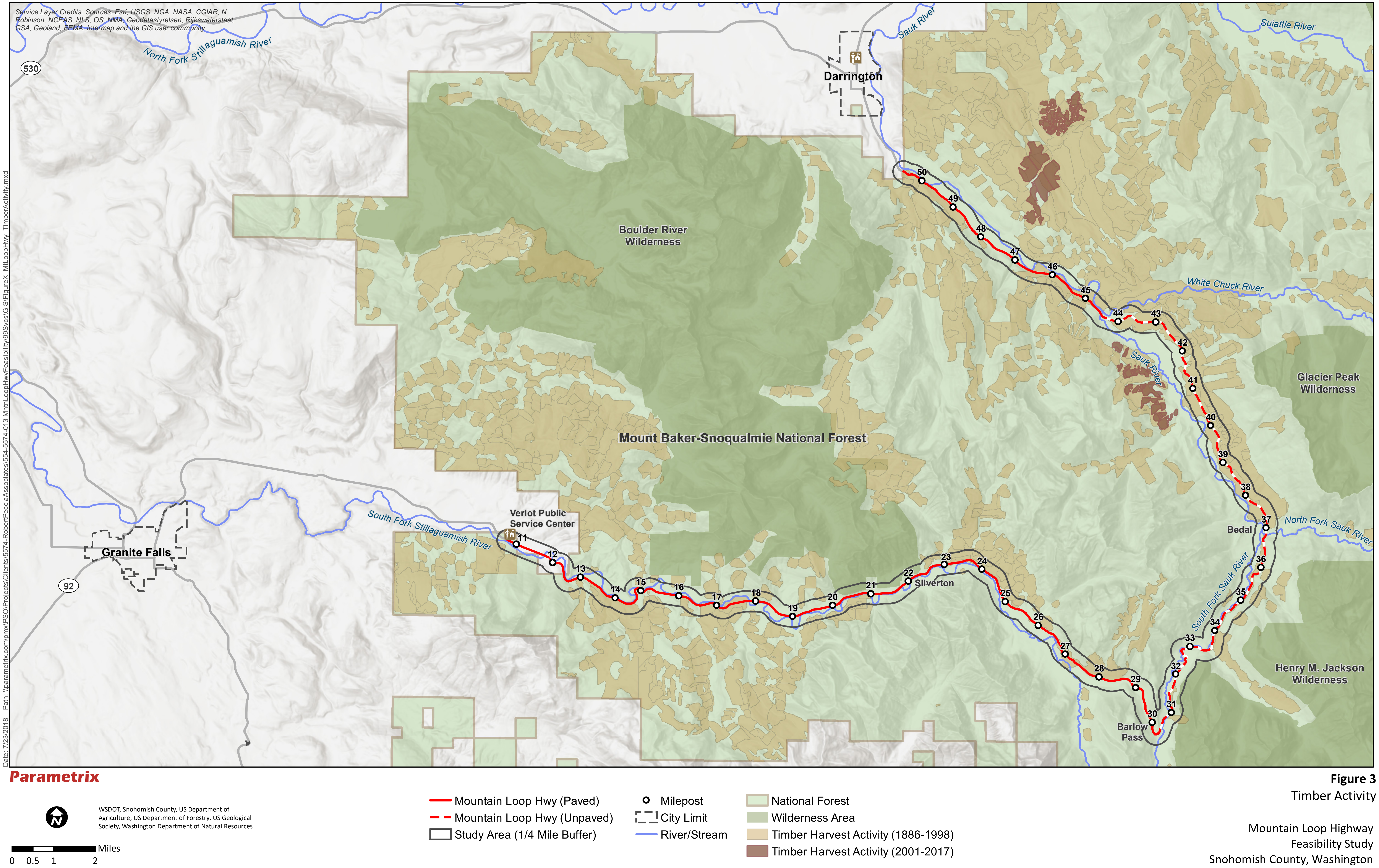
Map



Service Layer Credits: Sources: Esri, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

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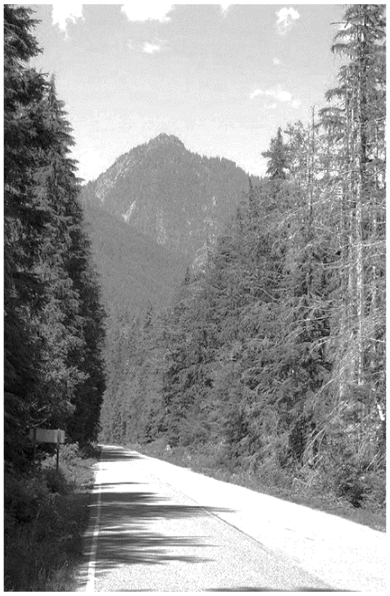
Parametrix

WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources

Figure 3
Timber Activity

Mountain Loop Highway
Feasibility Study
Snohomish County, Washington



RECREATIONAL OPPORTUNITIES MEMORANDUM

Mountain Loop Highway Feasibility Study

WA SNOHOMISH 20(1)
IDIQ Contract No. DTFH70-15-D-00007
Task Order No. 69056718F000005

U.S. Department
of Transportation
**Federal Highway
Administration**

Prepared for:
WESTERN FEDERAL LANDS HIGHWAY DIVISION

August 2018

Prepared by:
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In association with:
PARAMETRIX
Seattle, Washington

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ABBREVIATIONS/ACRONYMS

CCC	Civilian Conservation Corps
FHWA	Federal Highway Administration
Forest Service	United States Forest Service—Mount Baker-Snoqualmie National Forest
RNAs	Research Natural Areas
SR	State Route

RECREATIONAL OPPORTUNITIES MEMORANDUM

1.0 INTRODUCTION

The Federal Highway Administration (FHWA), in partnership with Snohomish County and the U.S. Forest Service (Forest Service), is completing a feasibility study for potential corridor improvements to the Mountain Loop Highway in the Mount Baker-Snoqualmie National Forest. The study, referred to as the *Mountain Loop Highway Feasibility Study*, will identify feasible improvement options to improve recreational access and operational safety in the study corridor as well as reduce maintenance concerns based on needs identified by the feasibility study.

The Mountain Loop Highway provides access between the Town of Darrington and the City of Granite Falls as an alternative to State Route (SR) 530. The highway also offers spectacular views and access to trails, campgrounds, picnic areas, and a large amount of dispersed use recreational activities. The *Mountain Loop Highway Feasibility Study* will include analyses of access needs, recreational and economic opportunities, geometric characteristics (road widths, curves, approaches, etc.), collision history, erosion and mass wasting issues, and existing and projected traffic patterns of the corridor. An inventory of existing and projected land uses and environmental resources will also be developed.

The feasibility study will be a collaborative process among FHWA, the Forest Service, Snohomish County, the Town of Darrington, the City of Granite Falls, resource agencies, and the public, and it will identify transportation needs and potential solutions. A key outcome of the study will be the development of a comprehensive package of short-term, mid-term, and long-term recommendations intended to address the transportation and access needs of highway users over the next 20 years (i.e., planning horizon year 2040). Developing these recommendations will help the feasibility study partners define the most critical needs and allocate resources. The study aims to reduce planning time while considering environmental and social issues, and to minimize construction costs through the demonstration of feasible improvement opportunities.

This document, called the *Recreational Opportunities Memorandum*, provides an overview of existing recreation opportunities along the Mountain Loop Highway using readily available information. A brief discussion of potential opportunities to improve recreational access is also included.

2.0 RECREATIONAL SITES

The Mountain Loop Highway is readily accessible to more than 3 million residents of the central Puget Sound area. The highway provides access to more than a dozen campgrounds, 2 public boat launches, 3 interpretive sites, 3 wilderness areas, 3 Research Natural Areas, 4 picnic areas, 2 National Historic Register sites, the historic mining town of Monte Cristo, and 30 trailheads with access to over 80 hikes, spanning over 200 miles of trail, including the Pacific Crest National Scenic Trail (Figure 1). Most recreational use occurs on the South Fork Stillaguamish side of the Mountain Loop Highway. The highest use occurs between May and September, when the corridor receives 17,000 to 20,000 visitors per month, on average. Recreational visitation decreases during the winter months, when Snohomish County typically plows the road from Verlot to Deer Creek (approximately milepost 23) and from Darrington to the White Chuck River (approximately milepost 44).

Dispersed recreational activities comprise a large portion of the recreation in the study area. Seasonal and traditional dispersed uses include camping (dispersed, non-fee), picnicking, driving for pleasure, hiking, birding, mushroom gathering, berry picking, hunting, target shooting, fishing, and trapping. Kayaking and canoeing are popular water-based activities; several firms have special use permits from the Forest Service for outfitting and guiding rafting trips on the Sauk River. Snowmobiling, cross-country skiing, and snowshoeing are popular winter activities. During summer and especially on holidays, every wide spot in the road and every turn-out may be used for camping and/or picnicking. Most users of the area are residents of local communities such as Darrington, Granite Falls, Marysville, Everett, and Lake Stevens, as well as the greater Puget Sound metropolitan area and southern British Columbia.

2.1 CAMPGROUNDS

There are 13 campgrounds located along the Mountain Loop Highway. This section includes information on campground usage, capacity, and amenities (USFS 2018).

2.1.1 Beaver Creek Group Campgrounds

The Beaver Creek Campground is a group campsite, situated along the South Fork Stillaguamish River (Table 1). The campground is located next to the confluence of Beaver Creek flows and the South Fork Stillaguamish River. Nearby recreational opportunities include hiking, climbing, fishing, swimming, boating, whitewater paddling, picnicking, mountain biking, and horseback riding in summer and early fall and nearby skiing and snowshoeing in the winter. The Gold Basin Mill Pond interpretive trail is also accessible from the campground.

Table 1. Beaver Creek Group Campground Data

Capacity	One site; can accommodate up to 25 people; tent, trailer, RV
Amenities	Picnic tables, vault toilets, ADA accessible vault toilets, tent pads, campfire rings with grills
Open Season	Memorial Day through Labor Day
Usage	Medium (site was rented 18 times, spanning 38 total site rental days in 2016)
Restrictions	Intended for use by a single group; no drinking water, no RV hookups
Pet Friendly?	Yes
Directions	From the Verlot Public Service Center, travel east on the Mountain Loop Scenic Byway for approximately 13 miles; the campground is on the south/river side of the road, just past the small town of Silverton, Washington 48°4'56"N, 121°32'2"W

2.1.2 Bedal Campground

The Bedal Campground is located just off the Mountain Loop Highway (Table 2). Recreational activities nearby include fishing, swimming, boating, white water rafting, biking, and hiking. The North Fork Sauk Falls hike is located within 5 miles of Bedal Campground.

Table 2. Bedal Campground Data

Capacity	21 standard tent sites
Amenities	Picnic tables, vault toilets, ADA accessible vault toilets, tent pads, campfire rings, firewood, and garbage service; large (18' x 18') adirondack shelter built of old-growth timber available; boat launch to Sauk River for nonmotorized watercraft
Open Season	Memorial Day through Labor Day
Usage	Medium (384 total sites occupied, 740 total site rental days in 2016)
Restrictions	No drinking water, no RV hookups; large motor homes and trailers are allowed but not recommended
Pet Friendly?	Yes
Directions	From Darrington, travel approximately 16 miles southeast on the graveled single lane section of the Mountain Loop Highway; the campground is located on the west side of the road at milepost 37, just beyond the junction of the byway and Forest Road #49 48°5'49"N, 121°23'29"W

2.1.3 Boardman Creek Group Campground

The Boardman Creek Campground is situated between the Mountain Loop Highway and the South Fork Stillaguamish River (Table 3). Boardman Creek Campground has two campsites suitable for tents, trailers, or RVs, and six sites suitable for tents only. Recreational activities nearby include hiking, biking, horseback riding, picnicking, swimming, boating, and fishing in summer and early fall, and nearby skiing and snowshoeing in the winter.

Table 3. Boardman Creek Group Campground Data

Capacity	One site, can accommodate up to 35 people, tent, trailer, RV
Amenities	Picnic tables, vault toilets, ADA accessible vault toilets, tent pads, campfire rings with grills, firewood
Open Season	Memorial Day through Labor Day
Usage	Medium to heavy (site was rented 30 times, spanning 59 total site rental days in 2016)
Restrictions	Intended for use by a single group, no drinking water, no RV hookups
Pet Friendly?	Yes
Directions	From the Verlot Public Service Center, travel east on the Mountain Loop Highway for approximately 6 miles; the campground is on the north/river side of the road immediately after crossing Boardman Creek 48°4'12"N, 121°40'36"W

2.1.4 Clear Creek Campground

The Clear Creek Campground is located between the Mountain Loop Highway and the Sauk River (Table 4). The Sauk River can be accessed from the campground and Clear Creek flows into the Sauk River just southeast of the campground. Recreational activities nearby include hiking, biking, picnicking, rafting, boating, swimming, and fishing in summer and early fall.

Table 4. Clear Creek Campground Data

Capacity	13 standard tent/trailer campsites
Amenities	Picnic tables, vault toilets, tent pads, campfire rings, firewood, garbage service
Open Season	Memorial Day through Labor Day,
Usage	Heavy (231 total sites occupied, 351 total site rental days in 2016)
Restrictions	No drinking water
Pet Friendly?	Yes
Directions	From Darrington, travel approximately 3.5 miles south on the Mountain Loop Highway 48°13'16"N, 121°34'38"W

2.1.5 Coal Creek Campground

The Coal Creek Group Campground is located at the confluence of Coal Creek and the South Fork Stillaguamish River, just off the Mountain Loop Highway (Table 5). The Coal Creek Group Campground provides opportunities for fishing, picnicking, horseback riding, hiking, climbing, swimming, wildlife watching, boating, and white water paddling in summer and early fall, and skiing and snowshoeing in the winter.

Table 5. Coal Creek Campground Data

Capacity	One site; can accommodate approximately 25 people, tent, trailer, RV
Amenities	Picnic tables, vault toilets, ADA accessible vault toilets, tent pads, campfire rings with grills, firewood
Open Season	Memorial Day through Labor Day
Usage	Medium (site was rented 22 times, spanning 39 total site rental days in 2016)
Restrictions	No drinking water, no RV hookups
Pet Friendly?	Yes
Directions	From Verlot Public Service Center, travel approximately 13 miles east on the Mountain Loop Highway 48°5'1"N, 121°33'23"W

2.1.6 Esswine Group Campground

The Esswine Group Campground is located along the South Fork Stillaguamish River, with camping spots on both sides of a short road just off the Mountain Loop Highway (Table 6). Nearby recreational activities include hiking, climbing, biking, fishing, swimming, boating, picnicking and horseback riding in summer and early fall, and skiing and snowshoeing during winter.

Table 6. Esswine Group Campground Data

Capacity	One site; can accommodate approximately 25 people, tent, trailer, RV
Amenities	Picnic tables, vault toilets, tent pads, campfire rings with grills
Open Season	Memorial Day through Labor Day
Usage	Light (site was rented 19 times, spanning 30 total site rental days in 2016)
Restrictions	No drinking water, no RV hookups
Pet Friendly?	Yes
Directions	From Verlot Public Service Center, travel approximately 5.2 miles east on the Mountain Loop Highway 48°4'26"N, 121°41'48"W

2.1.7 Gold Basin Campground

The Gold Basin Campground is the largest campground on the Mountain Loop Highway and provides the most accessible and developed camping experience, with amenities such as flushing toilets, drinking water, and showers (Table7). The campground also offers an amphitheater as well as a large, open field. Nearby recreational activities include hiking, climbing, biking, fishing, swimming, boating, picnicking, and horseback riding in summer and early fall. Skiing and snowshoeing is possible nearby during the winter. However, this site is currently closed pending a geological study.

Table 7. Gold Basin Campground Data

Capacity	82 standard tent/trailer campsites, 10 tent-only sites, one reservation group site that can accommodate up to 75 guests
Amenities	Picnic area, flushing toilets, drinking water, shower area, tent pads, campfire rings, firewood, amphitheater, open field
Open Season	The campground has been closed since 2015 and is currently closed until further notice. The Forest Service is currently evaluating the site’s renovation needs pending a geological study.
Usage	Not applicable
Restrictions	No RV hookups
Pet Friendly?	Yes
Directions	From Verlot Public Service Center, travel approximately 2.4 miles east on the Mountain Loop Highway 48°4'42"N, 121°44'15"W

2.1.8 Marten Creek Group Campground

The Marten Creek Group Campground sits above the confluence of the South Fork Stillaguamish River and Marten Creek (Table 8). Nearby recreational activities include hiking, climbing, biking, fishing, swimming, boating, picnicking and horseback riding in summer and early fall, and skiing and snowshoeing during the winter.

Table 8. Marten Creek Group Campground Data

Capacity	One site; can accommodate approximately 25 people, tent, trailer, RV
Amenities	Picnic tables, vault toilets, tent pads, campfire rings with grills
Open Season	Campground appears to be closed as of 2018
Usage	Light to medium (site was rented 21 times, spanning 33 total site rental days in 2016)
Restrictions	No RV hookups
Pet Friendly?	Yes
Directions	From Verlot Public Service Center, travel approximately 9.2 miles east on the Mountain Loop Highway 48°4'22"N, 121°36'24"W

2.1.9 Red Bridge Campground

The Red Bridge Campground is located near the South Fork Stillaguamish River. Nearby recreational activities include hiking, climbing, biking, fishing, swimming, boating, picnicking and horseback riding in summer and early fall, and skiing and snowshoeing during the winter (Table 9). The Youth-On-Age-Nature Interpretive Trail is located just a short walk east on the Mountain Loop Highway from the campground.

Table 9. Red Bridge Campground Data

Capacity	14 standard tent/trailer campsites
Amenities	Picnic tables, vault toilets, ADA accessible vault toilets, tent pads, campfire rings, firewood, garbage service
Open Season	May 18 through September 30
Usage	Heavy (661 total sites occupied, 982 total site rental days in 2016)
Restrictions	No drinking water, no RV hookups
Pet Friendly?	Yes
Directions	From Verlot Public Service Center, travel approximately 7.1 miles east on the Mountain Loop Highway 48°4'14"N, 121°39'20"W

2.1.10 Tulalip Mill Site Group Campground

The Tulalip Mill Site Group Campground is located in between the Old Mill Pond and the South Fork Stillaguamish River (Table 10). Nearby recreational activities include hiking, climbing, biking, fishing, swimming, boating, picnicking and horseback riding in summer and early fall, and skiing and snowshoeing during the winter.

Table 10. Tulalip Mill SIte Group Campground Data

Capacity	One site; can accommodate approximately 60 people, tent, trailer, RV
Amenities	Picnic tables, vault toilets, ADA accessible vault toilets, tent pads, campfire rings with grills, firewood
Open Season	Memorial Day through Labor Day
Usage	Heavy (site was rented 18 times, spanning 37 total site rental days in 2016)
Restrictions	No drinking water, no RV hookups
Pet Friendly?	Yes
Directions	From Verlot Public Service Center, travel approximately 8.2 miles east on the Mountain Loop Highway 48°4'24"N, 121°35'24"W

2.1.11 Turlo Campground

The Turlo Campground is located in between the Mountain Loop Highway and the South Fork Stillaguamish River (Table 11). There are nearby opportunities to fish, swim, and hike.

Table 11. Turlo Campground Data

Capacity	18 standard campsites, tent, trailer, RV
Amenities	Picnic tables, vault toilets, ADA accessible vault toilets, drinking water, tent pads, campfire rings, firewood
Open Season	April 27 through September 30
Usage	Medium to heavy (857 total sites occupied, 1,393 total site rental days in 2016)
Restrictions	No RV hookups
Pet Friendly?	Yes
Directions	Located west of and across the Mountain Loop Highway from the Verlot Public Service Center 48°5'44"N, 121°47'25"W

2.1.12 Verlot Campground

The Verlot Campground is located just off the Mountain Loop Highway near the confluence of Benson Creek and the South Fork Stillaguamish River (Table 12). Nearby recreational activities include fishing, hiking, climbing, biking, swimming, boating, picnicking, and horseback riding in summer and early fall, and skiing and snowshoeing during the winter. A short trail at the northeast end of the campground leads to the Verlot Public Service Center.

Table 12. Verlot Campground Data

Capacity	26 standard campsites, tent, trailer, RV
Amenities	Picnic tables, flush toilets, drinking water, tent pads, campfire rings, firewood
Open Season	April 27 through September 30
Usage	Medium to heavy (1,093 total sites occupied, 1,681 total site rental days in 2016)
Restrictions	No RV hookups
Pet Friendly?	Yes
Directions	Located east of and across the Mountain Loop Highway from the Verlot Public Service Center 48°5'30"N, 121°47'5"W

2.1.13 Wiley Creek Group Campground

The Wiley Creek Group Campground is located a short distance from the South Fork Stillaguamish River (Table 13). Nearby recreational activities include swimming, fishing, picnicking, hiking, biking, and horseback riding in summer and early fall, as well as skiing and snowshoeing in the winter. The Gold Basin Mill Pond Interpretive Trail and Lake Twenty-Two Trailhead are located a short distance west of the Wiley Creek Group Campground.

Table 13. Wiley Creek Group Campground Data

Capacity	Two group sites; each can accommodate approximately 20 people each, tent, trailer, RV
Amenities	Picnic tables, vault toilets, ADA accessible vault toilets, tent pads, adirondack shelters, campfire rings with grills, firewood, garbage service.
Open Season	Memorial Day through Labor Day
Usage	Heavy (site was rented 28 times, spanning 63 total site rental days in 2016)
Restrictions	No drinking water, no RV hookups
Pet Friendly?	Yes
Directions	From the Verlot Public Service Center, travel east on the Mountain Loop Highway for approximately 4 miles; the campground is on the north/river side of the road 48°4'28"N, 121°43'6"W

2.2 TRAILHEADS

This section summarizes trailheads and trails along the Mountain Loop Highway. Trailheads along the Mountain Loop Highway provide access to trails accommodating mountain climbing, mountain biking, horseback riding, nature viewing, backpacking, and day hiking (USFS 2018; Washington Trails Association 2018).

2.2.1 Trailheads

There is a total of 30 trailheads along the Mountain Loop Highway that provide access to numerous miles of trails near the study area. Information on the following 17 trailheads includes usage and parking information:

- Bald Eagle Trailhead: lightly trafficked with parking available.
- Barlow Pass Trailhead: lightly trafficked with parking for at least 15 vehicles; some reported criminal activity, such as car break-ins.
- Bedal Creek Trailhead: lightly to moderately trafficked with parking for about 5 vehicles. Parking currently occurs along the highway with hikers walking into the trailhead.
- Coal Lake/Independence Lake Trailhead: heavily trafficked trailhead with parking.
- Crystal Creek Trailhead: lightly trafficked trailhead with parking for about 5 vehicles.
- Dickerman Mountain/Perry Creek Trailhead: heavily trafficked trailhead with large parking lot.
- Elliot Creek/Goat Lake Trailhead: moderately to heavily trafficked trailhead with large parking lot.
- Heather Lake Trailhead: heavily trafficked trailhead with parking; some overflow parking occurs along the highway.
- Ice Caves Trailhead: heavily trafficked trailhead with a large parking lot.
- Lake Twenty-Two Trailhead: heavily trafficked trailhead with parking for at least 50 vehicles.
- Lost Creek Ridge Trailhead: lightly trafficked trailhead with limited parking.
- Meadow Mountain Trailhead: moderately trafficked with limited parking.
- Mount Pilchuck Trailhead: heavily trafficked trailhead with a parking lot.
- North Fork Sauk Trailhead: lightly trafficked trailhead with a parking lot.
- Sloan Peak Trailhead: lightly trafficked trailhead with limited parking.
- Sunrise Mine Trailhead: heavily trafficked trailhead with a parking lot available.
- Youth-On-Age Nature Trailhead: heavily trafficked trailhead with parking.

2.2.2 Mountain Climbing

The following trails accommodate mountain climbing:

- Cadet Peak
- Del Campo Peak
- Lewis Peak
- Mount Forgotten
- Neiderprum Trail 653
- Perry Creek Trail 711
- Sloan Peak Trail 648
- St'aul Mountain
- Sunrise Mine Trail 707
- Three Fingers Fire Lookout
- Three Fingers-Goat Flats-Saddle Lake Trail 641

- Voodoo Peak
- Weden Creek (Gothic Basin) Trail 724

2.2.3 Mountain Biking

The following trails accommodate mountain biking:

- Chocwich Mountain Bike Trail
- Old Monte Cristo Townsite Trail

2.2.4 Horseback Riding

The following trails accommodate horseback riding:

- Bald Eagle (Curry Gap) Trail 650
- Meadow Mountain Trail 657

2.2.5 Backpacking

The following trails accommodate backpacking:

- Ashland Lakes Trail
- Bald Eagle Mountain (Curry Gap) Trail 650
- Boardman Lake/Lake Evan Trail 704
- Boulder River Trail 734
- Crystal Lake Trail 638 and Circle Peak Trail 638.1
- Cutthroat Lakes via Walt Bailey Trail
- Eight-Mile Trail 654.02
- Elliot Creek (Goat Lake) Trail 647
- Glacier Peak
- Glacier Basin Trail 719
- Independence Lake Trail 712
- Island Lake Trail (near Boardman Lake)
- Kennedy Ridge Trail 639
- Lost Creek Ridge Trail 646
- Mallardy Ridge (Walt Bailey) Trail 706
- Meadow Mountain Trail 657
- Mount Forgotten
- North Fork Sauk Trail 649
- North Lake Trail 712.1
- Old Monte Cristo Townsite Trail
- Peek-a-Boo Lake Trail 656
- Pilot Ridge Trail 652
- Pinnacle Lake Trail 703.1
- Poodle Dog Pass-Silver Lake-Twin Lakes Trail 708
- Round Lake
- Sloan Peak Trail 648
- Squire Creek Trail 654
- Sunrise Mine Trail 707
- Three Fingers-Goat Flats-Saddle Lake Trail 641
- Weden Creek (Gothic Basin) Trail 724
- White Chuck River Trail 643

2.2.6 Day Hiking

The following trails accommodate day hiking:

- Anthracite Peak (near Coal Lake Trail)
- Ashland Lakes Trail
- Bald Eagle (Curry Gap) Trail 650
- Barlow Point Trail 709
- Bear Lake Trail 703
- Beaver Lake Trail 629
- Beaver Peak Trail
- Bedal Basin

- Bedal Creek Trail 705
- Big Four Ice Caves Trail 723
- Bluegrass Butte (near Independence Lake)
- Boardman Lake/Lake Evan Trail 704
- Boulder River Trail 734
- Canyon Lake Trail 720
- Chocwich Mountain Bike Trail
- Coal Lake Trail 632
- Crystal Lake Trail 638 and Circle Peak Trail 638.1
- Double Eagle Mine-Devil's Lake Trail
- Eight-Mile Trail 654.02
- Elliot Creek (Goat Lake) Trail 647
- Forks of Canyon Creek Trail 633
- Frog Lake Trail 659
- Glacier Basin Trail 719
- Gold Basin Mill Pond Interpretive Trail
- Gordon Ridge/Anaconda Peak
- Hall Peak
- Harold Engle's Memorial Grove Trail 642
- Headlee Pass and Vesper Lake
- Heather Lake Trail 701
- Independence Lake Trail 712
- Island Lake Trail (near Boardman Lake)
- Jumbo Mountain
- Kelcema Lake Trail 718
- Lake Twenty-Two Trail 702
- Lost Creek Ridge Trail 646
- Mallardy Ridge (Walt Bailey) Trail 706
- Marten Creek Trail 713
- Meadow Mountain Trail 657
- Mount Pilchuck Trail 700
- Mt. Dickerman Trail 710
- Mt. Higgins Trail 640
- Mt. Pugh Trail 644
- Neiderprum Trail 653
- North Fork Sauk Falls Trail 660
- North Fork Sauk Trail 649
- North Lake Trail 712.1
- Old Government Trail 733
- Old Monte Cristo Townsite Trail
- Old Robe Canyon Historic Trail
- Old Sauk Trail 728
- Old Sauk ADA Loop
- Pass Lake Trail 645
- Peek-a-Boo Lake Trail 656
- Perry Creek Trail 711
- Pilot Ridge Trail 652
- Pinnacle Lake Trail 703.1
- Poodle Dog Pass-Silver Lake-Twin Lakes Trail 708
- Red Mountain Trail 651
- Sloan Peak Trail 648
- Squire Creek Trail 654
- Sunrise Mine Trail 707
- Three Fingers-Goat Flats-Saddle Lake Trail 641
- Triple Creek Falls
- Weden Creek (Gothic Basin) Trail 724
- White Chuck Bench Trail 731
- White Chuck River Trail 643
- Youth-On-Age-Nature Trail 738

2.3 BOAT LAUNCHES

This section summarizes boat launches along the Mountain Loop Highway (USFS 2018).

2.3.1 Bedal Campground Boat Launch

The Bedal Campground boat launch is located at the lower section of the North Fork Sauk River, just before the river joins the South Fork Sauk River. The campground has a developed boat ramp available for nonmotorized watercraft. The boat launch is located at River Mile 40. This section of the Sauk River is known for its Class II and III rapids from late May to early August, but rapids may rise to Class IV during higher flows.

2.3.2 White Chuck Boat Launch

The White Chuck boat launch is located just downstream from the confluence of the White Chuck River and the Sauk River. This boat launch offers nonmotorized boat access and is a walk-in only with no ramp. The launch is located at River Mile 31.8. The loading and unloading zone close to river entry and the parking lot has capacity for 30 vehicles and trailers. This section of the Sauk River is known for its Class II and III rapids from late May to early August, but rapids may rise to Class IV during higher flows.

2.4 INTERPRETIVE SITES

This section summarizes interpretive sites along the Mountain Loop Highway (USFS 2018; Washington Trails Association 2018).

2.4.1 Big Four Picnic Area and Interpretive Trail

The Big Four Ice Caves Trail 723 provides interpretive information and is a heavily trafficked hike. The Big Four Ice Caves Trail 723 can be accessed from the Big Four Ice Caves Trailhead or the Big Four Picnic Area. A short connector loop connects the Big Four Picnic Area to the Big Four Ice Caves Trail 723.

2.4.2 Gold Basin Mill Pond Interpretive Trail

The Gold Basin Mill Pond Interpretive Trail is a short, accessible interpretive trail that passes by old mill relics and ends on a floating viewpoint looking across the old millpond. Interpretive signs discuss the history of the mill and the native wildlife in the area.

2.4.3 Youth-On-Age Nature Trail and Interpretive Area

The Youth-On-Age Interpretive Trail is self-guided, one-quarter-mile hike. The trail is heavily trafficked. Interpretive signs along the trail as well as interpretive brochures available at the trailhead discuss the native flora and fauna as well as local geology.

2.5 OTHER RECREATIONAL OPPORTUNITIES

This section summarizes other recreational opportunities available along the Mountain Loop Highway, such as historic sites, research natural areas, wilderness areas, picnic areas, fishing, and nature viewing.

2.5.1 National Historic Register Sites

Two properties in the study area are on the state and/or national registers, and a third has been determined to be eligible for inclusion:

- The Verlot Public Service Center: The Verlot Public Service Center was built in 1936 and is listed on the National Register of Historic Places and the Washington Heritage Register. The site is managed under a programmatic agreement among the Forest Service, the Oregon and Washington State Historic Preservation Offices, and the Advisory Council on Historic Preservation. Built by the Civilian Conservation Corps (CCC) in 1936, the Verlot Public Service Center operates seasonally as a visitor center and headquarters for hiking, camping, hunting, and fishing information. The Verlot Public Service Center also offers a newly renovated museum. Several trailheads for popular hikes, including the Big Four Ice Caves, Mount Pilchuck, Lake Twenty-Two, Heather Lake, Mount Dickerman and Goat Lake, are located within minutes of the Verlot Public Service Center (USFS 2018).
- South Fork Stillaguamish Bridge #537: The South Fork Stillaguamish Bridge #537 (milepost 17.8), also known as the Red Bridge, is listed on the Washington Heritage Register. The bridge has also been characterized as eligible for listing in the National Register of Historic Places because it is one of the few remaining unaltered examples of the 1950s-style, riveted steel/Pratt/Parker through-truss bridges in Washington.
- South Fork Stillaguamish River Bridge #538: The South Fork Stillaguamish River Bridge #538 (MP 11.7), known as the Blue Bridge, is also eligible for listing in the National Register of Historic Places as an excellent example of a riveted steel Pratt/Parker through-truss bridge. The Red Bridge and Blue Bridge were some of the last Pratt/Parker through trusses constructed in the state.

2.5.2 Research Natural Areas

There are three Research Natural Areas (RNAs) near the Mountain Loop Highway. These areas have restricted use and are set aside for biological research. Camping and campfires are not allowed in RNAs. However, these areas can be accessed and viewed from trails.

- Lake Twenty-Two: The Lake Twenty-Two RNA was established in 1947 to compare and study the effects on water, wildlife, and timber of an area left unmanaged by the Forest Service, as compared to nearby areas that undergo intensive forest management practices. The heavily trafficked, 1-mile loop passes through old-growth forest and up a large talus slope to Lake Twenty-Two. Recreational opportunities on this trail include hiking and fishing (Pacific Northwest Interagency Natural Areas Network 2013a).
- Long Creek: The Long Creek RNA was established in 1947 as an example of virgin western hemlock and western red-cedar forest type. The topography is steep to very steep with broken slopes. The variety of plant communities and environments found on the unstable till deposits in this landscape offers a unique research opportunity (Pacific Northwest Interagency Natural Areas Network 2013b).
- Perry Creek: The Perry Creek RNA was established in 1997 to preserve the unique plant communities, and particularly uncommon selection of plant species found in the area. The RNA encompasses a majority of the Perry Creek drainage basin. Perry Creek drains a rugged, high-elevation mountainous area and the extreme vertical relief has created a unique valley bottom habitat that hosts uncommon species of ferns. The heavily trafficked, 10.5-mile hike offers views of old-growth forest, waterfalls, meadows, expansive mountain views, and lakes (Pacific Northwest Interagency Natural Areas Network 2013c).

2.5.3 Wilderness Areas

The Mountain Loop Highway provides access to three wilderness areas, each managed by the Forest Service (USFS 2018):

- Boulder River Wilderness: The Boulder River Wilderness includes a total of 49,444 acres of wilderness, including Whitehorse Mountain, Liberty Mountain, and Three Fingers as well as the Clear Creek and Squire valleys. Recreational opportunities in the Boulder River Wilderness include day-hiking, backpacking, and rock climbing. The Boulder River Trail is the most popular trail in the wilderness area. Other trails near the Mountain Loop Highway that access the Boulder River Wilderness include Canyon Lake Trail 720, Eight-Mile Trail 654.02, Kelcema Lake Trail 718, Marten Creek Trail 713, Neiderprum Trail #654, and the Three Fingers-Goat Flats-Saddle Lake Trail 641.
- Henry M. Jackson Wilderness: The Henry M. Jackson Wilderness includes a total of 103,297 acres of wilderness, including Bedal Peak, Sloan Peak, Monte Cristo Peek, Sheep Mountain and Blanca Lake. Recreational opportunities in the Henry M. Jackson Wilderness include day-hiking, backpacking, rock climbing, fishing, and horse riding. The wilderness area offers approximately 49 miles of hiking trails, including a portion of the Pacific Crest Trail. Trails near the Mountain Loop Highway that access the Henry M. Jackson Wilderness include the Bald Eagle Trailhead, Barlow Trailhead, Bedal Creek Trailhead, Elliot Creek/Goat Lake Trailhead, and Sloan Peak Trailhead.
- Glacier Peak Wilderness: The Glacier Peak Wilderness includes a total of 566,057 acres of wilderness, including Glacier Peak, Mount Pugh, Red Mountain, and Black Mountain. With an elevation of 10,541 feet, Glacier Peak is the dominant geologic feature of the wilderness and is one of the most active volcanoes in Washington. Recreational opportunities in the Glacier Peak Wilderness include day-hiking, backpacking, and rock climbing. The wilderness area offers approximately 450 miles of hiking along more than 100 trails, including a portion of the Pacific Crest Trail. Trails near the Mountain Loop Highway that access the Glacier Peak Wilderness include the Lost Creek Ridge Trailhead, the Meadow Mountain Trailhead, the North Fork Sauk Trailhead, and the White Chuck River Trail 643.

2.5.4 Picnic Areas

This section summarizes four picnic areas along the Mountain Loop Highway (USFS 2018).

The Big Four Picnic Area is located at the site of the former Big 4 Inn, which was built in 1920 and destroyed by a fire in 1949 (Table 14). All that remains of the Big 4 Inn is the hearth and chimney from the lodge fireplace. A short interpretive trail leads from the picnic area to the Big Four Ice Caves Trailhead.

Table 14. Big Four Picnic Area Data

Number of Sites	4 accessible sites, 16 total sites
Operational Hours	Open year-round
Usage	Heavy
Fees	$5/vehicle/day
Amenities	6 pit toilets, 11 picnic tables, 5 grills, shelter with 4 large tables, large lawn, access to Big Four Ice Caves Trail 723
Restrictions	Day use only, dogs on leash, no drinking water
Pet Friendly	Yes
Directions	From Verlot Public Service Center, travel 14.5 miles east on the Mountain Loop Highway; the picnic area is located on the south side of the highway, just before the Big Four Trailhead

The Dick Sperry Picnic Area is a small day-use area with four picnic tables, campfire pits, grills, and an excellent view of the South Fork Stillaguamish River (Table 15). The picnic area is located at the historic site of the abandoned Sperry Iverson mine.

Table 15. Dick Sperry Picnic Area Data

Number of Sites	4 picnic tables
Operational Hours	Open year-round
Usage	Medium
Fees	No fee
Amenities	Picnic tables, campfire pits, grills, vault toilets
Restrictions	No drinking water
Pet Friendly	Yes
Directions	From Verlot Public Service Center, travel approximately 11 miles east on the Mountain Loop Highway; the picnic area is located on the south side of the highway

The Hemple Creek Picnic Area has several picnic tables, fire pits, and grills along the South Fork Stillaguamish River (Table 16). This area was a railroad stop during the gold mining era of the 1890s.

Table 16. Hemple Creek Picnic Area Data

Number of Sites	16 picnic sites, 28 total picnic tables
Operational Hours	Open year-round
Usage	Light
Fees	$5/vehicle/day
Amenities	Vault toilets, picnic tables, fire pits, grills
Restrictions	No drinking water
Pet Friendly	Yes
Directions	From Verlot Public Service Center, travel 2 miles east on the Mountain Loop Highway; the picnic area is located on the north side of the highway, just across from the Lake Twenty-Two Trailhead

The Whitechuck Overlook Picnic Area is a small, forested site and provides access to an interpretive sign at the picnic area that provides information about the history of the site, which was a railroad-mobile logging camp during the 1930s (Table 17).

Table 17. Whitechuck Overlook Picnic Area Data

Number of Sites	2 picnic tables
Operational Hours	Not listed
Usage	Medium
Fees	Not listed
Amenities	Vault toilets, picnic tables
Restrictions	No drinking water
Pet Friendly	Yes
Directions	From Darrington, travel approximately 11 miles south on the Mountain Loop Highway; the picnic area is on the left side of the road about 1 mile after the pavement ends and the gravel road begins

2.5.5 Fishing

The Mountain Loop Highway crosses more than 89 streams that are mapped in the Washington State Department of Natural Resources hydrography data layer for Washington (see Figure 1, Recreational Opportunities). Twenty-nine of these streams are named perennial, fish-bearing streams. Unnamed streams in the study area include a mix of perennial and seasonal streams, both fish-bearing and non-fish-bearing, as well as streams that have not been classified.

The Sauk River and a portion of the South Fork Sauk River (downstream of the Elliot Creek confluence) in the study area are part of the National Wild and Scenic Rivers System, designated by Congress to safeguard fisheries, wildlife, and scenic qualities for generations to come. The National Wild and Scenic Rivers designation is intended to balance demands among uses and protect some of the nation's most outstanding rivers in a natural and free-flowing state.

This section summarizes the rivers, streams, lakes, and ponds where there are recreational opportunities for fishing (USFS 2018):

- Fishing in Rivers and Streams
    - Beaver Creek Group Campground
    - Bedal Campground
    - Big Four Picnic Area
    - Clear Creek Campground
    - Red Bridge Campground
    - Turlo Campground
    - Verlot Campground
    - White Chuck Boat Launch
    - Wiley Creek Group Campground
- Fishing in Lakes and Ponds
    - Bear Lake Trail 703
    - Boardman Lake
    - Coal Creek Campground
    - Heather Lake Trail 701
    - Independence Lake Trail 712
    - Kelcema Lake Trail 718
    - Lake Twenty-Two Trail 702 (Lake Twenty-Two Trailhead)
    - Mallardy Ridge (Walt Bailey) Trail 706
    - North Lake Trail 712.1
    - Pass Lake Trail 645
    - Poodle Dog Pass-Silver Lake-Twin Lakes Trail 708

2.5.6 Nature Viewing

The Mountain Loop Highway provides many opportunities for nature viewing, including the following (USFS 2018):

- Scenery
    - Barlow Point Trail 709
    - Big Four Picnic Area
    - Frog Lake Trail 659
    - Kelcema Lake Trail 718
    - Meadow Mountain Trail 657
    - Mount Pilchuck Lookout
    - Mount Pilchuck Trail 700
    - Mt. Dickerman Trail 710
    - Mt. Pugh Trail 644
    - North Fork Sauk Trail 649
    - Red Mountain Trail 651
    - Three Fingers Fire Lookout
    - White Chuck Boat Launch
- Plants
    - Frog Lake Trail 659
- Wildlife
    - Beaver Lake Trail 629
    - Big Four Picnic Area
    - Gold Basin Campground

3.0 RECREATIONAL OPPORTUNITIES

Use of all types of recreation sites in the study area has shifted or expanded over the last few decades. Regional population growth, combined with a sharp increase in the proportion of the population participating in outdoor activities such as hiking, has contributed to increased demand for recreation on National Forest System lands. Despite this increase, the development or reconstruction of recreational opportunities and facilities (e.g., campgrounds, trails, picnic areas, trailheads) within the study area has remained somewhat static. Many trailheads, such as those for Heather Lake, Sunrise Mine, and Lake Twenty-Two, currently do not provide sufficient parking spaces to accommodate the visitation they receive. As a result, visitors park along nearby roadways, constricting traffic, and causing unsafe highway crossing conditions.

Representatives of local communities have also expressed interest in expanding the capacity to accommodate overnight visitors in the area. The Forest Service recently conducted a study to identify potential locations for a new campground on National Forest System lands in the South Fork Stillaguamish River drainage. The study concluded that no such locations are available. The Forest Service is exploring options for converting a site previously owned by the Everett School District (Camp Silverton, near milepost 20.5) into a public campground. The potential for new campground development on National Forest System lands in the Sauk River drainage is under consideration.

Recreational opportunities along the Mountain Loop Highway provide local communities with the potential to capture additional tourism and recreation dollars by attracting Active Adventurers[1]. Snohomish County's Strategic Tourism Plan reports that overnight and day-trippers generated approximately $1 billion of spending, creating 20,000 direct and indirect jobs, and $100 million of state and local revenue (Resonance Consultancy and Berk Consulting 2018). Active Adventurers globally spent more than $345 billion in 2012. Providing increased access to recreational opportunities along the Mountain Loop Highway provides the county and nearby communities with the potential to capture additional tourism dollars.

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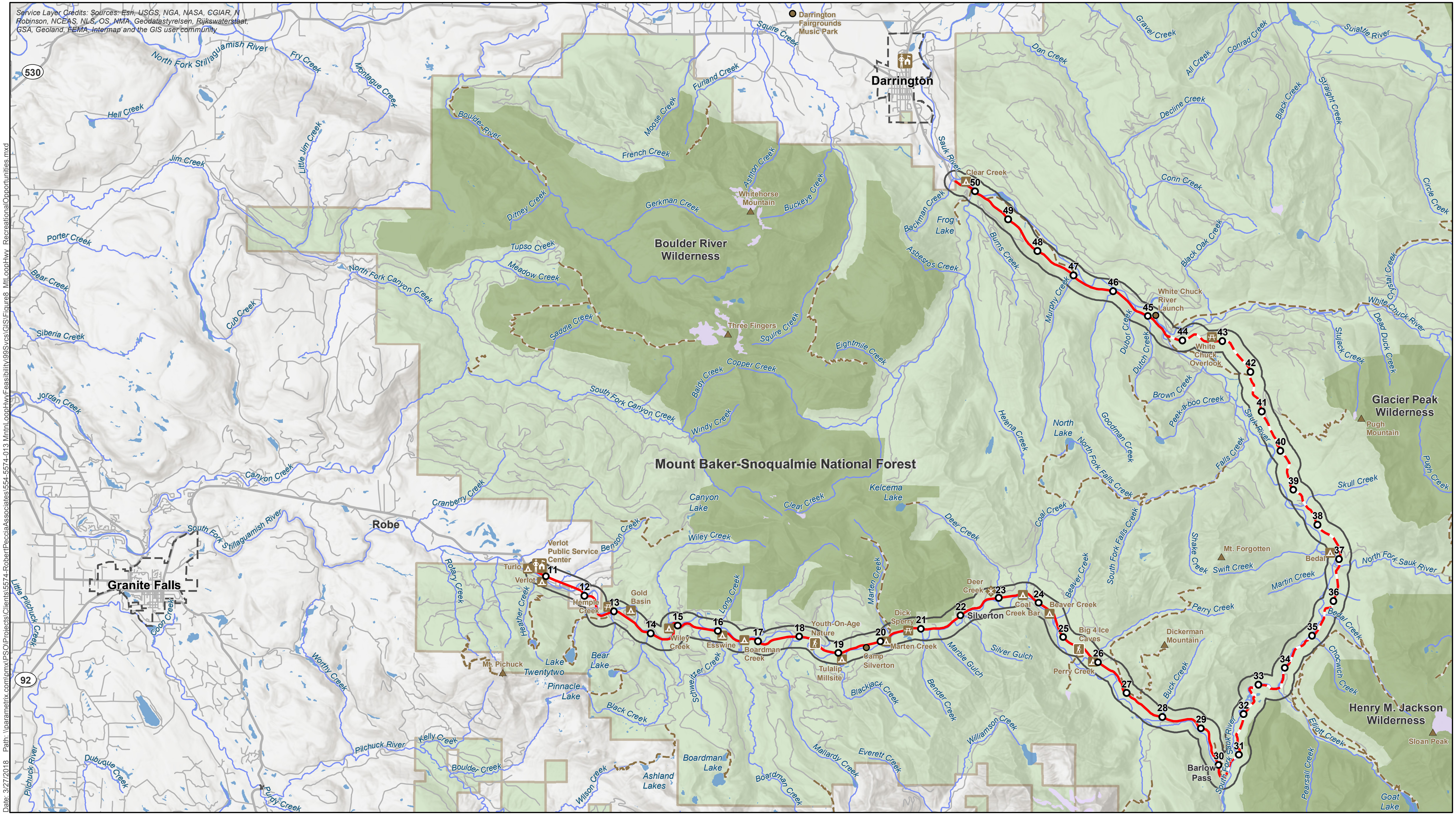
[1] Adventure travel includes two of three criteria: first, connection with nature; second interaction with culture; and third, a physical activity. Soft adventure options include hiking, kayaking, rafting, snorkeling, volunteer tourism, and archaeological expeditions, while hard adventure options include caving, climbing, heli-skiing, kite surfing, trekking, and paragliding.

Figure



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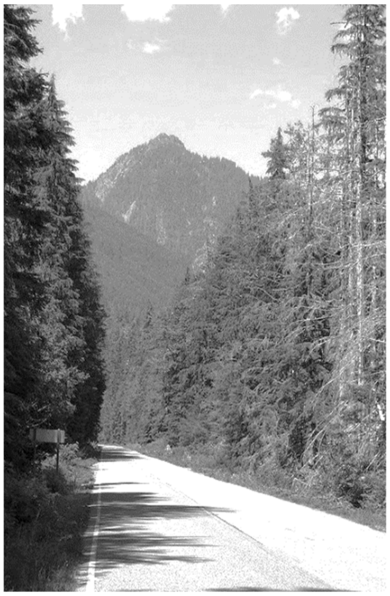
Parametrix

WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources

Figure 1
Recreational Opportunities

Mountain Loop Highway
Feasibility Study
Snohomish County, Washington



EXISTING AND PROJECTED CONDITIONS

Mountain Loop Highway Feasibility Study
WA SNOHOMISH 20(1)
IDIQ Contract No. DTFH70-15-D-00007
Task Order No. 69056718F000005

U.S. Department of Transportation
Federal Highway Administration

Prepared for:
WESTERN FEDERAL LANDS HIGHWAY DIVISION

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ABBREVIATIONS/ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
ADT	Average Daily Traffic
BUILD	Better Utilizing Investments to Leverage Development
CAGR	Compound Annual Growth Rate
ERFO	Emergency Relief for Federally Owned Roads
FHWA	Federal Highway Administration
FLAP	Federal Lands Access Program
GCR	General Condition Rating
GIS	Geographic Information System
MP	Mile Post
mph	miles per hour
NBI	National Bridge Inventory
PCI	Pavement Condition Index
PDO	Property Damage Only
SR	State Route
SSD	Stopping Sight Distance
vpd	vehicles per day

EXISTING AND PROJECTED CONDITIONS

1.0. INTRODUCTION

The Federal Highway Administration (FHWA), in partnership with Snohomish County and the United States Forest Service (Forest Service), is completing a feasibility study for potential corridor improvements to the Mountain Loop Highway in the Mount Baker – Snoqualmie National Forest. The study, referred to as the *Mountain Loop Highway Feasibility Study*, will identify feasible options to improve recreational access and operational safety along the study corridor, as well as reduce maintenance concerns, based on needs identified by the study.

The feasibility study is a collaborative process among FHWA, the Forest Service, Snohomish County, the communities of Darrington and Granite Falls, and the public. A key outcome of the study will be the development of a comprehensive package of short-, mid-, and long-term recommendations intended to address the transportation and access needs of highway users over the next 20 years. Developing these recommendations will help the study partners define the most critical needs and allocate resources. The study aims to reduce planning time, while considering environmental and social issues, and to minimize construction costs through the demonstration of feasible improvement opportunities.

This *Existing and Projected Conditions* report identifies roadway conditions and areas of concern for the study corridor. The analysis performed includes a planning level examination of the corridor based on existing and historic traffic data, collision history, field measurements and observations, roadway as-built plans, aerial imagery, Geographical Information Systems (GIS), and input from local stakeholders.

1.1. STUDY AREA

The study area for the *Mountain Loop Highway Feasibility Study* includes the Mountain Loop Highway (Forest Service Road 20) through Snohomish County, Washington. The Mountain Loop Highway provides access between the Town of Darrington and the City of Granite Falls as an alternative to State Route (SR) 530. The highway also offers spectacular views and access to trails, campgrounds, picnic areas, and a large amount of dispersed use recreational activities.

The study corridor is 52 miles in length and connects the communities of Granite Falls and Darrington. The project study area begins outside of Granite Falls at Mile Post (MP) 10.76 near the Verlot Public Service Center and ends near the National Forest Service Boundary south of Darrington at MP 50.87. **Figure A.1** presents the study area boundary.

Within the study area, the Mountain Loop Highway is functionally classified as a rural major collector by Snohomish County. The corridor is a Scenic Byway through the Mt. Baker – Snoqualmie Forest. The Mountain Loop Highway offers recreational access to hiking, biking, fishing, camping, kayaking, rock climbing, winter sports, sightseeing, and educational opportunities in the Mt. Baker – Snoqualmie National Forest. The corridor has historically provided substantial tourism traffic and economic subsistence for the rural communities of Granite Falls and Darrington.

1.2. HISTORIC CONSTRUCTION AND IMPROVEMENTS

Original Construction

Construction on the Mountain Loop Highway began in 1936 and was finished in 1941. The portion of the highway from the beginning of the study area (MP 10.76) to Barlow Pass (MP 30.68) was paved in 1961. The portion from White Chuck (MP 44.65) to the end of the study area (MP 50.87) was paved in 1983.

Pavement Preservation

Snohomish County provided the pavement preservation history for the Mountain Loop Corridor from 1995 to present. Since 1995, Snohomish County has completed 16 pavement preservation projects along the corridor. **Table 1** lists the location of these projects and the type of treatment performed.

Table 1: Pavement Preservation History

Year	From	To	Begin (MP)	End (MP)	Treatment
1995	Milepost 6.2	Bridge #538	6.200	11.600	Contract Overlay
1998	Bridge #538 (Blue Bridge)	Marble Pass	12.100	21.500	Maintenance Pave
1999	MP 6.83	Bridge #538 (Blue Bridge)	6.830	12.060	Prelevel / Chip Seal
1999	Marble Pass	MP 29	21.200	29.000	Maintenance Pave
2000	MP 29	Monte Cristo Rd	29.000	30.670	Maintenance Pave
2002	Bridge #538 (Blue Bridge)	Monte Cristo Rd	12.100	30.670	Prelevel / Chip Seal
2002	MP 46.2	MP 50.49	46.200	50.490	Maintenance Pave
2003	White Chuck Bridge	Darrington C/L	44.670	52.950	Prelevel / Chip Seal
2009	Mountain View Dr	Lk 22 Trailhead	9.685	13.200	Prelevel / Chip Seal
2010	Lk 22 Trailhead	Blue Bridge	13.200	18.110	Prelevel Only
2011	Lk 22 Trailhead	Blue Bridge	13.200	18.110	Chip Seal
2012	Red Bridge (#537)	Perry Cr (Bridge #551)	18.220	26.190	Prelevel / Chip Seal
2013	.53 mi SE of Bridge #551	USFS border	26.730	30.670	Chip Seal
2016	FS Gravel @ Whitechuck (FS Rd 22)	Darrington C/L	44.670	52.544	PreLevel Only
2017	Sink Hole	Sink Hole	19.280	19.340	PreLevel/Chip Seal
2017	FS Rd 22	Darrington C/L	44.670	52.544	Prelevel

Source: Snohomish County

1.3. CURRENT AND PLANNED PROJECTS

Emergency Relief for Federally Owned Roads

There are currently two Emergency Relief for Federally Owned Roads (ERFO) projects planned for the Mountain Loop Highway. ERFO funds assist federal agencies with the repair or reconstruction of federal lands' transportation facilities which have suffered serious damage by natural disaster or catastrophic failure. While there have been several ERFO on the study corridor in the past, both of the current ERFO sites on the Mountain Loop Highway were caused by landslides and resulted in debris flowing over the roadway closing the road to traffic. Emergency repairs opened the road to traffic but ERFO funding will enable road repairs. A description of the ERFO projects are as follows:

- **MP 35.4:** Debris slide filled Chockwich Creek and over topped the road. Minor damage to arch inlet. Emergency repairs re-opened the road to traffic by moving some slide material to a location 225-ft north of the site and piling some material at the site. Permanent repairs will remove emergency repair piles, and re-channel Chockwich creek to the arch. Resurface 100-feet of the road with 6-inches of aggregate.

- **MP 39.9:** Debris flow completely filled the channel and flowed over the road. The culvert is covered and neither end is visible. Emergency repairs opened the road to traffic. Debris was moved to the side of the road. Permanent repairs will lower grade 1-foot to the original, remove the slide material from the emergency repairs, install FS supplied 36-inch culvert down grade from damage, and clean existing 48-inch culvert buried in debris. Remove debris 50-feet upstream and slope debris removal excavation up to existing debris for another 50-feet for a total of 100-feet.

Federal Lands Access Program

In 2018, Snohomish County submitted three applications to the Federal Lands Access Program (FLAP) for projects along the study corridor. The FLAP program was established to improve transportation facilities that provide access to, are adjacent to, or are located within Federal lands. The program supplements State and local resources for transportation facilities with an emphasis on high-use recreation sites and economic generator. Two of the applications were infrastructure projects, while the third was for traffic circulation improvements around the Verlot Ranger Station. Although the three applications were not approved for funding in 2018, the County plans to resubmit again in the near future.

Better Utilizing Investments to Leverage Development

Snohomish County recently applied for a Better Utilizing Investments to Leverage Development (BUILD) grant to replace the Granite Falls Bridge. BUILD funding supports surface transportation infrastructure investments that have a significant local or regional impact. The application argues that increased traffic demand on the Mountain Loop highway necessitates replacement of the Granite Falls Bridge. While the bridge is not directly on the study corridor, failure of the bridge could have a substantial traffic impact on the highway if it is needed for a detour. During preparation of the application, it was revealed that the Mountain Loop Highway has been designated to be the focal project of the “Treasured Landscape Initiative” of the National Forest Foundation and that they are also planning for a 10-year forest thinning project on over 5,000 acres within the Mount Baker – Snoqualmie National Forest. It is unknown at this time if the application has been approved or not.

1.4. EXISTING PLANS AND REGULATIONS

Many local plans exist with goals and objectives related to the transportation system. The following provides a summary of existing planning documents and regulations associated with transportation in the area.

North Stillaguamish Valley Economic Redevelopment Plan (2017)

The *North Stillaguamish Valley Economic Redevelopment Plan*[1] was commissioned after the Oso mudslide on SR 530 in 2014. The mudslide closed SR 530, disconnecting Granite Falls and Darrington making the Mountain Loop Highway an important corridor. The goal of the plan was to create a comprehensive approach to leverage local and regional assets and to coordinate efforts between the rural communities in the North Stillaguamish Valley. The plan identified the Mountain Loop Highway as an infrastructure project critical to recreational and economic development in the region.

Snohomish County Comprehensive Plan (2015)

The *Snohomish County Comprehensive Plan*[2] serves as a complete policy document that guides County decisions and services on a wide range of topics, including: land use, transportation, parks, housing, and capital facilities. The transportation element of the plan is required by the State Growth Management Act to encourage efficient multimodal transportation systems that are based on regional priorities and coordination with county and city comprehensive plans. Within the transportation element, the Mountain Loop Highway is identified as a major collector on the Arterial Circulation Map. The highway is also identified on the Countywide Bicycle Facility System as a proposed county bikeway.

Mt. Baker – Snoqualmie National Forest Forest-wide Sustainable Roads Report (2015)

In 2005, the Forest Service created a Travel Management Rule to provide national consistency and clarity on motor vehicle uses on all National Forests within the National Forest System. The *Mt. Baker – Snoqualmie National Forest Forest-wide Sustainable Roads Report*[3] is a subpart of this rule and is a strategy used to help the forest identify its future road system needs for safe and efficient travel and for administration, utilization, and protection of National Forest System lands. The report is used to inform future analyses, decisions, and specific actions. It also serves as a guide to inform future decisions on where and how to invest resources on building new roads, managing current roads, or decommissioning old roads.

South Fork Stillaguamish Vegetation Project Environmental Assessment (2009)

The *South Fork Stillaguamish Vegetation Project Environmental Assessment*[4] for the Mt. Baker – Snoqualmie National Forest identified actions performed on the Mountain Loop Highway that have a potential cumulative impact on the environment. These activities include on-going, yearly maintenance activities to clear and brush the road. In terms of past projects, the Assessment lists emergency road repair and mitigation activities on the highway in response to high water events occurring in 2015 and 2016-2018.

USDA Forest-wide Roads Analysis (2003)

The *Forest-wide Roads Analysis*[5] identified the Mountain Loop Highway as High-Need for recreation and for access to heritage resources and Late Successional Reserves. The analysis also rated the road as High-Risk for both aquatic and wildlife resources. The conflict between these management goals is reflected in public comments on recent repair and improvements proposed on the Mountain Loop Highway. While some commenters have expressed support for improving the roadway, others have expressed a preference that the unpaved segment remain unpaved or even be closed to vehicular traffic.

USDA Forest Service Northwest Forest Plan (1994)

The *Forest Service Northwest Forest Plan*[6] is an overall vision for the Pacific Northwest that would allow production of timber products while still protecting and managing impacted species. The plan does not make any formal recommendations in regard to the Mountain Loop Highway. It does, however, detail how to keep roads through the Mt. Baker – Snoqualmie National Forest open for economic and recreational benefits. This information pertains to the environmental impacts of road construction for this project.

USFS Mt. Baker – Snoqualmie Forest Land and Resource Management Plan (1990)

The *Mount Baker – Snoqualmie National Forest Land and Resource Management Plan* guides all-natural resource management activities and establishes management standards and guidelines for the Mt. Baker – Snoqualmie National Forest. It describes resource management practices, levels of resource production and management, and the availability and suitability of lands for resource management.

In the road management portion of the plan, the 14-mile unpaved segment of the Mountain Loop Highway between Barlow Pass and the White Chuck River Road was classified as Traffic Service Level B with a desired Future Service Level of A. The plan also called for creation of a paved, double-lane roadway between Barlow Pass and the White Chuck River Road.

Environmental Impact Statement (1975)

An Environmental Impact Statement[7] for Washington Forest Highway Route 7 (Mountain Loop Highway) from Barlow Pass to Darrington was completed in 1975 by the US Department of Transportation and FHWA. The proposed action in the report was to construct the Barlow Pass to Darrington section of the Mountain Loop Highway providing a two-lane, paved road. The improvement called for a 24-foot road width with an average running speed from 20-40 miles per hour (mph) from Barlow Pass to White Chuck River and a 30-

foot road width with an average running speed of 30-45 mph to Darrington. The report recommends following the existing road with some minor deviation to avoid unstable areas and improve the alignment.

2.0. PHYSICAL FEATURES AND CHARACTERISTICS

The Mountain Loop Highway's beginning dates back to 1889 when gold was discovered in Snohomish County at a place that would later be known as Monte Cristo[8]. In 1891, a wagon road to move heavy mining equipment was developed by the miners between the present-day communities of Darrington and Bedal. Later that year, a surveyor discovered a good route to bring a railroad up from the smelter of Everett to the mining town of Monte Cristo (34 miles east of Granite Falls). Construction of the railway began in 1892. Severe weather events put the train out of service several times after its opening in 1893. When mining activity died out in 1899 the railroad served as transportation to the forest for wealthy tourists. After the stock market crash in 1929 and the Great Depression, the railroad was abandoned and access to the area became very difficult. When Franklin D. Roosevelt came up with the "New Deal" the old routes saw new life. A new road, that would later be known as the Mountain Loop Highway, began to take shape in 1936.

Two crews, stationed in Darrington and Verlot, began building the new road and finally connected the two ends of the road in 1941 at Barlow Pass. The road was originally meant to enable access to timber lands but was open for a short time to tourist traffic. At one time, a landowner who noticed the road went through his property began to charge travelers a toll to access the road through his property. During WWII the road was closed to civilian traffic and served as a duty station for the US Coast Guard. Military occupation in the area prompted the Federal Government to improve the road grade, straighten the road, and bypass the old railroad grade. In 1945 when the war ended, the road was reopened to civilian traffic. Over the years the road has been rerouted and replaced many times, primarily due to washout events from the scenic rivers in the area. In 1990, the Mountain Loop Highway was designated as a Forest Road Scenic Byway and now connects the towns of Granite Falls, Verlot, Silverton, Bedal, and Darrington.

Most of the Mountain Loop Highway is a paved, double-lane roadway managed by Snohomish County. The 14-mile segment between Barlow Pass and the White Chuck River Road contains gravel surfacing with varying widths and multiple turnouts, and is managed by the Forest Service. The road is steep and winding through the Mt. Baker – Snoqualmie National Forest and crosses many scenic rivers. Portions of the gravel road have only been built to minimum Forest Service standards and many segments only provide a single lane of travel.

2.1. HYDRAULICS

The Mountain Loop Highway generally parallels the South Fork Stillaguamish River from the beginning of the study corridor to Barlow Pass (MP 30.3), at which point it crosses into the Sauk River basin. The road then parallels the South Fork Sauk River for approximately 6.6 miles. After the North and South Forks join to form the Sauk River near MP 36.9, the road parallels the Sauk River to the end of the study area. The study corridor crosses 29 named streams and more than 60 unnamed streams. **Table 2** presents the major streams crossed by the corridor and their approximate location. The locations of the rivers are also displayed in **Figure A.1**.

Table 2. Major Streams Crossed by the Study Corridor

Name	Approximate Location (MP)
South Fork Stillaguamish River Watershed	
Benson Creek	11.4
South Fork Stillaguamish River	11.7
Twentytwo Creek	12.4
Hempel Creek	12.9
Black Creek	14.0
Wisconsin Creek	14.3
Schweitzer Creek	15.6
Boardman Creek	16.6
South Fork Stillaguamish River	17.8
Eldredge Creek	18.5
Marten Creek	20.3
Deer Creek	23.0
Coal Creek	23.6
Beaver Creek	24.5
Perry Creek	25.8
Buck Creek	28.0
Upper Sauk River Watershed	
South Fork Sauk River	30.9
Elliott Creek	33.5
Chocwich Creek	35.0
Bedal Creek	35.6
Merry Brook	36.2
North Fork Sauk River	36.8
Skull Creek	38.6
Sauk River	44.4
Lower Sauk River Watershed	
Dutch Creek	45.3
Dubor Creek	45.3
Goodman Creek	46.0
Murphy Creek	47.0
Clear Creek	50.1

2.2. BRIDGES

Bridge conditions are determined using the National Bridge Inventory (NBI) general condition ratings (GCRs). The GCRs are used to describe the existing bridge as compared to its as-built condition. The material used as well as the physical condition of the deck, superstructure, and substructure of the bridge are considered in the rating. GCRs are given a numerical rating ranging from 0 (failing condition) to 9 (excellent condition) as described in the *FHWA Coding Guide*[9].

The bridge condition is classified based on 23 CFR 490.409[10]. When the minimum GCR of the deck, superstructure, and substructure is 7, 8, or 9, the bridge is classified as “good”. When the minimum GCR is either 5 or 6 the bridge is classified as “fair”. If the minimum GCR is 4 or below the bridge is classified as “poor”. These condition ratings are useful for planning purposes to identify potential issues and needs.

Figure A.2 shows the locations of the 21 bridges along the study corridor. **Table 3** shows the bridge specifications and condition ratings. Four of the bridges have a condition of “good”, which indicates that they are candidates for continued preservation and cyclic maintenance. The majority of the bridges, 16 of 21, have a condition of “fair”, indicating that they may be candidates for preservation and condition-based maintenance. One bridge received a condition rating of “poor”, meaning it may be eligible for rehabilitation or replacement. Detailed bridge inspection reports are available in **Appendix B**.

Table 3 also lists the width of each bridge within the study area. According to the American Association of State Highway and Transportation Officials (AASHTO) *Policy on Geometric Design of Highways and Streets*[11] *(AASHTO Greenbook)*, a bridge on a rural collector road with annual daily traffic (ADT) of 400-1500 vehicles per day (vpd) is recommended to consist of the travel way plus three-foot shoulders on each side. The minimum travel way for the same street classification is 22 feet. This recommendation results in a recommended minimum bridge width of 28 feet for two travel lanes. A number of bridges within the study area have widths narrower than the recommended standards. However, the recommended standards are for new bridges. When a roadway is to be reconstructed, an existing bridge may remain in place if it is 22 feet or greater in width. If the structure has a total length greater than 100 feet, the minimum width does not apply, and the structure must be analyzed individually.

In addition to the condition ratings and bridge specifications, a bridge sufficiency rating is listed. FHWA uses the sufficiency rating to indicate the sufficiency of a bridge to remain in service. The rating is calculated using the FHWA Coding Guide. The rating is based 55% on the structural evaluation, 30% on the obsolescence of its design, 15% on its importance to the public, and can be reduced up to 13% based on detour length, traffic safety features, and structure type. The sufficiency rating is used to determine eligibility for federal funding with Highway Bridge Program funds. A score of 80 or less makes a bridge eligible for rehabilitation, and a score of 50 or less makes a bridge eligible for replacement. Seven bridges in the study area are eligible for rehabilitation and six bridges are eligible for replacement. Note that four bridges did not have a sufficiency rating listed.

The AASHTO *Standard Specifications for Highway Bridges*[12] identifies design vehicle loads. Most bridges in the United States were designed to accommodate either an H15 or HS20 loading. An H15 loading is represented by a two-axle single unit truck weighing 15 tons. The H truck configuration includes only two theoretical axles and represents dump truck vehicles. There are two sizes of H-type vehicles: the standard 20-ton, H20 truck, or a smaller 15-ton, H15 truck. An HS20 loading is represented by a three-axle semitrailer combination weighing 36 tons. The “20” in HS20 stands for 20 tons, the “S” stands for semitrailer combination which adds in the additional 16 tons for the third axle to give a total of 36 tons. Another type of design load is the “lane load”. This uniform load scheme represents a string of closely spaced H15 single trucks (with 30 feet between the rear axle of one vehicle and the front axle of the following vehicle), with a heavier H20 truck in the middle of the string. This type of vehicular load is important for long-span structures, where slow traffic can lead to a bunching effect, with heavier loads than those generated by higher speed traffic and traveling with more space between vehicles. AASHTO also has a specification, in which an HL93 loading is used. The HL93 is an HS20 truck with the lane load added. According to AASHTO standards for collector roadways, new bridges should be built using an HL93 design loading, and bridges to remain in place must have a design loading capacity of HS15 or better. All of the bridges in the study area have a design loading capacity of HS15 or better and the newest bridge (Marten Creek) has a HL93 design load capacity. Note that six bridges did not have a design load identified.

Table 3. Bridges in the Study Area

County Bridge No.	Location (MP)	Feature Crossed	Year Built	Curb to Curb Width (ft)	Length (ft)	Condition	Sufficiency Rating	Design Load
474	**11.2**	Benson Creek	1995	34	67	Good	79.89	HS25
538	**12.06**	South Fork Stillaguamish River	1954	26	211	Fair	56.89	HS20
497	**12.83**	Twenty-Two Creek	1952	26.3	31	Fair	54.45	Unknown
547	**14.33**	Black Creek	1952	26.2	91	Poor	41.55	HS20
620	**14.66**	Wisconsin Creek	1960	26.4	31	Fair	48.35	Unknown
576	**15.82**	Schweitzer Creek	1952	26.2	31	Fair	52.42	Unknown
587	**16.90**	Boardman Creek	1952	26.1	91	Fair	53.95	Unknown
537	**18.18**	South Fork Stillaguamish River	1954	26	209	Fair	59.19	HS20
658	**20.02**	Little Beaver Creek	2007	28	22	Good	47.58	Unknown
562	**20.64**	Marten Creek	2011	38	135	Good	84.99	HL93
670	**23.33**	Deer Creek	1949	26	187	Fair	48.15	HS15
556	**24.00**	Coal Creek	1949	26	70	Fair	40.45	HS15

County Bridge No.	Location (MP)	Feature Crossed	Year Built	Curb to Curb Width (ft)	Length (ft)	Condition	Sufficiency Rating	Design Load
551	**26.19**	Perry Creek	1958	26	61	Fair	48.72	HS20
544	**28.35**	Buck Creek	1960	26.3	91	Fair	55.8	HS20
465	**31.2**	South Fork Sauk River	1978	28	100	Fair	Not Listed	HS20
464	**33.9**	Elliott Creek	1978	28	115	Good	Not Listed	HS20
463	**35.9**	Bedal Creek	1978	58	57	Fair	Not Listed	HS20
469	**37.2**	North Fork Sauk River	1961	14	200	Fair	Not Listed	Unknown
655	**44.79**	Sauk River	1983	28	171	Fair	90.43	HS20
656	**45.69**	Dutch Creek	2003	26.8	108	Fair	88.39	HS25
654	**50.43**	Clear Creek	1964	28	125	Fair	89.56	HS20

2.3. CULVERTS

There are several culverts throughout the corridor. Sixty-one major culverts with a diameter of 30 inches or more were identified during field review. Approximately 84 percent of the culverts were in fair or good condition, and five percent (three culverts) had failed. There was water flow in approximately 82 percent of the culverts during the field review.

Appendix C contains an inventory of each structure and lists the specifications and condition of each. **Figure A.2** shows the locations of the culverts inventoried. All data contained in the appendix were collected during field review and may differ from data in inspection reports compiled by Snohomish County and/or the Forest Service. This analysis does not include a capacity assessment of the culverts nor does it examine whether the culverts pass aquatic organisms.

2.4. MAINTENANCE AND OPERATIONS

Maintenance of the Mountain Loop Highway is imperative to the safety of its users and to the economic stability of the rural communities of Granite Falls and Darrington. The Mount Baker – Snoqualmie National Forest classifies the road's current and proposed operational maintenance level as Level 4—usable by all vehicle types; constant or intermittent aggregate surface; user comfort and convenience a moderate priority.

The portion of the highway between Verlot and Barlow Pass is maintained by Snohomish County per a 1921 cooperative agreement with the Forest Service which governs this section. The 14-mile gravel portion of the Mountain Loop Highway is maintained by Snohomish County through a Forest Road Agreement (July 2009) that was amended in 2016 to specifically include the gravel portion. The portion of the highway between White Chuck and Darrington is owned by the Forest Service, and Snohomish County was granted an easement (deeded December 1999) which allows for improvement, operation, and maintenance of the road by Snohomish County with review and approval by USFS.

Parts of the Mountain Loop Highway are a primary route for county snow removal activities including the route from Granite Falls to Deer Creek and from Darrington to Backman Creek. During the winter, the 14-mile gravel section is impassable and is closed for the season, disconnecting the loop for months. In the spring, when the road reopens, snow runoff, rains, and flooding also cause significant maintenance issues.

In March of 2014, the Oso mudslide occurred on SR 530 blocking the main route to Darrington. This road closure necessitated the clearing of snow from the gravel portion of the Mountain Loop Highway in order to open the full highway and provide an alternate route to Darrington. This event forced a substantial amount of traffic onto the Mountain Loop Highway from March until September of 2014.

2.5. ROADWAY SURFACING

The corridor consists of paved roadway of varying widths, from 22 feet to 31 feet, and gravel roadway of widths between 12 and 21 feet. Existing roadway surfacing characteristics were determined from Snohomish County's road logs and on-site field review. **Table 4** shows the typical width of the existing roadway and the surfacing type. The AASHTO *Greenbook* requires a minimum travel way width of 22 feet with five-foot shoulders on each side for a minimum roadway width of 32 feet to meet standards for public use based on traffic patterns and volumes. Exceptions to standards are allowed based on topographic constraints, environmental factors, etc., as approved by the road owner and maintainer. The shoulder width may be reduced for design speeds greater than 30 mph so long as the total roadway width is 30 feet or greater. These standards are applicable to rural collector streets with 400 to 1500 vpd. The majority of the corridor falls within these bounds, however, there are sections that have an average traffic volume of greater than 1500 vpd and others with an average traffic volume less than 400 vpd.

AASHTO provides guidance for *Very Low-Volume Roads (ADT≤400)*[13]. For roadways that qualify for this classification in the recreational and scenic subclass, an 18-foot roadway width is required for new construction. However, the cross-section widths of existing roads need not be modified except in those cases where there is evidence of site-specific safety problems. These standards are only applicable to a small portion of the corridor (ADT < 400) and with increased traffic volumes predicted in the future, following this guide specification isn't anticipated.

Snohomish County Road Design Standards for a rural arterial, major collector, with an average daily traffic volume of less than 2,000 vpd calls for a minimum pavement width of 38 feet with 11-foot travel lanes and 8-foot shoulders. The standards allow the cross-section to be altered where a stream or wetland borders the road but does not specify minimums in these cases. There are also design standards listed for rural non-arterials, subcollectors (91-2000 ADT) and collectors (2001-3000 ADT). Subcollectors have a 25-mph design speed and 24-foot surface width, collectors have a 30 mph design speed and a 30-foot surface width. The standards do not give guidance for gravel roads except private, low volume access roads with less than 90 ADT.

There are various locations along the corridor where the roadway width is constrained either by steep side slopes, retaining walls, rivers, streams, or wetlands. In these areas, the roadway can be constrained to widths as narrow as 12 feet for a stretch of several hundred feet. These constraints occur in several locations along the gravel portion of the corridor.

Roadway widths were determined during field review and were measured from edge of pavement to edge of pavement. Measurements were taken approximately every half mile or when notable changes in pavement width were observed. Every change in pavement width is not captured in **Table 4** as widths varied substantially throughout the study area. The information in the table is meant to capture the average width of roadway through sections. Pavement widths listed in the table may differ from those contained in reports by Snohomish County or the Forest Service.

Table 4. Roadway Surfacing

Begin (MP)	End (MP)	Length (mi)	Width (ft)
Pavement			
10.76	**11.8**	1.0	28.5
11.8	**18.0**	6.2	22

Begin (MP)	End (MP)	Length (mi)	Width (ft)
18.0	**19.2**	1.2	27
19.2	**20.0**	0.8	31
20.0	**23.8**	3.8	28
23.8	**26.3**	2.5	26
26.3	**30.5**	4.3	30.5
30.5	**30.67**	0.2	26
Gravel			
30.67	**31.1**	0.4	17.5
31.1	**31.7**	0.6	21
31.7	**33.5**	1.8	16
33.5	**33.7**	0.2	12.5
33.7	**34.1**	0.3	17.5
34.1	**38.4**	4.4	14.5
38.4	**39.2**	0.8	13
39.2	**40.4**	1.2	16
40.4	**42.4**	2.0	15
42.4	**43.9**	1.5	18
43.9	**44.67**	0.8	16
Pavement			
44.67	**50.87**	6.2	28

2.6. PAVEMENT CONDITION

Pavement condition indices (PCI) are measured and tracked along the corridor by Snohomish County. The County collects various data to determine the relative performance of the pavement. Items of primary interest include the presence and degree of cracking and rutting, and overall ride quality. By understanding the condition of pavement, the County can identify the most appropriate treatments and resources to extend pavement life.

Table 5 shows the PCIs determined by Snohomish County in 2017 for various points throughout the corridor. A PCI with a numerical value of "100" is assigned to a new pavement with no flaws, and a value of "0" is assigned to a highly degraded pavement. For collector roadways, a PCI of greater than 85 is considered good, a PCI of 70-85 is satisfactory, 60-70 is fair, 40-60 is poor, and less than 40 means the pavement should be rehabilitated immediately. The last pavement preservation treatment and corresponding date is also listed in the table along with the pavement width and surface type.

Table 5. Pavement Condition

MP	Surface	Last Surface*	Last Treatment*	PCI	Condition
11.31	Single Chip Seal	2009	2009	86	Good
12.10	Single Chip Seal	2009	2009	90	Good
13.18	Single Chip Seal	2009	2009	86	Good
19.34	Single Chip Seal	2017	2017 (sink hole)	88	Good
21.20	Single Chip Seal	2012	2012	85	Good
26.73	Single Chip Seal	2013	2013	91	Good
29.00	Single Chip Seal	2013	2013	91	Good
44.67	Single Chip Seal	2003	2017	77	Satisfactory
46.20	Single Chip Seal	2003	2017	90	Good

Based on Pavement Preservation History Report from Snohomish County (Table 1**)*

The PCIs supplied by Snohomish County indicate that the first paved section, from MP 10.76 to MP 30.68, is in good condition. The last pavement preservation on this segment of the corridor was in 2013, with the exception of a sink hole repair performed in 2017. During field review, it was noted that the chip seal was separating in some areas in this section but that the overall pavement condition was good. After the gravel section ends, the PCI indicates the pavement is in satisfactory condition. Beyond that segment, beginning at MP 46.2, the rest of the pavement along the corridor is in good condition. The last chip seal on this section was performed in 2003, however, prelevel treatments were also performed in both 2016 and 2017. Prelevel is used to remove hazardous spot locations and to correct deficiencies in the roadway.

2.7. ACCESS POINTS

Access points were identified through field review in June 2018. Based on this review, there are approximately 147 access points along the corridor. Private approaches, pullout areas, service roads, parking areas, trail heads, picnic areas, and campgrounds are all considered access points. The majority of accesses are concentrated at the beginning of the corridor with private access roads for Verlot residents and accesses for the various campgrounds in the area. On average, there are approximately 3.7 access points per mile along the corridor. **Table 6** provides a summary of access points grouped in incremental segments along the study area.

Table 6. Access Points and Approaches

Begin (MP)	End (MP)	Segment Length (mi)	Approaches	Density (app/mi)	Description
10.76	**16**	4.24	55	13.0	Begin Study Area to Esswine GC
16	**21**	5.00	17	3.4	Esswine GC to Dick Sperry Picnic
21	**26**	5.00	23	4.6	Dick Sperry Picnic to Perry Creek GC
26	**31**	5.00	8	1.6	Perry Creek GC to Begin Gravel Section
31	**37**	6.00	14	2.0	Begin Gravel Section to Bedal
37	**45**	8.00	18	2.3	Bedal to End Gravel Section
45	**50.87**	5.87	12	2.0	End Gravel Section to End Study Area
Total		**40.11**	**147**	**3.7**	

2.8. ALTERNATIVE TRANSPORTATION MODES

The *Snohomish County Comprehensive Plan* designates the Mountain Loop Corridor as a county bikeway. There are currently no dedicated bicycle or pedestrian facilities along the study corridor. Local stakeholders report minimal biking activities along the corridor but anticipate that biking activity may increase with road improvements. There are also no transit services on the study corridor.

2.9. EMERGENCY SERVICES

Due to the numerous recreational activities occurring in the Mount Baker – Snoqualmie National Forest, search and rescue missions are fairly common. The majority of rescues are air rescues but emergency services occasionally to use the corridor for access. Typically, emergency vehicles approach from Granite Falls via the Mountain Loop Highway.

2.10. RECREATIONAL OPPORTUNITIES

There are numerous recreational opportunities along the corridor, including developed and dispersed campsites. Visitors use the many established campgrounds, picnic areas, parking lots for trailheads, and boat launches throughout the corridor. Currently, the corridor provides access to hiking, biking, fishing, camping, kayaking, rock climbing, and sightseeing activities and access to over 35 trails. During the wintertime, activities such as snow shoeing, cross country skiing, and snowmobiling are accessed by corridor. **Figure A.3** shows the locations of the various recreational opportunities throughout the Mt. Baker – Snoqualmie National Forest. More information will be contained in the *Recreational Memo* to be developed as part of this Feasibility Study.

3.0. GEOMETRIC CONDITIONS

Existing roadway geometrics were evaluated and compared to current standards. Available as-built drawings were reviewed for the Mountain Loop Highway within the study area. Field reviews of the study corridor took place in June 2018 to confirm and supplement information contained in the as-built drawings, as well as to identify additional areas of concern within the study area.

The *AASHTO Greenbook* specifies general design principles and controls that determine the overall operational characteristics of the roadway. Of critical importance to determining design standards is the design speed. AASHTO's manuals provide guidance for design speed based on facility and operating characteristics; however, some judgment is necessary. A facility's design speed and its operating speed may differ. The design speed is a selected speed used to determine the various geometric design features of the roadway. The operating speed is the highest overall speed at which a driver may travel on a given section of roadway under favorable weather conditions and prevailing traffic conditions without at any time exceeding the safe speed as determined by the design speed.

Design criteria for the study corridor are based on current AASHTO standards as described in the following sections.

3.1. DESIGN CRITERIA

Table 7 lists current design standards for rural major collector routes according to AASHTO design criteria. The highway design criteria depend on terrain, area context (i.e., urban or rural), and daily traffic volumes. Based on the definitions provided in the Greenbook, the study corridor appears to be of rural context under rolling terrain, with projected traffic volumes between 400 and 2000 vehicles per day (vpd). This correlates to a design speed of 40 mph. The speed limit throughout the majority of the corridor is 45 mph, however, for the purposes of this report, a design speed of 40 mph with associated design standards was assumed. A final determination of design speed will ultimately be made during project development.

Table 7. Geometric Design Criteria

Design Element			Design Criteria		
			0 to 400 vpd	400 to 2000 vpd	Over 2000 vpd
Design Control	Design Speed	Level	40 mph	50 mph	60 mph
		Rolling	30 mph	40 mph	50 mph
		Mountainous	20 mph	30 mph	40 mph
Alignment Elements	**Design Speed**		**30 mph**	**40 mph**	**50 mph**
	Maximum Grade	Level	7%	7%	6%
		Rolling	9%	8%	7%
		Mountainous	10%	10%	9%
	Vertical Curvature (K-value)	Crest	19	44	84
		Sag	37	64	96

	Stopping Sight Distance (SSD)	200	305	425
	Radius	215	444	758

Note that the horizontal and vertical alignments for the Mountain Loop Highway are based upon as built roadway plans from as early as 1932, when the road was originally built. The existing alignment may not match the original alignment as reconstruction projects may have occurred.

There are two gaps in the as built plans for the paved sections, between approximate MP 22.5 and MP 26, and between MP 47.5 and MP 50. Additionally, as built plans and/or accurate survey information were not available for the 14-mile gravel section. The alignment for the gravel section included in the following analysis is based upon a reviews of ground contours and aerial imagery, and as such, the curvature is approximated.

3.2. HORIZONTAL ALIGNMENT

Elements comprising horizontal alignment include curvature, superelevation (i.e., the bank on the road), and sight distance. These horizontal alignment elements influence traffic operation and safety and relate directly to the design speed of the corridor. AASHTO's 2011 Collector Road Standards for horizontal curves are defined in terms of curve radius, and they vary based on design speed. For a 40-mph design speed, the minimum recommended radius is 215 feet with a minimum stopping sight distance (SSD) of 200 feet.

Appendix D summarizes each horizontal curve identified along the study corridor. A determination of whether the curve met standards was decided based on the design criteria discussed previously. The controlling design criteria for the horizontal curves are radius and SSD. Stopping sight distance for a horizontal curve is evaluated based on the ability to see through the inside of the corner. Minimum sight obstruction distances were calculated based on the criteria contained in the *AASHTO Greenbook.* The minimum sight obstruction distance is measured from the center of the inside travel lane and defines the area that should be clear of obstructions to allow for the recommended SSD.

Table 8 summarizes the horizontal curves and the design speed that each of the curves meets. There are 280 existing horizontal curves along the Mountain Loop Highway within the study area. Approximately 40 percent of the curves (112 curves) do not meet the minimum standards for horizontal curvature based on a 40-mph design speed. Approximately 97 percent of the horizontal curves (108 curves) that do not meet 40-mph standards are on the gravel portion of the highway.

Table 8. Horizontal Curves – Design Speed Met

Design Speed Met (mph)	Pavement*		Gravel**	
	Number of Curves	Percent of Curves	Number of Curves	Percent of Curves
Total (≥40)	**92**	**96%**	**76**	**41%**
35	2	2%	14	8%
30	1	1%	35	19%
25	1	1%	53	29%
20	0	0%	6	3%
Total (<40)	**4**	**4%**	**108**	**59%**

** Does not include section between MP 22.5 and MP 26 or section between MP 47.5 and MP 50.*
*** Estimated based on existing survey contour data.*

3.3. VERTICAL ALIGNMENT

Vertical alignment is a measure of the elevation change of a roadway. The length and steepness of grades directly affect the operational characteristics of the roadway. The controlling design limits for vertical curves are SSD, vertical curvature (K-value), and maximum grade. Vertical curves can be placed into two categories: crest and sag. A crest curve is created at the top of a hill or when the grade decreases. Conversely, a sag curve occurs at the bottom of a hill or when the grade increases.

Appendix D lists the location and controlling design features for the vertical curves along the study corridor. According to the AASHTO 2011 Collector Road Design Standards, the maximum allowable grades for a 40-mph design speed are 7 percent for level terrain, 8 percent for rolling terrain, and 10 percent for mountainous terrain. The rate of vertical curvature is expressed in terms of the K-value. The K-value is defined as a function of the length of the curve compared to the algebraic change in grade, which comprises either a sag or a crest vertical curve. For a 40-mph design speed (rolling terrain), minimum K-values of 44 and 64 are recommended for crest and sag vertical curves, respectively.

Table 9 summarizes the vertical curves on the Mountain Loop Highway and the design speed that each of the curves meets. Within the study area, there are 253 vertical curves. Nearly half of the vertical curves (114) do not meet minimum design standards for a 40-mph design speed. All but two (112) of the curves that do not meet standards are on the gravel portion of the highway.

Table 9. Vertical Curves - Design Speed Met

Design Speed Met (mph)	Pavement*		Gravel**	
	Number of Curves	Percent of Curves	Number of Curves	Percent of Curves
Total (≥40)	**89**	**98%**	**50**	**31%**
35	1	1%	16	10%
30	1	1%	28	17%
25	0	0%	23	14%
20	0	0%	21	13%
15	0	0%	10	6%
<15	0	0%	14	9%
Total (<40)	**2**	**2%**	**112**	**69%**

** Does not include section between MP 22.5 and MP 26 or section between MP 47.5 and MP 50.*
*** Estimated based on existing survey contour data.*

Table 10 shows the vertical curves which do not meet the 8 percent maximum grade for a 40-mph design speed (rolling terrain). All 48 of the substandard grades are on the gravel section of the corridor. Note that the alignment for the gravel section is based upon survey contour data, and as such, the curvature and grades are approximated. Actual grades may differ from those listed in the table.

Table 10: Substandard Vertical Curve Grades

MP	Grade Back	Grade Ahead
30.70	4.7%	**15.2%**
30.71	**15.2%**	5.3%
30.91	0.0%	**-12.0%**
31.01	**-12.0%**	-0.3%
31.12	-4.9%	**-15.4%**
31.14	**-15.4%**	-2.2%
31.18	-2.2%	**-9.3%**
31.57	7.6%	**14.8%**
31.59	**14.8%**	6.7%
31.64	6.7%	**-11.1%**
31.67	**-11.1%**	-5.0%
32.20	-4.1%	**-8.9%**
32.22	**-8.9%**	-0.5%
32.27	-0.5%	**-15.7%**
37.32	-6.5%	**-9.3%**
37.46	**-9.3%**	-2.9%
37.72	1.3%	**8.7%**
37.81	**8.7%**	-3.0%
39.60	-0.1%	**-10.1%**
39.82	**-10.1%**	4.3%
40.79	-0.2%	**8.1%**

MP	Grade Back	Grade Ahead
31.19	**-9.3%**	-2.1%
31.27	4.6%	**-12.3%**
31.30	**-12.3%**	-5.6%
31.37	1.2%	**-12.6%**
31.38	**-12.6%**	-4.3%
31.40	-4.3%	**-8.1%**
31.42	**-8.1%**	-5.0%
31.44	-5.0%	**-22.9%**
31.45	**-22.9%**	-6.3%

MP	Grade Back	Grade Ahead
32.34	**-15.7%**	-0.4%
33.42	3.3%	**-11.6%**
33.48	**-11.6%**	-7.3%
33.64	-7.3%	**-11.8%**
33.75	**-11.8%**	-3.1%
34.25	0.0%	**-10.6%**
34.39	**-10.6%**	0.0%
36.72	4.0%	**9.6%**
36.76	**9.6%**	-0.8%

MP	Grade Back	Grade Ahead
40.92	**8.1%**	-4.7%
41.22	-6.8%	**-12.0%**
41.25	**-12.0%**	0.4%
41.33	0.4%	**-11.8%**
41.49	**-11.8%**	4.5%
42.17	7.2%	**12.3%**
42.20	**12.3%**	7.7%
42.46	-3.1%	**9.6%**
42.57	**9.6%**	4.6%

4.0. TRAFFIC CONDITIONS

An evaluation of traffic characteristics was completed using available data provided by Snohomish County and field-collected data. Snohomish County provided mainline traffic volume counts, vehicle speed distributions, and vehicle classifications at many locations throughout the corridor. The following sections provide details about the existing traffic characteristics of the corridor. Detailed data is included in the **Appendix E**.

4.1. EXISTING TRAFFIC VOLUMES

Snohomish County administers traffic count data at various locations along the paved roadway within the study area. Traffic counts for the gravel portion of the highway was not available for analysis. In the majority of the traffic count locations, volumes are available for an entire week during the summer. This data allows an analysis of daily variations throughout the corridor. Since the corridor is primarily used for recreational access, it is not surprising that the week days experience less traffic than the weekend days. It should be noted that the traffic counts provided in this section are counts for a given period and do not represent annual average daily traffic.

In addition to existing conditions, the County provided limited historic data for some of the traffic count sites within the study area. **Figure A.4** shows the most recent traffic data for each count location along the Mountain Loop Highway. Note that the Oso mudslide occurred in March of 2014, during this time traffic was diverted from SR 530 onto the Mountain Loop Highway. SR 530 was rebuilt and open to full traffic movements by September of 2014 and therefore the traffic counts provided in this section are not believed to be influenced by this event.

The traffic volumes on the Mountain Loop Highway range from 156 vehicles per day near White Chuck, to as high as 1,767 vpd near the Verlot campground. **Figures 1** through **3** show a yearly comparison of the daily variations in traffic. Since ADT values are not provided, the values in the following figures represent an average of the known volumes across the corridor. Also shown on the figures is a trendline indicating the compound average growth rates (CAGR) of traffic volumes. The trendline uses the average day for each year of data to calculate the growth rate.

Due to the limited availability of data, the data have been separated into three figures based on their location along the corridor (MP 10.76 – 19.99, MP 20.00 – 30.68, and MP 44.65 – 50.99). As noted previously, data was unavailable for the gravel portion (MP 30.68 to MP 44.65).

