SR 14 AND DOG MOUNTAIN CONGESTION AND SAFETY STUDY

APPENDICES

Comprehensive guidance to improve safety and manage congestion in Washington's Columbia River Gorge National Scenic Area

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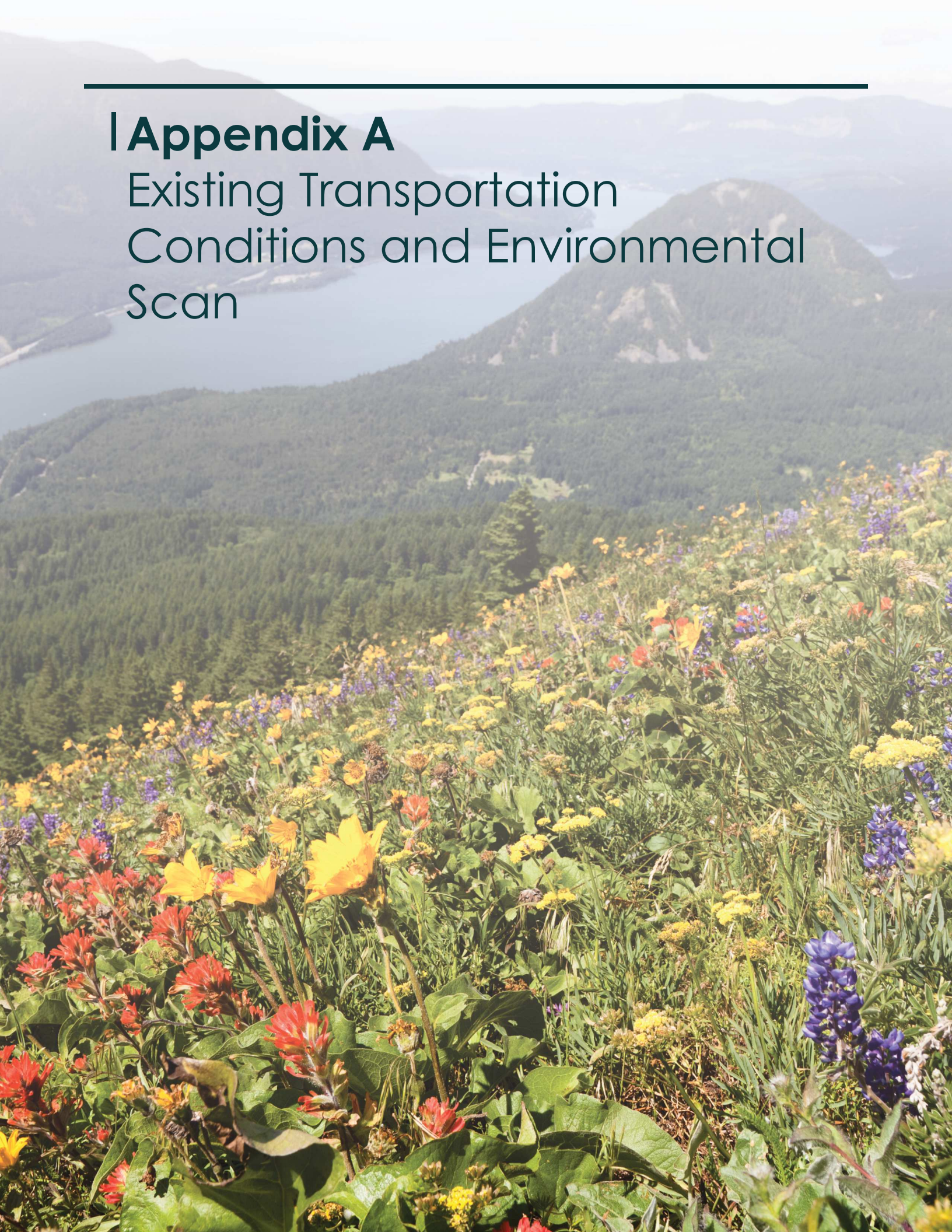

Appendix A
Existing Transportation Conditions and Environmental Scan

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SR 14 AND DOG MOUNTAIN CONGESTION AND SAFETY STUDY

Existing Conditions Report

Contract No. DTFH7015D00002, Task Order No. 69056720F000058:
WA DOT 14(4), Congestion and Safety Mitigation Plan
WA DOT 14(3), Dog Mountain Trailhead Study