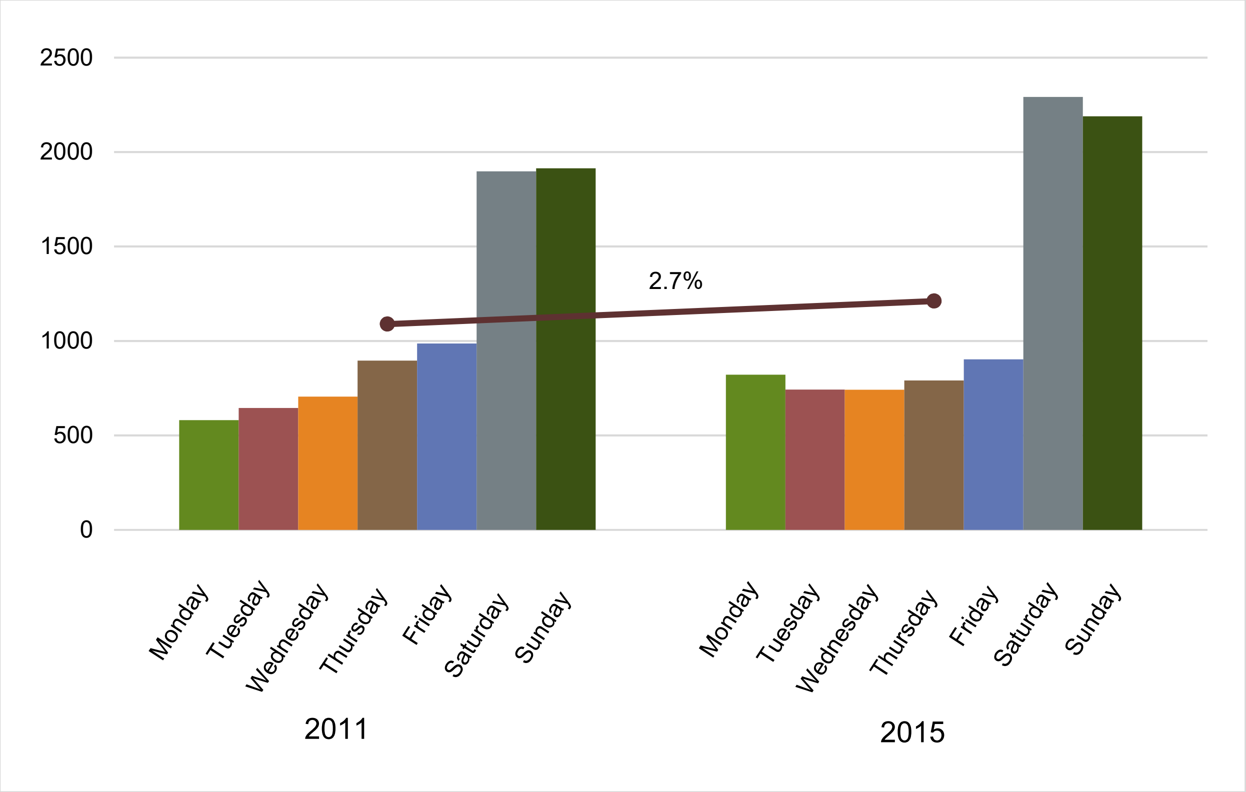

Figure 1. Traffic Volumes MP 10.76 - MP 19.99

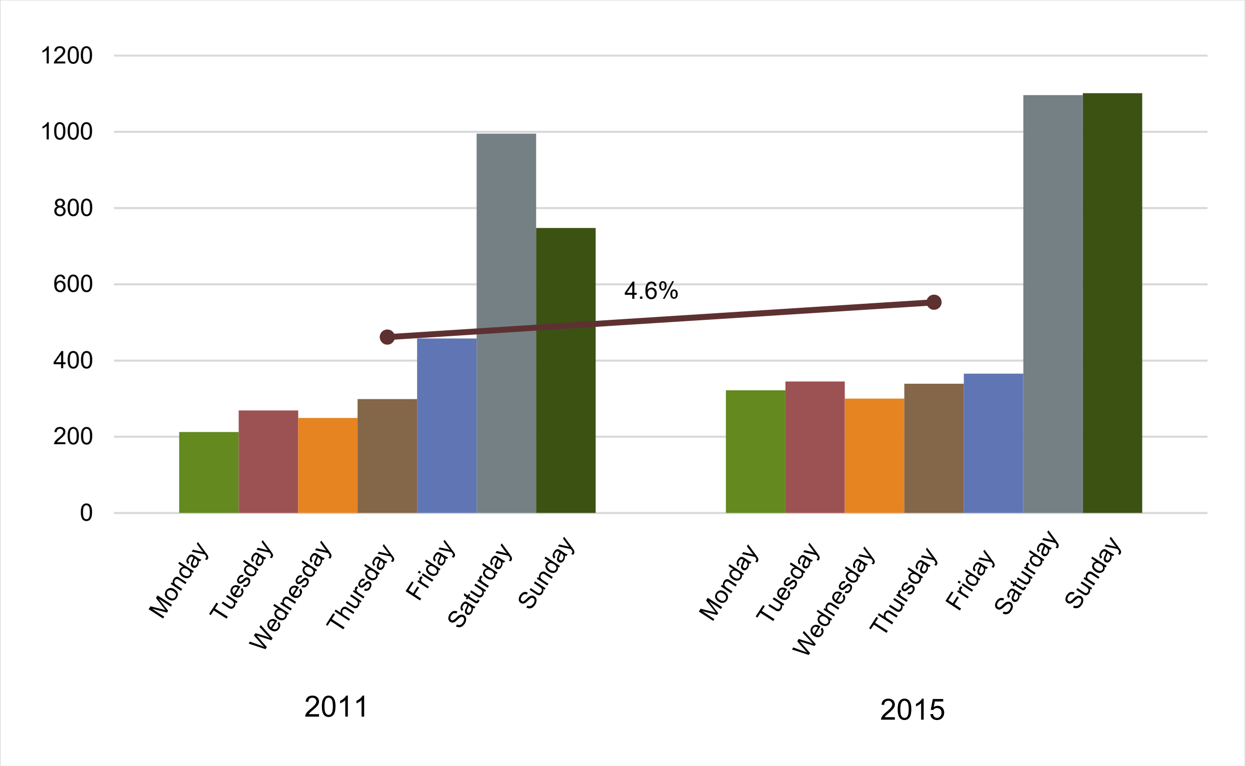

Figure 2. Traffic Volumes MP 20.00-30.68

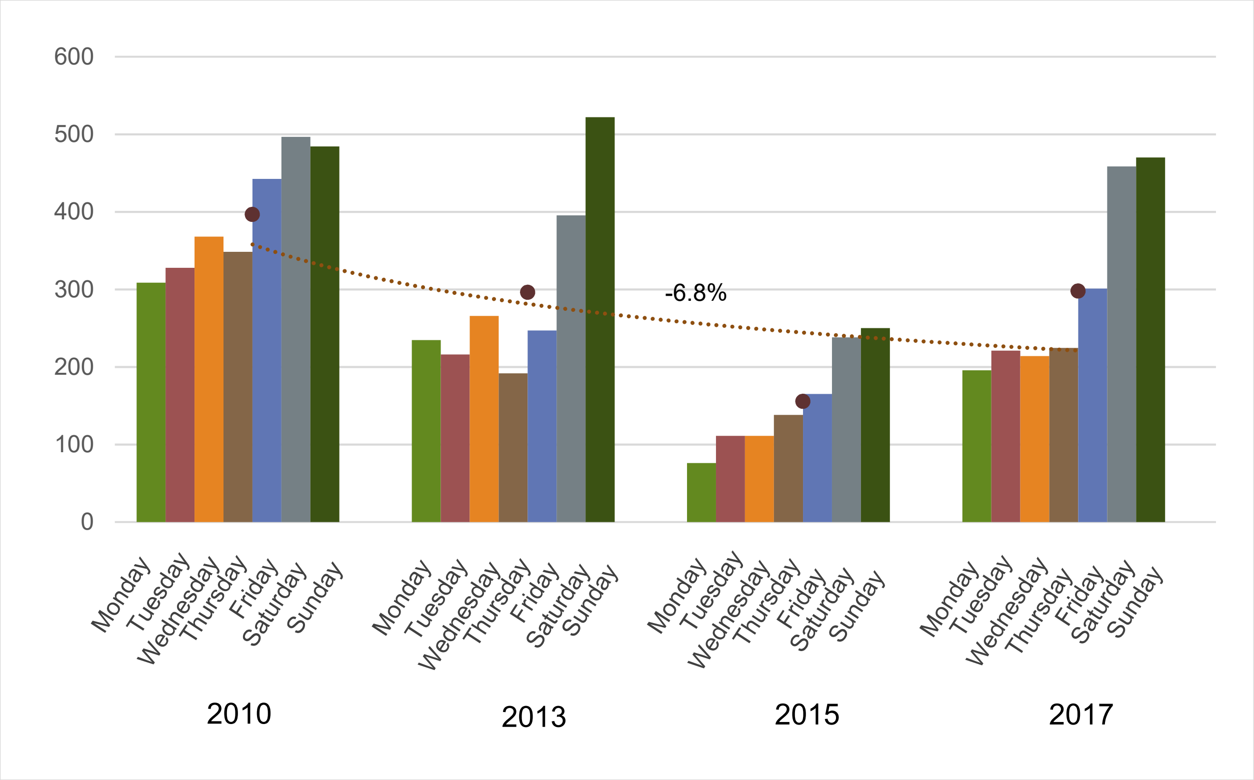

Figure 3. Traffic Volumes MP 44.65 - MP 50.99

As the figures show, the section of the Mountain Loop Highway between White Chuck and Darrington has the lowest traffic volumes and the section between the Verlot Ranger Station and Marten Creek has the highest traffic volumes. Population centers, as well as recreational opportunities such as camping and hiking, are concentrated near the beginning of the study area so the distribution of traffic volumes reflects this demand. As mentioned previously, traffic volumes are generally lesser during the weekdays (Monday through Friday) and are significantly higher during the weekend (Saturday and Sunday).

Analysis of the historic volumes reveals somewhat surprising trends. The front sections of the Mountain Loop Highway, from the beginning of the study area (MP 10.76) to Marten Creek and from Marten Creek to Barlow Pass experienced moderate growth from 2011 to 2015, 2.7 percent and 4.6 percent, respectively. However, the section from White Chuck to the end of the study area (MP 50.87) experienced extremely variable growth. Between 2010 and 2015 the corridor experienced significant decreases in volume dropping from a weekly average of nearly 400 vpd to a weekly average of about 150 vpd. Between 2015 and 2017 traffic volumes climbed significantly but fell just short of the volumes experienced in 2010. **Table 11** shows the compound annual growth rates experienced within the study area over various time intervals. Growth rates were determined using weekly average traffic volumes.

Table 11. Historic Traffic Growth Rates

Section	Growth Rate (CAGR)	Years
MP 10.86 - 19.99	2.7%	2011-2015
MP 20.00 - 30.68	4.6%	2011-2015
MP 44.65 - 50.99	-6.8%	2010-2017

4.2. PROJECTED TRAFFIC VOLUMES

Projected transportation conditions were analyzed to estimate how traffic patterns and characteristics may change compared to existing conditions. The analysis was based on known existing conditions, historic growth trends, and anticipated future land development. Historic growth trends were provided previously in **Table 11**. The travel demand model developed for the *Snohomish County Comprehensive Plan* uses known and anticipated land development through 2035 to provide growth rates for two locations in the study area. However, these growth rates only factor in peak hour volumes, not the daily volumes. **Table 12** shows the compound annual growth rates, as defined by the traffic demand model.

Table 12. Snohomish County Travel Demand Model Growth Rates

		2015		2035		CAGR		Weighted Average
From	To	AM	PM	AM	PM	AM	PM	
Granite Falls Urban Growth Boundary	**Monte Cristo Rd**	314	338	320	345	0.47%	0.10%	0.28%
Beginning of Gravel	**Darrington City Limits**	93	134	95	135	1.88%	0.04%	0.80%
							Weighted Average (Corridor)	**0.41%**

Table 13 shows the weekly average daily volume for the summer traffic counts in each section of the study corridor and projected traffic volumes for the year 2040. Since growth rates ranged greatly for the corridor, from -6.8 to 4.6 percent, three potential future growth scenarios were examined. The three scenarios examined were low (0.5%), medium (2.5%), and high (4.5%) growth scenarios. Each of the growth rates were applied to the most recent traffic count available to calculate future 2040 traffic volumes.

Table 13. Projected Traffic Volumes (2040)

Section	Average Summer Daily Volume					Future Volume (2040)		
	2010	2011	2013	2015	2017	Low (0.5%)	Medium (2.5%)	High (4.5%)
MP 10.76-19.99	--	1,089	--	1,211	--	1,372	2,245	3,640
MP 20.00-30.68	--	461	--	553	--	626	1,025	1,662
MP 44.65-50.99	397	--	296	156	298	334	526	820

Projected traffic volumes range from 626 vpd (low growth) to 3,640 vpd (high growth) on the first paved section of the corridor with higher volumes occurring on the first half of the pavement, between Verlot and Marten Creek. On the second section of pavement, past White Chuck, traffic volumes range from 334 vpd (low growth) to 820 vpd (high growth). Under the low growth assumption, the 2040 volumes along the corridor would increase by less than 200 vpd from existing volumes. If traffic volumes grow at a high growth rate, volumes could more than triple by 2040. Similar to how different sections of the road grew at different rates in the past, it is not unlikely that the traffic volumes will grow at different rates in the future. It is also possible that, if the gravel portion of the highway is paved in the future, traffic volumes could increase at an even higher growth rate due to an increase ease of access.

4.3. VEHICLE SPEEDS

In addition to traffic volumes, vehicle speed data was collected at the same traffic count locations along the corridor. There are many factors that can influence the speed of the vehicles traveling through the corridor including winding roads, steep grades, narrow roadways with limited passing opportunities, and several access points and parking lots. The speed data were collected over one week in the summer months at various times between 2010 and 2017. Since there is little variation in speeds between years and days of the week, all of the data for one count site was combined and averaged for the analysis. The existing speed limit throughout the majority of the corridor is 45 mph. **Figure A.5** shows the existing speed zones along the corridor.

Figure 4 shows the results of the speed data collection. The figure shows the 85th percentile speed at the various points throughout the corridor. The 85th percentile speed is the primary factor for determining the validity of the posted speed limit. The 85th percentile speed is that speed at or below which 85 percent of vehicles are traveling. For example, if the 85th percentile speed is 45 mph, it means that 85 percent of vehicles are traveling 45 mph or below.

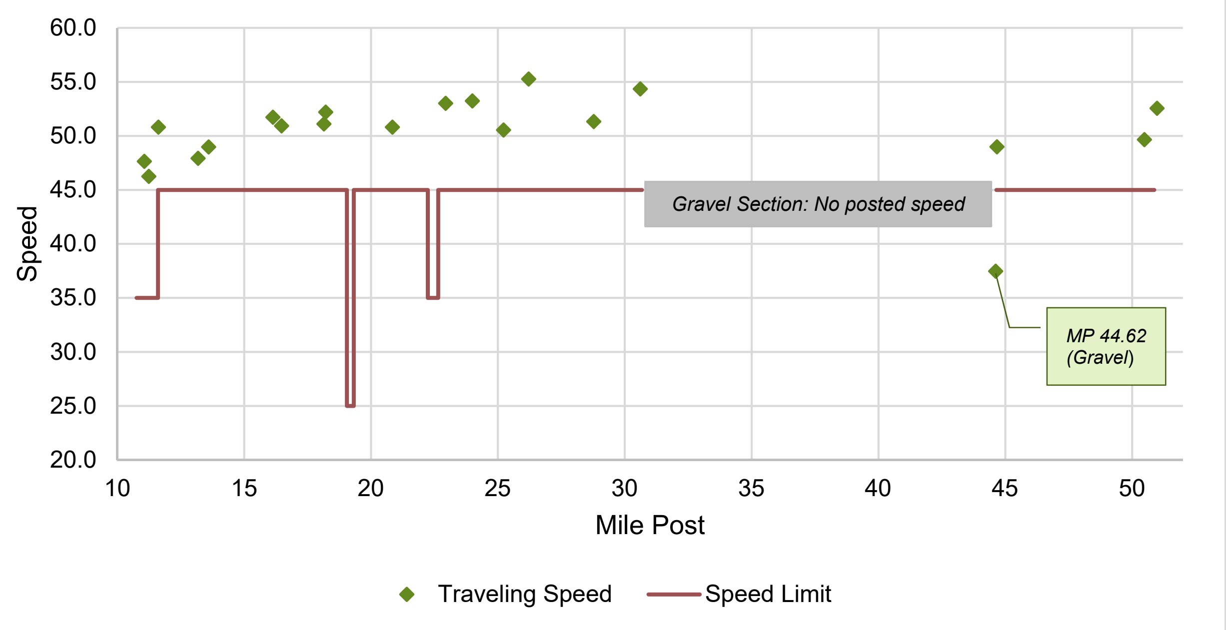

Figure 4. 85th Percentile Speed throughout Corridor

Average speeds varied from 37.5 mph at White Chuck to 55.3 mph at Perry Creek. More than 90 percent of vehicles traveled between 45 and 55 mph. Throughout the corridor, vehicles traveled at an average speed of 51 mph. Speed data for the gravel section was not available for this analysis.

4.4. VEHICLE CLASSIFICATIONS

Vehicle classification data was provided for each count location for each day of the week that counts were performed. The two paved sections have slightly different vehicle mix characteristics. Within each paved section the vehicle classes are generally the same throughout the days of the week and over the various count years. The counts were all averaged to provide a big picture of the vehicles on each paved section of the corridor.

A variety of vehicles travel throughout the corridor including motorcycles, passenger cars, buses, and a variety of heavy trucks. Portions of the corridor are not designed nor maintained to sustain the impact of heavy vehicles use, although it does occur. From MP 10.76 to MP 30.68 approximately 9 percent of vehicles are two axle six tire trucks or larger and from MP 44.65 to MP 50.87 approximately 14 percent of vehicles meet this large truck classification. However, the majority of vehicles traveling on the corridor are passenger cars (approximately 75 and 63 percent on the first and second paved sections, respectively) and two axle single unit vehicles (approximately 13 and 19 percent) which includes pickups, vans, and other vehicles such as campers, motorhomes, or vehicles pulling recreational trailers. **Figure 5** shows the vehicle classifications experienced along the corridor in the summer.

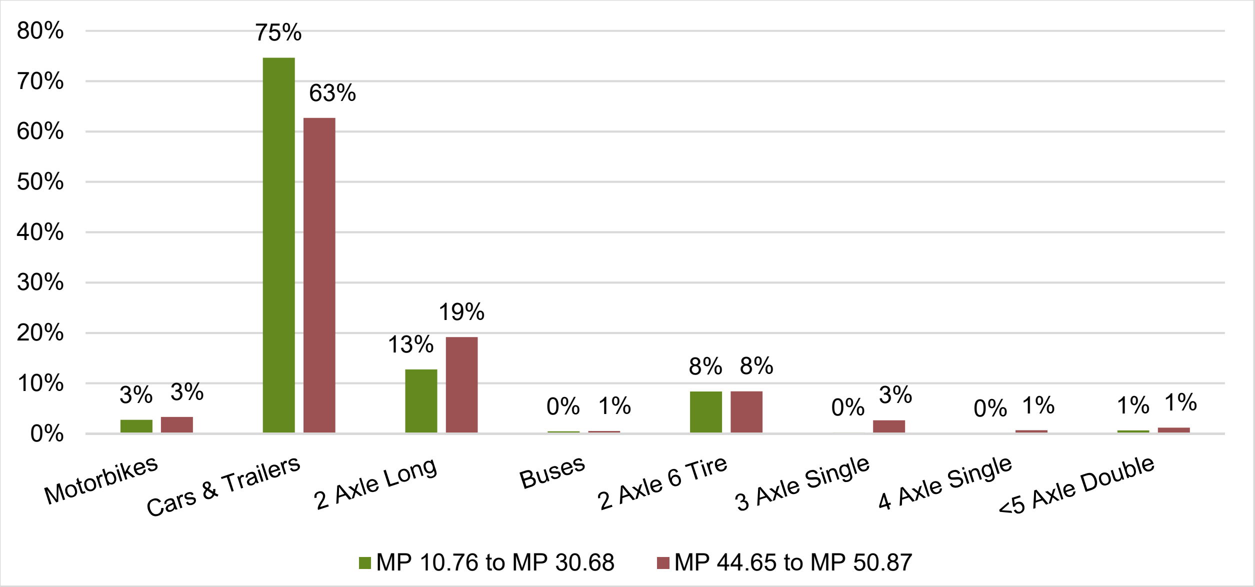

Figure 5. Summer Vehicle Classification

4.5. SEASONAL VARIATIONS

The majority of the traffic data supplied by the County was for the summer months, June through August. However, winter counts were provided at three locations along the corridor in February of 2015. This limited data allows for a seasonal comparison of data. For an accurate portrayal of the seasonal variation in traffic, the winter 2015 counts were compared to the summer 2015 counts in the same locations. The count sites included Barlow Pass, White Chuck, and Sauk River Road.

On average, there about half as many vehicles traveling the paved portions of the corridor in the wintertime as compared to the summertime. Volumes are significantly less in winter than in summer on the weekdays (Tuesday through Friday). **Figure 6** shows the seasonal variation in traffic volumes.

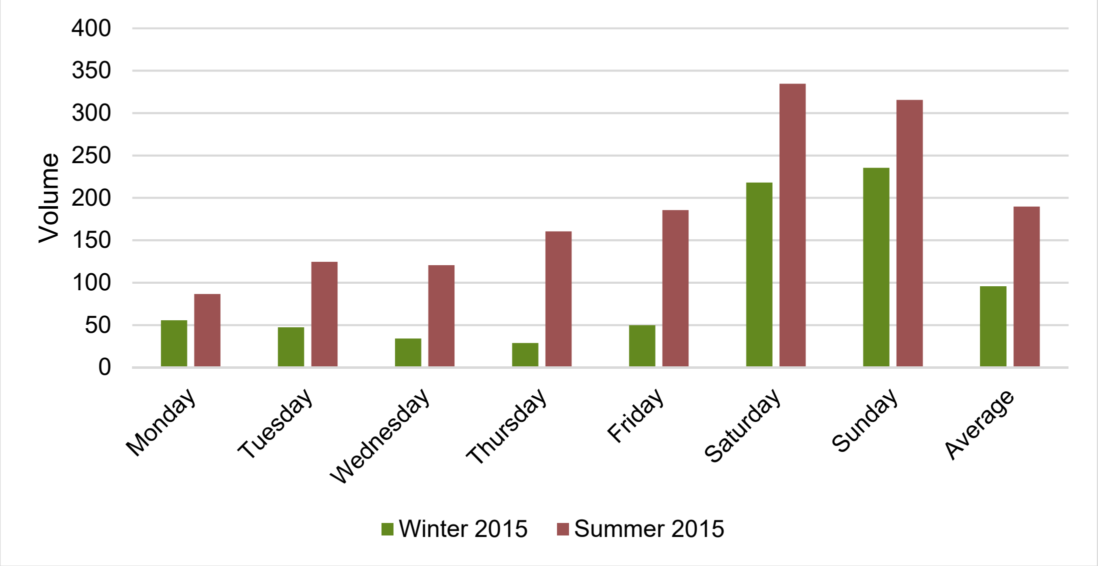

Figure 6. Seasonal Variation in Traffic (2015)

The speeds at the count locations are essentially the same in both the winter and summertime. It is common to see slower speeds during the winter as compared to the summer due to adverse weather and road conditions. However, the average speed at the count locations during the winter (46.3 mph) was slightly higher than the average speed in the summer (45.9 mph). This could be due to a fewer number of slow moving vehicles such as campers and RVs and overall lower volumes of traffic allowing vehicles to travel more freely.

The vehicle classification in the summer and winter is comparable. The biggest difference is that there is a larger percentage of two axle single unit vehicles during the winter than the summer. During the winter vehicles in this classification are typically pickups potentially hauling snowmobiles or other winter recreation equipment.

4.6. PASSING ZONES

Passing opportunities are provided along the corridor in areas where roadway geometrics allow. Passing areas are designated by broken yellow center pavement markings. No passing zones are established in areas where there is insufficient passing sight distance or near public approaches. **Figure A.5** shows the passing zones along the corridor as documented through on-site field review.

5.0. SAFETY

Snohomish County provided crash data on the Mountain Loop Highway from January 1, 2008, to December 31, 2017. Records show 55 crashes occurring within the study area during the crash analysis period. An additional seven crashes were recorded on the Mountain Loop Highway; however, the location of these crashes was unable to be determined and these records were consequently removed for the safety analysis. Data for the gravel portion of the corridor was not available and is therefore not accounted for in this analysis.

Of the 55 recorded crashes, 2 resulted in fatalities, 4 resulted in serious injuries, and 19 resulted in non-serious injuries. The rest of the crashes resulted in property damage only (PDO). A serious injury is defined as an injury, other than a fatality, which prevents the injured person from walking, driving, or normally continuing the activities the person was capable of performing before injury. **Figure A.6** presents the spatial distribution of the crash data for the ten-year analysis period.

Table 14 provides a comparison of the crash rate, crash severity index, and crash severity rate within the study area. The crash data presented in the table are based on crashes occurring from calendar year 2008 through 2017.

Table 14. Crash Rates throughout Corridor

MP	Length (mi)	Crashes	PDO	Injury	Severe	Fatal	Crashes per mile
10.76 to 15.76	5.00	30	20	7	3	0	0.6
15.77 to 20.77	5.00	10	5	4	1	0	0.2
20.78 to 25.78	5.00	3	1	2	0	0	0.1
25.78 to 30.67	4.89	1	0	1	0	0	0.0
30.67 to 44.67	*Gravel Section – Data Unavailable*						
44.67 to 50.87	6.20	11	4	5	0	2	0.2
TOTAL	**26.09**	**55**	**30**	**19**	**4**	**2**	**0.2**

5.1. Safety Trends, Contributing Factors, and Crash Clusters

On average, approximately 6 crashes occurred each year during the crash analysis period and the majority (49 percent) of crashes occurred during the summer months, June through September. Single vehicle crashes accounted for nearly 90 percent of crashes, with approximately 45 percent of all crashes occurring in dry conditions. Furthermore, 65 percent of crashes occurred during daylight. Approximately 49 percent of crashes during the analysis period happened when roads were icy, snowy, or wet.

The main observed crash trends are fixed object collisions (38) followed by roll-over collisions (10). The object struck listed in the fixed object crashes included the ditch (39 percent), guardrail (11 percent), and sign posts (11 percent). Fixed object collisions (7) were observed near MP 15.5 between the Wiley Creek Campground and Schweitzer Creek. Four vehicles collided with the ditch and three of the vehicles collided with a sign post.

Eight crashes were observed between MP 11 and MP 12. All but one of the crashes occurred during daylight and half occurred under clear or partly clear weather. Five out of eight crashes were fixed object collisions in addition to one of each roll over, rear-end, and sideswipe crash types.

There were four severe injury crashes, all of these crashes occurred in an approximate five-mile segment between MP 11 and MP 16.5. These crashes included two fixed object crashes, a roll over and rear end crash. There were also two fatalities on the study corridor over the past ten years. Both fatalities were fixed object crashes which occurred in an approximate five-mile segment between MP 45 and MP 50.

6.0. OTHER VULNERABILITIES

There are many points along the corridor where natural land events including landslides, sink holes, erosion, and washouts have occurred. Some of these events have damaged the highway and its bridges and rerouted rivers. As a result, parts of the road may become impassable and are either closed for repair or, in a few cases, the road may need to be rerouted to avoid a troublesome area. The following sections discuss the areas of concern throughout the corridor and the impact that natural events may have on the corridor. This information can be useful for future road design, maintenance, and repair work on the Mountain Loop Highway. **Figure A.7** presents other vulnerabilities identified along the study corridor during the field review.

Landslides

The highway passes through or alongside landslide hazard areas mapped by Snohomish County or the Washington State Department of Natural Resources at several locations, including near Schweitzer Creek and Boardman Creek (MP 16.5 to 16.9), at the base of Gordon Ridge (MP 19.3 to 19.6), near Palmer Creek west of Barlow Pass (MP 28.5 to 28.9), and between Barlow Pass and Monte Cristo Lake (MP 30.5 to 31.8). Signs of unstable soils, such as sunken or broken road beds, are evident at many locations along the corridor.

There are three major landslides in the area: the Gold Basin Campground slides, the Waldheim Slide, and the Marten Creek Slide. Slides at the Gold Basin Hill (approximate MP 13.25) have been documented going back to the 1940s. The slides have temporarily closed the campground and have necessitated moving or closing campground sites. These slides have not directly impacted the Mountain Loop Highway. The Waldheim Slide (approximate MP 20.6) occurred in December 2010 and closed the Mountain Loop Highway for five months to perform emergency repairs to the road and stabilized the slope. The slide caused one lane and part of a second lane to collapse into the river below. The Marten Creek Slide (approximate

MP 21) occurred in 2008. There is evidence of a number of other small, less impactful landslides that have occurred in the area.

The northernmost 8 miles of the corridor, from MP 42.5 to the Darrington city limits, are within a lahar hazard area mapped by Snohomish County. Lahars (rapidly flowing slurries of rock and mud formed during volcanic eruptions) can reroute rivers and damage roadways and bridges. Lahars associated with eruptions of Glacier Peak have inundated the Sauk River valley several times during the last 13,000 years[14].

Steep Slopes

There are many locations along the corridor that have steep side slopes on one or both sides of the roadway. On steep slopes there is an elevated risk of erosion. Slope failures, or landslides, typically occur where a slope is over-steep, where material is not compacted, or where cuts in natural soils encounter groundwater or zones of weak material. These areas of steep slopes are especially important to consider to minimize the risk of slope failure, avoiding the potential for expensive road repairs or road closures. Steep slopes can be stabilized by flattening the slope, adding drainage, or using retaining structures. A number of steep slope areas were documented during the field review.

Sink Hole

A sinkhole is a depression or hole in the ground causes by some form of collapse of the surface layer. The formation of sinkholes involves the natural processes of erosion or gradual removal of bedrock by groundwater or the lowering of a water table. Sinkholes can also be caused by a collapse of a cave below the surface, due to the area’s extensive mining history this is a probable cause of sinkholes in the area. There is a sinkhole along the corridor near MP 19 which requires ongoing maintenance efforts.

Washouts

A washout is a breach in a road caused by flooding. Washouts are fairly common along the corridor due to the many river crossings. The washout of the Bedal Creek Bridge (approximate MP 35.5) was caused by a debris torrent where floating logs jam the water source. Water builds up behind these jams, and when enough pressure builds up, the jam releases downstream in a torrent washing out bridges or roadways.

Drainage/Erosion

Improper drainage on a roadway can lead to serious erosion issues. When water falls on roads and is not removed promptly, the water seeps into lower layers of the pavement, weakens the soil which can compromise the soil’s stability and undermine the capacity of the pavement to carry traffic. There were multiple locations along the corridor that were observed to have poor drainage during field review. In some locations with poor drainage there were existing culverts built to divert water from the roadway. Some culverts have been blocked with debris allowing water to pool along the roadside.

7.0. SUMMARY

This *Existing and Projected Conditions Report* identifies physical features, geometric conditions, traffic conditions, safety trends, and other vulnerabilities within the study area that may be affected by potential future improvements arising from the Mountain Loop Highway Feasibility Study. Project-level traffic, geometric, or safety analysis may be required for any improvements forwarded from this study.

This following is a summary of observed trends and areas for further consideration. These areas were identified through review of as-built drawings, field review, public databases, and other resources. More discussion has been provided in the previous sections, and it is reiterated here as appropriate. The following transportation system conditions were noted:

Physical Features and Characteristics

- 16 of the bridges along the corridor are rated “fair” condition and one is rated “poor” condition. All bridges meet minimum design load rating standards, though there is not a consistent design load rating throughout the corridor.
- Over 60 culverts of 30” or larger were identified along the study corridor. Three of the culverts were in failing condition, six were in poor condition.
- The corridor does not meet the minimum roadway surface width of 32 feet. The width is generally 28 feet for the majority of the paved section, with the exception of six miles near the beginning of the study corridor which has a width of 22 feet. The width of the gravel section varies greatly, providing only one travel lane in some locations.
- The majority of the pavement in the corridor is in good condition.

Geometric Conditions

- Approximately 96 percent of the horizontal curves on the paved sections meet or exceed a 40-mph design speed, while only 41 percent of the horizontal curves on the gravel section appear to meet the same standard.
- Approximately 69 percent of the vertical curves on the gravel portion do not appear to meet a 40-mph design standard. Two percent of the vertical curves on the paved portion do not meet a 40-mph design speed.
- There are multiple vertical curves along the gravel portion of the study corridor that do not appear to meet a 40-mph design standard for grade.

Traffic Conditions

- The traffic volumes on the study corridor range from 156 vehicles per day near White Chuck, to as high as 1,767 vpd near the Verlot campground.
- Average speeds varied from 37.5 mph at White Chuck to 55.3 mph at Perry Creek. More than 90 percent of vehicles traveled between 45 and 55 mph. Throughout the corridor, vehicles traveled at an average speed of 51 mph. This does not include speed on the gravel portion.
- The majority of vehicles traveling on the corridor are passenger cars (approximately 75 and 63 percent on the first and second paved sections, respectively) and two axle single unit vehicles (approximately 13 and 19 percent) which includes pickups, vans, and other vehicles such as campers, motorhomes, or vehicles pulling recreational trailers.
- On average, there are about half as many vehicles traveling the paved portions of the corridor in the wintertime as compared to the summertime.

Safety

- Records show 55 crashes occurring within the study area between January 1, 2008, to December 31, 2017. Two crashes resulted in fatalities, four crashes resulted in serious injuries, and 19 crashes resulted in non-serious injuries.
- The main observed crash trends are fixed object collisions (38) followed by roll-over collisions (10).
- A cluster of fixed object collisions (7) were observed near MP 15.5 between the Wiley Creek Campground and Schweitzer Creek. Another cluster of crashes (8) was observed between MP 11 and MP 12.

Other Vulnerabilities

- Landslides, steep side slopes, sink holes, washouts, and drainage/erosion issues are common on the Mountain Loop Highway. These events have been known to cause road damage in the past.

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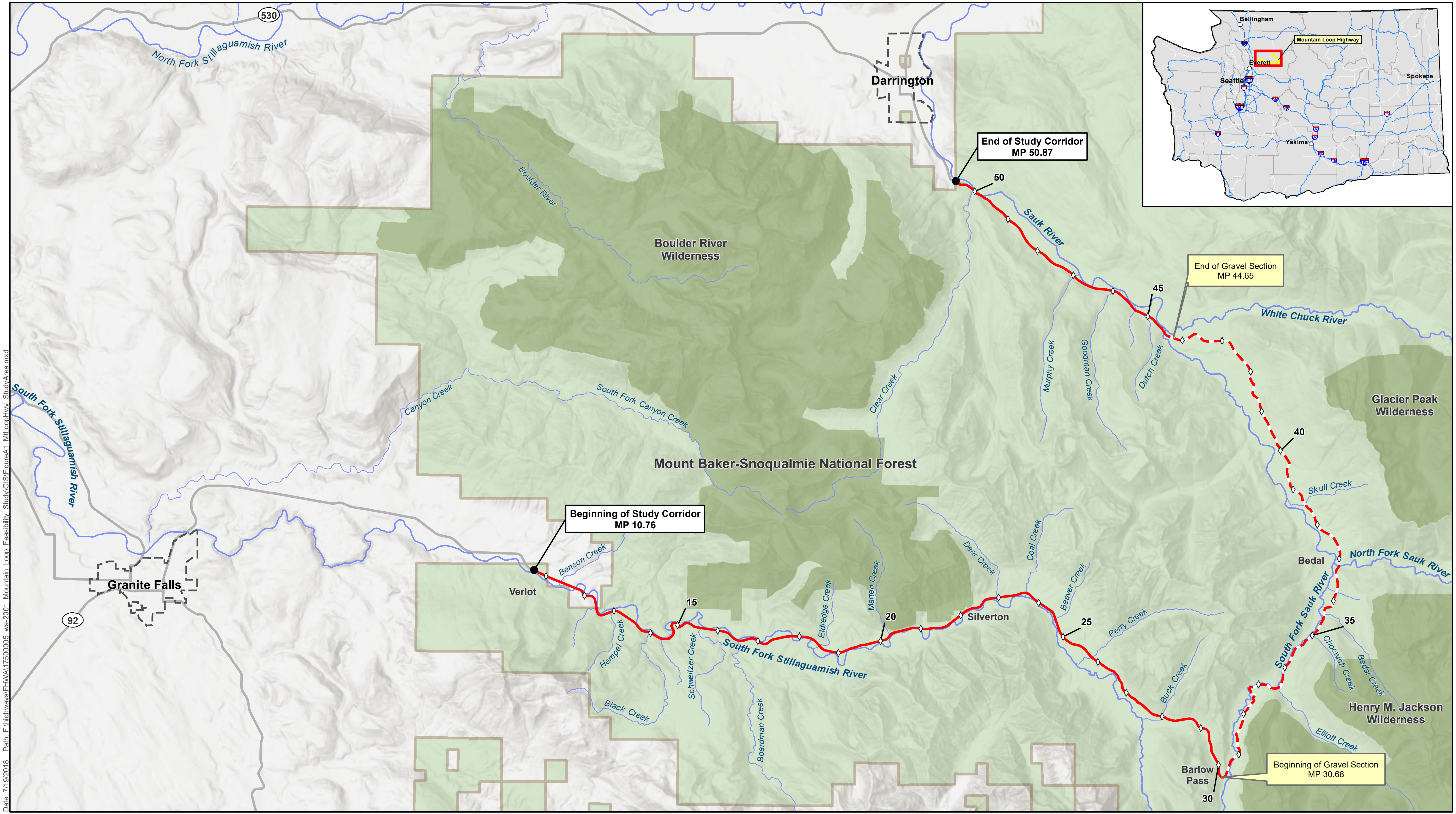
Appendix A:

Figures



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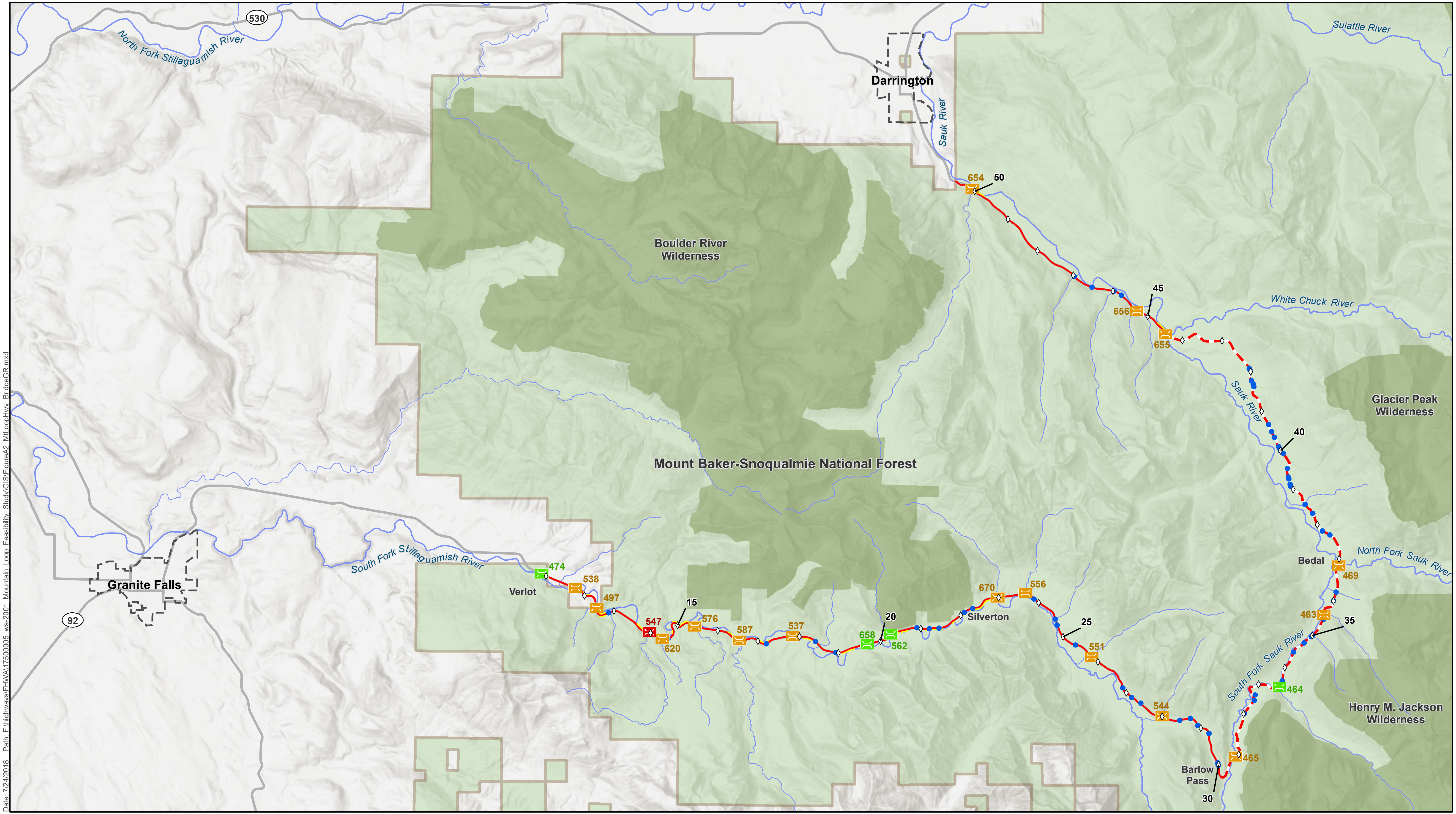
WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources

◊ Milepost
⬚ City Limit
— River/Stream
— Roads
🟩 National Forest
▨ Wilderness Area
— Mountain Loop Hwy (Paved)
- - Mountain Loop Hwy (Unpaved)

0 0.5 1 2 Miles

Figure A.1
Study Area

Mountain Loop Highway
Feasibility Study
Snohomish County, Washington



Date: 7/24/2018 Path: F:\highways\FHWA\17500005 wa-2001 Mountain Loop Feasibility Study\GIS\FigureA2 MtLoopHwy BridgeGR.mxd

WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources

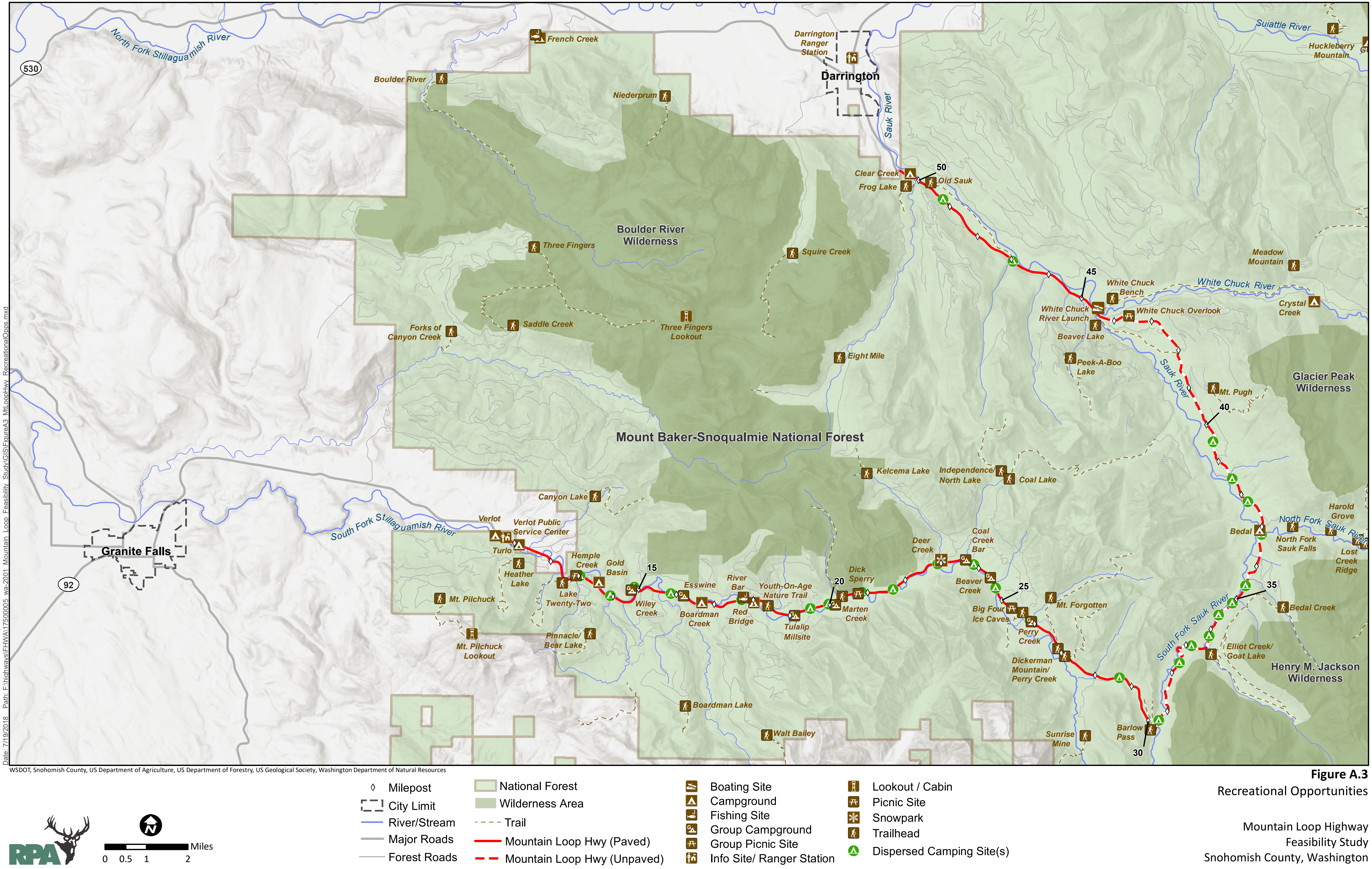
◊ Milepost
City Limit
River/Stream
Roads
National Forest
Wilderness Area
Mountain Loop Hwy (Paved)
Mountain Loop Hwy (Unpaved)
● Culvert
Guardrail

Bridge Condition (ID)
🟩 655 Good
🟧 655 Fair
🟥 655 Poor

0 0.5 1 2 Miles

Figure A.2
Bridge, Culvert, and Guardrail Locations

Mountain Loop Highway
Feasibility Study
Snohomish County, Washington



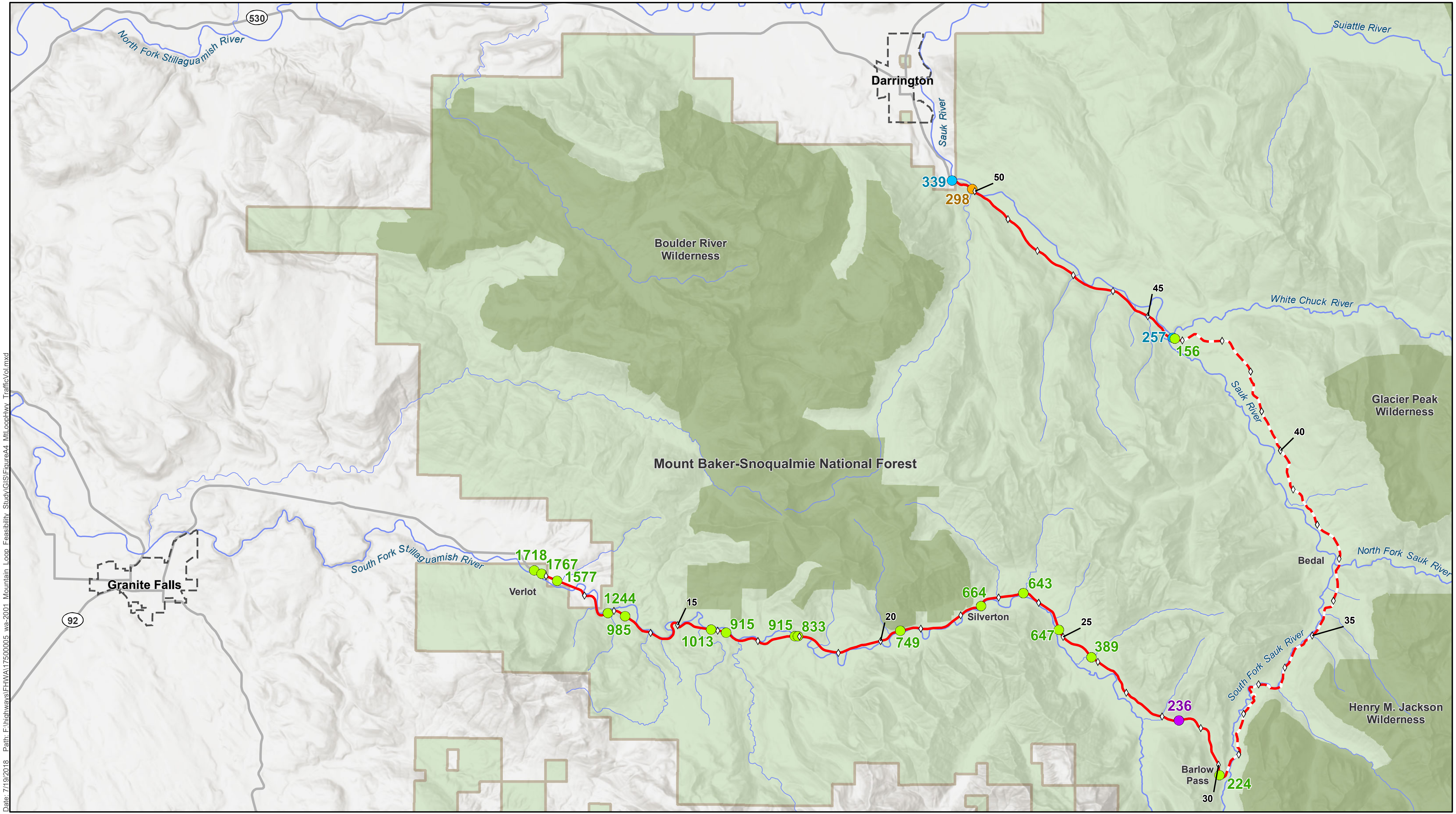
Date: 7/19/2018 Path: F:\highways\FHWA\175000005_wa-2001_Mountain_Loop_Feasibility_Study\GIS\FigureA3_MtLoopHwy_RecreationalOpps.mxd

WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources

Figure A.3
Recreational Opportunities

Mountain Loop Highway
Feasibility Study
Snohomish County, Washington

Date: 7/19/2018 Path: F:\highways\FHWA\17500005 wa-2001 Mountain Loop Feasibility Study\GIS\FigureA4 MtLoopHwy TrafficVol.mxd



WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources

◊ Milepost
City Limit
River/Stream
Roads

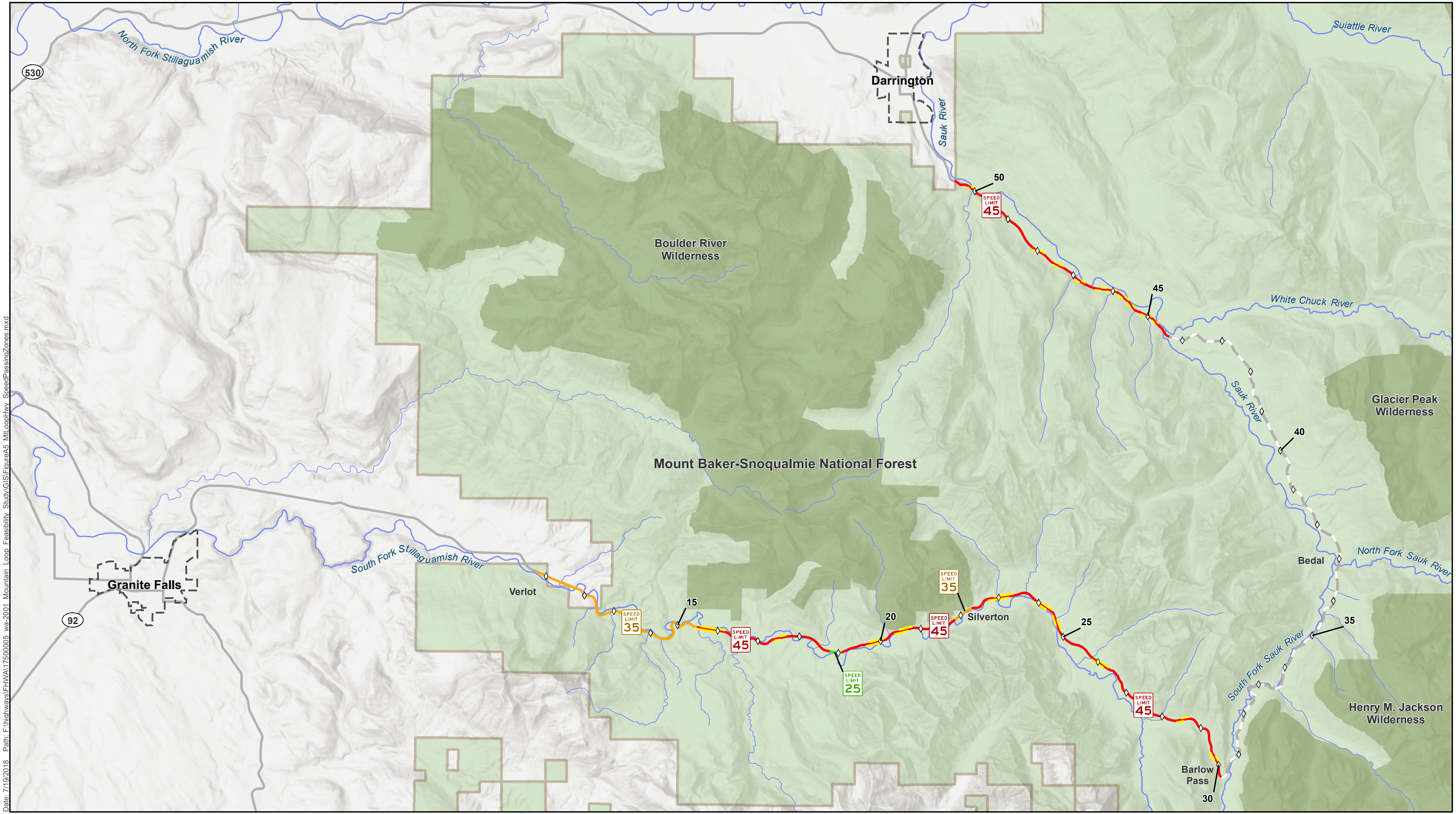
🟩 National Forest
🟩 Wilderness Area
Mountain Loop Hwy (Paved)
Mountain Loop Hwy (Unpaved)

Existing Traffic Volumes
(Year of Counts)
2011
2013
2015
2017

Miles
0 0.5 1 2

Figure A.4
Existing Traffic Volumes

Mountain Loop Highway
Feasibility Study
Snohomish County, Washington

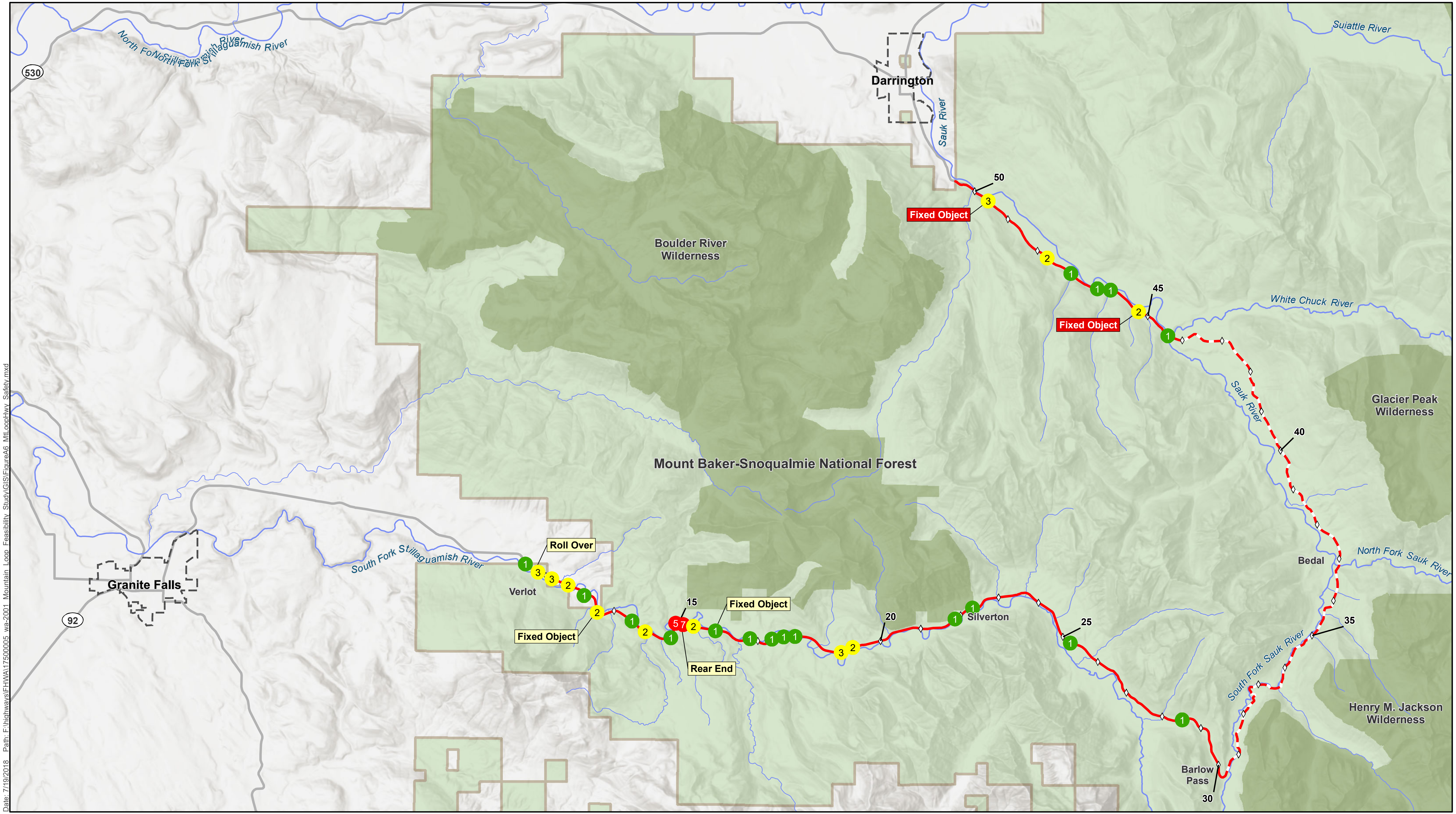


Date: 7/19/2018 Path: F:\highways\FHWA\17500005_wa-2001_Mountain_Loop_Feasibility_Study\GIS\FigureA5_MtLoopHwy_SpeedPassingZones.mxd

WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources

Figure A.5
Speed and Passing Zone Locations

Mountain Loop Highway
Feasibility Study
Snohomish County, Washington



WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources

Date: 7/19/2018 Path: F:\highways\FHWA\17500005 wa-2001 Mountain Loop Feasibility Study\GIS\FigureA6 MtLoopHwy Safety.mxd

◊ Milepost
City Limit
River/Stream
Roads
National Forest
Wilderness Area
Mountain Loop Hwy (Paved)
Mountain Loop Hwy (Unpaved)

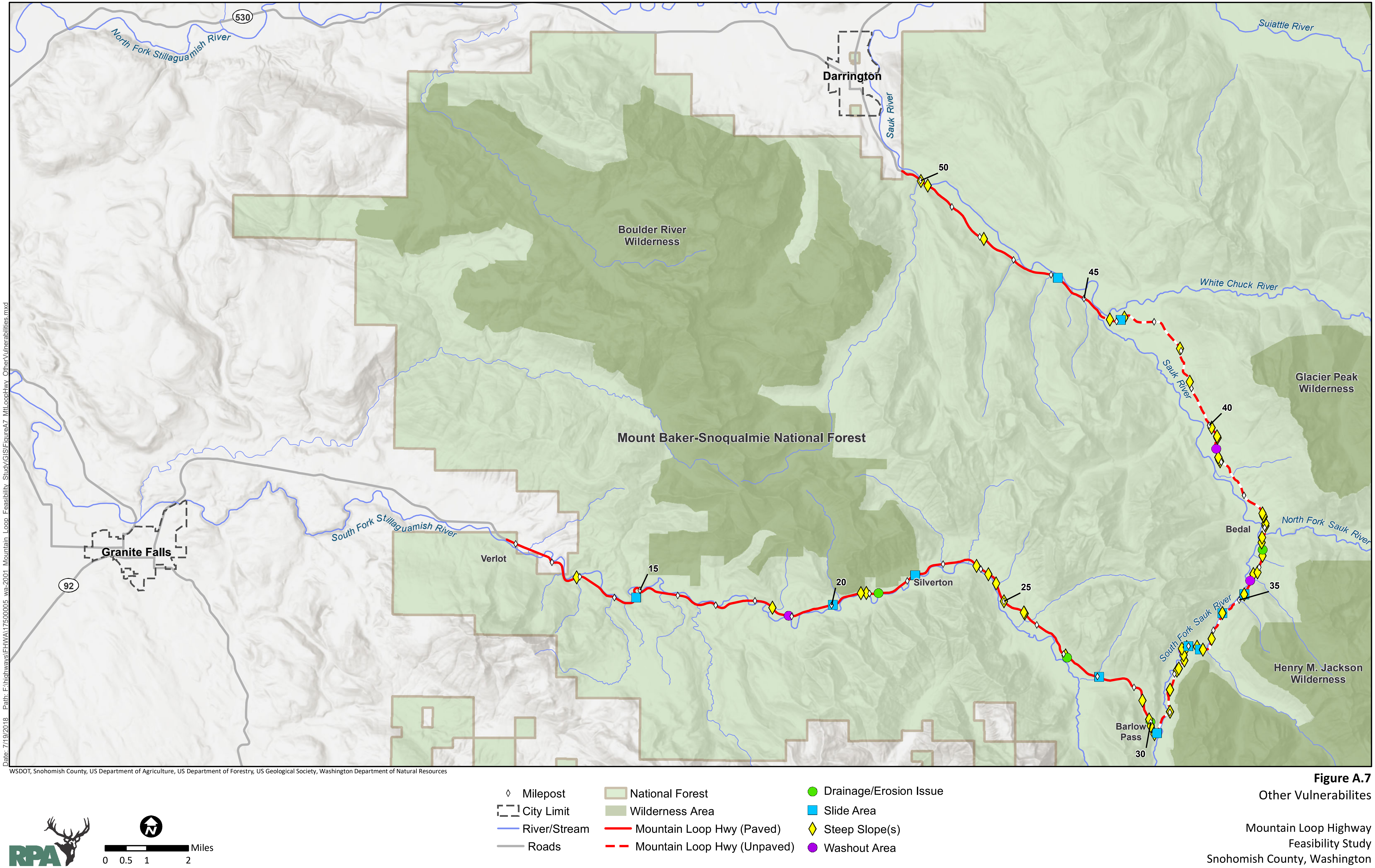
Number of Crashes
● 1
● 2 - 4
● 5 - 7

Crash Type Severe Crash
Crash Type Fatal Crash

0 0.5 1 2 Miles

Figure A.6
Crash Trends

Mountain Loop Highway
Feasibility Study
Snohomish County, Washington



Date: 7/19/2018 Path: F:\highways\FHWA\17500005_wa-2001_Mountain_Loop_Feasibility_Study\GIS\FigureA7_MtLoopHwy_OtherVulnerabilities.mxd

WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources

Figure A.7
Other Vulnerabilites

Mountain Loop Highway
Feasibility Study
Snohomish County, Washington

Appendix B:

Bridge Inspection Reports

BRIDGE INSPECTION REPORT

Ver Date: 07/19/2016 Agency: Snohomish County

Status: Released Printed On: 07/21/20 Program Mgr: Roman G. Peralta

Bridge No. 473 Page: 1/2 **Structure Type**

Bridge Name TURLO CREEK **Route** 98960 **Location** 10.6 MI E JCT SR 92

Structure ID 08615400 **MilePost** 1.06 **Intersecting** TURLO CREEK

Mike

Inspector's Signature MPZ IDent# G1331 Co-Inspector's Signature

7	6	Structural Adqcy	(657)
5		Deck Geometry	(658)
9		Underclearance	(659)
5		Operating Level	(660)
6		Alignment Adqcy	(661)
8		WaterwayAdqcy	(662)
7		Deck Overall	(663)
9		Drains Condition	(664)
7	6	Superstructure	(671)
3		Number Utilities	(675)
7		Substructure	(676)
6		Chan/Protection	(677)
9		Culvert	(678)

N		Pier/Abut/Protect	(679)
8		Scour	(680)
6		Retaining Walls	(682)
9		Pier Protection	(683)
1		Bridge Rails	(684)
1		Transition	(685)
1		Guardrails	(686)
1		Terminals	(687)
N		Revise Rating	(688)
		Photos Flag	(691)
		Soundings Flag	(693)
		Measure Clearance	(694)

1995		Year Built	(332)
0		Year Rebuilt	(336)
98		Oper Rating	(551)
38		Inv Rating	(554)
A		Open Close	(293)
9999		Vert Over Deck	(360)
0000		Vert Under	(374)
N		Vert Und Code	(378)
4.00		Asphalt Depth	
35		Speed Limit	

Inspections Performed

IT	NT	HRS	Date	Rep Type
Y	24	1.0	06/13/2016	Routine
				Fract Crit
				Underwater
				Special
				Interim
				Equipment
				Damage
				Safety
				Short Span

Total: 1.0

Suff Rating: 79.89 79.89

BMS Elements

Element	Element Description	Total	Units	State 1	State 2	State 3	State 4
13	Bridge Deck Surface	3990	SF	3990	0	0	0
108	Prestressed Concrete Bulb-T Girder	798	LF	783	15	0	0
215	Concrete Abutment	90	LF	90	0	0	0
310	Elastomeric Bearing	14	EA	14	0	0	0
330	Metal Bridge Railing	228	LF	228	0	0	0
361	Scour	2	EA	2	0	0	0
800	Asphaltic Concrete (AC) Overlay	3990	SF	3990	0	0	0

Notes

0	Oriented west to east. West toward Granite Falls.
11	Load rating indicates rating factors for all AASHTO trucks is near "3" (95-110-119 tons), and bridge is good for design overloads also.
13	Covered with ACP overlay. See element 806. Spalling/impact damage to curbs typical. Curbs on west side of road with many short broken sections.

BRIDGE INSPECTION REPORT

Ver Date: 07/19/2016 Agency: Snohomish County

Status: Released Printed On: 07/21/20 Program Mgr: Roman G. Peralta

Bridge No. 473 Page: 2/2 **Structure Type**

Bridge Name TURLO CREEK **Route** 98960 **Location** 10.6 MI E JCT SR 92

Structure ID 08615400 **MilePost** 1.06 **Intersecting** TURLO CREEK

108	There are seven lines of bulb tee girders. Diaphragms @ 1/3 points. The longitudinal construction joints are leaking with heavy leaching and stalactites to 4". Construction joint grout is also popping out in scattered areas along the joint. There is leaching between diaphragms and prestressed girders. Girder C was damaged in two places on downstream side to top flange during erection in 1995 near east abutment w/transverse cracks and efflorescence @ patches. Girders B, C, & G @ A1 and Girder B & E @ A2 with short hairline leaching cracks in webs and flange soffits close to end diaphragms. Also, a few hairline longitudinal leaching cracks in upper flange soffits close to longitudinal joints scattered about.
215	Hairline vertical leaching cracks in back walls. West abutment has just wing walls and east abutment has wing walls and retaining walls. SE retaining wall appears stable with no scour observed. Vertical hairline leaching crack at centerline in both abutments.
310	Elastomeric bearing pads are only visible at front face due to construction method.
330	Thrie beam is attached to galvanized steel posts which are attached to directly to the edge of the deck. The rail is in good condition, except for minor traffic scrapes along upstream side and rust in places. Thrie beam connections to steel post held w/ small bolts (5/16 or 3/8).
361	Turlo Creek flows north to south. Gabion baskets are present from previous bridge and are not needed to maintain current structure. East bank under bridge eroded quite substantially during winter 2012 flooding leaving the bank near vertical in places but still away from the abutment. Appears relatively stable and to not have advanced any - 2016. Some scour @ downstream, west bank 2016 but still approx. 20' from abutment.
675	There is two 2" and one 4" diameter PVC conduit between girders A and B.
677	Evidence of adjacent landowner grading activites under and adjacent to bridge on east side of channnel. Banks show evidence of scour upstream from heavy rains in 2012.
680	Abutments founded upon shallow drilled shafts and originally constructed well back and above flood water elevations but scour has lessened that. Scour summary sheet in file but not based on calculations.
681	Transverse cracks at east abutment - settlement < 1/2".
682	NE retaining wall is tipped out to the north relative to the wing walls up to 1-3/4" at the top.
687	Impact attenuator at NW corner was repaired 2010.
800	Asphalt concrete overlay added 2008. Reflective cracking @ east abutment. Fresh BST overlay 2014.

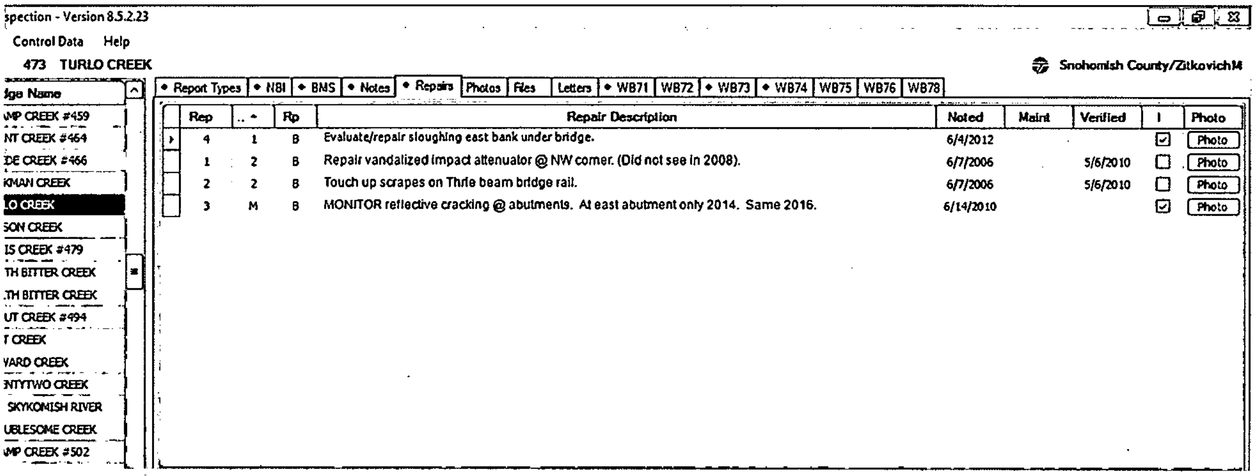
Repairs

Repair No	Pr	R	Repair Description	Noted	Maint	Verified
4	1	B		06/04/12		
3	M	B		06/14/10		

Inspections Performed and Resources Required

Report Type	Date	IT	Frq	Hrs	Insp	CertNo	Coinsp	Note
Routine	06/13/16		24	1.0	MPZ	G1331		

Resources	Use	Hour	Min	Req	Max	Notes



473 TURLO CREEK

Snohomish County/ZitkovichM

dge Name
MP CREEK #459
NT CREEK #464
DE CREEK #466
KMAN CREEK
LO CREEK
SON CREEK
IS CREEK #479
TH BITTER CREEK
TH BITTER CREEK
UT CREEK #494
T CREEK
VARD CREEK
NTYTWO CREEK
SKYKOMISH RIVER
UBLESOME CREEK
MP CREEK #502

Rep	..	Rp	Repair Description	Noted	Maint	Verified	I	Photo
4	1	B	Evaluate/repair sloughing east bank under bridge.	6/4/2012			☑	Photo
1	2	B	Repair vandalized impact attenuator @ NW corner. (Did not see in 2008).	6/7/2006		5/6/2010	☐	Photo
2	2	B	Touch up scrapes on Thrie beam bridge rail.	6/7/2006		5/6/2010	☐	Photo
3	M	B	MONITOR reflective cracking @ abutments. At east abutment only 2014. Same 2016.	6/14/2010			☑	Photo

Snohomish County
Bridge Load Rating Summary

JERI C. BERNSTEIN
STATE OF WASHINGTON
22128
REGISTERED PROFESSIONAL ENGINEER
EXPIRES 5/20/2003

9/5/2001

Structure ID No: 8615400

Bridge Name: Turlo Creek
Bridge Number: 473

Load Rating By: MB Date: Aug-01

Number of Spans 1
Bridge Type: Deck Bulb Tee
Year Built: 1995
Design Load: HS 25
Input Files: 473dbt1.bdf
Comments:

National Bridge Inventory (NBI) Load Factor Rating Method			
AASHTO HS-20 Truck	RF	Live Load Factor	Controlling Point
Inventory (Service or Ultimate)	1.06	2.17	Moment @ 56' from support
Operating (Ultimate only)	2.71	1.3	Moment @ 56' from support
Fatigue		NA	

National Bridge Inventory (NBI) Load Factor Rating Method				
	Actual Capacity	Required Capacity	(Tons)	NBI and SWIBS coding
Inventory	38	36		2 38.0
Operating	98	36		2 [illegible]6 98

Safe Load Capacity Load Factor Rating Method Operating Only				
Truck		RF	Live Load Factor	Controlling Point
AASHTO Type 3	Ultimate	3.79	1.3	Moment @ 56' from support
AASHTO Type 3S2	Ultimate	3.06	1.3	Moment @ 56' from support
AASHTO Type 3-3	Ultimate	2.97	1.3	Moment @ 56' from support
OL 1	Ultimate	2.07	1.3	Moment @ 56' from support
OL 2	Ultimate	1.23	1.3	Moment @ 56' from support

Safe Load Capacity Level (Load Factor Rating Method) (Posting Requirement)			
Truck	Actual Capacity Tons	Required Capacity Tons	Posting Required
AASHTO Type 3	95	25	No
AASHTO Type 3S2	110	36	No
AASHTO Type 3-3	119	40	No
OL 1	99	48	N/A
OL 2	127	103.5	N/A

Notes: Live Load Factors in this table apply to Ultimate Load Rating Analysis only. Inventory service load rating analysis applies to prestressed or post tensioned members only. Fatigue is evaluated for concrete bridges in locations where no prestressing or post tensioning is present.

Washington State Department of Transportation
WSBIS Inventory Report

7/21/2016

Structure Identifier	Bridge Number	Owner Code	County Number	City Number	Update
08615400	473	02	31	00000	0

WB71

Bridge Name	Location	Section	Township	Range	Latitude	Longtitude
TURLO CREEK	10.6 MI E JCT SR 92	09	30	08E	48°05'48.00"	121°47'06.00"
					° ' "	° ' "

WB72

Feature Intersected	Facilities Carried	Region	FIPS Place Code	Legis District (1)	Legis District (2)	Toll	Custodian	Parallel Structure	Temporary Structure	Critical Facility	Median	Hist Sig	Open Closed	Program Year
TURLO CREEK	MOUNTAIN LOOP HWY	NW	74760	39	0	3	02	N		☒	0	4	A	
										☒				

WB73

Year Built	Year ReBuilt	Bridge Length	NBIS Length	Maximum Span Length	Lanes On	Lanes Under	Curb to Curb Deck Width	Out to Out Deck Width	Sidewalk Curb Left	Sidewalk Curb Right	Min Vert Clearance Over Deck	Min Vert Clearance Under Bridge	Code	Min Lat UnderClr Right	Code	Min Lat UnderClr Left	Navigation Control	Navigation Vertical Clearance	Navigation Horizontal Clrnce	Vert Lift Min Clrnce	Appr Roadway Width	Skew Angle	Flare
1995	0	114	.	114	2	0	35.0	37.0	0.0	0.0	99'99"	0	N	0.0	N	0.0	0	0	0		28	0°	N
			.				34.5	.	.	.				.		.						°	

WB74

On Under	High way Class	Service Level	Route Number	Mile Post	ADT on Inventory Route	Truck ADT PCT	ADT Year	Future ADT	Future ADT Year	Linear Referencing System Route	LRS Sub Route	Fed Aid Route	Nat Hwy System	Base Hwy Network	Strahnet	Fed Lands Highway	Fed Funct Class	National Truck Net	Lane Use Direction	Horizontal Clearance Route Dir	Horizontal Clearance Reverse Dir	Max Vertical Clearance Route Dir	Detour Length
1	4	1	98960	1.06	2655	5	2011	3000	2034			X310	0	0	0	2	07	N	2	35'00"			94
				.	3270		2015	4000	2038														

WB75

Main Span Material	Main Span Design	Appr Span Material	Appr Span Design	Number of Main Spans	Number of Appr Spans	Service On	Service Under	Deck Type	Wearing Surface	Membrane	Fed Deck Protection	Design Load	Oper Rtng Method	Oper Rtng Tons	Invt Rtng Method	Invt Rtng Tons	Design Exception Date	Federal Aid Project	Border State Code	Border State PCT	Border Structure	Border State Structure Identifier
5	04	0	00	1	0	1	5	B	6	0	1	9	F	98	F	38		RSX310001				
																	/ /					

WB76

Routine Inspection

Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
24	06022014	1.0	MPZ	G1331	
	06/13/2016	1.0	MPZ	G1331	

Structural Adequacy	Deck Geometry	Underclrnce Adequacy	Operating Level	Alignment Adequacy	Waterway Adequacy	Deck Overall	Drain Cond	Drains	Scaling Severity	Scaling Percent	Deck Rutting	Exposed Reinf Steel	Superstruct Overall	Curb	Sidewalks	Paint	Number of Utilities	Substruct Overall	Channel Protection	Culvert	Pier Abutment	Scour	Approach Roadway	Retaining Walls	Pier Protection	Traffic Safety Bridge Rail	Traffic Safety Trans	Traffic Safety Guard Rail	Traffic Safety Term	Revise Rating	Repair Status	Card Check	Photos	Season	Soundings	Clearances	Monitor Structure
7	5	9	5	6	8	7	9	0	N	0	8	8	7	7	9	9	3	7	6	9	N	8	6	6	9	1	1	1	1	N							
☒	☒	☒											6																								

Sufficiency Rating: 79.89

WB77

Fracture Critical / UBIT Inspection

Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
			.			
		/ /	.			

Underwater Inspection

Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
			.			
		/ /	.			

Other Special Inspections

Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
			.			
		/ /	.			

WB78

Water Type	Flood Plain Intrusion	Flood Control	Scour History	Streambed Material	Substruct Stability	Waterway Obstruction	Streambed Stability	Streambed Anabranch	Piers in Water	Service On	Service Under	Work Type	Work Method
F	A	N	N	3	3	N	C	N	0	0	0	00	0

Proposed Improvements

Structure Improve Length	Roadway Width	Lanes On	Lanes Under	Total Costs In Thousands	Structure Cost In Thousands	Roadway Cost In Thousands	Estimate Year	Calc
0	0	0	0	0	0	0	0	N

Inspecting Agency Code	Inspecting Agency Number	Seismic Status-Superstruct Main Biennium	Seismic Status-Superstruct Approach Biennium	Seismic Status-Substruct Main Biennium	Seismic Status-Substruct Approach Biennium

BRIDGE INSPECTION REPORT

Status: Released

Printed On: 8/3/2017

Agency: Snohomish County

CD Guid: 22c5f4ee-5575-43f1-ac2f-9c656c520754

CD Date: 7/17/2017

Program Mgr: Roman G. Peralta

Br. No. 474 **SID** 08615500 **Br. Name** BENSON CREEK

Carrying MOUNTAIN LOOP HWY **Route On** 98960 **Mile Post** 1.12

Intersecting BENSON CREEK **Route Under** **Mile Post**

Mike Zethoval

Inspector's Signature MPZ Cert # G1331 Cert Exp Date 3/13/2019

Co-Inspector's Signature

8	7	Structural Eval	(1657)
5		Deck Geometry	(1658)
9		Underclearance	(1659)
8		Alignment	(1661)
8		Deck Overall	(1663)
8	7	Superstructure	(1671)
8		Substructure	(1676)
9		Culvert	(1678)
7		Chan/Protection	(1677)
N		Pier/Abut/Prot	(1679)
9		Drain Cond	(7664)
0		Drain Status	(7665)
N		Deck Scaling	(7666)
0		Scaling Pct	(7667)
8		Deck Rutting	(7669)
8		Exposed Rebar	(7670)
7		Curb Cond	(7672)

99		Operating Tons	(1552)
		Op RF	(1553)
69		Inventory Tons	(1555)
		Inv RF	(1556)
5		Operating Level	(1660)
A		Open/Closed	(1293)
8		Waterway	(1662)
8		Scour	(1680)
		Soundings Flag	(2693)
N		Revise Rating	(2688)
		Photos Flag	(2691)
		Measure Clrnc	(2694)
9		Sdwk Cond	(7673)
9		Paint Cond	(7674)
8		Approach Cond	(7681)
8		Retaining Wall	(7682)
9		Pier Prot	(7683)

2		No Utilities	(2675)
1		Bridge Rails	(1684)
1		Transition	(1685)
1		Guardrails	(1686)
1		Terminals	(1687)
3.00		Asphalt Depth	(2610)
	5.00	Design Curb Ht	(2611)
	33.0	Bridge Rail Ht	(2612)
1995		Year Built	(1332)
0		Year Rebuilt	(1336)
	Y	Subj to NBIS	(2614)

Alpha Span Type:

PCS

Sufficiency Rating 79.89

Low Risk

Inspections Performed:

Freq	Hrs	Date	Rep Type
24	1.0	7/17/2017	Routine
			Fract Crit
			UW
			Special
			Interim
			UWI
			Damage
			Safety
			Short Span
			In Depth
			Geometric

BMS Elements

Element	Element Description	Total	Units	State 1	State 2	State 3	State 4
13	Bridge Deck Surface	2,278	SF	2,278	0	0	0
51	Prestressed Conc Slab w/Coated Bars	2,278	SF	2,278	0	0	0
200	Abutment Fill	2	EA	2	0	0	0
215	Concrete Abutment	106	LF	106	0	0	0
310	Elastomeric Bearing	18	EA	18	0	0	0
330	Metal Bridge Railing	134	LF	134	0	0	0
361	Scour	2	EA	2	0	0	0
800	Asphaltic Concrete (AC) Overlay	2,278	SF	2,278	0	0	0

Notes

0 Oriented west to east.

11 Load rating 8/01 indicates rating factors are way above "1" for all AASHTO trucks (121-165-190 tons), and for all overloads. NRL rating needed by 2022.

BRIDGE INSPECTION REPORT

Status: Released | Printed On: 8/3/2017 | Agency: Snohomish County

CD Guid: 22c5f4ee-5575-43f1-ac2f-9c656c520754 | CD Date: 7/17/2017 | Program Mgr: Roman G. Peralta

Br. No. 474 **SID** 08615500 **Br. Name** BENSON CREEK

Carrying MOUNTAIN LOOP HWY **Route On** 98960 **Mile Post** 1.12

Intersecting BENSON CREEK **Route Under** **Mile Post**

Notes (Continued)

13	Top of voided slabs not visible for inspection, covered by ACP/BST overlay.
51	(9) lines prestressed, precast pcc void slabs (1995). Minor leakage through joints. Faint transverse hairline cracking near midspan mainly on exterior girders.
200	No problems noted.
215	PCC (cip). Shallow spall of 4" diameter on top of A1 below slab C. Short pcc (cip) wingwalls at the corners.
310	No defects noted, 2017.
330	Rail: Thrie beam on 3" x 6" rectangular steel tube posts, galv.
361	Stream flows north to south with thalweg near abut #1. Riprap @ abutments in good shape.
800	Overlay - 2009. BST added since. Minor rutting and wear in wheel lines.
1680	Vulnerability: single span bridge with good rip-rap at both abutments, no history of scour. Abutments founded upon 30" drilled shafts 21' below bottom of A1 and 26' below bottom of A2 per plans (None visible for inspection).
1685	Bridge sign in place. Delineator stickers on ends of terminals only. Flared "boxing glove" style terminals, with the NW a little low. Minor dings and scrapes throughout all rail.
2675	P.U.D. power cables and Viacom telephone cable installed inside slab void (per plans).
7672	Curbs: pcc (extruded), worn with cracking, fractures, and minor abrasion/spalling scattered throughout. Small length (1') missing at NE approach, for drainage?
7682	Gabion basket wall @ NE corner, (3) rows high = good. Short wall one row high @ NW corner near end of approach rail = good-to-fair. 2009 - undercutting at NE wall produced void appx. 20 ft x 3 ft x 2 ft - repaired 2010 w/addition of anchored LWD. Repair functioning well, 2017.

Repairs

Repair No	Pr	R	Repair Descriptions	Noted	Maint	Verified

Inspections Performed and Resources Required

Report Type	Date	Freq	Hrs	Insp	CertNo	Coinsp	Note
Routine	7/17/2017	24	1.0	MPZ	G1331		

Snohomish County
Bridge Load Rating Summary

JERI C. BERNSTEIN
STATE OF WASHINGTON
22128
REGISTERED PROFESSIONAL ENGINEER
EXPIRES 5/20/2003

9/5/2001

Structure ID No: 8615500

Bridge Name: Benson Creek
Bridge Number: 474

Load Rating By: MB Date: Aug-01

Number of Spans 1
Bridge Type: ~~Tee Beam~~ Void Slab
Year Built: 1995
Design Load: HS 25
Input Files: 474void1.bdf
Comments:

National Bridge Inventory (NBI) Load Factor Rating Method

AASHTO HS-20 Truck	RF	Live Load Factor	Controlling Point
Inventory (Service or Ultimate)	1.91	2.17	Moment @ 31' from support
Operating (Ultimate only)	3.57	1.3	Moment @ 31' from support
Fatigue		NA	

National Bridge Inventory (NBI) Load Factor Rating Method

	Actual Capacity	Required Capacity	(Tons)	NBI and SWIBS coding
Inventory	69	36		2 69
Operating	129	36		2 129

Safe Load Capacity Load Factor Rating Method Operating Only

Truck		RF	Live Load Factor	Controlling Point
AASHTO Type 3	Ultimate	4.84	1.3	Moment @ 31' from support
AASHTO Type 3S2	Ultimate	4.58	1.3	Shear @ face of support
AASHTO Type 3-3	Ultimate	4.75	1.3	Shear @ face of support
OL 1	Ultimate	2.78	1.3	Moment @ 31' from support
OL 2	Ultimate	2.23	1.3	Shear @ face of support

Safe Load Capacity Level (Load Factor Rating Method) (Posting Requirement)

Truck	Actual Capacity Tons	Required Capacity Tons	**Posting Required**
AASHTO Type 3	121	25	**No**
AASHTO Type 3S2	165	36	**No**
AASHTO Type 3-3	190	40	**No**
OL 1	133	48	**N/A**
OL 2	231	103.5	**N/A**

Notes: Live Load Factors in this table apply to Ultimate Load Rating Analysis only. Inventory service load rating analysis applies to prestressed or post tensioned members only. Fatigue is evaluated for concrete bridges in locations where no prestressing or post tensioning is present.

09/05/2001
br474.xls

Washington State Department of Transportation

WSBIS Local Agency Inventory Report

Bridge ID

1001	2009	2132	1019	1286	1021	2023	1156	2181	2183	2185	1188	1196
Structure ID	Bridge Number	Bridge Name	Owner	Cust	County	City	Location	Section	Twnshp	Range	Latitude	Longitude
08615500	474	BENSON CREEK	02	2	31	0000	11.2 MI E JCT SR 92	16	30	08E	48° 05' 24.00"	121° 46' 42.00"
	474										**48° 05' 26.36"**	**121° 46' 42.38"**

Facilities

1232	1256	1274	7281	7283	1276	1285	1288	1289	1293	1292	2295	7296
Feature Intersected	Facilities Carried	Region	Leg1	Leg2	FIPS	Toll	Para	Temp	OPC	NRHP	HAER	LRHP
BENSON CREEK	MOUNTAIN LOOP HWY	NW	39	0	74760	3	N		A	4		

Printed Date
8/3/2017

Sufficiency Rating:	
79.89	Item 2710 SR
	Item 2711 SD/FO
Low Risk	

Layout

1332	1336	1340	2346	1348	1352	1356	1360	1364	1367	1310	1312	1370	1374	1378	1379	1382	1383	1386	1387	1390	1394	1291	1397
Year Built	Year Rebuilt	Bridge Length	NBIS Length	Maximum Span Length	Lanes On	Curb to Curb Deck Width	Out to Out Deck Width	Sidewalk Left	Sidewalk Right	Skew	Flared	Min Vert Over Deck	Min Vert Under	Vert Code	Min Lat Under Right	Lat Code	Min Lat Under Left	Nav Ctl Code	Nav Vert Clear	Nav Horiz Clear	Nav Vert Lift Clear	Median	Appr Rdwy
1995	0	67		67	2	34.0	36.0	0.0	0.0	40	N	99' 99"	00' 00"	N	0.0	N	0.0	0	0	0		0	34
				64																			**29**

Crossing

1432	1433	1434	1435	2440	1445	1451	1453	1457	1463	1467	1477	1469	2410	7479	1483	1484	1485	1486	1487	1489	1490	1354	1491	1495	1499	1413	2441
On Under	Hwy Class	Service Level	Route Number	Milepost	ADT	Truck %	Year of ADT	Future ADT	Future ADT Year	Linear Referencing System	LRS Sub	LRS Milepost	NBI Bridge	Fed Aid Route #	NHS	BHS	STRAH	FLH	Funct. Class	NTN	Lane Use Direction	Lanes Under	Horizontal Clearance Route Dir	Horizontal Clearance Reverse Dir	Max Vert Clearance Route	Detour	Speed Limit
1	4	1	98960	1.12	3347	5	2015	4000	2037	98960			Y	X310	0	0	0	2	07	N	2	0	35' 07"			94	35

Design

1532	1533	1535	1536	1538	1541	1544	1545	1546	1547	1548	1549	1550	1551	1552	1553	1554	1555	1556	1585	1588	1590	7565	7557
Main Span Material	Main Span Design	Appr Span Material	Appr Span Design	Number Main Spans	Number Appr Spans	Service On	Service Under	Deck Type	Wearing Surface	Membrane	Deck Protect	Design Load Code	Oper Rating Method	Oper Rating Tons	Oper Rating Factor	Inv Rating Method	Inv Rating Tons	Inv Rating Factor	Border State Cd	Border Pct	Border Structure ID	Fed Aid Project No	Design Exemption
5	01	0	00	1	0	1	5	2	6	2	1	9	1	99		1	69					RSX310002	

Load Rating

2587	2588	2589	2590	2591	2592	2593	2594	2595	2596
Type 3	Type 3S2	Type 3-3	NRL	SHV 4	SHV 5	SHV 6	SHV 7	OL 1	OL 2
4.84	**4.58**	**4.75**						**2.78**	**2.23**

Waterway/ Prop Imp

7832	7833	7834	7835	7836	7837	7838	7839	7840	7841	1844	1846	1847	2853	2860	1867	1873	2870	1861	1879	2883
Water Type	Flood Pln Intr	Flood Control	Scour Hist	Strmbd Matrl	Substr Stablty	Wtrwy Obstr	Strmbd Stablty	Strmbd Anabrn	Piers In Watr	Type Work	Work Meth	Stru Imp Length	Roadway Width	Cost Per SF	Struct Cost	Rdwy Cost	Engr Cost	Total Cost	Estmt Year	Prop Imp Cost Calc
F	A	N	N	4	3	A	A	N	2											
											0									

Inspection Report Types

2920 Inspection	1990 Date	2646 Inspector	2649 Cert No	2654 Co-Inspector
Routine	7/17/2017	MPZ	G1331	
Fracture Critical				
Special Feature				
Underwater				

Inspection	Date	Inspector	Cert No	Co-Inspector
UW Interim				
Interim				
In Depth				
Damage				

Inspection	Date	Inspector	Cert No	Co-Inspector
Safety				
Short Span				
Geometric				
Info				
Inventory				

Control Data Guid: 22c5f4ee-5575-43f1-ac2f-9c656c520754 Control Data Date: 7/17/2017

INFORMATIONAL

BRIDGE INSPECTION REPORT

Ver Date: 10/11/2016

Agency: Snohomish County

Status: Released

Printed On: 10/24/20

Program Mgr: Roman G. Peralta

Bridge No.	538	Page:	1/4	**Structure Type**	
Bridge Name	S.F. STILLAGUAMISH RIVER	**Route**	98960	**Location**	12.1 E JCT SR 92
Structure ID	08194600	**MilePost**	12.06	**Intersecting**	S.F. STILLAGUAMISH RIVER

Inspector's Signature MPZ IDent# G1331

Co-Inspector's Signature

6	☐	Structural Adqcy	(657)	N	☐	Pier/Abut/Protect	(679)	1954		Year Built	(332)
3	☐	Deck Geometry	(658)	7	☐	Scour	(680)	0		Year Rebuilt	(336)
9	☐	Underclearance	(659)	9	☐	Retaining Walls	(682)	62	☐	Oper Rating	(551)
5	☐	Operating Level	(660)	9	☐	Pier Protection	(683)	37	☐	Inv Rating	(554)
8	☐	Alignment Adqcy	(661)	1	☐	Bridge Rails	(684)	A	☐	Open Close	(293)
8	☐	WaterwayAdqcy	(662)	1	☐	Transition	(685)	1500	☐	Vert Over Deck	(360)
7	☐	Deck Overall	(663)	1	☐	Guardrails	(686)	0000	☐	Vert Under	(374)
7	☐	Drains Condition	(664)	0	☐	Terminals	(687)	N	☐	Vert Und Code	(378)
6	☐	Superstructure	(671)	N	☐	Revise Rating	(688)	0.00	☐	Asphalt Depth	
0	☐	Number Utilities	(675)		☐	Photos Flag	(691)	45	☐	Speed Limit	
7	☐	Substructure	(676)		☐	Soundings Flag	(693)				
5	☐	Chan/Protection	(677)		☐	Measure Clearance	(694)				
9	☐	Culvert	(678)								

Inspections Performed

IT	NT	HRS	Date	Rep Type
Y	24	1.0	06/13/2016	Routine
Y	24	3.5	06/13/2016	Fract Crit
				Underwater
				Special
				Interim
				Equipment
				Damage
				Safety
				Short Span

Total: 0.0

Suff Rating: 56.89 FO | 56.89 FO

BMS Elements

Element	Element Description	Total	Units	State 1	State 2	State 3	State 4
12	Concrete Deck	4238	SF	4238	0	0	0
13	Bridge Deck Surface	1248	SF	1248	0	0	0
35	Concrete Deck Soffit	4238	SF	4236	0	2	0
38	Concrete Slab	1248	SF	1248	0	0	0
113	Steel Stringer	640	LF	640	0	0	0
126	Steel Thru Truss	320	LF	320	0	0	0
152	Steel Floor Beam	248	LF	248	0	0	0
205	Concrete Pile/Column	16	EA	16	0	0	0
210	Concrete Pier Wall	72	LF	66	0	6	0
215	Concrete Abutment	60	LF	60	0	0	0
311	Moveable Bearing (roller, sliding, etc)	2	EA	0	2	0	0
313	Fixed Bearing	2	EA	2	0	0	0

330	Metal Bridge Railing	420	LF	420	0	0	0
357	Pack Rust	2	EA	1	1	0	0
360	Bridge Movement	1	EA	0	1	0	0
361	Scour	2	EA	2	0	0	0
362	Impact Damage	2	EA	1	1	0	0
407	Steel Angle Header	26	LF	26	0	0	0
408	Steel Sliding Plate	26	LF	26	0	0	0
901	Red Lead Alkyd Paint System	20000	SF	19770	200	30	0

Notes

0	Bridge is oriented west to east in accordance with route convention. Routine inspections are in EVEN years and Interim inspections are in ODD years. Interim inspections are to monitor scour at piers and bridge movement.
12	Truss deck has transverse cracks and is worn in wheel lines.
13	Slab deck is worn in wheel lines.
35	Soffit has a few minor spalls and honeycombed areas. Overhangs have transverse leaching cracks. Edge spalls at most floorbeams. Near Floor Beam 6, there are two spalls. One spall measures 18" x 12" x 4" deep with 12" of exposed rebar, and the other is 18" x 8" x 3" deep. At the south side of Pier 3, there is a crack/delamination in the edge and soffit near the joint (see photo #3).
38	
113	Stringers have surface rust at top flange interface with deck and at end copes.
126	Truss has areas of rust blooms with minor rust pitting. Much of the rust pitting has been painted over (see photo #5). Verticals and diagonals have extra 3/4" holes in flanges from old rail connections (see photo #7). Portals, sways, and one vertical have impact damage: West portal lower flange is bent over a 3 ft. section above the eastbound lane. Sways at Panel Points 2, 3, and 5 have minor bends in flanges above westbound lane. North L3-U3 south flange is bent in 5/8" over 1 ft. near sway connection. Sway at Panel Point 4 has been repaired with new bolted sections. East portal lower flange and center diagonal gusset have been repaired. Upper flange is bent. At each of the four end posts, the top cover plate just above bearing has rivets with up to 20% top head section loss (see photo #6). At U3-L4 and L3-U4 in both trusses, the north and south angles are transversely tack welded to fill plates near upper and lower chord connections (four locations). See photo #8, typical. See attached FC Report for more truss details.
152	Floorbeams have rust on top flange at the interface with the deck, the worst being at Floorbeam 5.
205	Piers 2 and 3 each have six concrete stub columns above the pier walls and the abutments have two columns each. At Pier 2, Column 2A has full width crack open to .040".
210	Pier Wall 2 has a 3 ft. x 2 ft. x 7" deep spall with 26" of exposed rebar on the top NW corner (see photo #11). REPAIR 10001. Pier Wall 3 has pattern cracks on west face.

BRIDGE INSPECTION REPORT

Ver Date: 10/11/2016 Agency: Snohomish County

Status: Released Printed On: 10/24/20 Program Mgr: Roman G. Peralta

Bridge No. 538 Page: 3/4 **Structure Type**

Bridge Name S.F. STILLAGUAMISH RIVER **Route** 98960 **Location** 12.1 E JCT SR 92

Structure ID 08194600 **MilePost** 12.06 **Intersecting** S.F. STILLAGUAMISH RIVER

215	The west abutment is supported by deep foundation and has withstood flood events in 2003 and 2006 that washed out the approach roadway with no harm to the bridge itself. The shallow spread footing at Pier 4 was reinforced with deep drilled shafts by contractor in November 2007 to prevent further bridge movement (see drawings in File 1). Pier 1 should be tied back to prevent further bridge movement. REPAIR 10003.
311	The rocker bearings at Pier 2 are tipped out approximately 10 degrees. Superstructure above is jammed tight due to pier movement.
313	
330	Thriebeam not continuous at truss ends (see photo #4). REPAIR #10000.
357	Minor pack rust is starting in a few locations.
360	At Pier 2 the steel Floorbeam and concrete approach span deck are jammed tight, suggesting one or both of the Pier walls have tipped. This could be a result of undermining of the pile caps and earth pressure from backfill placed against the Pier walls.
361	Large rip rap at Pier 3. Drilled shafts have been installed at east abutment. See Element 215.
362	See Element 126.
407	Pier 3 joint is above pinned bearing, allows for rotation only and has no measurable movement.
408	Top gap of Pier 2 joint measures 3/4" at centerline. Joint has been pushed shut. Span 1 and 2 decks are locked tight due to rotation of Piers 2 and 3 toward the center of the river.
677	Degradation at east bank downstream has washed out Mount Pilchuck Rd.
680	Scour mitigation needs to be evaluated. REPAIR 10002.
681	West approach roadway repair overlayed with ACP April, 2007.
693	Take soundings every routine inspection on this scour critical bridge.
901	Painted in 1987 by county maintenance crew. Verticals, diagonals and the bearings in the "splash zone" were cleaned and overcoated in 2005. Paint is peeling in areas and has small rust blooms throughout; otherwise paint, although no longer attractive, is still covering most of the base steel. Minor rust along top edges of floor beams and stringers at interface with concrete deck.

Repairs

Repair No	Pr	R	Repair Description	Noted	Maint	Verified
10000	2	B		08/06/08		
10001	2	B		08/06/08		
10003	2	B		08/06/08		
10002	S	B		08/06/08		

Inspections Performed and Resources Required

Report Type	Date	IT	Frq	Hrs	Insp	CertNo	Coinsp	Note
Routine	06/13/16		24	1.0	ABK	G1220	PFK	8/24/2016Entered only Inspection Date, Hours, Inspectors' Initials and any data modified by the inspector on the NBI or WB71 through WB75 panels.MHB

Resources	Use	Hour	Min	Req	Max	Notes

BRIDGE INSPECTION REPORT

Ver Date: 10/11/2016 Agency: Snohomish County

Status: Released Printed On: 10/24/20 Program Mgr: Roman G. Peralta

Bridge No.	538	Page:	4/4	**Structure Type**	
Bridge Name	S.F. STILLAGUAMISH RIVER	**Route**	98960	**Location**	12.1 E JCT SR 92
Structure ID	08194600	**MilePost**	12.06	**Intersecting**	S.F. STILLAGUAMISH RIVER

Fracture Critical	06/13/16	24	3.5	ABK	G1220	PFK	8/24/2016Entered only Inspection Date, Hours, Inspectors' Initials and any data modified by the inspector on the NBI or WB71 through WB75 panels.MHB

Resources	**Use**	**Hour**	**Min**	**Req**	**Max**	**Notes**
UBIT	60		50	50	60	Truss was inspected using UB60 with two picks through the south truss. Due to close proximity of wires to the north truss, the uppers were inspected without deploying through the truss. Instead, UBIT bucket was raised along side the truck by raising Boom 1 and opening Boom 2.
Flagging	LA					Contact John Heighway of Snohomish County at 425-388-3488 ext 3195 for flagging.

Informational	09/28/16			MPZ	G1331		See Files tab for scanned copy of the 2016 WSDOT FC Report. ADT also updated.

Resources	**Use**	**Hour**	**Min**	**Req**	**Max**	**Notes**

COPY

Snohomish County
Bridge Load Rating Summary

IZZAT H. HASAYEN
STATE OF WASHINGTON
26933
REGISTERED PROFESSIONAL ENGINEER
10/20/04
EXPIRES 2/9/ 2004

Structure ID No:

Bridge Name: South Fork Stilly River Bridge
Bridge Number: # 537 & 538

Load Rating By: SHC Date: Aug-03

Number of Spans: Main Span #2 (CONTROLS) GdS 11/26/03
Bridge Types: Steel Truss
Year Built: 1953
Design Load: H20-S16-44

Comments: COMPLETE TEXT OF LOAD RATING IS FILED SEPARATELY IN LOAD RATING FILE.

National Bridge Inventory (NBI) Load Factor Rating Method

AASHTO HS-20 Truck	*RF*	Live Load Factor	*Controlling Point*
Inventory (Service or Ultimate)	1.04	2.17	Moment @ Center of Stringer
Operating (Ultimate Only)	1.73	1.30	Moment @ Center of Stringer
Fatigue		N/A	

National Bridge Inventory (NBI) Load Factor Rating Method

	Actual Capacity	*Required Capacity*	**NBI and SWIBS coding**
Inventory	37 Tons	36 Tons	**2 37**
Operating	62 Tons	36 Tons	**2 62**

Safe Load Capacity (Load Resistance Factor Rating Method)

Truck	*RF*	Live Load Factor	Resistance Factor	*Controlling Point*
HS-20	1.29	1.45	0.75	Moment @ Center of Stringer
AASHTO 1 (Type 3)	1.47	1.45	0.75	Moment @ Center of Stringer
AASHTO 2 (Type 3S2)	1.60	1.45	0.75	Moment @ Center of Stringer
AASHTO 3 (Type 3-3)	1.78	1.45	0.75	Moment @ Center of Stringer
OL 1	1.26	1.30	0.75	Moment @ Center of Stringer
OL 2	0.87	1.30	0.75	Truss Bottom Chord

Safe Load Capacity Level (Load Resistance Factor Rating Method)

Truck	*Actual Capacity*	*Required Capacity*	*Posting Required*
HS-20	46 Tons	36 Tons	**N/A**
AASHTO 1 (Type 3)	37 Tons	25 Tons	**No**
AASHTO 2 (Type 3S2)	58 Tons	36 Tons	**No**
AASHTO 3 (Type 3-3)	71 Tons	40 Tons	**No**
OL 1	60 Tons	48 Tons	**N/A**
OL 2	90 Tons	104 Tons	**N/A**

Snohomish County
Bridge Load Rating Summary

JERI C. BERNSTEIN
STATE OF WASHINGTON
32128
REGISTERED PROFESSIONAL ENGINEER
9/6/2001
EXPIRES 5/20/2001

Structure ID No: 8603300

Bridge Name: S.F. Stillaguamish River
Bridge Number: 538

Load Rating By: MB Date: Aug-01

Number of Spans 3
Bridge Type: CIP Slab (SPANS #1 & #3) GB
Year Built: 1954
Design Load: HS 20
Input Files: 537cip1.bdf
Comments: CIP approaches rated. Consultant ~~is currently rating~~ HAS RATED the steel truss mainspan.

National Bridge Inventory (NBI) Load Factor Rating Method			
AASHTO HS-20 Truck	RF	Live Load Factor	Controlling Point
Inventory (Service or Ultimate)	1.08	2.17	Span 1, shear @ 21' from support
Operating (Ultimate only)	1.81	1.3	Span 1, shear @ 21' from support
Fatigue	1.86	NA	Span 1, 11' from support

National Bridge Inventory (NBI) Load Factor Rating Method			
	Actual Capacity	Required Capacity (Tons)	**NBI and SWIBS coding**
Inventory	39	36	**2 39**
Operating	65	36	**2 65**

Safe Load Capacity Load Factor Rating Method Operating Only				
Truck		RF	Live Load Factor	Controlling Point
AASHTO Type 3	Ultimate	2.39	1.3	Span 1, shear @ 21' from support
AASHTO Type 3S2	Ultimate	2.47	1.3	Span 1, shear @ 21' from support
AASHTO Type 3-3	Ultimate	2.88	1.3	Span 1, shear @ 21' from support
OL 1	Ultimate	1.67	1.3	Span 1, shear @ 1' from support
OL 2	Ultimate	1.51	1.3	Span 1, shear @ 21' from support

Safe Load Capacity Level (Load Factor Rating Method) (Posting Requirement)			
Truck	Actual Capacity Tons	Required Capacity Tons	**Posting Required**
AASHTO Type 3	60	25	**No**
AASHTO Type 3S2	89	36	**No**
AASHTO Type 3-3	115	40	**No**
OL 1	80	48	**N/A**
OL 2	156	103.5	**N/A**

Notes: Live Load Factors in this table apply to Ultimate Load Rating Analysis only. Inventory service load rating analysis applies to prestressed or post tensioned members only. Fatigue is evaluated for concrete bridges in locations where no prestressing or post tensioning is present.

Structure Identifier	Bridge Number	Owner Code	County Number	City Number	Update
08194600	538	02	31	00000	0

Washington State Department of Transportation
WSBIS Inventory Report

10/24/2016

WB71

Bridge Name	Location	Section	Township	Range	Latitude	Longtitude
S.F. STILLAGUAMISH RIVER	12.1 E JCT SR 92	15	30	08E	48°05'06.00"	121°45'42.00"

WB72

Feature Intersected	Facilities Carried	Region	FIPS Place Code	Legis District (1)	Legis District (2)	Toll	Custodian	Parallel Structure	Temporary Structure	Critical Facility	Median	Hist Sig	Open Closed	Program Year
S.F. STILLAGUAMISH RIVER	MOUNTAIN LOOP HWY.	NW	74760	39	0	3	02	N		☒	0	5	A	
										☒				

WB73

Year Built	Year ReBuilt	Bridge Length	NBIS Length	Maximum Span Length	Lanes On	Lanes Under	Curb to Curb Deck Width	Out to Out Deck Width	Sidewalk Curb Left	Sidewalk Curb Right	Min Vert Clearance Over Deck	Min Vert Clearance Under Bridge	Code	Min Lat UnderClr Right	Code	Min Lat UnderClr Left	Navigation Control	Navigation Vertical Clearance	Navigation Horizontal Clrnce	Vert Lift Min Clrnce	Appr Roadway Width	Skew Angle	Flare
1954	0	211	.	163	2	0	26.0'	29.2'	0.5'	0.5'	15'00"	0"	N	0.0'	N	0.0'	0	0'	0'	'	30'	0°	N

WB74

On Under	High way Class	Service Level	Route Number	Mile Post	ADT on Inventory Route	Truck ADT PCT	ADT Year	Future ADT	Future ADT Year	Linear Referencing System Route	LRS Sub Route	Fed Aid Route	Nat Hwy System	Base Hwy Network	Strahnet	Fed Lands Highway	Fed Funct Class	National Truck Net	Lane Use Direction	Horizontal Clearance Route Dir	Horizontal Clearance Reverse Dir	Max Vertical Clearance Route Dir	Detour Length
1	4	1	98960	12.06	2412	5	2011	3000	2034			X310	0	0	0	2	07	N	2	26'00"	'"	15'03"	94
				.	3,145		2,015	4,000	2,038														

WB75

Main Span Material	Main Span Design	Appr Span Material	Appr Span Design	Number of Main Spans	Number of Appr Spans	Service On	Service Under	Deck Type	Wearring Surface	Membrance	Fed Deck Protection	Design Load	Oper Rtng Method	Oper Rtng Tons	Invt Rtng Method	Invt Rtng Tons	Design Exception Date	Federal Aid Project	Border State Code	Border State PCT	Border State Structure Identifier
3	10	1	01	1	2	1	5	1	1	0	0	5	F	62	F	37	/ /				

WB76

Routine Inspection						
Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
24	06132016	1.0	ABK	G1220	PFK

Structural Adequacy	Deck Geometry	Underclrnce Adequacy	Operating Level	Alignment Adequacy	Waterway Adequacy	Deck Overall	Drain Cond	Drains	Scaling Severity	Scaling Percent	Deck Rutting	Exposed Reinf Steel	Superstruct Overall	Curb	Sidewalks	Paint	Number of Utilities	Substruct Overall	Channel Protection	Culvert	Pier Abutment	Scour	Approach Roadway	Retaining Walls	Pier Protection	Traffic Safety Bridge Rail	Traffic Safety Trans	Traffic Safety Guard Rail	Traffic Safety Term	Revise Rating	Repair Status	Card Check	Photos	Season	Soundings	Clearances	Monitor Structure
6	3	9	5	8	8	7	7	1	L	1	7	8	6	6	9	6	0	7	5	9	N	7	6	9	9	1	1	1	0	N							
☒	☒	☒																																			

Sufficiency Rating: 56.89

FO

WB77

Fracture Critical / UBIT Inspection							
Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
U	24	06132016	3.5	ABK	G1220	PFK

Underwater Inspection							
Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
		/ /	.			

Other Special Inspections							
Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
		/ /	.			

WB78

Water Type	Flood Plain Intrusion	Flood Control	Scour History	Streambed Material	Substruct Stability	Waterway Obstruction	Streambed Stability	Streambed Anabranch	Piers in Water
F	A	N	C	3	7	A	B	A	2

Proposed Improvements											
Service On	Service Under	Work Type	Work Metho	Structure Improve Length	Roadway Width	Lanes On	Lanes Under	Total Costs In Thousands	Structure Cost In Thousands	Roadway Cost In Thousands	Estimate Year	Calc
1	5	31	1	220	32	2	0	117	78	8	2016	Y

Inspecting Agency Code	Inspecting Agency Number	Seismic Status-Superstruct Main Biennium	Seismic Status-Superstruct Approach Biennium	Seismic Status-Substruct Main Biennium	Seismic Status-Substruct Approach Biennium

BRIDGE INSPECTION REPORT

Status: Released
Printed On: 11/14/2017
Agency: Snohomish County
CD Guid: b51eb7ee-9525-4369-9151-4e0ae06dfdcc
CD Date: 9/14/2017
Program Mgr: Roman G. Peralta

Br. No. 497 **SID** 08316600 **Br. Name** TWENTYTWO CREEK

Carrying MOUNTAIN LOOP HWY. **Route On** 98960 **Mile Post** 12.83

Intersecting TWENTYTWO CREEK **Route Under** **Mile Post**

Inspector's Signature MPZ Cert # G1331 Cert Exp Date 3/13/2019

Co-Inspector's Signature MMA

5		Structural Eval	(1657)
3		Deck Geometry	(1658)
9		Underclearance	(1659)
8		Alignment	(1661)
7		Deck Overall	(1663)
5	6	Superstructure	(1671)
5		Substructure	(1676)
9		Culvert	(1678)
5		Chan/Protection	(1677)
N		Pier/Abut/Prot	(1679)
9		Drain Cond	(7664)
0		Drain Status	(7665)
N		Deck Scaling	(7666)
0		Scaling Pct	(7667)
0		Deck Rutting	(7669)
0		Exposed Rebar	(7670)
5		Curb Cond	(7672)

59		Operating Tons	(1552)
		Op RF	(1553)
35		Inventory Tons	(1555)
		Inv RF	(1556)
5		Operating Level	(1660)
A		Open/Closed	(1293)
6		Waterway	(1662)
3		Scour	(1680)
Y		Soundings Flag	(2693)
N		Revise Rating	(2688)
		Photos Flag	(2691)
		Measure Clrnc	(2694)
9		Sdwk Cond	(7673)
9		Paint Cond	(7674)
8		Approach Cond	(7681)
9		Retaining Wall	(7682)
9		Pier Prot	(7683)

2		No Utilities	(2675)
1		Bridge Rails	(1684)
1		Transition	(1685)
1		Guardrails	(1686)
1		Terminals	(1687)
3.00		Asphalt Depth	(2610)
	9.00	Design Curb Ht	(2611)
	31.5	Bridge Rail Ht	(2612)
1952		Year Built	(1332)
0		Year Rebuilt	(1336)
	Y	Subj to NBIS	(2614)

Alpha Span Type:

CG

Sufficiency Rating 54.45 FO

High Risk

Inspections Performed:

Freq	Hrs	Date	Rep Type
24	1.0	9/14/2017	Routine
			Fract Crit
			UW
			Special
			Interim
			UWI
			Damage
			Safety
			Short Span
			In Depth
			Geometric

BMS Elements

Element	Element Description	Total	Units	State 1	State 2	State 3	State 4
12	Concrete Deck	815	SF	815	0	0	0
35	Concrete Deck Soffit	815	SF	815	0	0	0
110	Concrete Girder	210	LF	204	6	0	0
216	Timber Abutment	80	LF	80	0	0	0
222	Timber Foundation	64	LF	64	0	0	0
228	Timber Submerged Pile/Column	12	EA	12	0	0	0
235	Timber Pier Cap	64	LF	64	0	0	0
330	Metal Bridge Railing	60	LF	60	0	0	0
342	Timber Pedestrian Railing	60	LF	60	0	0	0
361	Scour	2	EA	2	0	0	0
800	Asphaltic Concrete (AC) Overlay	815	SF	815	0	0	0

Notes

BRIDGE INSPECTION REPORT

Status: Released
Printed On: 11/14/2017
Agency: Snohomish County
CD Guid: b51eb7ee-9525-4369-9151-4e0ae06dfdcc
CD Date: 9/14/2017
Program Mgr: Roman G. Peralta

Br. No. 497 **SID** 08316600 **Br. Name** TWENTYTWO CREEK
Carrying MOUNTAIN LOOP HWY. **Route On** 98960 **Mile Post** 12.83
Intersecting TWENTYTWO CREEK **Route Under** **Mile Post**

Notes (Continued)

0	Oriented West to East.
11	Load rating (8/01) indicates rating factors for all AASHTO trucks are above "2" (54,82,106 tons) and good for overloads too. NRL rating update needed by 2022. See copy of summary sheet under Records tab.
12	Deck: pcc (cip). Inaccessible for inspection from above (ACP), but soffit side looks good.
35	Good conditon.
110	Precast pcc rectangular beams 9" x 25", (7) lines. Girder "G" has drift damage several places - one near A1 with 12" long exposed rebar (#10?) & 2 exposed stirrups, and girder "F" has one small (3" diam x 1/2" deep) ding. Both girders were patched 2015 (6 lf). All have tight hairline vertical cracks near midspan and randomly elsewhere. Pcc (cip) diaphragms over caps = OK.
216	4" x 12" creosote-treated timber bulkhead planks, losing some fill at SE corner of bridge, voids created within larger rocks - MONITOR. 2008 -two vertical planks added. Planks noted as soft - 2009. 2015 - void at SE is 2' high x 3' wide x 5' deep but appears stable. Not much change 2017, other than some of the riprap has settled down a little at SE corner, lessening the void.
222	Sills: 12" x 12" creo-tr timber (1952). Top half of sill is exposed at abut #1 near post A and a few misc. places at A2. Sills rest on CIP spread footings (not visible for inspection).
228	Posts: 12" x 12" creo-tr timber (1952) 3" x 10" creo-tr timber cross bracing = OK.
235	Caps: 12" x 14" creo-tr timber, dapped for superelevation (1952).
330	Rail: thrie beam on 6" x 6" steel "I" beam posts.
342	Treated timber pedestrian rail, 3"x8" mounted above bridge rail.
361	Stream flows south to north under bridge. Void behind SE wingwall planks, but larger rock stable in that area.
800	ACP, with Glasgrid fiberglass reinforcing mesh (1998). No signs of reflective cracking. Fresh chip seal - 2015.
1677	Minor wood debris buildup, slope protection at SE corner eroding some. Channel heavily lined with cobbles and boulders of all sizes.
1680	Scour vulnerability: Bridge is scour critical (spread footings). Stream gradient is very steep with high flow velocity. Previous flood events have not caused any significant scour, however.
1685	10" x 10" creo-treated timber posts and blocks. Guardrail with minor dings and rust.
1687	Bridge sign OK.
2675	4" galv steel conduit (elect. power) on downstream side of bridge; 4" galv steel conduit (telephone) on upstream "sidewalk".
7672	Curbs: "Safety walks" approx 1' - 9" wide both sides of bridge, pcc - 1 minor surface erosion, minor collision damage. One 6" x 12" spall on outboard face of downstream curb with exposed rebar.

Repairs

Repair No	Pr	R	Repair Descriptions	Noted	Maint	Verified
10006	3	B	Replace rotted 6x8 guardrail block #5 @ NE corner.	9/15/2015		

Inspections Performed and Resources Required

Report Type	Date	Freq	Hrs	Insp	CertNo	Coinsp	Note
Routine	9/14/2017	24	1.0	MPZ	G1331	MMA	

Snohomish County
Bridge Load Rating Summary

JERI C. BERNSTEIN
STATE OF WASHINGTON
22128
REGISTERED PROFESSIONAL ENGINEER
9/6/2001
EXPIRES 5/20/2003

Structure ID No: 8316600

Bridge Name: Twentytwo Creek
Bridge Number: 497

Load Rating By: MB Date: Aug-01

Number of Spans 1
Bridge Type: CIP Girders
Year Built: 1952
Design Load: Other or Unknown
Input Files: 497cip1.bdf
Comments:

National Bridge Inventory (NBI) Load Factor Rating Method

AASHTO HS-20 Truck	RF	Live Load Factor	Controlling Point
Inventory (Service or Ultimate)	0.98	2.17	Shear @ 6' from support
Operating (Ultimate only)	1.64	1.3	Shear @ 6' from support
Fatigue	1.40	NA	@ 17' from support

National Bridge Inventory (NBI) Load Factor Rating Method

	Actual Capacity	Required Capacity	(Tons)	**NBI and SWIBS coding**
Inventory	35	36		**2 35**
Operating	59	36		**2 59**

Safe Load Capacity Load Factor Rating Method Operating Only

Truck		RF	Live Load Factor	Controlling Point
AASHTO Type 3	Ultimate	2.17	1.3	Shear @ 6' from support
AASHTO Type 3S2	Ultimate	2.28	1.3	Shear @ 6' from support
AASHTO Type 3-3	Ultimate	2.66	1.3	Shear @ 6' from support
OL 1	Ultimate	1.52	1.3	Shear @ face of support
OL 2	Ultimate	1.32	1.3	Moment @ 14' from support

Safe Load Capacity Level (Load Factor Rating Method) (Posting Requirement)

Truck	Actual Capacity Tons	Required Capacity Tons	**Posting Required**
AASHTO Type 3	54	25	**No**
AASHTO Type 3S2	82	36	**No**
AASHTO Type 3-3	106	40	**No**
OL 1	73	48	**N/A**
OL 2	137	103.5	**N/A**

Notes: Live Load Factors in this table apply to Ultimate Load Rating Analysis only. Inventory service load rating analysis applies to prestressed or post tensioned members only. Fatigue is evaluated for concrete bridges in locations where no prestressing or post tensioning is present.

Washington State Department of Transportation

WSBIS Local Agency Inventory Report

Bridge ID

1001	2009	2132	1019	1286	1021	2023	1156	2181	2183	2185	1188	1196
Structure ID	Bridge Number	Bridge Name	Owner	Cust	County	City	Location	Section	Twnshp	Range	Latitude	Longitude
08316600	497	TWENTYTWO CREEK	02	2	31	0000	12.8 E JCT SR 92	23	30	08E	48° 04' 46.00"	121° 45' 04.00"
	497										**48° 04' 46.48"**	**121° 45' 04.42"**

Facilities

1232	1256	1274	7281	7283	1276	1285	1288	1289	1293	1292	2295	7296
Feature Intersected	Facilities Carried	Region	Leg1	Leg2	FIPS	Toll	Para	Temp	OPC	NRHP	HAER	LRHP
TWENTYTWO CREEK	MOUNTAIN LOOP HWY.	NW	39	0	74760	3	N		A	5		

Printed Date
11/14/2017

Sufficiency Rating:	
54.45 FO	Item 2710 SR Item 2711 SD/FO
High Risk	

Layout

1332	1336	1340	2346	1348	1352	1356	1360	1364	1367	1310	1312	1370	1374	1378	1379	1382	1383	1386	1387	1390	1394	1291	1397
Year Built	Year Rebuilt	Bridge Length	NBIS Length	Maximum Span Length	Lanes On	Curb to Curb Deck Width	Out to Out Deck Width	Sidewalk Left	Sidewalk Right	Skew	Flared	Min Vert Over Deck	Min Vert Under	Vert Code	Min Lat Under Right	Lat Code	Min Lat Under Left	Nav Ctl Code	Nav Vert Clear	Nav Horiz Clear	Nav Vert Lift Clear	Median	Appr Rdwy
1952	0	31		29	2	26.3	29.8	1.5	1.5	0	N	99' 99"	00' 00"	N	0.0	N	0.0	0	0	0		0	24

Crossing

1432	1433	1434	1435	2440	1445	1451	1453	1457	1463	1467	1477	1469	2410	7479	1483	1484	1485	1486	1487	1489	1490	1354	1491	1495	1499	1413	2441
On Under	Hwy Class	Service Level	Route Number	Milepost	ADT	Truck %	Year of ADT	Future ADT	Future ADT Year	Linear Referencing System	LRS Sub	LRS Milepost	NBI Bridge	Fed Aid Route #	NHS	BHS	STRAH	FLH	Funct. Class	NTN	Lane Use Direction	Lanes Under	Horizontal Clearance Route Dir	Horizontal Clearance Reverse Dir	Max Vert Clearance Route	Detour	Speed Limit
1	4	1	98960	12.83	2556	6	2015	3000	2037	98960			Y	X310	0	0	0	2	07	N	2	0	29' 00"			94	45
																							26' 04"				

Design

1532	1533	1535	1536	1538	1541	1544	1545	1546	1547	1548	1549	1550	1551	1552	1553	1554	1555	1556	1585	1588	1590	7565	7557
Main Span Material	Main Span Design	Appr Span Material	Appr Span Design	Number Main Spans	Number Appr Spans	Service On	Service Under	Deck Type	Wearing Surface	Membrane	Deck Protect	Design Load Code	Oper Rating Method	Oper Rating Tons	Oper Rating Factor	Inv Rating Method	Inv Rating Tons	Inv Rating Factor	Border State Cd	Border Pct	Border Structure ID	Fed Aid Project No	Design Exemption
1	02	0	00	1	0	1	5	1	6	0	0	0	1	59		1	35						

Load Rating

2587	2588	2589	2590	2591	2592	2593	2594	2595	2596
Type 3	Type 3S2	Type 3-3	NRL	SHV 4	SHV 5	SHV 6	SHV 7	OL 1	OL 2
2.17	**2.28**	**2.66**						**1.52**	**1.32**

Waterway/ Prop Imp

7832	7833	7834	7835	7836	7837	7838	7839	7840	7841	1844	1846	1847	2853	2860	1867	1873	2870	1861	1879	2883
Water Type	Flood Pln Intr	Flood Control	Scour Hist	Strmbd Matrl	Substr Stablty	Wtrwy Obstr	Strmbd Stablty	Strmbd Anabrn	Piers In Watr	Type Work	Work Meth	Stru Imp Length	Roadway Width	Cost Per SF	Struct Cost	Rdwy Cost	Engr Cost	Total Cost	Estmt Year	Prop Imp Cost Calc
F	A	N	N	5	1	N	D	N	2	31	1	34	30	11	8	1	3	12	2015	Y
												41	**38**	**800**	**623**	**125**	**498**	**1246**	**2014**	

Inspection Report Types

2920 Inspection	1990 Date	2646 Inspector	2649 Cert No	2654 Co-Inspector
Routine	9/14/2017	MPZ	G1331	MMA
Fracture Critical				
Special Feature				
Underwater				

Inspection	Date	Inspector	Cert No	Co-Inspector
UW Interim				
Interim				
In Depth				
Damage				

Inspection	Date	Inspector	Cert No	Co-Inspector
Safety				
Short Span				
Geometric				
Info				
Inventory				

Control Data Guid: b51eb7ee-9525-4369-9151-4e0ae06dfdcc Control Data Date: 9/14/2017

BRIDGE INSPECTION REPORT

Status: Released | Printed On: 9/6/2017 | Agency: Snohomish County

CD Guid: 7e42a225-3043-46a7-a446-9c1918f39cb4 | CD Date: 8/29/2017 | Program Mgr: Roman G. Peralta

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Br. No. 547 **SID** 08328800 **Br. Name** BLACK CREEK #547

Carrying MOUNTAIN LOOP HWY **Route On** 98960 **Mile Post** 14.33

Intersecting BLACK CREEK **Route Under** **Mile Post**

Inspector's Signature MPZ Cert # G1331 Cert Exp Date 3/13/2019

Co-Inspector's Signature PAH

4		Structural Eval	(1657)
3		Deck Geometry	(1658)
9		Underclearance	(1659)
8		Alignment	(1661)
6		Deck Overall	(1663)
6		Superstructure	(1671)
4		Substructure	(1676)
9		Culvert	(1678)
5		Chan/Protection	(1677)
N		Pier/Abut/Prot	(1679)
5		Drain Cond	(7664)
1		Drain Status	(7665)
N		Deck Scaling	(7666)
0		Scaling Pct	(7667)
0		Deck Rutting	(7669)
0		Exposed Rebar	(7670)
5		Curb Cond	(7672)

59		Operating Tons	(1552)
		Op RF	(1553)
35		Inventory Tons	(1555)
		Inv RF	(1556)
5		Operating Level	(1660)
D		Open/Closed	(1293)
5		Waterway	(1662)
3		Scour	(1680)
	Y	Soundings Flag	(2693)
N		Revise Rating	(2688)
		Photos Flag	(2691)
		Measure Clrnc	(2694)
9		Sdwk Cond	(7673)
9		Paint Cond	(7674)
8		Approach Cond	(7681)
9		Retaining Wall	(7682)
9		Pier Prot	(7683)

1		No Utilities	(2675)
1		Bridge Rails	(1684)
1		Transition	(1685)
1		Guardrails	(1686)
1		Terminals	(1687)
6.00		Asphalt Depth	(2610)
		Design Curb Ht	(2611)
	34.0	Bridge Rail Ht	(2612)
1952		Year Built	(1332)
0		Year Rebuilt	(1336)
	Y	Subj to NBIS	(2614)

Alpha Span Type:

CG

Sufficiency Rating 41.55 SD

High Risk

Inspections Performed:

Freq	Hrs	Date	Rep Type
12	2.0	8/9/2017	Routine
			Fract Crit
			UW
			Special
			Interim
			UWI
			Damage
			Safety
			Short Span
			In Depth
			Geometric

BMS Elements

Element	Element Description	Total	Units	State 1	State 2	State 3	State 4
12	Concrete Deck	2,384	SF	2,384	0	0	0
35	Concrete Deck Soffit	2,384	SF	2,383	0	1	0
110	Concrete Girder	630	LF	623	1	6	0
216	Timber Abutment	68	LF	68	0	0	0
220	Concrete Submerged Foundation	2	EA	2	0	0	0
222	Timber Foundation	120	LF	120	0	0	0
228	Timber Submerged Pile/Column	24	EA	23	0	1	0
235	Timber Pier Cap	120	LF	87	0	33	0
330	Metal Bridge Railing	182	LF	182	0	0	0
361	Scour	4	EA	2	0	2	0
800	Asphaltic Concrete (AC) Overlay	2,384	SF	2,384	0	0	0

Notes

Br. No. 547 **SID** 08328800 **Br. Name** BLACK CREEK #547

Carrying MOUNTAIN LOOP HWY **Route On** 98960 **Mile Post** 14.33

Intersecting BLACK CREEK **Route Under** **Mile Post**

Notes (Continued)

0	Oriented West to East.
11	Load rating 8/01 indicates rating factors for all three AASHTO trucks are above "2" (54-82-106 tons), and bridge is good for overloads. Load rating revision under consideration by Bridge Engineer due to cap deterioration at time of inspection, 2017.
12	Deck: pcc (cip), not visible due to ACP overlay.
35	Soffit looks OK. A few rock pockets and mudball voids noted. shallow spall, 4" diam. with 2" exposed rebar between girders 2E-2F. Shallow spall, 4" diam. also between girders 3A-3B near pier 3 and 3" delam near midspan 3A-3B.
110	(7) lines cip pcc girders, 9" x 25" in good condition, except upstream girders all have minor spalling from drift damage, no exposed rebar, others have faint hairline vertical cracking. Diaphrams at piers 2 & 3 with heavy cracking/leaching/delaminations, especially the west side of pier 2. Girders F & G @ P3 w/diagonal shear crack near soffit. Girder 3B with 12" diam patch.
216	4" x 12" creosote-treated timber bulkhead planks. At P4, bottom of lower plank exposed at downstream end - minor loss of embankment fill.
220	Concrete spread footing bearing on rock at Piers 2 & 3. Downstream end of pier 2 footing exposed 2.0' @ 4' from end, 2017. Downstream end of pier 3 footing exposed 3.2 feet - 2017. Both assumed to be 5' depth. Continue to monitor.
222	Sills: 12" x 12" creo-tr timber @ pier 2 and pier 3 (exposed on span 3 side of bent). Buried @ A1. Pier 2 sill - east side - with minor surface rot in places.
228	Posts: 12" x 12" creo-tr timber. Posts at P2 and P3 are only partially accessible for inspection due to four rows of 3" x 12" creo-tr timber fender planks on both sides. Several are beginning to sound dull near the bottom end, esp @ P3. 3" x 10" bracing @ A1 and A4, and 8" x 12" bracing @ P2 and P3 = monitor @ upstream ends. Middle and bottom braces at pier 3 at pile F with impact damage - 2015. Post 4A dull sounding on sides, 2016. Posts 1D, 1E, 2A, 2B, & 2D banded for splits. Posts 3A & 3E banded for splits - 3A and 3E with full height splits. Drill checked 4A post mid-height (2016), no rot detected.
235	Caps: creosote-treated timber, 12" x 14" @ A1 and A4, 14" x 14" @ P2 and P3 = fair. Upstream ends have drift damage. All are dapped 2" for superelevation. Posts are starting to push up into bottom of caps P2 and P3 - 1/2" at post 3E, and 1" at post 3F, 2016. Pier 2: YELLOW tag due to upstream end badly split over 3', drift damage, and minor rot; Upstream end of P2 has minor splits & 1/2" section loss in several spots due to impact. Pier 3: Yellow tag due to upstream end (3') failing at post "F" + hollow sounding between "E" and "F". Upstream 15' with split to 1/2" max and water leakage out bottom. Crushing from minor to moderate at all posts. Short fractured piece of cap underneath near 3F. End condition - impact split/section missing @ post support / sounds dull. Need to add dolphin pile or other protective measure @ P3. P3 Cap temp. repaired (2010) w/ 2' OC x 2 rows x 5/8" dia thru bolts. Drill checked pier 3 cap near south end in 2016, no rot detected. Drill checked again, 2017 - no rot detected.
330	Rail: thrie beam on 6" x 6" steel "I" beam posts w/ 3"x8" treated timber top rail. Top coat of brown paint is peeling from posts.
361	Creek flows south to north. Scour mitigation: none. Piers 2 & 3 with shallow spread footings exposed in places (see note 220). log hung up at upstream end of pier 3 in 2014, but appears to be directing water away from the pier end. Larger log with rootwad now jammed near pier 3 in span 3 - 2015. Log behind pier 2 also, 2016. No change 2017.
800	ACP overlay with Glasgrid (1998) in good cond. Chip sealed in 2011. A few snow plow scrapes in surface.
1680	Scour vulnerability: Bridge is scour critical. Bottom of footing is above thalweg elevation per plans.
1686	Minor collision damage to approach rails. Rails rusting in places. Transition damage @ SE corner.
1687	New terminals @ NW and SE corners - NE terminal with minor impact damage and minor top rot on post. No change 2017. Delineators at bridge ends removed.
2675	4" galv steel conduit (Beaver Creek telephone) added on top of upstream sidewalk.
7665	Only drain is at low point at SW corner of bridge and is plugged with vegetation and sand. Needs cleaned out and some sort of spacer grate.
7672	Curbs: pcc in fair condition, minor surface erosion, minor collision damage. "Safety" walks approx 1'-9" wide both sides of bridge. Height has been reduced by asphalt overlays. Now 2 1/2" to 3" high on the upstream side and 6" on the downstream side.

BRIDGE INSPECTION REPORT

Status: Released
Printed On: 9/6/2017
Agency: Snohomish County
CD Guid: 7e42a225-3043-46a7-a446-9c1918f39cb4
CD Date: 8/29/2017
Program Mgr: Roman G. Peralta

Br. No. 547 **SID** 08328800 **Br. Name** BLACK CREEK #547

Carrying MOUNTAIN LOOP HWY **Route On** 98960 **Mile Post** 14.33

Intersecting BLACK CREEK **Route Under** **Mile Post**

Notes (Continued)

7681 Smooth approaches. Transverse reflective crack @ A1, westbound lane.

Repairs

Repair No	Pr	R	Repair Descriptions	Noted	Maint	Verified
10001	1	B	Need protection design for P2 and P3 pier caps / posts - upstream ends.	1/23/2009		
10002	2	B	Remove drift upstream of P2 and P3.	9/15/2009		
10005	2	B	Replace piers 2 & 3 caps.	8/15/2012		
10007	3	B	Provide grate riser for deck drain.	8/19/2014		
10009	2	B	Remove log with rootwad jammed under span 3 at upstream side.	8/11/2015		

Inspections Performed and Resources Required

Report Type	Date	Freq	Hrs	Insp	CertNo	Coinsp	Note
Routine	8/9/2017	12	2.0	MPZ	G1331	PAH	

Sticky Notes

Creator	Created	Table Reference	Notes
Snohomish County/ZitkovichM	8/29/2017	Report Types	Measure sidewalk/curb widths at next inspection in 2018.

Snohomish County
Bridge Load Rating Summary

JERI C. BERNSTEIN
STATE OF WASHINGTON
22138
REGISTERED PROFESSIONAL ENGINEER
9/6/2001
EXPIRES 5/20/2003

Structure ID No: 8328800

Bridge Name: Black Creek
Bridge Number: 547

Load Rating By: MB Date: Aug-01

Number of Spans: 3
Bridge Type: CIP Girders
Year Built: 1952
Design Load: HS 20
Input Files: 497cip1.bdf
Comments: 3 Span Simply Supported.

National Bridge Inventory (NBI) Load Factor Rating Method			
AASHTO HS-20 Truck	RF	Live Load Factor	Controlling Point
Inventory (Service or Ultimate)	0.98	2.17	Shear @ 6' from support
Operating (Ultimate only)	1.64	1.3	Shear @ 6' from support
Fatigue	1.40	NA	@ 17' from support

National Bridge Inventory (NBI) Load Factor Rating Method			
	Actual Capacity	Required Capacity (Tons)	NBI and SWIBS coding
Inventory	35	36	2 35
Operating	59	36	2 59

Safe Load Capacity Load Factor Rating Method Operating Only				
Truck		RF	Live Load Factor	Controlling Point
AASHTO Type 3	Ultimate	2.17	1.3	Shear @ 6' from support
AASHTO Type 3S2	Ultimate	2.28	1.3	Shear @ 6' from support
AASHTO Type 3-3	Ultimate	2.66	1.3	Shear @ 6' from support
OL 1	Ultimate	1.52	1.3	Shear @ face of support
OL 2	Ultimate	1.32	1.3	Moment @ 14' from support

Safe Load Capacity Level (Load Factor Rating Method) (Posting Requirement)			
Truck	Actual Capacity Tons	Required Capacity Tons	Posting Required
AASHTO Type 3	54	25	No
AASHTO Type 3S2	82	36	No
AASHTO Type 3-3	106	40	No
OL 1	73	48	N/A
OL 2	137	103.5	N/A

Notes: Live Load Factors in this table apply to Ultimate Load Rating Analysis only. Inventory service load rating analysis applies to prestressed or post tensioned members only. Fatigue is evaluated for concrete bridges in locations where no prestressing or post tensioning is present.

09/05/2001
br547.xls

**Washington State
Department of Transportation**

WSBIS Local Agency Inventory Report

Bridge ID

1001	2009	2132	1019	1286	1021	2023	1156	2181	2183	2185	1188	1196
Structure ID	Bridge Number	Bridge Name	Owner	Cust	County	City	Location	Section	Twnshp	Range	Latitude	Longitude
08328800	547	BLACK CREEK #547	02	2	31	0000	14.3 E JCT SR 92	24	30	08E	48° 04' 18.00"	121° 43' 30.00"
	547										**48° 04' 18.48"**	**121° 43' 30.21"**

Facilities

1232	1256	1274	7281	7283	1276	1285	1288	1289	1293	1292	2295	7296
Feature Intersected	Facilities Carried	Region	Leg1	Leg2	FIPS	Toll	Para	Temp	OPC	NRHP	HAER	LRHP
BLACK CREEK	MOUNTAIN LOOP HWY	NW	39	0	74760	3	N	T	D	5		

Printed Date
9/6/2017

Sufficiency Rating:	
41.55 SD	Item 2710 SR Item 2711 SD/FO
High Risk	

Layout

1332	1336	1340	2346	1348	1352	1356	1360	1364	1367	1310	1312	1370	1374	1378	1379	1382	1383	1386	1387	1390	1394	1291	1397
Year Built	Year Rebuilt	Bridge Length	NBIS Length	Maximum Span Length	Lanes On	Curb to Curb Deck Width	Out to Out Deck Width	Sidewalk Left	Sidewalk Right	Skew	Flared	Min Vert Over Deck	Min Vert Under	Vert Code	Min Lat Under Right	Lat Code	Min Lat Under Left	Nav Ctl Code	Nav Vert Clear	Nav Horiz Clear	Nav Vert Lift Clear	Median	Appr Rdwy
1952	0	91		30	2	26.2	29.8	0.0	0.0	0	N	99' 99"	00' 00"	N	0.0	N	0.0	0	0	0		0	26

Crossing

1432	1433	1434	1435	2440	1445	1451	1453	1457	1463	1467	1477	1469	2410	7479	1483	1484	1485	1486	1487	1489	1490	1354	1491	1495	1499	1413	2441
On Under	Hwy Class	Service Level	Route Number	Milepost	ADT	Truck %	Year of ADT	Future ADT	Future ADT Year	Linear Referencing System	LRS Sub	LRS Milepost	NBI Bridge	Fed Aid Route #	NHS	BHS	STRAHNET	FLH	Funct. Class	NTN	Lane Use Direction	Lanes Under	Horizontal Clearance Route Dir	Horizontal Clearance Reverse Dir	Max Vert Clearance Route	Detour	Speed Limit
1	4	1	98960	14.33	2014	6	2015	2500	2037	98960			Y	X310	0	0	0	2	07	N	2	0	29' 00"			94	45
																							26' 02"				

Design

1532	1533	1535	1536	1538	1541	1544	1545	1546	1547	1548	1549	1550	1551	1552	1553	1554	1555	1556	1585	1588	1590	7565	7557
Main Span Material	Main Span Design	Appr Span Material	Appr Span Design	Number Main Spans	Number Appr Spans	Service On	Service Under	Deck Type	Wearing Surface	Membrane	Deck Protect	Design Load Code	Oper Rating Method	Oper Rating Tons	Oper Rating Factor	Inv Rating Method	Inv Rating Tons	Inv Rating Factor	Border State Cd	Border Pct	Border Structure ID	Fed Aid Project No	Design Exemption
1	02	0	00	3	0	1	5	1	6	0	0	5	1	59		1	35						

Load Rating

2587	2588	2589	2590	2591	2592	2593	2594	2595	2596
Type 3	Type 3S2	Type 3-3	NRL	SHV 4	SHV 5	SHV 6	SHV 7	OL 1	OL 2
2.17	**2.28**	**2.66**						**1.52**	**1.32**

Waterway/ Prop Imp

7832	7833	7834	7835	7836	7837	7838	7839	7840	7841	1844	1846	1847	2853	2860	1867	1873	2870	1861	1879	2883
Water Type	Flood Pln Intr	Flood Control	Scour Hist	Strmbd Matrl	Substr Stablty	Wtrwy Obstr	Strmbd Stablty	Strmbd Anabrn	Piers In Watr	Type Work	Work Meth	Stru Imp Length	Roadway Width	Cost Per SF	Struct Cost	Rdwy Cost	Engr Cost	Total Cost	Estmt Year	Prop Imp Cost Calc
F	A	N	C	5	1	A	D	A	4	31	1	94	30	12	23	2	10	35	2016	Y
												101	**38**	**800**	**1535**	**307**	**1228**	**3070**	**2014**	

Inspection Report Types

2920 Inspection	1990 Date	2646 Inspector	2649 Cert No	2654 Co-Inspector
Routine	8/9/2017	MPZ	G1331	PAH
Fracture Critical				
Special Feature				
Underwater				

Inspection	Date	Inspector	Cert No	Co-Inspector
UW Interim				
Interim				
In Depth				
Damage				

Inspection	Date	Inspector	Cert No	Co-Inspector
Safety				
Short Span				
Geometric				
Info				
Inventory				

Control Data Guid: 7e42a225-3043-46a7-a446-9c1918f39cb4   Control Data Date: 8/29/2017

BRIDGE INSPECTION REPORT

Ver Date: 09/07/2016 Agency: Snohomish County

Status: Released Printed On: 09/13/20 Program Mgr: Roman G. Peralta

Bridge No.	620	Page:	1/2	**Structure Type**	
Bridge Name	WISCONSIN CREEK	**Route**	98960	**Location**	14.7 E JCT SR 92
Structure ID	08328900	**MilePost**	14.66	**Intersecting**	WISCONSIN CREEK

Mike Zotkovich

Inspector's Signature MPZ IDent# G1331

Co-Inspector's Signature

5	☐	Structural Adqcy	(657)
4	3	Deck Geometry	(658)
9	☐	Underclearance	(659)
5	☐	Operating Level	(660)
6	8	Alignment Adqcy	(661)
6	☐	WaterwayAdqcy	(662)
7	☐	Deck Overall	(663)
9	☐	Drains Condition	(664)
6	☐	Superstructure	(671)
1	☐	Number Utilities	(675)
6	☐	Substructure	(676)
5	6	Chan/Protection	(677)
9	☐	Culvert	(678)

N	☐	Pier/Abut/Protect	(679)
5	☐	Scour	(680)
9	☐	Retaining Walls	(682)
9	☐	Pier Protection	(683)
1	☐	Bridge Rails	(684)
1	☐	Transition	(685)
1	☐	Guardrails	(686)
1	☐	Terminals	(687)
N	☐	Revise Rating	(688)
	☐	Photos Flag	(691)
	☐	Soundings Flag	(693)
	☐	Measure Clearance	(694)

1960		Year Built	(332)
0		Year Rebuilt	(336)
36	☐	Oper Rating	(551)
22	☐	Inv Rating	(554)
A	☐	Open Close	(293)
9999	☐	Vert Over Deck	(360)
0000	☐	Vert Under	(374)
N	☐	Vert Und Code	(378)
0.00	☐	Asphalt Depth	
45	☐	Speed Limit	

Inspections Performed

IT	NT	HRS	Date	Rep Type
Y	**24**	**1.0**	**08/17/2016**	**Routine**
				Fract Crit
				Underwater
				Special
				Interim
				Equipment
				Damage
				Safety
				Short Span

Total: 1.0

Suff Rating: 48.35 50.10 FO

BMS Elements

Element	Element Description	Total	Units	State 1	State 2	State 3	State 4
12	Concrete Deck	818	SF	818	0	0	0
35	Concrete Deck Soffit	818	SF	818	0	0	0
110	Concrete Girder	210	LF	210	0	0	0
216	Timber Abutment	80	LF	80	0	0	0
228	Timber Submerged Pile/Column	12	EA	12	0	0	0
235	Timber Pier Cap	60	LF	58	0	2	0
330	Metal Bridge Railing	62	LF	62	0	0	0
361	Scour	2	EA	0	2	0	0
800	Asphaltic Concrete (AC) Overlay	818	SF	818	0	0	0

Notes

0	Oriented West to East.
11	Load rating indicates rating factors for all AASHTO trucks are above "1" (29-44-57 tons), but overloads are limited.
12	Deck: pcc (cip) not visible due to ACP overlay.

BRIDGE INSPECTION REPORT

Ver Date: 09/07/2016 Agency: Snohomish County

Status: Released Printed On: 09/13/20 Program Mgr: Roman G. Peralta

Bridge No. 620 Page: 2/2 **Structure Type**

Bridge Name WISCONSIN CREEK **Route** 98960 **Location** 14.7 E JCT SR 92

Structure ID 08328900 **MilePost** 14.66 **Intersecting** WISCONSIN CREEK

35	Good condition.
110	(7) lines cip pcc girders, poured integral w/deck, 9" x 25" in good-to-fair condition. Upstream girder "G" has minor drift damage multiple places - 4' x 24" total, no exposed rebar. Girder "F" dinged one place - 4' x 6", no exposed rebar. Girders C, D, & F at A2 with diagonal hairline cracks on stems. Also, vertical hairline cracking on stems typical throughout especially closer to midspan.
216	Abutments: 4" x 12" creo-tr timber bulkhead planks in fair condition. A-1 Top Planks wet & soft -- MONITOR. A2 - Fender planks sounding dull. Void behind A1 at downstream side was repaired 2014. Some shoulder settlement 2016 at NW. Embankment material has slumped below bottom abutments board on both sides leaving minor voids.
228	Posts: 12" x 12" creo-tr timber in fair condition. Only top 12" is accessible for inspection. Partial bearing in 5 places due to slight gap between caps/posts, but no crushing noted. Pile 2D has vert split (1" gap 2012) - MONITOR - no change 2016. Piles hidden by 4" x 12" creo-treated timber fender planks 4 high @ A2 and 5 high @ A1. Upper planks @ A2 are broken @ upstream end & forced waterward -- MONITOR. Same 2014 w/rot at end of top plank.
235	Caps: 12" x 14" creo-tr timber (dapped) in good-to-fair condition. Construction damage marked w/yellow tag @ P1-D location - MONITOR. Okay 2016.
330	Rail: Thrie beam on 6" x 6" steel "I" beam posts w/3"-5" Chemonite treated timber (2010) in good condition. Portions of rail system have been painted white. Rust is starting to show thru in places.
361	Creek flows south to north. Scour protection - rip rap @ abutments. Minor wash out mid span Abut 1 & 2 to bottom of fenders (2010) -- MONITOR. Okay 2016.
672	Weathering, a few patches.
675	1 - 4" dia conduit located on upstream curb.
677	Channel boulder filled, appears mostly stable. Some loss of rock at NW.
680	Scour assessments in file from both WEST Consultants (1997) and Snohomish County (1996). Rating of "5" is the lower of the two.
800	ACP overlay (1998) with Glasgrid in good condition. Road was partially washed out West of the bridge in October 2003. Repaired and repaved in spring 2004 - curb @ d/s side is now only 1.5" high.

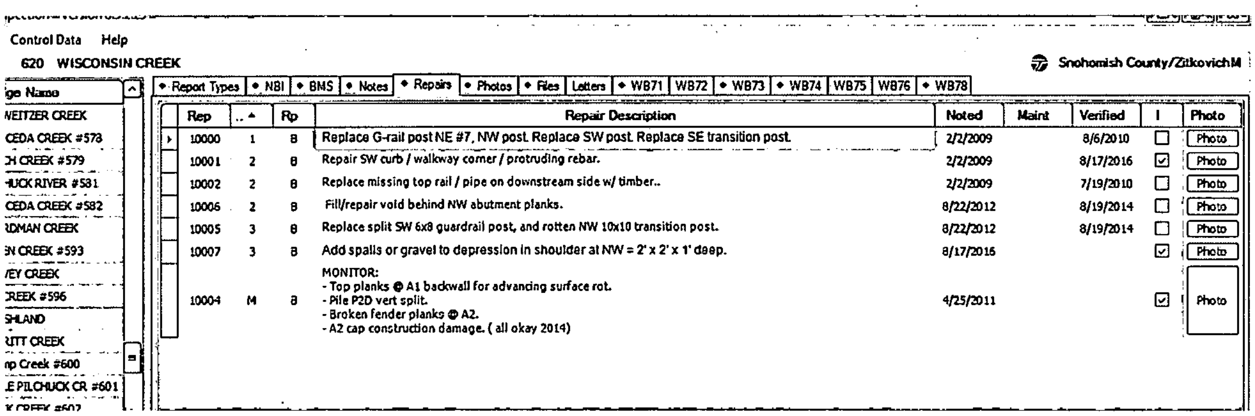
Repairs

Repair No	Pr	R	Repair Description	Noted	Maint	Verified
10001	2	B		02/02/09		08/17/16
10007	3	B		08/17/16		
10004	M	B		04/25/11		

Inspections Performed and Resources Required

Report Type	Date	IT	Frq	Hrs	Insp	CertNo	Coinsp	Note
Routine	08/17/16		24	1.0	MPZ	G1331		

Resources	Use	Hour	Min	Req	Max	Notes



	Rep	.. ▲	Rp	Repair Description	Noted	Maint	Verified	I	Photo
▸	10000	1	8	Replace G-rail post NE #7, NW post. Replace SW post. Replace SE transition post.	2/2/2009		8/6/2010	☐	Photo
	10001	2	8	Repair SW curb / walkway corner / protruding rebar.	2/2/2009		8/17/2016	☑	Photo
	10002	2	8	Replace missing top rail / pipe on downstream side w/ timber..	2/2/2009		7/19/2010	☐	Photo
	10006	2	8	Fill/repair void behind NW abutment planks.	8/22/2012		8/19/2014	☐	Photo
	10005	3	8	Replace split SW 6x8 guardrail post, and rotten NW 10x10 transition post.	8/22/2012		8/19/2014	☐	Photo
	10007	3	8	Add spalls or gravel to depression in shoulder at NW = 2' x 2' x 1' deep.	8/17/2016			☑	Photo
	10004	M	8	MONITOR: - Top planks @ A1 backwall for advancing surface rot. - Pile P2D vert split. - Broken fender planks @ A2. - A2 cap construction damage. (all okay 2014)	4/25/2011			☑	Photo

Snohomish County
Bridge Load Rating Summary

Structure ID No: 8328900

Bridge Name: Wisconsin Creek
Bridge Number: 620

Load Rating By: MB Date: Aug-01

Number of Spans: 1
Bridge Type: CIP Girders
Year Built: 1960
Design Load: Other or Unknown
Input Files: 620cip1.bdf
Comments:

JERI C. BERNSTEIN
22128
EXPIRES 5/20/2003
9/6/2001

National Bridge Inventory (NBI) Load Factor Rating Method			
AASHTO HS-20 Truck	RF	Live Load Factor	Controlling Point
Inventory (Service or Ultimate)	0.60	2.17	Moment @ 12' from support
Operating (Ultimate only)	0.99	1.3	Moment @ 12' from support
Fatigue	0.83	NA	Moment @ 12' from support

National Bridge Inventory (NBI) Load Factor Rating Method			
	Actual Capacity	Required Capacity (Tons)	NBI and SWIBS coding
Inventory	22	36	2 22
Operating	36	36	2 36

Safe Load Capacity Load Factor Rating Method Operating Only				
Truck		RF	Live Load Factor	Controlling Point
AASHTO Type 3	Ultimate	1.15	1.3	Moment @ 15' from support
AASHTO Type 3S2	Ultimate	1.22	1.3	Moment @ 14' from support
AASHTO Type 3-3	Ultimate	1.43	1.3	Moment @ 16' from support
OL 1	Ultimate	0.83	1.3	Moment @ 15' from support
OL 2	Ultimate	0.70	1.3	Moment @ 14' from support

Safe Load Capacity Level (Load Factor Rating Method) (Posting Requirement)			
Truck	Actual Capacity Tons	Required Capacity Tons	**Posting Required**
AASHTO Type 3	29	25	**No**
AASHTO Type 3S2	44	36	**No**
AASHTO Type 3-3	57	40	**No**
OL 1	40	48	**N/A**
OL 2	72	103.5	**N/A**

Notes: Live Load Factors in this table apply to Ultimate Load Rating Analysis only. Inventory service load rating analysis applies to prestressed or post tensioned members only. Fatigue is evaluated for concrete bridges in locations where no prestressing or post tensioning is present.

Washington State Department of Transportation
WSBIS Inventory Report

9/13/2016

Structure Identifier	Bridge Number	Owner Code	County Number	City Number	Update
08328900	620	02	31	00000	0
1	9	19	21	23	27

	Bridge Name	Location	Section	Township	Range	Latitude	Longtitude
WB71	WISCONSIN CREEK	14.7 E JCT SR 92	24	30	08E	48°04'12.00"	121°43'06.00"
						48°04'11.00"	121°43'07.00"
	32	56	81	83	85	88	96 / 104

	Feature Intersected	Facilities Carried	Region	FIPS Place Code	Legis District (1)	Legis District (2)	Toll	Custodian	Parallel Structure	Temporary Structure	Critical Facility	Median	Hist Sig	Open Closed	Program Year
WB72	WISCONSIN CREEK	MOUNTAIN LOOP HWY.	NW	74760	39	0	3	02	N		☒	0	5	A	
											☒				
	32	56	74	76	81	83	85	86	88	89	90	91	92	93	94

	Year Built	Year ReBuilt	Bridge Length	NBIS Length	Maximum Span Length	Lanes On	Lanes Under	Curb to Curb Deck Width	Out to Out Deck Width	Sidewalk Curb Left	Sidewalk Curb Right	Min Vert Clearance Over Deck	Min Vert Clearance Under Bridge	Code	Min Lat UnderClr Right	Code	Min Lat UnderClr Left	Navigation Control	Navigation Vertical Clearance	Navigation Horizontal Clrnce	Vert Lift Min Clrnce	Appr Roadway Width	Skew Angle	Flare
WB73	1960	0	31	.	29'	2	0	26.4	30.0	0.0	0.0	99'99"	'0"	N	0.0	N	0.0	0	0'	0'	'	30'	0°	N
				.	'			.	.	.	.	' "	' "		. '		. '		'	'	'	25'	°	
	32	36	40	46	48	52	54	56	60	64	67	70	74	78	79	82	83	86	87	90	94	97	100	102

	On Under	High way Class	Service Level	Route Number	Mile Post	ADT on Inventory Route	Truck ADT PCT	ADT Year	Future ADT	Future ADT Year	Linear Referencing System Route	LRS Sub Route	Fed Aid Route	Nat Hwy System	Base Hwy Network	Strahnet	Fed Lands Highway	Fed Funct Class	National Truck Net	Lane Use Direction	Horizontal Clearance Route Dir	Horizontal Clearance Reverse Dir	Max Vertical Clearance Route Dir	Detour Length
WB74	1	4	1	98960	14.66	1609	6	2011	2000	2034			X310	0	0	0	2	07	N	2	26'05"	' "	' "	94
					.	2014		2015	2500	2038											29'00"	' "	' "	
	32	33	34	35	40	45	51	53	57	63	67	77	79	83	84	85	86	87	89	90	91	95	99	103

	Main Span Material	Main Span Design	Appr Span Material	Appr Span Design	Number of Main Spans	Number of Appr Spans	Service On	Service Under	Deck Type	Wearing Surface	Membrane	Deck Protection	Fed Design Load	Oper Rtng Method	Oper Rtng Tons	Invt Rtng Method	Invt Rtng Tons	Design Exception Date	Federal Aid Project	Border State Code	Border State PCT	Border State Structure Identifier
WB75	1	02	0	00	1	0	1	5	1	6	0	0	0	F	36	F	22					
																		/ /				
	32	33	35	36	38	41	44	45	46	47	48	49	50	51	52	54	55	57	65	85	88	90 / 104

	Routine Inspection																																	Traffic Safety											
	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector	Structural Adequacy	Deck Geometry	Underclrnce Adequacy	Operating Level	Alignment Adequacy	Waterway Adequacy	Deck Overall	Drain Cond	Drains	Scaling Severity	Scaling Percent	Deck Rutting	Exposed Reinf Steel	Superstruct Overall	Curb	Sidewalks	Paint	Number of Utilities	Substruct Overall	Channel Protection	Culvert	Pier Abutment	Scour	Approach Roadway	Retaining Walls	Pier Protection	Bridge Rail	Trans	Guard Rail	Term	Revise Rating	Repair Status	Card Check	Photos	Season	Soundings	Clearances	Monitor Structure
WB76	24	08192014	1.0	MPZ	G1331	MMA	5	4	9	5	6	6	7	9	0	N	0	0	0	6	4	9	9	1	6	5	9	N	5	8	9	9	1	1	1	1	N							
		08/17/2016	1.0	MPZ	G1331		☒	☒	☒		8															6																		
	32	34	42	46	49	54	57	58	59	60	61	62	63	64	65	66	67	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95

Sufficiency Rating: 50.10

FO

	Fracture Critical / UBIT Inspection							Underwater Inspection							Other Special Inspections						
	Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector	Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector	Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
WB77				.							.							.			
			/ /	.						/ /	.						/ /	.			
	32	33	35	43	47	50	55	58	59	61	69	73	76	81	84	85	87	95	99	102	107

	Water Type	Flood Plain Intrusion	Flood Control	Scour History	Streambed Material	Substruct Stability	Waterway Obstruction	Streambed Stability	Streambed Anabranch	Piers in Water	Proposed Improvements													Inspecting Agency		Seismic Status-Superstruct		Seismic Status-Substruct	
											Service On	Service Under	Work Type	Work Method	Structure Improve Length	Roadway Width	Lanes On	Lanes Under	Total Costs In Thousands	Structure Cost In Thousands	Roadway Cost In Thousands	Estimate Year	Calc	Code	Number	Main Biennium	Approach Biennium	Main Biennium	Approach Biennium
WB78	F	A	N	N	5	7	N	D	C	2	0	0	00	0	0	0	0	0	0	0	0	0	N						
											1	5	31	1	40	34	2		17	11	1	2016	Y						
	32	33	34	35	36	37	38	39	40	41	42	43	44	46	47	53	57	59	61	67	73	79	83	84	86	90	94	98	102

BRIDGE INSPECTION REPORT

Status: Released
Printed On: 8/3/2017
Agency: Snohomish County
CD Guid: 4b5eb228-4265-4ac5-819d-5f1d36703e92
CD Date: 7/17/2017
Program Mgr: Roman G. Peralta

Br. No. 576 **SID** 08259600 **Br. Name** SCHWEITZER CREEK
Carrying MOUNTAIN LOOP HWY. **Route On** 98960 **Mile Post** 15.82
Intersecting SCHWEITZER CREEK **Route Under** **Mile Post**

Mike
Inspector's Signature MPZ Cert # G1331 Cert Exp Date 3/13/2019
Co-Inspector's Signature

5	Structural Eval	(1657)
4	Deck Geometry	(1658)
9	Underclearance	(1659)
6	Alignment	(1661)
7	Deck Overall	(1663)
6	Superstructure	(1671)
6	Substructure	(1676)
9	Culvert	(1678)
6	Chan/Protection	(1677)
N	Pier/Abut/Prot	(1679)
9	Drain Cond	(7664)
0	Drain Status	(7665)
N	Deck Scaling	(7666)
0	Scaling Pct	(7667)
0	Deck Rutting	(7669)
0	Exposed Rebar	(7670)
6	Curb Cond	(7672)

36	Operating Tons	(1552)
	Op RF	(1553)
22	Inventory Tons	(1555)
	Inv RF	(1556)
5	Operating Level	(1660)
A	Open/Closed	(1293)
8	Waterway	(1662)
3	Scour	(1680)
Y	Soundings Flag	(2693)
N	Revise Rating	(2688)
D	Photos Flag	(2691)
	Measure Clrnc	(2694)
9	Sdwk Cond	(7673)
9	Paint Cond	(7674)
8	Approach Cond	(7681)
9	Retaining Wall	(7682)
9	Pier Prot	(7683)

1	No Utilities	(2675)
1	Bridge Rails	(1684)
1	Transition	(1685)
1	Guardrails	(1686)
1	Terminals	(1687)
4.00	Asphalt Depth	(2610)
7.00	Design Curb Ht	(2611)
33.0	Bridge Rail Ht	(2612)
1952	Year Built	(1332)
0	Year Rebuilt	(1336)
Y	Subj to NBIS	(2614)

Alpha Span Type: CG

Sufficiency Rating 52.42
High Risk

Inspections Performed:

Freq	Hrs	Date	Rep Type
24	**1.5**	**7/17/2017**	**Routine**
			Fract Crit
			UW
			Special
			Interim
			UWI
			Damage
			Safety
			Short Span
			In Depth
			Geometric

BMS Elements

Element	Element Description	Total	Units	State 1	State 2	State 3	State 4
12	Concrete Deck	812	SF	812	0	0	0
35	Concrete Deck Soffit	812	SF	812	0	0	0
110	Concrete Girder	210	LF	210	0	0	0
216	Timber Abutment	80	LF	80	0	0	0
220	Concrete Submerged Foundation	30	EA	30	0	0	0
222	Timber Foundation	60	LF	60	0	0	0
228	Timber Submerged Pile/Column	12	EA	12	0	0	0
235	Timber Pier Cap	60	LF	60	0	0	0
330	Metal Bridge Railing	62	LF	62	0	0	0
342	Timber Pedestrian Railing	62	LF	62	0	0	0
361	Scour	2	EA	1	0	1	0
800	Asphaltic Concrete (AC) Overlay	812	SF	812	0	0	0

Notes

BRIDGE INSPECTION REPORT

Status: Released
Printed On: 8/3/2017
Agency: Snohomish County
CD Guid: 4b5eb228-4265-4ac5-819d-5f1d36703e92
CD Date: 7/17/2017
Program Mgr: Roman G. Peralta

Br. No. 576 **SID** 08259600 **Br. Name** SCHWEITZER CREEK
Carrying MOUNTAIN LOOP HWY. **Route On** 98960 **Mile Post** 15.82
Intersecting SCHWEITZER CREEK **Route Under** **Mile Post**

Notes (Continued)

0	Oriented west to east.
11	Load rating 8/01 indicates all three AASHTO trucks have rating factors above "1" (29-44-57 tons), but overloads are limited. NRL rating needed by end of 2017.
12	PCC (cip) = good. Driving surface inaccessible for inspection due to ACP/BST overlay, but soffit side looks O.K.
35	Faint transverse hairline cracking in places.
110	(7) lines precast pcc girders, 9" x 25" with light vertical and transverse hairline cracks scattered throughout.
216	4" x 12" creosote-treated timber planks = O.K. Unreinforced wingwalls = MONITOR.
220	Concrete footing partially visible at A2 under timber sill from post A to post D.
222	Sills: 12" x 12" creo-tr timber on concrete footing = fair. Upstream 1/4 of sill at A1 is buried in gravel.
228	Posts: 12" x 12" creo-tr timber.
235	Caps: 12" x 14" creo-tr timber (dapped for superelevation - sloped to north).
330	Rail: upgraded to Thrie beam (2001) on existing 6" x 6" steel "I" beam posts. Topcoat of paint on posts is peeling. Approach railing, transition sections and ET-Plus terminals all upgraded.
342	New 3" x 8" chem-treated top rail (2015).
361	Schweitzer creek flows south to north. Low flow 2017. Riprap at corners but not across abutments.
800	Overlaid in 1998 with Glasgrid fiberglass reinforcing mesh. No reflective cracking. Chipseal newer 2015. Deterioration of surface along centerline of road, and a few other shallow spalls in driving lanes.
1680	Scour: At A1, top 9" of timber sill is exposed along the downstream half of the bridge, remainder is still buried. At A2, all of timber sill is exposed, and concrete footing is exposed 12" at post A down to just the top visible at post D. Not much change noted over last 20+ years.
1687	Four delineators and bridge sign = O.K. NE terminal w/ minor impact damage.
7672	Curbs: pcc (cip) = good-to-fair. Minor surface erosion, collision damage.
7681	Slight settlement @ east abutment, mostly in eastbound lane.

Repairs

Repair No	Pr	R	Repair Descriptions	Noted	Maint	Verified
4286	2	B	Bridge rail posts need repainting - monitor.	8/4/2003		

Inspections Performed and Resources Required

Report Type	Date	Freq	Hrs	Insp	CertNo	Coinsp	Note
Routine	7/17/2017	24	1.5	MPZ	G1331		

Snohomish County
Bridge Load Rating Summary

Structure ID No: 8259600

Bridge Name: Schweitzer Creek
Bridge Number: 576

Load Rating By: MB Date: Aug-01

Number of Spans 1
Bridge Type: CIP Girders
Year Built: 1952
Design Load: Other or Unknown
Input Files: 620cip.bdf
Comments:

JERI C. BERNSTEIN
STATE OF WASHINGTON
22128
REGISTERED PROFESSIONAL ENGINEER
9/6/2001
EXPIRES 5/20/2003

National Bridge Inventory (NBI) Load Factor Rating Method			
AASHTO HS-20 Truck	RF	Live Load Factor	Controlling Point
Inventory (Service or Ultimate)	0.60	2.17	Moment @ 12' from support
Operating (Ultimate only)	0.99	1.3	Moment @ 12' from support
Fatigue	0.83	NA	Moment @ 12' from support

National Bridge Inventory (NBI) Load Factor Rating Method			
	Actual Capacity	Required Capacity (Tons)	NBI and SWIBS coding
Inventory	22	36	2 22
Operating	36	36	2 36

Safe Load Capacity Load Factor Rating Method Operating Only				
Truck		RF	Live Load Factor	Controlling Point
AASHTO Type 3	Ultimate	1.15	1.3	Moment @ 15' from support
AASHTO Type 3S2	Ultimate	1.22	1.3	Moment @ 14' from support
AASHTO Type 3-3	Ultimate	1.43	1.3	Moment @ 16' from support
OL 1	Ultimate	0.83	1.3	Moment @ 15' from support
OL 2	Ultimate	0.70	1.3	Moment @ 14' from support

Safe Load Capacity Level (Load Factor Rating Method) (Posting Requirement)			
Truck	Actual Capacity Tons	Required Capacity Tons	Posting Required
AASHTO Type 3	29	25	No
AASHTO Type 3S2	44	36	No
AASHTO Type 3-3	57	40	No
OL 1	40	48	N/A
OL 2	72	103.5	N/A

Notes: Live Load Factors in this table apply to Ultimate Load Rating Analysis only. Inventory service load rating analysis applies to prestressed or post tensioned members only. Fatigue is evaluated for concrete bridges in locations where no prestressing or post tensioning is present.

09/05/2001
br576.xls

Washington State Department of Transportation

WSBIS Local Agency Inventory Report

Bridge ID

1001	2009	2132	1019	1286	1021	2023	1156	2181	2183	2185	1188	1196
Structure ID	Bridge Number	Bridge Name	Owner	Cust	County	City	Location	Section	Twnship	Range	Latitude	Longitude
08259600	576	SCHWEITZER CREEK	02	2	31	0000	15.8 E JCT SR 92	19	30	09E	48° 04' 18.00"	121° 42' 12.00"
	576										**48° 04' 25.78"**	**121° 42' 10.08"**

Facilities

1232	1256	1274	7281	7283	1276	1285	1288	1289	1293	1292	2295	7296
Feature Intersected	Facilities Carried	Region	Leg1	Leg2	FIPS	Toll	Para	Temp	OPC	NRHP	HAER	LRHP
SCHWEITZER CREEK	MOUNTAIN LOOP HWY.	NW	39	0	74760	3	N		A	5		

Printed Date
8/3/2017

Sufficiency Rating:	
52.42	Item 2710 SR
High Risk	Item 2711 SD/FO

Layout

1332	1336	1340	2346	1348	1352	1356	1360	1364	1367	1310	1312	1370	1374	1378	1379	1382	1383	1386	1387	1390	1394	1291	1397
Year Built	Year Rebuilt	Bridge Length	NBIS Length	Maximum Span Length	Lanes On	Curb to Curb Deck Width	Out to Out Deck Width	Sidewalk Left	Sidewalk Right	Skew	Flared	Min Vert Over Deck	Min Vert Under	Vert Code	Min Lat Under Right	Lat Code	Min Lat Under Left	Nav Ctl Code	Nav Vert Clear	Nav Horiz Clear	Nav Vert Lift Clear	Median	Appr Rdwy
1952	0	31		29	2	26.2	30.0	0.0	0.0	0	N	99' 99"	00' 00"	N	0.0	N	0.0	0	0	0		0	24
				28																			

Crossing

1432	1433	1434	1435	2440	1445	1451	1453	1457	1463	1467	1477	1469	2410	7479	1483	1484	1485	1486	1487	1489	1490	1354	1491	1495	1499	1413	2441
On Under	Hwy Class	Service Level	Route Number	Milepost	ADT	Truck %	Year of ADT	Future ADT	Future ADT Year	Linear Referencing System	LRS Sub	LRS Milepost	NBI Bridge	Fed Aid Route #	NHS	BHS	STRAH	FLH	Funct. Class	NTN	Lane Use Direction	Lanes Under	Horizontal Clearance Route Dir	Horizontal Clearance Reverse Dir	Max Vert Clearance Route	Detour	Speed Limit
1	4	1	98960	15.82	1775	8	2015	2000	2037	98960			Y	X310	0	0	0	2	07	N	2	0	28' 00"			94	45
																							26' 02"				

Design

1532	1533	1535	1536	1538	1541	1544	1545	1546	1547	1548	1549	1550	1551	1552	1553	1554	1555	1556	1585	1588	1590	7565	7557
Main Span Material	Main Span Design	Appr Span Material	Appr Span Design	Number Main Spans	Number Appr Spans	Service On	Service Under	Deck Type	Wearing Surface	Membrane	Deck Protect	Design Load Code	Oper Rating Method	Oper Rating Tons	Oper Rating Factor	Inv Rating Method	Inv Rating Tons	Inv Rating Factor	Border State Cd	Border Pct	Border Structure ID	Fed Aid Project No	Design Exemption
1	02	0	00	1	0	1	5	1	6	0	0	0	1	36		1	22						

Load Rating

2587	2588	2589	2590	2591	2592	2593	2594	2595	2596
Type 3	Type 3S2	Type 3-3	NRL	SHV 4	SHV 5	SHV 6	SHV 7	OL 1	OL 2
1.15	**1.22**	**1.43**						**0.83**	**0.70**

Waterway/ Prop Imp

7832	7833	7834	7835	7836	7837	7838	7839	7840	7841	1844	1846	1847	2853	2860	1867	1873	2870	1861	1879	2883
Water Type	Flood Pln Intr	Flood Control	Scour Hist	Strmbd Matrl	Substr Stablty	Wtrwy Obstr	Strmbd Stablty	Strmbd Anabrn	Piers In Watr	Type Work	Work Meth	Stru Imp Length	Roadway Width	Cost Per SF	Struct Cost	Rdwy Cost	Engr Cost	Total Cost	Estmt Year	Prop Imp Cost Calc
F	A	N	N	3	1	N	D	N	2											
										31	**1**	**41**	**38**	**800**	**623**	**125**	**498**	**1246**	**2014**	**Y**

Inspection Report Types

2920 Inspection	1990 Date	2646 Inspector	2649 Cert No	2654 Co-Inspector
Routine	7/17/2017	MPZ	G1331	
Fracture Critical				
Special Feature				
Underwater				

Inspection	Date	Inspector	Cert No	Co-Inspector
UW Interim				
Interim				
In Depth				
Damage				

Inspection	Date	Inspector	Cert No	Co-Inspector
Safety				
Short Span				
Geometric				
Info				
Inventory				

Control Data Guid: 4b5eb228-4265-4ac5-819d-5f1d36703e92 Control Data Date: 7/17/2017

BRIDGE INSPECTION REPORT

Status: Released
Printed On: 8/7/2017
Agency: Snohomish County
CD Guid: efb4da13-f307-4f53-8b27-2ab3403ca567
CD Date: 7/18/2017
Program Mgr: Roman G. Peralta

Br. No. 587 **SID** 08277100 **Br. Name** BOARDMAN CREEK

Carrying MOUNTAIN LOOP HWY. **Route On** 98960 **Mile Post** 16.90

Intersecting BOARDMAN CREEK **Route Under** **Mile Post**

Inspector's Signature MPZ Cert # G1331 Cert Exp Date 3/13/2019
Co-Inspector's Signature MMA

5	Structural Eval	(1657)	39		Operating Tons	(1552)	1		No Utilities	(2675)
4	Deck Geometry	(1658)			Op RF	(1553)	1		Bridge Rails	(1684)
9	Underclearance	(1659)	23		Inventory Tons	(1555)	1		Transition	(1685)
6	Alignment	(1661)			Inv RF	(1556)	1		Guardrails	(1686)
6	Deck Overall	(1663)	5		Operating Level	(1660)	1		Terminals	(1687)
6	Superstructure	(1671)	A		Open/Closed	(1293)	3.00	2.00	Asphalt Depth	(2610)
6	Substructure	(1676)	8		Waterway	(1662)		9.00	Design Curb Ht	(2611)
9	Culvert	(1678)	5		Scour	(1680)		31.0	Bridge Rail Ht	(2612)
5	Chan/Protection	(1677)	Y	*	Soundings Flag	(2693)	1952		Year Built	(1332)
N	Pier/Abut/Prot	(1679)	N		Revise Rating	(2688)	0		Year Rebuilt	(1336)
6	Drain Cond	(7664)	D		Photos Flag	(2691)		Y	Subj to NBIS	(2614)
1	Drain Status	(7665)			Measure Clrnc	(2694)				
N	Deck Scaling	(7666)	9		Sdwk Cond	(7673)				
0	Scaling Pct	(7667)	9		Paint Cond	(7674)				
0	Deck Rutting	(7669)	6		Approach Cond	(7681)				
0	Exposed Rebar	(7670)	9		Retaining Wall	(7682)				
6	Curb Cond	(7672)	9		Pier Prot	(7683)				

Alpha Span Type:

CG

Sufficiency Rating 53.95

Low Risk

Inspections Performed:

Freq	Hrs	Date	Rep Type
24	1.5	7/18/2017	Routine
			Fract Crit
			UW
			Special
			Interim
			UWI
			Damage
			Safety
			Short Span
			In Depth
			Geometric

BMS Elements

Element	Element Description	Total	Units	State 1	State 2	State 3	State 4
12	Concrete Deck	2,375	SF	2,375	0	0	0
35	Concrete Deck Soffit	2,375	SF	2,375	0	0	0
110	Concrete Girder	364	LF	364	0	0	0
205	Concrete Pile/Column	8	EA	8	0	0	0
214	Concrete Web Wall between Columns	30	LF	30	0	0	0
216	Timber Abutment	60	LF	60	0	0	0
219	Concrete Cantilevered Span Abutment	60	EA	60	0	0	0
220	Concrete Submerged Foundation	2	EA	2	0	0	0
330	Metal Bridge Railing	182	LF	182	0	0	0
361	Scour	2	EA	2	0	0	0
800	Asphaltic Concrete (AC) Overlay	2,375	SF	2,325	10	40	0

Notes

Br. No. 587 **SID** 08277100 **Br. Name** BOARDMAN CREEK

Carrying MOUNTAIN LOOP HWY. **Route On** 98960 **Mile Post** 16.90

Intersecting BOARDMAN CREEK **Route Under** **Mile Post**

Notes (Continued)

0	Oriented west to east.
11	Load rating 8/01 indicates all three AASHTO trucks have rating factors well above "1" (33-53-61 tons). Bridge is good for OL-1 overloads, but OL-2 overloads are limited to 64%. NRL rating needed by 2022.
12	Deck: pcc (cip). Not visible - due to ACP and BST overlay.
35	Transverse leaching cracks hairline to narrow throughout, several with rust stains visible @ soffit side with efflorescence and stalactites up to 4" in length.
110	Girders: pcc (cip), (4) lines, arch-shaped, 1'-6" wide x 3'-0" deep @ midspan (5'-0" deep @ P2 and P3) pcc (cip) diaphragm's at pier 2, mid span and at pier 3, hairline vertical cracks random. Minor diaphragm spall at pier 3 bottom between column B and C, no visible rebar.
205	Columns: pcc (cip), 2'-6" x 3'-0". Pier 3, minor edge spall column D u/s side, no visible rebar 2017.
214	1' x 5' concrete web wall between column's A - B, B - C and C - D pier 2 and 3.
216	4" x 12" creosote-treated timber bulkheads were added at ends of cantelivered spans #1 and #4 in the early 90's to contain roadway fill coming out beheath cantilevered ends. 6" x 16" braces for the A1 bulkheads replaced 2017.
219	Spans 1 and 3. Monitor approach fill eroding at pavement seat, NW corner at Abut. 1 and NE corner at Abut. 4.
220	Pier 2 not visible for inspection. Pier 3 pile cap exposed up to 14" at down stream side. = Monitor.
330	Rail: Thrie beam (2000) on 6" x 6" steel "I" beam posts (paint is peeling = Monitor) w/ 3" x 8" timber treated ped. rail . Approach rail, transition sections, and terminals all upgraded to current standards in 2002. Minor scrapes and tree strike noted 2015.
361	Poor stream alignment u/s of bridge. See note 677. Monitor scour depth @ P3. Footing seal founded upon timber piles. Stream flow south to north under span 2. Riprap in place @ pier 2 and pier 3. Channel sounding taken of upstream rail - 2017.
800	ACP = good, except for transverse cracking at ends of bridge. West approach settlement repaired with 1' wide asphalt feather (too short - still a bump). East approach with < 1" settlement. Approx. 40 sf of shallow spalling, mostly near pier 2.
1677	Waterway adequacy seems good, but stream is dynamic. Bridge was built in 1952, and creek has changed up and downstream since then. Bridge location relative to stream looks wrong today. Large gravel bar has formed upstream and creek is attacking left bank 100 ft u/s of bridge. Also, the river has created a massive gravel bar downstream of the bridge, with a unique "swimming hole". These developments do not seem to be threatening the bridge at present. Time will tell if the stream ever has enough power to try to cross the highway west of the bridge - monitor scour.
1680	Scour at P3 remains stable. Seal is partially exposed up to 14" but no measurable change since 1992, no exposed piling. Per plan, 33 untreated timber piles per pier 2 & 3. See note 677 re-channel. Scour survey done 2009. No change 2017.
1687	Four delineators and bridge sign O.K. ET-PLUS terminals at SW and NE corners @ leading ends.
2675	4" galvanized conduit attached to top of south side curb (Telephone) with bent or broken hold down straps random = Monitor.
7664	4" diam free-fall drains are open @ NE & NW corners of deck.
7681	NW corner, west bound lane at Abutment 1 w/ 1.5' dia. sink hole. Sinkhole temporary repaired, 2017 - waiting on work order to reinforce with rock underneath.
7682	4" x 12" creo-tr timber lagging added as bulkheads at both ends of bridge in 1995 - horizontal planks (4) high at west abut, vertical planks at east abut.

Repairs

Repair No	Pr	R	Repair Descriptions	Noted	Maint	Verified
10004	2	B	Replace 6" x 16" timber brace A and D between Abut. 1 and Pier 2 rotted at P2.	7/22/2015		7/18/2017

Br. No. 587 **SID** 08277100 **Br. Name** BOARDMAN CREEK

Carrying MOUNTAIN LOOP HWY. **Route On** 98960 **Mile Post** 16.90

Intersecting BOARDMAN CREEK **Route Under** **Mile Post**

Repairs (Continued)

Repair No	Pr	R	Repair Descriptions	Noted	Maint	Verified
10005	1	B	Repair 1.5' Dia. sink hole at NW corner of Abut. 1.	7/22/2015		7/18/2017
10006	2	B	Repair NW abrupt lane edge west bound approach.	7/22/2015		7/18/2017
10007	2	B	Repair West approach 1"+ asphalt approach settlement.	7/22/2015		7/18/2017
10008	2	B	Replace 10"x10" transition post #1 @ NW because of top rot.	7/18/2017		
10009	2	B	Re-nail NW delineator to post.	7/18/2017		
10010	2	B	Patch 40 sf shallow spalling on bridge deck and 6 sf in east approach.	7/18/2017		

Inspections Performed and Resources Required

Report Type	Date	Freq	Hrs	Insp	CertNo	Coinsp	Note
Routine	7/18/2017	24	1.5	MPZ	G1331	MMA	

Sticky Notes

Creator	Created	Table Reference	Notes
Snohomish County/ZitkovichM	7/24/2017	Report Types	Check bridge length in field at next inspection.

Snohomish County
Bridge Load Rating Summary

Structure ID No: 8277100

JERI C. BERNSTEIN
STATE OF WASHINGTON
22128
REGISTERED PROFESSIONAL ENGINEER
9/6/2001
EXPIRES 5/20/2003

Bridge Name: Boardman Creek
Bridge Number: 587

Load Rating By: MB Date: Aug-01

Number of Spans 3
Bridge Type: CIP Girders
Year Built: 1952
Design Load: Other or Unknown
Input Files: 587cip1.bdf,587cip2.bdf
Comments: 3 SPAN SIMPLY SUPPORTED

National Bridge Inventory (NBI) Load Factor Rating Method			
AASHTO HS-20 Truck	RF	Live Load Factor	Controlling Point
Inventory (Service or Ultimate)	0.65	2.17	Span 3, exterior, Moment @ 2' from support
Operating (Ultimate only)	1.09	1.3	Span 3, exterior, Moment @ 2' from support
Fatigue	0.85	NA	Span 3, exterior, Moment @ 2' from support

National Bridge Inventory (NBI) Load Factor Rating Method				
	Actual Capacity	Required Capacity	(Tons)	**NBI and SWIBS coding**
Inventory	23	36		**2 23**
Operating	39	36		**2 39**

Safe Load Capacity Load Factor Rating Method Operating Only				
Truck		RF	Live Load Factor	Controlling Point
AASHTO Type 3	Ultimate	1.32	1.3	Span 3, exterior, Moment @ 2' from support
AASHTO Type 3S2	Ultimate	1.47	1.3	Span 3, exterior, Moment @ 2' from support
AASHTO Type 3-3	Ultimate	1.52	1.3	Span 2, exterior, Moment @ 53' from support
OL 1	Ultimate	1.05	1.3	Span 3, exterior, Moment @ 2' from support
OL 2	Ultimate	0.64	1.3	Span 2, exterior, Moment @ 53' from support

Safe Load Capacity Level (Load Factor Rating Method) (Posting Requirement)			
Truck	Actual Capacity Tons	Required Capacity Tons	**Posting Required**
AASHTO Type 3	33	25	**No**
AASHTO Type 3S2	53	36	**No**
AASHTO Type 3-3	61	40	**No**
OL 1	50	48	**N/A**
OL 2	66	103.5	**N/A**

Notes: Live Load Factors in this table apply to Ultimate Load Rating Analysis only. Inventory service load rating analysis applies to prestressed or post tensioned members only. Fatigue is evaluated for concrete bridges in locations where no prestressing or post tensioning is present.

Washington State
Department of Transportation

WSBIS Local Agency Inventory Report

Bridge ID

1001	2009	2132	1019	1286	1021	2023	1156	2181	2183	2185	1188	1196
Structure ID	Bridge Number	Bridge Name	Owner	Cust	County	City	Location	Section	Twnshp	Range	Latitude	Longitude
08277100	587	BOARDMAN CREEK	02	2	31	0000	16.9 E JCT SR 92	20	30	09E	48° 04' 12.00"	121° 40' 54.00"
	587										**48° 04' 09.87"**	**121° 40' 52.14"**

Facilities

1232	1256	1274	7281	7283	1276	1285	1288	1289	1293	1292	2295	7296
Feature Intersected	Facilities Carried	Region	Leg1	Leg2	FIPS	Toll	Para	Temp	OPC	NRHP	HAER	LRHP
BOARDMAN CREEK	MOUNTAIN LOOP HWY.	NW	39	0	74760	3	N		A	5		

Printed Date
8/7/2017

Sufficiency Rating:	
53.95	**Item 2710 SR**
	Item 2711 SD/FO
Low Risk	

Layout

1332	1336	1340	2346	1348	1352	1356	1360	1364	1367	1310	1312	1370	1374	1378	1379	1382	1383	1386	1387	1390	1394	1291	1397
Year Built	Year Rebuilt	Bridge Length	NBIS Length	Maximum Span Length	Lanes On	Curb to Curb Deck Width	Out to Out Deck Width	Sidewalk Left	Sidewalk Right	Skew	Flared	Min Vert Over Deck	Min Vert Under	Vert Code	Min Lat Under Right	Lat Code	Min Lat Under Left	Nav Ctl Code	Nav Vert Clear	Nav Horiz Clear	Nav Vert Lift Clear	Median	Appr Rdwy
1952	0	91		55	2	26.1	30.0	0.0	0.0	0	N	99' 99"	00' 00"	N	0.0	N	0.0	0	0	0		0	25

Crossing

1432	1433	1434	1435	2440	1445	1451	1453	1457	1463	1467	1477	1469	2410	7479	1483	1484	1485	1486	1487	1489	1490	1354	1491	1495	1499	1413	2441
On Under	Hwy Class	Service Level	Route Number	Milepost	ADT	Truck %	Year of ADT	Future ADT	Future ADT Year	Linear Referencing System	LRS Sub	LRS Milepost	NBI Bridge	Fed Aid Route #	NHS	BHS	STRAH	FLH	Funct. Class	NTN	Lane Use Direction	Lanes Under	Horizontal Clearance Route Dir	Horizontal Clearance Reverse Dir	Max Vert Clearance Route	Detour	Speed Limit
1	4	1	98960	16.90	1864	9	2015	2000	2035	98960			Y	X310	0	0	0	2	07	N	2	0	26' 01"			94	45

Design

1532	1533	1535	1536	1538	1541	1544	1545	1546	1547	1548	1549	1550	1551	1552	1553	1554	1555	1556	1585	1588	1590	7565	7557
Main Span Material	Main Span Design	Appr Span Material	Appr Span Design	Number Main Spans	Number Appr Spans	Service On	Service Under	Deck Type	Wearing Surface	Membrane	Deck Protect	Design Load Code	Oper Rating Method	Oper Rating Tons	Oper Rating Factor	Inv Rating Method	Inv Rating Tons	Inv Rating Factor	Border State Cd	Border Pct	Border Structure ID	Fed Aid Project No	Design Exemption
2	02	0	00	3	0	1	5	1	6	0	0	0	1	39		1	23						

Load Rating

2587	2588	2589	2590	2591	2592	2593	2594	2595	2596
Type 3	Type 3S2	Type 3-3	NRL	SHV 4	SHV 5	SHV 6	SHV 7	OL 1	OL 2
1.32	**1.47**	**1.52**						**1.05**	**0.64**

Waterway/ Prop Imp

7832	7833	7834	7835	7836	7837	7838	7839	7840	7841	1844	1846	1847	2853	2860	1867	1873	2870	1861	1879	2883
Water Type	Flood Pln Intr	Flood Control	Scour Hist	Strmbd Matrl	Substr Stablty	Wtrwy Obstr	Strmbd Stablty	Strmbd Anabrn	Piers In Watr	Type Work	Work Meth	Stru Imp Length	Roadway Width	Cost Per SF	Struct Cost	Rdwy Cost	Engr Cost	Total Cost	Estmt Year	Prop Imp Cost Calc
F	A	N	N	5	8	N	D	C	2											
										31	**1**	**101**	**38**	**800**	**1535**	**307**	**1228**	**3070**	**2014**	**Y**

Inspection Report Types

2920 Inspection	1990 Date	2646 Inspector	2649 Cert No	2654 Co-Inspector
Routine	7/18/2017	MPZ	G1331	MMA
Fracture Critical				
Special Feature				
Underwater				

Inspection	Date	Inspector	Cert No	Co-Inspector
UW Interim				
Interim				
In Depth				
Damage				

Inspection	Date	Inspector	Cert No	Co-Inspector
Safety				
Short Span				
Geometric				
Info				
Inventory				

Control Data Guid: efb4da13-f307-4f53-8b27-2ab3403ca567 Control Data Date: 7/18/2017

INFORMATIONAL

BRIDGE INSPECTION REPORT

Ver Date: 10/11/2016 Agency: Snohomish County

Status: Released Printed On: 10/24/20 Program Mgr: Roman G. Peralta

Bridge No.	537	Page:	1/4	**Structure Type**	
Bridge Name	RED BRIDGE	**Route**	98960	**Location**	18.2 E JCT SR 92
Structure ID	08291500	**MilePost**	18.18	**Intersecting**	S.F. STILLAGUAMISH RIVER

Mike Zithow

Inspector's Signature MPZ IDent# G1331

Co-Inspector's Signature

6	☐	Structural Adqcy	(657)
4	☐	Deck Geometry	(658)
9	☐	Underclearance	(659)
5	☐	Operating Level	(660)
8	☐	Alignment Adqcy	(661)
8	☐	WaterwayAdqcy	(662)
6	☐	Deck Overall	(663)
8	☐	Drains Condition	(664)
6	☐	Superstructure	(671)
2	☐	Number Utilities	(675)
6	☐	Substructure	(676)
8	☐	Chan/Protection	(677)
9	☐	Culvert	(678)

N	☐	Pier/Abut/Protect	(679)
3	☐	Scour	(680)
9	☐	Retaining Walls	(682)
9	☐	Pier Protection	(683)
1	☐	Bridge Rails	(684)
1	☐	Transition	(685)
1	☐	Guardrails	(686)
0	☐	Terminals	(687)
N	☐	Revise Rating	(688)
	☐	Photos Flag	(691)
Y	☐	Soundings Flag	(693)
	☐	Measure Clearance	(694)

1954		Year Built	(332)
0		Year Rebuilt	(336)
62	☐	Oper Rating	(551)
37	☐	Inv Rating	(554)
A	☐	Open Close	(293)
1500	☐	Vert Over Deck	(360)
0000	☐	Vert Under	(374)
N	☐	Vert Und Code	(378)
0.00	☐	Asphalt Depth	
45	☐	Speed Limit	

Inspections Performed

IT	NT	HRS	Date	Rep Type
Y	24	1.0	06/16/2016	Routine
Y	24	3.5	06/16/2016	Fract Crit
D	24	1.5	05/18/2015	Underwater
				Special
				Interim
				Equipment
				Damage
				Safety
				Short Span

Total: 0.0

Suff Rating: 61.90 59.19

BMS Elements

Element	Element Description	Total	Units	State 1	State 2	State 3	State 4
12	Concrete Deck	4238	SF	4199	39	0	0
13	Bridge Deck Surface	1196	SF	1196	0	0	0
35	Concrete Deck Soffit	4238	SF	4237	1	0	0
38	Concrete Slab	1196	SF	1196	0	0	0
113	Steel Stringer	640	LF	640	0	0	0
126	Steel Thru Truss	322	LF	161	23	138	0
133	Truss Gusset Plates	28	EA	27	0	1	0
152	Steel Floor Beam	248	LF	248	0	0	0
205	Concrete Pile/Column	16	EA	16	0	0	0
210	Concrete Pier Wall	60	LF	58	0	2	0
215	Concrete Abutment	60	LF	60	0	0	0
220	Concrete Submerged Pile Cap/Footing	1	EA	1	0	0	0

BRIDGE INSPECTION REPORT

Ver Date: 10/11/2016 Agency: Snohomish County

Status: Released Printed On: 10/24/20 Program Mgr: Roman G. Peralta

Bridge No. 537 Page: 2/4 **Structure Type**

Bridge Name RED BRIDGE **Route** 98960 **Location** 18.2 E JCT SR 92

Structure ID 08291500 **MilePost** 18.18 **Intersecting** S.F. STILLAGUAMISH RIVER

311	Moveable Bearing (roller, sliding, etc)	2	EA	0	0	2	0
313	Fixed Bearing	2	EA	2	0	0	0
330	Metal Bridge Railing	420	LF	420	0	0	0
355	Damaged Bolts or Rivets	34	EA	0	24	10	0
360	Bridge Movement	1	EA	0	1	0	0
361	Scour	2	EA	1	0	1	0
402	Hot Poured and/or Premolded Joint Filler	52	LF	52	0	0	0
407	Steel Angle Header	26	LF	26	0	0	0
408	Steel Sliding Plate	26	LF	26	0	0	0
901	Red Lead Alkyd Paint System	20000	SF	16800	3000	200	0

Notes

0	Bridge is oriented from west to east.
11	Load rating by Izzat Hasayen of KPFF Aug. 2003 indicates rating factors for all AASHTO trucks is well above "1" (37-58-71 tons) and bridge is ok for OL-1 overloads and 87% of OL-2 overloads (Truss span governs).
12	Deck is worn in wheel lines with several areas of light scale, as well as a 3' x 3' patch in the westbound lane of panel 6 and a 3 ft. x 10 ft. patch in the eastbound lane of panel 7 of the truss span. Exposed aggregate throughout.
13	Slab deck is worn in to aggregate with minor to moderate scale up to 1" deep. Scaling is heaviest in the westbound lane at the west end and the eastbound lane at the east end.
35	Soffit has a 4" diameter patched core hole in the east bay of the truss. Several edge spalls at floorbeams. Panels 1 & 2 with hairline transverse leaching cracks scattered throughout, visible from west bank.
38	Spans 1 & 3 with a few minor hairline cracks in soffit.
113	Stringers have several bullet dings on downstream side at the east end of bridge. End copes all look good.
126	Both portals have minor collision damage. Truss has areas of rust blooms with minor rust pitting. Some areas of minor rust pitting have been painted over (see photo #3). The worst case at north truss U4-L4 with 1/8" deep rust pitting at the U4 connection. South truss bottom chord member L4-L5 bottom splice plate bulging down (see photo #4). North truss at L4 connection has shallow laminar rust (see photo #5). Bottom cross bracing from South L4 to North L5 is bent up approximately 3". At each of the four end posts the top cover plate just above bearing has rivets with up to 80% top head section loss (see photo #6). Rivets have less rust at downstream (south facing) end posts. See 2014 WSDOT FC Report for more details on the truss inspection (Attached in Files tab).
133	L2 north plate with rust pitting. See 2014 FC report for details (Located under "Files" tab, or in bridge file).
152	Floorbeam 7 has some rust staining at top flange deck interface.
205	Piers 2 and 3 each have six concrete stub columns above the pier walls, and the abutments have two columns each.
210	Pier 3 has a diagonal leaching crack beneath the south bearing. Also at Pier 3, two - 1 ft. diameter spalls on the east side below cap like cornice.(Const. Damage). Vertical full depth hairline cracks typical pier wall faces.
215	At A1 and A4, with a few hairline cracks. The east abutment A4 had a 4" x 12" treated timber backwall (vertical planks) placed in 1994.

BRIDGE INSPECTION REPORT

Ver Date: 10/11/2016 Agency: Snohomish County

Status: Released Printed On: 10/24/20 Program Mgr: Roman G. Peralta

Bridge No. 537 Page: 3/4 **Structure Type**

Bridge Name RED BRIDGE **Route** 98960 **Location** 18.2 E JCT SR 92

Structure ID 08291500 **MilePost** 18.18 **Intersecting** S.F. STILLAGUAMISH RIVER

220	At pier 3, cip concrete in sound condition but abraded up to 1/8" at waterline. The entire west half of pile cap/footing is exposed and undermined - see 2013 WSDOT Underwater Report for more detailed information (Attached in Files tab). The 2015 UW Report, in Draft stage at the time of the 2015 Routine Inspection, showed no significant changes, however the undermined area did increase slightly since 2013, and 11 piles in total are now exposed and visible during the UW inspection.
311	The rocker bearings at Pier 2 are tipped out approximately 10 degrees. Superstructure above is jammed tight due to suspected Pier movement.
313	Pinned bearings at pier 3 allow for rotation only.
330	Thriebeam continuous at truss ends to transitions.
355	As identified in the 2014 WSDOT FC Report - attached in Files tab.
360	At Pier 2 the steel Floorbeam and concrete approach span deck are jammed tight, suggesting one or both of the Pier walls have tipped. This could be a result of undermining of the pile caps and earth pressure from backfill placed against the Pier walls. Survey monitoring of pier 2 cap on 3 dates in 2011 to 2012 showed no signs of settlement. See (360) note on the 2014 WSDOT FC report for additonal details on this matter.
361	River flow from south to north under span 2. Pier 3 pile cap is exposed and undermined up to 40% on the river side, and 11 timber piles now exposed and visible under pile cap per 2015 UW Report draft copy (not yet attached). Riprap at upstream and downstream edges of pier 3 pier wall. See also 2013 UW Report for more details (attached in files tab).
402	Located at L3 and L6 with minor D-spalls.
407	Pier 3 joint is above pinned bearing, allows for rotation only and has no measurable movement.
408	Top gap of Pier 2 joint measures 3/4" at centerline. No change 2015. Joint has been pushed shut. Span 1 and 2 decks are locked tight due to rotation of Piers 2 and 3 toward the center of the river.
675	Utilities consist of two 2-1/2" diameter galvanized conduits suspended form the north side.
677	Channel banks are well vegetated and appear stable. Streambed material is cobbles with areas of gravel. River bears sharply towards pier 3 during low water flow.
680	Scour assessment by WEST Consultants in Jan 1997 determined the bridge to be scour critical.
681	West approach with 1/2" settlement.
693	Conducted yearly either during the FC inspection or the Underwater inspection.
694	Vertical Clearance was measured to be 15'-0" at the northwest and northeast corner curbs and 15'-3" at the fog line. Bridge is posted for 14'-9". Bridge not posted with advance low clearance warning signs.
901	Painted last in 1991 by county forces. "Splash zone" was pressure washed and overcoated in spring 2005 during rail upgrade work. Paint is peeling in areas and has small rust blooms throughout, otherwise paint, although no longer attractive, is still covering most of the base steel (see photos #3 and 5). Continue REPAIR #4274.

Repairs

Repair No	Pr	R	Repair Description	Noted	Maint	Verified
10006	1	S		06/11/15		
10007	1	B		06/11/15		
10009	1	B		06/11/15		
4274	2	B		06/24/03		

BRIDGE INSPECTION REPORT

Ver Date: 10/11/2016
Agency: Snohomish County
Status: Released
Printed On: 10/24/20
Program Mgr: Roman G. Peralta

Bridge No. 537
Page: 4/4
Structure Type
Bridge Name RED BRIDGE
Route 98960
Location 18.2 E JCT SR 92
Structure ID 08291500
MilePost 18.18
Intersecting S.F. STILLAGUAMISH RIVER

10005	2	B	06/19/13
10003	M	B	01/01/98
10008	M	B	06/11/15

Inspections Performed and Resources Required

Report Type	Date	IT	Frq	Hrs	Insp	CertNo	Coinsp	Note
Routine	06/16/16		24	1.0	ABK	G1220	PFK	8/24/2016Routine changed to 24 month frequency in 2016. Scour issues are now inspected on the odd years with a dive inspection.Entered only Inspection Date, Hours, Inspectors' Initials and any data modified by the inspector on the NBI or WB71 through WB75 panels.MHB

Resources	Use	Hour	Min	Req	Max	Notes

Report Type	Date	IT	Frq	Hrs	Insp	CertNo	Coinsp	Note
Fracture Critical	06/16/16		24	3.5	ABK	G1220	PFK	8/24/2016Entered only Inspection Date, Hours, Inspectors' Initials and any data modified by the inspector on the NBI or WB71 through WB75 panels.MHB

Resources	Use	Hour	Min	Req	Max	Notes
UBIT	60	4.00	30	60	ANY	Able to inspect truss with only two picks per truss with UB60, other trucks should also work.

Report Type	Date	IT	Frq	Hrs	Insp	CertNo	Coinsp	Note
Underwater	05/18/15	D	24	1.5	JRH	G0911	RMP	Underwater inspection performed by WSDOT Dive Team.5/18/15Entered only Inspection Date, Hours, Inspectors' Initials and any data modified by the inspector on the NBI or WB71 through WB75 panels (as indicated on the BPO WSBIS Inventory Report). MHB

Resources	Use	Hour	Min	Req	Max	Notes

Report Type	Date	IT	Frq	Hrs	Insp	CertNo	Coinsp	Note
Informational	09/27/16				MPZ	G1331		See Files tab for scanned copy of the 2016 WSDOT FC Report. ADT also updated.

Resources	Use	Hour	Min	Req	Max	Notes

Snohomish County
Bridge Load Rating Summary

IZZAT H. HASAYEN
26933
EXPIRES 2/9/ 2004

10/20/0

Structure ID No: ______

Bridge Name: South Fork Stilly River Bridge
Bridge Number: # 537

Load Rating By: SHC Date: Aug-03

Number of Spans: Main Span #2 (CONTROLS) GCL
Bridge Types: Steel Truss
Year Built: 1953
Design Load: H20-S16-44

Comments: COMPLETE TEXT OF LOAD RATING IS FILED IN LOAD RATING FILE

National Bridge Inventory (NBI) Load Factor Rating Method

AASHTO HS-20 Truck	*RF*	Live Load Factor	*Controlling Point*
Inventory (Service or Ultimate)	1.04	2.17	Moment @ Center of Stringer
Operating (Ultimate Only)	1.73	1.30	Moment @ Center of Stringer
Fatigue		N/A	

National Bridge Inventory (NBI) Load Factor Rating Method

	Actual Capacity	*Required Capacity*	**NBI and SWIBS coding**
Inventory	37 Tons	36 Tons	**2 37**
Operating	62 Tons	36 Tons	**2 62**

Safe Load Capacity (Load Resistance Factor Rating Method)

Truck	*RF*	Live Load Factor	Resistance Factor	*Controlling Point*
HS-20	1.29	1.45	0.75	Moment @ Center of Stringer
AASHTO 1 (Type 3)	1.47	1.45	0.75	Moment @ Center of Stringer
AASHTO 2 (Type 3S2)	1.60	1.45	0.75	Moment @ Center of Stringer
AASHTO 3 (Type 3-3)	1.78	1.45	0.75	Moment @ Center of Stringer
OL 1	1.26	1.30	0.75	Moment @ Center of Stringer
OL 2	0.87	1.30	0.75	Truss Bottom Chord

Safe Load Capacity Level (Load Resistance Factor Rating Method)

Truck	*Actual Capacity*	*Required Capacity*	*Posting Required*
HS-20	46 Tons	36 Tons	**N/A**
AASHTO 1 (Type 3)	37 Tons	25 Tons	**No**
AASHTO 2 (Type 3S2)	58 Tons	36 Tons	**No**
AASHTO 3 (Type 3-3)	71 Tons	40 Tons	**No**
OL 1	60 Tons	48 Tons	**N/A**
OL 2	90 Tons	104 Tons	**N/A**

Washington State Department of Transportation
WSBIS Inventory Report

10/24/2016

Structure Identifier	Bridge Number	Owner Code	County Number	City Number	Update
08291500	537	02	31	0000	0

WB71

Bridge Name	Location	Section	Township	Range	Latitude	Longtitude
RED BRIDGE	18.2 E JCT SR 92	21	30	09E	48°04'18.00"	121°39'18.00"

WB72

Feature Intersected	Facilities Carried	Region	FIPS Place Code	Legis District (1)	Legis District (2)	Toll	Custodian	Parallel Structure	Temporary Structure	Critical Facility	Median	Hist Sig	Open Closed	Program Year
S.F. STILLAGUAMISH RIVER	MOUNTAIN LOOP HWY.	NW	64470	39	0	3	02	N		☒	0	1	A	
										☒				

WB73

Year Built	Year ReBuilt	Bridge Length	NBIS Length	Maximum Span Length	Lanes On	Lanes Under	Curb to Curb Deck Width	Out to Out Deck Width	Sidewalk Curb Left	Sidewalk Curb Right	Min Vert Clearance Over Deck	Min Vert Clearance Under Bridge	Code	Min Lat UnderClr Right	Code	Min Lat UnderClr Left	Navigation Control	Navigation Vertical Clearance	Navigation Horizontal Clrnce	Vert Lift Min Clrnce	Appr Roadway Width	Skew Angle	Flare
1954	0	209	.	163	2	0	26.0'	29.3'	0.5'	0.5'	15'00"	0"	N	0.0'	N	0.0'	0	0'	0'	'	32'	0°	N

WB74

On Under	High way Class	Service Level	Route Number	Mile Post	ADT on Inventory Route	Truck ADT PCT	ADT Year	Future ADT	Future ADT Year	Linear Referencing System Route	LRS Sub Route	Fed Aid Route	Nat Hwy System	Base Hwy Network	Strahnet	Fed Lands Highway	Fed Funct Class	National Truck Net	Lane Use Direction	Horizontal Clearance Route Dir	Horizontal Clearance Reverse Dir	Max Vertical Clearance Route Dir	Detour Length
1	4	1	98960	18.18	1355	10	2011	2000	2034			X310	0	0	0	2	07	N	2	26'00"	' "	15'03"	94
					1,662		2,015		2,038														

WB75

Main Span Material	Main Span Design	Appr Span Material	Appr Span Design	Number of Main Spans	Number of Appr Spans	Service On	Service Under	Deck Type	Wearing Surface	Membrane	Fed Deck Protection	Design Load	Oper Rtng Method	Oper Rtng Tons	Invt Rtng Method	Invt Rtng Tons	Design Exception Date	Federal Aid Project	Border State Code	Border State PCT	Border State Structure Identifier
3	10	1	01	1	2	1	5	1	1	0	0	5	F	62	F	37					
																	/ /				

WB76

Routine Inspection

Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector	Structural Adequacy	Deck Geometry	Underclrnce Adequacy	Operating Level	Alignment Adequacy	Waterway Adequacy	Deck Overall	Drain Cond	Drains	Scaling Severity	Scaling Percent	Deck Rutting	Exposed Reinf Steel	Superstruct Overall	Curb	Sidewalks	Paint	Number of Utilities	Substruct Overall	Channel Protection	Culvert	Pier Abutment	Scour	Approach Roadway	Retaining Walls	Pier Protection	Traffic Safety Bridge Rail	Traffic Safety Trans	Traffic Safety Guard Rail	Traffic Safety Term	Revise Rating	Repair Status	Card Check	Photos	Season	Soundings	Clearances	Monitor Structure
24	06162016	1.0	ABK	G1220	PFK	6	4	9	5	8	8	6	8	1	L	1	7	8	6	5	9	5	2	6	8	9	N	3	8	9	9	1	1	1	0	N					Y		
	/ /	.				☒	☒	☒																																			

Sufficiency Rating: 59.19

WB77

Fracture Critical / UBIT Inspection

Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
U	24	06162016	3.5	ABK	G1220	PFK

Underwater Inspection

Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
D	24	05182015	1.5	JRH	G0911	RMP

Other Special Inspections

Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
		/ /	.			

WB78

Water Type	Flood Plain Intrusion	Flood Control	History	Scour Material	Streambed Stability	Substruct Obstruction	Waterway Stability	Streambed Anabranch	Piers in Water	Service On	Service Under	Work Type	Work Methd	Structure Improve Length	Roadway Width	Lanes On	Lanes Under	Total Costs In Thousands	Structure Cost In Thousands	Roadway Cost In Thousands	Estimate Year	Calc	Inspecting Agency Code	Inspecting Agency Number	Seismic Status-Superstruct Main Biennium	Seismic Status-Superstruct Approach Biennium	Seismic Status-Substruct Main Biennium	Seismic Status-Substruct Approach Biennium
F	A	N	C	3	7	N	B	N	2	0	0	00	0	0	0	0	0	0	0	0	0	N						

(Proposed Improvements: Work Type through Calc)

BRIDGE INSPECTION REPORT

Status: Released
Printed On: 1/8/2018
Agency: Snohomish County
CD Guid: cceb042a-074d-4ae3-adc0-6720f12bcfa7
CD Date: 11/16/2017
Program Mgr: Roman G. Peralta

Br. No. 658 **SID** 08802600 **Br. Name** LITTLE BEAVER CREEK
Carrying MOUNTAIN LOOP HWY **Route On** 98960 **Mile Post** 20.02
Intersecting LITTLE BEAVER CR **Route Under** **Mile Post**

Inspector's Signature MPZ Cert # G1331 Cert Exp Date 3/13/2019
Co-Inspector's Signature

4	Structural Eval	(1657)
5	Deck Geometry	(1658)
9	Underclearance	(1659)
8	Alignment	(1661)
9	Deck Overall	(1663)
9	Superstructure	(1671)
9	Substructure	(1676)
5	Culvert	(1678)
6	Chan/Protection	(1677)
N	Pier/Abut/Prot	(1679)
9	Drain Cond	(7664)
0	Drain Status	(7665)
	Deck Scaling	(7666)
	Scaling Pct	(7667)
	Deck Rutting	(7669)
	Exposed Rebar	(7670)
	Curb Cond	(7672)

28		Operating Tons	(1552)
		Op RF	(1553)
17		Inventory Tons	(1555)
		Inv RF	(1556)
5		Operating Level	(1660)
A		Open/Closed	(1293)
8		Waterway	(1662)
4		Scour	(1680)
		Soundings Flag	(2693)
Y	*	Revise Rating	(2688)
D	*	Photos Flag	(2691)
		Measure Clrnc	(2694)
		Sdwk Cond	(7673)
		Paint Cond	(7674)
		Approach Cond	(7681)
9		Retaining Wall	(7682)
9		Pier Prot	(7683)

0		No Utilities	(2675)
N		Bridge Rails	(1684)
N		Transition	(1685)
1		Guardrails	(1686)
N		Terminals	(1687)
4.00		Asphalt Depth	(2610)
		Design Curb Ht	(2611)
		Bridge Rail Ht	(2612)
2007		Year Built	(1332)
0		Year Rebuilt	(1336)
	N	Subj to NBIS	(2614)

Alpha Span Type:

CS

Sufficiency Rating 47.58

No Risk Category

Inspections Performed:

Freq	Hrs	Date	Rep Type
			Routine
			Fract Crit
			UW
			Special
			Interim
			UWI
			Damage
			Safety
24	**1.0**	**11/16/2017**	**Short Span**
			In Depth
			Geometric

BMS Elements

Element	Element Description	Total	Units	State 1	State 2	State 3	State 4
241	Concrete Culvert	60	LF	60	0	0	0
330	Metal Bridge Railing	44	LF	44	0	0	0
361	Scour	2	EA	1	0	1	0
800	Asphaltic Concrete (AC) Overlay	1,308	SF	1,308	0	0	0

Notes

0	Oriented west to east.
11	Load rating by SARGENT (4/2011) assigned NBI values only (Administrative). Posting of legal loads not required, but overloads should not be allowed. See summary sheet under Records tab.
241	Precast concrete bottomless box culvert by Utility Vault Co., with 14" thick deckslab. (12) sections x 5 ft. wide x 20 ft. span, supported by precast concrete spread footings 7 feet wide. Some efflorescence at joints. Culvert has approx. 10 ft. of fill over it to roadway surface. Two small spalls on ceiling at entrance - rebar chair showing in one.
330	CORE10 W-beam (weathering steel) both sides of roadway above culvert. Wind felled tree damaged 12' of guardrail both sides of road (2015) - north side repaired but south side still damaged at time of inspection.

BRIDGE INSPECTION REPORT

Status: Released Printed On: 1/8/2018 Agency: Snohomish County

CD Guid: cceb042a-074d-4ae3-adc0-6720f12bcfa7 CD Date: 11/16/2017 Program Mgr: Roman G. Peralta

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Br. No. 658 **SID** 08802600 **Br. Name** LITTLE BEAVER CREEK

Carrying MOUNTAIN LOOP HWY **Route On** 98960 **Mile Post** 20.02

Intersecting LITTLE BEAVER CR **Route Under** **Mile Post**

Notes (Continued)

361	Little Beaver Cr. flows north to south with thalweg against west side. Anabranch and sharp angles at entrance but low volume stream. Small void in road fill behind west side of culvert at the entrance has settled some (2017). Major high water event in November, 2015 caused moderate scour at entrance and along the west spread footing of culvert. Water was cloudy and up to 7' deep in culvert at time of inspection but by probing along west footing it was determined that top of footing was exposed along entire length, and up to 1.8' vertical below edge of footing was exposed over approx. 10 lf near roadway centerline. Undetermined whether undermining had occurred, but no sign of settlement in culvert or roadway. Continue to monitor until damage can be assessed at low water in summer. Probed, Sept 2017, not much change to scour situation.
800	ACP overlay on fill. Much construction related damage to eastbound lane from Waldiem slide repair work early 2011. Repaired 2013. New chip seal 2013.
1677	Minor bank slump and a few uprooted trees spanning waterway upstream. Anchored logs are in place and functioning well upstream in east branch of creek.
7682	Stabilized earth walls @ fill locations. North slope - 7 layers, South slope - 5 layers.

Repairs

Repair No	Pr	R	Repair Descriptions	Noted	Maint	Verified
10001	M	S	Monitor for signs of settlement after high water events due to scour of west footing. (Checked Sept. 2017).	11/30/2015		

Inspections Performed and Resources Required

Report Type	Date	Freq	Hrs	Insp	CertNo	Coinsp	Note
Short Span	11/16/2017	24	1.0	MPZ	G1331		Changed to short span 11/20/2013 - 20' inside face to inside face of culvert.

Washington State Department of Transportation

WSBIS Local Agency Inventory Report

Bridge ID

1001	2009	2132	1019	1286	1021	2023	1156	2181	2183	2185	1188	1196
Structure ID	Bridge Number	Bridge Name	Owner	Cust	County	City	Location	Section	Twnshp	Range	Latitude	Longitude
08802600	658	LITTLE BEAVER CREEK	02	2	31	0000	20.0 E JCT SR92	23	30	09E	48° 04' 00.00"	121° 37' 00.00"
	658										**48° 04' 07.06"**	**121° 37' 05.08"**

Facilities

1232	1256	1274	7281	7283	1276	1285	1288	1289	1293	1292	2295	7296
Feature Intersected	Facilities Carried	Region	Leg1	Leg2	FIPS	Toll	Para	Temp	OPC	NRHP	HAER	LRHP
LITTLE BEAVER CR	MOUNTAIN LOOP HWY	NW	39	0	64470	3	N		A	4		

Printed Date
1/8/2018

Sufficiency Rating:	
47.58	Item 2710 SR
	Item 2711 SD/FO

Layout

1332	1336	1340	2346	1348	1352	1356	1360	1364	1367	1310	1312	1370	1374	1378	1379	1382	1383	1386	1387	1390	1394	1291	1397
Year Built	Year Rebuilt	Bridge Length	NBIS Length	Maximum Span Length	Lanes On	Curb to Curb Deck Width	Out to Out Deck Width	Sidewalk Left	Sidewalk Right	Skew	Flared	Min Vert Over Deck	Min Vert Under	Vert Code	Min Lat Under Right	Lat Code	Min Lat Under Left	Nav Ctl Code	Nav Vert Clear	Nav Horiz Clear	Nav Vert Lift Clear	Median	Appr Rdwy
2007	0	22	20.0	21	2	28.0	28.0	0.0	0.0	0	N	99' 99"	00' 00"	N	0.0	N	0.0	0	0	0		0	28

Crossing

1432	1433	1434	1435	2440	1445	1451	1453	1457	1463	1467	1477	1469	2410	7479	1483	1484	1485	1486	1487	1489	1490	1354	1491	1495	1499	1413	2441
On Under	Hwy Class	Service Level	Route Number	Milepost	ADT	Truck %	Year of ADT	Future ADT	Future ADT Year	Linear Referencing System	LRS Sub	LRS Milepost	NBI Bridge	Fed Aid Route #	NHS	BHS	STRAH	FLH	Funct. Class	NTN	Lane Use Direction	Lanes Under	Horizontal Clearance Route Dir	Horizontal Clearance Reverse Dir	Max Vert Clearance Route	Detour	Speed Limit
1	4	1	98960	20.02	1239	15	2011	1500	2035	98960			N	X310	0	0	0	2	07	N	2	0	28' 00"			94	45
					1542	**5**	**2015**	**2000**	**2039**																		

Design

1532	1533	1535	1536	1538	1541	1544	1545	1546	1547	1548	1549	1550	1551	1552	1553	1554	1555	1556	1585	1588	1590	7565	7557
Main Span Material	Main Span Design	Appr Span Material	Appr Span Design	Number Main Spans	Number Appr Spans	Service On	Service Under	Deck Type	Wearing Surface	Membrane	Deck Protect	Design Load Code	Oper Rating Method	Oper Rating Tons	Oper Rating Factor	Inv Rating Method	Inv Rating Tons	Inv Rating Factor	Border State Cd	Border Pct	Border Structure ID	Fed Aid Project No	Design Exemption
1	19	0	00	1	0	5	5	N	N	N	N	5	0	28		0	17						

Load Rating

2587	2588	2589	2590	2591	2592	2593	2594	2595	2596
Type 3	Type 3S2	Type 3-3	NRL	SHV 4	SHV 5	SHV 6	SHV 7	OL 1	OL 2

Waterway/ Prop Imp

7832	7833	7834	7835	7836	7837	7838	7839	7840	7841	1844	1846	1847	2853	2860	1867	1873	2870	1861	1879	2883
Water Type	Flood Pln Intr	Flood Control	Scour Hist	Strmbd Matrl	Substr Stablty	Wtrwy Obstr	Strmbd Stablty	Strmbd Anabrn	Piers In Watr	Type Work	Work Meth	Stru Imp Length	Roadway Width	Cost Per SF	Struct Cost	Rdwy Cost	Engr Cost	Total Cost	Estmt Year	Prop Imp Cost Calc
F	A	N	C	3	1	A	A	A	2											
											0									

Inspection Report Types

2920 Inspection	1990 Date	2646 Inspector	2649 Cert No	2654 Co-Inspector
Routine				
Fracture Critical				
Special Feature				
Underwater				

Inspection	Date	Inspector	Cert No	Co-Inspector
UW Interim				
Interim				
In Depth				
Damage				

Inspection	Date	Inspector	Cert No	Co-Inspector
Safety				
Short Span	11/16/2017	MPZ	G1331	
Geometric				
Info				
Inventory				

Control Data Guid: cceb042a-074d-4ae3-adc0-6720f12bcfa7 Control Data Date: 11/16/2017

BRIDGE INSPECTION REPORT

Status: Released

Printed On: 5/9/2017

Agency: Snohomish County

CD Guid: 636dfa5c-8dd1-4f67-aa30-1daef0418fff

CD Date: 4/6/2017

Program Mgr: Roman G. Peralta

Br. No. 562 **SID** 08839000 **Br. Name** MARTEN CREEK

Carrying MOUNTAIN LOOP HWY **Route On** 98960 **Mile Post** 20.64

Intersecting MARTEN CREEK **Route Under** **Mile Post**

Mike Zatkovich

Inspector's Signature MPZ Cert # G1331 Cert Exp Date 3/13/2019

Co-Inspector's Signature

7	Structural Eval	(1657)
6	Deck Geometry	(1658)
9	Underclearance	(1659)
8	Alignment	(1661)
8	Deck Overall	(1663)
7	Superstructure	(1671)
8	Substructure	(1676)
9	Culvert	(1678)
5	Chan/Protection	(1677)
N	Pier/Abut/Prot	(1679)
9	Drain Cond	(7664)
0	Drain Status	(7665)
N	Deck Scaling	(7666)
0	Scaling Pct	(7667)
0	Deck Rutting	(7669)
0	Exposed Rebar	(7670)
9	Curb Cond	(7672)

99	Operating Tons	(1552)
3.32	Op RF	(1553)
71	Inventory Tons	(1555)
1.99	Inv RF	(1556)
5	Operating Level	(1660)
A	Open/Closed	(1293)
8	Waterway	(1662)
8	Scour	(1680)
Y	Soundings Flag	(2693)
N	Revise Rating	(2688)
	Photos Flag	(2691)
	Measure Clrnc	(2694)
9	Sdwk Cond	(7673)
9	Paint Cond	(7674)
8	Approach Cond	(7681)
9	Retaining Wall	(7682)
9	Pier Prot	(7683)

1	No Utilities	(2675)
1	Bridge Rails	(1684)
1	Transition	(1685)
1	Guardrails	(1686)
1	Terminals	(1687)
3.00	Asphalt Depth	(2610)
0.00	Design Curb Ht	(2611)
33.0	Bridge Rail Ht	(2612)
2011	Year Built	(1332)
0	Year Rebuilt	(1336)
Y	Subj to NBIS	(2614)

Alpha Span Type:

PCBTG

Sufficiency Rating 84.99

Low Risk

Inspections Performed:

Freq	Hrs	Date	Rep Type
24	1.0	4/6/2017	Routine
			Fract Crit
			UW
			Special
			Interim
			UWI
			Damage
			Safety
			Short Span
			In Depth
			Geometric

BMS Elements

Element	Element Description	Total	Units	State 1	State 2	State 3	State 4
13	Bridge Deck Surface	5,130	SF	5,130	0	0	0
108	Prestressed Concrete Bulb-T Girder	929	LF	929	0	0	0
215	Concrete Abutment	154	LF	154	0	0	0
310	Elastomeric Bearing	14	EA	14	0	0	0
321	Concrete Roadway Approach Slab	1,360	SF	1,360	0	0	0
331	Concrete Bridge Railing	340	LF	340	0	0	0
340	Metal Pedestrian Railing	340	LF	340	0	0	0
361	Scour	2	EA	2	0	0	0
404	Compression Seal / Concrete Header	80	LF	80	0	0	0
800	Asphaltic Concrete (AC) Overlay	5,130	SF	5,130	0	0	0

Notes

0 Bridge elements numbered west to east.

Br. No. 562 **SID** 08839000 **Br. Name** MARTEN CREEK

Carrying MOUNTAIN LOOP HWY **Route On** 98960 **Mile Post** 20.64

Intersecting MARTEN CREEK **Route Under** **Mile Post**

Notes (Continued)

11	Load rating (11/2011) indicates AASHTO factors all above "3" and good for overloads also. NRL > 1.0 thus SUV ratings not needed.
13	Not visible due to ACP overlay. No membrane.
108	7 lines Deck Bulb-Tee Girders: 45 deg diagonal cracks with efflorescence on webs of girders A,B,C,D & F @ Abut #1, and on girders B,C,D,E, & G @ Abut 2. Moisture leaking through longitudinal joints - typ. Moisture with efflorescence at cip concrete end diaphragms - typ.
215	Embankment soil migrating through end diaphrams at transition to wing walls @ all 4 corners. Maintenance crew repaired in 2012. Abutments are supported by 2.0' diam. reinforced concrete pipe piles 110' minimum depth capped by concrete footing of 3'-6" thickness. Piles not visible for inspection. Wingwalls at all 4 corners parralel to road centerline, integral with abutments, thus counted in abutment quantities.
310	No defects noted.
321	17' x 40' each end of bridge. Not visible due to ACP overlay.
331	Jersey Barrier style (cip). Random hairline vertical cracks throughout with efflorescence.
340	10" high metal pedestrian railing mounted to top of concrete bridge railing with slight impact damage from falling trees at 2 places - upstream side.
361	Marten Cr. flows north to south under bridge. Downcutting and subsequent channel widening that was talked about in the Geo Report has progressed with scour attacking the west bank especially hard. Vertical streambank now 17' from west abutment - 2015 = Monitor. Streambank 12' from abutment - 2017 but appears to be stabilizing somewhat.
404	Covered by ACP overlay.
800	No cracking noted. (per plan ACP=3" 2011). Chip sealed 2012.
1677	There is LWD located randomly under, and just upstream and downstream from bridge - most of which was placed for mitigation and slope stability during construction. Scour has unburied all but one of these logs - 2015. There is a large amount of naturally downed trees several hundred feet upstream in the stream channel, and also severe slope erosion at the NW corner upstream of bridge.
1680	Bridge is founded on deep piles. Per geologic investigation by Geoengineers: Downcutting on order of 5' to 8' expected, resulting in channel widening under bridge.
2675	Galvanized conduit - 4" - carrying communication line(?) between girts B-C, and 4" future utility stubouts between girts E-F.

Repairs

Repair No	Pr	R	Repair Descriptions	Noted	Maint	Verified

Inspections Performed and Resources Required

Report Type	Date	Freq	Hrs	Insp	CertNo	Coinsp	Note
Routine	4/6/2017	24	1.0	MPZ	G1331		Baseline sounding taken of stream channel.

Bridge Rating Summary

YAKOV POLYAKOV
31252
5/25/2012

Bridge Name:	Marten Creek Bridge
Bridge Number:	#562
Span Types:	Prestressed decked bulb-tee girders
Bridge Length:	One span 130 ft between bearings
Design Load:	HL-93
Rated By:	Parsons Brinckerhoff/Yakov Polyakov
Checked By:	ERIC KELLEY
Date:	1-Nov-2011

Inspection Report Date	N/A, new bridge	Substructure Condition	
Rating Method	Load Factor (LFR)	Deck Condition	
Overlay Thickness	3" minimum	Superstructure Condition	

Truck	RF (INV)	RF (OPR)	Controlling Point
AASHTO-1	2.81	4.69	Interior girder, flexure at midspan (Ultimate)
AASHTO-2	2.20	3.67	Interior girder, flexure at midspan (Ultimate)
AASHTO-3	2.10	3.51	Interior girder, flexure at midspan (Ultimate)
NRL	1.75	2.92	Interior girder, flexure at midspan (Ultimate)
OL-1	1.87	3.26	Interior girder, flexure at midspan (service [4])
OL-2	1.06	1.85	Interior girder, flexure at midspan (service [4])

NBI Rating	RF	Controlling Point
Inventory (HS-20)	1.99	Interior girder, flexure at midspan, load factor
Operating (HS-20)	3.32	Interior girder, flexure at midspan, load factor

Remarks:

1. The bridge was designed in 2009 and built in 2011.
2. Load factor method (LFR) was used for rating in accordance with WSDOT requirements for bridges designed prior to October 1, 2010.
3. Flexural capacity and stresses in midspan of the bridge govern rating.
4. Ultimate moment capacity at midspan govenrs operating rating for permit trucks OL-1 and OL-2.
5. Software BRIDG (version 10.8h, 2007) was used to compute rating factors.
6. To comply with July 2011 WSDOT BDM and AASHTO Guide for Bridge Evaluation (2nd Edition, 2011) additional independent calculations have been performed (see appendix A to this report).

Washington State
Department of Transportation

WSBIS Local Agency Inventory Report

Bridge ID

1001	2009	2132	1019	1286	1021	2023	1156	2181	2183	2185	1188	1196
Structure ID	Bridge Number	Bridge Name	Owner	Cust	County	City	Location	Section	Twnshp	Range	Latitude	Longitude
08839000	562	MARTEN CREEK	02	2	31	0000	20.6 E JCT SR 92	23	30	09E	48° 04' 18.00"	121° 36' 24.00"
	562											

Facilities

1232	1256	1274	7281	7283	1276	1285	1288	1289	1293	1292	2295	7296
Feature Intersected	Facilities Carried	Region	Leg1	Leg2	FIPS	Toll	Para	Temp	OPC	NRHP	HAER	LRHP
MARTEN CREEK	MOUNTAIN LOOP HWY	NW	39	0	64470	3	N		A	4		

Printed Date
5/9/2017

Sufficiency Rating:	
84.99	Item 2710 SR
	Item 2711 SD/FO
Low Risk	

Layout

1332	1336	1340	2346	1348	1352	1356	1360	1364	1367	1310	1312	1370	1374	1378	1379	1382	1383	1386	1387	1390	1394	1291	1397
Year Built	Year Rebuilt	Bridge Length	NBIS Length	Maximum Span Length	Lanes On	Curb to Curb Deck Width	Out to Out Deck Width	Sidewalk Left	Sidewalk Right	Skew	Flared	Min Vert Over Deck	Min Vert Under	Vert Code	Min Lat Under Right	Lat Code	Min Lat Under Left	Nav Ctl Code	Nav Vert Clear	Nav Horiz Clear	Nav Vert Lift Clear	Median	Appr Rdwy
2011	0	135		130	2	38.0	41.0	0.0	0.0	0	N	99' 99"	00' 00"	N	0.0	N	0.0	0	0	0		0	30

Crossing

1432	1433	1434	1435	2440	1445	1451	1453	1457	1463	1467	1477	1469	2410	7479	1483	1484	1485	1486	1487	1489	1490	1354	1491	1495	1499	1413	2441
On Under	Hwy Class	Service Level	Route Number	Milepost	ADT	Truck %	Year of ADT	Future ADT	Future ADT Year	Linear Referencing System	LRS Sub	LRS Milepost	NBI Bridge	Fed Aid Route #	NHS	BHS	STRAH	FLH	Funct. Class	NTN	Lane Use Direction	Lanes Under	Horizontal Clearance Route Dir	Horizontal Clearance Reverse Dir	Max Vert Clearance Route	Detour	Speed Limit
1	4	1	98960	20.64	1239	15	2011	1500	2034	98960			Y	X310	0	0	0	2	07	N	2	0	38' 00"			94	45
					1541	**10**	**2016**	**2000**	**2039**																		

Design

1532	1533	1535	1536	1538	1541	1544	1545	1546	1547	1548	1549	1550	1551	1552	1553	1554	1555	1556	1585	1588	1590	7565	7557
Main Span Material	Main Span Design	Appr Span Material	Appr Span Design	Number Main Spans	Number Appr Spans	Service On	Service Under	Deck Type	Wearing Surface	Membrane	Deck Protect	Design Load Code	Oper Rating Method	Oper Rating Tons	Oper Rating Factor	Inv Rating Method	Inv Rating Tons	Inv Rating Factor	Border State Cd	Border Pct	Border Structure ID	Fed Aid Project No	Design Exemption
5	04	0	00	1	0	1	5	B	6	0	1	A	1	99		1	71					BRS-X310(008)	
													6		**3.32**	**6**		**1.99**					

Load Rating

2587	2588	2589	2590	2591	2592	2593	2594	2595	2596
Type 3	Type 3S2	Type 3-3	NRL	SHV 4	SHV 5	SHV 6	SHV 7	OL 1	OL 2
4.69	**3.67**	**3.51**	**2.92**					**3.26**	**1.85**

Waterway/ Prop Imp

7832	7833	7834	7835	7836	7837	7838	7839	7840	7841	1844	1846	1847	2853	2860	1867	1873	2870	1861	1879	2883
Water Type	Flood Pln Intr	Flood Control	Scour Hist	Strmbd Matrl	Substr Stablty	Wtrwy Obstr	Strmbd Stablty	Strmbd Anabrn	Piers In Watr	Type Work	Work Meth	Stru Imp Length	Roadway Width	Cost Per SF	Struct Cost	Rdwy Cost	Engr Cost	Total Cost	Estmt Year	Prop Imp Cost Calc
F	A	N	N	3	3	A	D	N	0											

Inspection Report Types

2920 Inspection	1990 Date	2646 Inspector	2649 Cert No	2654 Co-Inspector
Routine	4/6/2017	MPZ	G1331	
Fracture Critical				
Special Feature				
Underwater				

Inspection	Date	Inspector	Cert No	Co-Inspector
UW Interim				
Interim				
In Depth				
Damage				

Inspection	Date	Inspector	Cert No	Co-Inspector
Safety				
Short Span				
Geometric				
Info				
Inventory				

Control Data Guid: 636dfa5c-8dd1-4f67-aa30-1daef0418fff   Control Data Date: 4/6/2017

BRIDGE INSPECTION REPORT

Status: Released
Printed On: 8/7/2017
Agency: Snohomish County
CD Guid: ff7ff4a2-54e5-40a5-bdce-f9b62a28871f
CD Date: 7/18/2017
Program Mgr: Roman G. Peralta

Br. No. 670 **SID** 08228300 **Br. Name** DEER CREEK #670
Carrying MOUNTAIN LOOP HWY. **Route On** 98960 **Mile Post** 23.33
Intersecting DEER CREEK **Route Under** **Mile Post**

Inspector's Signature MPZ Cert # G1331 Cert Exp Date 3/13/2019
Co-Inspector's Signature MMA

5		Structural Eval	(1657)
4		Deck Geometry	(1658)
9		Underclearance	(1659)
8		Alignment	(1661)
6		Deck Overall	(1663)
6		Superstructure	(1671)
5		Substructure	(1676)
9		Culvert	(1678)
6		Chan/Protection	(1677)
N		Pier/Abut/Prot	(1679)
6	7	Drain Cond	(7664)
1		Drain Status	(7665)
L		Deck Scaling	(7666)
2		Scaling Pct	(7667)
7		Deck Rutting	(7669)
8		Exposed Rebar	(7670)
6		Curb Cond	(7672)

41		Operating Tons	(1552)
		Op RF	(1553)
26		Inventory Tons	(1555)
		Inv RF	(1556)
5		Operating Level	(1660)
A		Open/Closed	(1293)
8		Waterway	(1662)
U		Scour	(1680)
Y		Soundings Flag	(2693)
N		Revise Rating	(2688)
		Photos Flag	(2691)
		Measure Clrnc	(2694)
9		Sdwk Cond	(7673)
9		Paint Cond	(7674)
8	6	Approach Cond	(7681)
9		Retaining Wall	(7682)
9		Pier Prot	(7683)

0		No Utilities	(2675)
1		Bridge Rails	(1684)
1		Transition	(1685)
1		Guardrails	(1686)
1		Terminals	(1687)
2.50	0.50	Asphalt Depth	(2610)
	7.00	Design Curb Ht	(2611)
	33.5	Bridge Rail Ht	(2612)
1949		Year Built	(1332)
0		Year Rebuilt	(1336)
	Y	Subj to NBIS	(2614)

Alpha Span Type:
TTC

Sufficiency Rating 48.15
High Risk

Inspections Performed:

Freq	Hrs	Date	Rep Type
12	1.5	7/18/2017	Routine
			Fract Crit
			UW
			Special
			Interim
			UWI
			Damage
			Safety
			Short Span
			In Depth
			Geometric

BMS Elements

Element	Element Description	Total	Units	State 1	State 2	State 3	State 4
12	Concrete Deck	4,862	SF	4,861	0	1	0
35	Concrete Deck Soffit	4,862	SF	4,861	0	1	0
117	Timber Sawn Girder	2,431	LF	2,431	0	0	0
216	Timber Abutment	80	LF	80	0	0	0
228	Timber Submerged Pile/Column	39	EA	36	0	1	2
235	Timber Pier Cap	252	LF	252	0	0	0
331	Concrete Bridge Railing	374	LF	374	0	0	0
361	Scour	5	EA	2	0	3	0
417	Silicone Rubber Joint Filler	182	LF	182	0	0	0
806	BST on Concrete (Chip Seal)	4,862	SF	3,662	0	1,200	0

Notes

0 Oriented West to East.

Br. No. 670 **SID** 08228300 **Br. Name** DEER CREEK #670

Carrying MOUNTAIN LOOP HWY. **Route On** 98960 **Mile Post** 23.33

Intersecting DEER CREEK **Route Under** **Mile Post**

Notes (Continued)

11	Load rating 8/01 indicates rating factors for all three AASHTO trucks are well above "1" (36-53-71 tons), but overloads are limited. NRL rating needed by 2022.
12	Deck: pcc, cip (1949) in fair condition. Minor transverse cracking. Worn to aggregate in wheel lines. A few small spalls totaling 1 sf. Chip seal that was added in 2004 has worn bare in places, especially west end of bridge.
35	Some construction form material left in-place. Minor efflorescence / cracking typ. Minor transverse hairline leaching cracks scattered throughout soffit. Rust stain Bent 5 between girders B & C midspan.
117	Stringers: 8" x 24" treated timber (1949), (13) lines x (6) spans in fair condition. 2" x 6" treated timber x-bracing diaphragms @ 1/3 points and solid timber bridging over caps. Dapped up to 1/2" over caps. Jack stringers with minor exposed edge surface deterioration and dull sounding in places. Checking near midsection scattered throughout, especially on stringer 1E, full length.
216	Abutments: 4" x 12" treated timber bulkhead planks (1998) @ A1 . Four new planks added @ A7 (2009).
228	Piles: 10" to 12" diam creosote-treated timber (1949) in fair-to-poor condition. A1 (5) , B2 (6) , B3 (7) , B4 (7) , B5 (5), B6 (5), A7 (5). Impel rods installed in Piers 3, 4, 5, & 6 piles in 1998. Most of piles are pale looking with very little creosote visibly left at surface. Pile 4F w/4' long x 2" wide delam/fracture 1" deep near groundline. Piles 4G & 5D drill checked 2015 = okay. Pile 5A w/2' long x 3" wide x 1" deep fractured off piece near groundline. Pile 5C w/3' long check x 1/8 " wide at west side near ground. B5 - A,B,D - eccentric placement of caps to pile tops / some crushing resulting. Minor eccentric placement of other piles in relation to caps throughout. Pile 6D = R - temporary posts on mud sills were added 2009. Pile 7C = R - temporary posts and mud sills were added 2009. Piles 6C(Y), 6D, & 7C with shallow temporary sleave repairs made in 2014, with temporary support posts on mud sills left in place. 2016 - Drill checked piles 2B, 3B, 3G, 4F, 5E, & 6B near ground level. All found okay. Pile 7E with slight lean to west resulting in 50% bearing.
235	Caps: 12" x 14" creo-tr timber. Caps at B2, B3, B4, and B5 new in 1998 and A7 cap new in 2009. Other two (1949) are in fair cond. Cap crushing of approx. 1/4" @ Pier 5 - piles A & B.
331	Rail: pcc (cip) 1949 in fair condition. Minor collision damage, scrapes, spalls,cracks and surface erosion. Pressure washed and sealed in 2010. New spall at midspan of north rail - 2014 - 6"x6"x4" deep.
361	Two channels have formed upstream of the bridge, flowing under spans 4 and 5 from north to south, with span 4 the main channel (very low flow under span 5 - 2017). Piers 4,5, & 6 have stream flow adjacent to them. Piers 2 & 3 in OHW also.
417	Poured joints (1998) in good condition. 5 locations w/ 1/2" - 3/4" joint below deck surface in good condition.
806	Deck chip sealed in 2004. Minor rutting & spalling 2010. Worn very thin to none in places especially at west end of bridge, 2017.
1677	Flow is in spans 4 and 5. Minor debris buildup up around piers 5 & 6 - 2015. Aggradation of 1' - 2' near piers 4, 5, & 6 - 2016. No change 2017.
1680	Wood piles with unknown pile tip elevations.
1686	Guardrails and transitions all new 2014.
1687	Four delineators & bridge sign are OK. Terminals new 2014.
7664	Drains: (6) 3" diam free-fall pipe drains are clear.
7681	Several small spalls in BST totaling 4 sf over east abutment top board. Several small D-spalls at west abutment.

Repairs

Repair No	Pr	R	Repair Descriptions	Noted	Maint	Verified

Inspections Performed and Resources Required

Report Type	Date	Freq	Hrs	Insp	CertNo	Coinsp	Note

BRIDGE INSPECTION REPORT

Status: Released

Printed On: 8/7/2017

Agency: Snohomish County

CD Guid: ff7ff4a2-54e5-40a5-bdce-f9b62a28871f

CD Date: 7/18/2017

Program Mgr: Roman G. Peralta

Br. No. 670 **SID** 08228300 **Br. Name** DEER CREEK #670

Carrying MOUNTAIN LOOP HWY. **Route On** 98960 **Mile Post** 23.33

Intersecting DEER CREEK **Route Under** **Mile Post**

Inspections Performed and Resources Required (Continued)

Report Type	Date	Freq	Hrs	Insp	CertNo	Coinsp	Note
Routine	7/18/2017	12	1.5	MPZ	G1331	MMA	

Resources	Hours	Min	Pref	Max	Freq Date	Need Date	Override	Notes
Access Issues								Need ladder @ P4.

Snohomish County

BRIDGE LOAD RATING SUMMARY

Date: Monday, ~~April~~ Mar 16, 2018 DEA

Structure ID No:	8228300
Bridge Name	Deer Creek
Bridge Number:	670
Bridge Length (ft):	670
Design Load:	HS-15-44
Rated By:	ATD
Revised By:	DEA
Year Built:	1949
Span Type:	Treated Timber Stringers with CIP Conc. Deck

DARRELL E. ASH
STATE OF WASHINGTON
18745
REGISTERED PROFESSIONAL ENGINEER

Darrell E Ash
3 ~~4~~/16/2018
DEA

Insp. Report Date:	7/27/2016	Substructure Condition:	5
Rating Method:	ASD	Deck Condition:	6
Overlay Thickness (in):	0.00	Superstructure Condition:	6

TRUCK:	RF (Inv.):	RF (Oper):	Controlling Point
AASHTO 1 (Type 3):	1.31	1.96	Tension @ bottom fiber midspan
AASHTO 2 (Type 3S2):	1.35	2.03	Tension @ bottom fiber midspan
AASHTO 3 (Type 3-3):	1.61	2.42	Tension @ bottom fiber midspan
NRL	0.86	1.29	Tension @ bottom fiber midspan
SU4:	1.09	1.64	Tension @ bottom fiber midspan
SU5:	1.03	1.55	Tension @ bottom fiber midspan
SU6:	0.93	1.40	Tension @ bottom fiber midspan
SU7:	0.89	1.34	Tension @ bottom fiber midspan
OL-1	0.89	1.34	Tension @ bottom fiber midspan
OL-2	0.77	1.16	Tension @ bottom fiber midspan

NBI Rating:	RF	Tons (US)	Controlling Point
Inventory (HS-20):	1.05	37.7	Tension @ bottom fiber midspan
Operating (HS-20):	1.57	56.6	Tension @ bottom fiber midspan

Remarks:

All operating ratings are above 1.0 (except overloads). No Load Posting is required.

SR = 48

Washington State
Department of Transportation

WSBIS Local Agency Inventory Report

Bridge ID

1001	2009	2132	1019	1286	1021	2023	1156	2181	2183	2185	1188	1196
Structure ID	Bridge Number	Bridge Name	Owner	Cust	County	City	Location	Section	Twnshp	Range	Latitude	Longitude
08228300	670	DEER CREEK #670	02	2	31	0000	23.3 E JCT SR 92	17	30	10E	48° 05' 04.00"	121° 33' 16.00"
	670										**48° 05' 03.83"**	**121° 33' 16.31"**

Facilities

1232	1256	1274	7281	7283	1276	1285	1288	1289	1293	1292	2295	7296
Feature Intersected	Facilities Carried	Region	Leg1	Leg2	FIPS	Toll	Para	Temp	OPC	NRHP	HAER	LRHP
DEER CREEK	MOUNTAIN LOOP HWY.	NW	39	0	64470	3	N		A	5		

Printed Date
8/7/2017

Sufficiency Rating:	
48.15	Item 2710 SR
	Item 2711 SD/FO
High Risk	

Layout

1332	1336	1340	2346	1348	1352	1356	1360	1364	1367	1310	1312	1370	1374	1378	1379	1382	1383	1386	1387	1390	1394	1291	1397
Year Built	Year Rebuilt	Bridge Length	NBIS Length	Maximum Span Length	Lanes On	Curb to Curb Deck Width	Out to Out Deck Width	Sidewalk Left	Sidewalk Right	Skew	Flared	Min Vert Over Deck	Min Vert Under	Vert Code	Min Lat Under Right	Lat Code	Min Lat Under Left	Nav Ctl Code	Nav Vert Clear	Nav Horiz Clear	Nav Vert Lift Clear	Median	Appr Rdwy
1949	0	187		31	2	26.0	31.2	2.0	2.0	0	N	99' 99"	00' 00"	N	0.0	N	0.0	0	0	0		0	26

Crossing

1432	1433	1434	1435	2440	1445	1451	1453	1457	1463	1467	1477	1469	2410	7479	1483	1484	1485	1486	1487	1489	1490	1354	1491	1495	1499	1413	2441
On Under	Hwy Class	Service Level	Route Number	Milepost	ADT	Truck %	Year of ADT	Future ADT	Future ADT Year	Linear Referencing System	LRS Sub	LRS Milepost	NBI Bridge	Fed Aid Route #	NHS	BHS	STRAH	FLH	Funct. Class	NTN	Lane Use Direction	Lanes Under	Horizontal Clearance Route Dir	Horizontal Clearance Reverse Dir	Max Vert Clearance Route	Detour	Speed Limit
1	4	1	98960	23.33	1402	14	2015	2000	2037	98960			Y	X310	0	0	0	2	07	N	2	0	26' 00"			94	45

Design

1532	1533	1535	1536	1538	1541	1544	1545	1546	1547	1548	1549	1550	1551	1552	1553	1554	1555	1556	1585	1588	1590	7565	7557
Main Span Material	Main Span Design	Appr Span Material	Appr Span Design	Number Main Spans	Number Appr Spans	Service On	Service Under	Deck Type	Wearing Surface	Membrane	Deck Protect	Design Load Code	Oper Rating Method	Oper Rating Tons	Oper Rating Factor	Inv Rating Method	Inv Rating Tons	Inv Rating Factor	Border State Cd	Border Pct	Border Structure ID	Fed Aid Project No	Design Exemption
7	02	0	00	6	0	1	5	1	6	0	0	4	2	41		2	26						

Load Rating

2587	2588	2589	2590	2591	2592	2593	2594	2595	2596
Type 3	Type 3S2	Type 3-3	NRL	SHV 4	SHV 5	SHV 6	SHV 7	OL 1	OL 2
1.45	**1.48**	**1.78**						**0.98**	**0.84**

Waterway/ Prop Imp

7832	7833	7834	7835	7836	7837	7838	7839	7840	7841	1844	1846	1847	2853	2860	1867	1873	2870	1861	1879	2883
Water Type	Flood Pln Intr	Flood Control	Scour Hist	Strmbd Matrl	Substr Stablty	Wtrwy Obst	Strmbd Stablty	Strmbd Anabrn	Piers In Watr	Type Work	Work Meth	Stru Imp Length	Roadway Width	Cost Per SF	Struct Cost	Rdwy Cost	Engr Cost	Total Cost	Estmt Year	Prop Imp Cost Calc
F	A	N	N	5	3	A	A	A	5	31	1	190	32	12	49	5	20	74	2016	Y
												197	**38**	**800**	**2994**	**599**	**2396**	**5989**	**2014**	

Inspection Report Types

2920 Inspection	1990 Date	2646 Inspector	2649 Cert No	2654 Co-Inspector
Routine	7/18/2017	MPZ	G1331	MMA
Fracture Critical				
Special Feature				
Underwater				

Inspection	Date	Inspector	Cert No	Co-Inspector
UW Interim				
Interim				
In Depth				
Damage				

Inspection	Date	Inspector	Cert No	Co-Inspector
Safety				
Short Span				
Geometric				
Info				
Inventory				

Control Data Guid: ff7ff4a2-54e5-40a5-bdce-f9b62a28871f Control Data Date: 7/18/2017

BRIDGE INSPECTION REPORT

Status: Released

Printed On: 9/11/2017

Agency: Snohomish County

CD Guid: 70a87f77-cc57-46a8-b9bd-9d84d8eb2a65

CD Date: 8/23/2017

Program Mgr: Roman G. Peralta

Br. No. 556 **SID** 08228400 **Br. Name** COAL CREEK

Carrying MOUNTAIN LOOP HWY. **Route On** 98960 **Mile Post** 24.00

Intersecting COAL CREEK **Route Under** **Mile Post**

Inspector's Signature MPZ Cert # G1331 Cert Exp Date 3/13/2019

Co-Inspector's Signature

5	4	Structural Eval	(1657)
4		Deck Geometry	(1658)
9		Underclearance	(1659)
6		Alignment	(1661)
6		Deck Overall	(1663)
5		Superstructure	(1671)
6		Substructure	(1676)
9		Culvert	(1678)
5		Chan/Protection	(1677)
N		Pier/Abut/Prot	(1679)
9		Drain Cond	(7664)
0		Drain Status	(7665)
N		Deck Scaling	(7666)
0		Scaling Pct	(7667)
0		Deck Rutting	(7669)
0		Exposed Rebar	(7670)
6		Curb Cond	(7672)

40	31	Operating Tons	(1552)
1.13		Op RF	(1553)
24	19	Inventory Tons	(1555)
0.67		Inv RF	(1556)
5	3	Operating Level	(1660)
A	B	Open/Closed	(1293)
6		Waterway	(1662)
U		Scour	(1680)
		Soundings Flag	(2693)
N		Revise Rating	(2688)
		Photos Flag	(2691)
		Measure Clrnc	(2694)
9		Sdwk Cond	(7673)
9		Paint Cond	(7674)
6		Approach Cond	(7681)
9		Retaining Wall	(7682)
9		Pier Prot	(7683)

0		No Utilities	(2675)
0		Bridge Rails	(1684)
1		Transition	(1685)
1		Guardrails	(1686)
1		Terminals	(1687)
3.00		Asphalt Depth	(2610)
		Design Curb Ht	(2611)
	33.0	Bridge Rail Ht	(2612)
1949		Year Built	(1332)
0		Year Rebuilt	(1336)
	Y	Subj to NBIS	(2614)

Alpha Span Type:

TTC

Sufficiency Rating 40.45

High Risk

Inspections Performed:

Freq	Hrs	Date	Rep Type
24	3.0	8/23/2017	Routine
			Fract Crit
			UW
			Special
			Interim
			UWI
			Damage
			Safety
			Short Span
			In Depth
			Geometric

BMS Elements

Element	Element Description	Total	Units	State 1	State 2	State 3	State 4
12	Concrete Deck	1,820	SF	1,820	0	0	0
35	Concrete Deck Soffit	1,820	SF	1,820	0	0	0
117	Timber Sawn Girder	910	LF	910	0	0	0
200	Abutment Fill	1	EA	1	0	0	0
206	Timber Pile/Column	5	EA	5	0	0	0
214	Concrete Web Wall between Columns	36	LF	36	0	0	0
215	Concrete Abutment	68	LF	68	0	0	0
216	Timber Abutment	60	LF	60	0	0	0
227	Concrete Submerged Pile/Column	4	EA	4	0	0	0
234	Concrete Pier Cap/Crossbeam	60	LF	60	0	0	0
235	Timber Pier Cap	104	LF	96	0	8	0
331	Concrete Bridge Railing	140	LF	0	0	140	0
361	Scour	3	EA	3	0	0	0
800	Asphaltic Concrete (AC) Overlay	1,820	SF	1,820	0	0	0

BRIDGE INSPECTION REPORT

Status: Released
Printed On: 9/11/2017
Agency: Snohomish County
CD Guid: 70a87f77-cc57-46a8-b9bd-9d84d8eb2a65
CD Date: 8/23/2017
Program Mgr: Roman G. Peralta

Br. No. 556 **SID** 08228400 **Br. Name** COAL CREEK
Carrying MOUNTAIN LOOP HWY. **Route On** 98960 **Mile Post** 24.00
Intersecting COAL CREEK **Route Under** **Mile Post**

Notes

0	Oriented West to East.
11	Load rating 10/18/2016 indicates rating factors for AASHTO trucks are above "1", but overloads and SHV's are restricted. Posting for SHV's recommended.
12	Deck (1949): pcc (cip). Covered by ACP overlay.
35	D-spalls noted @ P3/G-H and midspan of span 2 between K-L and L-M. Some timber shoring embedded in deck soffit. Transverse/diagonal leaching cracks throughout. Efflorescence with stalactites up to 7" along outside edges.
117	Stringers (1949): creo-tr timber, (13) 6" x 20" in spans 1 and 3, (13) 8" x 24" in span 2 = fair cond. Minor crushing noted at jack stringer "M" = Monitor. Surface badly water-stained, creo. treatment leached out. Dapped 1" at abutments. 2" x 6" tt bridging at midspan of spans 1 and 3, and at 1/3 points of span 2, with solid bridging over caps. Span 1 - Girder J soft above A1 (End). Spacer block at P2 under girder "M" rotten = Replace. P2 - outside face girder splice bolt missing - REPLACE. Span 3 - Girder K w/end rot above P3 = monitor. 2012- carpenter ants noted at pier 3 = MONITOR. Not seen 2015, or 2017.
200	At A1, with no significant defects noted.
206	Posts (1949): (5) ea 12" x 12" creo-treated timber @ A4 in good-to-fair condition.
214	CIP concrete at piers 2 & 3. Bottom of pier 3 web wall visible, 2017. Channel depth around base of downstream column at pier 3 is 3.0' below bottom of web wall in 2017.
215	Abut. (1949): pcc @ A1 = good. Includes wing walls w/timber cap supporting stringers. Upstream top abutment board with end rot.
216	Abut (1949): 4" x 12" treated timber bulkhead planks @ A4 in good condition - replaced 2012. A1 w/soft and rotten backwall planks behind & above cap. Monitor, no change 2015.
227	CIP square concrete columns, (2) each at piers 2 & 3 with unknown foundations.
234	At piers 2 & 3 at top of columns/pier walls.
235	Caps (1949): 12" x 12" creo-treated timber atop concrete piers at A1, P2, and P3. 12" x 14" cap at A4. Pier 2: Dull sounding @ downstream end of cap with shakes and splits over 2 lf = Monitor. Pier 3 w/carpenter ant activity = MONITOR - no ant activity noted 2015, or 2017. Monitor pier 3 end cap for crushing and rot over 1 lf. No change 2017. Pier 3 cap with 5 lf yellow tagged between stringers C-E for rot from 2" through 4.5" depth from east face = Monitor. A4 w/ surface rot and splits esp. at ends.
331	Baluster rail: pcc (cip) = poor. Spalling crumbing badly @ top surface. Sealer applied 2012. Continued section loss 2015. No change 2017.
361	Scour mitigation: rock check dam downstream gone in 2008. Monitor scour depth @ P1 footing: 2010 - 2' max from t/conc. No change 2015. 2017 - footing not visible. Channel has filled in some in span 1 and flow is now mostly under span 2. Older reports alluded to some possible undermining and settlement at A1 lower end in the late 80's/early 90's but not visible now.
800	ACP overlay with Glasgrid reinforcing mesh (1999). Transverse reflective cracks at abutments A1 and A4. Reflective cracking over caps at P2 and P3.
1662	Span 1 is carrying all flow now. Downed trees upstream of bridge were relocated to the downstream side by crane. Span #3 is mostly blocked with large rock rip-rap and large woody debris.
1680	Scour vulnerability = "U" foundations unknown.
1685	Approach railing and transition sections added - 2006 / 2009. New transitions and guardrail 2012.
1687	4 delineators and bridge sign in place 2017.
7681	NW approach settlement noted (< 1") 2017.

Repairs

Repair No	Pr	R	Repair Descriptions	Noted	Maint	Verified

BRIDGE INSPECTION REPORT

Status: Released
Printed On: 9/11/2017
Agency: Snohomish County
CD Guid: 70a87f77-cc57-46a8-b9bd-9d84d8eb2a65
CD Date: 8/23/2017
Program Mgr: Roman G. Peralta

Br. No. 556 **SID** 08228400 **Br. Name** COAL CREEK
Carrying MOUNTAIN LOOP HWY. **Route On** 98960 **Mile Post** 24.00
Intersecting COAL CREEK **Route Under** **Mile Post**

Repairs (Continued)

Repair No	Pr	R	Repair Descriptions	Noted	Maint	Verified
10007	1	B	Replace stringer 1M shim block at pier 2: 2.5' long x 4" thick x 8" wide. Could be wider if extends under to span 2 girders also (hard to tell until removed).	8/23/2017		
10008	1	B	Post for SHV's	8/23/2017		

Inspections Performed and Resources Required

Report Type	Date	Freq	Hrs	Insp	CertNo	Coinsp	Note
Routine	8/23/2017	24	3.0	MPZ	G1331		

Snohomish County

BRIDGE LOAD RATING SUMMARY

Date: Tuesday, October 18, 2016

Structure ID No:	8228400
Bridge Name	Coal Creek #556
Bridge Number:	556
Bridge Length (ft):	70
Design Load:	HS-15-44
Rated By:	SJ
Checked By:	
Year Built:	1949
Span Type:	Treated Timber Trestle with Concrete Deck

DARRELL E. ASH
STATE OF WASHINGTON
18745
REGISTERED PROFESSIONAL ENGINEER

Insp. Report Date:	9/17/2015	Substructure Condition:	6
Rating Method:	ASD	Deck Condition:	6
Overlay Thickness (in):	3.00	Superstructure Condition:	5

TRUCK:	**RF (Inv.):**	**RF (Oper):**	**Controlling Point**
AASHTO 1 (Type 3):	0.64	1.02	Tension @ bottom fiber midspan
AASHTO 2 (Type 3S2):	0.71	1.12	Tension @ bottom fiber midspan
AASHTO 3 (Type 3-3):	0.78	1.24	Tension @ bottom fiber midspan
NRL	0.51	0.82	Tension @ bottom fiber midspan
SU4:	0.56	0.88	Tension @ bottom fiber midspan
SU5:	0.53	0.85	Tension @ bottom fiber midspan
SU6:	0.51	0.82	Tension @ bottom fiber midspan
SU7:	0.51	0.82	Tension @ bottom fiber midspan
OL-1	0.52	0.83	Tension @ bottom fiber midspan
OL-2	0.42	0.66	Tension @ bottom fiber midspan

NBI Rating:	**RF**	**Tons (US)**	**Controlling Point**
Inventory (HS-20):	0.55	19.7	Tension @ bottom fiber midspan
Operating (HS-20):	0.87	31.3	Tension @ bottom fiber midspan

Remarks:

S:\engsvcs\BRIDGE\LOAD RATE\TIMBER BRIDGES\2016\ 556 Timber

Snohomish County

TIMBER BRIDGE RATING CALCULATION SHEET

Date: 10/18/2016

Br.Name and Number:	Coal Creek #556	Year Built:	1949
Span & Stringer line:		Rated By:	SJ
Span Type:	Treated Timber Trestle with Concrete Deck	Checked By:	11/16/16

Member Input :

Net Stringer Size (in):	5.50	(wide)	17.50	(tall)	Span (ft):	19.00
Curb to curb width:	26				Str. Spacing (ft):	2.60
Timber Deck Thick.(in)	0.00	(45#/cf)			No. Lanes:	2
Conc. Deck Thick. (in)	7.50	(155#/cf)			Beam Type:	Longitudinal
ACP Overlay Thick.(in)	3.00	(150#/cf)			(Str. Spa./Table Value):	5
DEAD LOAD =	0.379	(klf)			**Distribution Factor:**	0.52
SECTION MODULUS;	280.73	(in.3)				
1/Distr. Factor:	1.92	NA				

Analysis Result:

Per Stringer Values	**Units**	**INV.**	**OPER.**	Fb' = Fb*CM*CD*CF*CV*CL*Cf*Cfu*Cr			
F'b = Allow. Stress (ksi)	ksi	1.66	2.20	Fb=	1.50	CL =	1.00
Mcap = Total Mom. Capacity	K-ft	38.74	51.53	CM=	1.00	Cf =	1.00
Mdl = Dead Load Mom.	K-ft	17.12	17.12	CD=	1.15	Cfu =	1.00
Mllcap. = LL Mom. Capacity	K-ft	21.62	34.4	CF =	0.96	Cr =	1.00
M(wl)cap.= Wheel Line Cap.	K-ft	41.57	66.16	CV =		Condition 8	Fb=1.35

1/DF *Mllcap.= Moment Capacity per Wheel Line= M(wl)cap.			<1955 Fb=1.60ksi	Condition 7	Fb=1.30
M(wl) = Wheel Line Moments from table w/o Impact			>1955 Fb=1.35ksi	Condition 6	Fb=1.25
RF = M(wl)cap./Table Value per Wheel Line w/o Impact			Oper.F'b = 1.33* Inv. F'b	Condition 5	Fb=1.15
INV. RF:	41.57	/Table Value per Wheel Line w/o Impact	1992 AASHTO, Table 13.5.1A	Condition 4	Fb=1.00
OPER. RF:	66.16	/Table Value per Wheel Line w/o Impact		Condition 3	Fb=0.85

Rating Factor:

TRUCK	**M(wl)**	**INV. RF**	**OPER. RF**	**INV. TONS(US)**	**OPER. TONS(US)**		
HS-20	76.0	0.55	0.87	19.69	31.34	36	US TONS
AASHTO 1 (Type 3)	64.6	0.64	1.02	16	26	25	US TONS
AASHTO 2 (Type 3S2)	58.9	0.71	1.12	25	40	36	US TONS
AASHTO 3 (Type 3-3)	53.2	0.78	1.24	31	50	40	US TONS
NRL	80.8	0.51	0.82				
SU4	74.9	0.56	0.88				
SU5	77.8	0.53	0.85				
SU6	80.8	0.51	0.82				
SU7	80.8	0.51	0.82				
OL-1	80.1	0.52	0.83				
OL-2	100.1	0.42	0.66				

Washington State
Department of Transportation

WSBIS Local Agency Inventory Report

Bridge ID

1001	2009	2132	1019	1286	1021	2023	1156	2181	2183	2185	1188	1196
Structure ID	Bridge Number	Bridge Name	Owner	Cust	County	City	Location	Section	Twnshp	Range	Latitude	Longitude
08228400	556	COAL CREEK	02	2	31	0000	24.0 E JCT SR 92	17	30	10E	48° 05' 06.00"	121° 32' 30.00"
	556										**48° 05' 09.74"**	**121° 32' 25.40"**

Facilities

1232	1256	1274	7281	7283	1276	1285	1288	1289	1293	1292	2295	7296
Feature Intersected	Facilities Carried	Region	Leg1	Leg2	FIPS	Toll	Para	Temp	OPC	NRHP	HAER	LRHP
COAL CREEK	MOUNTAIN LOOP HWY.	NW	39	0	64470	3	N		A	5		
									B			

Printed Date
9/11/2017

Sufficiency Rating:	
40.45	Item 2710 SR
High Risk	Item 2711 SD/FO

Layout

1332	1336	1340	2346	1348	1352	1356	1360	1364	1367	1310	1312	1370	1374	1378	1379	1382	1383	1386	1387	1390	1394	1291	1397
Year Built	Year Rebuilt	Bridge Length	NBIS Length	Maximum Span Length	Lanes On	Curb to Curb Deck Width	Out to Out Deck Width	Sidewalk Left	Sidewalk Right	Skew	Flared	Min Vert Over Deck	Min Vert Under	Vert Code	Min Lat Under Right	Lat Code	Min Lat Under Left	Nav Cl Code	Nav Vert Clear	Nav Horiz Clear	Nav Vert Lift Clear	Median	Appr Rdwy
1949	0	70		31	2	26.0	31.4	0.0	0.0	0	N	99' 99"	00' 00"	N	0.0	N	0.0	0	0	0		0	30
								1.7	**1.7**														**26**

Crossing

1432	1433	1434	1435	2440	1445	1451	1453	1457	1463	1467	1477	1469	2410	7479	1483	1484	1485	1486	1487	1489	1490	1354	1491	1495	1499	1413	2441
On Under	Hwy Class	Service Level	Route Number	Milepost	ADT	Truck %	Year of ADT	Future ADT	Future ADT Year	Linear Referencing System	LRS Sub	LRS Milepost	NBI Bridge	Fed Aid Route #	NHS	BHS	STRAH	FLH	Funct. Class	NTN	Lane Use Direction	Lanes Under	Horizontal Clearance Route Dir	Horizontal Clearance Reverse Dir	Max Vert Clearance Route	Detour	Speed Limit
1	4	1	98960	24.00	1334	4	2015	1500	2034	98960			Y	X310	0	0	0	2	07	N	2	0	26' 00"			94	45

Design

1532	1533	1535	1536	1538	1541	1544	1545	1546	1547	1548	1549	1550	1551	1552	1553	1554	1555	1556	1585	1588	1590	7565	7557
Main Span Material	Main Span Design	Appr Span Material	Appr Span Design	Number Main Spans	Number Appr Spans	Service On	Service Under	Deck Type	Wearing Surface	Membrane	Deck Protect	Design Load Code	Oper Rating Method	Oper Rating Tons	Oper Rating Factor	Inv Rating Method	Inv Rating Tons	Inv Rating Factor	Border State Cd	Border Pct	Border Structure ID	Fed Aid Project No	Design Exemption
7	02	7	02	1	2	1	5	1	6	0	0	2	7	40	1.13	7	24	0.67					
												3	**2**	**31**		**2**	**19**						

Load Rating

2587	2588	2589	2590	2591	2592	2593	2594	2595	2596
Type 3	Type 3S2	Type 3-3	NRL	SHV 4	SHV 5	SHV 6	SHV 7	OL 1	OL 2
1.02	**1.12**	**1.24**	**0.82**	**0.88**	**0.85**	**0.82**	**0.82**	**0.83**	**0.66**

Waterway/ Prop Imp

7832	7833	7834	7835	7836	7837	7838	7839	7840	7841	1844	1846	1847	2853	2860	1867	1873	2870	1861	1879	2883
Water Type	Flood Pln Intr	Flood Control	Scour Hist	Strmbd Matrl	Substr Stablty	Wtrwy Obstr	Strmbd Stablty	Strmbd Anabrn	Piers In Watr	Type Work	Work Meth	Stru Imp Length	Roadway Width	Cost Per SF	Struct Cost	Rdwy Cost	Engr Cost	Total Cost	Estmt Year	Prop Imp Cost Calc
F	A	N	H	3	7	N	G	N	3											
							B			**31**	**1**	**80**	**38**	**800**	**1216**	**243**	**973**	**2432**	**2014**	**Y**

Inspection Report Types

2920 Inspection	1990 Date	2646 Inspector	2649 Cert No	2654 Co-Inspector
Routine	8/23/2017	MPZ	G1331	
Fracture Critical				
Special Feature				
Underwater				

Inspection	Date	Inspector	Cert No	Co-Inspector
UW Interim				
Interim				
In Depth				
Damage				

Inspection	Date	Inspector	Cert No	Co-Inspector
Safety				
Short Span				
Geometric				
Info				
Inventory				

Control Data Guid: 70a87f77-cc57-46a8-b9bd-9d84d8eb2a65   Control Data Date: 8/23/2017

BRIDGE INSPECTION REPORT

Ver Date: 08/24/2016 Agency: Snohomish County

Status: Released Printed On: 08/25/20 Program Mgr: Roman G. Peralta

Bridge No. 551 Page: 1/3 **Structure Type**

Bridge Name PERRY CREEK **Route** 98960 **Location** 26.2 E JCT SR 92

Structure ID 08305700 **MilePost** 26.19 **Intersecting** PERRY CREEK

Inspector's Signature MPZ IDent# G1331

Co-Inspector's Signature PAH

5	☐ Structural Adqcy	(657)
5	☐ Deck Geometry	(658)
9	☐ Underclearance	(659)
5	☐ Operating Level	(660)
8	☐ Alignment Adqcy	(661)
6	☐ WaterwayAdqcy	(662)
6	☐ Deck Overall	(663)
9	☐ Drains Condition	(664)
6	☐ Superstructure	(671)
0	☐ Number Utilities	(675)
5	☐ Substructure	(676)
5	☐ Chan/Protection	(677)
9	☐ Culvert	(678)

N	☐ Pier/Abut/Protect	(679)
3	☐ Scour	(680)
9	☐ Retaining Walls	(682)
9	☐ Pier Protection	(683)
1	☐ Bridge Rails	(684)
1	☐ Transition	(685)
1	☐ Guardrails	(686)
1	☐ Terminals	(687)
N	☐ Revise Rating	(688)
	☐ Photos Flag	(691)
	Y Soundings Flag	(693)
	☐ Measure Clearance	(694)

1958	Year Built	(332)
0	Year Rebuilt	(336)
39	☐ Oper Rating	(551)
23	☐ Inv Rating	(554)
A	☐ Open Close	(293)
9999	☐ Vert Over Deck	(360)
0000	☐ Vert Under	(374)
N	☐ Vert Und Code	(378)
3.00	☐ Asphalt Depth	
45	☐ Speed Limit	

Inspections Performed

IT	NT	HRS	Date	Rep Type
Y	24	1.5	07/27/2016	Routine
				Fract Crit
				Underwater
				Special
				Interim
				Equipment
				Damage
				Safety
				Short Span

Total: 1.5

Suff Rating: 58.41 48.72

BMS Elements

Element	Element Description	Total	Units	State 1	State 2	State 3	State 4
12	Concrete Deck	1586	SF	1586	0	0	0
35	Concrete Deck Soffit	1586	SF	1586	0	0	0
110	Concrete Girder	420	LF	420	0	0	0
215	Concrete Abutment	30	LF	30	0	0	0
216	Timber Abutment	50	LF	50	0	0	0
220	Concrete Submerged Pile Cap/Footing	3	EA	3	0	0	0
222	Timber Sill/Footing	60	LF	60	0	0	0
228	Timber Submerged Pile/Column	12	EA	12	0	0	0
235	Timber Pier Cap	60	LF	60	0	0	0
330	Metal Bridge Railing	124	LF	124	0	0	0
361	Scour	3	EA	1	0	2	0
800	Asphaltic Concrete (AC) Overlay	1586	SF	1586	0	0	0

BRIDGE INSPECTION REPORT

Ver Date: 08/24/2016 Agency: Snohomish County

Status: Released Printed On: 08/25/20 Program Mgr: Roman G. Peralta

Bridge No. 551 Page: 2/3 **Structure Type**

Bridge Name PERRY CREEK **Route** 98960 **Location** 26.2 E JCT SR 92

Structure ID 08305700 **MilePost** 26.19 **Intersecting** PERRY CREEK

Notes

0	Oriented west to east.
11	Load rating 8/01 indicates all rating factors for all AASHTO trucks above "1" (31-47-61 tons), but overloads are limited.
12	Deck: pcc (cip), covered by ACP overlay.
35	Minor transverse hairline leaching cracks scattered throughout.
110	(7) lines precast pcc girders, 9" x 25" in good condition. Small hairline leaching diaphragm cracks @ A1 near girders A & G. Girt "C" w/ minor spall, no repair, at span 2. Pier 2 diaphragms with hairline leaching cracks typical throughout with leakage onto caps below in places. The eastside of pier 2 diaphragms have horizontal leaching delams/fractures typical (except on westside of diaphragm between girts A-B). Abutment 3 diaphragms also with hairline leaching cracks especially at Girt F with heavier leakage onto cap below.
215	Pcc abut @ A1 in good condition.
216	4" x 12" creo-tr timber bulkhead planks @ A3 in good-to-fair condition, but loosing rock fill through gaps between planks (see photo). Wingwalls are too shallow to be effective - rock rip-rap is retaining roadway fill. Top wingwall plank at SE sounds dull = Monitor.
220	Spread footing: pcc @ P2 and A3 - submerged in fair condition; considerable surface erosion, minor cracking. Exposed rebar @ A2 downstream corner along with 6" diam x 3" deep spall.
222	Sills: 12" x 12" creo-tr timber @ P2 and A3 (1958) in fair condition, dull sounding - MONITOR. Drill check made at mud sill along P3A centerline and found to be sound. 2016 - upstream end of A3 with surface rot and dull sounding.
228	Posts: 12" x 12" creo-tr timber @ B2 and A3 (1958) in fair condition, dull sounding - MONITOR.
235	Caps: creo-tr timber (1958), 12" x 14" @ A3, 14" x 14" @ B2 in fair condition with water staining, moss & algae in places. Caps are dapped at bottom surface for superelevation. Both are getting some surface rot in places from diapragm leaching especially below girt F at A3 to 1" depth = Monitor. Some crushing noted at concrete bearings - east side of B2 w/ 1/4" to 1/2" of surface rot. Upstream end of cap at pier 2 with split over 6' allowing water to infiltrate - leakage out of bottom of cap noted near downstream end = Monitor. Upstream and downstream ends at pier 2 over approx. 5' with surface deterioration.
330	Rail: Thrie beam (2001) on 6" x 6" steel "I" beam posts 3 x 6 creo. top rail.
361	Scour mitigation at bridge: rock rip rap was added 10/05 @ NE / SW corners - drift accumulation moved downstream by crane. Potential problem @ downstream end of P2 has improved with recent gravel accretion in span #1. All flow is currently under main span #2. Check downstream aggradation. Pier 2 footing vertical dimension appears to be 5' in plans with 2.5' exposed at downstream end - 2014 - Monitor. 2'-11" downstream and 2'-8" upstream in 2016. A3 footing top 1' exposed throughout also (Appears to be 3' depth of footing in plans).
677	Rip-rap has been added at the West abutment, both upstream and downstream.
680	Scour: code revised back to "3". Thalweg is back in span #2. Piers founded upon shallow spread footings.
681	West approach with reflective crack and very minor settlement. East approach settlement dug out and repaired with soil raps and new abutment boards to depth of approx. 8' across entire width of roadway in 2013.
687	All four delineators are in place. ET-PLUS terminals at SW & NE corners at leading ends only.
800	Overlaid in 1999 with Glasgrid fiberglass reinforcing mesh. Chip sealed in 2008. Transverse reflective crack at west abutment with 1/2" settlement. Sealed cracks at middle pier and east abutment.

Repairs

Repair No	Pr	R	Repair Description	Noted	Maint	Verified
10007	2	B		07/27/16		

Inspections Performed and Resources Required

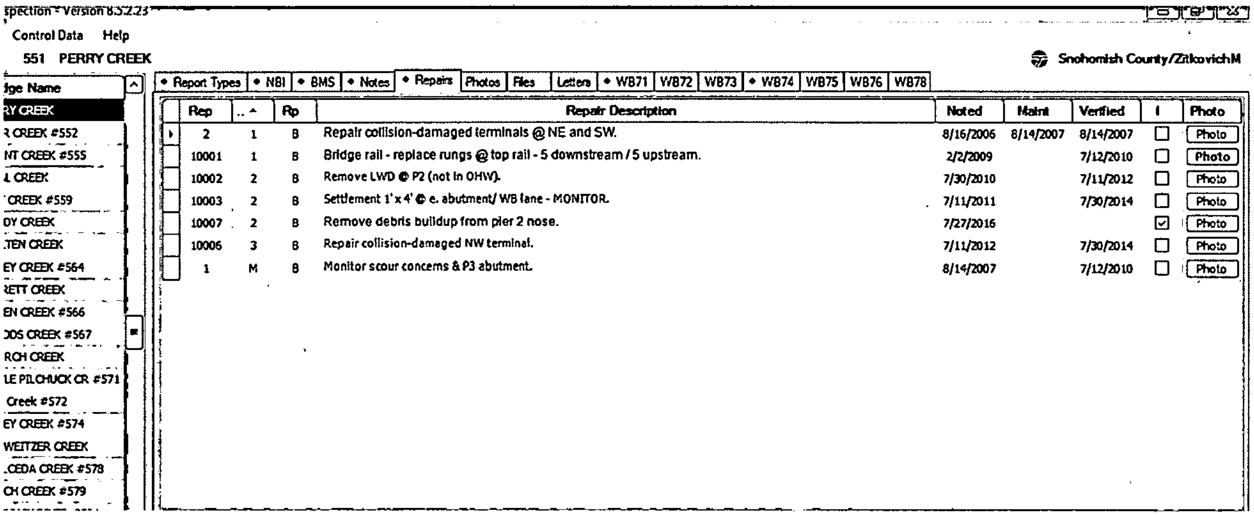
Report Type	Date	IT	Frq	Hrs	Insp	CertNo	Coinsp	Note
Routine	07/27/16		24	1.5	MPZ	G1331	PAH	

BRIDGE INSPECTION REPORT

Ver Date: 08/24/2016
Agency: Snohomish County
Status: Released
Printed On: 08/25/20
Program Mgr: Roman G. Peralta

Bridge No. 551
Page: 3/3
Structure Type
Bridge Name PERRY CREEK
Route 98960
Location 26.2 E JCT SR 92
Structure ID 08305700
MilePost 26.19
Intersecting PERRY CREEK

Resources	Use	Hour	Min	Req	Max	Notes



551 PERRY CREEK

Rep	.. ▲	Rp	Repair Description	Noted	Maint	Verified	I	Photo
2	1	B	Repair collision-damaged terminals @ NE and SW.	8/16/2006	8/14/2007	8/14/2007	☐	Photo
10001	1	B	Bridge rail - replace rungs @ top rail - 5 downstream / 5 upstream.	2/2/2009		7/12/2010	☐	Photo
10002	2	B	Remove LWD @ P2 (not in OHW).	7/30/2010		7/11/2012	☐	Photo
10003	2	B	Settlement 1' x 4' @ e. abutment/ WB lane - MONITOR.	7/11/2011		7/30/2014	☐	Photo
10007	2	B	Remove debris buildup from pier 2 nose.	7/27/2016			☑	Photo
10006	3	B	Repair collision-damaged NW terminal.	7/11/2012		7/30/2014	☐	Photo
1	M	B	Monitor scour concerns & P3 abutment.	8/14/2007		7/12/2010	☐	Photo

Snohomish County
Bridge Load Rating Summary

JERI C. BERNSTEIN
STATE OF WASHINGTON
22138
REGISTERED PROFESSIONAL ENGINEER
9/6/2001
EXPIRES 5/20/2003

Structure ID No: 8305700

Bridge Name: Perry Creek
Bridge Number: 551

Load Rating By: MB Date: Aug-01

Number of Spans 2
Bridge Type: CIP Girders
Year Built: 1920
Design Load: HS 20
Input Files: 551cip1.bdf,551cip2.bdf
Comments:

National Bridge Inventory (NBI) Load Factor Rating Method			
AASHTO HS-20 Truck	RF	Live Load Factor	Controlling Point
Inventory (Service or Ultimate)	0.64	2.17	Interior girder, Moment @ 12' from support
Operating (Ultimate only)	1.07	1.3	Interior girder, Moment @ 12' from support
Fatigue	0.89	NA	Interior girder, Moment @ 12' from support

National Bridge Inventory (NBI) Load Factor Rating Method			
	Actual Capacity	Required Capacity (Tons)	NBI and SWIBS coding
Inventory	23	36	**2 23**
Operating	39	36	**2 39**

Safe Load Capacity Load Factor Rating Method Operating Only				
Truck		RF	Live Load Factor	Controlling Point
AASHTO Type 3	Ultimate	1.24	1.3	Interior girder, Moment @ 15' from support
AASHTO Type 3S2	Ultimate	1.31	1.3	Interior girder, Moment @ 14' from support
AASHTO Type 3-3	Ultimate	1.53	1.3	Interior girder, Moment @ 16' from support
OL 1	Ultimate	0.89	1.3	Interior girder, Moment @ 15' from support
OL 2	Ultimate	0.75	1.3	Interior girder, Moment @ 15' from support

Safe Load Capacity Level (Load Factor Rating Method) (Posting Requirement)			
Truck	Actual Capacity Tons	Required Capacity Tons	Posting Required
AASHTO Type 3	31	25	**No**
AASHTO Type 3S2	47	36	**No**
AASHTO Type 3-3	61	40	**No**
OL 1	43	48	**N/A**
OL 2	78	103.5	**N/A**

Notes: Live Load Factors in this table apply to Ultimate Load Rating Analysis only. Inventory service load rating analysis applies to prestressed or post tensioned members only. Fatigue is evaluated for concrete bridges in locations where no prestressing or post tensioning is present.

Structure Identifier	Bridge Number	Owner Code	County Number	City Number	Update
08305700	551	02	31	00000	0

Washington State Department of Transportation

WSBIS Inventory Report

8/25/2016

WB71

Bridge Name	Location	Section	Township	Range	Latitude	Longtitude
PERRY CREEK	26.2 E JCT SR 92	22	30	10E	48°04'00.00"	121°30'24.00"
					48°03'54.00"	121°30'28.00"

WB72

Feature Intersected	Facilities Carried	Region	FIPS Place Code	Legis District (1)	Legis District (2)	Toll	Custodian	Parallel Structure	Temporary Structure	Critical Facility	Median	Hist Sig	Open Closed	Program Year
PERRY CREEK	MOUNTAIN LOOP HWY.	NW	64470	39	0	3	02	N		☒	0	5	A	
										☒				

WB73

Year Built	Year ReBuilt	Bridge Length	NBIS Length	Maximum Span Length	Lanes On	Lanes Under	Curb to Curb Deck Width	Out to Out Deck Width	Sidewalk Curb Left	Sidewalk Curb Right	Min Vert Clearance Over Deck	Min Vert Clearance Under Bridge	Code	Min Lat UnderClr Right	Code	Min Lat UnderClr Left	Navigation Control	Navigation Vertical Clearance	Navigation Horizontal Clrnce	Vert Lift Min Clrnce	Appr Roadway Width	Skew Angle	Flare
1958	0	61		30	2	0	26.0	29.8	1.8	1.8	99'99	0	N	0.0	N	0.0	0	0	0		27	0	N

WB74

On Under	High way Class	Service Level	Route Number	Mile Post	ADT on Inventory Route	Truck ADT PCT	ADT Year	Future ADT	Future ADT Year	Linear Referencing System Route	LRS Sub Route	Fed Aid Route	Nat Hwy System	Base Hwy Network	Strahnet	Fed Lands Highway	Fed Funct Class	National Truck Net	Lane Use Direction	Horizontal Clearance Route Dir	Horizontal Clearance Reverse Dir	Max Vertical Clearance Route Dir	Detour Length
1	4	1	98960	26.19	657	2	2011	1000	2034			X310	0	0	0	2	07	N	2	26'00"			94
					822		2015	1200	2038											29'00"			

WB75

Main Span Material	Main Span Design	Appr Span Material	Appr Span Design	Number of Main Spans	Number of Appr Spans	Service On	Service Under	Deck Type	Wearing Surface	Membrane	Fed Deck Protection	Design Load	Oper Rtng Method	Oper Rtng Tons	Invt Rtng Method	Invt Rtng Tons	Design Exception Date	Federal Aid Project	Border State Code	Border State PCT	Border	Border State Structure Identifier
1	02	0	00	2	0	1	5	1	6	0	0	5	F	39	F	23						
																	/ /					

WB76

Routine Inspection

Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
24	07302014	2.0	MPZ	G1331	MMA
	07/27/2016	1.5	MPZ	G1331	PAH

Structural Adequacy	Deck Geometry	Undercrnce Adequacy	Operating Level	Alignment Adequacy	Waterway Adequacy	Deck Overall	Drain Cond	Drains	Scaling Severity	Scaling Percent	Deck Rutting	Exposed Reinf Steel	Superstruct Overall	Curb	Sidewalks	Paint	Number of Utilities	Substruct Overall	Channel Protection	Culvert	Pier Abutment	Scour	Approach Roadway	Retaining Walls	Pier Protection	Traffic Safety Bridge Rail	Traffic Safety Trans	Traffic Safety Guard Rail	Traffic Safety Term	Revise Rating	Repair Status	Card Check	Photos	Season	Soundings	Clearances	Monitor Structure
5	5	9	5	8	6	6	9	0	N	0	0	0	6	6	9	9	0	5	5	9	N	3	8	9	9	1	1	1	1	N							
☒	☒	☒																					6												Y		

Sufficiency Rating: 48.72

WB77

Fracture Critical / UBIT Inspection							Underwater Inspection							Other Special Inspections						
Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector	Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector	Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
		/ /							/ /							/ /				

WB78

Water Type	Flood Plain Intrusion	Flood Control	Scour History	Streambed Material	Substruct Stability	Waterway Obstruction	Streambed Stability	Streambed Anabranch	Piers in Water	Service On	Service Under	Work Type	Work Metho	Structure Improve Length	Roadway Width	Lanes On	Lanes Under	Total Costs In Thousands	Structure Cost In Thousands	Roadway Cost In Thousands	Estimate Year	Calc	Inspecting Agency Code	Inspecting Agency Number	Seismic Status-Superstruct Main Biennium	Seismic Status-Superstruct Approach Biennium	Seismic Status-Substruct Main Biennium	Seismic Status-Substruct Approach Biennium
F	A	N	N	5	1	A	E	A	3	0	0	00	0	0	0	0	0	0	0	0	0	N						

Proposed Improvements

BRIDGE INSPECTION REPORT

Status: Released
Printed On: 7/6/2017
Agency: Snohomish County
CD Guid: ed8f481d-c13b-4075-b8b1-c0aa3991a233
CD Date: 6/20/2017
Program Mgr: Roman G. Peralta

Br. No. 544 **SID** 08492600 **Br. Name** BUCK CREEK

Carrying MOUNTAIN LOOP HWY. **Route On** 98960 **Mile Post** 28.35

Intersecting BUCK CREEK **Route Under** **Mile Post**

Mike

Inspector's Signature MPZ Cert # G1331 Cert Exp Date 3/13/2019

Co-Inspector's Signature

5	Structural Eval	(1657)	35	Operating Tons	(1552)	0		No Utilities	(2675)
5	Deck Geometry	(1658)		Op RF	(1553)	1		Bridge Rails	(1684)
9	Underclearance	(1659)	21	Inventory Tons	(1555)	1		Transition	(1685)
8	Alignment	(1661)		Inv RF	(1556)	1		Guardrails	(1686)
6	Deck Overall	(1663)	5	Operating Level	(1660)	1		Terminals	(1687)
6	Superstructure	(1671)	A	Open/Closed	(1293)	3.00		Asphalt Depth	(2610)
5	Substructure	(1676)	8	Waterway	(1662)		6.00	Design Curb Ht	(2611)
9	Culvert	(1678)	3	Scour	(1680)		32.0	Bridge Rail Ht	(2612)
5	Chan/Protection	(1677)	Y	Soundings Flag	(2693)	1960		Year Built	(1332)
N	Pier/Abut/Prot	(1679)	N	Revise Rating	(2688)	0		Year Rebuilt	(1336)
9	Drain Cond	(7664)		Photos Flag	(2691)		Y	Subj to NBIS	(2614)
0	Drain Status	(7665)		Measure Clrnc	(2694)				
N	Deck Scaling	(7666)	9	Sdwk Cond	(7673)				
0	Scaling Pct	(7667)	9	Paint Cond	(7674)				
0	Deck Rutting	(7669)	6	Approach Cond	(7681)				
0	Exposed Rebar	(7670)	9	Retaining Wall	(7682)				
6	Curb Cond	(7672)	9	Pier Prot	(7683)				

Alpha Span Type:
CG

Sufficiency Rating 55.80
High Risk

Inspections Performed:

Freq	Hrs	Date	Rep Type
24	1.5	6/20/2017	Routine
			Fract Crit
			UW
			Special
12	0.5	6/20/2017	Interim
			UWI
			Damage
			Safety
			Short Span
			In Depth
			Geometric

BMS Elements

Element	Element Description	Total	Units	State 1	State 2	State 3	State 4
12	Concrete Deck	2,366	SF	2,366	0	0	0
35	Concrete Deck Soffit	2,366	SF	2,366	0	0	0
110	Concrete Girder	630	LF	629	0	1	0
200	Abutment Fill	1	EA	1	0	0	0
206	Timber Pile/Column	18	EA	18	0	0	0
215	Concrete Abutment	30	LF	30	0	0	0
216	Timber Abutment	30	LF	25	0	5	0
220	Concrete Submerged Foundation	2	EA	2	0	0	0
235	Timber Pier Cap	90	LF	90	0	0	0
330	Metal Bridge Railing	184	LF	184	0	0	0
361	Scour	2	EA	0	0	2	0
800	Asphaltic Concrete (AC) Overlay	2,366	SF	2,365	0	1	0

Notes

Notes (Continued)

0	Oriented West to East.
11	Load rating 8/01 indicates rating factors for AASHTO trucks are all above "1" (29-43-57 tons), but overloads are limited. NRL rating needed by end of 2017.
12	Deck: pcc (cip) not visible due to ACP overlay.
35	Span 1 with a couple short diagonal hairline leaching cracks between girders A-B and F-G extending into diaphragms at A1, and a few light transverse hairline leaching cracks. Transverse hairline leaching cracks scattered across spans 2 & 3 along with a few longitudinal hairline cracks. Also, some leaching from girder/soffit interface in places.
110	Girders: pcc, precast (7) lines 9" x 25" w/pcc diaphragms over caps. East faces of diaphragms have leaching cracks throughout at B2 and B3 - seperation to 1/4 " max. Staining w/no rust shown. Moisture coming through cracks is leaking onto timber caps below. Edge spall of 1 sf on outer side of girder 3A w/ no rebar showing. Small spall on girder 3B near A4 w/ no rebar showing.
200	At A1, no problems noted.
206	Timber Pile/Column Posts: 12" x 12" creosote-treated timber, (6) ea at B2 and B3 = good-to-fair, except for being in moist conditions from stream spray at times. Softness beginning to show on bottom surfaces. 12" X 12" creosote-treated timber @ A4 (1960) in fair condition. 2008: drilled timber piles @ midheight - no shell reduction found; red survey tags noted @ Piles 2A, 2E, 3A, & 3E. 2010: P2B, P2D, P3C sound dull @ base - MONITOR. No change 2015. 2011: Pier 3, lower end of horz. brace on streamside w/damage = replace. Not replaced 2015. Brace on opposite side of piles at same location with some rot also but difficult to access = add helper brace above. 2013 P2 & P3 w/large amount of rock retained to midheight of timber on abut. sides. No displacement of timber piles noted. MONITOR. No change 2017. 2017: Pier 2 columns slightly dull sounding at bases. Column A at pier 3 with broken piece 18" long x 2" wide x 1" deep at NW corner of post.
215	CIP @ A1 in good condition 2015.
216	4" x 12" creosote-treated timber bulkhead planks @ A4 (1960) full width of bridge in fair condition. Interior planks with some dull soundings. Wingwall at SE corner (5 lf) with a few planks beginning to rot = Monitor. Wingwall planks at A1 visible @ outside of girders only (concrete abutment).
220	CIP spread footings @ P2 and P3, integral with short stem walls that support the timber pile columns. P2 footing has been scoured out (2007) on downstream half. 2008 - no scour noted after temp. repair. See also elements 361 and 680. Concrete surfaces with moss, water staining, and abrasion in places.
235	Caps: creo-treated timber, 14" x 14" @ B2, 14" x 18" @ B3, 12" x 14" @ A4 in good-to-fair condition with heavy algae and water staining on surfaces. Caps are dapped slightly top and bottom for superelevation. Wet from deck leakage year 'round, but sounding with hammer detects no soft spots yet. A4 damaged on surface two places @ ends - probably construction damage. Minor surface rot noted, typ. A4 also with 2' x 2" x 2" fractured piece on edge between E-F, and hatchet marks between D-E on side.
330	Railing: Thrie beam on 6" x 6" steel "I" beam posts with 3" x 6" chemomite-treated timber blocks (2015) in good condition with a few snow plow scrapes. Treated timber 3"x6" plank for top rail (2015).
361	Stream flows north to south under bridge. Downstream ends of Piers 2 & 3 footing tops exposed. In 2007, an undermined Pier 2 footing was mitigated with handpacked 4" - 8" spalls and 4-5 man rock at the downstream end over 12 lf. Since then, the area has stablized with no signs of addtional scour, distress of footing, or settlement of bridge. Continue to monitor after high water events. 2016 - pier 2 footing exposed over 3 lf to 1' max depth approx. 5' from downstream end but no undermining, and pier 3 footing exposed over 8 lf to 1' max depth @ downstream end but no undermining. Both still appear very stable and no action needed at this time. 2017 - no change other than pier 2 also exposed over 8 lf but less depth than before.
800	ACP overlay with glasgrid reinforcing mesh new in 1999. New chip seal in 2015. A few small shallow potholes over deck totaling 1 sf.
1677	Bank erosion upstream and downstream of west abutment appears to have stablilized 2015. 4-5 man rock placed downstream of piers 2 & 3 in 2007 has moved around some but channel appears fairly stable 2015. No change 2017.
1680	Piers 2 & 3 founded upon shallow cip spread footings that bear on the rocky stream channel sides. Both abutments well above high water.

BRIDGE INSPECTION REPORT

Status: Released

Printed On: 7/6/2017 Agency: Snohomish County

CD Guid: ed8f481d-c13b-4075-b8b1-c0aa3991a233

CD Date: 6/20/2017 Program Mgr: Roman G. Peralta

Br. No. 544 **SID** 08492600 **Br. Name** BUCK CREEK

Carrying MOUNTAIN LOOP HWY. **Route On** 98960 **Mile Post** 28.35

Intersecting BUCK CREEK **Route Under** **Mile Post**

Notes (Continued)

1684	Curbs are pcc with minor collision damage. Slight exposed rebar at SW corner.
1687	All four delineators are in place Bridge sign OK.
7681	Reflective crack with settlement of 1/2" over east abutment. Shallow pothole in west approach, eastbound lane.

Repairs

Repair No	Pr	R	Repair Descriptions	Noted	Maint	Verified

Inspections Performed and Resources Required

Report Type	Date	Freq	Hrs	Insp	CertNo	Coinsp	Note
Routine	6/20/2017	24	1.5	MPZ	G1331		Monitor scour critical piers 2 & 3. Substructure (676) raised to "5" to reflect stability of scour mitigation at pier 2 footing.
Interim	6/20/2017	12	0.5	MPZ	G1331		Interim report type added to monitor pier 2 and pier 3 spread footings for scour at twelve month intervals max (see 361 note).

Snohomish County
Bridge Load Rating Summary

YERI C. BERNSTEIN
21178
9/6/2001
EXPIRES 5/20/2003

Structure ID No: 8492600

Bridge Name: Buck Creek
Bridge Number: 544

Load Rating By: MB Date: Aug-01

Number of Spans 3
Bridge Type: CIP Girders
Year Built: 1960
Design Load: HS 20
Input Files: 544cip1.bdf
Comments: 3 Simply Supported Spans

National Bridge Inventory (NBI) Load Factor Rating Method			
AASHTO HS-20 Truck	RF	Live Load Factor	Controlling Point
Inventory (Service or Ultimate)	0.58	2.17	Moment @ 13' from support
Operating (Ultimate only)	0.96	1.3	Moment @ 13' from support
Fatigue	0.83	NA	Moment @ 13' from support

National Bridge Inventory (NBI) Load Factor Rating Method				
	Actual Capacity	Required Capacity	(Tons)	NBI and SWIBS coding
Inventory	21	36		**2 21**
Operating	35	36		**2 35**

Safe Load Capacity Load Factor Rating Method Operating Only				
Truck		RF	Live Load Factor	Controlling Point
AASHTO Type 3	Ultimate	1.16	1.3	Moment @ 15' from support
AASHTO Type 3S2	Ultimate	1.20	1.3	Moment @ 15' from support
AASHTO Type 3-3	Ultimate	1.43	1.3	Moment @ 15' from support
OL 1	Ultimate	0.81	1.3	Moment @ 13' from support
OL 2	Ultimate	0.68	1.3	Moment @ 15' from support

Safe Load Capacity Level (Load Factor Rating Method) (Posting Requirement)			
Truck	Actual Capacity Tons	Required Capacity Tons	Posting Required
AASHTO Type 3	29	25	**No**
AASHTO Type 3S2	43	36	**No**
AASHTO Type 3-3	57	40	**No**
OL 1	39	48	**N/A**
OL 2	70	103.5	**N/A**

Notes: Live Load Factors in this table apply to Ultimate Load Rating Analysis only. Inventory service load rating analysis applies to prestressed or post tensioned members only. Fatigue is evaluated for concrete bridges in locations where no prestressing or post tensioning is present.

09/05/2001
br544.xls

Washington State
Department of Transportation

WSBIS Local Agency Inventory Report

Bridge ID

1001	2009	2132	1019	1286	1021	2023	1156	2181	2183	2185	1188	1196
Structure ID	Bridge Number	Bridge Name	Owner	Cust	County	City	Location	Section	Twnshp	Range	Latitude	Longitude
08492600	544	BUCK CREEK	02	2	31	0000	28.4 E JCT SR 92	36	30	10E	48° 02' 48.00"	121° 28' 24.00"
	544										**48° 02' 44.92"**	**121° 28' 23.18"**

Facilities

1232	1256	1274	7281	7283	1276	1285	1288	1289	1293	1292	2295	7296
Feature Intersected	Facilities Carried	Region	Leg1	Leg2	FIPS	Toll	Para	Temp	OPC	NRHP	HAER	LRHP
BUCK CREEK	MOUNTAIN LOOP HWY.	NW	39	0	64470	3	N		A	4		

Printed Date
7/6/2017

Sufficiency Rating:	
55.80	Item 2710 SR
	Item 2711 SD/FO
High Risk	

Layout

1332	1336	1340	2346	1348	1352	1356	1360	1364	1367	1310	1312	1370	1374	1378	1379	1382	1383	1386	1387	1390	1394	1291	1397
Year Built	Year Rebuilt	Bridge Length	NBIS Length	Maximum Span Length	Lanes On	Curb to Curb Deck Width	Out to Out Deck Width	Sidewalk Left	Sidewalk Right	Skew	Flared	Min Vert Over Deck	Min Vert Under	Vert Code	Min Lat Under Right	Lat Code	Min Lat Under Left	Nav Ctl Code	Nav Vert Clear	Nav Horiz Clear	Nav Vert Lift Clear	Median	Appr Rdwy
1960	0	91		30	2	26.3	29.8	1.8	1.8	0	N	99' 99"	00' 00"	N	0.0	N	0.0	0	0	0		0	26
						26.1																	

Crossing

1432	1433	1434	1435	2440	1445	1451	1453	1457	1463	1467	1477	1469	2410	7479	1483	1484	1485	1486	1487	1489	1490	1354	1491	1495	1499	1413	2441
On Under	Hwy Class	Service Level	Route Number	Milepost	ADT	Truck %	Year of ADT	Future ADT	Future ADT Year	Linear Referencing System	LRS Sub	LRS Milepost	NBI Bridge	Fed Aid Route #	NHS	BHS	STRAH	FLH	Funct. Class	NTN	Lane Use Direction	Lanes Under	Horizontal Clearance Route Dir	Horizontal Clearance Reverse Dir	Max Vert Clearance Route	Detour	Speed Limit
1	4	1	98960	28.35	665	5	2015	1000	2038	98960			Y	X310	0	0	0	2	07	N	2	0	28' 06"			94	45
																							26' 01"				

Design

1532	1533	1535	1536	1538	1541	1544	1545	1546	1547	1548	1549	1550	1551	1552	1553	1554	1555	1556	1585	1588	1590	7565	7557
Main Span Material	Main Span Design	Appr Span Material	Appr Span Design	Number Main Spans	Number Appr Spans	Service On	Service Under	Deck Type	Wearing Surface	Membrane	Deck Protect	Design Load Code	Oper Rating Method	Oper Rating Tons	Oper Rating Factor	Inv Rating Method	Inv Rating Tons	Inv Rating Factor	Border State Cd	Border Pct	Border Structure ID	Fed Aid Project No	Design Exemption
1	02	0	00	3	0	1	5	1	6	0	0	5	1	35		1	21						

Load Rating

2587	2588	2589	2590	2591	2592	2593	2594	2595	2596
Type 3	Type 3S2	Type 3-3	NRL	SHV 4	SHV 5	SHV 6	SHV 7	OL 1	OL 2
1.16	**1.20**	**1.43**						**0.81**	**0.68**

Waterway/ Prop Imp

7832	7833	7834	7835	7836	7837	7838	7839	7840	7841	1844	1846	1847	2853	2860	1867	1873	2870	1861	1879	2883
Water Type	Flood Pln Intr	Flood Control	Scour Hist	Strmbd Matrl	Subst Stablty	Wtrwy Obstr	Strmbd Stablty	Strmbd Anabrn	Piers In Watr	Type Work	Work Meth	Stru Imp Length	Roadway Width	Cost Per SF	Struct Cost	Rdwy Cost	Engr Cost	Total Cost	Estmt Year	Prop Imp Cost Calc
F	A	N	H	5	1	N	D	N	2											
										31	**1**	**101**	**38**	**800**	**1535**	**307**	**1228**	**3070**	**2014**	**Y**

Inspection Report Types

2920 Inspection	1990 Date	2646 Inspector	2649 Cert No	2654 Co-Inspector
Routine	6/20/2017	MPZ	G1331	
Fracture Critical				
Special Feature				
Underwater				

Inspection	Date	Inspector	Cert No	Co-Inspector
UW Interim				
Interim	6/20/2017	MPZ	G1331	
In Depth				
Damage				

Inspection	Date	Inspector	Cert No	Co-Inspector
Safety				
Short Span				
Geometric				
Info				
Inventory				

Control Data Guid: ed8f481d-c13b-4075-b8b1-c0aa3991a233 Control Data Date: 6/20/2017

USDA FOREST SERVICE, REGION 6

MT BAKER-SNOQUALMIE NATIONAL FOREST

MOWICH-FLTPS1

ROAD BRIDGE INSPECTION REPORT

Inspection Date: **11/7/2017**

Route: **2000000** Milepost: **31.2000** Structure No: **060502000001465**

INSPECTION TYPE: **ROUTINE**

MOWICH-FLTPS1 OVER S FORK SAUK RIVER

Snohomish County, Washington

INSPECTION TEAM LEADER: **Luke Silvis**

(Signature)

U.S. DEPARTMENT OF AGRICULTURE
BRIDGE INSPECTION AND MANAGEMENT PROGRAM

USDA FOREST SERVICE, REGION 6

MT BAKER-SNOQUALMIE NATIONAL FOREST

BRIDGE IDENTIFICATION AND LOCATION

Structure Name:	**MOWICH-FLTPS1**			(8)Structure No:	**060502000001465**
(5D)Route:	**2000000**	(11)Milepost:	**31.2000**	(6)Feature Crosse	**S FORK SAUK RIVER**
Forest:	**MT BAKER-SNOQUALMIE**	District:	**DARRINGTON**	Security ID	**0605**

BRIDGE DESCRIPTION and MEASUREMENTS

(27)Year Built:	**1978**	Description:	**PI10 - Single-span presstress girders on piles**		
(49)Overall Br Length:	**100.0**	(48)Max Span:	**97.2**	NBIS Bridge Opening:	**96.0**
(51)Roadway Width (Curb to Curb):	**28.0**	(52)Deck Width out-out:	**31.3**	(32)Approach Roadway Width:	**30.0**
(47)Horizontal	**28**	(53)Vertical	**99.99**	(34)Skew:	**30**
(107)Deck StructureType:	**Concrete Cast-In-Place**	(108A)Wearing Surface:	**None**		
(45)No. Main Spans:	**1**	(43A)Superstr Material:	**Concrete, Prestressed**	(43B)Superstr Type:	**Stringer/Multi-Beam Or Girder**
(46)No. Appr Spans:	**0**	(44A)Superstr Material:		(44B)Superstr Type:	
No. Substrs:	**2**	Substr Material:	**Concrete, Reinforced**	Substr Type:	**Piling Abutment**

BRIDGE RATING SUMMARY:

(in Tons)	Inventory	Operating	Safe Load Capacity	Posting
HL-93 (RF)			-	-
HS-20				-
Type 3	**41**	**59**		-
Type 3S2	**50**	**93**		-
Type 3-3	**55**	**103**		-
NRL (RF)		-		-

Rating Date:	**6/29/1983**
(41) Posting Status:	**Open, No Restriction**
(70) Posting Capacity:	**At Or Above Legal Loads**
(31)Design Load:	**HS20-44**
(63,65)Method of Load Rating:	

SPECIALIZED INSPECTIONS:

Specialized Inspections Required (23 CFR 650.303)		Based on this inspection, is additional inspection work needed in these specialized inspection areas?
	Yes/No	If Yes How Soon Need
(92A) Fracture Critical	**N**	**0 Months**
(92B) Underwater	**N**	**0 Months**
(92C) Special	**N**	**0 Months**

Critical Findings:

Re-rating required based on this inspection?
Yes ☐ No ☒

INSPECTION INFORMATION

Date:	**11/7/2017**	Time Started:	11:24 AM	Time Completed:	12:25 PM
Inspection Team:	**Kluz**	Leader:	**Luke Silvis**	Jurisdiction:	**FS**
Weather:	**Cloudy, 34° F**	Latitude:	**48.03069444**	Longitude:	**-121.4338889**
Township:	**29N**	Range:	**11E**	Section:	**6**
1/4 Sect:		Meridian:			
(9)Location:	**From Granite Falls, 31 miles on County Rd 20, 0.2 miles on FR20**				
Recommended Inspection Frequency:	**24**	**Months**	☐ Special Equipment Need		

Narrative Report: (Add additional sheets if necessary)

Orientation is opposite of road milepost but consistent with the plans, US Right.
The pre-stressed concrete super and reinforced concrete substructure are in generally good structural condition. No shear cracking was observed in the girders. There are a few small spalls in the girders and some hairline cracking with efflorescence in the substructure members. There is some settlement at both approaches. The approach rail is damaged at EOB downstream side. The abutments are fairly well armored with riprap.

Deck was covered with snow, so top side inspection was not possible.

Infra data used for this report was pulled on: 04/23/2017

Inspection Template Revision Date: 05/31/2017

Structure Name:	**MOWICH-FLTPS1**	Date:	**11/7/2017**
Route: **2000000**	Milepost: **31.2000**	Structure No:	**060502000001465**

CONDITION CODES and REMARKS

(Overall Code for item, to be reported to FHWA, in bold box)			CODE	REMARKS
Wearing Surface			N	
58. DECK:			**6**	
	* 1.	Deck Slab/Panels/Joists	F	See narrative page 5
	C1.	Expansion Joints	-	
	C2.	Curbs	-	
	C3.	Sidewalks	-	
	C4.	Drains and Drainage	-	
	C5.	Rideability	G	
	C6.	Cleanliness	NOB	Bridge deck covered in snow
	C7.	Utilities	No	
59. SUPERSTRUCTURE:			**7**	
	* 1.	Girders_4__ea.	G	See narrative page 5
		a. Diaphragms	G	
		b. Bracing	-	
	* 2.	Floor Beams	-	
	* 3.	Stringers	-	
	* 4.	Trusses	-	
		a. Chords	-	
		b. Portals	-	
		c. Verticals/Diagonals	-	
		d. Bracing	-	
	C1.	Bearing Devices	G	
	C2.	Paint	-	
	C3.	Deflection Under Load	NOB	Not observed during this inspection
	C4.	Vibration Under Load	NOB	Not observed during this inspection
60. SUBSTRUCTURE:			**7**	
ABUTMENTS	*1.	Alignment (tilting, rotating, etc.)	G	
	*2.	Erosion or Scour	G	
	*3.	Settlement	G	
	Timber Abutments (incl. WW)			
	*4.	Caps	-	
	*5.	Posts/Piles/Tie Backs	-	
	*6.	Backing Planks	-	
	*7.	Sills/Footings	-	
	*8.	Crib Walls/Tie Backs	-	
	Other Abutments			
	*9.	Caps	G	Minor vertical cracks at EOB, one with efflo.
	*10.	Footings	-	
	*11.	Walls	-	
	*12.	Piles	NOB	Not visible for inspection
	*13.	Wingwalls	G	See narrative page 5
PIERS	*14.	Alignment (tipping, tilting, etc.)	-	
	*15.	Erosion or Scour	-	
	*16.	Settlement	-	
	*17.	Caps	-	
	*18.	Columns or Walls	-	
	*19.	Footings	-	
	*20.	Piles	-	
	*21.	Bracing	-	

* Only these items are used in the determination of the overall condition rating for that category, i.e. Deck, Superstructure, Substructure. Other items should be rated and remarked on but NOT included in determining the overall category rating. Items enumerated using a C (ex. C1) should be commented on but not rated. See the FHWA Coding Guide for further information as to what is included in condition ratings.

[1] Also includes wingwalls connected to the superstructure above the beam seat.

[2] Includes wingwalls integral with the abutment or the portion of the wingwall below the bearing seat.

Structure Name:	**MOWICH-FLTPS1**	Date:	**11/7/2017**
Route:	**2000000**	Milepost: **31.2000**	Structure No.: **060502000001465**

CONDITION CODES and REMARKS (continued)

(Overall Code for item, to be reported to FHWA, in bold box)		CODE	REMARKS
61. CHANNEL and CHANNEL PROTECTION:		**7**	
1.	Channel Scour/Erosion	G	
2.	Channel Protection	G	
3.	Vegetation	G	
4.	Waterway Obstructions/Drift	G	
5.	Observed Lateral Movement	G	
6.	Clear Height	17	Height (feet) from thalwag to bottom of lowest superstructure member
62. CULVERTS		**N**	
*1.	Shape	-	
*2.	Seams or Joints	-	
*3.	Material Condition	-	
*4.	Foundations	-	
5.	Headwall/Wingwall	-	
APPROACH CONDITION:		**F**	(Not needed for reporting to FHWA)
1.	Surfacing	G	
2.	Shoulder Embankment	G	
3.	Roadway Embankment	G	
4.	Approach Settlement	F	2" drops at bridge ends

APPRAISAL CODES and REMARKS

36. TRAFFIC SAFETY FEATURES:	**36A**	**0**	**36B**	**0**	**36C**	**0**	**36D**	**0**

			CODE	REMARKS
CONDITION of elements	A.	Bridge Railing	G	Minor vertical hairline cracking
	B.	Rail Transitions	G	
	C.	Approach Guardrails	P	See narrative page 5
	D.	Approach Rail Ends	P	
	1.	Signing	-	
	2.	Object Markers	P	Missing BOB left, reset/replace all 4 markers
72. APPROACH ROADWAY ALIGNMENT:			**8**	
	1.	Horizontal	G	
	2.	Vertical	G	
29. ROAD ADT			**140**	
67. STRUCTURAL EVALUATION			**7**	
68. DECK GEOMETRY:			**6**	
69. UNDERCLEARANCE:			**N**	
71. WATERWAY ADEQUACY:			**8**	
113. SCOUR CRITICAL BRIDGES:			**8**	Pile foundation

* Only these items are used in the determination of the overall condition rating for that category, i.e. Deck, Superstructure, Substructure. Other items should be rated and remarked on but NOT included in determining the overall category rating. Items enumerated using a C (ex. C1) should be commented on but not rated. See the FHWA Coding Guide for further information as to what is included in condition ratings.

CONDITION RATING OF EACH MEMBER OR ELEMENT

-	-NOT APPLICABLE
NOB	-APPLICABLE, BUT NO OBSERVED. (Give reason unless obvious)
G = GOOD	-ELEMENT IN NEW OR GOOD CONDITION WITH NO REPAIRS NECESSARY.
F = FAIR	-ELEMENT IS STILL PERFORMING THE FUNCTION FOR WHICH IT WAS INTENDED BUT MAY NEED MAINTENANCE.
P = POOR	-ELEMENT IS PERFORMING AT REDUCED CAPACITY.
C = CRITICAL	-ELEMENT IS NOT PERFORMING THE FUNCTION FOR WHICH IT WAS INTENDED

USDA FOREST SERVICE, REGION 6

MT BAKER-SNOQUALMIE NATIONAL FOREST

ELLIOTT CREEK BRIDGE-FLTPS1

ROAD BRIDGE INSPECTION REPORT

Inspection Date: **7/25/2016**

Route: **2000000**

Milepost: **33.9000**

Structure No: **060502000001464**

INSPECTION TYPE: **ROUTINE**

ELLIOTT CREEK BRIDGE-FLTPS1 **OVER** **ELLIOTT CREEK**

Snohomish County, Washington

INSPECTION TEAM LEADER: **Luke Silvis**

(Signature)

U.S. DEPARTMENT OF AGRICULTURE
BRIDGE INSPECTION AND MANAGEMENT PROGRAM

USDA FOREST SERVICE, REGION 6

MT BAKER-SNOQUALMIE NATIONAL FOREST

BRIDGE IDENTIFICATION AND LOCATION

Structure Name:	**ELLIOTT CREEK BRIDGE-FLTPS1**			(8)Structure No:	**060502000001464**
(5D)Route:	**2000000**	(11)Milepost:	**33.9000**	(6)Feature Crosse	**ELLIOTT CREEK**
Forest:	**MT BAKER-SNOQUALMIE**	District:	**DARRINGTON**	Security ID	**0605**

BRIDGE DESCRIPTION and MEASUREMENTS

(27)Year Built:	**1978**	Description:	**PI10 - Single span prestressed concrete girder**		
(49)Overall Br Length:	**115.0**	(48)Max Span:	**110.0**	NBIS Bridge Opening:	**108.0**
(51)Roadway Width (Curb to Curb):	**28.0**	(52)Deck Width out-out:	**31.3**	(32)Approach Roadway Width:	**30.0**
(47)Horizontal	**99.9**	(53)Vertical	**99.99**	(34)Skew:	**0**
(107)Deck StructureType:	**Concrete Cast-In-Place**	(108A)Wearing Surface:	**None**		
(45)No. Main Spans:	**1**	(43A)Superstr Material:	**Concrete, Prestressed**	(43B)Superstr Type:	**Stringer/Multi-Beam Or Girder**
(46)No. Appr Spans:	**0**	(44A)Superstr Material:		(44B)Superstr Type:	
No. Substrs:	**2**	Substr Material:	**Concrete, Unreinforced**	Substr Type:	**Piling Abutment**

BRIDGE RATING SUMMARY:

(in Tons)	Inventory	Operating	Safe Load Capacity	Posting
HL-93 (RF)			-	-
HS-20				-
Type 3	**36**	**51**		-
Type 3S2	**57**	**8**		-
Type 3-3	**54**	**99**		-
NRL (RF)		-		-

Rating Date:	**3/4/1983**
(41) Posting Status:	**Open, No Restriction**
(70) Posting Capacity:	**At Or Above Legal Loads**
(31)Design Load:	**HS20-44**
(63,65)Method of Load Rating:	

SPECIALIZED INSPECTIONS:

Specialized Inspections Required (23 CFR 650.303)		Based on this inspection, is additional inspection work needed in these specialized inspection areas?	
	Yes/No	If Yes How Soon Neede	
(92A) Fracture Critical	**N**	**0**	**Months**
(92B) Underwater	**N**	**0**	**Months**
(92C) Special	**N**	**0**	**Months**

Critical Findings:

Re-rating required based on this inspection?

Yes ☐ No ☒ X

INSPECTION INFORMATION

Date:	**7/25/2016**	Time Started:	11:40 AM		Time Completed:	12:47 PM	
Inspection Team:	**Silvis**	Leader:	**Luke Silvis**			Jurisdiction:	**FS**
Weather:	**Sunny 70° F**	Latitude:	**48.05308333**		Longitude:	**-121.4161667**	
Township:	**30N**	Range:	**11E**	Section:	**29**	1/4 Sect:	Meridian:
(9)Location:	**From Granite Falls, WA - take Mtn. Loop Hwy west 33.9 miles to the bridge.**						
Recommended Inspection Frequency:	**24**	**Months**	☐ Special Equipment Need				

Narrative Report: (Add additional sheets if necessary)

Bridge label orientation is consistant with the plans and increasing milepost. Stream flows right to left. Orientation and labeling corrected from the previous inspection. This is a single span concrete bridge with prestressed bulb-t girders and a cast in place concrete deck. The bridge sits on two cast in place, concrete wall abutments supported by concrete piles cast in steel pipe. This bridge is in overall good condition.

Infra data used for this report was pulled on: 04/23/2017

Inspection Template Revision Date: 05/31/2017

Structure Name: **ELLIOTT CREEK BRIDGE-FLTPS1** Date: **7/25/2016**

Route: **2000000** Milepost: **33.9000** Structure No: **060502000001464**

CONDITION CODES and REMARKS

(Overall Code for item, to be reported to FHWA, in bold box)			**CODE**	**REMARKS**
Wearing Surface			N	
58. DECK:			**7**	
	* 1.	Deck Slab/Panels/Joists	G	See narrative page 5
	C1.	Expansion Joints	-	
	C2.	Curbs	-	
	C3.	Sidewalks	-	
	C4.	Drains and Drainage	F	No drains and approaches are higher than the bridge
	C5.	Rideability	G	
	C6.	Cleanliness	F	Dirt and debris accumulation on the shoulders
	C7.	Utilities	No	
59. SUPERSTRUCTURE:			**7**	
	* 1.	Girders_6_ea.	G	See narrative page 5
		a. Diaphragms	G	
		b. Bracing	-	
	* 2.	Floor Beams	-	
	* 3.	Stringers	-	
	* 4.	Trusses	-	
		a. Chords	-	
		b. Portals	-	
		c. Verticals/Diagonals	-	
		d. Bracing	-	
	C1.	Bearing Devices	G	Bearing pads at Abut. 2 are pushed towards EOB
	C2.	Paint	-	
	C3.	Deflection Under Load	NOB	Not observed during this inspection
	C4.	Vibration Under Load	NOB	Not observed during this inspection
60. SUBSTRUCTURE:			**7**	
ABUTMENTS	*1.	Alignment (tilting, rotating, etc.)	G	
	*2.	Erosion or Scour	G	
	*3.	Settlement	G	
	Timber Abutments (incl. WW)			
	*4.	Caps	-	
	*5.	Posts/Piles/Tie Backs	-	
	*6.	Backing Planks	-	
	*7.	Sills/Footings	-	
	*8.	Crib Walls/Tie Backs	-	
	Other Abutments			
	*9.	Caps	F	See narrative page 5
	*10.	Footings	NOB	Not visible for inspection
	*11.	Walls	G	
	*12.	Piles	NOB	Not visible for inspection
	*13.	Wingwalls	G	
PIERS	*14.	Alignment (tipping, tilting, etc.)	-	
	*15.	Erosion or Scour	-	
	*16.	Settlement	-	
	*17.	Caps	-	
	*18.	Columns or Walls	-	
	*19.	Footings	-	
	*20.	Piles	-	
	*21.	Bracing	-	

* Only these items are used in the determination of the overall condition rating for that category, i.e. Deck, Superstructure, Substructure. Other items should be rated and remarked on but NOT included in determining the overall category rating. Items enumerated using a C (ex. C1) should be commented on but not rated. See the FHWA Coding Guide for further information as to what is included in condition ratings.

[1] Also includes wingwalls connected to the superstructure above the beam seat.

[2] Includes wingwalls integral with the abutment or the portion of the wingwall below the bearing seat.

Structure Name:	**ELLIOTT CREEK BRIDGE-FLTPS1**		Date:	**7/25/2016**
Route:	**2000000**	Milepost: **33.9000**	Structure No.:	**060502000001464**

CONDITION CODES and REMARKS (continued)

(Overall Code for item, to be reported to FHWA, in bold box)		CODE	REMARKS
61. CHANNEL and CHANNEL PROTECTION:		**8**	
1.	Channel Scour/Erosion	G	
2.	Channel Protection	G	
3.	Vegetation	G	
4.	Waterway Obstructions/Drift	G	
5.	Observed Lateral Movement	G	
6.	Clear Height	13.6	Height (feet) from thalwag to bottom of lowest superstructure member
62. CULVERTS		**N**	
*1.	Shape	-	
*2.	Seams or Joints	-	
*3.	Material Condition	-	
*4.	Foundations	-	
5.	Headwall/Wingwall	-	
APPROACH CONDITION:		**G**	(Not needed for reporting to FHWA)
1.	Surfacing	G	AC approaches covered with gravel; gravel has potholes
2.	Shoulder Embankment	G	
3.	Roadway Embankment	G	
4.	Approach Settlement	G	

APPRAISAL CODES and REMARKS

36. TRAFFIC SAFETY FEATURES:	**36A**	**1**	**36B**	**0**	**36C**	**1**	**36D**	**1**

CONDITION of elements A.	Bridge Railing	G	Covered in moss, spalling due to non-uniform concrete pour
B.	Rail Transitions	G	Rusted
C.	Approach Guardrails	G	Rusted
D.	Approach Rail Ends	G	
1.	Signing	-	
2.	Object Markers	P	Need to have object markers installed
72. APPROACH ROADWAY ALIGNMENT:		**8**	
1.	Horizontal	G	
2.	Vertical	G	
29. ROAD ADT		**140**	
67. STRUCTURAL EVALUATION		**7**	
68. DECK GEOMETRY:		**6**	
69. UNDERCLEARANCE:		**N**	
71. WATERWAY ADEQUACY:		**9**	
113. SCOUR CRITICAL BRIDGES:		**8**	

* Only these items are used in the determination of the overall condition rating for that category, i.e. Deck, Superstructure, Substructure. Other items should be rated and remarked on but NOT included in determining the overall category rating. Items enumerated using a C (ex. C1) should be commented on but not rated. See the FHWA Coding Guide for further information as to what is included in condition ratings.

CONDITION RATING OF EACH MEMBER OR ELEMENT

-	-NOT APPLICABLE
NOB	-APPLICABLE, BUT NO OBSERVED. (Give reason unless obvious)
G = GOOD	-ELEMENT IN NEW OR GOOD CONDITION WITH NO REPAIRS NECESSARY.
F = FAIR	-ELEMENT IS STILL PERFORMING THE FUNCTION FOR WHICH IT WAS INTENDED BUT MAY NEED MAINTENANCE.
P = POOR	-ELEMENT IS PERFORMING AT REDUCED CAPACITY.
C = CRITICAL	-ELEMENT IS NOT PERFORMING THE FUNCTION FOR WHICH IT WAS INTENDED

USDA FOREST SERVICE, REGION 6

MT BAKER-SNOQUALMIE NATIONAL FOREST

BEDAL CREEK BRIDGE-FLTPS1

ROAD BRIDGE INSPECTION REPORT

Inspection Date: **7/25/2016**

Route: **2000000** Milepost: **35.9000** Structure No: **060502000001463**

INSPECTION TYPE: **ROUTINE**

BEDAL CREEK BRIDGE-FLTPS1 **OVER** **BEDAL CREEK**
Snohomish County, Washington

INSPECTION TEAM LEADER: **Luke Silvis**

(Signature)

U.S. DEPARTMENT OF AGRICULTURE
BRIDGE INSPECTION AND MANAGEMENT PROGRAM

USDA FOREST SERVICE, REGION 6

MT BAKER-SNOQUALMIE NATIONAL FOREST

BRIDGE IDENTIFICATION AND LOCATION

Structure Name:	BEDAL CREEK BRIDGE-FLTPS1		(8)Structure No:	060502000001463	
(5D)Route:	2000000	(11)Milepost: 35.9000	(6)Feature Crosse	BEDAL CREEK	
Forest:	MT BAKER-SNOQUALMIE	District:	DARRINGTON	Security ID	0605

BRIDGE DESCRIPTION and MEASUREMENTS

(27)Year Built:	1978	Description:	PS10 - Single-span voided slab bridge on spread ftgs		
(49)Overall Br Length:	57.0	(48)Max Span:	53.7	NBIS Bridge Opening:	51.7
(51)Roadway Width (Curb to Curb):	28.0	(52)Deck Width out-out:	32.0	(32)Approach Roadway Width:	32.0
(47)Horizontal	99.9	(53)Vertical	99.99	(34)Skew:	0
(107)Deck StructureType:	Integral W/Prestress Unit	(108A)Wearing Surface:	Asphalt Concrete Pavement		
(45)No. Main Spans:	1	(43A)Superstr Material:	Concrete, Prestressed	(43B)Superstr Type:	Slab
(46)No. Appr Spans:	0	(44A)Superstr Material:		(44B)Superstr Type:	
No. Substrs:	2	Substr Material:	Concrete, Reinforced	Substr Type:	Column Abutment/Spill Thru

BRIDGE RATING SUMMARY:

(in Tons)	Inventory	Operating	Safe Load Capacity	Posting
HL-93 (RF)			-	-
HS-20				-
Type 3	42	78		-
Type 3S2	63	115		-
Type 3-3	77	141		-
NRL (RF)		-		-

Rating Date:	3/4/1983
(41) Posting Status:	Open, No Restriction
(70) Posting Capacity:	At Or Above Legal Loads
(31)Design Load:	HS20-44
(63,65)Method of Load Rating:	

SPECIALIZED INSPECTIONS:

Specialized Inspections Required (23 CFR 650.303)	Yes/No	Based on this inspection, is additional inspection work needed in these specialized inspection areas? If Yes How Soon Neede
(92A) Fracture Critical	N	0 Months
(92B) Underwater	N	0 Months
(92C) Special	N	0 Months

Critical Findings:

Re-rating required based on this inspection?
Yes ☐ No ☒

INSPECTION INFORMATION

Date:	7/25/2016	Time Started:	12:56 PM	Time Completed:	1:54 PM
Inspection Team:	Silvis	Leader:	Luke Silvis	Jurisdiction:	FS
Weather:	Sunny 70° F	Latitude:	48.07888889	Longitude:	-121.3955833
Township:	30N	Range:	11E	Section: 21	1/4 Sect:
Meridian:					
(9)Location:	19.3 miles SE of Darrington on Mtn. Loop Hwy (FSR 20)				
Recommended Inspection Frequency:	24	Months	☐ Special Equipment Need		

Narrative Report: (Add additional sheets if necessary)

Orientation is South to North (direction of increasing MP), stream flows right to left. Substructure units are Abut. 1 and Abut. 2 (same as plans).

This report is a record of the routine inspection for the Bedal Creek Bridge. The superstructure and substructure of this concrete bridge are both in fair condition overall. A scour hole under the footing at Abutment 1 was filled with concrete in August of 2009. Scour of Abutment 2 footings were filled with concrete previously. Currently the scour is stable but this condition should be monitored regularly and especially after high flow event.

Infra data used for this report was pulled on: 04/23/2017

Inspection Template Revision Date: 05/31/2017

Structure Name: **BEDAL CREEK BRIDGE-FLTPS1** Date: **7/25/2016**

Route: **2000000** Milepost: **35.9000** Structure No: **060502000001463**

CONDITION CODES and REMARKS

(Overall Code for item, to be reported to FHWA, in bold box)			**CODE**	**REMARKS**
Wearing Surface			6	Minor tracked vehicle damage. Longitudinal cracks near midspan.
58. DECK:			**7**	
	* 1.	Deck Slab/Panels/Joists	G	Missing 1/2 of steel angle guard at BOB
	C1.	Expansion Joints	-	
	C2.	Curbs	-	
	C3.	Sidewalks	-	
	C4.	Drains and Drainage	G	No drains but water flows off bridge at BOB
	C5.	Rideability	G	
	C6.	Cleanliness	G	
	C7.	Utilities	No	
59. SUPERSTRUCTURE:			**6**	
	* 1.	Slabs_8_ea.	F	See narrative page 5
		a. Diaphragms	-	
		b. Bracing	G	Hardware for tie-rods are intact and tight.
	* 2.	Floor Beams	-	
	* 3.	Stringers	-	
	* 4.	Trusses	-	
		a. Chords	-	
		b. Portals	-	
		c. Verticals/Diagonals	-	
		d. Bracing	-	
	C1.	Bearing Devices	P	See narrative page 5
	C2.	Paint	-	
	C3.	Deflection Under Load	NOB	Not observed during this inspection
	C4.	Vibration Under Load	NOB	Not observed during this inspection
60. SUBSTRUCTURE:			**6**	
ABUTMENTS	*1.	Alignment (tilting, rotating, etc.)	G	
	*2.	Erosion or Scour	F	See narrative page 5
	*3.	Settlement	G	
	Timber Abutments (incl. WW)			
	*4.	Caps	-	
	*5.	Posts/Piles/Tie Backs	-	
	*6.	Backing Planks	-	
	*7.	Sills/Footings	-	
	*8.	Crib Walls/Tie Backs	-	
	Other Abutments			
	*9.	Caps	G	
	*10.	Footings	G	Footings are moderately abraded
	*11.	Columns or Walls	G	Columns at BOB and wall at EOB
	*12.	Piles	-	
	*13.	Wingwalls	-	
PIERS	*14.	Alignment (tipping, tilting, etc.)	-	
	*15.	Erosion or Scour	-	
	*16.	Settlement	-	
	*17.	Caps	-	
	*18.	Columns or Walls	-	
	*19.	Footings	-	
	*20.	Piles	-	
	*21.	Bracing	-	

* Only these items are used in the determination of the overall condition rating for that category, i.e. Deck, Superstructure, Substructure. Other items should be rated and remarked on but NOT included in determining the overall category rating. Items enumerated using a C (ex. C1) should be commented on but not rated. See the FHWA Coding Guide for further information as to what is included in condition ratings.

[1] Also includes wingwalls connected to the superstructure above the beam seat.

[2] Includes wingwalls integral with the abutment or the portion of the wingwall below the bearing seat.

Structure Name:	**BEDAL CREEK BRIDGE-FLTPS1**	Date:	**7/25/2016**
Route: **2000000**	Milepost: **35.9000**	Structure No.:	**060502000001463**

CONDITION CODES and REMARKS (continued)

(Overall Code for item, to be reported to FHWA, in bold box)		CODE	REMARKS
61. CHANNEL and CHANNEL PROTECTION:		**4**	
1.	Channel Scour/Erosion	P	See narrative page 5
2.	Channel Protection	F	Riprap is slumped
3.	Vegetation	G	
4.	Waterway Obstructions/Drift	G	
5.	Observed Lateral Movement	F	Flow is directed towards BOB
6.	Clear Height	10.3	Height (feet) from thalwag to bottom of lowest superstructure member
62. CULVERTS		**N**	
*1.	Shape	-	
*2.	Seams or Joints	-	
*3.	Material Condition	-	
*4.	Foundations	-	
5.	Headwall/Wingwall	-	
APPROACH CONDITION:		**G**	(Not needed for reporting to FHWA)
1.	Surfacing	G	AC approach is in fair condition
2.	Shoulder Embankment	G	
3.	Roadway Embankment	G	
4.	Approach Settlement	G	

APPRAISAL CODES and REMARKS

36. TRAFFIC SAFETY FEATURES:	**36A**	**1**	**36B**	**0**	**36C**	**1**	**36D**	**1**

CONDITION of elements			
A.	Bridge Railing	G	Minor vertical cracks with efflo
B.	Rail Transitions	G	Light rust on rails
C.	Approach Guardrails	G	Light rust on rails
D.	Approach Rail Ends	G	
1.	Signing	-	
2.	Object Markers	F	all markers need to be replaced
72. APPROACH ROADWAY ALIGNMENT:		**7**	
1.	Horizontal	G	
2.	Vertical	G	Bridge is on a vertical curve.
29. ROAD ADT		**140**	
67. STRUCTURAL EVALUATION		**6**	
68. DECK GEOMETRY:		**6**	
69. UNDERCLEARANCE:		**N**	
71. WATERWAY ADEQUACY:		**6**	
113. SCOUR CRITICAL BRIDGES:		**3**	

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CONDITION RATING OF EACH MEMBER OR ELEMENT

-	-NOT APPLICABLE
NOB	-APPLICABLE, BUT NO OBSERVED. (Give reason unless obvious)
G = GOOD	-ELEMENT IN NEW OR GOOD CONDITION WITH NO REPAIRS NECESSARY.
F = FAIR	-ELEMENT IS STILL PERFORMING THE FUNCTION FOR WHICH IT WAS INTENDED BUT MAY NEED MAINTENANCE.
P = POOR	-ELEMENT IS PERFORMING AT REDUCED CAPACITY.
C = CRITICAL	-ELEMENT IS NOT PERFORMING THE FUNCTION FOR WHICH IT WAS INTENDED

USDA FOREST SERVICE, REGION 6

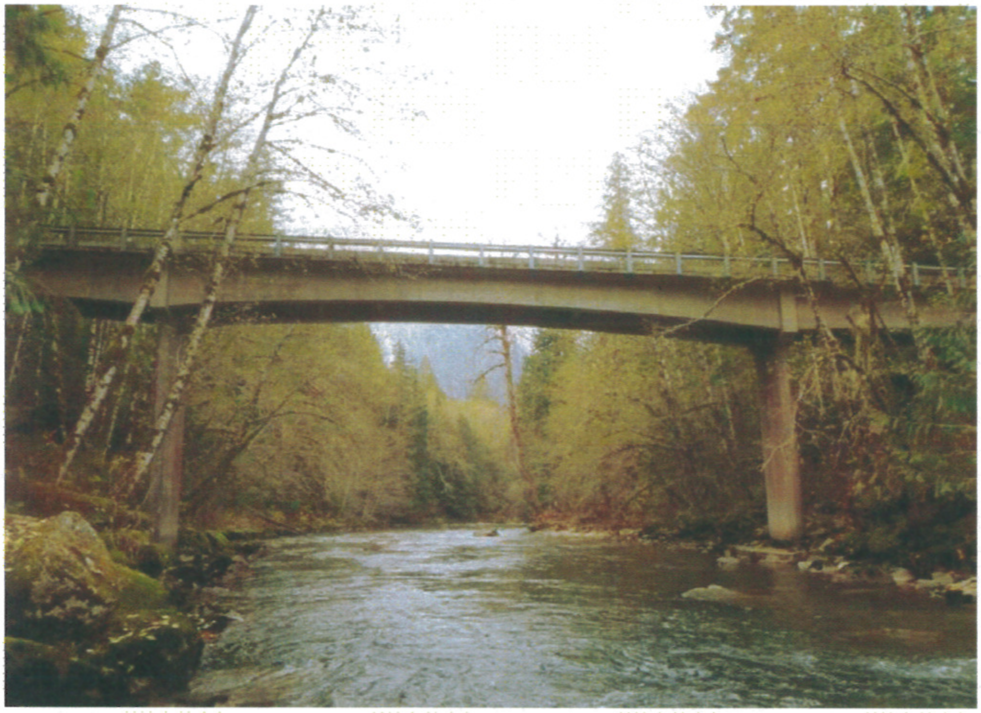
MT BAKER-SNOQUALMIE NATIONAL FOREST

N FORK SAUK BRIDGE-FLTPS1

ROAD BRIDGE INSPECTION REPORT Inspection Date: **11/7/2017**

Route: **2000000** Milepost: **37.2000** Structure No: **060502000001469**

INSPECTION TYPE: **ROUTINE**



N FORK SAUK BRIDGE-FLTPS1 OVER N FORK SAUK RIVER

Snohomish County, Washington

INSPECTION TEAM LEADER: **Luke Silvis**

(Signature)

U.S. DEPARTMENT OF AGRICULTURE
BRIDGE INSPECTION AND MANAGEMENT PROGRAM

USDA FOREST SERVICE, REGION 6

MT BAKER-SNOQUALMIE NATIONAL FOREST

BRIDGE IDENTIFICATION AND LOCATION

Structure Name:	**N FORK SAUK BRIDGE-FLTPS1**	(8)Structure No:	**060502000001469**

(5D)Route:	**2000000**	(11)Milepost:	**37.2000**	(6)Feature Crosse	**N FORK SAUK RIVER**
Forest:	**MT BAKER-SNOQUALMIE**	District:	**DARRINGTON**	Security ID	**0605**

BRIDGE DESCRIPTION and MEASUREMENTS

(27)Year Built:	**1961**	Description:	**CI30 - Three-span concrete frame**		
(49)Overall Br Length:	**200.0**	(48)Max Span:	**80.0**	NBIS Bridge Opening:	**195.7**
(51)Roadway Width (Curb to Curb):	**14.0**	(52)Deck Width out-out:	**18.5**	(32)Approach Roadway Width:	**18.0**
(47)Horizontal	**99.9**	(53)Vertical	**99.99**	(34)Skew:	**0**
(107)Deck StructureType:	**Concrete Cast-In-Place**	(108A)Wearing Surface:	**None**		
(45)No. Main Spans:	**3**	(43A)Superstr Material:	**Concrete, Continuous**	(43B)Superstr Type:	**Stringer/Multi-Beam Or Girder**
(46)No. Appr Spans:	**0**	(44A)Superstr Material:		(44B)Superstr Type:	
No. Substrs:	**3**	Substr Material:	**Concrete, Reinforced**	Substr Type:	**Solid Shaft Pier**

BRIDGE RATING SUMMARY:

(in Tons)	Inventory	Operating	Safe Load Capacity	Posting
HL-93 (RF)			-	-
HS-20				-
Type 3	38	55		-
Type 3S2	59	87		-
Type 3-3	64	102		-
NRL (RF)		-		-

Rating Date:	**4/18/1979**
(41) Posting Status:	**Open, No Restriction**
(70) Posting Capacity:	**At Or Above Legal Loads**
(31)Design Load:	**FS U54**
(63,65)Method of Load Rating:	

SPECIALIZED INSPECTIONS:

Specialized Inspections Required (23 CFR 650.303)	Yes/No	Based on this inspection, is additional inspection work needed in these specialized inspection areas? If Yes How Soon Neede
(92A) Fracture Critical	**N**	**0 Months**
(92B) Underwater	**N**	**0 Months**
(92C) Special	**N**	**0 Months**

Critical Findings:

Re-rating required based on this inspection?

Yes ☐ No ☒

INSPECTION INFORMATION

Date:	**11/7/2017**	Time Started:	9:56 AM	Time Completed:	11:00 AM		
Inspection Team:	**Kluz**	Leader:	**Luke Silvis**	Jurisdiction:	**FS**		
Weather:	**Cloudy, 45° F**	Latitude:	**48.09458333**	Longitude:	**-121.38375**		
Township:	**30N**	Range:	**11E**	Section:	**16**	1/4 Sect:	Meridian:
(9)Location:	**From Darrington south on FR20 to MP 37.2, (17.5 Miles from Darrington)**						
Recommended Inspection Frequency:	**24**	**Months**	☐ Special Equipment Need				

Narrative Report: (Add additional sheets if necessary)

Orientation is S to N, US Right. Current notation and milepost is opposite of plans (BOB is south end, Girder #1=A on the plans). The reinforced concrete super and the reinforced concrete substructure are in generally good structural condition. A short hairline crack at the construction joint in Girder 2, Span 2 (see sketch) noted in 2009 was not confirmed in this inspection. No shear cracking was observed in the girders. Both interior pier footings have varying degree of exposure to the flow, but no undermining has occurred yet. The deck is worn to raised medium aggregate from approach gravel and snowplow scrapes. Fill is sloughing out behind the backwalls causing some potholing at both ends of the bridge. The shoulders at the sidewalk ends are eroding due to foot traffic.

Infra data used for this report was pulled on:	04/23/2017
Inspection Template Revision Date:	05/31/2017

Structure Name:	**N FORK SAUK BRIDGE-FLTPS1**		Date:	**11/7/2017**
Route:	**2000000**	Milepost: **37.2000**	Structure No:	**060502000001469**

CONDITION CODES and REMARKS

(Overall Code for item, to be reported to FHWA, in bold box)			CODE	REMARKS
Wearing Surface			N	
58. DECK:			**6**	
	* 1.	Deck Slab/Panels/Joists	F	One transverse crack w/ efflo in Span 2 near Pier 2
	C1.	Expansion Joints	-	
	C2.	Curbs	F	See narrative page 5
	C3.	Sidewalks	F	Minor impact spalling at EOB corner
	C4.	Drains and Drainage	G	Drains are partially blocked but functioning (cleared during inspection)
	C5.	Rideability	G	
	C6.	Cleanliness	G	
	C7.	Utilities	No	
59. SUPERSTRUCTURE:			**7**	
	* 1.	Girders__2__ea.	G	See narrative page 5
		a. Diaphragms	G	
		b. Bracing	-	
	* 2.	Floor Beams	-	
	* 3.	Stringers	-	
	* 4.	Trusses	-	
		a. Chords	-	
		b. Portals	-	
		c. Verticals/Diagonals	-	
		d. Bracing	-	
	C1.	Bearing Devices	-	
	C2.	Paint	-	
	C3.	Deflection Under Load	NOB	Not observed during this inspection
	C4.	Vibration Under Load	NOB	Not observed during this inspection
60. SUBSTRUCTURE:			**7**	
ABUTMENTS	*1.	Alignment (tilting, rotating, etc.)	G	
	*2.	Erosion or Scour	G	Some fill raveling under abutment ends
	*3.	Settlement	G	
	Timber Abutments (incl. WW)			
	*4.	Caps	-	
	*5.	Posts/Piles/Tie Backs	-	
	*6.	Backing Planks	-	
	*7.	Sills/Footings	-	
	*8.	Crib Walls/Tie Backs	-	
	Other Abutments			
	*9.	Caps	-	
	*10.	Footings	NOB	Not visible for inspection
	*11.	Walls	-	
	*12.	Piles	-	
	*13.	Wingwalls	-	
PIERS	*14.	Alignment (tipping, tilting, etc.)	G	
	*15.	Erosion or Scour	F	See narrative page 5
	*16.	Settlement	G	
	*17.	Caps	G	
	*18.	Columns or Walls	G	Concrete abraded up to high water line and minor small spall outs
	*19.	Footings	F	See narrative page 5
	*20.	Piles	NOB	Not visible for inspection
	*21.	Bracing	-	

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[1] Also includes wingwalls connected to the superstructure above the beam seat.

[2] Includes wingwalls integral with the abutment or the portion of the wingwall below the bearing seat.

Structure Name:	**N FORK SAUK BRIDGE-FLTPS1**	Date:	**11/7/2017**
Route: **2000000**	Milepost: **37.2000**	Structure No.:	**060502000001469**

CONDITION CODES and REMARKS (continued)

(Overall Code for item, to be reported to FHWA, in bold box)		CODE	REMARKS
61. CHANNEL and CHANNEL PROTECTION:		**6**	
1.	Channel Scour/Erosion	F	Footings exposed at Pier 2 and 3
2.	Channel Protection	F	
3.	Vegetation	G	
4.	Waterway Obstructions/Drift	G	Minor drift
5.	Observed Lateral Movement	G	
6.	Clear Height	39	Height (feet) from thalwag to bottom of lowest superstructure member
62. CULVERTS		**N**	
*1.	Shape	-	
*2.	Seams or Joints	-	
*3.	Material Condition	-	
*4.	Foundations	-	
5.	Headwall/Wingwall	-	
APPROACH CONDITION:		**F**	(Not needed for reporting to FHWA)
1.	Surfacing	F	Gravel with some potholes at both approaches
2.	Shoulder Embankment	F	Steep shldrs at all corners from pedestrian traffic, drops at sidewalk ends
3.	Roadway Embankment	G	
4.	Approach Settlement	F	Up to 4" deep drops at bridge ends mostly due to potholes

APPRAISAL CODES and REMARKS

36. TRAFFIC SAFETY FEATURES:	**36A**	**0**	**36B**	**0**	**36C**	**0**	**36D**	**0**

			CODE	REMARKS
CONDITION of elements	A.	Bridge Railing	F	Moderate rust on rails, damaged end piece BOB right.
	B.	Rail Transitions	-	
	C.	Approach Guardrails	-	
	D.	Approach Rail Ends	-	
	1.	Signing	-	
	2.	Object Markers	F	BOB right is knocked over, EOB markers are leaning
72. APPROACH ROADWAY ALIGNMENT:			**3**	
	1.	Horizontal	P	Curve at BOB
	2.	Vertical	F	
29. ROAD ADT			**140**	
67. STRUCTURAL EVALUATION			**7**	
68. DECK GEOMETRY:			**2**	
69. UNDERCLEARANCE:			**N**	
71. WATERWAY ADEQUACY:			**9**	
113. SCOUR CRITICAL BRIDGES:			**5**	Spill thru abutments on spread ftgs, intermediate piers on piles

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CONDITION RATING OF EACH MEMBER OR ELEMENT

-	-NOT APPLICABLE
NOB	-APPLICABLE, BUT NO OBSERVED. (Give reason unless obvious)
G = GOOD	-ELEMENT IN NEW OR GOOD CONDITION WITH NO REPAIRS NECESSARY.
F = FAIR	-ELEMENT IS STILL PERFORMING THE FUNCTION FOR WHICH IT WAS INTENDED BUT MAY NEED MAINTENANCE.
P = POOR	-ELEMENT IS PERFORMING AT REDUCED CAPACITY.
C = CRITICAL	-ELEMENT IS NOT PERFORMING THE FUNCTION FOR WHICH IT WAS INTENDED

BRIDGE INSPECTION REPORT

Ver Date: 06/27/2016 Agency: Snohomish County

Status: Released Printed On: 06/28/20 Program Mgr: Roman G. Peralta

Bridge No. 655 Page: 1/3 **Structure Type**

Bridge Name SAUK RIVER #655 **Route** 98960 **Location** 9.0 SE DARRINGTON

Structure ID 08652100 **MilePost** 44.79 **Intersecting** SAUK RIVER

Inspector's Signature MPZ IDent# G1331

Co-Inspector's Signature

6	☐	Structural Adqcy	(657)	N	☐	Pier/Abut/Protect	(679)	1983		Year Built	(332)
5	☐	Deck Geometry	(658)	5	☐	Scour	(680)	0		Year Rebuilt	(336)
9	☐	Underclearance	(659)	9	☐	Retaining Walls	(682)	70	☐	Oper Rating	(551)
5	☐	Operating Level	(660)	9	☐	Pier Protection	(683)	35	☐	Inv Rating	(554)
6	8	Alignment Adqcy	(661)	1	☐	Bridge Rails	(684)	A	☐	Open Close	(293)
8	☐	WaterwayAdqcy	(662)	1	☐	Transition	(685)	9999	☐	Vert Over Deck	(360)
6	7	Deck Overall	(663)	1	☐	Guardrails	(686)	0000	☐	Vert Under	(374)
9	☐	Drains Condition	(664)	1	☐	Terminals	(687)	N	☐	Vert Und Code	(378)
6	☐	Superstructure	(671)	Y	N	Revise Rating	(688)		☐	Asphalt Depth	
0	☐	Number Utilities	(675)		☐	Photos Flag	(691)		☐	Speed Limit	
6	7	Substructure	(676)		☐	Soundings Flag	(693)				
6	☐	Chan/Protection	(677)		☐	Measure Clearance	(694)				
9	☐	Culvert	(678)								

Inspections Performed

IT	NT	HRS	Date	Rep Type
Y	24	1.5	05/31/2016	Routine
				Fract Crit
				Underwater
				Special
				Interim
				Equipment
				Damage
				Safety
				Short Span

Total: 1.5

Suff Rating: 90.43 90.43

BMS Elements

Element	Element Description	Total	Units	State 1	State 2	State 3	State 4
12	Concrete Deck	4788	SF	4788	0	0	0
35	Concrete Deck Soffit	4788	SF	4788	0	0	0
115	Prestressed Concrete Girder	922	LF	922	0	0	0
214	Concrete Web Wall between Columns	28	LF	28	0	0	0
215	Concrete Abutment	56	LF	56	0	0	0
227	Concrete Submerged Pile/Column	2	EA	2	0	0	0
234	Concrete Pier Cap / Crossbeam	35	LF	35	0	0	0
266	Concrete Sidewalk & Supports	850	SF	850	0	0	0
310	Elastomeric Bearing	20	EA	20	0	0	0
331	Concrete Bridge Railing	340	LF	310	0	30	0
340	Metal Pedestrian Railing	170	LF	170	0	0	0
361	Scour	1	EA	1	0	0	0

BRIDGE INSPECTION REPORT

Ver Date: 06/27/2016 Agency: Snohomish County

Status: Released Printed On: 06/28/20 Program Mgr: Roman G. Peralta

Bridge No. 655 Page: 2/3 **Structure Type**

Bridge Name SAUK RIVER #655 **Route** 98960 **Location** 9.0 SE DARRINGTON

Structure ID 08652100 **MilePost** 44.79 **Intersecting** SAUK RIVER

406	Compression Seal / Steel Header	28	LF	28	0	0	0
407	Steel Angle Header	56	LF	56	0	0	0

Notes

0	South to North.
11	Load Rating by Sargent Engineers (12/2010) indicates rating factors for AASHTO trucks all well above "2" (64,102,113) tons) and good for overloads also.
12	CIP deck. Chain dragged 6/12/2000 - no delams detected. Appears to be superelevated @ 2% to east. Exposed aggregate typ.
35	Soffit between 1C-1D with minor exposed rebar. Soffit between 2E-2F at north end with 4 lf exposed rebar.
115	Girders: precast, prestressed pcc, (6) lines @ main span #2, (4) lines @ span #1 = good, except girders in both spans appear to have epoxy-patched cracks along downstream side near P2. Patched areas are all in good condition. Same pattern appears on all girders - probably some problem with the forms during fabrication (?). Concrete diaphragms at midspan of span 2 sre full depth of girders - no intermediate diaphragms @ span 1. Girders with patches at lifting holes typical at ends. Girder 1C with 3sf patch on bottom near P2. Girder 2A w/ 2sf patch on end of web near P2. Girder 2A with exposed rebar @ soffit side of interior flange near pier 2. Girder F w/ 4" diam. spall @ outside flange. Girders A & F with angle iron girder stops @ crossbeam. Girts B & C with short horizontal cracks @ web section of span 2 girts above crossbeam near pier 2. At pier 3, Girder A with 1' soffit crack. Girts C,D,F with 1' leaching crack each in web.
214	P2 foundation. 4"x4" delam midheight @ south face web wall. Many small chips low on north face probably from riprap placement.
215	Minor hairline cracks near bottom of A1. Form ties are present w/ rust. A3, west side, with leaching cracks typical. A3 with 18" x 6" x 3" deep spall @ west corner and minor hairline vertical and transverse cracks on face.
227	Columns: pcc (cip), 60" diam drilled shafts, 2 ea @ P2. Column B @ P2 with 1 ft. long ver crack @ top of south face. Column A w/6" exposed rebar midheight- upstream side. Some smaller spalls, north side of both columns from riprap placement.
234	Located @ P2, above concrete web wall. Girder stop @ span 1 side for girder C w/ exposed rebar and girder D stop for span 2 with exposed rebar. SW face of pier 2 crossbeam with 5" exposed vertical rebar.
266	Sidewalk: pcc @ downstream side only in good condition.
310	At all piers: no defects noted.
331	Rail: pcc barrier both sides - precast in 26 ft lengths. T/rail @ 2'-4" from pvmt. Mostly crumbling/weathered at ends with spalling- typical. Two locations with exposed rebar - east side = Monitor. General deterioration throughout especially east side.
340	Pedestrian rail: 2" diam galv steel tube in good condition.
361	Rip rap installed @ P2, A3. Pier 2 in OHW.
406	Compression seal @ P2 - sand filled @ deck. Minor damage over 1 lf in northbound lane = Monitor.
407	3" x 3" steel guard angle @ A1 and A3 = good. 2008 - joint paved over.
664	One drain inlet off bridge on downstream side @ north end.
680	No scour summary in file. Per as-built plans, Pier 2 drilled shafts anchored 5' into rock.
681	Longitudinal cracks in approach roadway at north end of bridge have been sealed, but will need future attention, esp in n/b lane. No cracking visible in 2010 due to recent chip seal. Slight settlement in south approach. Smooth approach north.
686	Approach railing is beginning to rust through galvanized coating. Posts showing signs of age - MONITOR. Okay 2016.

Repairs

Repair No	Pr	R	Repair Description	Noted	Maint	Verified

BRIDGE INSPECTION REPORT

Ver Date: 06/27/2016

Agency: Snohomish County

Status: Released

Printed On: 06/28/20

Program Mgr: Roman G. Peralta

Bridge No. 655

Page: 3/3

Structure Type

Bridge Name SAUK RIVER #655

Route 98960

Location 9.0 SE DARRINGTON

Structure ID 08652100

MilePost 44.79

Intersecting SAUK RIVER

10000	M	B	12/17/08
10001	M	B	11/22/10

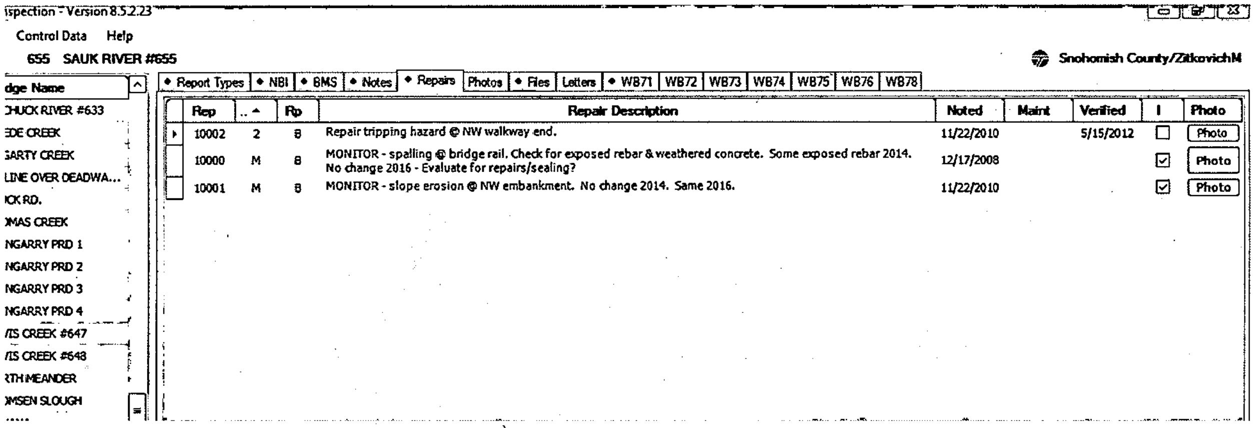
Inspections Performed and Resources Required

Report Type	Date	IT	Frq	Hrs	Insp	CertNo	Coinsp	Note
Routine	05/31/16		24	1.5	MPZ	G1331		

Resources	Use	Hour	Min	Req	Max	Notes

Report Type	Date	IT	Frq	Hrs	Insp	CertNo	Coinsp	Note
2 Man UBIT	05/15/12		72	2.0	JRH	G1014	MZ	

Resources	Use	Hour	Min	Req	Max	Notes
UBIT	ANY	2.00	30	50	60	Whatcom co. platform truck used 2012. Deployed off west side. Approx. 30' reach - Difficult to reach last girder to east.
Flagging	LA		LA	LA	LA	



655 SAUK RIVER #655

Snohomish County/ZitkovichM

dge Name

- ƆHUCK RIVER #633
- ƎDE CREEK
- ƷARTY CREEK
- LINE OVER DEADWA...
- ICK RD.
- ƆMAS CREEK
- NGARRY PRD 1
- NGARRY PRD 2
- NGARRY PRD 3
- NGARRY PRD 4
- /IS CREEK #647
- /IS CREEK #648
- ꓤTH MEANDER
- ƆMSEN SLOUGH

	Rep	.. ▲	Rp	Repair Description	Noted	Maint	Verified	I	Photo
▸	10002	2	8	Repair tripping hazard @ NW walkway end.	11/22/2010		5/15/2012	☐	Photo
	10000	M	8	MONITOR - spalling @ bridge rail. Check for exposed rebar & weathered concrete. Some exposed rebar 2014. No change 2016 - Evaluate for repairs/sealing?	12/17/2008			☑	Photo
	10001	M	8	MONITOR - slope erosion @ NW embankment. No change 2014. Same 2016.	11/22/2010			☑	Photo

SARGENT

40851

12/22/10

PE Stamp

Bridge Rating Summary

Bridge Name: Sauk River

Bridge Number: 655

Span Types: Two-Span Prestressed Girders w/ CIP deck

Bridge Length: 169-ft

Design Load: HS20-44

Rated By: D.J. Manwill

Checked By: E.C. Martin

Date: 12/22/2010

Inspection Report Date	6/3/2008	Substructure Condition	7
Rating Method	LFR	Deck Condition	7
Overlay Thickness	0.0-in	Superstructure Condition	7

Truck	RF (INV)	RF (OPR)	Controlling Point
TYPE 3 (AASHTO 1)	1.38	2.59	Service Moment Span 2 / Abutment Shear
TYPE 3S2 (AASHTO 2)	1.09	2.84	Service Moment Span 2 / Abutment Shear
TYPE 3-3 (AASHTO 3)	1.06	2.83	Service Moment Span 2 / Span 2 Shear
NRL	0.87	2.00	Service Moment Span 2 / Abutment Shear
OL-1	0.75	1.84	Service Moment Span 2 / Abutment Shear
OL-2	0.43	1.24	Service Moment Span 2 / Span 2 Shear

NBI Rating	RF	TONS (US)	Controlling Point
Inventory (HS-20)	0.98	35	Service Moment Span 2
Operating (HS-20)	1.96	70	Abutment Shear

Remarks:

Washington State Department of Transportation
WSBIS Inventory Report

6/28/2016

Structure Identifier	Bridge Number	Owner Code	County Number	City Number	Update
08652100	655	02	31	0000	0

WB71

Bridge Name	Location	Section	Town ship	Range	Latitude	Longtitude
SAUK RIVER #655	9.0 SE DARRINGTON	14	31	10E	48°10'20.00"	121°28'20.00"
					48°10'19.00"	121°28'25.00"

WB72

Feature Intersected	Facilities Carried	Region	FIPS Place Code	Legis District (1)	Legis District (2)	Toll	Custodian	Parallel Structure	Temporary Structure	Critical Facility	Median	Hist Sig	Open Closed	Program Year
SAUK RIVER	MOUNTAIN LOOP HWY	NW	05040	10	0	3	02	N		☒	0	4	A	
										☒				

WB73

Year Built	Year ReBuilt	Bridge Length	NBIS Length	Maximum Span Length	Lanes On	Lanes Under	Curb to Curb Deck Width	Out to Out Deck Width	Sidewalk Curb Left	Sidewalk Curb Right	Min Vert Clearance Over Deck	Min Vert Clearance Under Bridge	Code	Min Lat UnderClr Right	Code	Min Lat UnderClr Left	Navigation Control	Navigation Vertical Clearance	Navigation Horizontal Clrnce	Vert Lift Min Clrnce	Appr Roadway Width	Skew Angle	Flare
1983	0	171	. '	127'	2	0	28.0'	37.0'	0.0'	5.5'	9'99"	' 0"	N	0.0'	N	0.0'	0	0'	0'	'	28'	0°	N

WB74

On Under	High way Class	Service Level	Route Number	Mile Post	ADT on Inventory Route	Truck ADT PCT	ADT Year	Future ADT	Future ADT Year	Linear Referencing System Route	LRS Sub Route	Fed Aid Route	Nat Hwy System	Base Hwy Network	Strahnet	Fed Lands Highway	Fed Funct Class	National Truck Net	Lane Use Direction	Horizontal Clearance Route Dir	Horizontal Clearance Reverse Dir	Max Vertical Clearance Route Dir	Detour Length
1	4	1	98960	44.79	472	5	2013	800	2036			X310	0	0	0	2	07	N	2	28'00"	' "	' "	94

WB75

Main Span Material	Main Span Design	Appr Span Material	Appr Span Design	Number of Main Spans	Number of Appr Spans	Service On	Service Under	Deck Type	Wearing Surface	Membrane	Deck Protection	Fed Design Load	Oper Rtng Method	Oper Rtng Tons	Invt Rtng Method	Invt Rtng Tons	Design Exception Date	Federal Aid Project	Border State Code	Border State PCT	Border State Structure Identifier
5	02	5	02	1	1	5	5	1	0	0	8	5	F	70	F	35					
																	/ /				

WB76

Routine Inspection					
Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
24	05292014	1.0	MPZ	G1331	PH
	05/31/2016	1.5	MPZ	G1331	

Structural Adequacy	Deck Geometry	Underclrnce Adequacy	Operating Level	Alignment Adequacy	Waterway Adequacy	Deck Overall	Drain Cond	Drains	Scaling Severity	Scaling Percent	Deck Rutting	Exposed Reinf Steel	Superstruct Overall	Curb	Sidewalks	Paint	Number of Utilities	Substruct Overall	Channel Protection	Culvert	Pier Abutment	Scour	Approach Roadway	Retaining Walls	Pier Protection	Traffic Safety Bridge Rail	Traffic Safety Trans	Traffic Safety Guard Rail	Traffic Safety Term	Revise Rating	Repair Status	Card Check	Photos	Season	Soundings	Clearances	Monitor Structure
6	5	9	5	6	8	6	9	1	N	0	8	8	6	7	7	9	0	6	6	9	N	5	6	9	9	1	1	1	1	Y							
☒	☒	☒		8		7												7												N							

Sufficiency Rating: 90.43

WB77

Fracture Critical / UBIT Inspection							
Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
I	72	05152012	2.0	JRH	G1014	MZ
		/ /	.	/		

Underwater Inspection						
Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
			.			
		/ /	.			

Other Special Inspections						
Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
			.			
		/ /	.			

WB78

Water Type	Flood Plain Intrusion	Flood Control	Scour History	Streambed Material	Substruct Stability	Waterway Obstruction	Streambed Stability	Streambed Anabranch	Piers in Water	Service On	Service Under	Work Type	Work Method
F	A	N	N	3	7	N	D	N	1	0	0	00	0

Proposed Improvements								
Structure Improve Length	Roadway Width	Lanes On	Lanes Under	Total Costs In Thousands	Structure Cost In Thousands	Roadway Cost In Thousands	Estimate Year	Calc
				0	0	0	0	

Inspecting Agency		Seismic Status-Superstruct		Seismic Status-Substruct	
Code	Number	Main Biennium	Approach Biennium	Main Biennium	Approach Biennium

BRIDGE INSPECTION REPORT

Ver Date: 06/27/2016 Agency: Snohomish County

Status: Released Printed On: 06/28/20 Program Mgr: Roman G. Peralta

Bridge No. 656 Page: 1/2 **Structure Type**

Bridge Name DUTCH CREEK #656 **Route** 98960 **Location** 8.0 SE DARRINGTON

Structure ID 08703000 **MilePost** 45.69 **Intersecting** DUTCH CREEK

Inspector's Signature MPZ IDent# G1331

Co-Inspector's Signature

6		Structural Adqcy	(657)	N		Pier/Abut/Protect	(679)	2003		Year Built	(332)
5		Deck Geometry	(658)	9		Scour	(680)	0		Year Rebuilt	(336)
9		Underclearance	(659)	7		Retaining Walls	(682)	78		Oper Rating	(551)
5		Operating Level	(660)	9		Pier Protection	(683)	43		Inv Rating	(554)
8		Alignment Adqcy	(661)	1		Bridge Rails	(684)	A		Open Close	(293)
8		WaterwayAdqcy	(662)	1		Transition	(685)	9999		Vert Over Deck	(360)
6		Deck Overall	(663)	1		Guardrails	(686)	0000		Vert Under	(374)
9		Drains Condition	(664)	1		Terminals	(687)	N		Vert Und Code	(378)
6		Superstructure	(671)	Y	N	Revise Rating	(688)			Asphalt Depth	
0		Number Utilities	(675)	P		Photos Flag	(691)			Speed Limit	
7		Substructure	(676)			Soundings Flag	(693)				
8		Chan/Protection	(677)			Measure Clearance	(694)				
9		Culvert	(678)								

Inspections Performed

IT	NT	HRS	Date	Rep Type
Y	24	1.0	05/31/2016	Routine
				Fract Crit
				Underwater
				Special
				Interim
				Equipment
				Damage
				Safety
				Short Span

Total: 1.0

Suff Rating: 88.81 | 88.39

BMS Elements

Element	Element Description	Total	Units	State 1	State 2	State 3	State 4
13	Bridge Deck Surface	2894	SF	2894	0	0	0
108	Prestressed Concrete Bulb-T Girder	428	LF	416	10	2	0
215	Concrete Abutment	100	LF	100	0	0	0
310	Elastomeric Bearing	8	EA	8	0	0	0
330	Metal Bridge Railing	214	LF	214	0	0	0
340	Metal Pedestrian Railing	214	LF	214	0	0	0
800	Asphaltic Concrete (AC) Overlay	2894	SF	2894	0	0	0

Notes

0	Oriented South to North.
11	Load Rating by Sargent Engineers (10/2010) indicates all AASHTO rating factors above "2" (75,90,98 tons) and good for overloads also.
13	Not visible due to ACP overlay

BRIDGE INSPECTION REPORT

Ver Date: 06/27/2016 Agency: Snohomish County

Status: Released Printed On: 06/28/20 Program Mgr: Roman G. Peralta

Bridge No. 656 Page: 2/2 **Structure Type**

Bridge Name DUTCH CREEK #656 **Route** 98960 **Location** 8.0 SE DARRINGTON

Structure ID 08703000 **MilePost** 45.69 **Intersecting** DUTCH CREEK

108	(4) lines precast, prestressed pcc deck bulb tee girders in satisfactory condition. Recycled from WSDOT. Welded galvanized steel diaphragms at 1/3 points have low quality field welds. Leaching at longitudinal joints with stalactites, and misc minor spalling at long joints throughout. Girder stops were poured over girder bottom bulbs with no bond breaker for expansion, with some cracking. Some leaching @ lifting eye patches with rust. Girts A, B, C with rust @ lower flange rebar tips. Leakage at rail to flange connections. Some rust @ diaphragm bracing. Girt C near A2 @ top flange w/dry pack repair. Some dry pack repair and rebar painting accomplished 2013. Some missed at A1 near soffit & on bottom flange @ girder B with 2 lf exposed rebar and a few other areas of minor rebar exposure. Leaching from spall repair @ A1 and also from girder/end diaphragm interface. At A2, typically the same w/failed lifting hole spall repairs between girders C-D. Girt D near A2 with a few hairline diagonal cracks on web.
215	CIP concrete abutments on fill retained by reinforced earth retaining walls.
310	Elastomeric bearing pads - (4) at each abutment.
330	Railing: Oregon "2-tube" galvanized steel tubular railing on 6" x 6" steel "I" beam posts with rust in places. Threads rusty on rail bolts. Ped-bike rails added 2008. T/traffic barrier - 2'-4" / T/ped rail 4'-1" from pvmt. Concrete curb has hairline random cracks, extending into soffit. Leaching out of bolt plates on bottom. Extensive leaching cracking with shallow spalling & delaminations of outside surface of west curb throughout.
340	Mounted above bridge railing.
680	Abutments well above and back from high water elevations. No scour summary in file. Steep channel but riprap appears stable is functioning as designed.
681	Reflective crack at A1. Very minor settlement.
682	100 LF of wire-basket gabion wall @ P1/P2. Wall has end returns each side/each corner. 15 ft max height @ NE bank. Functioning well 2012.a
800	ACP by county crew in spring 2004. Repaved over abutment joints in 2008. 2 x 2 = 4" total ACP layer thickness. BST overlay 2011.

Repairs

Repair No	Pr	R	Repair Description	Noted	Maint	Verified
10003	2	B		11/22/10		
10001	3	J		11/22/10		
10004	3	B		05/29/14		

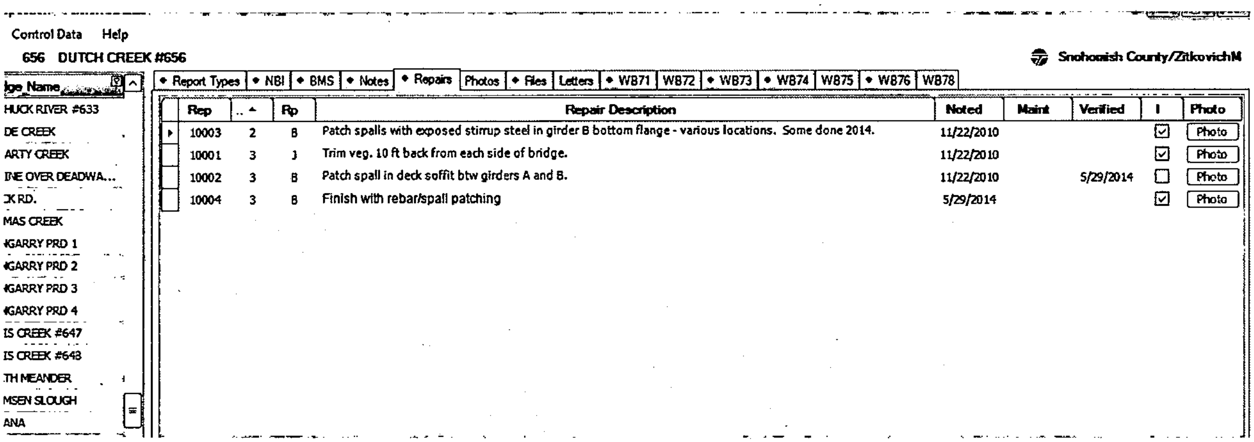
Inspections Performed and Resources Required

Report Type	Date	IT	Frq	Hrs	Insp	CertNo	Coinsp	Note
Routine	05/31/16		24	1.0	MPZ	G1331		

Resources	Use	Hour	Min	Req	Max	Notes

Report Type	Date	IT	Frq	Hrs	Insp	CertNo	Coinsp	Note
2 Man UBIT	05/15/12		72	2.0	JRH	G1014	MZ	

Resources	Use	Hour	Min	Req	Max	Notes
UBIT	ANY	2.00	30	50	60	Whatcom Co. platform truck w/ approx. 30' reach used for 2012 inspection. Difficult to reach last girder.



656 DUTCH CREEK #656

Snohomish County/ZitkovichM

ige_Name
HUCK RIVER #633
DE CREEK
ARTY CREEK
INE OVER DEADWA...
CK RD.
MAS CREEK
GARRY PRD 1
GARRY PRD 2
GARRY PRD 3
GARRY PRD 4
IS CREEK #647
IS CREEK #648
TH MEANDER
MSEN SLOUGH
ANA

Rep	.. ▲	Rp	Repair Description	Noted	Maint	Verified	I	Photo
10003	2	B	Patch spalls with exposed stirrup steel in girder B bottom flange - various locations. Some done 2014.	11/22/2010			☑	Photo
10001	3	J	Trim veg. 10 ft back from each side of bridge.	11/22/2010			☑	Photo
10002	3	B	Patch spall in deck soffit btw girders A and B.	11/22/2010		5/29/2014	☐	Photo
10004	3	B	Finish with rebar/spall patching	5/29/2014			☑	Photo

SARGENT

Bridge Rating Summary

40851

10/22/10

PE Stamp

Bridge Name:	Dutch Creek
Bridge Number:	656
Span Types:	Prestressed Deck Bulb Tee Girders
Bridge Length:	108-ft
Design Load:	HS-25
Rated By:	D.J. Manwill
Checked By:	E.C. Martin
Date:	10/12/2010

Inspection Report Date	6/3/2008	Substructure Condition	7
Rating Method	LFR	Deck Condition	6
Overlay Thickness	4.0-in.	Superstructure Condition	7

Truck	RF (INV)	RF (OPR)	Controlling Point
TYPE 3 (AASHTO 1)	1.67	3.02	Service / Ultimate Moment Midspan
TYPE 3S2 (AASHTO 2)	1.39	2.50	Service / Ultimate Moment Midspan
TYPE 3-3 (AASHTO 3)	1.37	2.46	Service / Ultimate Moment Midspan
NRL	1.05	1.90	Service / Ultimate Moment Midspan
OL-1	1.02	1.84	Service / Ultimate Moment Midspan
OL-2	0.63	1.14	Service / Ultimate Moment Midspan

NBI Rating	RF	TONS (US)	Controlling Point
Inventory (HS-20)	1.21	43	Service Moment Midspan
Operating (HS-20)	2.18	78	Ultimate Moment Midspan

Remarks:

From: Weelborg, James
Sent: Friday, October 29, 2010 2:41 PM
To: Heighway, John
Cc: Accetturo, Mario; Miller, Steven; Lui, Kinyan
Subject: 7 new load ratings

John,
Sargent Engineers has completed 7 load ratings so far. A hard copy of each load rating report, and a CD of each electronic file/s, has been left on your desk for inclusion into the bridge inspection files. A summary of data and file location is shown in the following tables.
Jim

Br #	UPI #	Location of Hardcopy Original/s	Location of CD	Are load rating files on Hard Disk in a project file?
006	09-0002-1o	• One in Permanent UPI# File • One in Bridge Inspection	Bridge Inspection	Yes – See Table Below
150	09-0002-1ab	• One in Permanent UPI# File • One in Bridge Inspection	Bridge Inspection	Yes – See Table Below
299	09-0002-1t	• One in Permanent UPI# File • One in Bridge Inspection	Bridge Inspection	Yes – See Table Below
301	09-0002-1u	• One in Permanent UPI# File • One in Bridge Inspection	Bridge Inspection	Yes – See Table Below
631	09-0002-1q	• One in Permanent UPI# File • One in Bridge Inspection	Bridge Inspection	Yes – See Table Below
647	09-0002-1y	• One in Permanent UPI# File • One in Bridge Inspection	Bridge Inspection	Yes – See Table Below
656	09-0002-1s	• One in Permanent UPI# File • One in Bridge Inspection	Bridge Inspection	Yes – See Table Below

---

Location of each Bridge Load Rating electronic file in its UPI project file

Br #	Location of Bridge Load Rating electronic file in its UPI project file
006	S:\PW_Project_Data_Management\6-PROJECTS_UPI Year_2009\09-0002-1o\3 RESOURCE GROUPS_WorksInProgress\Design Teams Project Data (3DSGN)\Bridge Data\Load Ratings
150	S:\PW_Project_Data_Management\6-PROJECTS_UPI Year_2009\09-0002-1ab\3 RESOURCE GROUPS_WorksInProgress\Design Teams Project Data (3DSGN)\Bridge Data\Load Ratings
299	S:\PW_Project_Data_Management\6-PROJECTS_UPI Year_2009\09-0002-1t\3 RESOURCE GROUPS_WorksInProgress\Design Teams Project Data (3DSGN)\Bridge Data\Load Ratings
301	S:\PW_Project_Data_Management\6-PROJECTS_UPI Year_2009\09-0002-1u\3 RESOURCE GROUPS_WorksInProgress\Design Teams Project Data (3DSGN)\Bridge Data\Load Ratings
631	S:\PW_Project_Data_Management\6-PROJECTS_UPI Year_2009\09-0002-1q\3 RESOURCE GROUPS_WorksInProgress\Design Teams Project Data (3DSGN)\Bridge Data\Load Ratings
647	S:\PW_Project_Data_Management\6-PROJECTS_UPI Year_2009\09-0002-1y\3 RESOURCE GROUPS_WorksInProgress\Design Teams Project Data (3DSGN)\Bridge Data\Load Ratings
656	S:\PW_Project_Data_Management\6-PROJECTS_UPI Year_2009\09-0002-1s\3 RESOURCE GROUPS_WorksInProgress\Design Teams Project Data (3DSGN)\Bridge Data\Load Ratings

Structure Identifier	Bridge Number	Owner Code	County Number	City Number	Update
08703000	656	02	31	00000	0

1 9 19 21 23 27

Washington State Department of Transportation
WSBIS Inventory Report

6/28/2016

WB71

Bridge Name	Location	Section	Town ship	Range	Latitude	Longtitude
DUTCH CREEK #656	8.0 SE DARRINGTON	14	31	10E	48°10'36.00"	121°29'08.00"
					48°10'45.00"	121°29'13.00"

32 56 81 83 85 88 96 104

WB72

Feature Intersected	Facilities Carried	Region	FIPS Place Code	Legis District (1)	Legis District (2)	Toll	Custodian	Parallel Structure	Temporary Structure	Critical Facility	Median	Hist Sig	Open Closed	Program Year
DUTCH CREEK	MOUNTAIN LOOP HWY	NW	05040	39	0	3	02	N		☒	0	4	A	-
										☒				

32 56 74 76 81 83 85 86 88 89 90 91 92 93 94

WB73

Year Built	Year ReBuilt	Bridge Length	NBIS Length	Maximum Span Length	Lanes On	Lanes Under	Curb to Curb Deck Width	Out to Out Deck Width	Sidewalk Curb Left	Sidewalk Curb Right	Min Vert Clearance Over Deck	Min Vert Clearance Under Bridge	Code	Min Lat UnderClr Right	Code	Min Lat UnderClr Left	Navigation Control	Navigation Vertical Clearance	Navigation Horizontal Clrnce	Vert Lift Min Clrnce	Appr Roadway Width	Skew Angle	Flare
2003	0	108	.	107	2	0	26.8	30.0	1.6	1.6	99'99	0	N	0.0	N	0.0	0	0	0		28	11°	N
			.				.	.	.	.				.		.					26	°	

32 36 40 46 48 52 54 56 60 64 67 70 74 78 79 82 83 86 87 90 94 97 100 102

WB74

On Under	High way Class	Service Level	Route Number	Mile Post	ADT on Inventory Route	Truck ADT PCT	ADT Year	Future ADT	Future ADT Year	Linear Referencing System Route	LRS Sub Route	Fed Aid Route	Nat Hwy System	Base Hwy Network	Strahnet	Fed Lands Highway	Fed Funct Class	National Truck Net	Lane Use Direction	Horizontal Clearance Route Dir	Horizontal Clearance Reverse Dir	Max Vertical Clearance Route Dir	Detour Length
1	4	1	98960	45.69	415	8	2010	800	2034			X310	0	0	0	2	07	N	2	26'08"			94
				.	472		2013		2036														

32 33 34 35 40 45 51 53 57 63 67 77 79 83 84 85 86 87 89 90 91 95 99 103

WB75

Main Span Material	Main Span Design	Appr Span Material	Appr Span Design	Number of Main Spans	Number of Appr Spans	Service On	Service Under	Deck Type	Wearing Surface	Membrane	Fed Deck Protection	Design Load	Oper Rtng Method	Oper Rtng Tons	Invt Rtng Method	Invt Rtng Tons	Design Exception Date	Federal Aid Project	Border State Code	Border State PCT	Border State Structure Identifier
5	04	0	00	1	0	1	5	B	6	2	1	9	F	78	F	43					
																	/ /				

32 33 35 36 38 41 44 45 46 47 48 49 50 51 52 54 55 57 65 85 88 90 104

WB76

Routine Inspection Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector	Structural Adequacy	Deck Geometry	Underclrnce Adequacy	Operating Level	Alignment Adequacy	Waterway Adequacy	Deck Overall	Drain Cond	Drains	Scaling Severity	Scaling Percent	Deck Rutting	Exposed Reinf Steel	Superstruct Overall	Curb	Sidewalks	Paint	Number of Utilities	Substruct Overall	Channel Protection	Culvert	Pier Abutment	Scour	Approach Roadway	Retaining Walls	Pier Protection	Traffic Safety Bridge Rail	Trans	Guard Rail	Term	Revise Rating	Repair Status	Card Check	Photos	Season	Soundings	Clearances	Monitor Structure
24	05292014	1.0	MPZ	G1331	PH	6	5	9	5	8	8	6	9	0	N	0	8	8	6	8	9	9	0	7	8	9	N	9	8	7	9	1	1	1	1	Y			P				
	05/31/2016	1.0	MPZ	G1331		☒	☒	☒												6																N							

32 34 42 46 49 54 57 58 59 60 61 62 63 64 65 66 67 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95

Sufficiency Rating: 88.39

WB77

Fracture Critical / UBIT Inspection Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector	Underwater Inspection Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector	Other Special Inspections Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
I	72	05152012	2.0	JRH	G1014	MZ				.							.			
		/ /	.						/ /	.						/ /	.			

32 33 35 43 47 50 55 58 59 61 69 73 76 81 84 85 87 95 99 102 107

WB78

Water Type	Flood Plain Intrusion	Flood Control	Scour History	Streambed Material	Substruct Stability	Waterway Obstruction	Waterway Stability	Streambed Anabranch	Piers in Water	Service On	Service Under	Work Type	Work Method	Proposed Improvements Structure Improve Length	Roadway Width	Lanes On	Lanes Under	Total Costs In Thousands	Structure Cost In Thousands	Roadway Cost In Thousands	Estimate Year	Calc	Inspecting Agency Code	Number	Seismic Status-Superstruct Main Biennium	Approach Biennium	Seismic Status-Substruct Main Biennium	Approach Biennium
F	A	N	N	5	1	N	C	C	0	0	0	00	0					0	0	0	0							

32 33 34 35 36 37 38 39 40 41 42 43 44 46 47 53 57 59 61 67 73 79 83 84 86 90 94 98 102

BRIDGE INSPECTION REPORT

Ver Date: 07/19/2016 Agency: Snohomish County

Status: Released Printed On: 07/21/20 Program Mgr: Roman G. Peralta

Bridge No. 654 Page: 1/3 **Structure Type**

Bridge Name CLEAR CREEK **Route** 98960 **Location** 3.0 SE DARRINGTON

Structure ID 08652000 **MilePost** 50.43 **Intersecting** CLEAR CREEK

Mike

Inspector's Signature MPZ IDent# G1331

Co-Inspector's Signature

6	☐	Structural Adqcy	(657)	N	☐	Pier/Abut/Protect	(679)	1960		Year Built	(332)
5	☐	Deck Geometry	(658)	5	☐	Scour	(680)	1984		Year Rebuilt	(336)
9	☐	Underclearance	(659)	9	☐	Retaining Walls	(682)	57	☐	Oper Rating	(551)
5	☐	Operating Level	(660)	9	☐	Pier Protection	(683)	34	☐	Inv Rating	(554)
6	☐	Alignment Adqcy	(661)	1	☐	Bridge Rails	(684)	A	☐	Open Close	(293)
8	☐	WaterwayAdqcy	(662)	0	☐	Transition	(685)	9999	☐	Vert Over Deck	(360)
6	☐	Deck Overall	(663)	1	☐	Guardrails	(686)	0000	☐	Vert Under	(374)
9	☐	Drains Condition	(664)	1	☐	Terminals	(687)	N	☐	Vert Und Code	(378)
7	☐	Superstructure	(671)		☐	Revise Rating	(688)	3.00	☐	Asphalt Depth	
0	☐	Number Utilities	(675)		☐	Photos Flag	(691)	45	☐	Speed Limit	
6	☐	Substructure	(676)		☐	Soundings Flag	(693)				
6	☐	Chan/Protection	(677)		☐	Measure Clearance	(694)				
9	☐	Culvert	(678)								

Inspections Performed

IT	NT	HRS	Date	Rep Type
Y	24	1.0	06/14/2016	Routine
				Fract Crit
				Underwater
				Special
				Interim
				Equipment
				Damage
				Safety
				Short Span

Total: 1.0

Suff Rating: 89.56 89.56

BMS Elements

Element	Element Description	Total	Units	State 1	State 2	State 3	State 4
12	Concrete Deck	3500	SF	3500	0	0	0
35	Concrete Deck Soffit	3500	SF	3500	0	0	0
110	Concrete Girder	500	LF	500	0	0	0
219	Concrete Cantilevered Span Abutment	70	LF	70	0	0	0
227	Concrete Submerged Pile/Column	6	EA	6	0	0	0
234	Concrete Pier Cap / Crossbeam	28	LF	28	0	0	0
266	Concrete Sidewalk & Supports	375	SF	375	0	0	0
331	Concrete Bridge Railing	250	LF	250	0	0	0
340	Metal Pedestrian Railing	125	LF	125	0	0	0
361	Scour	2	EA	2	0	0	0
800	Asphaltic Concrete (AC) Overlay	3500	SF	3500	0	0	0

Notes

BRIDGE INSPECTION REPORT

Ver Date: 07/19/2016 Agency: Snohomish County

Status: Released Printed On: 07/21/20 Program Mgr: Roman G. Peralta

Bridge No. 654 Page: 2/3 **Structure Type**

Bridge Name CLEAR CREEK **Route** 98960 **Location** 3.0 SE DARRINGTON

Structure ID 08652000 **MilePost** 50.43 **Intersecting** CLEAR CREEK

0	Oriented south to north.
1	Northbound (downstream) half originally built in 1960. Widened to two lane bridge in 1984. Structures are actually independent of each other.
11	Load rating by SARGENT (Nov/2010) indicates AASHTO rating factors all above "1" (33, 39, 42 tons) but overloads restricted.
12	CIP - 8" thick. Not visible due to ACP overlay. Some soffit cracking and rusted chairs visible from below.
35	Rusty rebar chair and other misc. rebar tip stains throughout w/random transverse hairline cracks, some leaching. Exposed rusted rebar and leaching transverse hairline cracks @ outside sidewalk soffit / east side. Leaching with stalactites through barrier bolt holes at outside soffits. Rusty spot - 3" diam. - in soffit between girders 2A-2B closer to peir 2.
110	Girders: pcc (cip) - 4 lines, arch-shaped, spans 1 and 3 are cantilevered. One pcc diaphragm @ midspan in SB lane, perpendicular to centerline; three pcc diaphragms at quarter points in NB lane, on 30 degree skew. Surface mold & algae on east structure girders. Girder 2C with 6" round x 1-1/2" deep spall - no rebar - near pier 2.
219	1 sf spall @ seam of 1960/1984 structures @ N end, both sides of seam with 1 piece protruding rusted rebar. 4"x4"x1" spall in south end diaphragm between girts C-D. Minor sloughing with wetness under end diaphragms.
227	Columns: Pcc (cip), rectangular, one each at P2 and P3 in SB span (1984) + two each in NB span (1960). Minor spall @ col 2C, 2 spalls @ col 3B. Random hairline cracks noted.
234	Caps: pcc (cip) at P2 and P3 in SB lane only = good.
266	Pcc sidewalk at downstream side only (1960). Thru bolts and exposed rebar with surface corrosion visible from soffit below.
331	Pre-cast concrete jersey barrier with a few hairline leaching cracks and scattered map cracking
340	Pedestrian rail: (4) ea 2 1/2" diam galv pipe (1960) with steel cables added (2008). Minor corrosion over most of surface.
361	Large rip rap @ P2, P3. Appears stable and is functioning to protect banks. Stream flows west to east.
680	No scour summary sheet in bridge file. From plans, foundations are spread footings at pier 2, and spread footings & HP piles at pier 3. The spread footings appear to be resting on bedrock. No history of scour.
681	Approach roadway and ACP on bridge were chip sealed in 2004 or 2005. NE pavement repaired in 2011. North approach with 1/2" settlement - 2016.
687	4 delineators and bridge sign are O.K. FHWA benchmark @ sidewalk / NE corner. Impact damage to SE transition rail = Monitor.
800	Cracks in ACP bridge overlay at abutments and down center of bridge were sealed in 2004. Bridge deck and approach roadway were chip sealed in 2004 or 2005.

Repairs

Repair No	Pr	R	Repair Description	Noted	Maint	Verified
10000	2	B		12/17/08		
10002	3	B		12/28/10		
10004	3	B		06/25/14		06/14/16

Inspections Performed and Resources Required

Report Type	Date	IT	Frq	Hrs	Insp	CertNo	Coinsp	Note
Routine	06/14/16		24	1.0	MPZ	G1331		

Resources	Use	Hour	Min	Req	Max	Notes

BRIDGE INSPECTION REPORT

Ver Date: 07/19/2016 Agency: Snohomish County

Status: Released Printed On: 07/21/20 Program Mgr: Roman G. Peralta

Bridge No. 654 Page: 3/3 **Structure Type**

Bridge Name CLEAR CREEK **Route** 98960 **Location** 3.0 SE DARRINGTON

Structure ID 08652000 **MilePost** 50.43 **Intersecting** CLEAR CREEK

SARGENT

40851

11/30/10

Bridge Rating Summary

Bridge Name: Clear Creek
Bridge Number: 654
Span Types: CIP Concrete T-Beams
Bridge Length: 125-ft
Design Load: 54-TON Log Truck (1960) / HS-20 (1984)
Rated By: D.J. Manwill
Checked By: E.C. Martin
Date: 11/30/2010

Inspection Report Date	06/30/2008	Substructure Condition	6
Rating Method	LFR	Deck Condition	7
Overlay Thickness	2.0-in	Superstructure Condition	7

Truck	RF (INV)	RF (OPR)	Controlling Point
TYPE 3 (AASHTO 1)	1.34	2.24	Shear Near Pier 2
TYPE 3S2 (AASHTO 2)	1.09	1.82	Shear Near Pier 1
TYPE 3-3 (AASHTO 3)	1.06	1.78	Shear Near Pier 1
NRL	0.89	1.48	Shear Near Pier 1
OL-1	0.75	1.26	Shear Near Pier 1
OL-2	0.51	0.85	Shear Near Pier 1

NBI Rating	RF	TONS (US)	Controlling Point
Inventory (HS-20)	0.95	34	Shear Near Pier 1
Operating (HS-20)	1.59	57	Shear Near Pier 1

Remarks:

The Inventory Rating for the HS-20 is below 1.0 because the widening performed in 1984 causes more load to be distributed to the interior girder of the 1960 structure than the original design allowed.

Washington State Department of Transportation
WSBIS Inventory Report

7/21/2016

Structure Identifier	Bridge Number	Owner Code	County Number	City Number	Update
08652000	654	02	31	0000	0

1 9 19 21 23 27

	Bridge Name	Location	Section	Township	Range	Latitude	Longtitude
WB71	CLEAR CREEK	3.0 SE DARRINGTON	31	32	10E	48°12'48.00"	121°34'00.00"
						48°13'08.00	121°34'07.00"

32 56 81 83 85 88 96 104

	Feature Intersected	Facilities Carried	Region	FIPS Place Code	Legis District (1)	Legis District (2)	Toll	Custodian	Parallel Structure	Temporary Structure	Critical Facility	Median	Hist Sig	Open Closed	Program Year
WB72	CLEAR CREEK	MOUNTAIN LOOP HWY	NW	16690	39	0	3	02	N		☒	0	4	A	
											☒				

32 56 74 76 81 83 85 86 88 89 90 91 92 93 94

	Year Built	Year ReBuilt	Bridge Length	NBIS Length	Maximum Span Length	Lanes On	Lanes Under	Curb to Curb Deck Width	Out to Out Deck Width	Sidewalk Curb Left	Sidewalk Curb Right	Min Vert Clearance Over Deck	Min Vert Clearance Under Bridge	Code	Min Lat UnderClr Right	Code	Min Lat UnderClr Left	Navigation Control	Navigation Vertical Clearance	Navigation Horizontal Clrnce	Vert Lift Min Clrnce	Appr Roadway Width	Skew Angle	Flare
WB73	1960	1984	125	.'	85	2	0	28.0'	34.5'	0.0'	3.0'	99'99"	'0"	N	0.0'	N	0.0'	0	0'	0'	'	28'	31°	N
				.'	'			.'	.'	.'	.'	'"	'"		.'		.'		'	'	'	'	°	

32 36 40 46 48 52 54 56 60 64 67 70 74 78 79 82 83 86 87 90 94 97 100 102

	On Under	High way Class	Service Level	Route Number	Mile Post	ADT on Inventory Route	Truck ADT PCT	ADT Year	Future ADT	Future ADT Year	Linear Referencing System Route	LRS Sub Route	Fed Aid Route	Nat Hwy System	Base Hwy Network	Strahnet	Fed Lands Highway	Fed Funct Class	National Truck Net	Lane Use Direction	Horizontal Clearance Route Dir	Horizontal Clearance Reverse Dir	Max Vertical Clearance Route Dir	Detour Length
WB74	1	4	1	98960	50.43	521	5	2013	1000	2036			X310	0	0	0	2	07	N	2	28'00"	'"	'"	94
					.																'"	'"	'"	

32 33 34 35 40 45 51 53 57 63 67 77 79 83 84 85 86 87 89 90 91 95 99 103

	Main Span Material	Main Span Design	Appr Span Material	Appr Span Design	Number of Main Spans	Number of Appr Spans	Service On	Service Under	Deck Type	Wearing Surface	Membrane	Fed Deck Protection	Design Load	Oper Rtng Method	Oper Rtng Tons	Invt Rtng Method	Invt Rtng Tons	Design Exception Date	Federal Aid Project	Border State Code	Border State PCT	Border State Structure Identifier
WB75	2	02	2	02	1	2	5	5	1	6	0	8	5	F	57	F	34					
																		/ /				

32 33 35 36 38 41 44 45 46 47 48 49 50 51 52 54 55 57 65 85 88 90 104

	Routine Inspection: Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector	Structural Adequacy	Deck Geometry	Underclrnce Adequacy	Operating Level	Alignment Adequacy	Waterway Adequacy	Deck Overall	Drain Cond	Drains	Scaling Severity	Scaling Percent	Deck Rutting	Exposed Reinf Steel	Superstruct Overall	Curb	Sidewalks	Paint	Number of Utilities	Substruct Overall	Channel Protection	Culvert	Pier Abutment	Scour	Approach Roadway	Retaining Walls	Pier Protection	Traffic Safety: Bridge Rail	Trans	Guard Rail	Term	Revise Rating	Repair Status	Card Check	Photos	Season	Soundings	Clearances	Monitor Structure
WB76	24	06252014	1.0	MPZ	G1331	MMA	6	5	9	5	6	8	6	9	0	N	0	8	8	7	9	7	9	0	6	6	9	N	5	6	9	9	1	0	1	1								
		06/14/2016	1.0	MPZ	G1331		☒	☒	☒																																			

32 34 42 46 49 54 57 58 59 60 61 62 63 64 65 66 67 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95

Sufficiency Rating: 89.56

	Fracture Critical / UBIT Inspection: Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector	Underwater Inspection: Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector	Other Special Inspections: Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
WB77				.							.							.			
			/ /	.						/ /	.						/ /	.			

32 33 35 43 47 50 55 58 59 61 69 73 76 81 84 85 87 95 99 102 107

	Water Type	Flood Plain Intrusion	Flood Control	Scour History	Streambed Material	Streambed Stability	Substruct Obstruction	Waterway Obstruction	Streambed Anabranch	Piers in Water	Service On	Service Under	Work Type	Work Method	Proposed Improvements: Structure Improve Length	Roadway Width	Lanes On	Lanes Under	Total Costs In Thousands	Structure Cost In Thousands	Roadway Cost In Thousands	Estimate Year	Calc	Inspecting Agency: Code	Number	Seismic Status-Superstruct: Main Biennium	Approach Biennium	Seismic Status-Substruct: Main Biennium	Approach Biennium
WB78	F	A	N	N	4	2	N	D	N	2	0	0	00	0					0	0	0	0							

32 33 34 35 36 37 38 39 40 41 42 43 44 46 47 53 57 59 61 67 73 79 83 84 86 90 94 98 102

BRIDGE INSPECTION REPORT

Ver Date: 07/19/2016

Agency: Snohomish County

Status: Released

Printed On: 07/21/20

Program Mgr: Roman G. Peralta

Bridge No. 470

Page: 1/2

Structure Type

Bridge Name BACKMAN CREEK

Route 98960

Location 2.9 SE JCT SR 530

Structure ID 08492800

MilePost 50.95

Intersecting TRIB, SAUK RIVER

Inspector's Signature MPZ IDent# G1331

Co-Inspector's Signature

5	Structural Adqcy	(657)	N	Pier/Abut/Protect	(679)	1979	Year Built	(332)
6	Deck Geometry	(658)	5	Scour	(680)	0	Year Rebuilt	(336)
9	Underclearance	(659)	9	Retaining Walls	(682)	46	Oper Rating	(551)
5	Operating Level	(660)	9	Pier Protection	(683)	20	Inv Rating	(554)
8	Alignment Adqcy	(661)	1	Bridge Rails	(684)	A	Open Close	(293)
6	WaterwayAdqcy	(662)	1	Transition	(685)	9999	Vert Over Deck	(360)
7	Deck Overall	(663)	1	Guardrails	(686)	0000	Vert Under	(374)
9	Drains Condition	(664)	1	Terminals	(687)	N	Vert Und Code	(378)
7	Superstructure	(671)	N	Revise Rating	(688)	2.00	Asphalt Depth	
0	Number Utilities	(675)		Photos Flag	(691)		Speed Limit	
6	Substructure	(676)		Soundings Flag	(693)			
6	Chan/Protection	(677)		Measure Clearance	(694)			
9	Culvert	(678)						

Inspections Performed

IT	NT	HRS	Date	Rep Type
Y	24	1.0	06/14/2016	Routine
				Fract Crit
				Underwater
				Special
				Interim
				Equipment
				Damage
				Safety
				Short Span

Total: 1.0

Suff Rating: 71.92 71.92

BMS Elements

Element	Element Description	Total	Units	State 1	State 2	State 3	State 4
13	Bridge Deck Surface	1500	SF	1500	0	0	0
50	Prestressed Concrete Slab	1500	SF	1500	0	0	0
202	Steel Pile/Column	10	EA	7	2	1	0
234	Concrete Pier Cap / Crossbeam	80	LF	80	0	0	0
331	Concrete Bridge Railing	88	LF	88	0	0	0
361	Scour	2	EA	1	1	0	0
407	Steel Angle Header	74	LF	74	0	0	0
800	Asphaltic Concrete (AC) Overlay	1500	SF	1500	0	0	0

Notes

0	Oriented north to south.
11	Load rating indicates rating factors for all AASHTO trucks are well above "1" (41-64-80 tons), and bridge is good for OL-1 overloads but limited on OL-2 overloads.
13	Top of slab, covered by ACP overlay.

BRIDGE INSPECTION REPORT

Ver Date: 07/19/2016 Agency: Snohomish County

Status: Released Printed On: 07/21/20 Program Mgr: Roman G. Peralta

Bridge No. 470 Page: 2/2 **Structure Type**

Bridge Name BACKMAN CREEK **Route** 98960 **Location** 2.9 SE JCT SR 530

Structure ID 08492800 **MilePost** 50.95 **Intersecting** TRIB, SAUK RIVER

50	(9) lines precast pcc void slabs = good, except slab "H" has a spall 6" x 8" x 1" deep on the upstream side near P2 (no exposed rebar). Leakage at joints with minor efflorescence. Longitudinal cracking @ slab edges - NB lane. Form hole patches leaching rust.
202	5 - HP 10x42 piles @ ea abutment. Several P2 piles are exposed below pier cap and are corroded. 2010: P2C has significant scaling. P2D has surface corrosion. P2B has shows some surface corrosion. All 3 painted 2012. 2016 - pile 2C w/corrosion, pitting on backside flange.
234	2.2'x3'(wide) cip concrete. 3" void full depth below A2 crossbeam 2014. Minor leakage through abutments below slabs onto crossbeams. 2016 - void at A2 now 6" high x 3' penetration x most of roadway width.
331	PCC Jersey barrier both sides = good, except for minor scrape 1/2" deep near SE corner of bridge. Pressure washed and sealed in 1999.
361	Concrete reinforced bank @ P1. P2 scoured out 10/03 - scoured bank replaced with light loose rip rap. H piles @ P2 are exposed @ top. Bank appears stable 2014 - small void of 3" height present to full depth of abutment. 2016 - minor sloughing, riprap displacement at A2.
407	No defects noted.
680	Bridge plugged up at upstream side with drift and gravel during Oct. 2003 flooding, not present 2010. Some fill was scoured from beneath A2, exposing the top 6" of several steel H piles. Repairs were made by excavating roadway behind the abutment, filling with 4" - 8" quarry spalls, and patching ACP. Drift not present 2012. No change w/A2 scour. Scour summary of 1996 suggested scour code "8" based upon pile tips 29' below thalweg. With tops of piles now visible at A2, scour code changed to "5" (2014).
681	Approach roadway patched full width x 8 ft. back from A2 after flood damage repairs in 2003. Rock riprap and quarry spalls still in place. Minor settlement at south abutment, 2016.
686	Weathering steel approach rail all (4) corners = good. All posts solid but well weathered with checks typical = Monitor.
687	4 delineators and bridge sign O.K.
800	Reflective cracks typical at longintudinal joints in places, some are sealed. Surface irregularities in places. Deck and approaches chip sealed - 2004.

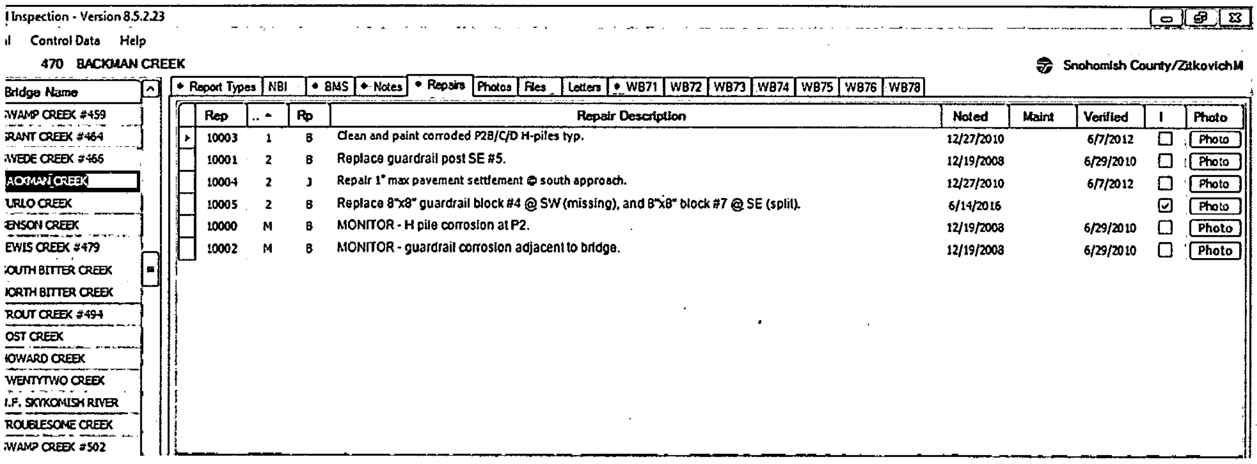
Repairs

Repair No	Pr	R	Repair Description	Noted	Maint	Verified
10005	2	B		06/14/16		

Inspections Performed and Resources Required

Report Type	Date	IT	Frq	Hrs	Insp	CertNo	Coinsp	Note
Routine	06/14/16		24	1.0	MPZ	G1331		From Laptop98 database 'H:\LP_Upd\1 to be processed\Snohomish Updates103106.mdb'.

Resources	Use	Hour	Min	Req	Max	Notes



470 BACKMAN CREEK

Bridge Name
WAMP CREEK #459
RANT CREEK #464
WEDE CREEK #466
ACKMAN CREEK
URLO CREEK
ENSON CREEK
EWIS CREEK #479
OUTH BITTER CREEK
ORTH BITTER CREEK
ROUT CREEK #494
OST CREEK
OWARD CREEK
WENTYTWO CREEK
I.F. SKYKOMISH RIVER
ROUBLESONE CREEK
WAMP CREEK #502

	Rep	.. ▲	Rp	Repair Description	Noted	Maint	Verified	I	Photo
▸	10003	1	B	Clean and paint corroded P2B/C/D H-piles typ.	12/27/2010		6/7/2012	☐	Photo
	10001	2	B	Replace guardrail post SE #5.	12/19/2008		6/29/2010	☐	Photo
	10004	2	J	Repair 1" max pavement settlement @ south approach.	12/27/2010		6/7/2012	☐	Photo
	10005	2	B	Replace 8"x8" guardrail block #4 @ SW (missing), and 8"x8" block #7 @ SE (split).	6/14/2016			☑	Photo
	10000	M	B	MONITOR - H pile corrosion at P2.	12/19/2008		6/29/2010	☐	Photo
	10002	M	B	MONITOR - guardrail corrosion adjacent to bridge.	12/19/2008		6/29/2010	☐	Photo

Snohomish County
Bridge Load Rating Summary

JERI C. BERNSTEIN 22128

9/5/2001

EXPIRES 5/20/2003

Structure ID No: 8492800

Bridge Name: Backman Creek
Bridge Number: 470

Load Rating By: MB Date: Aug-01

Number of Spans 1
Bridge Type: ~~Tee Beam~~ VOID SLAB
Year Built: 1979
Design Load: HS 20
Input Files: 470void1.bdf, 470void2.bdf
Comments:

National Bridge Inventory (NBI) Load Factor Rating Method			
AASHTO HS-20 Truck	RF	Live Load Factor	Controlling Point
Inventory (Service or Ultimate)	0.55	2.17	Exterior member, Moment @ 20' from support
Operating (Ultimate only)	1.28	1.3	Exterior member, Moment @ 20' from support
Fatigue		NA	

National Bridge Inventory (NBI) Load Factor Rating Method				
	Actual Capacity	Required Capacity	(Tons)	NBI and SWIBS coding
Inventory	20	36		**2 20**
Operating	46	36		**2 46**

Safe Load Capacity Load Factor Rating Method Operating Only				
Truck		RF	Live Load Factor	Controlling Point
AASHTO Type 3	Ultimate	1.65	1.3	Exterior member, Moment @ 20' from support
AASHTO Type 3S2	Ultimate	1.77	1.3	Exterior member, Moment @ 20' from support
AASHTO Type 3-3	Ultimate	1.99	1.3	Exterior member, Moment @ 20' from support
OL 1	Ultimate	1.03	1.3	Exterior member, Moment @ 20' from support
OL 2	Ultimate	0.98	1.3	Exterior member, Moment @ 21' from support

Safe Load Capacity Level (Load Factor Rating Method) (Posting Requirement)			
Truck	Actual Capacity Tons	Required Capacity Tons	**Posting Required**
AASHTO Type 3	41	25	**No**
AASHTO Type 3S2	64	36	**No**
AASHTO Type 3-3	80	40	**No**
OL 1	49	48	**N/A**
OL 2	101	103.5	**N/A**

Notes: Live Load Factors in this table apply to Ultimate Load Rating Analysis only. Inventory service load rating analysis applies to prestressed or post tensioned members only. Fatigue is evaluated for concrete bridges in locations where no prestressing or post tensioning is present.

09/05/2001
br470.xls

Structure Identifier	Bridge Number	Owner Code	County Number	City Number	Update
08492800	470	02	31	00000	0
1	9	19	21	23	27

Washington State Department of Transportation

WSBIS Inventory Report

7/21/2016

WB71	Bridge Name	Location	Section	Township	Range	Latitude	Longtitude
	BACKMAN CREEK	2.9 SE JCT SR 530	36	32	09E	48°13'18.00"	121°34'48.00"
						° '	121°34'45.00"
	32	56	81	83	85	88	96 104

WB72	Feature Intersected	Facilities Carried	Region	FIPS Place Code	Legis District (1)	Legis District (2)	Toll	Custodian	Structure Parallel Structure	Temporary Structure	Critical Facility	Median	Hist Sig	Open Closed	Program Year
	TRIB, SAUK RIVER	CLEAR CR RD	NW	16690	39	0	3	02	N		☒	0	4	A	
											☒				
	32	56	74	76	81	83	85	86	88	89	90	91	92	93	94

WB73	Year Built	Year ReBuilt	Bridge Length	NBIS Length	Maximum Span Length	Lanes On	Lanes Under	Curb to Curb Deck Width	Out to Out Deck Width	Sidewalk Curb Left	Sidewalk Curb Right	Min Vert Clearance Over Deck	Min Vert Clearance Under Bridge	Code	Min Lat UnderClr Right	Code	Min Lat UnderClr Left	Navigation Control	Navigation Vertical Clearance	Navigation Horizontal Clrnce	Vert Lift Min Clrnce	Appr Roadway Width	Skew Angle	Flare
	1979	0	44	. '	37	2	0	34.0'	37.0'	0.0'	0.0'	99'99"	0	N	0.0'	N	0.0'	0	0'	0'	'	34'	0°	N
				. '	'			. '	. '	. '	. '	' "	' "		. '		. '		'	'	'	'	°	
	32	36	40	46	48	52	54	56	60	64	67	70	74	78	79	82	83	86	87	90	94	97	100	102

WB74	On Under	High way Class	Service Level	Route Number	Mile Post	ADT on Inventory Route	Truck ADT PCT	ADT Year	Future ADT	Future ADT Year	Linear Referencing System Route	LRS Sub Route	Fed Aid Route	Nat Hwy System	Base Hwy Network	Strahnet	Fed Lands Highway	Fed Funct Class	National Truck Net	Lane Use Direction	Horizontal Clearance Route Dir	Horizontal Clearance Reverse Dir	Max Vertical Clearance Route Dir	Detour Length
	1	4	1	98960	50.95	573	5	2013	1000	2036			X310	0	0	0	2	07	N	2	34'00"	' "	' "	94
					.																' "	' "	' "	
	32	33	34	35	40	45	51	53	57	63	67	77	79	83	84	85	86	87	89	90	91	95	99	103

WB75	Main Span Material	Main Span Design	Appr Span Material	Appr Span Design	Number of Main Spans	Number of Appr Spans	Service On	Service Under	Deck Type	Wearing Surface	Membrance	Deck Protection	Design Load	Oper Rtng Method	Oper Rtng Tons	Invt Rtng Method	Invt Rtng Tons	Design Exception Date	Federal Aid Project	Border State Code	Border State PCT	Border	Border State Structure Identifier
	5	01	0	00	1	0	1	5	2	6	0	0	5	F	46	F	20						
																		/ /					
	32	33	35	36	38	41	44	45	46	47	48	49	50	51	52	54	55	57	65	85	88		90 104

Routine Inspection

WB76	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector	Structural Adequacy	Deck Geometry	Underclrnce Adequacy	Operating Level	Alignment Adequacy	Waterway Adequacy	Deck Overall	Drain Cond	Drains	Scaling Severity	Scaling Percent	Deck Rutting	Exposed Reinf Steel	Superstruct Overall	Curb	Sidewalks	Paint	Number of Utilities	Substruct Overall	Channel Protection	Culvert	Pier Abutment	Scour	Approach Roadway	Retaining Walls	Pier Protection	Traffic Safety Bridge Rail	Traffic Safety Trans	Traffic Safety Guard Rail	Traffic Safety Term	Revise Rating	Repair Status	Card Check	Photos	Season	Soundings	Clearances	Monitor Structure
	24	06242014	1.0	MPZ	G1331	MMA	5	6	9	5	8	6	7	9	0	N	0	0	0	7	9	9	9	0	6	6	9	N	5	8	9	9	1	1	1	1	N	Y						
		06/14/2016	1.0	MPZ	G1331		☒	☒	☒																																			
	32	34	42	46	49	54	57	58	59	60	61	62	63	64	65	66	67	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95

Sufficiency Rating: 71.92

WB77	Fracture Critical / UBIT Inspection							Underwater Inspection							Other Special Inspections						
	Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector	Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector	Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
				.							.							.			
			/ /	.						/ /	.						/ /	.			
	32	33	35	43	47	50	55	58	59	61	69	73	76	81	84	85	87	95	99	102	107

WB78	Water Type	Flood Plain Intrusion	Flood Control	Scour History	Streambed Material	Substruct Stability	Waterway Obstruction	Streambed Stability	Streambed Anabranch	Piers in Water	Proposed Improvements Service On	Service Under	Work Type	Work Method	Structure Improve Length	Roadway Width	Lanes On	Lanes Under	Total Costs In Thousands	Structure Cost In Thousands	Roadway Cost In Thousands	Estimate Year	Calc	Inspecting Agency Code	Inspecting Agency Number	Seismic Status-Superstruct Main Biennium	Seismic Status-Superstruct Approach Biennium	Seismic Status-Substruct Main Biennium	Seismic Status-Substruct Approach Biennium
	F	A	N	N	5	3	N	D	N	2	0	0	00	0	0	0	0	0	0	0	0	0	N						
	32	33	34	35	36	37	38	39	40	41	42	43	44	46	47	53	57	59	61	67	73	79	83	84	86	90	94	98	102

Appendix C:

Culvert Inventory

Milepost	Diameter (in)	Arch Diameter (in)	Dimensions (in)	Type	Condition	Flow	Comments
13.195			84x48	Concrete box	Fair	Yes	
14.725	66			Concrete	Fair	Yes	
17.464	48			Plastic	Good	Yes	
18.622			120x98	Wooden box structure	Good	Yes	
19.175	36			CMP	Fair/good	No	
21.241			72x60	Wooden box structure	Good	Yes	
21.534	72			CMP	Fair	Yes	
21.779	30			CMP	Fair	Yes	
22.498	42			CMP	Poor	Yes	
22.73	36			CMP	Fair	Yes	
23.92	30			CMP	Fair	No	Double
24.283			72x72	Concrete box	Good	Yes	
24.965			72x72	Concrete box	Good	Yes	
25.109		128x83		CMPA	Good	Yes	
25.741		142x91		CMPA	Good	Yes	
27.229		42x29		CMPA	Fair	Yes	
27.539		35x24		CMPA	Fair	No	
27.787	54			CMP	Fair	Yes	
28.802	36			CMP	Poor	No	
29.04	36			CMP	Fair	No	
29.273		71x47		CMPA	Fair	Yes	
29.602	30			Plastic	Good	Yes	
30.325	30			CMP	Fair	Yes	
30.38	30			CMP	Poor	Yes	
32.416	36			CMP	Fair	Yes	
32.799		35x24		CMPA	Poor	Yes	
32.944		77x52		CMPA	Fair	No	Standing water
34.088		49x33		CMPA	Fair	Yes	
34.816		60x46		CMPA	Good	Yes	New
35.147	42			CMP	Fair	Yes	
35.357		66x51		CMPA	Good	Yes	New with diversion project
35.402		10' wide		SSPPA	Fair, buried	Yes	Old culvert prior to diversion
35.854	36			Plastic	Good	No	New
36.009		57x38		CMPA	Good	No	
36.401	48			CMP	Good	Yes	
36.607		81x59		CMPA	Good	Yes	New
38.086	96			CMP	Good	Yes	
38.296	96			CMP	Good	Yes	
38.795	36			CMP	Failed	Yes	

Milepost	Diameter (in)	Arch Diameter (in)	Dimensions (in)	Type	Condition	Flow	Comments
39.08		10’ wide		SSPPA	Good	Yes	
39.617	36			Plastic	Good	Yes	
39.658	60			CMP	Good	Yes	
39.782	36			CMP	Fair	Yes	
39.823	60			CMP	Good	Yes	New as part of diversion repair area
40.017	36			CMP	Fair	No	
40.382	60			CMP	Good	Yes	
40.464	36			CMP	Good	Yes	
40.492	36			Plastic	Good	Yes	Retaining wall on outfall
40.562	48			Plastic	Good	Yes	Retaining wall on outfall
40.777	60			CMP	Fair	Yes	
40.907	60			CMP	Fair	Yes	
41.073	36			CMP	Fair	Yes	
42.055	48			CMP	Fair	Yes	
42.126	36			CMP	Fair	Yes	
42.209	48			CMP	Failed	Yes	36 CMP 10' above failed, poor condition
42.472		49x33		CMPA	Poor	Yes	
42.515	36			CMP	Fair	No	
46.227	30			CMP	Poor	No	
46.417	13 feet			SSPP	Failed	Yes	Washouts at outlet
46.928	72			CMP	Poor	Yes	
47.407		Double 10’-3” x 6’-9”		SSPPA	Good	Yes	

Appendix D:

Horizontal and Vertical Alignments

Horizonal Alignment

Curve PS (MP)	Radius of Curve (ft)	Length of Curve (ft)	SSD (ft)	Design Speed Met (mph)	Meets Standards?
Pavement*					
10.75	1432.4	940	17.18	60	Yes
11.46	2864.8	1487.5	10.88	80	Yes
12.12	1432.4	826	19.54	60	Yes
12.16	572.96	256	28.04	40	**No**
12.29	440.74	418.72	36.25	35	**No**
12.30	2864.8	1370.8	11.80	80	Yes
12.44	746.2	902.08	21.60	45	Yes
12.72	2864.8	627.5	25.64	80	Yes
12.88	520.87	636.06	30.79	40	**No**
13.28	954.93	619.17	16.91	50	Yes
13.28	1432.4	756.3	21.32	60	Yes
13.84	1432.4	255	11.29	60	Yes
13.98	2864.79	95.83	5.65	80	Yes
14.10	636.62	244.63	25.28	45	Yes
14.23	1637.02	502.82	9.89	65	Yes
14.56	954.93	332.78	16.91	50	Yes
14.76	572.96	275.17	28.04	40	**No**
14.94	716.79	836.25	22.48	45	Yes
15.09	369.65	1142.9	42.97	35	**No**
15.37	168.52	234.6	87.33	25	**No**
15.53	674.06	658.82	23.89	45	Yes
15.75	954.93	241.67	16.91	50	Yes
16.47	1527.89	784.44	10.59	65	Yes
16.71	1432.4	1349.58	11.29	60	Yes
17.14	9554.93	696.94	1.70	80	Yes
17.38	954.93	380.56	16.91	50	Yes
17.52	572.96	319.33	28.04	40	**No**
17.67	954.93	265.28	16.91	50	Yes
18.04	1909.86	182.5	8.48	70	Yes
18.28	5729.58	628.33	2.83	80	Yes
18.74	881.47	442.7	18.31	50	Yes
18.87	1432.4	602.92	11.29	60	Yes
18.87	1145.91	457	14.11	55	Yes
19.09	2083.48	1000.3	7.77	70	Yes
19.30	954.93	82.22	16.91	50	Yes
19.54	2864.79	148.33	5.65	80	Yes

Curve PS (MP)	Radius of Curve (ft)	Length of Curve (ft)	SSD (ft)	Design Speed Met (mph)	Meets Standards?
20.42	954.93	474.45	16.91	50	Yes
20.60	818.51	374.88	19.71	50	Yes
21.11	1432.4	221.04	11.29	60	Yes
21.32	2864.79	725	5.65	80	Yes
21.58	1909.86	33.33	8.48	70	Yes
21.74	1762.95	927.18	17.42	65	Yes
22.07	1637.02	16.19	14.21	65	Yes
26.06	2864.79	730.42	22.07	80	Yes
26.63	954.93	88.89	127.89	50	Yes
26.73	520.87	86.14	128.85	40	**No**
26.88	572.96	32	6.68	40	**No**
26.97	716.2	44.38	71.47	45	Yes
27.05	716.2	161.67	90.27	45	Yes
27.19	716.2	421.46	37.86	45	Yes
27.35	716.2	44.18	70.50	45	Yes
27.44	818.51	172.62	85.65	50	Yes
27.55	818.51	203.33	74.60	50	Yes
27.65	881.47	195.13	77.30	50	Yes
27.75	954.93	146.11	97.54	50	Yes
27.87	2291.83	133.67	103.95	75	Yes
27.94	1909.86	182.22	81.91	70	Yes
28.04	1432.39	610	26.37	60	Yes
28.23	2291.83	95.33	125.08	75	Yes
28.33	954.93	190.28	78.98	50	Yes
28.45	1145.92	158.67	91.61	55	Yes
28.61	954.93	196.39	76.87	50	Yes
28.95	954.93	1060.42	15.24	50	Yes
29.24	636.62	438.7	36.41	45	Yes
29.42	636.62	695.74	23.15	45	Yes
29.69	1637.02	558.57	28.75	65	Yes
29.84	818.51	158.33	91.76	50	Yes
29.95	954.93	294.44	53.33	50	Yes
30.30	954.93	371.67	42.74	50	Yes
30.45	1041.74	410.91	38.80	55	Yes
Gravel**					
30.77	1000	603.454	26.65	55	Yes
30.91	200	270.421	57.73	25	**No**
30.99	200	107.966	118.36	25	**No**
31.03	200	167.079	87.94	25	**No**

Curve PS (MP)	Radius of Curve (ft)	Length of Curve (ft)	SSD (ft)	Design Speed Met (mph)	Meets Standards?
31.08	400	300.944	52.24	35	**No**
31.12	200	84.465	129.35	25	**No**
31.14	600	68.747	128.29	45	Yes
31.38	600	312.484	50.42	45	Yes
31.52	200	161.254	90.45	25	**No**
31.60	200	290.485	54.01	25	**No**
31.65	600	122.991	109.82	45	Yes
31.72	600	131.661	105.03	45	Yes
31.77	200	151.51	94.92	25	**No**
31.82	150	119.664	111.70	25	**No**
31.89	200	84.073	129.46	25	**No**
31.92	200	101.316	122.02	25	**No**
31.96	200	85.825	128.95	25	**No**
32.05	400	281.511	55.61	35	**No**
32.11	400	142.216	99.49	35	**No**
32.15	200	186.981	80.15	25	**No**
32.25	600	206.031	73.75	45	Yes
32.30	1,000	80.451	130.19	55	Yes
32.46	600	171.355	86.16	45	Yes
32.52	200	101.561	121.89	25	**No**
32.58	300	234.234	65.82	30	**No**
32.64	200	180.334	82.62	25	**No**
32.70	600	129.061	106.45	45	Yes
32.73	600	169.315	87.00	45	Yes
32.82	150	110.084	117.16	25	**No**
32.86	200	198.826	76.06	25	**No**
32.93	300	154.684	93.43	30	**No**
32.96	300	98.656	123.42	30	**No**
33.05	80	116.39	113.57	20	**No**
33.10	150	135.384	103.04	25	**No**
33.15	150	129.857	106.01	25	**No**
33.22	115	279.29	56.02	20	**No**
33.27	200	176.781	83.99	25	**No**
33.33	300	143.108	99.04	30	**No**
33.40	250	374.801	42.40	30	**No**
33.46	125	152.438	94.48	20	**No**
33.51	200	123.573	109.50	25	**No**
33.59	400	289.803	54.13	35	**No**
33.64	150	212.408	71.81	25	**No**

Curve PS (MP)	Radius of Curve (ft)	Length of Curve (ft)	SSD (ft)	Design Speed Met (mph)	Meets Standards?
33.69	400	170.187	86.64	35	**No**
33.73	200	101.917	121.70	25	**No**
33.75	200	80.4	130.20	25	**No**
33.79	200	91.711	126.74	25	**No**
33.81	150	122.012	110.37	25	**No**
33.85	600	129.796	106.05	45	Yes
33.87	200	52.635	103.25	25	**No**
33.91	125	120.76	111.08	20	**No**
33.93	125	70.785	129.26	20	**No**
33.96	125	81.973	129.94	20	**No**
34.04	600	166.802	88.05	45	Yes
34.11	600	176.009	84.29	45	Yes
34.22	200	266.305	58.55	25	**No**
34.28	150	95.485	125.01	25	**No**
34.31	200	41.931	59.01	25	**No**
34.37	200	59.333	118.32	25	**No**
34.38	200	88.984	127.85	25	**No**
34.39	200	21.823	30.20	25	**No**
34.44	400	94.292	125.57	35	**No**
34.58	400	192.054	78.35	35	**No**
34.66	400	147.521	96.85	35	**No**
34.73	600	100.653	122.38	45	Yes
34.78	600	81.334	130.06	45	Yes
34.81	300	116.055	113.76	30	**No**
34.90	5,000	337.098	46.93	80	Yes
34.97	5,000	91.484	126.84	80	Yes
35.08	600	26.944	2.10	45	Yes
35.11	600	96.455	124.53	45	Yes
35.16	600	364.851	43.51	45	Yes
35.23	1,000	24.347	13.52	55	Yes
35.39	250	234.364	65.79	30	**No**
35.45	250	228.365	67.34	30	**No**
35.51	600	166.598	88.14	45	Yes
35.73	600	11.924	21.68	45	Yes
35.80	600	229.476	67.05	45	Yes
35.88	600	72.631	129.86	45	Yes
35.91	600	59.015	117.78	45	Yes
35.95	600	34.981	20.29	45	Yes
36.00	600	46.992	83.27	45	Yes

Curve PS (MP)	Radius of Curve (ft)	Length of Curve (ft)	SSD (ft)	Design Speed Met (mph)	Meets Standards?
36.06	600	66.156	126.54	45	Yes
36.13	300	143.067	99.06	30	**No**
36.37	250	338.172	46.78	30	**No**
36.52	325	313.109	50.33	35	**No**
36.60	600	298.838	52.59	45	Yes
36.65	600	129.524	106.20	45	Yes
36.73	600	117.8	112.76	45	Yes
36.84	600	110.143	117.13	45	Yes
36.97	600	81.924	129.95	45	Yes
37.12	300	165.172	88.75	30	**No**
37.14	300	109.568	117.45	30	**No**
37.26	600	80.136	130.24	45	Yes
37.36	500	446.281	35.81	40	**No**
37.44	500	149.681	95.80	40	**No**
37.47	150	118.49	112.37	25	**No**
37.53	150	75.624	130.37	25	**No**
37.61	300	233.001	66.14	30	**No**
37.71	300	116.422	113.55	30	**No**
37.80	300	106.576	119.14	30	**No**
37.97	600	93.199	126.08	45	Yes
38.01	200	112.252	115.93	25	**No**
38.04	200	41.843	58.54	25	**No**
38.13	1,000	72.784	129.90	55	Yes
38.21	400	184.499	81.06	35	**No**
38.27	150	67.843	127.75	25	**No**
38.29	150	150.354	95.48	25	**No**
38.31	150	76.082	130.40	25	**No**
38.45	600	147.278	96.97	45	Yes
38.54	1,000	164.757	88.93	55	Yes
38.70	1,000	397.496	40.06	55	Yes
38.88	1,000	183.956	81.26	55	Yes
39.03	1,000	468.833	34.13	55	Yes
39.15	1,000	352.821	44.93	55	Yes
39.33	600	270.805	57.65	45	Yes
39.40	600	119.442	111.83	45	Yes
39.44	400	214.695	71.14	35	**No**
39.52	300	61.075	121.00	30	**No**
39.56	300	110.066	117.17	30	**No**
39.60	300	124.431	109.01	30	**No**

Curve PS (MP)	Radius of Curve (ft)	Length of Curve (ft)	SSD (ft)	Design Speed Met (mph)	Meets Standards?
39.70	300	164.749	88.93	30	**No**
39.75	600	54.167	107.44	45	Yes
39.80	200	126.289	107.98	25	**No**
39.84	200	108.848	117.86	25	**No**
39.92	2,000	271.863	57.44	70	Yes
40.02	2,000	162.753	89.80	70	Yes
40.10	1,000	439.355	36.36	55	Yes
40.18	600	184.878	80.92	45	Yes
40.32	300	328.959	48.03	30	**No**
40.39	300	78.199	130.41	30	**No**
40.47	1,500	485.542	32.98	65	Yes
40.56	300	97.511	124.00	30	**No**
40.60	300	125.335	108.51	30	**No**
40.68	200	172.184	85.82	25	**No**
40.70	200	59.932	119.29	25	**No**
40.73	200	91.772	126.71	25	**No**
40.76	200	76.212	130.41	25	**No**
40.78	150	102.688	121.28	25	**No**
40.80	150	92.65	126.33	25	**No**
40.82	300	24.923	10.20	30	**No**
40.83	300	94.703	125.38	30	**No**
40.89	600	113.846	115.02	45	Yes
40.97	600	107.212	118.78	45	Yes
41.00	600	104.237	120.44	45	Yes
41.03	300	81.626	130.00	30	**No**
41.10	200	54.578	108.49	25	**No**
41.12	200	110.245	117.07	25	**No**
41.15	300	136.993	102.19	30	**No**
41.21	600	164.48	89.05	45	Yes
41.30	600	123.653	109.45	45	Yes
41.34	300	122.274	110.23	30	**No**
41.47	2,000	105.505	119.73	70	Yes
41.53	2,000	124.391	109.04	70	Yes
41.58	600	158.799	91.55	45	Yes
41.74	2,000	121.374	110.73	70	Yes
41.85	2,000	135.105	103.19	70	Yes
41.94	1,000	108.266	118.19	55	Yes
42.00	400	201.209	75.28	35	**No**
42.14	300	342.357	46.24	30	**No**

Curve PS (MP)	Radius of Curve (ft)	Length of Curve (ft)	SSD (ft)	Design Speed Met (mph)	Meets Standards?
42.20	1,000	80.297	130.22	55	Yes
42.28	1,000	63.674	124.22	55	Yes
42.35	300	271.1	57.59	30	**No**
42.41	600	176.206	84.22	45	Yes
42.55	300	180.542	82.54	30	**No**
42.60	300	89.873	127.50	30	**No**
42.64	300	259.196	60.03	30	**No**
42.79	400	172.192	85.82	35	**No**
42.86	1,000	110.167	117.11	55	Yes
42.91	1,000	51.909	101.08	55	Yes
43.09	5,000	127.899	107.09	80	Yes
43.28	800	219.458	69.77	50	Yes
43.37	5,000	101.405	121.97	80	Yes
43.54	800	912.843	17.69	50	Yes
43.82	5,000	0.391	0.44	80	Yes
44.09	800	616.662	26.08	50	Yes
44.36	425	557.549	28.80	35	**No**
44.49	300	71.216	129.42	30	**No**
44.52	200	82.57	129.82	25	**No**
44.54	200	62.672	123.08	25	**No**
44.56	200	77.569	130.43	25	**No**
44.61	300	63.167	123.66	30	**No**
44.63	200	101.724	121.80	25	**No**
44.65	572.96	416	38.34	40	**No**
Pavement*					
44.67	600	77.575	130.43	45	Yes
44.71	300	89.975	127.46	30	**No**
44.75	600	25.513	7.23	45	Yes
44.78	600	196.153	76.95	45	Yes
44.84	600	50.222	95.61	45	Yes
44.87	954.93	387.08	41.10	50	Yes
45.00	1637.02	364.29	43.57	65	Yes
45.17	1432.39	583.13	27.56	60	Yes
45.32	1432.39	214.17	71.29	60	Yes
45.45	1273.24	212.58	71.76	60	Yes
45.69	1273.24	17.86	32.04	60	Yes
45.85	3815.72	1060.35	15.24	80	Yes
46.18	2864.79	165.42	88.64	80	Yes
46.42	1145.32	357.5	44.37	55	Yes

Curve PS (MP)	Radius of Curve (ft)	Length of Curve (ft)	SSD (ft)	Design Speed Met (mph)	Meets Standards?
46.73	2854.79	385	41.32	80	Yes
47.03	716.2	220.34	69.52	45	Yes
47.17	1309.34	101.57	121.89	60	Yes
49.90	1145.92	546.33	29.39	55	Yes
50.05	1041.74	244.24	63.38	55	Yes
50.13	954.93	232.22	66.34	50	Yes
50.26	572.96	342.5	46.22	40	**No**
50.36	458.37	205.4	73.95	40	**No**
50.47	5729.578	200	75.68	80	Yes
50.55	763.94	468.22	34.18	50	Yes
50.68	572.96	425.08	37.54	40	**No**
50.79	1145.92	369	43.04	55	Yes

** Does not include section between MP 22.5 and MP 26 or section between MP 47.5 and MP 50.*

*** Estimated based on existing survey contour data.*

Vertical Alignment

VPI (MP)	Curve Type	Curve Length (ft)	Grade Back	Grade Ahead	K-value	Design Speed Met (mph)	Meets Standards
Pavement*							
10.61	crest	1300	2.0%	-3.0%	262.6	70	Yes
10.78	sag	400	-3.0%	1.8%	83.4	45	Yes
11.02	crest	1200	1.8%	-2.0%	316.1	75	Yes
11.22	sag	400	-2.0%	2.2%	94.2	45	Yes
11.65	crest	400	2.2%	0.5%	233.4	65	Yes
11.87	sag	1200	0.5%	6.0%	219.5	75	Yes
12.03	sag	1000	-1.5%	2.8%	232.6	80	Yes
12.26	crest	600	2.8%	0.2%	231.1	65	Yes
12.51	sag	400	0.2%	1.8%	263.9	80	Yes
12.85	crest	400	1.8%	0.4%	296.7	70	Yes
13.12	crest	400	0.4%	1.2%	493.8	80	Yes
13.28	crest	300	1.2%	0.9%	1022.1	80	Yes
13.53	crest	300	0.9%	1.2%	1183.4	80	Yes
13.78	crest	400	1.2%	1.8%	678.0	80	Yes
14.01	crest	400	1.8%	0.8%	404.0	80	Yes
14.44	crest	400	0.8%	-0.4%	340.1	75	Yes
14.63	sag	1200	-0.4%	2.1%	487.4	80	Yes
14.93	crest	400	2.1%	1.7%	1227.0	80	Yes
15.31	crest	600	1.7%	-0.9%	227.4	65	Yes
15.48	sag	600	-0.9%	0.7%	377.8	80	Yes
15.71	crest	200	0.7%	0.4%	772.2	80	Yes
15.98	sag	200	0.4%	1.0%	371.1	80	Yes
16.34	sag	400	1.0%	1.4%	985.2	80	Yes
16.49	crest	400	1.4%	0.2%	340.4	75	Yes
16.96	sag	300	0.2%	0.3%	4285.7	80	Yes
17.19	sag	400	0.3%	0.4%	3539.8	80	Yes
17.38	sag	400	0.4%	1.1%	568.7	80	Yes
17.66	sag	400	1.1%	2.5%	283.0	80	Yes
18.10	crest	400	0.3%	-0.2%	800.0	80	Yes
18.27	crest	400	-0.2%	-0.5%	1333.3	80	Yes
18.74	crest	400	2.0%	0.2%	219.8	65	Yes
18.85	crest	400	0.2%	-0.3%	857.4	80	Yes
19.06	sag	400	-0.3%	0.6%	461.6	80	Yes
19.09	sag	400	1.1%	2.1%	411.1	80	Yes
19.23	crest	600	2.1%	0.7%	440.2	80	Yes
19.38	sag	400	0.4%	1.2%	477.2	80	Yes
19.43	sag	200	0.7%	1.1%	540.5	80	Yes

VPI (MP)	Curve Type	Curve Length (ft)	Grade Back	Grade Ahead	K-value	Design Speed Met (mph)	Meets Standards
19.63	sag	700	1.1%	7.0%	118.6	55	Yes
19.86	crest	1320	7.0%	-7.0%	94.3	50	Yes
20.06	sag	700	-7.0%	1.8%	79.2	45	Yes
20.59	crest	400	1.8%	-1.1%	136.1	55	Yes
20.74	sag	800	-1.1%	1.1%	372.1	80	Yes
21.29	sag	300	1.2%	2.2%	291.3	80	Yes
21.46	crest	300	2.2%	0.4%	163.9	60	Yes
21.63	sag	200	0.4%	0.8%	482.7	80	Yes
21.90	sag	200	1.0%	1.7%	260.1	80	Yes
22.09	sag	400	1.7%	2.5%	528.7	80	Yes
22.26	crest	600	2.5%	0.3%	268.4	70	Yes
26.33	Sag	400	0.3%	2.5%	184.7	70	Yes
26.57	Crest	400	2.5%	2.0%	846.2	80	Yes
26.76	Sag	400	2.0%	2.8%	545.2	80	Yes
26.98	Crest	400	2.8%	2.3%	835.6	80	Yes
27.13	Sag	400	2.3%	2.5%	2163.3	80	Yes
28.03	Sag	400	2.4%	2.9%	814.3	80	Yes
28.23	Crest	400	2.9%	2.3%	616.3	80	Yes
28.35	Sag	400	2.3%	3.2%	440.3	80	Yes
28.66	Crest	1200	3.2%	-4.1%	164.4	60	Yes
28.86	Sag	900	-4.1%	6.3%	86.5	45	Yes
29.19	Crest	400	6.3%	3.5%	144.9	55	Yes
29.35	Crest	400	3.5%	2.7%	470.6	80	Yes
29.42	Sag	200	2.7%	3.7%	199.6	70	Yes
29.47	Crest	200	3.7%	2.3%	144.2	55	Yes
29.69	Crest	200	2.7%	2.4%	714.3	80	Yes
29.82	Crest	400	2.4%	0.7%	233.6	65	Yes
29.93	Sag	400	0.7%	2.6%	208.2	75	Yes
30.04	Crest	400	2.6%	1.0%	243.6	65	Yes
30.38	Sag	800	1.0%	7.0%	132.8	55	Yes
Gravel**							
30.70	sag	30	4.7%	15.2%	2.8	<15	**No**
30.71	crest	30	15.2%	5.3%	3.0	15	**No**
30.80	crest	200	5.3%	2.2%	64.3	45	Yes
30.86	crest	150	2.2%	0.0%	69.3	45	Yes
30.91	crest	100	0.0%	-12.0%	8.3	20	**No**
31.01	sag	200	-12.0%	-0.3%	17.1	20	**No**
31.08	crest	100	-0.3%	-4.9%	21.6	30	**No**
31.12	crest	100	-4.9%	-15.4%	9.5	20	**No**

VPI (MP)	Curve Type	Curve Length (ft)	Grade Back	Grade Ahead	K-value	Design Speed Met (mph)	Meets Standards
31.14	sag	30	-15.4%	-2.2%	2.3	<15	**No**
31.18	crest	30	-2.2%	-9.3%	4.2	15	**No**
31.19	sag	30	-9.3%	-2.1%	4.2	<15	**No**
31.23	sag	30	-2.1%	4.6%	4.5	<15	**No**
31.27	crest	250	4.6%	-12.3%	14.9	25	**No**
31.30	sag	60	-12.3%	-5.6%	9.0	<15	**No**
31.32	sag	50	-5.6%	1.2%	7.4	<15	**No**
31.37	crest	50	1.2%	-12.6%	3.6	15	**No**
31.38	sag	50	-12.6%	-4.3%	6.0	<15	**No**
31.40	crest	100	-4.3%	-8.1%	26.4	30	**No**
31.42	sag	30	-8.1%	-5.0%	9.7	<15	**No**
31.44	crest	30	-5.0%	-22.9%	1.7	<15	**No**
31.45	sag	30	-22.9%	-6.3%	1.8	<15	**No**
31.54	sag	200	-6.3%	7.6%	14.4	15	**No**
31.57	sag	70	7.6%	14.8%	9.8	<15	**No**
31.59	crest	100	14.8%	6.7%	12.5	25	**No**
31.64	crest	200	6.7%	-11.1%	11.2	20	**No**
31.67	sag	70	-11.1%	-5.0%	11.5	15	**No**
31.71	sag	30	-5.0%	7.0%	2.5	<15	**No**
31.75	crest	50	7.0%	2.0%	10.0	20	**No**
31.77	sag	50	2.0%	2.8%	59.7	35	**No**
31.80	crest	100	2.8%	-4.6%	13.4	25	**No**
31.83	sag	150	-4.6%	0.0%	32.6	25	**No**
31.89	sag	100	0.0%	4.8%	20.8	20	**No**
31.91	crest	100	4.8%	-4.4%	10.9	20	**No**
31.93	sag	50	-4.4%	-2.5%	26.7	25	**No**
31.96	crest	100	-2.5%	-7.0%	22.0	30	**No**
32.00	sag	50	-7.0%	-1.1%	8.4	<15	**No**
32.03	sag	100	-1.1%	0.0%	90.0	45	Yes
32.07	crest	100	0.0%	-3.7%	26.9	30	**No**
32.10	sag	100	-3.7%	2.2%	17.0	20	**No**
32.13	crest	100	2.2%	-4.1%	16.0	25	**No**
32.20	crest	100	-4.1%	-8.9%	20.8	30	**No**
32.22	sag	70	-8.9%	-0.5%	8.4	<15	**No**
32.27	crest	100	-0.5%	-15.7%	6.6	15	**No**
32.34	sag	600	-15.7%	-0.4%	39.3	30	**No**
32.47	crest	300	-0.4%	-6.9%	46.4	40	**No**
32.67	sag	200	-6.9%	7.7%	13.7	15	**No**
32.77	crest	850	7.7%	-6.4%	60.2	40	**No**

VPI (MP)	Curve Type	Curve Length (ft)	Grade Back	Grade Ahead	K-value	Design Speed Met (mph)	Meets Standards
32.99	sag	600	-6.4%	5.1%	52.0	35	No
33.06	crest	100	5.1%	-1.2%	15.7	25	No
33.15	crest	100	-1.2%	-7.8%	15.2	25	No
33.20	sag	300	-7.8%	7.0%	20.2	20	No
33.24	crest	100	7.0%	-2.1%	11.0	20	No
33.34	sag	100	-2.1%	3.3%	18.7	20	No
33.42	crest	150	3.3%	-11.6%	10.1	20	No
33.48	sag	100	-11.6%	-7.3%	23.3	20	No
33.64	crest	200	-7.3%	-11.8%	44.7	40	No
33.75	sag	700	-11.8%	-3.1%	80.2	45	Yes
33.95	crest	200	-3.1%	-7.8%	42.7	35	No
34.09	sag	200	-7.8%	0.0%	25.6	20	No
34.25	crest	200	0.0%	-10.6%	18.8	25	No
34.39	sag	500	-10.6%	0.0%	47.1	30	No
34.47	crest	200	0.0%	-5.7%	35.3	35	No
34.52	sag	100	-5.7%	-0.7%	20.0	20	No
34.55	crest	100	-0.7%	-6.6%	16.8	25	No
34.66	sag	100	-6.6%	-3.5%	31.8	25	No
34.71	crest	100	-3.5%	-7.1%	27.3	30	No
34.81	sag	200	-7.1%	-3.3%	51.9	35	No
35.23	sag	100	-3.3%	-2.2%	88.4	45	Yes
35.42	crest	200	-2.2%	-5.4%	61.8	45	Yes
35.49	sag	300	-5.4%	-1.8%	83.2	45	Yes
35.57	crest	300	-1.8%	-2.4%	450.5	80	Yes
35.61	sag	150	-2.4%	-1.0%	103.9	50	Yes
35.68	crest	200	-1.0%	-2.0%	200.0	65	Yes
35.73	crest	200	-2.0%	-2.3%	766.3	80	Yes
35.84	sag	300	-2.3%	0.5%	109.2	50	Yes
35.93	crest	250	0.5%	-6.7%	34.6	35	No
35.98	sag	200	-6.7%	-0.4%	31.4	25	No
36.12	sag	250	-0.4%	5.2%	44.7	30	No
36.21	crest	400	5.2%	0.7%	88.1	50	Yes
36.32	sag	100	0.7%	1.8%	88.0	45	Yes
36.38	crest	200	1.8%	-2.1%	50.3	40	No
36.45	sag	200	-2.1%	-0.5%	119.0	55	Yes
36.51	crest	200	-0.5%	-4.0%	56.5	40	No
36.62	sag	500	-4.0%	4.0%	62.5	35	No
36.72	sag	200	4.0%	9.6%	36.0	25	No
36.76	crest	200	9.6%	-0.8%	19.3	30	No

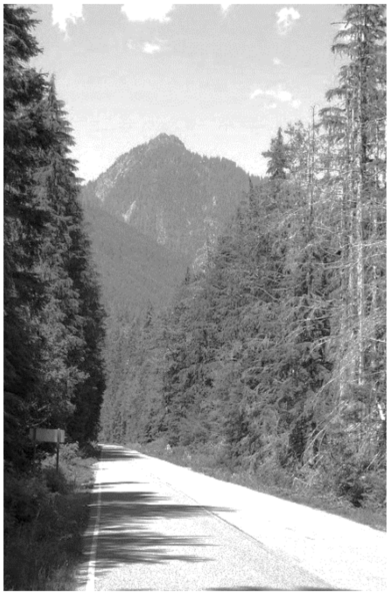
VPI (MP)	Curve Type	Curve Length (ft)	Grade Back	Grade Ahead	K-value	Design Speed Met (mph)	Meets Standards
36.86	sag	200	-0.8%	3.7%	44.6	30	**No**
36.89	crest	100	3.7%	0.1%	27.8	30	**No**
36.94	crest	100	0.1%	-6.7%	14.7	25	**No**
37.01	sag	400	-6.7%	-2.6%	96.1	50	Yes
37.19	crest	300	-2.6%	-6.5%	75.6	45	Yes
37.32	crest	300	-6.5%	-9.3%	109.2	50	Yes
37.46	sag	300	-9.3%	-2.9%	47.3	30	**No**
37.58	sag	300	-2.9%	3.9%	43.8	30	**No**
37.64	crest	300	3.9%	1.3%	115.8	55	Yes
37.72	sag	300	1.3%	8.7%	40.7	30	**No**
37.81	crest	300	8.7%	-3.0%	25.7	30	**No**
38.00	sag	200	-3.0%	-0.3%	73.7	40	**No**
38.11	crest	500	-0.3%	-3.1%	174.0	60	Yes
38.29	sag	300	-3.1%	-0.5%	115.0	50	Yes
38.56	crest	300	-0.5%	-2.7%	135.0	55	Yes
38.88	sag	400	-2.7%	5.7%	47.4	30	**No**
38.97	crest	200	5.7%	-3.6%	21.5	30	**No**
39.10	sag	200	-3.6%	5.9%	20.9	20	**No**
39.27	crest	500	5.9%	-0.1%	82.5	45	Yes
39.60	crest	1500	-0.1%	-10.1%	150.4	55	Yes
39.82	sag	300	-10.1%	4.3%	20.8	20	**No**
39.88	crest	100	4.3%	-3.8%	12.3	25	**No**
39.99	sag	1000	-3.8%	6.0%	101.9	50	Yes
40.20	crest	400	6.0%	0.0%	66.3	45	Yes
40.33	sag	200	0.0%	6.7%	29.7	25	**No**
40.40	crest	350	6.7%	-2.7%	37.2	35	**No**
40.47	sag	150	-2.7%	2.2%	30.5	25	**No**
40.49	crest	100	2.2%	-2.5%	21.3	30	**No**
40.52	sag	150	-2.5%	1.6%	36.4	25	**No**
40.60	crest	200	1.6%	-2.3%	51.4	40	**No**
40.67	sag	300	-2.3%	7.0%	32.4	25	**No**
40.71	crest	100	7.0%	-0.2%	13.9	25	**No**
40.79	sag	600	-0.2%	8.1%	71.9	40	**No**
40.92	crest	350	8.1%	-4.7%	27.2	30	**No**
41.01	sag	100	-4.7%	4.0%	11.4	15	**No**
41.03	crest	100	4.0%	-6.3%	9.7	20	**No**
41.15	sag	100	-6.3%	1.2%	13.3	15	**No**
41.18	crest	150	1.2%	-6.8%	18.8	25	**No**
41.22	crest	100	-6.8%	-12.0%	19.0	30	**No**

VPI (MP)	Curve Type	Curve Length (ft)	Grade Back	Grade Ahead	K-value	Design Speed Met (mph)	Meets Standards
41.25	sag	200	-12.0%	0.4%	16.1	15	**No**
41.33	crest	100	0.4%	-11.8%	8.2	20	**No**
41.49	sag	600	-11.8%	4.5%	36.7	25	**No**
41.62	crest	300	4.5%	-1.9%	46.2	40	**No**
41.97	sag	300	-1.9%	5.5%	40.1	30	**No**
42.04	crest	100	5.5%	2.9%	38.1	35	**No**
42.09	sag	100	2.9%	7.2%	23.4	20	**No**
42.17	sag	100	7.2%	12.3%	19.6	20	**No**
42.20	crest	100	12.3%	7.7%	21.9	30	**No**
42.27	crest	200	7.7%	-3.1%	18.5	25	**No**
42.46	sag	500	-3.1%	9.6%	39.5	30	**No**
42.57	crest	200	9.6%	4.6%	40.1	35	**No**
42.79	crest	300	4.6%	-5.4%	30.0	35	**No**
42.90	sag	200	-5.4%	-2.7%	72.4	40	**No**
42.93	crest	100	-2.7%	-4.4%	57.5	40	**No**
42.96	sag	200	-4.4%	-1.6%	70.8	40	**No**
42.99	crest	100	-1.6%	-3.4%	54.9	40	**No**
43.02	sag	150	-3.4%	-0.6%	52.9	35	**No**
43.05	crest	100	-0.6%	-3.9%	30.1	35	**No**
43.08	sag	300	-3.9%	-0.4%	85.4	45	Yes
43.19	crest	200	-0.4%	-1.3%	203.3	65	Yes
43.30	sag	300	-1.3%	0.8%	140.6	60	Yes
43.36	crest	100	0.8%	-2.5%	30.4	35	**No**
43.40	sag	200	-2.5%	-0.2%	88.2	45	Yes
43.44	crest	100	-0.2%	-2.8%	38.5	35	**No**
43.47	sag	100	-2.8%	-0.6%	43.9	30	**No**
43.50	crest	100	-0.6%	-2.8%	45.3	40	**No**
43.60	sag	200	-2.8%	-0.5%	87.9	45	Yes
43.95	crest	200	-0.5%	-1.8%	151.1	60	Yes
44.05	sag	200	-1.8%	-0.5%	149.4	60	Yes
44.13	crest	100	-0.5%	-4.0%	28.3	30	**No**
44.15	sag	100	-4.0%	-1.6%	42.3	30	**No**
44.20	sag	100	-1.6%	0.8%	41.4	30	**No**
44.24	crest	100	0.8%	-1.0%	56.2	40	**No**
44.40	crest	500	-1.0%	-5.8%	105.3	50	Yes
44.48	sag	200	-5.8%	-2.4%	59.3	35	**No**
44.51	crest	200	-2.4%	-5.9%	57.3	40	**No**
Pavement*							
44.72	sag	520	7.1%	-2.2%	56.2	35	**No**

VPI (MP)	Curve Type	Curve Length (ft)	Grade Back	Grade Ahead	K-value	Design Speed Met (mph)	Meets Standards
44.86	sag	260	-2.2%	3.9%	42.5	30	No
44.87	sag	200	-5.9%	-3.4%	82.1	45	Yes
44.93	crest	200	-3.4%	-5.2%	114.1	55	Yes
44.99	crest	800	3.9%	-1.7%	141.0	55	Yes
45.32	sag	400	1.4%	2.2%	494.4	80	Yes
45.35	sag	500	-1.7%	-1.2%	1017.5	80	Yes
45.44	crest	900	2.2%	0.2%	454.2	80	Yes
45.55	sag	400	0.2%	0.8%	723.3	80	Yes
45.68	sag	400	0.8%	1.2%	1068.1	80	Yes
45.89	sag	400	1.2%	2.0%	492.9	80	Yes
46.29	crest	800	2.0%	0.6%	573.1	80	Yes
46.46	sag	1000	0.6%	3.7%	322.4	80	Yes
46.63	crest	800	3.7%	0.4%	242.8	65	Yes
46.91	sag	600	0.4%	1.3%	628.7	80	Yes
47.21	sag	300	1.3%	3.0%	178.8	65	Yes
47.27	crest	300	3.0%	2.9%	4347.8	80	Yes
47.38	crest	400	2.9%	1.5%	270.2	70	Yes
50.14	sag	800	-1.2%	0.5%	469.8	80	Yes
50.26	crest	700	0.5%	-1.4%	369.5	75	Yes
50.36	sag	400	-1.4%	-0.5%	434.6	80	Yes
50.50	crest	200	-0.5%	-0.6%	1500.4	80	Yes
50.68	crest	400	-0.6%	-1.4%	515.5	80	Yes
50.89	sag	400	-1.4%	1.9%	122.2	55	Yes

** Does not include section between MP 22.5 and MP 26 or section between MP 47.5 and MP 50.*

*** Estimated based on existing survey contour data.*



OUTREACH SUMMARY REPORT: PUBLIC MEETING SERIES 1

Mountain Loop Highway Feasibility Study

WA SNOHOMISH 20(1)
IDIQ Contract No. DTFH70-15-D-00007
Task Order No. 69056718F000005

U.S. Department
of Transportation
Federal Highway
Administration

Prepared for:
WESTERN FEDERAL LANDS HIGHWAY DIVISION

March 2019

Prepared by:
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OUTREACH SUMMARY REPORT: PUBLIC MEETING SERIES 1

1.0 INTRODUCTION

The Federal Highway Administration (FHWA), in partnership with Snohomish County and the U.S. Forest Service (USFS), is developing a feasibility study of the Mountain Loop Highway (MLH) between the communities of Granite Falls, WA and Darrington, WA. The Mountain Loop Highway Feasibility Study (Study) will be a collaborative process among FHWA, the USFS, Snohomish County, the Town of Darrington, the City of Granite Falls, resource agencies, and the public.

The Study's intent is to identify feasible improvement options to enhance access to recreational opportunities while also improving operational safety and reducing maintenance. The Study will examine geometric characteristics, crash history, and existing and projected operational characteristics of the corridor. Existing and projected physical constraints, land uses, recreational and economic opportunities, funding constraints, and environmental resources will also be analyzed. A key outcome of the Study will be the development of short- and long-term recommendations intended to address the access, maintenance, and transportation needs of the MLH over the planning horizon (year 2038). These recommendations will assist the study partners in targeting the most critical needs and allocation of resources.

Education and outreach are essential elements in successfully informing individuals about the planning process and soliciting feedback on the Study outcomes. The goal of the Study's public outreach effort is to ensure that the public, stakeholders, and other interested parties are engaged in all phases of the corridor planning process. As outlined in the Study's Public Involvement Plan (PIP), three sets of informational meetings are to be held in both Darrington and Granite Falls.

This document summarizes the public comments received at the first series of informational meetings.

2.0 MEETING LOCATIONS

The first series of informational meetings provided members of the public the opportunity to review information about past projects and planning efforts for the MLH, the planning process and policies that will affect the Study, and initial Study findings. Specifically, the first set of meetings focused on providing attendees information on project goals, schedule, process, and next steps, and the opportunity to submit comments during or following the meetings. Duplicate meetings were held in the following locations in Granite Falls and Darrington, allowing for easier attendance by interested parties at either end of the MLH:

Granite Falls (August 20, 2018, 6–8:30 p.m.)

Granite Falls Middle School, Multipurpose Room
405 N Alder Ave, Granite Falls, WA 98252

Darrington (August 21, 2018, 6–8:30 p.m.)

Darrington Community Center
570 Sauk Ave, Darrington, WA 98241

3.0 STAKEHOLDER AND GENERAL PUBLIC NOTIFICATION METHODS

The Study encourages active participation from stakeholders and the public in identifying and commenting on study issues at every stage of the planning process. To effectively notify interested parties about the opportunity to comment during the first set of informational meetings, several notification methods were employed:

- Study partners coordinated with the Daily Herald newspaper of Everett, WA to print display advertisements of the informational meetings, printed in editions on August 12 and 15, 2018.

- Study partners coordinated with the Daily Herald newspaper of Everett, WA to print display advertisements of the informational meetings, printed in editions on August 12 and 15, 2018.

- Postcard meeting invitations were mailed to property owners directly adjacent to the MLH corridor. A total of 195 households were mailed postcards.
- Meeting information was posted on the Daily Herald online community calendar (https://www.heraldnet.com/calendar/).
- Meeting information was posted to the MLH Feasibility Study Project Website (https://flh.fhwa.dot.gov/projects/wa/mountain-loop/).
- Study stakeholders, outlined in the PIP, were emailed postcard meeting invitations and were encouraged to further distribute information through their mailing lists and interested parties.
- A meeting notification press release was distributed to the Daily Herald.

4.0 SUMMARY OF PARTICIPATION AND COMMENTS

Twenty community members attended the Granite Falls informational meeting and 27 were in attendance in Darrington. Attendees represented the following groups:

- Granite Falls School District
- Granite Falls Planning Commission
- Granite Falls Historical Society
- USFS
- Pilchuck Audubon Society
- Snohomish County
- Washington State Senate
- Glacier Peak Institute
- Darrington Prevention Intervention Community Coalition
- Washington ATV Association
- Darrington Strong
- Darrington Area Resource Advocates
- Town of Darrington

In addition to the above referenced groups, residents and community members from and near both Granite Falls and Darrington attended the meetings.

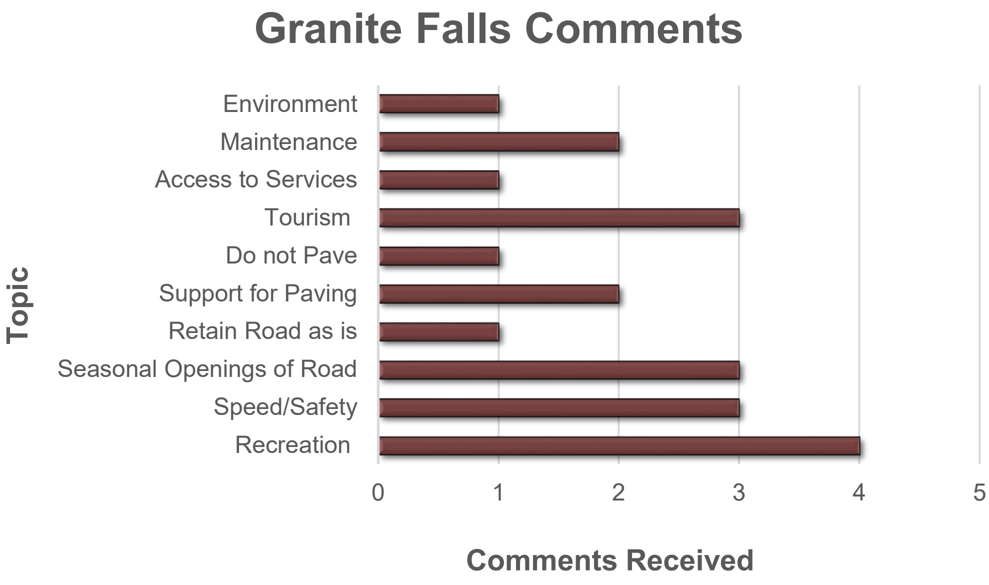
Seven written comments were received during the meeting in Granite Falls and 10 were received during or shortly after the meeting in Darrington. In general, comments centered on current roadway conditions, potential benefits and drawbacks of roadway improvements, and project concerns that should be considered.

4.1 GRANITE FALLS

Comments received were categorized by topic area, as shown in Figure 1. Major topic areas included recreation, tourism, seasonal use of the MLH, and speed/safety.

Over half of the commenters in Granite Falls noted that they were longtime residents and/or visitors of the MLH area. Similarly, many added that they enjoy traveling the MLH because of the multitude of recreational opportunities in the area, such as hiking, sightseeing, camping, biking, skiing, driving, and ATV usage. Several others travel the MLH for transportation purposes, noting the corridor as an alternative to State Route (SR) 530 to the north. The MLH was also cited as an evacuation route for residents of the area.

Comments on the MLH's current state centered on the condition of its surface and potential trade-offs associated with paving the roadway, with two commenters remarking that the gravel portion between Barlow Pass and Darrington is of particular concern. One commenter mentioned that the condition of the gravel portion has negatively affected tourism in the area, while another commenter noted that roadway maintenance has not kept pace with traffic volumes and overall use. One meeting attendee commented that the current roadway is acceptable as-is.



Environment	1
Maintenance	2
Access to Services	1
Tourism	3
Do not Pave	1
Support for Paving	2
Retain Road as is	1
Seasonal Openings of Road	3
Speed/Safety	3
Recreation	4

Figure 1. Comments Received by Topic, August 20, 2018 Granite Falls Informational Meeting

Over half of commenters noted positive benefits associated with paving and widening the MLH, citing increased potential for economic development, historical tourism, and access to services. However, some individuals listed several potential concerns regarding roadway improvements. Three commenters noted the potential for a loss of roadside campsites and natural features if the road is widened, and raised concerns about the potential for speeding if the MLH is paved in addition to being widened. One individual mentioned the possibility of lowering existing posted speed limits to allow for ATV usage of the roadway and to increase nonmotorized user safety. Two commenters stated that the MLH should remain closed during winter months and potential snow-related operating costs should be considered. Individuals also raised concerns over the current lack of overnight lodging and camping opportunities in the area, and the effects that an improved roadway would have on this issue. Potential recreational improvements mentioned include a designated bicycle route, interpretive opportunities, and an additional rest area between Barlow Pass and Darrington.

4.2 DARRINGTON

Figure 2 shows the categories of comments received at the Darrington open house. Major topic areas in Darrington included environment, tourism, speed/safety, and maintenance.

Three commenters in Darrington noted that the unpaved portion of the MLH is currently in poor condition, with many potholes and high levels of dust and mud. Commenters mentioned that paving the roadway could make the area a larger tourist destination through increased comfort and accessibility to the area's hiking, camping, biking, skiing, photography, picnicking, driving, and ATV opportunities. Commenters also noted that roadway improvements would reduce maintenance costs, improve corridor safety, reduce sediment flow into the Sauk River, provide an additional evacuation route for the area, and allow greater winter recreation access.

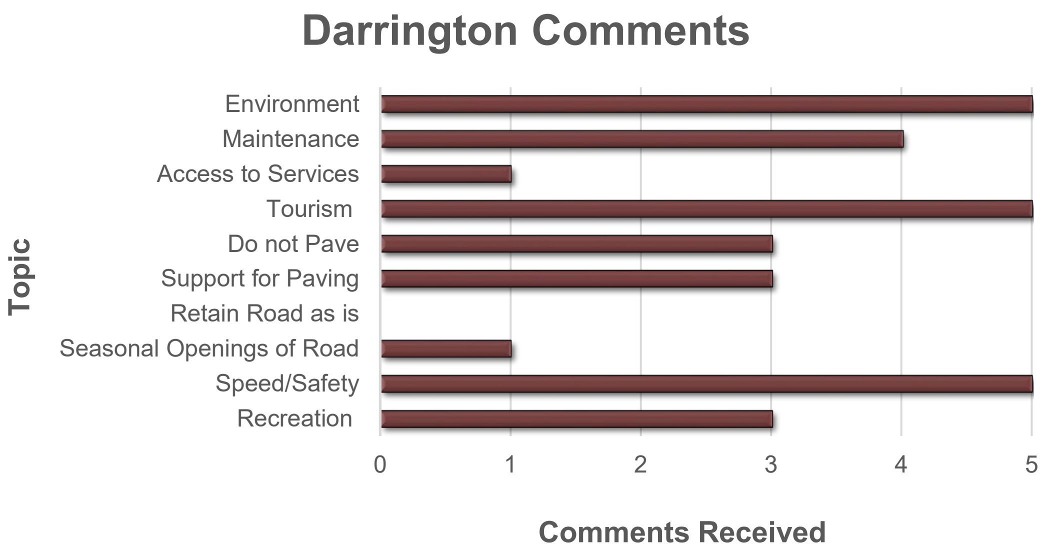


Figure 2. Comments Received by Topic, August 21, 2018 Darrington Informational Meeting

Several commenters were against, or expressed reservations about, paving and widening the roadway. Concerns were expressed over the potential for speeding and increases in traffic volumes leading to environmental harm (in the form of soil quality, impacts on trees, increased greenhouse gas emissions, increased levels of trash, and harm to wildlife) and the need for increased safety/law enforcement efforts along the corridor. Individuals also noted that while current MLH travelers often stop in Darrington, paving the highway could induce visitors to simply pass through town, hindering the tourism portion of Darrington's economy. One commenter noted that considerations for pedestrians would need to be made.

5.0 NEXT STEPS

Comments from the public meetings will be considered as improvement options are developed. Improvement options are being developed over the winter and will be introduced at the next set of public meetings. As the Study moves forward, FHWA will continue to coordinate with Snohomish County, the USFS, the City of Granite Falls, the Town of Darrington, and the public.

Appendix A
Citizen Comments

Comment	Meeting Attended	Date Received
I have walked, biked, skiied, camped on the mt. loop for a half century…it is imperative that the road stays open; I prefer the route to be traveled and closed for the snow months…but am not averse to it being paved; what concerns me is that an interest in the road and the back country be kept in the public eye. One possible solution is a bike route or a route open on certain days only for bikes. The road as it stands today is certainly acceptable. Of late, the route up to Barlow Pass has grown in its use; witness the LF 22 trail head on any weekend day. The county has only one mt. pass route, one to revere and keep.	Granite Falls	8/20/18
Live there and work near. -Providing a way out for families stuck up the loop. -Economic equality (structure) -Devel. Of GF - - looking forward -Access to services for all	Granite Falls	8/20/18
I mostly hike and camp. I like the little camp spots along the river off the unpaved section and my concern is that paving the road would make the speeds faster and possibly eliminate those spots by widening the road. I balance that with the convenience of going to Darrington as an alternative to Hwy 530. If it were widened and paved would it be open all year around? There is a lot of snow and cold that would be an expensive challenge. I don't know that having to repair it every spring would be more expensive than the current gravel road.	Granite Falls	8/20/18
50 years ago, I worked summers at the Forest Service in Verlot, WA. Mostly, I worked on trails and was able to see the beautiful lakes and scenery in the area. I still enjoy driving up the Mountain Loop Hwy but only a few times do I drive from Granite Falls to Darrington because of the poor condition of the road beyond Barlow Pass. I would like to see improvements to the general portion of the road beyond Barlow Pass. Widening and paving of the road would open up the area to more people who may not venture beyond Barlow Pass because of the road condition. If not widening and paving the entire stretch, a portion may be easier to widen and pave from the Darrington side where the pavement now ends.	Granite Falls	8/20/18

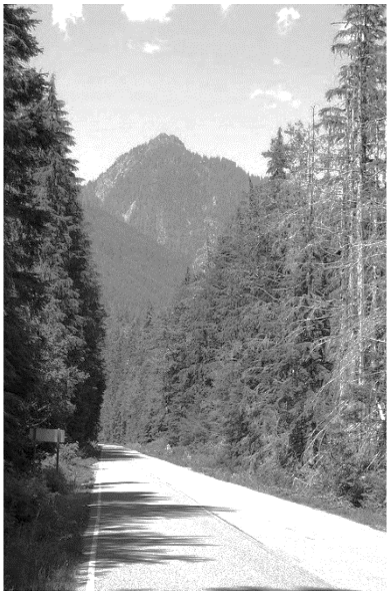
Comment	Meeting Attended	Date Received
I have enjoyed motorized recreation, site seeing and trail hiking up the Mtn. Loop Hwy since the 1980's. I have always enjoyed the views from mtn peaks. I enjoyed the Stillaquamish River and the Sauk River. I enjoy a leisurely drive from Granite Falls to Darrington and back many times a year. Being a planning commissioner for the City of Granite Falls, we have watched our tourism start to decline because of lack of maintenance. We would like to see the speed limit lowered for better viewing, safety to pedestrians and bikes. Also to allow for WATV's. It is a great alternate route for the City of Darrington. I will email some more ideas that you will be able to read.	Granite Falls	8/20/18
I've lived near MP4 on SR92 for 38 years and have gone on frequent trips out on the Mountain Loop Highway into the Mt Baker - Snoqualmie NF all the time. I would like to email my comments - handwriting is difficult.	Granite Falls	8/20/18
The Mt. Loop Hwy represents the finest focal point for "Historical Tourism" in Snohomish County. If paved (for both maintenance and ease-of-travel issues), it needn't be widened into a full-width two-lane highway. It could be a 30mph scenic drive with turnouts and markers for both historical and environmental points of interest. The closure of Gold Basin Campground near Verlot has been and environmental nightmare for the Loop! Camping will continue unabated and uncontrolled - the natural beauty guarantees that! Good road, low speed limits, toilets, and planned camping will attract folks who appreciate the history and the environment. A "gentle" Mt. Loop Hwy would make a great educational and entertainment/relaxation tool. Keep the narrow bridges, leave most bends, set a low speed limit, add a "rest stop" between Barlow Pass and Darrington...then harvest the good will of tourists. Winter closure expected!	Granite Falls	8/20/18
I go hiking, scenic drives, picnics, photography. The roadbed is increasingly getting worse with potholes, washboarding, dust and mud. This road sees very high use for gravel (part gravel) road and not maintained to standards. I'm finding I drive this road less because it has become less enjoyable due to the condition of the road. Last time I was on the Mountain Loop I got a flat tire. I think the Loop is a bigger destination than it currently is. I know that many do not drive the complete road because of the gravel portion.	Darrington	8/21/18

Comment	Meeting Attended	Date Received
I live in Darrington and volunteer on forest roads through Friends for Public Use, a division of Darrington Strong, Inc. I've spent many hours picking up trash, clearing ditches and culverts and cutting out down trees on the Mountain Loop Hwy and the many side roads north of Barlow Pass that visitors use to access outdoor recreation off the Mountain Loop. I'm excited about the possibility of paving the Mountain Loop because I can foresee that leading to increasing access to winter recreation like cross country skiing, snow-shoeing and sledding. I also believe that it will cut down on the amount of maintenance the road overall will need.	Darrington	8/21/18
I am against improvement of the Mountain Loop that involves paving. I say this because from my perspective its improvement could hinder the economy of Darrington. As it stands now most drivers spend several hours driving the loop, this lands them in Darrington looking for food, gas, and refreshment. If the Mountain Loop was paved I believe travelers would be more likely to pass by Darrington. The second reason I am against improvement is the impact increased traffic could have on the environment. More cars mean more people, trash, and infrastructure. As it stands now the 14 mile section between Verlot and Clear Creek is fairly remote. I would hate to see a beautiful stretch of land become polluted and abused by those who will not have to live in the mess.	Darrington	8/21/18
Cost to communities (Darrington). Taxes - safety (fire dept/medical), increase in fatalities w/speed. The unwalkability of one lane rds w/today's ex large vehicles and trailers. The incraese of development thus more taxes, risk to the infrastructure and environment. Loss of law enforcement in our community because of 60% increase in vandalism and theft.	Darrington	8/21/18
*I have lived in Darrington since 1993 and have completed "the loop" 3 times in that time. *It is a beautiful drive but the 14 miles of unpaved section make it unbearable. *That section needs to be paved. The economic boost on the Mount Loop Highway would benefit Darrington and Granite Falls. *Also, another evacuation route out of town would have been a help during the road closure between Arlington and Darrington. I cannot think of one reason not to pave that portion of the road. The cost will be worth it. I would like more information on project timeline and potential cost. I hope it gets done before 2038. Thank you.	Darrington	8/21/18

Comment	Meeting Attended	Date Received
Please recognize that Seattle area residents do not need another Highway style loop road. There are many. This loop is valuable for its low speed, close to nature feel. (Like hiking for old folks and others who can't do 10 mile hikes). "Car hiking." Please improve safety and maintenance, but don't cut large tree buffers.	Darrington	8/21/18
Gravel portion is not adequate to handle current traffic load. Continued Forest Service maintenance with their meager budget means other road systems get no attention. There are full time residences accessed by road, should be Sno Co responsibility. Paving would massively reduce dust, both a safety issue and that all goes into the Sauk. Paving would reduce sediment that flows into Sauk.	Darrington	8/21/18
Jeff, I have a suggestion for the next public meeting. I suggest the next meeting format be a question and answer type forum. That way everybody hears all the questions and concerns and can respond. I know, from having attended many meetings here in town, that most of our people prefer the old fashioned question an and answer type of meeting.	Darrington	8/22/18
Hello, my name is _______ from Darrington, WA. I am the Vice-President of Darrington Strong, Chairman of the Darrington Street Fair, among other activities. I would like to put my comments in about the Feasibility study. A.) I have lived here for 5 years. The road has been in its present condition since I have lived here. I do not know the impact of having it open all year and being paved. B.) What I do feel about the road being paved: 1.) I am a photographer, my daughter and I hike in the woods and shoot nature at its finest. We park our truck on the unpaved portion, hike in. On several occasions we have ran into the black bears, we do not carry food, just our cameras. The bears just look at us and move on, as we let them have their room. My concern is now that the road has been unpaved for many years they are quite comfortable walking on the unpaved road, it will be very troubling for all the animals to have their part of the forest being invaded by machines and paving and then traffic. With traffic comes the speeders, (of course) and with the bears and other animals that will be in their path, someone is bound to get hurt. Not a good outcome. We can't stop the speeders, and we can't stop the animals coming out and walking on what they consider their woods. I would like to keep it unpaved for humans and animals safety. 2.) Before I moved up here my friends and I would ride our snowmobiles up here during the winter and in the Spring and fall, we would ride our atv's up here. So I enjoyed the recreation aspects of the area. If the road is paved then we would like to see more recreation areas opened up for	Darrington	8/21/18

Comment	Meeting Attended	Date Received
us snowmobiles and atv's 3.) It is beautiful up here. I like it the way it is right now. less traffic on the road is not a bad situation. In Darrington and the surrounding area, we are creative and invite people up here for street fairs and other activities and then the town makes their money and the visitors have a nice visit and can go back home. We have our town back and less traffic. Thank you for reading by opinion I appreciate you taking the time.		
Dear Mr. Traffalis: We appreciate the opportunity to serve on the Stakeholder Committee and attend one of the public open houses concerning this project. We have reviewed the Environmental Scan (ES) and have the following comments on that document, and on the study. Greenhouse gas emissions: It was interesting to learn that one of the stated objectives of the National Scenic Byways Program is to “Meet the growing demand of driving for pleasure as a significant recreation use.” Given that this highway designation dates to 1961, we question the appropriateness of this purpose today. Many communities and even the State of California are working towards reduction or outright elimination of fossil fuel consumption for the benefit of all forms of life on this earth (including ours) as we know it. At least until far-ranging electric automobiles are in common use by the majority of the population, driving purely for pleasure should not be encouraged. The mere existence of a desire or “demand” does not necessarily mean that it should be met. We suggest that it is time to update the goals of the National Scenic Byways Program. The ES (p.11) mentions evaluation of “greenhouse gas emissions that may result from project construction, operation, and maintenance” but not the increased emissions expected from the increased use that is a desired outcome of the proposal. This information should be included in the formal environmental analysis of any project that results from this study. Soils/Geologic hazards: In the discussion of soil resources, the EA (p. 3) asserts that soils data is lacking from the National Forest lands. The US Forest Service (USFS) commonly uses soil maps in their environmental analyses of proposed projects. Was the USFS contacted for this information? Was the Federal Highway Administration made aware of the area locally known as “The Sinkhole” near Camp Silverton? The ES does mention (p.4) “sunken or broken road beds,” but you should be aware of this	Darrington	9/17/18

Comment	Meeting Attended	Date Received
location in particular, which is so mobile that Snohomish County wisely stopped resurfacing it with pavement decades ago. In fact, there was until recent years an informational sign at the location. Any proposal for adding pavement to this highway should incorporate pervious materials wherever possible, in order to reduce runoff of toxic materials and stormwater. In many locations along the highway, such runoff would directly enter important rivers or creeks. If gravel surfacing is to be replaced, utilization of pervious pavement would be responsive to the Snohomish County Code provision requiring minimization of impervious surfaces within landslide hazard areas. Northwest Forest Plan compliance: We were pleased to see the attention paid by the ES to the relevant Northwest Forest Plan provisions. As noted, both the Late Successional Reserve designation and Aquatic Conservation Strategy Objectives pertaining to Riparian Reserves mandate minimization of road construction. Most if not all of the study area falls within one or both of these categories. In addition, the Tier 1 Key watershed designation that incorporates the entire study area includes the guideline to reduce road mileage. Wildlife: It is difficult to imagine any proposal for the Mountain Loop Highway that would not adversely impact the numerous species listed under the Endangered Species Act, or their designated Critical Habitat, in the study area. Even permanent road closure would involve some short-term impacts from deconstruction activities. It is imperative that any proposal generated by this study include a rigorous analysis of impacts to the Northern spotted owl, Marbled murrelet, Chinook salmon, Steelhead trout, and Bull trout; as well as Gray wolf and Grizzly bear. Deleterious effects on migratory birds must also be avoided, by law. As noted in the ES, there are many other species of concern in the area which must be considered prior to any work on the highway. It is imperative that this evaluation include current survey data for relevant species. Social and Economic effects: We urge you to consider data on sales tax receipts during past episodes of road closure due to washouts in analysis of the economic effects of the Mountain Loop Highway. Such data for the period when the highway was closed between 2003 and 2008 show level to increased, not reduced, receipts for both Darrington and Granite Falls. Thus, any presumed economic benefit to the local communities of increased traffic on the road is suspect, at best. Conclusion: Thank you for the opportunity to provide these comments. We look forward to continuing to work with you regarding this project.		



OUTREACH SUMMARY REPORT: PUBLIC MEETING SERIES 2

Mountain Loop Highway Feasibility Study

WA SNOHOMISH 20(1)
IDIQ Contract No. DTFH70-15-D-00007
Task Order No. 69056718F000005

U.S. Department of Transportation
Federal Highway Administration

Prepared for:
WESTERN FEDERAL LANDS HIGHWAY DIVISION

March 2019

Prepared by:
ROBERT PECCIA & ASSOCIATES
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In association with:
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Seattle, Washington

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OUTREACH SUMMARY REPORT: PUBLIC MEETING SERIES 2

1.0 INTRODUCTION

The Federal Highway Administration (FHWA), in partnership with Snohomish County and the U.S. Forest Service (USFS), is developing a feasibility study of the Mountain Loop Highway (MLH) between the communities of Granite Falls, WA and Darrington, WA. The Mountain Loop Highway Feasibility Study (Study) will be a collaborative process among FHWA, the USFS, Snohomish County, the Town of Darrington, the City of Granite Falls, resource agencies, and the public.

The Study's intent is to identify feasible improvement options to enhance access to recreational opportunities while also improving operational safety and reducing maintenance. The Study will examine geometric characteristics, crash history, and existing and projected operational characteristics of the corridor. Existing and projected physical constraints, land uses, recreational and economic opportunities, funding constraints, and environmental resources will also be analyzed. A key outcome of the Study will be the development of short- and long-term recommendations intended to address the access, maintenance, and transportation needs of the MLH over the planning horizon (year 2038). These recommendations will assist the study partners in targeting the most critical needs and allocation of resources.

Education and outreach are essential elements in successfully informing individuals about the planning process and soliciting feedback on the Study outcomes. The goal of the Study's public outreach effort is to ensure that the public, stakeholders, and other interested parties are engaged in all phases of the corridor planning process. As outlined in the Study's Public Involvement Plan (PIP), three sets of informational meetings are to be held in both Darrington and Granite Falls.

This document summarizes the public comments received at the second set of informational meetings for the Study.

2.0 MEETING LOCATIONS

The second set of informational meetings provided members of the public the opportunity to review information about the existing and projected conditions along the MLH and provide comment on potential improvement options to be forwarded to the local partner agencies for consideration. A formal presentation was given at the beginning of each meeting, followed by a question and answer session. Duplicate meetings were held in the following locations in Granite Falls and Darrington, allowing for easier attendance by interested parties at either end of the MLH:

Granite Falls (March 6, 2019, 5:30–8:30 p.m.)

Granite Falls Middle School, Multipurpose Room
405 N Alder Ave, Granite Falls, WA 98252

Darrington (March 7, 2019, 5:30–8:30 p.m.)

Darrington Community Center
570 Sauk Ave, Darrington, WA 98241

3.0 STAKEHOLDER AND GENERAL PUBLIC NOTIFICATION METHODS

The Study encourages active participation from stakeholders and the public in identifying and commenting on study issues at every stage of the planning process. To effectively notify interested parties about the opportunity to comment during the first set of informational meetings, the following notification methods were employed:

- Study partners coordinated with the Everett Daily Herald to print display advertisements of the informational meetings, printed in editions on February 24 and March 1, 2019.
- Postcard meeting invitations were mailed to property owners directly adjacent to the MLH corridor. A total of 195 households were mailed postcards.
- Meeting information was posted on the Daily Herald of Everett, WA online community calendar at https://www.heraldnet.com/calendar/.
- Meeting information was posted to the MLH Feasibility Study Project website at https://flh.fhwa.dot.gov/projects/wa/mountain-loop/.
- Study stakeholders, outlined in the PIP, were emailed postcard meeting invitations and were encouraged to further distribute information through their mailing lists and interested parties.
- Interested parties who had requested that their names be added to the email mailing list were emailed the postcard meeting invitation.
- A meeting notification press release was distributed to the Daily Herald.

On March 4, 2019, an article was published in the Daily Herald that summarized the efforts of the Study to date and included information on the public meetings.

4.0 SUMMARY OF PARTICIPATION AND COMMENTS

Twenty-seven attendees signed in at the Granite Falls informational meeting and 33 attendees signed in at the meeting in Darrington. Attendees represented the following groups:

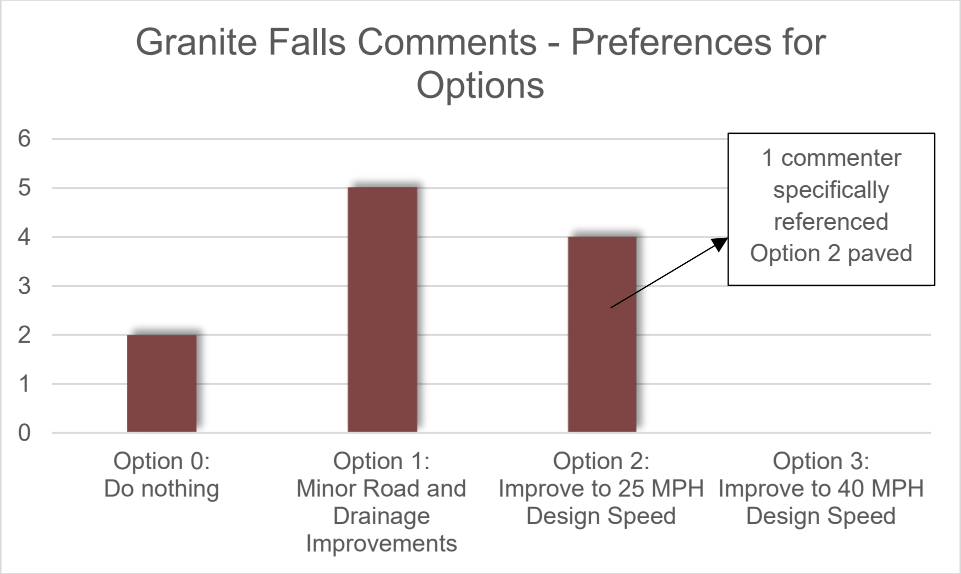
- Granite Falls City Council
- Granite Falls Planning Commission
- Granite Falls Historical Society
- USFS
- Pilchuck Audubon Society
- Snohomish County
- Mountain Loop Conservancy
- Washington Trails Association
- Town of Darrington
- City of Granite Falls
- Darrington Strong
- Friends for Public Use
- Darrington Town Council
- Darrington Area Resource Advocates
- North Cascades Conservation Council

In addition to the above-referenced groups, residents and community members living in and near both Granite Falls and Darrington attended the meetings.

Ten written comments were received during or shortly after (via email) the meeting in Granite Falls and 10 were received during or shortly after (via email) the meeting in Darrington. In general, comments provided feedback on preferences for the potential improvement options as well as reactions to the findings of the existing and projected conditions analysis.

4.1 GRANITE FALLS

Figure 1 summarizes the preferences for improvement options that were received from written comments. Option 1 received the highest number of comments in favor, followed closely by Option 2. Several commenters also remarked that they would prefer nothing to be done along the 14-mile gravel section of the MLH. These commenters noted that they felt that funds could be better spent in other locations.



MPH = miles per hour

Figure 1. Comments Received by Improvement Option Preference, March 6, 2019 Granite Falls Informational Meeting 2

Other topics in the comments included a desire for additional trailhead parking and assurance that improvements have a minimal impact on the environment. Commenters also communicated concerns about funding availability for both project construction and regular seasonal maintenance.

4.2 DARRINGTON

Seven of the 10 comments received in Darrington indicated a preference for Option 2; no other preferences were indicated in the other comments. Of these seven comments, six indicated that paving was preferred. One commenter was against paving the unpaved portion of the MLH.

Other topics in the comments included concerns about long-term maintenance, safety in the corridor, tourism, seasonal road openings, increased traffic, and the economic benefit to Darrington.

5.0 NEXT STEPS

Comments from the public meetings will be considered as improvement options are developed. The draft Study report is being developed over late Winter and early Spring and will be introduced at the final set of public meetings. The report will incorporate feedback from comments received throughout the Study and provide them to the project partners for consideration in the next phase of the project. As the Study moves forward, FHWA will continue to coordinate with Snohomish County, the USFS, the City of Granite Falls, the Town of Darrington, and the public.

Appendix A
Citizen Comments

Comment	Meeting Attended	Date Received
Dear Mr. Traffalis, Thank you very much for the presentation by your team at the Darrington Community Center on March 7th, 2019. As a Darrington resident and as one who enjoys access to the many trails and other recreational opportunities along the Mountain Loop Highway corridor, I would like to offer my view of the best option to pursue for the Mountain Loop Highway. (MLH) I strongly favor Option 2 - 25 mph Design Speed • Follows the existing road • Modest improvements to existing alignment and profile • Asphalt surfacing (not gravel) • 18 - 32 feet in width With regard to the section of the MLH that has the river on one side and a steep cliff on the other side, I think the best option there is to maintain the current width for single lane traffic, make modest improvements and pave with asphalt. Clear signage visible from both directions can alert drivers to yield to oncoming traffic as it is a one lane section. (White Chuck River Bridge south of Darrington as model) I favor Option 2 with Asphalt surfacing for these reasons: • It will improve highway safety • It will improve emergency response access to remote areas • It will increase recreational access to the MLH corridor • It will bring more tourism business to the Darrington area • It will improve emergency evacuation options • It will greatly reduce airborne dust that is a health hazard • It will greatly reduce dust that settles on vegetation close to the MLH In addition to the highway improvements planned with Option 2, I believe it would be beneficial to harvest some of the trees close to the MLH for these reasons: • To improve long term maintenance of the highway surface • To improve the view of the mountains throughout the MLH corridor • To allow more sunlight to reach the highway surface to reduce black ice Please add my email address to your contact list for updates on the MLH.	Darrington	3/11/2019

Comment	Meeting Attended	Date Received
Good afternoon, Thank you for your presence at the meeting last night. I noticed all accidents occurred on the pavement. Based on the increased paved areas, how many more accidents (fatal and nonfatal) would be added by paving this section? This would be based upon current levels of traffic. Sorry for my apathy towards the project. I am told frequently told this narrative of tourism and paving roads as a solution for our rural community, but I have not found an example of the benefit that these people refer to. For the economic viewpoint, there is not one rural community in close proximity to a large urban area that has succeeded with the tourism model. I see more kids dying on the pavement and the majority of the economic benefit going to I5. The visitor buy everything in the city, drive the road, and go back to the city. Oakridge, Oregon is often cited by those claiming the benefits of tourism and a paved highway. Like Darrington, it is an amazing community, but it has the same struggles. I thank you for your time. If you can figure out a way to design the highway for logtrucks (those people actually make a living wage and volunteer in the community) as well as design it to minimize the death of local kids and have the tourists actually stop in town, that would be greatly appreciated. While I imagine you do not have an answer yet, I believe all of that is possible. If you find a way to involve local kids with your project, that would be great as well. We have few opportunities up here to exposed to careers and projects. Thanks for your work and have a wonderful weekend	Darrington	3/8/2019
At the bottom is my feedback from the Granite Falls feasibility study meeting on Wednesday, March 6, 2019. I used the Mountain Loop area quite frequently when our children were growing up. We ventured into Darrington the back way only a few times, went to Monte Cristo a couple of times, but would annually go anywhere up the Mtn Loop to “find snow” where we could drive in, get stuck, play in the snow, then dig ourselves out and go home. We take all our visitors to the Big Four Ice Caves, for us several times a year (mostly in the summer). We have been in Black Chief Mine many times. We have explored some of the other mines in the area by just trying to find them, never going inside. We have gone on other short hikes on trails or just on a side logging road. We have obtained Christmas tree permits in the children’s early years. We have hiked Mt. Pilchuck a couple of times. We have stopped at each camping site to look it over, but never have camped. We’ve picnicked in several areas and have picked up trash when found on	Granite Falls	3/7/2019

Comment	Meeting Attended	Date Received
the old logging roads and always cleaned up after ourselves ("pack it out"). We have never needed a tow, but have helped other people if they got stuck in the snow. As a teacher in the Everett School District, I was part of team each year for 14 years that took about 80-100 5th graders to Camp Silverton (Waldheim) for a 3-day, 2-night environmental experience. We had regular curriculum and also included hikes to Big Four, Marten Creek, Youth on Age, and Red Bridge (and Black Chief Mine). The school district closed Camp Silverton down in 2003 but did not return the lease to the USFS until years later. Waldheim is ready for redevelopment into a campground (water, septic, electricity, phone, and a few existing buildings remain. Students and teachers have lingering fond memories of the Mountain Loop and Camp Silverton, and would love to bring their families to the area to reminisce. I support paving the 14-mile gravel section. Do not keep the gravel surface. Pave the 14 miles. Keeping the gravel section sounds like it would continue to be more expensive. Being fiscally responsible is a very strong argument to pave it. Keep the existing roadway by using existing footprint, with only minor changes for road maintenance longevity and safety. No need to widen everything to the 25 mph standard. Getting to 25 mph standard isn't necessary, but might be a good guideline. Minimum environmental impact (some is needed, I'm sure, but try to minimize). Definitely do not use the 45 mph standard! Environmentally, paving would be better. Gravel from the roadway would not continually erode (slowly) into the river, nor would the dust choke the vegetation or pollute the air. The paving (and other necessary minor prep work) would make the road more stable. Even though this would probably increase traffic (especially in the summer months), the increased traffic would provide for more security of the area, specifically targeting those people who are not respectful or caring for our environment. Littering, vandalism, and destructive uses would probably decrease despite the increase in traffic because the individuals who have been ruining things would know that there are more people out and around, making a better chance of someone reporting them. I think the increased traffic would be people who would want to see the beauty of the wilderness and would have a stake in keeping it preserved (being careful themselves, reporting improper use, etc). Don't go overboard on signage, just the bare minimum for safety. Striping on the pavement edge ("fog line") might be good for safety. Center line striping probably would not help in the area when road widths are too narrow. No center line in the new section will let people know they are still in the 25 mph zone		

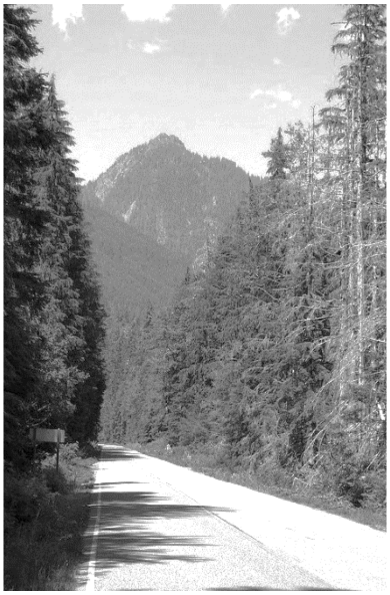
Comment	Meeting Attended	Date Received
Design and maintenance: Be proactive by protecting road from river-curve washout. Protect road from rock/slides from steep cliffs (such as wire mesh coverings). Improve road width without major work (if an existing side can just be filled in without major culvert work or major environmental impact). Build up crown and whatever else is needed for proper drainage and safety for curves. Provide pullouts at each end of one-lane sections where possible, and pullouts for slower vehicles to pull over to allow others to pass (where needed and if possible). Keeping the Mtn Loop open throughout winter isn't important enough to outweigh the extra cost of plowing. However, having the possibility of plowing for emergency access during the winter would be beneficial. Winter closures would add to the wintertime wilderness allure for tourism/recreation, but maybe close the gates later in the year and open earlier because of snowplow capabilities along the new paved stretch. When it's time to gate the road, maybe plow further from each end towards Barlow Pass. Deer Creek has the nice parking area on the South Fork, but maybe try getting to Big Four for that larger paved lot. That would provide better access to winter sports, especially if there is minimal snow (lack of snowfall and/or early melt off) during the winter at or below MP 24. Usually there is much more snow the further east and the higher in elevation a person travels. If the gate is closed at Deer Creek and the roadway is bare, winter sports enthusiasts like snowmobilers, snowshoe'ers, and cross-country skiers would benefit from having parking at Big Four available. If there is heavy snow, then the Mtn Loop can be closed at Deer Creek with no need to plow to Big Four because people can use the snow-covered highway to access places further up the highway. I'm not sure about the Darrington side if it would be beneficial to have a road closure further upstream along the Sauk. Tourism and recreation would benefit from paving the gravel. More people would use it on weekends, and probably more would use it during the week. Wintertime might see more snow visitors who can enjoy the wilderness, especially if parking at Big Four were available or Deer Creek parking could be improved. Other tourism and recreation benefits would be the opening of Gold Basin and Waldheim (Camp Silverton) on the South Fork. Even though there are currently no RV hookups on the south side, Waldheim could be developed for tent, trailer, and RV (with hookups) and Gold Basin can handle trailers. Each would have flush toilets, drinking water, showers, as well as the tent/trailer sites. With the opening of those two campgrounds, traffic would probably increase dramatically throughout the year. More of that traffic would get to Barlow Pass and beyond (probably because of the newly		

Comment	Meeting Attended	Date Received
paved road). Tourists and outdoor recreationists would increase which would bring a welcomed economic boost to both Granite Falls and Darrington. The safety along the Mountain Loop I think has been engineered well. Problems (crashes) due to driver error/inexperience (driving in snow, DUI, distracted driving, etc) hopefully would be at or better than the countywide average. Signage for safety on the existing hard surface seems to be adequate. Appropriate signage on the newly paved section would hopefully be heeded by all drivers. Existing 45 mph on the current paved areas seems about right. For the newly paved area, a 25 mph speed would be about right, with signs warning of the need to reduce speed.		
Thanks for providing the presentation earlier this evening and for sharing some thoughts afterward. It was really nice to see some of the data and statistics going into the evaluation - it's fine for folks to disagree, as long as they do it based on facts. I currently serve as the chairperson of the Granite Falls Planning Commission, vice-President of the League of Snohomish County Heritage Organizations (LOSCHO), and a commissioner of the Snohomish County Historic Preservation Commission. Thus far, the data I've seen supports the conclusion that maintenance would be noticeably lower for a paved road than it would for a gravel road (assuming they are maintained to like standards). Little of that data was shown this evening, but I do have copies of some of that data which was shared in 2015 and 2016 in Darrington during discussions leading up to this project study. I believe that paving also reduces some of the potential environmental hazards to the river - that point needs to be made in the report, if true. That said, I favor Opt #2, a 25mph speed limit standard (quite consistent behind the idea of a "scenic byway"), with the addition of turn-outs in the case(s) of horizontal curves that cannot be practically addressed, and turn-outs at each end of necessarily narrow sections. In both cases, signage would be appropriate :-) For maintenance reasons, I would prefer it to be paved, although that in no way (in my mind) implies year-round operation. I believe the primary driving force behind paving the 14 miles is to enhance tourism, and until we somehow saturate the winter season tourism/recreational opportunities along the already-paved portions, there's no driving reason to open the Loop in the winter any more than it is opened now. Along the paved portions, there are several places where additional trail-head parking would vastly improve the traffic flow, safety, and enjoyment of the Loop. At this point, cars parked on the roadside represent unnecessary hazard. Just for your enjoyment, you might visit the "Mountain Loop Tour"	Granite Falls	3/6/2019

Comment	Meeting Attended	Date Received
available online at "Mountain Loop Tour". If nothing else, you can click on the historic site at about MP 15 to see why those sharp turns exist (and cause so many accidents). If you choose from the list, it's called "tunnel 7". Again, thanks for the work being done, and if there's anything we can do, please don't hesitate to ask.		
I strongly support Option 2B with 25 mph design speed following the existing road with modest improvements to alignment and profile and asphalt surfacing at a width of 18-32 feet. Having the MLH paved would 1) improve safety 2) increase access to recreation 3) improve emergency response 4) improve economic activity for Darrington.	Darrington	3/8/2019
I've been recreating on the MLH since 1991, probably 150 trips since then for whitewater boating and hiking. Most of this is between Darrington and Bedal campground. I'm a local resident since 2018. I'm concerned about access during construction of a paved road - closures and delays. The MF Snoqualmie Road was closed some weekends because of equipment vandalism. I am concerned that paving will be detrimental to the wilderness experience and the Town of Darrington. Don't want to see increase traffic on the MLH.	Darrington	3/8/2019
This is an incredible, beautiful scenic highway that everyone should have access to. Having a 25 MPH paved highway will open up opportunities for all to be able to drive through!	Darrington	3/8/2019
I travel the corridor dozens of times a year to do volunteer road maintenance of recreation, hiking, mushroom hunting, camping. I favor paving to a 25 MPH standard. We need to assess the economic value of a paved road to Darrington.	Darrington	3/8/2019
I enjoy scenic drives, hiking, and photography. I get tired of the dust and potholes and I would love to see this road paved including a turnaround at the White Chuck Road (#23) junction and winter gate at Barlow and Bedal to allow the road to be plowed for winter recreation. Design the road using option 2. Plow for winter recreation up to the winter gates, making access beyond the gate for winter recreation. Where there are problem areas such as Chockwich and Gravel Creeks, incorporate fords with box culverts, possibly keep gravel. Enhance the driving experience by adding viewpoints to see Perry Creek Falls, Forgotten Mountain, and other vistas. Plan for pullouts for future picnic areas (not build them but a plan where future sites can be).	Darrington	3/8/2019

Comment	Meeting Attended	Date Received
Option 2 paved 25 MPH or less	Darrington	3/8/2019
First I live 4 miles from Bedal Campground. In 18+ years I estimate 30,000 miles driven on the dirt section from White Chuck to Bedal. The prospect of paving that section of the road is attractive. The road today is very difficult. No snow removal and very potholed. Vehicle maintenance is a huge issue. Speed on a narrow paved road is obviously an issue but variable speed warnings seem logical. A question I have is about winter maintenance. At least to Reeces Hideout, our home. Economically this would help Darrington by increased volume during the good weather months. This is totally a viable option in my opinion. The other side of the coin is this will bring many more people who have no business in the mountains, because of only having lived in a city. I am willing to give any feedback that you would like, so contact me.	Darrington	3/8/2019
Live in Verlot - People need more parking on roads - summer to winter. Open MLH up to the ice caves - people want to play in snow - fish?	Granite Falls	3/7/2019
In the Spring, Summer, and Fall we travel the MLH 2-3 times a month. We would like to see Option 1 or 2 as a solution to the gravel portion. Since we travel this road regularly, we would enjoy a smoother ride. We would like to see this road maintained to be able to have easier access.	Granite Falls	3/7/2019
I enjoy being able to drive the MLH from Spring through mid-September but by then the ruts and potholes and wash boarding are too much for my little car. I would support option 1 of grading and improving the gravel portion as a minimum. Then option 2 where feasible as funds become available. The argument that improving the gravel portion will adversely impact Darrington is false thinking since most people come from the south of Everett. There will be more people who will continue north from Barlow Pass and likely to eat and shop up in Darrington than do now. I'm curious how your standard metrics for improving a roadway apply here since in reality we now have 2 dead end roads at the gravel portion. At the dividing/end points vs creating a new/accessible long road by doing even option 1 and making it more driver friendly.	Granite Falls	3/7/2019
My use: drive the loop to Darrington; picnic; fish; camp; photograph; recreation	Granite Falls	3/7/2019

Comment	Meeting Attended	Date Received
Live in Granite Falls, have a cabin at Silverton; travel there and beyond at least weekly to bike, hike, camp… at times backpack for multi-day trips. Option 1 I heavily support; to improve and keep up the 14 mile gravel roadway. Funding is and has been the primary problem.. just too many different agencies... historically the corridor has been poorly maintained.	Granite Falls	3/7/2019
I support option 1	Granite Falls	3/7/2019
Option 0 - do nothing, or option 1 would be our 'vote'. Save the money to maintain the current road and mitigate environmental impacts.	Granite Falls	3/7/2019
I enjoy hiking and scrambling the various mountain peaks of MLH. I also belong to SCVSAR (Snohomish County Volunteer Search and Rescue) so I have used the MLH to get to search missions as well. I have driven at night and in the rain on the highway. So I understand the need to make the gravel and crown improvements. I would rather see roads like NF-49 open fully to allow deeper hiking and access to help for search and rescue missions versus paving this section of the MLH. Since there's always landslide cleanup it seems to be easier and cheaper to do that for a gravel road versus paved.	Granite Falls	3/7/2019
Please include my comments in the official record. Please do not pave the entire unpaved portion. Make limited fixes to washout areas, and leave the rest to enjoy. We have plenty of roads that whoosh through forests at high speed with major clear cuts along the road, but this stretch is a rare opportunity for "car hiking" for less athletic people. Now you can just put the windows down and roll along slowly enjoying the beauty of the area, every bit as much as a hiker would. A "highway" would ruin it for people (and wildlife, and other aspects of the environment). Not everyone can do a several mile hike into the wilds, but most can put the windows down and "car hike" this beautiful stretch of "wilderness". I am sure that "car hiking" for everyone can be a better tourism and recreation draw than a clear cut highway duplicating many existing roads	Darrington	3/14/2019



OUTREACH SUMMARY REPORT: PUBLIC MEETING SERIES 3

Mountain Loop Highway Feasibility Study
WA SNOHOMISH 20(1)
IDIQ Contract No. DTFH70-15-D-00007
Task Order No. 69056718F000005

U.S. Department
of Transportation
Federal Highway Administration

Prepared for:
WESTERN FEDERAL LANDS HIGHWAY DIVISION

December 2019

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Seattle, Washington

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Exhibits

OUTREACH SUMMARY REPORT: PUBLIC MEETING SERIES 3

1.0 INTRODUCTION

The Federal Highway Administration (FHWA), in partnership with Snohomish County and the U.S. Forest Service (USFS), is developing a feasibility study of the Mountain Loop Highway (MLH) between the communities of Granite Falls, WA and Darrington, WA. The Mountain Loop Highway Feasibility Study (Study) will be a collaborative process among FHWA, the USFS, Snohomish County, the Town of Darrington, the City of Granite Falls, resource agencies, and the public.

The Study's intent is to identify feasible improvement options to enhance access to recreational opportunities, while also improving operational safety and reducing maintenance. The Study will examine geometric characteristics, crash history, and existing and projected operational characteristics of the corridor. Existing and projected physical constraints, land uses, recreational and economic opportunities, funding constraints, and environmental resources will also be analyzed. A key outcome of the Study will be the development of short- and long-term recommendations intended to address the access, maintenance, and transportation needs of the MLH over the planning horizon (year 2038). These recommendations will assist the study partners in targeting the most critical needs and allocation of resources.

Education and outreach are essential elements in successfully informing individuals about the planning process and soliciting feedback on the Study outcomes. The goal of the Study's public outreach effort is to ensure that the public, stakeholders, and other interested parties are engaged in all phases of the corridor planning process. As outlined in the Study's Public Involvement Plan (PIP), three sets of informational meetings are to be held in both Darrington and Granite Falls.

This document summarizes the public comment received at the third set of informational meetings for the Study.

2.0 MEETING LOCATIONS

The third set of informational meetings provided members of the public the opportunity to review the draft Study and learn about the next steps for the project following the completion of the Study. A formal presentation was given at the beginning of each meeting, followed by question and answer. Duplicate meetings were held in the following locations in Granite Falls and Darrington, allowing for easier attendance by interested parties at either end of the MLH:

Granite Falls (November 6, 2019, 5:30–7:30 p.m.)

Granite Falls Middle School, Multipurpose Room
405 N Alder Avenue, Granite Falls, WA 98252

Darrington (November 7, 2019, 5:30–7:30 p.m.)

Darrington Community Center
570 Sauk Avenue, Darrington, WA 98241

3.0 STAKEHOLDER AND GENERAL PUBLIC NOTIFICATION METHODS

The MLH Feasibility Study encourages active participation on the part of stakeholders and the public in identifying and commenting on study issues at every stage of the planning process. To effectively notify interested parties about the opportunity to comment during the first set of informational meetings, several notification methods were employed:

- Study partners coordinated with the Everett Daily Herald to print display advertisements of the informational meetings, printed in editions on October 24 and November 3.
- Postcard meeting invitations were mailed to property owners directly adjacent to the MLH corridor. A total of 195 households were mailed postcards.
- Meeting information was posted on the Daily Herald of Everett, WA online community calendar at https://www.heraldnet.com/calendar/.
- Meeting information was posted to the MLH Feasibility Study Project website at https://flh.fhwa.dot.gov/projects/wa/mountain-loop/.
- Study stakeholders, outlined in the PIP, were emailed postcard meeting invitations and were encouraged to further distribute information through their mailing lists and interested parties.
- Interested parties that had requested their names be added to the email mailing list were emailed the postcard meeting invitation.
- A meeting notification press release was distributed to the Daily Herald.

On November 5, an article was published in the Daily Herald that summarized the efforts of the Study so far and included information on the public meetings.

4.0 SUMMARY OF PARTICIPATION AND COMMENTS

Thirty-four attendees signed the attendance sheet at the Granite Falls informational meeting and 32 attendees signed in at the meeting in Darrington. Attendees represented the following groups:

- Pilchuck Audubon Society
- Mountain Loop Conservancy
- Washington State House of Representatives
- Snohomish County
- Granite Falls Historical Society
- League of Snohomish Heritage Organization
- Snohomish County Fire District
- Washington State Republican Party
- Darrington Area Resource Advocates
- USFS
- Town of Darrington
- River Resource Trust
- North Cascades Conservation Council

In addition to the above-referenced groups, residents and community members from and near both Granite Falls and Darrington attended the meetings.

Fourteen written comments were received during the meeting in Granite Falls and thirteen were received during the meeting in Darrington. Twenty-one comments were received via email following the meetings. In general, comments provided preferences for the potential improvement options as well as reactions to the draft Study.

4.1 GRANITE FALLS

Exhibit 1 summarizes the preferences for improvement options that were received from written comments. Option 2: Minor Roadway and Drainage Improvements received the highest number of comments in favor, followed by Option 1: Maintain Status Quo and Option 3: 25 MPH Design Speed Gravel. There was generally no support for Option 4: 40 MPH Design Speed. Many of the comments also indicated a desire to complete spot improvements and improve maintenance along the corridor. Many commenters also indicated the importance of protecting the natural environment and providing adequate recreational access.

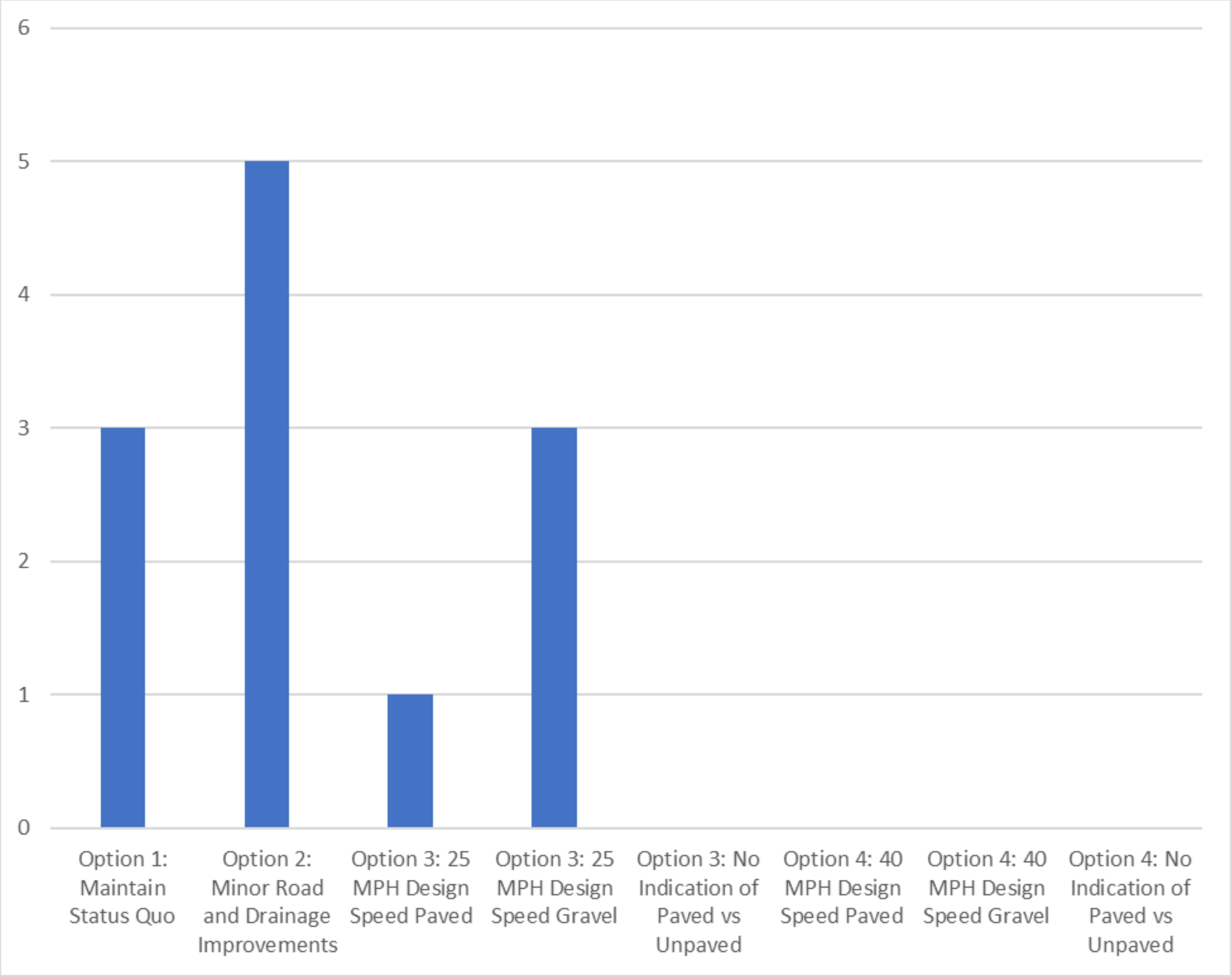

Exhibit 1. Comments Received by Improvement Option Preference, November 6, 2019 Granite Falls Informational Meeting 3

4.2 DARRINGTON

Exhibit 2 summarizes the preferences for improvement options that were received from written comments in Darrington. Option 3: 25 MPH Design Speed Paved received the highest number of comments in favor, followed closely by Option 2: Minor Roadway and Drainage Improvements. Comments also include a desire to protect the rural feel of the roadway and prevent speeding along the corridor. Many commenters also indicated their support of spot improvements along the corridor.

Commenters also indicated concern for environmental protection, long-term maintenance, and safety in the corridor.

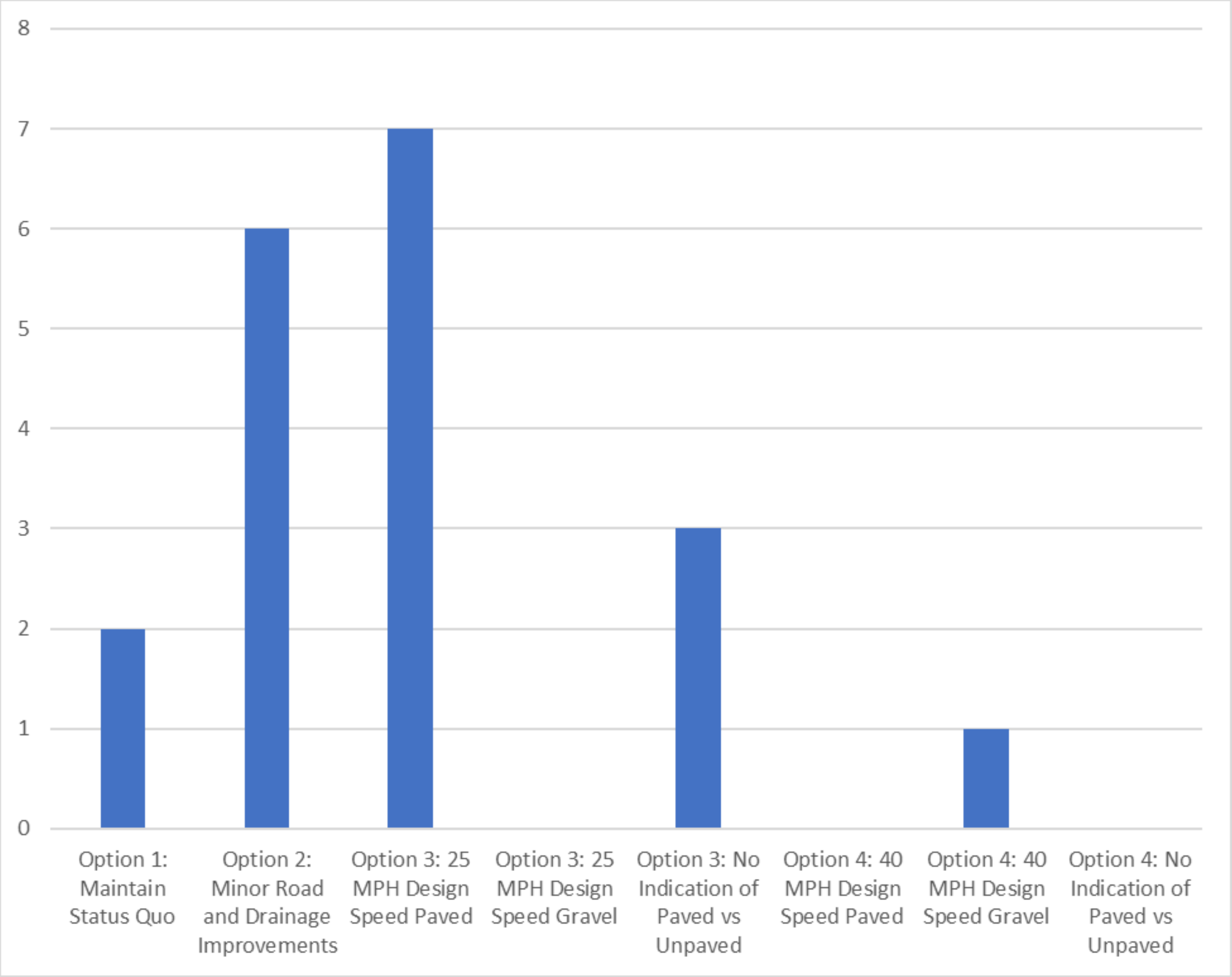

Exhibit 2. Comments Received by Improvement Option Preference, November 7, 2019 Darrington Informational Meeting 3

4.3 EMAIL COMMENTS

Comments received via email indicated a preference for Option 2: Minor Roadway and Drainage Improvements and Option 3: 25 MPH Design Speed (no indication of paved vs gravel). This was followed closely by a preference for Option 1: Maintain the Status Quo and Option 3: 25 MPH Design Speed Gravel.

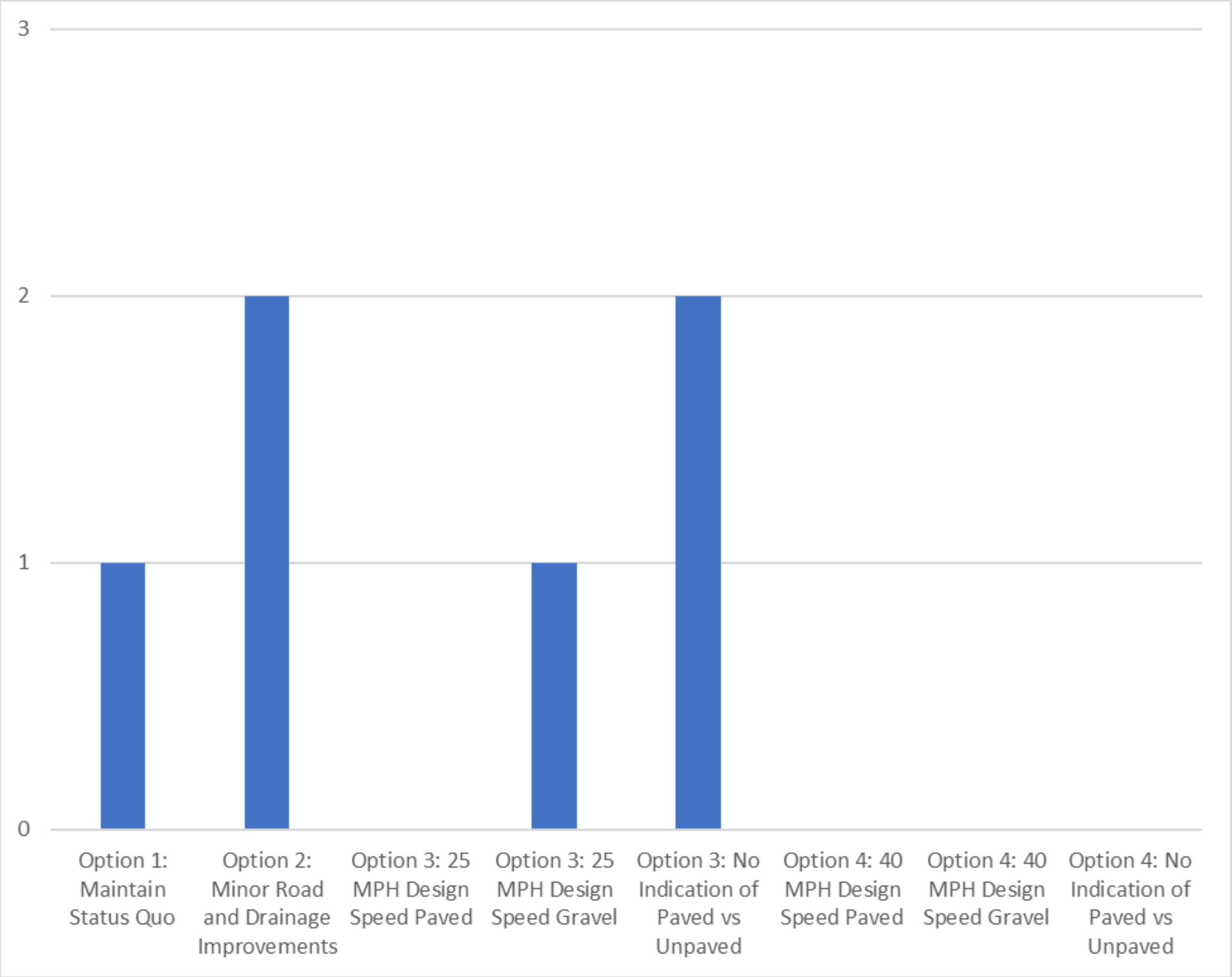

Exhibit 3. Comments Received by Improvement Option Preference by Email

Mountain Loop Project Comment Sheet

Category of Comment *Environmental, Transportation, Recreational, Health?*	**Comment ID**	**Comment**	**Name/Organization**	**Date**	**Community**
	1	"Our initial concerns include runoff from the paving project, culverting, and increased visitor impact on road and river side. What impacts will there be on increased traffic to the current bridge project across the Stillaguamish river east of Granite Falls?"	Mountain Loop Conservancy (Paul Sheppard, President)	28-Feb-18	
	2	Whether or not paving the gravel road section from Barlow Pass north to the White Chuck River crossing will a) enhance recreational opportunities b) improve highway road safety and c) reduce highway/road maintenance cost	Ed Henderson, North Cascades	7-Mar-18	
	3	The study area of the Mountain Loop Highway (MLH) between Verlot and Darrington should be broken down into three distinct segments: Verlot to Barlow Pass, Barlow Pass to the White Chuck River crossing and finally from the White Chuck River crossing on into Darrington	Ed Henderson, North Cascades	7-Mar-18	
	4	For enhancing recreational opportunities: Well, everyone is, The Federal Lands Access Program (FLAP) application, which is funding this study, states that the MLH corridor is a heavily used recreational area. Before dumping more users into the area, what is the current usage?	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	5	Identify campgrounds, locations (milepost on MLH), and number of campsites.	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	6	Usage of campgrounds, percentage of capacity occupied? When?	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	7	Parking facilites, location, capacity, usage (percentage occupied, week, day and weekend) (The Barlow Pass parking lot is notoriously overcrowded with parked cars down both sides of the road.)	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	8	Location of trailheads with associated parking facilities	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	9	Location of dispersed camping,	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	10	Identify impacts from increasing "dispersed" camping along the MLH, including impacts to vegetation and public health risks due to lack of sanitary facilitiies at heavily used dispersed camping areas along the MLH.	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	11	Evaluate prohibiting dispersed camping within one-mile either side of the MLH.	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	12	Location of dispersed parking (roadside) for recreation access, fishing, hunting, river rafting, snowmobiling, etc?	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	13	Location of toilet facilitites, Maintenance scheduke, i.e. pumping of toilet vaults.	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	14	Identify Maintenance budgets for current recreational facilities	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	15	Plans for additional, new, facilities by Forest Service, Washington State, Snohomish County, private entities, others?	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	16	The estimated annual budget required to maintain any new recreational facilities and the source of the maintenance budget.	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	17	Any information on other recreational facilities, locations and usage that may be helpful in documenting current conditions.	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	18	For improving highway road safety: Well everyone is in favor of improving safety, but the scare numbers cited in the FLAP application are meaningless as stand alone data. Detailed information of each individual incident is required including but not limited to the period of January 1, 2000 until present.	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	19	Location, MLH milepost	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	20	Date and time of day, direction of travel	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	21	Number of vehicles involved, or type of collusion	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	22	Weather conditions	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	23	Condition of driver (was driver impaired by drugs or alcohol? Or just tired?)	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	24	Speed at accident, what was posted, safe speed at accident site?	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	25	Did the accident involve another vehicle, pedestrian, or fixed object?	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	26	Was the accident deemed minor, serious, or were there any injuries or fatalities?	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	27	Posted, safe speed on each segment and at specific locations requireing reduced speed.	Ed Henderson, North Cascades Conservation Council	7-Mar-18	

Category of Comment *Environmental, Transportation, Recreational, Health?*	**Comment ID**	**Comment**	**Name/Organization**	**Date**	**Community**
	28	General information pertaining to traffic speed and volume on each segment of the MLH.	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	29	How does this compare with similar roads? Such as U.S. #2 or State Route 530.	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	30	From personal experience, driving the paved segment from Verlot to Barlow Pass there are a number of "choke points" where sharp turns, narrow bridges or steep grades require a decrease in speed. These should be identified by MLH milepost.	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	31	To reduce highway maintenance cost by paving: Once again the current conditions must be cataloged.	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	32	What segment by milepost in annually closed by snow? Dates? Cost of snow plowing to reopen the road in the spring including removal of downed trees.	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	33	What is the current maintenance cost per mile of the gravel segment and what is the comparable cost per mile on the paved segments? How much of this is actually spent, by whom, what agencies? And how much is deferred?	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	34	What maintenance cost would be eliminated or reduced by paving?	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	35	What new maintenance cost would be incurred by paving?	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	36	What is the estimated cost of paving? Including design and environmental studies?	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	37	These questions are not intended to be complete, comprehensive, exhaustive or final. I am certain as the study progresses other issues will emerge requireing examination and evaluation.	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	38	You stated on March 7th, that the Feasibility Study seeks to answer three questions, on enhanced recreational opportunties, improved highway safety and reduced maintenance cost. The goal of the study ignores the elephant in the room! Commercial interest in both Darrington and Granite Falls have long lobbied for paving the gravel segment of the MLH believing such a road will increase tourist traffic and be an economic boon to their communities. Will the Feasibility Study address this very pertienent issue?	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	39	Thank you for your attention to the foregoing issues and questions in this letter and your response at the stakeholder's meeting	Ed Henderson, North Cascades Conservation Council	7-Mar-18	
	40	Jeff as verbally discussed at the March 7, 2018 Stakeholder's meeting, can you furnish early next week pdf copies of: 1. The attendee sign-up sheet for the March 7,2018 meeting; 2. The signed, dated and complete copy of the FLAP application; and 3. RPA consultant agreement and Parametrix sub-consultant agreement with FHWA/WFLHD including the Agreement, Scope of Work, List of Deliverables, and the project budget. Also, in the event that in the future, there are any amendments to above referenced consultant, it is requested that copies of those amendments also be passed along too. Thank you for your prompt attention to this request.	William (Bill) Lider, PR, CESCL Lider Engineering, PLLC	9-Mar-18	
	41	Hello Bill. I just sent out an email to the group that takes care of your numbers 1 and 2. Let me know if you do not receive the materials for whatever reason. Regarding number 3, I am not able to send the requested information to you. You could pursue this information through a FOIA request should you so desire. I am not familliar with that proccess however I'm guessing you are.	Jeff Key, PE President/Senior Project Manager Robert Peccia & Associate Inc.	13-Mar-18	
	42	I am currently reviewing the FLAP application, but one item that jumps out at me is why Sherriff Trenary's letter supporting the Index-Galena Road was included in this FLAP application for the MLH? The Index-Galena Road has nothing to do with the Mountain Loop Highway and it is doubtful that the Sherriff's Department has the deputies available to patrol this remote stretch of road. I will pursue the request for your agreement with FHWA/WFLHD via FOIA.	William (Bill) Lider, PR, CESCL Lider Engineering, PLLC	14-Mar-18	
	43	The King County sheriffs, more lavishly funded than SnoCo's, has stated flatly and unequivocally that they cannot and will not be patrolling the newly paved Middle Fork Snoqualmie road. We are duced to trying to raise money to hire overtime officers to get at least some weekend patrols. But we gotta pay for it. There will be no official law enforecement on the N Fk Sky other than maybe a once a month (if we are lucky,) drive up and back by a Forest Service LEO.	Rick McGuire	14-Mar-18	
	44	I have walked, biked, skiied, camped on the mt. loop for a half century…it is imperative that the road stays open; I prefer the route to be traveled and closed for the snow months…but am not averse to it being paved; what concerns me is that an interest in the road and the back country be kept in the public eye. One possible solution is a bike route or a route open on certain days only for bikes. The road as it stands today is certainly acceptable. Of late, the route up to Barlow Pass has grown in its use; witness the LF 22 trail head on any weekend day. The county has only one mt. pass route, one to revere and keep.	Ray Hanby	20-Aug-18	granite falls
	45	Live there and work near. -Providing a way out for families stuck up the loop. -Economic equality (structure) -Devel. Of GF - - looking forward -Access to services for all	E Panagos	20-Aug-18	granite falls
	46	I mostly hike and camp. I like the little camp spots along the river off the unpaved section and my concern is that paving the road would make the speeds faster and possibly eliminate those spots by widening the road. I balance that with the convenience of going to Darrington as an alternative to Hwy 530. If it were widened and paved would it be open all year around? There is a lot of snow and cold that would be an expensive challenge. I don't know that having to repair it every spring would be more expensive than the current gravel road.	Kevin McClow	20-Aug-18	granite falls
	47	50 years ago, I worked summers at the Forest Service in Verlot, WA. Mostly, I worked on trails and was able to see the beautiful lakes and scenery in the area. I still enjoy driving up the Mountain Loop Hwy but only a few times do I drive from Granite Falls to Darrington because of the poor condition of the road beyond Barlow Pass. I would like to see improvements to the general portion of the road beyond Barlow Pass. Widening and paving of the road would open up the area to more people who may not venture beyond Barlow Pass because of the road condition. If not widening and paving the entire stretch, a portion may be easier to widen and pave from the Darrington side where the pavement now ends.	Gil Winje	20-Aug-18	granite falls

Category of Comment *Environmental, Transportation, Recreational, Health?*	**Comment ID**	**Comment**	**Name/Organization**	**Date**	**Community**
	48	I have enjoyed motorized recreation, site seeing and trail hiking up the Mtn. Loop Hwy since the 1980's. I have always enjoyed the views from mtn peaks. I enjoyed the Stillaquamish River and the Sauk River. I enjoy a leisurely drive from Granite Falls to Darrington and back many times a year. Being a planning commissioner for the City of Granite Falls, we have watched our tourism start to decline because of lack of maintenance. We would like to see the speed limit lowered for better viewing, safety to pedestrians and bikes. Also to allow for WATV's. It is a great alternate route for the City of Darrington. I will email some more ideas that you will be able to read.	Christopher Marsh	20-Aug-18	granite falls
	49	I've lived near MP4 on SR92 for 38 years and have gone on frequent trips out on the Mountain Loop Highway into the Mt Baker - Snoqualmie NF all the time. I would like to email my comments - handwriting is difficult.	Tom Thorleifson	20-Aug-18	granite falls
	50	The Mt. Loop Hwy represents the finest focal point for "Historical Tourism" in Snohomish County. If paved (for both maintenance and ease-of-travel issues), it needn't be widened into a full-width two-lane highway. It could be a 30mph scenic drive with turnouts and markers for both historical and environmental points of interest. The closure of Gold Basin Campground near Verlot has been and environmental nightmare for the Loop! Camping will continue unabated and uncontrolled - the natural beauty guarantees that! Good road, low speed limits, toilets, and planned camping will attract folks who appreciate the history and the environment. A "gentle" Mt. Loop Hwy would make a great educational and entertainment/relaxation tool. Keep the narrow bridges, leave most bends, set a low speed limit, add a "rest stop" between Barlow Pass and Darrington...then harvest the good will of tourists. Winter closure expected!	Fred Cruger	20-Aug-18	granite falls
	51	I go hiking, scenic drives, picnics, photography. The roadbed is increasingly getting worse with potholes, washboarding, dust and mud. This road sees very high use for gravel (part gravel) road and not maintained to standards. I'm finding I drive this road less because it has become less enjoyable due to the condition of the road. Last time I was on the Mountain Loop I got a flat tire. I think the Loop is a bigger destination than it currently is. I know that many do not drive the complete road because of the gravel portion.	Martha Rasmussen	21-Aug-18	Darrington
	52	I live in Darrington and volunteer on forest roads through Friends for Public Use, a division of Darrington Strong, Inc. I've spent many hours picking up trash, clearing ditches and culverts and cutting out down trees on the Mountain Loop Hwy and the many side roads north of Barlow Pass that visitors use to access outdoor recreation off the Mountain Loop. I'm excited about the possibility of paving the Mountain Loop because I can foresee that leading to increasing access to winter recreation like cross country skiing, snow-shoeing and sledding. I also believe that it will cut down on the amount of maintenance the road overall will need.	Nels Rasmussen	21-Aug-18	Darrington
	53	I am against improvement of the Mountain Loop that involves paving. I say this because from my perspective its improvement could hinder the economy of Darrington. As it stands now most drivers spend several hours driving the loop, this lands them in Darrington looking for food, gas, and refreshment. If the Mountain Loop was paved I believe travelers would be more likely to pass by Darrington. The second reason I am against improvement is the impact increased traffic could have on the environment. More cars mean more people, trash, and infrastructure. As it stands now the 14 mile section between Verlot and Clear Creek is fairly remote. I would hate to see a beautiful stretch of land become polluted and abused by those who will not have to live in the mess.	Oliver Rankin	21-Aug-18	Darrington
Transportation ?	54	Cost to communities (Darrington). Taxes - safety (fire dept/medical), increase in fatalities w/speed. The unwalkability of one lane rds w/today's ex large vehicles and trailers. The incraese of development thus more taxes, risk to the infrastructure and environment. Loss of law enforcement in our community because of 60% increase in vandalism and theft.	Randy Rankin	21-Aug-18	Darrington
	55	*I have lived in Darrington since 1993 and have completed "the loop" 3 times in that time. *It is a beautiful drive but the 14 miles of unpaved section make it unbearable. *That section needs to be paved. The economic boost on the Mount Loop Highway would benefit Darrington and Granite Falls. *Also, another evacuation route out of town would have been a help during the road closure between Arlington and Darrington. I cannot think of one reason not to pave that portion of the road. The cost will be worth it. I would like more information on project timeline and potential cost. I hope it gets done before 2038. Thank you.	Marree Perrault	21-Aug-18	Darrington
Environmental, Transportation, Recreational	56	Please recognize that Seattle area residents do not need another Highway style loop road. There are many. This loop is valuable for its low speed, close to nature feel. (Like hiking for old folks and others who can't do 10 mile hikes). "Car hiking." Please improve safety and maintenance, but don't cut large tree buffers.	Lora Petso	21-Aug-18	Darrington
Transportation, Health	57	Gravel portion is not adequate to handle current traffic load. Continued Forest Service maintenance with their meager budget means other road systems get no attention. There are full time residences accessed by road, should be Sno Co responsibility. Paving would massively reduce dust, both a safety issue and that all goes into the Sauk. Paving would reduce sediment that flows into Sauk.	Paul Wagner	21-Aug-18	Darrington
	58	Jeff, I have a suggestion for the next public meeting. I suggest the next meeting format be a question and answer type forum. That way everybody hears all the questions and concerns and can respond. I know, from having attended many meetings here in town, that most of our people prefer the old fashioned question an and answer type of meeting.	Kevin Ashe	22-Aug-18	Darrington
Transportation, Recreational	59	Hello, my name is JoAnn Milton from Darrington, WA. I am the Vice-President of Darrington Strong, Chairman of the Darrington Street Fair, among other activities. I would like to put my comments in about the Feasibility study. A.) I have lived here for 5 years. The road has been in its present condition since I have lived here. I do not know the impact of having it open all year and being paved. B.) What I do feel about the road being paved: 1.) I am a photographer, my daughter and I hike in the woods and shoot nature at its finest. We park our truck on the unpaved portion, hike in. On several occasions we have ran into the black bears, we do not carry food, just our cameras. The bears just look at us and move on, as we let them have their room. My concern is now that the road has been unpaved for many years they are quite comfortable walking on the unpaved road, it will be very troubling for all the animals to have their part of the forest being invaded by machines and paving and then traffic. With traffic comes the speeders, (of course) and with the bears and other animals that will be in their path, someone is bound to get hurt. Not a good outcome. We can't stop the speeders, and we can't stop the animals coming out and walking on what they consider their woods. I would like to keep it unpaved for humans and animals safety. 2.) Before I moved up here my friends and I would ride our snowmobiles up here during the winter and in the Spring and fall, we would ride our atv's up here. So I enjoyed the recreation aspects of the area. If the road is paved then we would like to see more recreation areas opened up for us snowmobiles and atv's 3.) It is beautiful up here. I like it the way it is right now. less traffic on the road is not a bad situation. In Darrington and the surrounding area, we are creative and invite people up here for street fairs and other activities and then the town makes their money and the visitors have a nice visit and can go back home. We have our town back and less traffic. Thank you for reading by opinion I appreciate you taking the time. JoAnn Milton Darrington Resident 360-399-8037	JoAnn Milton	21-Aug-18	Darrington
	60	My name is Randy Bevan, My Email address is randybevan@msn.com. I am against some of the improvements I have heard about thru the grapevine. Paving this road would be a huge waste of money and draw in the wrong crowds to the forest. The gravel section of the MLH is NOT where the recreational opportunities are. We should spend our money on existing trail heads (where you have "NO parking" signs along the roads) I just took a drive up MLH yesterday to visit the river on a hot summer day. There was NO access points anywhere for me to park with my family and enjoy the river. With a growing population in the area we need to take care of and expand our existing facilities and not open up another huge can of worms by opening up more areas even more remote. We must also remember that if decided to pave the MLH we would need full time law enforcement out there because I can guarantee you will be attracting the wrong crowds out that way. My vote would be to spend money taking care of what we already have, upgrading those facilities, add some public picnic areas and river access areas, and leave the gravel section of road alone for a more remote and wilderness type experience, but maybe look into more continual maintenance of the gravel road. For what it would cost to pave, I would bet that section could be taken care of for years to come, and be a much less financial impact. I have a lot more to offer as I have spent most of my life up the MLH, and hate to see it ruined by overpopulation, and turning it into a major highway. We already have way too much crime out there, don't add to it. Respectfully -Randy Bevan	Randy Bevan	13-Aug-18	

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	61	Greenhouse gas emissions: It was interesting to learn that one of the stated objectives of the National Scenic Byways Program is to "Meet the growing demand of driving for pleasure as a significant recreation use." Given that this highway designation dates to 1961, we question the appropriateness of this purpose today. Many communities and even the State of California are working towards reduction or outright elimination of fossil fuel consumption for the benefit of all forms of life on this earth (including ours) as we know it. At least until far-ranging electric automobiles are in common use by the majority of the population, driving purely for pleasure should not be encouraged. The mere existence of a desire or "demand" does not necessarily mean that it should be met. We suggest that it is time to update the goals of the National Scenic Byways Program. The ES (p.11) mentions evaluation of "greenhouse gas emissions that may result from project construction, operation, and maintenance" but not the increased emissions expected from the increased use that is a desired outcome of the proposal. This information should be included in the formal environmental analysis of any project that results from this study. Soils/Geologic hazards: In the discussion of soil resources, the EA (p. 3) asserts that soils data is lacking from the National Forest lands. The US Forest Service (USFS) commonly uses soil maps in their environmental analyses of proposed projects. Was the USFS contacted for this information? Was the Federal Highway Administration made aware of the area locally known as "The Sinkhole" near Camp Silverton? The ES does mention (p.4) "sunken or broken road beds," but you should be aware of this location in particular, which is so mobile that Snohomish County wisely stopped resurfacing it with pavement decades ago. In fact, there was until recent years an informational sign at the location. Any proposal for adding pavement to this highway should incorporate pervious materials wherever possible, in order to reduce runoff of toxic materials and stormwater. In many locations along the highway, such runoff would directly enter important rivers or creeks. If gravel surfacing is to be replaced, utilization of pervious pavement would be responsive to the Snohomish County Code provision requiring minimization of impervious surfaces within landslide hazard areas. Northwest Forest Plan compliance: We were pleased to see the attention paid by the ES to the relevant Northwest Forest Plan provisions. As noted, both the Late Successional Reserve designation and Aquatic Conservation Strategy Objectives pertaining to Riparian Reserves mandate minimization of road construction. Most if not all of the study area falls within one or both of these categories. In addition, the Tier 1 Key watershed designation that incorporates the entire study area includes the guideline to reduce road mileage. Wildlife: It is difficult to imagine any proposal for the Mountain Loop Highway that would not adversely impact the numerous species listed under the Endangered Species Act, or their designated Critical Habitat, in the study area. Even permanent road closure would involve some short-term impacts from deconstruction activities. It is imperative that any proposal generated by this study include a rigorous analysis of impacts to the Northern spotted owl, Marbled murrelet, Chinook salmon, Steelhead trout, and Bull trout; as well as Gray wolf and Grizzly bear. Deleterious effects on migratory birds must also be avoided, by law. As noted in the ES, there are many other species of concern in the area which must be considered prior to any work on the highway. It is imperative that this evaluation include current survey data for relevant species. Social and Economic effects: We urge you to consider data on sales tax receipts during past episodes of road closure due to washouts in analysis of the economic effects of the Mountain Loop Highway. Such data for the period when the highway was closed between 2003 and 2008 show level to increased, not reduced, receipts for both Darrington and Granite Falls. Thus, any presumed economic benefit to the local communities of increased traffic on the road is suspect, at best. Conclusion: Thank you for the opportunity to provide these comments. We look forward to continuing to work with you regarding this project.	Kathy Johnson, Pilchuk Audobon Society	9/17/2018	Darrington
Transportation	62	Dear Mr. Traffalis, Thank you very much for the presentation by your team at the Darrington Community Center on March 7th, 2019. As a Darrington resident and as one who enjoys access to the many trails and other recreational opportunities along the Mountain Loop Highway corridor, I would like to offer my view of the best option to pursue for the Mountain Loop Highway. (MLH) I strongly favor Option 2 - 25 mph Design Speed • Follows the existing road • Modest improvements to existing alignment and profile • Asphalt surfacing (not gravel) • 18 - 32 feet in width With regard to the section of the MLH that has the river on one side and a steep cliff on the other side, I think the best option there is to maintain the current width for single lane traffic, make modest improvements and pave with asphalt. Clear signage visible from both directions can alert drivers to yield to oncoming traffic as it is a one lane section. (White Chuck River Bridge south of Darrington as model) I favor Option 2 with Asphalt surfacing for these reasons: • It will improve highway safety • It will improve emergency response access to remote areas • It will increase recreational access to the MLH corridor • It will bring more tourism business to the Darrington area • It will improve emergency evacuation options • It will greatly reduce airborne dust that is a health hazard • It will greatly reduce dust that settles on vegetation close to the MLH In addition to the highway improvements planned with Option 2, I believe it would be beneficial to harvest some of the trees close to the MLH for these reasons: • To improve long term maintenance of the highway surface • To improve the view of the mountains throughout the MLH corridor • To allow more sunlight to reach the highway surface to reduce black ice Please add my email address to your contact list for updates on the MLH.	Stephen Somsen	3/11/2019	darrington
Transportaiton	63	Good afternoon, Thank you for your presence at the meeting last night. I noticed all accidents occurred on the pavement. Based on the increased paved areas, how many more accidents (fatal and nonfatal) would be added by paving this section? This would be based upon current levels of traffic. Sorry for my apathy towards the project. I am told frequently told this narrative of tourism and paving roads as a solution for our rural community, but I have not found an example of the benefit that these people refer to. For the economic viewpoint, there is not one rural community in close proximity to a large urban area that has succeeded with the tourism model. I see more kids dying on the pavement and the majority of the economic benefit going to I5. The visitor buy everything in the city, drive the road, and go back to the city. Oakridge, Oregon is often cited by those claiming the benefits of tourism and a paved highway. Like Darrington, it is an amazing community, but it has the same struggles. I thank you for your time. If you can figure out a way to design the highway for logtrucks (those people actually make a living wage and volunteer in the community) as well as design it to minimize the death of local kids and have the tourists actually stop in town, that would be greatly appreciated. While I imagine you do not have an answer yet, I believe all of that is possible. If you find a way to involve local kids with your project, that would be great as well. We have few opportunities up here to exposed to careers and projects. Thanks for your work and have a wonderful weekend	Oak Rankin	3/8/2019	darrington

Category of Comment *Environmental, Transportation, Recreational, Health?*	**Comment ID**	**Comment**	**Name/Organization**	**Date**	**Community**
Safety	64	At the bottom is my feedback from the Granite Falls feasibility study meeting on Wednesday, March 6, 2019. I used the Mountain Loop area quite frequently when our children were growing up. We ventured into Darrington the back way only a few times, went to Monte Cristo a couple of times, but would annually go anywhere up the Mtn Loop to "find snow" where we could drive in, get stuck, play in the snow, then dig ourselves out and go home. We take all our visitors to the Big Four Ice Caves, for us several times a year (mostly in the summer). We have been in Black Chief Mine many times. We have explored some of the other mines in the area by just trying to find them, never going inside. We have gone on other short hikes on trails or just on a side logging road. We have obtained Christmas tree permits in the children's early years. We have hiked Mt. Pilchuck a couple of times. We have stopped at each camping site to look it over, but never have camped. We've picnicked in several areas and have picked up trash when found on the old logging roads and always cleaned up after ourselves ("pack it out"). We have never needed a tow, but have helped other people if they got stuck in the snow. As a teacher in the Everett School District, I was part of team each year for 14 years that took about 80-100 5th graders to Camp Silverton (Waldheim) for a 3-day, 2-night environmental experience. We had regular curriculum and also included hikes to Big Four, Marten Creek, Youth on Age, and Red Bridge (and Black Chief Mine). The school district closed Camp Silverton down in 2003 but did not return the lease to the USFS until years later. Waldheim is ready for redevelopment into a campground (water, septic, electricity, phone, and a few existing buildings remain. Students and teachers have lingering fond memories of the Mountain Loop and Camp Silverton, and would love to bring their families to the area to reminisce. I support paving the 14-mile gravel section. Do not keep the gravel surface. Pave the 14 miles. Keeping the gravel section sounds like it would continue to be more expensive. Being fiscally responsible is a very strong argument to pave it. Keep the existing roadway by using existing footprint, with only minor changes for road maintenance longevity and safety. No need to widen everything to the 25 mph standard. Getting to 25 mph standard isn't necessary, but might be a good guideline. Minimum environmental impact (some is needed, I'm sure, but try to minimize). Definitely do not use the 45 mph standard! Environmentally, paving would be better. Gravel from the roadway would not continually erode (slowly) into the river, nor would the dust choke the vegetation or pollute the air. The paving (and other necessary minor prep work) would make the road more stable. Even though this would probably increase traffic (especially in the summer months), the increased traffic would provide for more security of the area, specifically targeting those people who are not respectful or caring for our environment. Littering, vandalism, and destructive uses would probably decrease despite the increase in traffic because the individuals who have been ruining things would know that there are more people out and around, making a better chance of someone reporting them. I think the increased traffic would be people who would want to see the beauty of the wilderness and would have a stake in keeping it preserved (being careful themselves, reporting improper use, etc). Don't go overboard on signage, just the bare minimum for safety. Striping on the pavement edge ("fog line") might be good for safety. Center line striping probably would not help in the area when road widths are too narrow. No center line in the new section will let people know they are still in the 25 mph zone Design and maintenance: Be proactive by protecting road from river-curve washout. Protect road from rock/slides from steep cliffs (such as wire mesh coverings). Improve road width without major work (if an existing side can just be filled in without major culvert work or major environmental impact). Build up crown and whatever else is needed for proper drainage and safety for curves. Provide pullouts at each end of one-lane sections where possible, and pullouts for slower vehicles to pull over to allow others to pass (where needed and if possible). Keeping the Mtn Loop open throughout winter isn't important enough to outweigh the extra cost of plowing. However, having the possibility of plowing for emergency access during the winter would be beneficial. Winter closures would add to the wintertime wilderness allure for tourism/recreation, but maybe close the gates later in the year and open earlier because of snowplow capabilities along the new paved stretch. When it's time to gate the road, maybe plow further from each end towards Barlow Pass. Deer Creek has the nice parking area on the South Fork, but maybe try getting to Big Four for that larger paved lot. That would provide better access to winter sports, especially if there is minimal snow (lack of snowfall and/or early melt off) during the winter at or below MP 24. Usually there is much more snow the further east and the higher in elevation a person travels. If the gate is closed at Deer Creek and the roadway is bare, winter sports enthusiasts like snowmobilers, snowshoers, and cross-country skiers would benefit from having parking at Big Four available. If there is heavy snow, then the Mtn Loop can be closed at Deer Creek with no need to plow to Big Four because people can use the snow-covered highway to access places further up the highway. I'm not sure about the Darrington side if it would be beneficial to have a road closure further upstream along the Sauk. Tourism and recreation would benefit from paving the gravel. More people would use it on weekends, and probably more would use it during the week. Wintertime might see more snow visitors who can enjoy the wilderness, especially if parking at Big Four were available or Deer Creek parking could be improved. Other tourism and recreation benefits would be the opening of Gold Basin and Waldheim (Camp Silverton) on the South Fork. Even though there are currently no RV hookups on the south side, Waldheim could be developed for tent, trailer, and RV (with hookups) and Gold Basin can handle trailers. Each would have flush	Tom Thorleifson	3/7/2019	granite falls
	65	Thanks for providing the presentation earlier this evening and for sharing some thoughts afterward. It was really nice to see some of the data and statistics going into the evaluation - it's fine for folks to disagree, as long as they do it based on facts. I currently serve as the chairperson of the Granite Falls Planning Commission, vice-President of the League of Snohomish County Heritage Organizations (LOSCHO), and a commissioner of the Snohomish County Historic Preservation Commission. Thus far, the data I've seen supports the conclusion that maintenance would be noticeably lower for a paved road than it would for a gravel road (assuming they are maintained to like standards). Little of that data was shown this evening, but I do have copies of some of that data which was shared in 2015 and 2016 in Darrington during discussions leading up to this project study. I believe that paving also reduces some of the potential environmental hazards to the river - that point needs to be made in the report, if true. That said, I favor Opt #2, a 25mph speed limit standard (quite consistent behind the idea of a "scenic byway"), with the addition of turn-outs in the case(s) of horizontal curves that cannot be practically addressed, and turn-outs at each end of necessarily narrow sections. In both cases, signage would be appropriate :-) For maintenance reasons, I would prefer it to be paved, although that in no way (in my mind) implies year-round operation. I believe the primary driving force behind paving the 14 miles is to enhance tourism, and until we somehow saturate the winter season tourism/recreational opportunities along the already-paved portions, there's no driving reason to open the Loop in the winter any more than it is opened now. Along the paved portions, there are several places where additional trail-head parking would vastly improve the traffic flow, safety, and enjoyment of the Loop. At this point, cars parked on the roadside represent unnecessary hazard. Just for your enjoyment, you might visit the "Mountain Loop Tour" available online at "Mountain Loop Tour". If nothing else, you can click on the historic site at about MP 15 to see why those sharp turns exist (and cause so many accidents). If you choose from the list, it's called "tunnel 7". Again, thanks for the work being done, and if there's anything we can do, please don't hesitate to ask.	Fred Cruger	3/6/2019	granite falls
Transportation	66	I stronly support Option 2B with 25 mph design speed following the existing road with modest improvements to alignment and profile and asphalt surfacing at a width of 18-32 feet.Having the MLH paved would 1) improve safety 2) increase access to recreation 3) improve emergency response 4) improve economic activity for Darrington.	Stephen Somsen	3/8/2019	darrington
Transportation	67	I've been recerating on the MLH since 1991, probably 150 trips since then for whitewater boating and hiking. Most of this is between Darrington and Bedal campground. I'm a local resident since 2018. I'm concerned about access during construction of a paved road - closures and delays. The MF Snoqualmie Road was closed some weekends because of equipment vandalism. I am concerned that paving will be detrimental to the wilderness experience and the Town of Darrington. Don't want to see increase traffic on the MLH.	Stephen Laboff	3/8/2019	darrington
Transportation	68	This is an incredible, beautiful scenic highway that everyone should have acess to. Having a 25 MPH paved highway will open up opportunities for all to be able to drive through!	Judy Pendergrass	3/8/2019	darrington
Transportation?	69	I travel the corridor dozens of times a year to do volunteer road maintenance of recreation, hiking, mushroom hunting, camping. I favor paving to a 25 MPH standard. We need to assess the economic value of a paved road to Darrington.	Nels Rasmussen	3/8/2019	darrington
Transportation?	70	I enjoy scenic drives, hiking, and photography. I get tired of the dust and potholes and I would love to see this road paved including a turnaround at the White Chuck Road (#23) junction and winter gate at Barlow and Bedal to allow the road to be plowed for winter recreation. Design the road using option 2. Plow for winter recreation up to the winter gates, making access beyond the gate for winter recreation. Where there are problem areas such as Chockwich and Gravel Creeks, incorporate fords with box culverts, possibly keep gravel. Enhance the driving experience by adding viewpoints to see Perry Creek Falls, Forgotten Mountain, and other vistas. Plan for pullouts for future picnic areas (not build them but a plan where future sites can be).	Martha Rasmussen	3/8/2019	darrington
Transportation?	71	Option 2 paved 25 MPH or less	Doug Hordyk	3/8/2019	darrington
	72	First I live 4 miles from Bedal Campground. In 18+ years I estimate 30,000 miles driven on the dirt section from White Chuck to Bedal. The prospect of paving that section of the road is attractive. The road today is very difficult. No snow removal and very potholed. Vehicle maintenance is a huge issue. Speed on a narrow paved road is obviously an issue but variable speed warnings seem logical. A question I have is about winter maintenance. At least to Reeces Hideout, our home. Economically this would help Darrington by increased volume during the good weather months. This is totally a viable option in my opinion. The other side of the coin is this will bring many more people who have no business in the mountains, because of only having lived in a city. I am willing to give any feedback that you would like, so contact me.	Michael Knott	3/8/2019	darrington
	73	Live in Verlot - People need more parking on roads - summer to winter. Open MLH up to the ice caves - people want to play in snow - fish?	Dick Dinham	3/7/2019	granite falls
	74	In the Spring, Summer, and Fall we travel the MLH 2-3 times a month. We would like to see Option 1 or 2 as a solution to the gravel portion. Since we travel this road regularly, we would enjoy a smoother ride. We would like to see this road maintained to be able to have easier access.	Todd and Julie Marshall	3/7/2019	granite falls
	75	I enjoy being able to drive the MLH from Spring through mid-September but by then the ruts and potholes and wash boarding are too much for my little car. I would support option 1 of grading and improving the gravel portion as a minimum. Then option 2 where feasible as funds become available. The argument that improving the gravel portion will adversally impact Darrington is falkse thinking since most people come from the south of Everett. There will be more people who will continue north from Barlow Pass and likely to eat and shop up in Darrington than do now. I'm curious how your standard metrics for improving a roadway apply here since in reality we now have 2 dead end roads at the gravel portion. At the dividing/end points vs creating a new/accessible long road by doing even option 1 and making it more driver friendly.	Pete Eartheart	3/7/2019	granite falls
	76	My use: drive the loop to Darrington; picnic; fish; camp; photograph; recreation	Tom Fitzgerald	3/7/2019	granite falls
	77	Live in Granite Falls, have a cabin at Silverton; travel there and beyond at least weekly to bike, hike, camp… at times backpack for multi-day trips. Option 1 I heavily support; to improve and keep up the 14 mile gravel roadway. Funding is and has been the primary problem.. just too many different agencies... historically the corridor has been poorly maintained.	Ray Hanby	3/7/2019	granite falls
	78	I support option 1	Debra Hanby	3/7/2019	granite falls
	79	Option 0 - do nothing, or option 1 would be our 'vote'. Save the money to maintain the current road and mitigate environmental impacts.	Paul and Sharon Sheppard	3/7/2019	granite falls

Category of Comment *Environmental, Transportation, Recreational, Health?*	**Comment ID**	**Comment**	**Name/Organization**	**Date**	**Community**
	80	I enjoy hiking and scrambling the various mountain peaks of MLH. I also belong to SCVSAR (Snohomish County Volunteer Search and Rescue) so I have used the MLH to get to search missions as well. I have driven at night and in the rain on the highway. So I understand the need to make the gravel and crown improvements. I would rather see roads like NF-49 open fully to allow deeper hiking and access to help for search and rescue missions veruss paving this section of the MLH. Since there's always landslide cleanup it seems to be easier and cheaper to do that for a gravel road versus paved.	James Smith	3/7/2019	granite falls
Transporation	81	Please include my comments in the official record. Please do not pave the entire unpaved portion. Make limited fixes to washout areas, and leave the rest to enjoy. We have plenty of roads that whoosh through forests at high speed with major clear cuts along the road, but this streatch is a rare opportunity for "car hiking" for less athletic people. Now you can just put the windows down and roll along slowly enjoying the beauty of the area, every bit as much as a hiker would. A "highway" would ruin it for people (and wildlife, and other aspects of the environment). Not everone can do a several mile hike into the wilds, but most can put the windows down and "car hike" this beautiful streatch of "wilderness". I am sure that "car hiking" for everyone can be a better tourism and recreation draw than a clear cut highway duplicating many existing roads	Lora Petso	3/14/2019	Darrington
	82	Thank you for your email. I am opposed to paving mountain loop highway. I will follow up with a comment that explains the reasons.	Taryn Rehn	3/20/2019	
	83	I'm adamantly opposed to paving the mountain loop highway. It is the only place for hiking and recreation that is not extremely crowded. Places like Mount Rainier and Mount Baker are almost unbearable in peak season because of the crowds and traffic. Trails along the MLH are the precious few places where one can still experience a degree of solitude in nature. Paving the highway would forever eliminate the possibility of finding out of the way hikes that are not crowded. All of the above speaks to the impact on humans looking to connect with nature. The real tragedy would be the impact on the forest ecosystem including the animals who rely on wild, relatively untouched habitat. Others such as biologists can speak to that potential loss better than I can. But it's clear from driving or flying across Washington state that there are few connected wilderness areas remaining. It's best that MLH is closed in the winter and that the human impact on wildlife is somewhat reduced by the gravel road which decreases traffic. Almost every corner of this beautiful state has been paved, developed, and exploited. It would be a tragedy to increase access and human impact on one of the last remote areas. The population of Washington is on a massive growth trajectory. Progress, growth, and economic development are great. But where will present and future generations find solitude from the traffic congestion and urbanization? I hope that MLH will remain one of those rare and priceless places.	Taryn Rehn	3/23/2019	
	84	1. The cost estimate must include budgetary costs for TESC-BMP's, flow control, and water quality treatment design. At a minimum, any roadway improvement must be designed in accordance with Department of Ecology's 2019 Stormwater Management Manual for Western Washington.	William (Bill) Lider, PR, CESCL Lider Engineering, PLLC	9/28/2019	
Environmental	85	2. Safety cannot be used as an excuse to justify this project. As you and I have both confirmed, there are no reportable accidents in the 14-mile road stretch between Barlow Pass and the White Chuck River. The maximum travel length on the un-paved road is 7-miles for emergency vehicles to reach a paved road, which is insufficient economic justification for this project with no reportable traffic accidents.	William (Bill) Lider, PR, CESCL Lider Engineering, PLLC	9/29/2019	
Environmental	86	3. Traffic accidents reported on the MLH between Verlot and Darrington are concentrated at the Verlot Service Center, Mt. Pilchuck Road, Lake 22 Trailhead, Gold Basin Campground and Red Bridge Campground. Construction of roundabouts at these intersections on the MLH would greatly reduce accidents and increase safety rather than spending limited road funds for improvements on a road section with no reportable accidents. Roundabout construction will provide a bigger safety bang-for-the-buck than any improvements to the 14-mile gravel section.	William (Bill) Lider, PR, CESCL Lider Engineering, PLLC	9/29/2019	
Funding	87	4. The need for the MLH as an emergency "back-door" access for Darrington is a non sequitur. Darrington currently has two accesses routes via SR-530 meeting the requirements of RCW 47.50. The MLH is closed approximately half the year due to snow and there is no proposal or cost allowance to plow snow in winter to maintain year-round access. Wet soils are prone to liquefy due to vibrations from increased heavy vehicle use with the potential of injury to users and a reduction to safety. If there were to be a geological event at Glacier Peak, the MLH could not be used as evacuation route as it would direct evacuees into the path of lahars and pyroclastic flows from a volcanic eruption, per USGS volcanic hazard maps.	William (Bill) Lider, PR, CESCL Lider Engineering, PLLC	9/29/2019	
Environmental	88	5. There is no economic benefit to either Granite Falls or Darrington from this project. This has been documented by quarterly Washington State Sales Tax receipts previously transmitted to you for the period 1994-2010 when the MLH was closed for 5-years due to washouts. Additionally the MLH is closed annually between Deer Creek and Bedal Creek, typically December through May. The lost cost benefit of all seasonal and washout road closures must be addressed in any feasibility cost estimate.	William (Bill) Lider, PR, CESCL Lider Engineering, PLLC	9/29/2019	
Funding	89	6. The feasibility cost estimate must include present value costs for road maintenance. As I stated, and SNOCO has confirmed in its 2017 Annual Bridge Report. Specifically bridges on the MLH have Sufficiency Ratings (SR*): Bridge Bridge No. SR Notes Red Bridge 537 59 Scour at Foundation Deer Creek 670 47 Coal Creek 556 45 Black Creek 547 41 Determined to be Obsolete & Structurally Deficient *A SR of 100 is equivalent to a new bridge, while a SR of zero is an entirely insufficient or deficient bridge. Additionally there are at least four major bridges in the 14-mile gravel stretch that will require significant additional maintenance and/or replacement: South Fork Sauk River Elliott Creek Bedal Creek North Fork Sauk River Because the four above mentioned bridges are maintained by the USFS and not currently maintained by Snohomish County their sufficiency rating is unknown. Annual costs for all bridge maintenance must be included in your feasibility cost estimate. The annual maintenance cost for all bridges should be converted to a Present Value using a 7% compounded annual interest rate for 50-years and included in the feasibility study cost estimate.	William (Bill) Lider, PR, CESCL Lider Engineering, PLLC	9/29/2019	
	90	7. The feasibility estimate should also address additional costs to address climate change cost impacts, such as more frequent washouts and landslides. FHWA Order 5520, December 2014, Transportation System Preparedness and Resilience to Climate Change and Extreme Weather Events, states, that Federal land management agencies should, "develop, prioritize, implement, and evaluate risk-based and cost-effective strategies to minimize climate and extreme weather risks and protect critical infrastructure using the best available science, technology, and information." Your feasibility cost estimate must consider the feasibility (economic costs, staff time, regulations, and logistics) and likelihood of success for each specific climate change adaptation tactic, in accordance with the USFS's Transportation Resiliency Guidebook Addressing Climate Change Impacts on U.S. Forest Service Transportation Assets, September 2018.	William (Bill) Lider, PR, CESCL Lider Engineering, PLLC	9/29/2019	
	91	8. Road widening cannot place any fill within the Channel Migration Zone (CMZ) in accordance with SCC 30.62B.330. The CMZ must be identified for any road re-alignment.	William (Bill) Lider, PR, CESCL Lider Engineering, PLLC	9/29/2019	
	92	9. Sheriff Department costs to patrol the MLH not currently maintained by Snohomish County must be included. This should include at a minimum, the full cost of one FTE Sherriff Deputy and patrol vehicle. This cost of the deputy's salary, including benefits, FICA, FUTA, SUTA (e.g. weighted wage), the patrol vehicle purchase cost, and vehicle operation & maintenance costs must be included; all amortized costs must be presented as a present value using a 7% compound interest rate for 50-years.	William (Bill) Lider, PR, CESCL Lider Engineering, PLLC	9/29/2019	
	93	10. The proposed use of Calcium Chloride (CaCl), a highly soluble salt, cannot be allowed as a road surface stabilizer to reduce maintenance costs, especially adjacent to the South Fork Sauk River where runoff is directly into salmon spawning redds for ESA listed Chinook salmon and Bull Trout. Chronic chloride pollution standards have been set at 230 mg/L and the acute standard at 860 mg/L; these limits may be high for sensitive salmon and trout species eggs and require further investigation and study. For the purposes of this feasibility estimate, the use of any chloride salt must not be considered in determining a reduction in annual maintenance costs.	William (Bill) Lider, PR, CESCL Lider Engineering, PLLC	9/29/2019	
	94	11. Funding sources for any road improvements must be fully identified, including any monetary commitments from Snohomish County, the USFS, or any other municipality in the feasibility study. The continued availability of FLAP funds is problematic and this program may not be continued by Congress after 2020. The project must be found to be not feasible if it cannot be maintained.	William (Bill) Lider, PR, CESCL Lider Engineering, PLLC	9/29/2019	

Category of Comment *Environmental, Transportation, Recreational, Health?*	**Comment ID**	**Comment**	**Name/Organization**	**Date**	**Community**
	95	12. agree with your assessment that the MLH's Scenic Byway designation, unilaterally obtained by the USFS in the 1990's, is overly dependent on motorized vehicle use which is detrimental to the local environment. To this end, consideration should be given to adding an additional option to close and lock the existing gates at Barlow Pass and Bedal Creek. In turn this section of road could be dedicated for non-motorized bicycle use and could become a destination point for mountain and recreational bicyclists. This stretch of the MLH adjacent to the Wild and Scenic Sauk River contains river otters, harlequin ducks, and other wildlife best enjoyed on foot or bicycle without disruption from motorized vehicles. The gates could be unlocked for motorized use by authorized vehicles such as emergency response or official USFS business. There is only one hiking trail and side road in this area into Goat Lake, which would still be accessible to backpackers and day hikers from either end of the closed/gated road. This new option would greatly improve safety and reduce maintenance costs on the MLH.	William (Bill) Lider, PR, CESCL Lider Engineering, PLLC	9/29/2019	
Transportation	96	When the feasibility study started, it was going to ask and presumably answer three questions: Would paving the 14 mile gravel segment improve safety? Would paving the 14 mile gravel segment reduce maintenance cost? and Would paving the 14 mile gravel segment improve recreational access? Last Thursday's presentation failed to answer these questions, or rather it ignored the clear answer of no in all three cases. There are no records of any accidents on the 14 mile gravel segment. One can not improve on that, yet the presentation, even in the No Action, Option 1, Alternative, proposes adjustments to "Improve safety." There are however records of numerous accidents on the paved section, these should addressed or at least noted in the final report. The paved sections are where safety improvements need to be made. Once again Option 1, the Status Quo or No Action Alternative proposed an annual maintenance budget of $112,000. It is unclear how or even if this is any improvement (reduction) over the current maintenance cost because nowhere are the current cost even alluded to. Much less which agency, either Snohomish County or the Forest Service, is bearing these cost. The question of improved recreational access is wafted off into the future when more as yet unspecified amenities may become available. There apparently is no restrictions on current access to available recreational sites attributable to 14 mile gravel section. Anecdotally, restrictions are due to lack of parking at the recreational sites along the entire MLH. So since the no answers to the three questions don't support the preferred recommendation of paving, the feasibility study simply ignores them. It is strange that the feasibility study fails to question let alone answer the basic raison d'être for the study, that is that paving the 14 mile gravel section will result in increased economic activity in Granite Falls and Darrington. There is no factual basis for this belief beyond wishful thinking on the part of commercial interest in these two communities. The feasibility study has determined that paving the 14 mile gravel section of the MLH will not improve safety, will not improve recreational access nor will it reduce maintenance cost. Neither incidentally will it increase economic activity in either Darrington or Granite Falls. It is time for Robert Peccia & Associates to render an honest recommendation to wit: that paving the 14 mile gravel segment is not justified. I hope you will consider these comments in preparing your presentation for the final public meetings and the final report.	Ed Henderson, North Cascades Conservation Council	9/30/2019	
Economics	97	Please note that these comments represent only my initial reaction to the pdf (which I assume is not the whole story of what was presented), and Pilchuck Audubon Society may be submitting additional comments in the future. First let me say that we agree with the comments submitted by Ed Henderson in his email in this thread, dated 9-30-19. Slides #26-27 are completely fallacious. They appear to assume that increasing design standards to 25 mph will improve safety (over 0 accidents, as Ed has pointed out!), without providing ANY evidence of the truth of that assumption. Common sense says that slower speeds reduce accidents. Slide #30 assumes that it is DESIRABLE to increase traffic volumes, without considering the effects of that outcome on the environment, or otherwise justifying it. We disagree with this goal. At the very least, it should be evaluated in light of environmental as well as economic impacts. We believe that both would be negative. The conclusion reached in slide #31 is the polar opposite of common sense. In other words, paving and increasing speeds and traffic volume would adversely affect non-motorized transportation; not the reverse, as depicted! Increased speeds and traffic volumes increase the risk of accidents and markedly impair the quality of the pedestrian/bicycling/horseback riding experience. If any future stakeholder meetings are held, we hope that they can take place in the evening or on a weekend when working people can attend.	Kathy Johnson, Pilchuk Audobon Society	10/1/2019	
Recreational	98	I attended the meeting last evening in Darrington at the community center. I was not able to submit a written comment at the end of the meeting and I would like this email to be that submitted comment. As a Darrington resident and frequent user of the Mt Loop Highway for a variety of recreational activities, I would like to add my support for option 2 as presented at the Darrington November 7 presentation, Minor Road and Drainage improvements. My choice of preference has 3 elements based on your study information. 1. Safe and reliable travel, which for my use includes bicycle use. 2. Protect the surrounding environment which includes wonderful recreation opportunities and also critical wildlife and resource protection needs that are very important. The Wild and Scenic River and designated Wilderness and Roadless areas adjacent to the road are primary protected status conditions that I value and see as public priorities. 3. Overall cost and long term annual maintenance are realistic limiting factors in achieving the goals outlined in the Darrington presentation. Any proposed major change in road width, alignment, and encroachment in to surrounding land or river corridor would incur huge litigation costs that would effectively be entirely detrimental to the already constrained maintenance dollars that the Forest Service and Snohomish County have at their disposal. Thank you for the opportunity to see the results of this feasibility study and add comment	George Winters	11/8/2019	Darrington
Safety	99	I represent the Sauk-Suiattle Indian Tribe, who's lands and resources are impacted by the above referenced Mountain Loop Feasibility Study and any future plans and permitting that may result from this Study I have been asked by the Chairman of the Tribe, Chairman Ben Joseph to contact you to arrange a meeting with the Tribe's Historic Preservation Officer to first learn more about your Federal agencies' plans for this Study, and to work with you on cultural resource protections reserved by the Pt. Elliot Treaty of 1855. Please be notified that this meeting does not replace your Federal Trust responsibilities to fulfill your Consultation process with the Sauk-Suiattle Tribal Government as reserved by the Pt. Elliot Treaty of 1855 and other Federal laws. Please contact me regarding your availability for meeting dates in the near future.	Dawn Vyvyan	11/7/2019	
Transportation	100	I am unable to attend the information meetings regarding this proposal. I am a lifelong Seattle resident. As I child, I camped at Verlot. My father was a frequent visitor to Silverton in his younger years. His uncle had a cabin there. This area contains some of the most beautiful, unspoiled wilderness in the state. It is an easy destination for hiking. Just one week ago, we hiked the poplar Lake 22 trail. In the winter, we love to come near to where the road is closed, in order to cross country ski the road. It is spectacular. No, this road should never be paved. Plenty of people find there way to this area—the road is no barrier. If this road is paved, it will be overrun, littered, and will have a detrimental impact on wildlife—not to mention a detrimental effect on people seeking a peaceful respite from the city. Thank you	Lorraine Gibbs	11/7/2019	

Category of Comment *Environmental, Transportation, Recreational, Health?*	**Comment ID**	**Comment**	**Name/Organization**	**Date**	**Community**
Transportation	101	I saw a news report about the possible paving of 14 miles of the Mountain Loop Highway on KIRO 7 news at noon today. Living in Kirkland this is the first I have ever heard anything about this idea. If I may take this opportunity I would like to voice some real concerns about what I have heard and subsequently read about. My largest concern is why is the federal government and Snohomish county spending so much money on a study or even a project of this kind? I have driven the Mountain Loop Highway several times over the years. True, the stretch from Barlow pass to Darrington is a gravel road, it has always been maintained to a passable state with the exception of the winter months when it is closed by snow. The road as it exists now is very usable and it would seem to me that paving it, at least at this time, would be a most wasteful use of state, local, and federal funds when there are other road repairs and improvements that could be done. One case in point is the repair of the Index-Galena Road where a portion of that road was washed out by the North Fork Skykomish River about 10 or so years ago. This road runs along the river east and north from Highway 2 just outside of the City of Index. There are several trail heads, camp grounds and view sites along that road. It is already paved and there are some paved bridges over the river in places. It would seem to me to be money better spent repairing that road and reopening it to the public and thus helping to generate revenue for Index Washington than to spend the money upgrading a road that is already quite functional even though it may be gravel in some places. By that I am referring to the Mountain Loop Highway. I'm hoping that my comments here might be passed along or perhaps prompt someone to look in to why a working road is chosen for a federal study over a very repairable road that could be reopened and utilized once again. Thank you for letting me comment and voice an opinion.	Jerry Witters	11/5/2019	
Recreational	102	After the public meeting in Darrington on 11/7/2019, I learned the truth. Under option 3 you are proposing "re-alignment" of the gravel portion of the highway. (Everett Herald 11/8/2019). Although I attended two public meetings in Darrington, at no time was "re-alignment" mentioned. At the 11/7 meeting, option 3 at 25 mph was pushed, both verbally and in charts, without any mention of "re-alignment". Obviously "re-alignment" would maximize adverse environmental impacts, and must be rejected. You ask about my use of the road: re-alignment would also eliminate my recreational use of the road (hiking for old people), as there is not much point "car-hiking" a re-aligned road. Deceptive. You should redo your public process and tell the truth: option 3 includes "re-alignment. Isn't this area supposed to be for recreation? No recreation value in "re-alignment".	Lora Petso	11/9/2019	Darrington
Health?	103	I was at the meeting last night in Darrington, but left early due to another meeting which was scheduled at the same time. I would like to commend you all for the presentation. As you alluded to in your talk the prospect of improving the Mt. Loop Hwy is a quagmire of emotional concerns for many. Seeing how budgets for the government have been shrinking over the years while costs to perform basic maintenance continues to rise I do not see the Forest Service being able to tackle the Mt. Loop improvements except by small project by small project. I manage the Darrington Districts hiking and stock trails, and work on the trails is similar - a little at a time. I doubt we will see a large infusion of funds to do any significant work on the Mt. Loop, because of the cost, environment concerns, and the fact the highway is not open year round. Thank you for a good presentation	Bridget Wisniewski	11/8/2019	Darrington
	104	As a property owner within the study area for over 30 years I am very interested in this study. My father also owned property along the Mountain Loop so I have been traveling that highway and dealing with the fourteen mile gravel section from Barlow Pass to the White Chuck since 1961. There have been many talks in the past of paving the last fourteen miles but to our disappointment it has never come to fruition. We are hoping that this will be time that it actually gets done. It has taken far too long. After reading all four options I believe that option #3 is best suited for the area in question.	Thomas Jones	11/15/2019	
	105	The undersigned organizations work to preserve the scenic, scientific, recreational, educational, wildlife and wilderness values of the North Cascades. We all have long and varied histories of concern with the Mountain Loop Highway (MLH) and the unique opportunities and challenges it presents. The MLH Feasibility Study presents a chance to identify and evaluate the multiple, and sometimes conflicting, goals of access, safety and environmental protection. Because of the importance our organizations attach to the MLH we have all been engaged as Stakeholders in the Feasibility Study process from the beginning. With its initial goals the Feasibility Study appeared to be a thinly disguised attempt to justify recommending paving of the 14-mile gravel section between Barlow Pass and the White Chuck River. These three goals were to: Improve safety, Reduce maintenance cost and Improve recreational access. Traffic accident records for the ten years, 2007 to 2017 show that all accidents occurred on paved sections of the MLH. The gravel section is treated as “No Data Available.” We object to that terminology as indicating that possibly there is unknown data and maybe there were accidents. The study must assume if there were serious accidents with fatalities or injuries they would have been reported to the Sheriff’s Department and that there would be records included for these accidents. Indeed, in order for a motorist to even file an accident claim with its insurance company, a police report for the accident must also be filed. It is difficult and indeed impossible to improve safety by paving or whatever other means when there are no accidents reported. In the proposed Option 1 – Maintain Status Quo, annual maintenance cost is budgeted at $112,000. We were astonished to learn, at the public meeting in Darrington on November 7th, that nobody knows what the current budget/expenditure are for maintenance or even which agency is responsible. So it begs the question of how any of the proposed options can improve or reduce the unknown maintenance cost. The goal of improved recreational access is purely speculative. It is wafted off into the future when more as-yet-unspecified-amenities may be provided. Access to recreational sites on the 14-mile gravel section is apparently adequate. Lack of paving does not deter access. Anecdotally, access to these sites may be limited due to lack of parking as it is at recreational sites along the entire MLH. Many areas along the length of the MLH are being degraded due to roadside “dispersed camping.” In reality, the vegetation in roadside camping areas is being trampled and the human feces pock-marking these areas pose a public health hazard. Unstated but implicit additional goals for paving the gravel section are for the MLH to serve as an emergency evacuation route from Darrington and to increase economic activity by improved access. The MLH as a potential emergency evacuation route is of dubious value. The route is closed for half the year from November to May by snow, and the northern eight miles into Darrington is threatened by lahars, volcanic mudflows, off Glacier Peak. No economic benefit to either Granite Falls or Darrington from paving can be expected. This is documented by quarterly Washington State Sales Tax receipts for the period 1994-2010 when the MLH was closed for 5-years due to washouts. There was no discernible difference in sales tax receipts during the closure and after the MLH was reopened. Our analysis of the Feasibility Study indicates that paving the 14-mile gravel section of the MLH will not improve safety, nor improve recreational access, nor will it reduce maintenance cost. Nor incidentally will it increase economic activity in either Darrington or Granite Falls. It is time to render an honest recommendation, to wit: that paving the 14-mile gravel segment is not justified. The Feasibility Study while providing a range of options for the 14-mile gravel section also includes information on conditions on the entire fifty plus miles of the MLH. There are highway traffic hazards (accident sites), narrow bridges, potential landslides, culverts needing repair or replacement, and 28 locations, none of which are in the 14-mile gravel section, requiring bank stabilization monitoring. These present abundant opportunities to enhance traffic safety, such as roundabout construction at high accident locations at Verlot Service Center or Gold Basin Campground, maximize effective maintenance expenditures and provide for	Phillip Fenner, Eric Adman, Kathy Johnson	11/22/2019	

Category of Comment *Environmental, Transportation, Recreational, Health?*	**Comment ID**	**Comment**	**Name/Organization**	**Date**	**Community**
Transportation, Recreational	106	I attended the Mountain Loop Highway Feasibility Study in Granite Falls on November 6, 2019. I have also attended the previous MLH feasibility meetings in Granite Falls. My interest in this feasibility study as a concerned taxpayer also includes my involvement as a frequent, long-time recreationist, an environmental and historical educator, and a community volunteer involved with the historical impact of the South Fork of the Stillaguamish River Valley. I have lived in Snohomish County 69 years (with the exception of college and military service). The last 35 years have been in the Lochsloy area near Granite Falls. I have seen how the Mountain Loop has changed over the years, mainly as a direct result of natural causes, flooding being the most frequent and biggest force. I've always enjoyed my frequent trips along the Mountain Loop Highway, usually for day-trip recreation as my children were growing up. I also spent 13 sessions over the years with more than 1,000 students total (3-day, 2-night environmental education) as a teacher and counselor at Camp Silverton when it was in operation, retiring from the Everett and Granite Falls School Districts after 31 years of teaching. I currently volunteer as a board member for the Granite Falls Historical Museum studying and sharing the historical significance of the Granite Falls - Monte Cristo area. My opinions: 1. Option 3: Pave the 14-mile with a 25 mph design speed. • This will be less expensive in the long term. • It will satisfy your goals and objectives (which make sense): to improve safety and operation of the road; to reduce maintenance and take care of future use; to protect the environment (and historic, cultural, and archaeological resources) while still providing public access to this area for recreation. 2. Your plans in addition to the 14-mile portion of the highway are proactive to increase public safety and to prevent further damage to the environment or to existing infrastructure by repairing/replacing or otherwise improving (as needed) the spot locations mentioned in the study. I especially liked the recognition for bank stabilizations near the roadway. Improving parking at trailheads and at the Verlot Ranger Station would be very helpful for the general public, as well as road signage updates. Bridges and culverts are always a concern because of the frequent flooding and the potential damage that would close the highway until repaired. The corridor-wide spot improvements are needed. 3. Funding should be arranged as soon as possible so work can start and finish as soon as possible. Timelines and priorities for all the different phases can be developed for concurrent work, taking into consideration the seasonal weather. 4. Getting public opinion is important. I hope the bigger picture is seen that will recognize the mission of the U.S. Forest Service "to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations." The handful of people who have been able to attend the meetings and who might have submitted their own opinions (including mine) should be considered within the framework of this USFS mission statement and also their motto: “Caring for the land and serving people." What this study has shown is something that has been needed for years. Please get the work started as soon as possible!	Tom Thorleifson	11/22/2019	Granite Falls
Transportation?	107	First of all, a big thank you to you Michael, Steve and Jeff for the study of that project. I am a big user of that road since I live near MP37 on the Mtn Loop. I am an avid runner too and logged several thousands miles on that road, and ride my bike as well. I feel so lucky to have such a beautiful "playground". To me, the Option 3 paved is the most reasonable and makes the most sense. Cars turn around few hundred yards after hitting the gravel, either sides. Fast drivers will always go fast, but most want to enjoy the scenery. And they sure will enjoy it more on a smooth road, their eyes around them, not on the potholes. Come Summer time, many people camp along the beautiful Sauk River. Not sure how they can stand the dust each time a vehicle drives by, fast or slow. It takes quite some time to dissipate. Paved, would allow more people to drive through Darrington, Granite Falls, Concrete to some extend and Arlington. Associated with the Jordan Rd, it would make a magnificent loop for smooth riding on bicycle.	Odile Dortch	11/22/2019	Darrington
	108	Sir, as requested. •Goal # 1. Option 2 or option 3 gravel. •Goal # 2. option 2 or option 3 gravel. •Goal # 3. option 2 or option 3 gravel. Other considerations (in no set order of importance): 1.No improved surface for recreational bicycle riders, they can stay on the removed infrastructure, for light railbanked areas, known as rails-to-trails. 2.Expand popular trailhead parking areas along MLH and enforce parking pass requirement. 3.Remove the no parking signage east of Lake 22 trailhead and ticket individuals parking over the fog line in that area. On street parking should be on the same side as the trailhead. 4.Broad based dips (vs speed bumps) to slow traffic to 15 MPH.	RJK	11/19/2019	
Recreational	109	My name is Randall Ashe and i would like to make a couple comments on the proposed paving of the Mtn. Loop Highway. I personally like option 3 with paving and the 25 mile per hour speed limit. I think that the paving of the loop would open up a great opportunity for the elderly and the handicapped to be able to get out and enjoy a beautifull loop experience and be home before dark. It would be a beautifull day trip and I cant think of another drive that would compare. With the growth we are seeing in Snohomish County and the busy lives that everyone has it would be very relaxing to be able to take a drive such as this without having to worry about beating your vehicle up. I think a lot of folks would benefit from from the improvemnts that option 3 with pavement would bring to our county	Randall Ashe	11/19/2019	Darrington
Recreational	110	I have driven the Mountain Loop Highway frequently both for recreation and also, for 30 years, as an employee of the US Forest Service working on many trail construction and maintenance projects all along the highway. I am familiar with the problems along the road and the safety concerns. I would like to offer a few comments on the Mountain Loop Feasibility Study. I did attend the November 7th meeting in Darrington and appreciated learning more about the project at that time. I support all of the “spot fixes” including bridge and culvert replacement along the highway. Parking is an issue in both the Lake 22 and Barlow Pass Trailheads – particularly Lake22. Busy summer days along the Mountain Loop cause vehicles to fill the parking lot and park up and down along the Mountain Loop with families, kids, etc walking down the highway – which has no shoulder to reach the trailhead. This situation is unacceptable from a public safety point of view. This problem is not as severe at Barlow Pass, but may become worse in the future. While Heather Lake Trailhead is 1.5 miles off the Mountain Loop, parking there does need to be addressed due to limited parking at the trailhead. I believe planning for increased capacity to enhance public safety and resource issues should be part of this study. Among the options studied for improvements on the 14-mile-long gravel section, I would like to generally support the concepts proposed in Option 2. I believe that driving speeds should be kept low and the highway should retain most of the character it has now. I would support some spot widening in locations where public safety and environmental objectives can be achieved with minimal tree and/or rock removal. I would like to propose several features that have not been addressed that would add to public access and enjoyment of the Mountain Loop. These include the creation, or enhancement, of viewpoints of some of the mountains along the highway. In my roll at the Forest Service, I heard comments from many people over the years that here is this loop drive through the mountains, but all that could be seen was a tunnel of trees. There are spectacular peaks that could be visible from the highway with creation of viewpoints. Presently, there are two: Big Four Mountain from the picnic area and another developed for White Chuck Mountain at Milepost 43.5. Possibly the most spectacular view along the highway is near Milepost 28 that would showcase Del Campo Peak, Morning Star Mountain and Sperry Peak. Roadway widening and clearing would be needed. Another viewpoint that would showcase Mt. Pugh could be built somewhere between Milepost 33.5 and 35.5. The White Chuck viewpoint could be updated. In addition, what is currently the most popular viewpoint along the highway – but outside the study area – is located near Milepost 45 on SR 530. This site offers a wide-open view of Whitehorse Mountain. While there could be a range in development, I would opt for low maintenance turnouts similar to the photo below of the Skookum Falls Viewpoint on SR 410. Finally, a shoulder sidewalk/trail should be constructed that connects the Clear Creek Campground to the Old Sauk Trailhead. This would allow campers to access a prime recreation feature without having to either walk along the guard railed road, or drive ½ mile to the trailhead. This would be a big improvement. Thank you for considering these comments for the final study report.	Gary Paull	11/19/2019	darrington
Recreational	111	Please consider this my official notification supporting OPTION 3 for the Mountain Loop Highway. I am a resident of the Darrington area. I have seen first hand the importance and need for economic stability in the Mount Baker-Snoqualmie National Forest areas. Option 3 would enhance tourism opportunities for communities within the “Loop” as well as the surrounding metropolitan cities. Having a truly magnificent scenic bi-way will provide economic benefits, but most importantly, provide a safe roadway for anyone wishing to immerse themselves in a beauty you have to see to believe. I urge support of OPTION 3 as presented in the MLH Feasibility Study.	Judy Pendergrass	11/19/2019	Darrington
	112	The Mountain Loop feasibility study truly explored all options, presenting to the public, 4 options to improve the existing road. Each was research and studied in depth. We see a need to maintain the roadway for the safety of the public. Maintenance is the main goal shown in all options along with safety, environment impact, fish and wildlife habitat, while accommodating residents and recreational access. We favor option 2 or 3 by using the same road prism, by of shaping, gravel, improving drainage, signage, daylighting the area for visibility of scenic by-ways, providing an opportunity to thin timber via a timber sale along the current road prism, thus creating jobs and creating habitat for animals. Some areas of the 14-mile gravel road could be blacktop easily while other areas with improved graveling. Specific project areas could be completed through phases.	Bob and Diane Boyd	11/16/2019	
Transportation	113	Michael, I said I would respond so here are my thoughts. I prefer a single lane road with turn outs, PAVED! So probably option 3. I’ve lived in Darrington since 1978, and retired from the the U.S. Forest Service in 2011. I use to drive wild land fire engines on that road often. When the Forest Service had money and MAINTAINED the road it was fine. But no more! I believe paving would reduce the maintenance costs, adding fords in slide prone areas and some gravel where necessary. This road affords access to many trailheads, dispersed camping areas and access to the PCT. Driving this road is also a “recreational” activity. The key to this project is to ensure a dedicated maintenance funding stream yearly! Keeping speeds down is an issue and big motor homes is another, but it’s an issue now! Signage is nice but during hunting season they get heavily damaged. That would need to be added to the maintenance costs. I hope this helps but I won’t hold my breath because NEPA is an onerous process.	Rich Dahl	11/15/2019	Darrington
Recreational	114	Yes get that road fixed, I was here when we had the slide and had to drive around on highway 20 but that route is prone to slides and water over the road at times . We really need a way out during an emergency.	Sargent53@aol.com	11/14/2019	Darrington
Recreational (or environmental?)	115	I’d like to weigh in on the Mountain Loop Highway improvement options that are under consideration. I am a Darrington resident, and I would like to see the highway area maintain its current natural conditions. So no to paving. I would be very concerned, not just about the increased traffic with paving, but the years of construction that would limit access to that area. I wouldn’t like to see what happened when they did all that work on the Middle Fork Snoqualmie River Road happen here. So I would like to see some minor improvements as in Option 1, Minor Road and Drainage Improvements. But that’s as far as I’d like to see it go.	Stephen Laboff	11/13/2019	Darrington

Category of Comment *Environmental, Transportation, Recreational, Health?*	**Comment ID**	**Comment**	**Name/Organization**	**Date**	**Community**
Environmental	116	In regards to conditions of the Mountain Loop Highway from Barlow Pass to White Chuck: 1) My opinion is that the first priority be given to the community that lives year-round at Bedal (also known as Reese's Hideout). The MLH needs to be able to always provide emergency support to these folks. 2) My second opinion is that the Option 1 description is my preference. No matter what is eventually decided, I feel that under NO circumstances should any part of the Barlow Pass to White Chuck part of the MLH be able to support a 40 mph speed limit or construction standard. I am also of the opinion that there is something to be said for keeping this part of the MLH in a somewhat "primitive" condition, by that I mean that Mother Nature does a very nice job in keeping speed limits down by providing wash-boarding and potholes. Obviously, there is needed maintenance on a yearly basis required on this piece of the MLH along with drainage improvements and that's fine. I guess I feel that this is a very special roadway, and if we make it easily accessible to anyone with any kind of automobile, that's exactly what we'll get. We already have problems with break-ins at trail heads and to bring the MLH to a standard that invites Corvettes and Ferraris will only encourage that kind of behavior.	Jon Allen	11/13/2019	Darrington
Environmental (health?)	117	Hello, I recently attended a public meeting RE MLH here in Darrington. I was urged to provide my input regarding paving the loop. I was unable to enter my thoughts into the adobe form. I would NOT like to see the loop paved. I do think it should be maintained and upgraded as needed for safety and access to the many recreation areas. I weekly bicycle the paved portion near Darrington and I value and appreciate the solitude and beauty of the river corridor. I also ride a street legal off road motorcycle which does not need pavement. I also drive a four wheel drive legal truck that gets me any where I want to visit. I support the volunteer maintenance of out local and spectacular dirt roads that lead to alpine elevations. I don't think any more access is needed. Our wild lands will never return and they are continually decreasing. I am a 62 year old retired man who lives in Darrington because of it's rare natural features.	David Bell	11/12/2019	Darrington
Transportation, Recreational	118	Part of the project should include consideration of implementing a hiker shuttle program along the Mt. Loop.. This has the potential to help limit parking congestion and decrease the number of vehicles using the roadway, providing benefits for both safety and maintenance needs. In addition, it could create economic benefits for the gateway communities of Darrington and Granite Falls,.	Matt Riggen	11/7/2019	granite falls
Recreational	119	Option 1 or 2 only please. My experiences along the corridor depend on having the forest near the road without setback. "Hiking for old people"	Lora Petso	11/7/2019	Darrington
Recreational	120	Enhanced recreation opportunities along and on the Mountain Loop Highway. Option #3 appears to present opportunities for mutliple use, particularly if 4 foot shoulders are considered for bike/non-motorized use.	Ashley Ross	11/7/2019	Darrington
Recreational	121	Keep road open to Bedal, - summer and winter - with improvements, couple of bad spots will be challengine enough - plow it - close gate (just beyond) Bedal in Winter. People live year round. Keep it open to Deer Creek - summer and winter - plow it - close gate in witner - winter recreation easily accessible - there is heavy foot use in the winter to Big 4. People live year round. Snowmobiling is another issue to be addressed separately. Get cars off road at Barlow Pass. Keep section rural - in between - gravel it and maintain as needed into the future - minimal cost, better for all (wildlife and everyone except speeders) emergency response time would be minimal in that short section of rad, less impact on Monte Cristo Lake, close vertical bank to Sauk River and less impact on tribal ancestral grounds. Been involved with Sauk and Suiattle valley since early 50's	Rod Oson	11/7/2019	Darrington
Recreational	122	I am fairly new to this area (3 years) and have only driven a short portion of the 14-mile road. However, I moved out here because of the rural/wilderness area that it is. The town is the right size to provide services needed and keep a balance with the wildlife. I feel that balance continues with the MLH and that 14-mile stretch of gravel. I would like to see some improvements to maintain the road, Option #2 with widening options for safety, but not any more so as to keep that balance of people and nature.	Shelly Sumption	11/7/2019	Darrington
Transportation	123	I enjoy access to the GP wilderness area. Road access to trail heads allows both.... activities hiking, bike, skiing, hunting, fishing, treking, mountaineering, etc. Without roads into the USNF deeper areas of the wilderness to be explored, I use the NF Sauk and Moutain Loop at least every 3 weeks year round! Road must be maintained, drainage and culverts need maintenance,. Construction to minimize effects of erosion. Basic safe access a necessity! Paving unneccessary but continue with road rebuild to minimize futuer effects of slides and erosion. My perference would be to widen the road, 40-mph design, leave it gravel.	Gary Schillhammer	11/7/2019	Darrington
Transportation	124	I live at Bedal (Reeses Hideout). I travel the section of Mtn Loop from Darrington daily. From the options given I believe option 3 seems to be the best to achieve the goals and objectives. I velieve option 2 would be an improvement but would take as much maintenance as currently exists. Option 4 is not practical or needed. Do something to reduce the pothole damage to my vehicles; it is very costly. THank you for your hard work and diligent consideration.	Michael Knott	11/7/2019	Darrington
Transportation	125	We love the slow drive down the gravel road! We would prefer the road not be paved so that traffic can zoom by. The work on the culverts would be very beneficial. Personally, I would like to see a speed limit of 15-20 MPH.	Colin Petso	11/7/2019	Darrington
Transportation	126	Pavement and 25 MPH design speed. -will eliminate dust that impacts water, recreation, and safety (vision). - high comfort experience for users, better experience - emergency vehicle response + - service vehicle + septic service for rec + private - upgrade culverts/drainage for fish - assume gravel will not be maintained, USFS is not funded or organized to adequately maintain, pave & Sno. Co manage - should display net present value of $112,000 assumued annual maintenance with existing condition. Allows better comparison with other costs	Paul Wagner	11/7/2019	Darrington
Environmental	127	I use the MLH mostly for day hikes or trips. I like the option 3 with pavement. Darrington and Granite Falls would greatly benefit with added tourism that this would bring.	Randy Hayden	11/7/2019	Darrington
Health?	128	*The Mt Loop is a Forest Service Scenic Byway - NOT a National Scenic Byway. * To distribute to other recreational needs would entail road maintenance of roads that branch off of the Mt Loop. FS #49 for example - one of two access sites into the Glacier Peak Wilderness. * Strongly encourage traffic circulation improvements at Verlot Public Service Center!! Not enough parkign and accident hazards! *Prefer option #2! * Sno Cty has done an outstanding job in road maintenance!	Adrienne Hall	11/7/2019	Darrington
Transportation?	129	1. Build the road so that it requires the least amount of maintenance later. 2. Include trailhead parking. 3. Goal #1 - Option #3 - paved 20 foot makes the most sense here. (Option 4 would not be conducive to peaceful camping by the river).*Option 3 would leave space for non-motorized pathways. 4. Address the human waste problem at camping areas - education, sawdust toilets	Kathy Rodgers	11/7/2019	Darrington
Transportation	130	Add in spot repairs - bridges with weight restriction - what will it take to get bridges up to log haul and equipment. Provide estimates of maintenance/mile for the different options.		11/7/2019	Darrington
Transportation	131	We need to be able to see the road corridor be able to handle increased loads from heavy truck traffic such as log trucks, focus on the spots identified and try and get something in between option 2 and option 3 and keep it gravel.	Matt Ross	11/7/2019	Darrington
Recreational	132	I think the primary considerations should be safety, resource conservation, and minimizing maintenance. I also think consideration of pedestrian and nonmotorized use of the roadway and immediate vicinity should be priorities. Lastly, please take into account the frequency of flood events in recent years and the corecast, for western Washington and the of increasing likelihood of longer flood events with climate change impacts. I think it makes the most sense to focus on problem areas wtih option 2 type fixes to shore up and protect the natural resources and infrastructure.	Matt RIggen	11/6/2019	granite falls
Environmental, Transportation, Recreational	133	Years before we moved to Sand Hill on the Mt Loop Highway, we traveled from the Seattle area to hike, climb, ski, and enjoyu nature this area. Since we live here now we see daily the unmet needs of this area - lack of law enforcement, illegal dumping, illegal camping and shooting near homes and farms. When this area becomes a well cared for then we can consider more development. Do you know if $112,000 is spent annually on the 14- mile? Your cost number was developed by your group. Why doesn't the County or Forest Service have this information? Would Option #1 fare better (or worse) with this level of maintenance? (since you don't know if this is currently being spent). I'm for Option #1.	Sharon Sheppard	11/6/2019	Granite Falls
Transportation, Recreational	134	My preference is for minimal improvement to limit the easy accessibility ot the area. Improve fish passage and maintain a safe by slow speed road.	Jim Holt	11/6/2019	granite falls
Transportation, Recreational	135	Winter usage - stop plowing at Deer Creek - use money saved to plow from Clear Creek to Bedal (people live at both ends). Make ongoing improvement on gravel over time - but keep it a small road. My usage is from the summer and winter.	Rod Olson	11/6/2019	Granite Falls
Environmental, Transportation, Recreational	136	As a resident, I would love to see low environmental impact repairs to the road. Mainly to protect the forest and river and their natural inhabitants. I fully support Option 2. I understand funding may be at issue (duh). Anything that improves emergency response time is good. Everything that supports the preservation of the environment and local wildlife is best. Why not ask Washington Corporations, or even nationally recognized brands (Patagonia, REI) to donate funds? They get good press, we get improvments. Win=win. Thank you for this study.	Sarah Jorgensen	11/6/2019	granite falls
Environmental, Transportation, Health	137	We use the highway to get away from the paved roads. It is fine the way it is. We slow down and enjoy the scenery, there are less and less roadslike this around. The people that don't enjoy it can go somewhere else. Any improvements would allow increased speeds that are already excessive by many vehicles. The highway is unique because it has remained unchanged all these years. I have been using it since the 70's (grew up in Seattle). Please allow it to just be the way it has been for so long. Some things should be left alone. Improvements = more traffic. Thank you.	Scott Toevs	11/6/2019	granite falls
Transportation, Recreational	138	Option 2. Minor repairs/culverts. Keep it so only people who are interested in the outdoors and beauty of the land. Not a speedway for lots traffic. Keep it natural. Gate the Pilchuck Road. Almost buried our car.	Elaine Campbell	11/6/2019	granite falls
Environmental, Transportation, Recreational	139	Spot Improvements - hydraulics (drainage), culverts/bridges, sunken grade Gravel section option 2 or option 3 depending on funding - Oso slide points up option if SR closed Bridge 102 is major chokepoint - County responsibility	Louis Coulson	11/6/2019	granite falls
Environmental, Transportation, Recreational	140	Def no on Option 4! Increased non-raodside parking options needed at popular trailheads! Current No Parking signs erected by Sno Co are driving parking onto private properties. RE 14 miles either Option 2 or non-paved option of Option #3. Increase smoothness of raodway for emergency response, but not so improved that general speeds increase.	Rick/Karen Kammerer	11/6/2019	Granite Falls

Category of Comment *Environmental, Transportation, Recreational, Health?*	**Comment ID**	**Comment**	**Name/Organization**	**Date**	**Community**
	141	I have spent thirty years on the Mountain Loop. I visit the more remote roads off the main road. More and more people are using the road so some improvements are needed. If improvements are made will access to forest service roads improve? Roads have been closed or not maintained for years so less places to go while on the loop. Thanks for having this meeting.	Ed Reuter	11/6/2019	Granite Falls
	142	I support option 2 along with a good maintenance program.	Ed Pasowicz	11/6/2019	Granite Falls
	143	Improvements need to be made, potholes are not desireable. 25 MPH well-maintained gravel seems reasonable. Slower traffic (25 mph vs 40 mph) is safer, helps maintain the rural experience of enjoying a casual drive in the country, and allows campers to have a more enjoyable time. Just my two-cents	Robert J Sutherland	11/6/2019	granite falls
	144	I've been camping on the loop highway all my life, along with my family. I support only option 1 because of these reasons. Many spots along the 14 miles section are not practical to widen beause there's a mountain on one side of the road and river on the other. Campsites are along the road in many locations. Firsthand experience tells me that cars already go too fast on the road. Any paving of the road would make no sense.	Robin Olson	11/6/2019	Granite Falls
Options	145	I find that our unpaved section of the Mountain Loop Highway requires a separate skillset to drive it safely. Pavement would reduce accidents. My use of this highway is recreational.	Topne Hutton	11/6/2019	Granite Falls
Transportation, Recreational	146	My name is Kevin Ashe. I think my views on improving road conditions are well known to everyone involved. Especially the 14 miles of gravel. There are several reasons why I feel this way. 1. Increased traffic that will translate into increased economic benefits. 2. Better access for a greater number of people including the handicapped and senior citizens. 3. Better for the environment. Water runoff can better be channeled, the heavy dust problem will go away, water pooling and mud in the road will go away. Just to name a few. 4. Whether the road is paved or not, usage is going to continue to grow. This means a more emergency and aid calls to this area. An improved road will allow emergency and aid crews better and quicker access. The option I prefer is the 18 foot, paved, 25 mph. I want to thank Federal Highways, Snohomish County, the U.S. Forest Service, and Jeff Key and the company he works for. It has been an interesting, sometimes exhausting, yet thorough experience. I am hoping for a positive outcome (whatever that might turn out to be). Thank you to all. I look forward to outcome.	Kevin Ashe	12/4/2019	Darrington

Granite Falls #1

Mountain Loop Highway Feasibility Study

Sign-In Sheet

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Christopher Marsh	Granite Falls Planning Commission	thehouseofcccc@msn.com	18106 123rd PL NE, Arlington WA
Roger E. Bates	Hiking in Snohomish Co.	ROGER.BATES@FRONTIER.com	
Kathy Johnson	Pilchuck Audubon Society	katherine@earthlink.net	927 Quinn Ave, Marysville 98270
Gil Winje		gil.winje@gmail.com	13725 Burn Rd, Arlington, WA
Scott Morrison	Granite falls Planning	SDAVIDmorr@Hotmail.com	
Ken McClw		Volkeno@Hotmail.com	208 Anderson Ave GF 98252
Elizabeth Panagos	GFSD	lpanagos@gfalls.wednet.edu	205 N. Alder Ave GF 98252
Ray Healy		YESD 45 @ YAHOO.com	6421 MENZEL LK RD G.F 98252

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Granite Falls

Sign-In Sheet

NAME	ORGANIZATION	EMAIL	MAILING ADDRESS
ADAM STUDEBAKER		ADAM.STUDEBAKER2@YAHOO	34606 BENSON CREEK GRANITE
Tom Thorleifson	Granite Falls Historical Society	tthorleifson@comcast.net	FALLS WA 98252
Rich Huebner	Snohomish County Parks/ Recreation & Tourism	rich.huebner@snoco.org	6705 Puget Park Drive Snohomish, WA 98012

What is this project?

- Identify needs and objectives
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Please provide your input on your experiences along the corridor!

Name: RAY HANBY

Contact Info (email): YEEP 45 @ YAHOO.COM

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

I HAVE WALKED, BIKED, SKIED, CAMPED ON THE MT. LOOP FOR A HALF CENTURY... IT IS IMPERATIVE THAT THE RODE STAYS OPEN; I PREFER THE ROUTE TO BE GRAVELED + CLOSED FOR THE SNOW MONTHS... BUT AM NOT AVERSE TO IT BEING PAVED; WHAT CONCERNS ME IS THAT AN INTEREST IN THE ROAD + THE BACK COUNTRY BE KEPT IN THE PUBLIC EYE.

ONE POSSIBLE SOLUTION IS A BIKE ROUTE OR A ROUTE OPEN ON CERTAIN DAYS ONLY FOR BIKES

THE ROAD AS IT STANDS TODAY IS CERTAINLY ACCEPTABLE. OF LATE, THE ROUTE UP TO BARLOW PASS HAS GROWN IN ITS USE; WITNESS THE LK. 22 TRAIL HEAD ON ANY WEEK END DAY

THE COUNTY HAS ONLY ONE MT. PASS ROUTE, ONE TO REVERE + KEEP

Please leave your comment sheet with staff before leaving!

GF

Mountain Loop Highway Feasibility Study

U.S. Department of Transportation
Federal Highway Administration

RPA

Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

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Please provide your input on your experiences along the corridor!

Name: E PANAGOS

Contact Info (email): lpanagos@gfalls.wednet.edu

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

live there and work near.

- providing a way out for families stuck up the loop.
- economic equality (structure)
- devel. of GF --> looking forward
- access to services for ALL.

Please leave your comment sheet with staff before leaving!

GF

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Please provide your input on your experiences along the corridor!

Name: Ken McClow

Contact Info (email): Volkeno@Hotmail.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

I mostly hike and camp.

I like the little camp spots along theriver off the unpaved section and my concern is that paving the road would make the speeds faster and possibly eliminate those spots by widening the road.

I balance that with the convenience of going to Darrington as an alternative to Hwy 530.

If it were widened and paved would it be open all year around? There is a lot of snow and cold that would be an expensive challenge.

I don't know that having to repair it every spring would be more expensive than the current gravel road.

Please leave your comment sheet with staff before leaving!

GF

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Please provide your input on your experiences along the corridor!

Name: Gil Winje

Contact Info (email): gil.winje@gmail.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

50 years ago, I worked summers at the Forest Service in Verlot, WA. Mostly, I worked on trails and was able to see the beautiful lakes and scenery in the area. I still enjoy driving up the Mountain Loop Hwy but only a few times do I drive from Granite Falls to Darrington because of the poor condition of the road beyond Barlow Pass. I would like to see improvements to the gravel portion of the road beyond Barlow pass. Widening and paving of the road would open up the area to more people who may not venture beyond Barlow pass because of the road condition. If not widening and paying the entire stretch, a portion may be easier to widen and pave from the Darrington side where the pavement now ends.

Thanks,
Gil Winje
Arlington, WA

Please leave your comment sheet with staff before leaving!

GF

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Please provide your input on your experiences along the corridor!

Christopher Marsh
Name

thehouseofccccc@msn.com
Contact Info (email)

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

I have enjoyed motorized Recraction, site seeing and trail Hiking up the Mtn. Loop Hwy since the 1980's. I have always enjoyed the views from mtn Peaks. I enjoyed the stillaguamish river and the Sauk river. I Enjoy a Leisurely drive from Granite Falls to Darrington and Back many time a year.

Being a Planning Commissioner for the city of Granite Falls. We have watched our tourism start to decline Because of Lack of maintmance.

We would Like to see the speed Limit Lowered For Better Viewing, safety to pedestrians and Bikes. also to allow For WATV's.

It is a great altenate route for the city of darrington

Please leave your comment sheet with staff before leaving!

I will email some more Ideas that you will be able to read.

Chris

GF

Mountain Loop Highway Feasibility Study

U.S. Department of Transportation
Federal Highway Administration

RPA

Parametrix
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Please provide your input on your experiences along the corridor!

Tom Thorleifson
Name

tthorleifson@comcast.net
Contact Info (email)

Granite Falls 8/20/2018

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

I've lived near MP4 on SR92 for 38 years and have gone on frequent trips out on the Mountain Loop Highway into the Mt Baker-Snoqualmie NF all the time. I would like to email my comments – handwriting is difficult.

Please leave your comment sheet with staff before leaving!

6F

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Please provide your input on your experiences along the corridor!

Name: FRED CRUGER

Contact Info (email): abbott1912@aol.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

The Mt. Loop Hwy represents the finest focal point for "Historical Tourism" in Snohomish County. If paved (for both maintenance and ease-of-travel issues), it needn't be widened into a full-width two-lane highway. It could be a 30 mph scenic drive with turnouts and markers for both historical and environmental points of interest.

The closure of Gold Basin Campground near Verlot has been an environmental nightmare for The Loop! Camping will continue unabated - the natural beauty guarantees that! Good road, and uncontrolled low speed limits, toilets, and planned camping will attract folks who appreciate the history and the environment.

A "gentle" Mt. Loop Hwy would make a great educational and entertainment/relaxation tool. Keep the narrow bridges, leave most bends, set a low speed limit, add a "rest stop" between Barlow Pass & Darrington... then harvest the good will of tourists. Winter closure expected!

Please leave your comment sheet with staff before leaving!

GF

Sign-In Sheet

NAME	ORGANIZATION	EMAIL	MAILING ADDRESS
Oak Rankin	Glacier Peak Inst.	Oak.Rankin@wsu.edu	PO Box 206 98241
Kealine Ash	TOWN OF DARR. (DARA)	to	
Paul Wagner	Various - SAF	pwagner@atterbury.com	PO Box 891 Darr, 98241

Darrington
#1

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Sign-In Sheet

NAME	ORGANIZATION	EMAIL	MAILING ADDRESS
Stephen Somsen	Darrington Strong	ssomsen@aol.com	Box 526, Darrington WA 98241
Joe Downes	Sen. Maria Cantwell	Joe_Downes@cantwell.senate.gov	2930 Wetmore Ave. 9-B Everett WA 98201
Rep Carolyn Eslick	State of Wash	carolyneslick@	Po Box 776 Sultan Wa
Marree Perrault	NCFS, DPRCC	marreeperrault@gmail.com	P.O. Box 580, Darrington, WA 98241
Randy Rankin	Darrington Rec	[illegible]	PO Box 4 Darrington Wa
Nels Rasmussen	Darrington Strong	drnels79@gmail.com	PO Box 84, Darr WA 98241
Martha Rasmussen	Darrington Strong	marthasgardens@gmail.com	" " "

Sign-In Sheet

NAME	ORGANIZATION	EMAIL	MAILING ADDRESS
John Graham	NQA	JohnG48_7@msn.com	9017 180th ST SE, Snohomish 98296
TED JACKSON	WA ATV ASC	TEDSBIR@GMAIL.COM	BATONVILLE
Judy Pendergrass	DARA	judypendergrass@hotmail.com	
Dock PENDERGRASS		dougn62@gmail.com	
Keith L Wagoner	Senator 39th LD		
Billye Brooks-Sebastian.	self	blb5333@yahoo.com	—
Bob Longley	NQA	bondonide@comcast.net	5125 15th Ave W Everett 98208
RICK KNIGHT	DARR STRONG	RICK@RWKNIGHT.com	Swede Heaven Rd.
DAN RANKIN	TOWN of DARRINGTON	dan.rankin@darringtonwa.us	~~PO Box~~ DARRINGTON
Oliver Rankin	NA	rankinOliverg@gmail	P.O. BOX 1209, Darrington
Ben Rankin	NA	benemrankin@gmail.com	Po. Box 1209, Darrington
JoAnn Milton	Darrington Strong	thunder13@frontier.com	PO Box 768, 98241
Ken Milton		miltonken@hotmail	PO Box 768 98241
Lora Petso	—	votepetso@aol.com	10616 237th PLSW, Edmonds 98020
Colin Petso		Albionact@aol.com	" "
Matthew Medina	NA	matthewmedina@fs.fed.us	1405 Emens Ave Darrington, WA 98241
Phyllis Reed	USFS	plreed@fs.fed.us	P.O. Box 891, Darrington, WA 98241

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Please provide your input on your experiences along the corridor!

Martha Rasmussen
Name

marthasgardens@gmail.com
Contact Info (email)

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

I go hiking, scenic drives, picnics, photography

The roadbed is increasingly getting worse with potholes, washboarding, dust & mud. This road sees very high use for gravel (part gravel) road & not maintained to standards. I'm finding I drive this road less because it has become less enjoyable due to the condition of the road. Last time I was on the Mountain Loop I got a flat tire.

I think the Loop is a bigger destination than it currently is. I know that many do not drive the complete road because of the gravel portion.

Please leave your comment sheet with staff before leaving!

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Please provide your input on your experiences along the corridor!

Name: Nels Rasmussen

Contact Info (email): drnels79@gmail.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

I live in Darrington and volunteer on forest roads through Friends for Public Use, a division of Darrington Strong, Inc. I've spent many hours picking up trash, clearing ditches and culverts and cutting out down trees on the mountain loop hwy and the many side roads north of Barlow Pass that visitors use to access outdoor recreation off the mountain loop.

I'm excited about the possibility of paving the mountain loop because I can foresee that leading to increasing access to winter recreation like cross country skiing, snow-shoeing and sledding.

I also believe that it will cut down on the amount of maintenance the road overall will need

Please leave your comment sheet with staff before leaving!

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Please provide your input on your experiences along the corridor!

Oliver Rankin
Name

rankinoliver3@gmail.
Contact Info (email)

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

I am against improvement of the mountain loop that involves paving. I say this because from my [illegible] perspective it's improvement could hender the economy of Darrington. As it stands now most drivers spend several hours driving the loop, this lands them in Darrington looking for food, gas, and refreshment. If the Mountain loop was paved I believe travilers would be more likely to pass by Darrington. The second reason I am against improvement is the impact increased traffic could have on the enviroment. More cars mean more people, trash and infurstructure. As it stands now the 14 mile section betwean verlot and Clear Creek is fairly [illegible] remote. I would hate to see a beautiful streech of land become polluted and abused by those who will not have to live in the mess.

Please leave your comment sheet with staff before leaving!

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Please provide your input on your experiences along the corridor!

Randy Rankin
Name

PO Box 4 Darrington Wa 98241
Contact Info (email)

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

~~The~~ ~~a~~ Cost too Communities (Darringto.)
Taxes - Safty (Fire Dept / Medical), increase in
fatalities w/speed. The unworkability
of one lane Rds w/todays exlarge Vehicles
& Trailers. The increase of developement
thus more Taxes & risk to the infastruct
& envirometn
Loss of law Enforment in our Community
Because of 60% increase in Vandalism &
Theft.

Please leave your comment sheet with staff before leaving!

Mountain Loop Highway Feasibility Study

U.S. Department of Transportation
Federal Highway Administration
RPA
Parametrix
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Please provide your input on your experiences along the corridor!

Name: Marree Perrault

Contact Info (email): marreeperrault@gmail.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

- I have lived in Darrington since 1993 and have completed "the loop" 3 times in that time.
- It is a beautiful drive but the 14 miles of unpaved section make it unbearable.
- That section needs to be paved. The economic boost on the mountloop Highway would benefit Darrington and Granite Falls.
- Also, another evacution route out of town would have been a help during the road closure between Arlington and Darrington.

I cannot think of one reason not to pave that portion of the road. The cost will be worth it.

I would like more information on project timeline and potential cost. I hope it gets done before 2038.

Thank you :)

Please leave your comment sheet with staff before leaving!

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Please provide your input on your experiences along the corridor!

Name: Lora Petso

Contact Info (email): votepetso@aol.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

Please recognize that Seattle area residents do not need another Highway style loop road. There are many.

This loop is valuable for its low speed, close to nature feel. (Like hiking for old folks and others who can't do 10 mile hikes). "Car hiking".

Please improve safety & maintenance, but don't cut large tree buffers.

Please leave your comment sheet with staff before leaving!

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Please provide your input on your experiences along the corridor!

Paul Wagner
Name

pwagner@atterbury.com
Contact Info (email)

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

Gravel portion is not adequate to handle current traffic load. Continued Forest Service maintenance with their meger budget means other road systems get no attention. There are full time residences accessed by road, should be Sno Co responsibility.

Paving would ~~et~~ massively reduce dust, both a safety issue & that all goes into the Sauk. Paving would reduce sediment that flows into Sauk.

Please leave your comment sheet with staff before leaving!

Darrington #2

Mountain Loop Highway Feasibility Study

U.S. Department of Transportation
Federal Highway Administration
RPA
Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

Sign-In Sheet

NAME	ORGANIZATION	EMAIL	MAILING ADDRESS
bridget wisniewski		bambittybam@frontier.com	
Martha Rasmussen	Darrington Strong FFPU	martha@ffpu.org	
Joann Melton	Darrington Strong &	thunder13@~~gma~~l.Frontier.com	TRAIL Strt.
Peter Forbes	Concerned Citizen	prforbes@gmail.com	
Ashley Boss		lang7138@alumni.uidaho.edu	
Kerry Frable	City Council	Kerry.frable@frontier.com	
Floyd Reece			30705 SAUK PR. RD
JON ALLEN			
Bradley CAll			Po box 543 Darrington WA
Gary Willis	Town Council		PO box 571 Darrington
DAN RANKIN	Town of DARRINGTON		
Kevin Ashe	Town Council		
Randall Ashe	DARA		
Judy Pendergrass	DARA	judypendergrass@hotmail	
Doug Pendergrass			
RICK KNIGHT	D. STRONG	RICK@RWKNIGHT.com	
Trisha ODell			36616 324th St. NE Arlington
Doug Hordyk			36616 324th st ne arligton
Phillis Reed	USFS	plreed@fs.fed.us	
Ed Henderson	North Cascades Conservation Council	edhenderson57@comcast.net	
Steve Laboff	GPI	slaboff@gmail.com	POB 369 98241
Steve Somsen	DARRINGTON Strong	ssomsen@aol.com	Box 526 Darrington
Robert Crum	Bedal	[illegible]@cam	PO BOX 62.
MICHAEL G. KNOTT	BEDAL	MKNOTT3353@GMAIL	POBOX 62
William D. Walter	Resident	walter24721@yahoo.com	P.O.B 996 98241

Darrington

Mountain Loop Highway Feasibility Study

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RPA

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ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

Sign-In Sheet

NAME	ORGANIZATION	EMAIL	MAILING ADDRESS
Marla Skaglund	D Strong	marlaskaglund@yahoo	
Nels Rasmussen	D. Strong	drnels79@gmail.com	
Dave & Sarah Holme	DSD	hoopswa@gmail.com	
Rhionna Conley	D. strong	Conley.Manda111618@gmail.com	P.O. 282 98241
Ronna Conley	D strong	rrthingsnmore@yahoo.com	P.O. 282 98241
Paul Wagner	D. Strong	pwagner@arterbury.com	PO Box 891
Bob + Duane Boyd	River Resource Trust	duaneboyd@frontier.com	29920 SR 530 NE Dtn
Oak Rankin	Glacier Peak Institute	Oak@glacierpeakinstitute.org	206-817466

Darrington

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Please provide your input on your experiences along the corridor!

Name: Stephen Somsen

Contact Info (email): ssomsen@aol.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

1. I Strongly Support Option 2-B w/25 mph design speed following the existing road w/ modest improvements to alignment and profile and asphalt surfacing at a width of 18-32 feet.

2. Having the MLH paved would:
   - improve safety
   - increase access to recreation
   - improve emergency respone
   - improve economic activity for Darrington

Please leave your comment sheet with staff before leaving!

Derrington

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Please provide your input on your experiences along the corridor!

Name: Stephen Laboff

Contact Info (email): slaboff@gmail.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

I've been recreating on the ML since 1991, probably 150 trips since then for whitewater boating & hiking. most of this is between Darrington & Bedal campground. I'm a local resident since 2018. I'm concerned about access during construction of a paved road — closures and delays. The Mt Snoqualmie Rd. was closed some weekends because of equipt. vandalism. I am concerned that paving will be detrimental to the wilderness experience and the town of Darrington. Dont want to see increased traffic on the ML Highway.

Please leave your comment sheet with staff before leaving!

Darrington

Mountain Loop Highway Feasibility Study

U.S. Department of Transportation
Federal Highway Administration

Parametrix

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Please provide your input on your experiences along the corridor!

Name: Judy Pendergrass

Contact Info (email): judypendergrass@hotmail.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

This is an incredibly beautiful scenic highway that <u>everyone</u> should have access to. Having a 25 mph paved highway will open up opportunities for <u>all</u> to be able to drive there!

Please leave your comment sheet with staff before leaving!

Darrington

Mountain Loop Highway Feasibility Study

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ENGINEERING . PLANNING . ENVIRONMENTAL SERVICES

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Please provide your input on your experiences along the corridor!

Name: Nels Rasmussen

Contact Info (email): drnels79@gmail.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

I travel this corridor dozens of times a year to do volunteer road maintenance & recreation - hiking - mushroom hunting - camping. I favor paving to a 25 mile per hour standard.

We need to assess the economic value of a paved road to the Darrington community.

Please leave your comment sheet with staff before leaving!

Darrington

Mountain Loop Highway Feasibility Study

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Please provide your input on your experiences along the corridor!

Name: Martha Rasmussen

Contact Info (email): martha@ffpu.org

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

I enjoy scenic drives, hiking & photography. I get tired of the dust & potholes. I would love to see this road paved including a turnaround at the White Chuck Road (#23) junction & winter gate at Barlow & Bedal to allow the road to be plowed for winter recreation. Design the road using option #2. Plow for winter recreation up to the winter-gates, making access beyond the gate for winter recreation. Where there are problem areas such as Chockwich & Gravel Creeks, incorporate fords w/ box culverts, possibly keep gravel.

Enhance the driving experience by adding viewpoints to see Perry Creek Falls, Forgotten →

Please leave your comment sheet with staff before leaving!

Darrington

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Please provide your input on your experiences along the corridor!

Doug Hordyk
Name

Contact Info (email)

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

Option 2 Paved 25 mph or less

Please leave your comment sheet with staff before leaving!

Darrington

What is this project?

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- Develop planning-level cost estimates
- Develop information and data to be forwarded into the environmental process if a project moves forward from the study (dependent on available funds)

Please provide your input on your experiences along the corridor!

MICHAEL G. KNOTT
Name

206-552-6375 MKNOTT3353@GMAIL
Contact Info (email)

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

FIRST I LIVE :4 MILES FROM BEDAL CAMPGROUND. IN 18+ YEARS I ESTIMATE 30,000 MILES DRIVEN ON THE DIRT SECTION FROM WHITE CHUCK TO BEDAL. THE PROSPECT OF PAVING THAT SECTION OF THE ROAD IS ATTRACTIVE. THE ROAD TODAY 3/7/19 IS VERY DIFFICULT NO SNOW REMOVAL AND VERY POT HOLED. VEHICLE MAINTINENCE IS A HUGE ISSUE. SPEED ON A NARROW PAVED ROAD IS OBVIOUSLY AN ISSUE BUT VARIABLE SPEED WARNINGS SEEM LOGICAL. A QUESTION I HAVE IS ABOUT WINTER MAINTIENCE AT LEAST TO REECES HIDEOUT, OUR HOME. ECONOMICALY THIS WOULD HELP DARRINGTON BY INCREASED VOLUME DURRING THE GOOD WEATHER MONTHS. THIS IS TOTALLY A VIABLE OPTION IN MY OPINION. THE OTHER SIDE OF THE COIN IS THIS WILL BRING MANY MORE PEPOLE WHO HAVE NO BUSINESS IN THE MOUNTIANS, BECAUSE OF ONLY HAVING LIVED IN A CITY. I AM WILLING TO GIVE ANY FEED BACK THAT ~~TH~~ YOU WOULD LIKE, SO CONTACT ME.

SINCERLY, Michael G. Knott

Please leave your comment sheet with staff before leaving!

Granite Falls #2

Sign-In Sheet

NAME	ORGANIZATION	EMAIL	MAILING ADDRESS
Dick Dinham		None	34010-102 ST. NE GF
Marty Goodrich		None	Box 742 Granite Falls
PETE EARTHCARE		EARTHCARE@COMCAST.NET	2203-172nd ST NE, MARYSVILLE, WA 98271
Tom FitzGerald	GF City Council	fitzmo@aol.com	113 Noble Way G.F. 98252
Gil Winje		gil.winje@gmail.com	P.O. Box 708; G.F. 98252
Fred Cruger	GF Planning Comm	abbott1912@aol.com	7020 230th Ave NE, G.F. 98252
Tom Thorleifson	GF Historical Society	tthorleifson@comcast.net	6401 147th Ave NE 98258 Lake Stevens
RAY HANBY	CITIZEN (SILVERTON)	YBSEP 45 @ YAHOO.COM	
Joe Garrotto	USFS	jgarrotto@fs.fed.us	
Kathy Ailand	Pilchuck Aud Soc	AilandKf@earthlink.net	—
Debra Hanby		hanbyfarm@yahoo.com	PO Box 1259 G Falls 9825
Bruce Straughn	GF City Council	bruce.straughn@granitefallswa.gov	PO Box 2014 GF 98252
Brook Chesterfield	Snohomish County	Brook.Chesterfield@snoco.org	3606 Rockefeller, Everett WA
Peter Forbes	Interested Citizen	prforbes60@gmail.com	233 N Gifford Ave, Arlington 98223
Eric Ozog	USFS	eozog@fs.fed.us	406 Shilley Way, G.Falls.
Felix Nishida	USFS - MBS NF	fnishida@fs.fed.us	
Kathy Johnson	PAS	katherine@earthlink.net	927 Quinn, Marysville
Sharon Sheppard	Mt. Loop Con	msharon@mindspring.com	~~Bo~~ 13532 278th Dr. NE G 98220
Paul Sheppard	Mt. Loop Conservancy	paulshep@mindspring.com	13532 278th Drive NE
Anna Roth	WTA	anna@wta.org.	
DAN RANKIN	TOWN of DARRINGTON		
MATT HARTMAN	City of Granite Falls		
Todd + Julie Marshall		todd@windermere.com	10127-40th Ave. SE, EVT
Steve White	Resident		31212 M.L. Hwy
Justin Myser	Resident	jmyser21@gmail.com	17515 Engebretsen Rd
James Smith	Resident	Jfairbairnsmith@gmail.com	13005 279th Ave NE GF.

GF

Sign-In Sheet

NAME	ORGANIZATION	EMAIL	MAILING ADDRESS
Ken McClow		Volkeno@Hotmail.com	208 Anderson Ave GF. 98252

GF2

Mountain Loop Highway Feasibility Study

U.S. Department of Transportation
Federal Highway Administration

RPA

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Please provide your input on your experiences along the corridor!

Name: Dick Dinham

Contact Info (email): None

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

live in Verlot —
People need more parking on Roads —
Summer & winter
open ML — up to the ice caves — people
want to Play in snow — fish & ?

Please leave your comment sheet with staff before leaving!

GF2

Mountain Loop Highway Feasibility Study

U.S. Department of Transportation
Federal Highway Administration
RPA
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Please provide your input on your experiences along the corridor!

Name: Todd & Julie Marshall

Contact Info (email): todd@windermere.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

In the Spring, Summer and Fall we travel the Mountain Loop Highway 2-3 times a month.

We would like to see Option 1 or 2 as a solution to the gravel portion. Since we travel this road regularly we would enjoy a smoother ride. We would like to see this road maintained to be able to have easier access.

Please leave your comment sheet with staff before leaving!

GF2

Mountain Loop Highway Feasibility Study

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Please provide your input on your experiences along the corridor!

Name: PETE EARTHEART

Contact Info (email): EARTHEART@COMCAST.NET

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

I ENJOY BEING ABLE TO DRIVE THE MLH
FROM SPRING THRO'N MID SEPT. BUT BY THEN
THE RUTS + POT HOLES + WASH BOARDING ARE TOO MUCH
FOR MY LITTLE CAR
I WOULD SUPPORT OPTION 1 OF GRADING + IMPROVING
THE GRAVEL PORTION AS A MINIMUM. THEN
~~[illegible]~~ OPTION 2 WHERE FEASIBLE AS FUNDS BECOME
AVAILABLE.
THE ARGUMENT THAT IMPROVING THE GRAVEL PORTION
WILL ADVERSLY ~~AF~~ IMPACT DARRINGTON IS FALSE THINKING
SINCE MOST PEOPLE COME FROM THE SO + EVERETT
THERE WILL BE MORE PEOPLE WHO WILL CONTINUE
N. FROM BARLOW PASS + LIKELY TO EAT + GAS UP
IN DARRINGTON THAN DO NOW.
I'M CURIOUS HOW YOU STANDARD METRICS FOR
IMPROVING A ROADWAY APPLY HERE SINCE IN REALITY WE

Please leave your comment sheet with staff before leaving!

NOW HAVE 2 DEAD END ROADS AT THE GRAVEL PORTION
AT THE DIVIDING END POINTS, VS CREATING A
NEW/ACCESSIBLE LONG ROAD BY DOING EVEN OPTION 1
+ MAKING IT MORE DRIVER FRIENDLY

GF2

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Please provide your input on your experiences along the corridor!

Name: Tom FitzGerald

Contact Info (email): fitzmo @ aol.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

My Use

- Drive The loop to Darrington
- pic-Nic
- fish
- camp
- photograph
- recreation

Please leave your comment sheet with staff before leaving!

GF 2

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Please provide your input on your experiences along the corridor!

Name: RAY HANBY

Debra Hanby → I support option #1

Contact Info (email): YBEP 45 @ YAHOO . COM

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

LIVE IN GRANITE, HAVE A CABIN AT SILVERTON; TRAVEL THERE + BEYOND AT LEAST WEEKLY TO BIKE, HIKE, CAMP ... AT TIMES BACKPACK FOR MULTI-DAY TRIPS.

OPTION ONE I HEAVILY SUPPORT; TO IMPROVE + KEEP UP THE 14 MILE TRAVEL ROADWAY

FUNDING IS AND HAS BEEN THE PRIMARY PROBLEM ... JUST TOO MANY DIFFERENT AGENCIES ... HISTORICALLY THE CORRIDOR HAS BEEN POORLY MAINTAINED

Ray

Please leave your comment sheet with staff before leaving!

GF 2

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Please provide your input on your experiences along the corridor!

Name: Paul + Sharon Sheppard

Contact Info (email): msharon@mindspring.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

Option 0 - do nothing, or option #1 would be our "vote". Save the money to maintain the current road and mitigate environmental impacts.

Please leave your comment sheet with staff before leaving!

GF 2

Mountain Loop Highway Feasibility Study

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Please provide your input on your experiences along the corridor!

Name: James Smith

Contact Info (email): JFairbairnSmith@gmail.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

I enjoy hiking and scrambling the various mtn peaks off Mtn Loop. I also belong to SCVSAR, So I have used Mtn loop to get to Search missions as well, I have driven at Night and in the rain on the highway. So I understand the need to make the gravel and crown improvements. I would rather see roads like NF-49 open fully to allow deeper hiking and access to help for search and rescue missions; versus paving this section of Mtn loop. Since there's alway landslide cleanup it seems to be easier and cheaper to do that for a gravel road vs paved.

Please leave your comment sheet with staff before leaving!

11

Granite Falls

Sign-In Sheet

NAME	ORGANIZATION	EMAIL	MAILING ADDRESS
Gil Winje	—	gil.winje@gmail.com	
Kathryn Piland	Pilchuck Audubon	piland4@earthlink.net	
Linda Forsman		chance91@Hotmail.com	Po Box 1632 GF 98252
Paul Sheppard	Mountain Loop Conservancy	paulshep@mindspring.com	Po Box 300 GF 98252
Scott Toews		czmping@w-link.net	
JIM SEBRING	ME	~~[illegible]~~	
Les Traulsen		dadtraulsen@comcast.net	
Tone Hutton		tone@.frontier.com	1811 Balser Ave, Everett 98201
FRED CRUGER		abbott1912@aol.com	7020 230th Ave NE, G.F, 98252
JIM HOLT		holt.jr.holt@gmail	MONROE, WA 98272
Ed Phelps			PO. 294 Lk. Stevens 98258

GF

Sign-In Sheet

NAME	ORGANIZATION	EMAIL	MAILING ADDRESS
Richard L. Stewart			11829 7th PL SE Lk. Stevens
Rod Olson			11708 SR530 NE Arlington
Robert Sutherland	State Representative		
Elaine Campbell	self		
Tom Campbell			
Louis Coulson	Resident		PO Box 851 GF Falls
Robin Olson.	Res.		11622 Silver Lk. Rd. #94
Craig Wells	Resident		20020 Silverton Way GF 98252
Sarah Jorgensen	Resident		Mountain Loop Hwy
Rep Carolyn Eslick	State of Wash		PO BOX 776 Sultan WA
Sharon Sheppard	Mt. Loop Conservancy		PO Box 300 G.F. WA
DAN RANKIN	Town of DARRINGTON		P.O. Box 397 98241
Rick White	Mt Loop Papas		PO Box 1623 98252
Kathy Dalton	Mt Loop Mamas		Po Box 1623 98252
Ed Rauter			
Ed Pasowicz			
Ken McClow			208 Anderson ave GF 98252
Steve Dickson.	Snohomish County		3000 Rockefeller Ave Evtt.
Rick & Karen Kammerer			12903 74th St NE Lk Stevens 98258
JESSE W. JAMES	F.D. #17		
Kelly Marquardt	Rep Del Bene's office	kelly.marquardt@mail.house.gov	
Tom Thorleifson	G.F. Historical Society and League of Snohomish Heritage Organizations		tthorleifson@comcast.net
Tom Campbell			3521-147th Ave NE 98258

Mountain Loop Highway Feasibility Study

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Please provide your input on your experiences along the corridor!

Matt Riggen
Name

mriggen64@gmail.com
Contact Info (email)

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

I think primary considerations should be Safety, resource conservation and minimizing maintenance. I also think consideration of pedestrian and non-motorized use of the roadway and immediate vacinity should be priorities. Lastly, please take into account the frequency of flood events in recent years and the forecasts for western Washington and the Skagit of increasing likelyhood of large flood events with climate change impacts. I think it makes the most sense to focus on problem areas with option 2 type fixes to shore up and protect the natural resources and infrastructure.

Please leave your comment sheet with staff before leaving!

What is this project?

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Please provide your input on your experiences along the corridor!

Name: Sharon Sheppard

Contact Info (email): msharon@mindspring.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

Years before we moved to Sand Hill on the Mt. Loop Highway, we traveled from the Seattle area to hike, climb, ski + enjoy nature this area.

Since we live here now we see daily the unmet needs of this area - lack of law enforcement, illegal dumping, illegal camping + shooting near homes + farms.

When this area becomes a well cared for then we can consider

Please leave your comment sheet with staff before leaving!

Mountain Loop Highway Feasibility Study

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Please provide your input on your experiences along the corridor!

Name: Jim Holt

Contact Info (email): holtjr.holt@gmail.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

My Preference is for minimal improvement To Limit the easy accessibility to The area. improve fish passage & maintain a safe but slow speed road.

Please leave your comment sheet with staff before leaving!

What is this project?

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Please provide your input on your experiences along the corridor!

Name: Rod Olson

Contact Info (email): olsonssawshop@frontier.com
11708 SR530 NE. Rd.

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

Winter usage - Stop Plowing at Deer Cr. - use Money saved to plow from Clear Cr. to Bedal. People live at both ends.

Make ongoing improvement on gravel over time - But keep it a small rural Road -

My usage is from the 50s Summer & winter.

Please leave your comment sheet with staff before leaving!

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Please provide your input on your experiences along the corridor!

Name: Sarah Jorgensen

Contact Info (email): healingtreemaws@gmail.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

As a resident, I would love to see low environmental impact repairs to the road. Mainly to protect the forest and river and their natural inhabitants.

I fully support Option 2:
I understand funding may be at issue (duh.)

Anything that improves Emergency Response time is good.

Everything that supports the preservation of the environment and local wildlife is best.

Why not ask Washington Corporations, or even nationally recognized brands (Patagonia, R.E.I.) to donate funds? They get good press, we get improvements. Win = Win. Thank You for this Study.

Please leave your comment sheet with staff before leaving!

What is this project?

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Please provide your input on your experiences along the corridor!

Name: Scott Toevs

Contact Info (email): camping@w-link.net

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

We use the highway to get away from the paved roads. It is fine the way it is. We slow down and enjoy the scenery, there ~~are~~ less and less roads like this around. The people that don't enjoy it can go somewhere else. Any improvements would allow increased speeds that are already excessive by many vehicles. The highway is unique because it has remained unchanged all these years. I have been using it since the 70's (grew up in Seattle). please allow it to just be the way it has been for so long. Some things should be left alone. Improvements = more traffic

Please leave your comment sheet with staff before leaving!

thank you.

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Please provide your input on your experiences along the corridor!

Name: Elaine Campbell

Contact Info (email): aarau5004@yahoo.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

Option 2
Minor repairs/culverts.
Keep it so only people who are interested in the outdoors & beauty of the land. Not a speedway for lots of traffic. Keep it natural.

X Grade the Pilchuck road. Almost buried our car. Egad!

Please leave your comment sheet with staff before leaving!

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Please provide your input on your experiences along the corridor!

Name: Louis Coulson

Contact Info (email): louieman@live.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

> spot improvements - hydraulics (drainage)
- culverts / bridges
- sunken grade

> Gravel Section Option 2 or Option 3
depending on funding
- OSO slide points up option if
SR closed

> Bridge 102 is major chokepoint
- county responsibility

Please leave your comment sheet with staff before leaving!

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Please provide your input on your experiences along the corridor!

Rick/Karen Kammerer
Name

rjkamm624@aol.com
Contact Info (email)

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

Def NO on option 4!

Increased non-roadside parking options needed at popular Trailheads. Current No Parking signs erected by Sno. Co. are driving parking onto private properties.

Re 14 miles either option 2 or non-paved option of option #3. Increase smoothness of roadway for emergency response, but not so improved that general speeds increase.

Please leave your comment sheet with staff before leaving!

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Please provide your input on your experiences along the corridor!

Name: Ed Reuter

Contact Info (email): reuteredc@gmail.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

I have spent thirty years on the mountain loop. I visit the more remote roads off the main road.

More & More people are using the road so some improvements are needed.

If improvements are made will access to forest service roads improve? Roads have been closed or not maintained for years so less places to go while on the loop.

Thanks for having this meeting.

Please leave your comment sheet with staff before leaving!

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Please provide your input on your experiences along the corridor!

Ed Pasowicz

Name

Contact Info (email)

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

I support option 2. along with a good maintance program,

Please leave your comment sheet with staff before leaving!

What is this project?

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Please provide your input on your experiences along the corridor!

Robert J. Sutherland
Name

robert.sutherland@leg.wa.gov
Contact Info (email)

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

Improvements need to be made, Potholes are not desireable. 25 mph well-maintained gravel seems reasonable. Slower traffic (25 mph vs 40mph) is safer, helps maintain the rural experience of enjoying a casual drive in the country, and allows campers to have a more enjoyable time.

Just my $0.02.

Please leave your comment sheet with staff before leaving!

What is this project?

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Please provide your input on your experiences along the corridor!

Name: MR. Robin Olson

Contact Info (email): rh_olson@yahoo.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

I've been camping on the loop hwy. all my life, along with my family. I support only option one because of these reasons.

- Many spots along the 14 mi. section are not practical to widen, because there's a mountain on one side of the road, and river on the other.
- Campsites are along the road in many locations. Firsthand experience tells me that cars already go too fast on the road. Any paving of the road would make no sense.

Please leave your comment sheet with staff before leaving!

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Please provide your input on your experiences along the corridor!

Name: Tone Hutton

Contact Info (email): tone@frontier.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

I find that our unpaved section of the Mountain Loop Hwy requrres a separate skillset to drive it safely. Pavement would reduce accidents.

My use of this highway is recreational.

Please leave your comment sheet with staff before leaving!

Mountain Loop Highway Feasibility Study Darrington

Sign-In Sheet

NAME	ORGANIZATION	EMAIL	MAILING ADDRESS
Randy Hayden	WSRP	christiancowburgh@hotmail	P.O. Box 945 Darrington 98241
RANDY ASKE	DARA	Randall.Aske52@gmail.com	
DAN RANKIN	TOWN of DARRINGTON	olsonssawshop@frontier.com	1708 SR5-30 NE Dr
Rod OLSON			
STEVE THOMSEN	SNOCO PW'S	steve.thomsen@snoco.org	
Diane Boyd	River Resource Trust	dianeboyd@frontier.com	
Shelley Sumpter			
bridget wisniewski		bambittybam@frontier.com	
Phyllis Reed	USFS	phyllis.reed@usda.gov	
Lora Petso			
~~Adrienne Hall~~	~~PUBLIC~~	RDAHLAHALL@GMAIL	
Merline Aske	DARA		
Matt Ross			
GARY PAULL	—	garyjpaull@gmail.com	
STEVE CHAMBERS	GRANITE CONSTRUCTION CO	steve.chambers@gcinc.com	
Kerry Frable		Kerry.frable@frontier.com	
Ed Henderson	North Cascades Con	edhenderson57@comcast.net	
JON ALLEN		kalakala_1@hotmail.com	
MICHAEL KNOTT		MKNOTT3353@GMAIL	PO BX 62 DARRINGTON
Jessica Coleman	Resident of Darrington	howejessr@hotmail.com	1110 EMENS AVE DARRINGTON

Darrington

Sign-In Sheet

NAME	ORGANIZATION	EMAIL	MAILING ADDRESS
Kathy Rodgers			
DENNIS MATTES			Po Box 192
Paul Wagner		pwagner@atterbury.com	PO BOX 891 - Dar.
Odile + Walt DORTCH		waltdortch@gmail.com	Po Box 1091 - DARR.
George Winters		geowinters@frontier.com	
Colin Getty		altbibract@AOL.coM	
Rick Dahl		Rdahl1953@gmail.com	31030 Crawford Loop
Ashley Ross		ashley.ross@usda.gov	1409 Emens Ave. N, Darrington
CAMERON CARDWELL			
Matthew Rigger			940 Sauk Ave Darrington
Gary Schillhammer		gschillhammer@gmail	36019 Swede Heaven Rd 98223

Darrington

Sign-In Sheet

NAME	ORGANIZATION	EMAIL	MAILING ADDRESS
DAVE BELL		DAVISCULE@GMAIL.com	700 clear creek

Mountain Loop Highway Feasibility Study

U.S. Department of Transportation
Federal Highway Administration
RPA
Parametrix
ENGINEERING PLANNING ENVIRONMENTAL SCIENCES

What is this project?

- Identify needs and objectives
- Identify potential impacts and constraints
- Identify possible short-range and long-range improvements
- Develop planning-level cost estimates
- Develop information and data to be forwarded into the environmental process if a project moves forward from the study (dependent on available funds)

Please provide your input on your experiences along the corridor!

Lora Petso
Name

votepetso
Contact Info (email)

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

Option 1 or 2 only please

My experiences along the corridor depend on having the forest near the road w/o setback.

"Hiking for old people"

Please leave your comment sheet with staff before leaving!

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Please provide your input on your experiences along the corridor!

Name: Rod Olson

Contact Info (email): Olsonssawshop@frontier.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

See Att.

Please leave your comment sheet with staff before leaving!

November 7, 2019

Mountain Loop Study

Keep road open to Bedal, – summer and winter - with improvements, couple of bad spots will be challenging enough - plow it - close gate (just beyond) Bedal in winter *

Keep it open to Deer Creek – summer and winter – plow it – close gate in winter – winter recreation easily accessible - there is heavy foot use in the winter to Big 4 *

Snowmobiling is another issue to be addressed separately

Get cars off road at Barlow Pass

Keep the section rural -in between - gravel it and maintain as needed into the future – minimal cost, better for all (wildlife and everyone except speeders) emergency response time would be minimal in that short section of road, less impact on Monte Cristo Lake, close vertical bank to Sauk River and less impact on tribal ancestral grounds

Been involved with Sauk and Suiattle valley since early 50's

Rod Olson

* People live year around.

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Please provide your input on your experiences along the corridor!

Name: Shelley Sumption

Contact Info (email): ssumption57@gmail.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

I am fairly new to this area (3yrs) and have only driven a short portion of the 14 mile road. However, I moved out here because of the rural/wilderness area that it is. The town is the right size to ~~[illegible]~~ provide services needed + keep a balance with the wildlife. I feel that balance continues with the MLH + that 14 mile stretch of gravel. I would like to see some improvements to maintain the road, Opt #2E with widening options for safety, but not any more so as to keep that balance of people + nature.

Please leave your comment sheet with staff before leaving!

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Please provide your input on your experiences along the corridor!

Gary Schillhammer
Name

gschillhammer@gmail.com
Contact Info (email)

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

I enjoy access to the GP wilderness area.
Road access to trailheads allows both on foot/trail activities hiking, bike, skiing, hunting, fishing, treking, mountaineering, etc without roads into the USNF deeper areas of the Wilderness to be explored, I use the NF Sauk and Mtn Loop at least every 3 weeks year round!
Road must be maintained, drainage and culverts road maintenance construction to minimize effects of erosion.
Basic safe access a necessity!! Paving unnecessary but continue with road rebuilds to minimize future effects of slides + erosion
My preference would be to widen the road, 40 mph design leave it gravel,

Please leave your comment sheet with staff before leaving!

Mountain Loop Highway Feasibility Study

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ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

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Please provide your input on your experiences along the corridor!

Name: MICHAEL KNOTT

Contact Info (email): [redacted] - MKNOTT3353@GMAIL

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

I LIVE AT BEDAL (CREEKS HIDEOUT). I TRAVEL THE SECTION OF MTN. LOOP FROM DARRINGTON DAILY. FROM THE OPTIONS GIVEN I BELIEVE OPTION 3 SEEMS TO BE THE BEST TO ACHIEVE THE GOALS AND OBJECTIVES. I BELIVE OPTION 2 WOULD BE AN IMPROVEMENT BUT WOULD TAKE AS MUCH MATINENCE AS CURRENTLY EXISTS.
OPTION 4 IS NOT PRACTICAL OR NEEDED.
DO SOMETHING TO REDUCE THE POT HOLE DAMAGE TO MY VEHICLES, IT IS VERY COSTLY.
THANK YOU FOR YOUR HARD WORK AND DILIGENT CONSIDERATION.

Please leave your comment sheet with staff before leaving!

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Please provide your input on your experiences along the corridor!

Name: Colin Petso

Contact Info (email): albionact@aol.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

We love the slow drive down the gravel road! We would prefer the road not be paved so that ~~traffic~~ can zoom by. The work on the culverts would be very beneficial. Personally, I would like to see a speed limit of 15 – 20 mph.

Please leave your comment sheet with staff before leaving!

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Please provide your input on your experiences along the corridor!

Name: Paul Wagner

Contact Info (email): pawagner@atterbury.com
atterbury

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

Pavement + 25 mph design speed.

- will eliminate dust that impacts water, recreation and safety (vision)
- high comfort experience for users, better experience
- Em. vehical response +
- service vehicle + septic service for rec private.
- upgrade culverts/drainage for fish
- Assume gravel will not be maintained, USFS is not funded or organized to adequately maintain, Pave & Sno. Co manage.
- Should display Net Present Value of $112,000 assumed annual maint. w/ existing condition. Allows better comparison w/ other costs.

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Please provide your input on your experiences along the corridor!

Randy Hayden
Name

christiancowboyrh@hotmail.com
Contact Info (email)

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

I use the MLH mostly for day hikes or trips
I like the option 3 with pavement. Darrington
and Granite Falls would greatly Benift with
the addal Tourism that this would bring.

Please leave your comment sheet with staff before leaving!

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Please provide your input on your experiences along the corridor!

ADRIENNE HALL
Name

RDAHLAHALL@GMAIL.COM
Contact Info (email)

→RETIRED USFS VERLOT/MT LOOP REC MGR

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

✱ THE MT LOOP IS A FOREST SERVICE SCENIC BYWAY. NOT A NATIONAL SCENIC BYWAY

✱ TO DISTRIBUTE TO OTHER RECREATIONAL NEEDS WOULD ENTAIL ROAD MAINTENANCE ~~OF~~ ROADS THAT BRANCH OFF OF THE MT. LOOP FS #49 FOR EXAMPLE. - ONE OF TWO ACCESS SITES INTO GLACIER PEAK WILDERNESS

✱ STRONGLY ENCOURAGE TRAFFIC CIRCULATION IMPROVEMENTS AT VERLOT PUBLIC SERVICE CENTER!! NOT ENOUGH PARKING + ACCIDENT HAZARDS!

✱ PREFER OPTION #2

SNO CTY HAS DONE AN OUTSTANDING JOB IN ROAD MAINTENANCE!

Please leave your comment sheet with staff before leaving!

What is this project?

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Please provide your input on your experiences along the corridor!

Kathy Rodgers
Name

kathy.rodgerz@gmail.com
Contact Info (email)

DENNIS M[redacted]

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

① Build the road so that it requires the least amount of maintenance later.

② Include trailhead parking, bathrooms

③ Goal #1 – Option #3 - ~~18 foot~~ - 24 foot paved makes the most sense here.
(option 4 would not be conducive to peaceful camping by the river)
★ option 3 would leave space for non-motorized pathways

④ Address the human waste problem @ camping areas
education, sawdust toilets,

Please leave your comment sheet with staff before leaving!

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Please provide your input on your experiences along the corridor!

Name

Contact Info (email)

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

- Add in spot repair – bridges with weight restrictions – what will it take to get bridges up to log haul & equipment
- Provide estimates of maintenance/mile for the different options

Please leave your comment sheet with staff before leaving!

What is this project?

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- Develop planning-level cost estimates
- Develop information and data to be forwarded into the environmental process if a project moves forward from the study (dependent on available funds)

Please provide your input on your experiences along the corridor!

Name: Matt Ross

Contact Info (email): downtrees@aol.com

Please tell us about your experiences along the Mountain Loop Highway. What do you do when you visit the corridor? Do you have any observations that you would like us to know? (please use the back of this sheet if you need additional space)

We need to see the road corridor be able to handle increased loads from heavy truck traffic such as log trucks, focus on the spots identified and try and get something in between option 2 and option 3 and keep it gravel.

Please leave your comment sheet with staff before leaving!

WA SNOHOMISH 20(1)
Mountain Loop Highway Feasibility Study
40 MPH Design Speed, 32 Foot Width, Paved Conceptual Cost Estimate

Main Construction Items	Unit Price	Quantity	Unit	Total Cost (Rounded)	Cost per Mile	
Clearing & Grubbing	$18,000.00	149	ACRE	$2,682,000	$191,550	
Roadway Excavation	$17.00	1,117,500	CUYD	$18,998,000	$1,357,000	
Aggregate Base Course	$28.00	131,000	TON	$3,668,000	$262,000	
Asphalt Concrete Pavement	$100.00	57,500	TON	$5,750,000	$410,700	
24-Inch Pipe Culvert	$125.00	3,700	LNFT	$463,000	$33,050	
Placing Conserved Topsoil	$7,000.00	75	ACRE	$525,000	$37,500	
Turf Establishment	$2,000.00	300	SLRY	$600,000	$42,850	
			Subtotal 1 =	$32,686,000	$2,334,700	
Temporary Traffic Control		5%		$1,634,000	$116,700	
Erosion Control		5%		$1,634,000	$116,700	
Schedule		0.5%		$163,000	$11,650	
Contractor QC/QA		5%		$1,634,000	$116,700	
Sampling & Testing		5%		$1,634,000	$116,700	
Survey		5%		$1,634,000	$116,700	
Contingency		50%		$16,343,000	$1,167,350	
			Subtotal 2 =	$57,362,000	$4,097,300	
Mobilization		10%		$5,736,000	$409,700	
			Subtotal 3 =	$63,098,000	**$4,510,000**	**Total Cost per Mile**
			Total Estimated Cost, 2019 =	**$63,100,00**		

WA SNOHOMISH 20(1)

Mountain Loop Highway Feasibility Study

25 MPH Design Speed, 18 Foot Width, Paved Conceptual Cost Estimate

Main Construction Items	Unit Price	Quantity	Unit	Total Cost (Rounded)	Cost per Mile	
Clearing & Grubbing	$18,000.00	79	ACRE	$1,422,000	$101,550	
Roadway Excavation	$17.00	170,500	CUYD	$2,899,000	$207,050	
Aggregate Base Course	$28.00	78,500	TON	$2,198,000	$157,000	
Asphalt Concrete Pavement	$100.00	35,500	TON	$3,550,000	$253,550	
24-Inch Pipe Culvert	$125.00	3,700	LNFT	$463,000	$33,050	
Placing Conserved Topsoil	$7,000.00	68	ACRE	$476,000	$34,000	
Turf Establishment	$2,000.00	272	SLRY	$544,000	$38,850	
		Subtotal 1 =		$11,552,000	$825,150	
Temporary Traffic Control		5%		$578,000	$41,300	
Erosion Control		5%		$578,000	$41,300	
Schedule		0.5%		$58,000	$4,150	
Contractor QC/QA		5%		$578,000	$41,300	
Sampling & Testing		5%		$578,000	$41,300	
Survey		5%		$578,000	$41,300	
Contingency		50%		$5,776,000	$412,550	
		Subtotal 2 =		$20,276,000	$1,448,300	
Mobilization		10%		$2,028,000	$144,850	
		Subtotal 3 =		$22,304,000	**$1,590,000**	**Total Cost per Mile**
	Total Estimated Cost, 2019 =			**$22,350,00**		

WA SNOHOMISH 20(1)

Mountain Loop Highway Feasibility Study

25 MPH Design Speed, 18 Foot Width, Gravel Conceptual Cost Estimate

Main Construction Items	Unit Price	Quantity	Unit	Total Cost (Rounded)	Cost per Mile	
Clearing & Grubbing	$18,000.00	79	ACRE	$1,422,000	$101,550	
Roadway Excavation	$17.00	170,500	CUYD	$2,899,000	$207,050	
Surface Course Aggregate	$35.00	115,000	TON	$4,025,000	$287,500	
24-Inch Pipe Culvert	$125.00	3,700	LNFT	$463,000	$33,050	
Placing Conserved Topsoil	$7,000.00	68	ACRE	$476,000	$34,000	
Turf Establishment	$2,000.00	272	SLRY	$544,000	$38,850	
			Subtotal 1 =	$9,829,000	$702,050	
Temporary Traffic Control		5%		$491,000	$35,050	
Erosion Control		5%		$491,000	$35,050	
Schedule		0.5%		$49,000	$3,500	
Contractor QC/QA		5%		$491,000	$35,050	
Sampling & Testing		5%		$491,000	$35,050	
Survey		5%		$491,000	$35,050	
Contingency		50%		$4,915,000	$351,050	
			Subtotal 2 =	$17,248,000	$1,232,000	
Mobilization		10%		$1,725,000	$123,200	
			Subtotal 3 =	$18,973,000	**$1,360,000**	**Total Cost per Mile**
			Total Estimated Cost, 2019 =	**$19,000,000**		

WA SNOHOMISH 20(1)
Mountain Loop Highway Feasibility Study
25 MPH Design Speed, 32 Foot Width, Paved Conceptual Cost Estimate

Main Construction Items	**Unit Price**	**Quantity**	**Unit**	**Total Cost (Rounded)**	**Cost per Mile**	
Clearing & Grubbing	$18,000.00	111	ACRE	$1,998,000	$142,700	
Roadway Excavation	$17.00	284,500	CUYD	$4,837,000	$345,500	
Aggregate Base Course	$28.00	132,000	TON	$3,696,000	$264,000	
Asphalt Concrete Pavement	$100.00	58,000	TON	$5,800,000	$414,300	
24-Inch Pipe Culvert	$125.00	3,700	LNFT	$463,000	$33,050	
Placing Conserved Topsoil	$7,000.00	73	ACRE	$511,000	$36,500	
Turf Establishment	$2,000.00	292	SLRY	$584,000	$41,700	
			Subtotal 1 =	$17,889,000	$1,277,800	
Temporary Traffic Control		5%		$894,000	$63,850	
Erosion Control		5%		$894,000	$63,850	
Schedule		0.5%		$89,000	$6,350	
Contractor QC/QA		5%		$894,000	$63,850	
Sampling & Testing		5%		$894,000	$63,850	
Survey		5%		$894,000	$63,850	
Contingency		50%		$8,945,000	$638,950	
			Subtotal 2 =	$31,393,000	$2,242,350	
Mobilization		10%		$3,139,000	$224,200	
			Subtotal 3 =	$34,532,000	**$2,470,000**	**Total Cost per Mile**
			Total Estimated Cost, 2019 =	**$34,550,00**		