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FIGURES

TABLES

ABBREVIATIONS/ACRONYMS

AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway Transportation Officials
ADA	Americans with Disabilities Act
BFE	Base Flood Elevation
BGEPA	Bald and Golden Eagle Protection Act
BIA	Bureau of Indian Affairs
BNSF	BNSF Railway
CAT	Columbia Area Transit
CFR	Code of Federal Regulations
CRGC	Columbia River Gorge Commission
CRGNSA	Columbia River Gorge National Scenic Area
DAHP	Department of Archaeology and Historic Preservation (Washington State)
DAR	Dial-A-Ride
DHV	Design Hourly Volume
DPS	Distinct Population Segment
EO	Executive Order
ESA	Endangered Species Act
ESU	Evolutionary Significant Unit
FEMA	Federal Emergency Management Agency
FGTS	Freight and Good Transportation System
FHWA	Federal Highway Administration
FLAP	Federal Lands Access Program
FTA	Federal Transit Administration
GCR	General Condition Ratings
GIS	Geographic Information System
GMA	General Management Area
iPAC	Information for Planning and Consultation (USFWS)
KVA	Key Viewing Area
LE	Listed Endangered
LT	Listed Threatened
MATS	Mt. Adams Transportation Service
MBTA	Migratory Bird Treaty Act
MEV	Million Entering Vehicles
MP	Mile Post
MPO	Metropolitan Planning Organization
mph	Miles Per Hour
MVM	Million Vehicle Miles
N/A	Not Applicable
NEMT	Non-Emergent Medical Transportation
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service

NRCS	National Resource Conservation Service
NRHP	National Register of Historic Places
ODOT	Oregon Department of Transportation
PHS	Priority Habitats and Species
RCW	Revised Code of Washington
RIC	Recreation Intensity Class
SFHA	Special Flood Hazard Area
SMA	Special Management Area
SOC	Species of Concern
SR	State Route
SSD	Stopping Sight Distance
USACE	United States Army Corps of Engineers
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VMT	Vehicle Miles of Travel
VPD	Vehicles Per Day
WA	Washington
WDFW	Washington Department of Fish and Wildlife
WNHP	Washington Natural Heritage Program
WSDOT	Washington Department of Transportation
WSPMS	Washington State Pavement Management System

EXECUTIVE SUMMARY

The Federal Highway Administration (FHWA) is partnering with the United States Forest Service (USFS) and the Washington State Department of Transportation (WSDOT) to develop a congestion and safety study for and 80-mile stretch of Washington State Route (SR) 14 and the Dog Mountain Trailhead.

This Existing Conditions Report identifies roadway conditions and areas of concern for the study area, including a scan of environmental resources. The existing conditions analysis performed includes a review of previous studies, adopted plans and policies, and a desktop planning-level examination of the study area based on available historic traffic data, collision history, field observations, aerial imagery, Geographic Information System (GIS) data, and input from project partners.

POLICY AND REGULATORY ENVIRONMENT

Because this portion of SR 14 runs through the Columbia River Gorge National Scenic Area (CRGNSA), any changes to the corridor will be subject to the CRGNSA Management Plan. The CRGNSA Management Plan is sponsored and adopted by the Gorge Commission, a 13-member body comprised of 12 voting members, three each from Washington and Oregon (Governor-appointed) and one per county (six counties). A thirteenth non-voting member is appointed by the U.S. Secretary of Agriculture who must be from the USFS. The CRGNSA Management Plan was originally adopted in 1991, updated in 2004 and 2016, and a new revision is adopted as of October 2020. The USFS is charged with developing the land use regulations for federal land in special management areas: General Management Areas (GMAs), Special Management Areas (SMAs), and Urban Areas. The USFS is the principal landowner for SMAs, whose uses are more restricted than designated GMAs and which are the focus of this planning process.

The CRGNSA Management Plan further designates policies and provisions related to development for four recreation intensity classes (RICs) in GMA and SMA lands. The RIC of any GMA or SMA land dictates the allowable recreation uses. Specific to the development of the SR 14 and Dog Mountain Congestion and Safety Plan, the RIC of a recreation site will play an important role in alternatives development and selection because it will dictate the size and type of improvements that can be made.

KEY ISSUES

PARKING AT RECREATION SITES

The evaluation of existing conditions determined recreation sites within the study area that experience recurring instances of parking overflow that result in visitors parking on the shoulder of the adjacent county road or along SR 14.

CONGESTION

Traffic volume on SR 14 varies significantly in the study area and generally does not exceed the capacity limits of SR 14 in the rural sections. Congestion typically occurs within the urban communities during morning and evening rush hours, and at popular recreation sites during peak tourism seasons (typically spring and summer).

Parking lots at these popular recreation sites fill up and overflow on weekends during peak seasons, which can create safety and congestion concerns as people park on the shoulders of adjacent roads. In areas such as the Dog Mountain Trailhead, this parking overflow has started to happen on Fridays and Mondays

as well. Traffic and visitor use are expected to increase in the future, particularly at locations most accessible from urban areas. Figure E-1 summarizes those recreation sites along SR 14 that experience recurring parking overflow. Figure E-1 also notes the eight segments along the SR 14 corridor (in 10-mile increments) that this report uses to summarize safety issues and characteristics in the study area.

Figure E-1. Recreation Sites with Recurring Parking Overflow in the Study Area

SAFETY

This existing conditions analysis looked at five years of crash data along SR 14 to determine locations where the number of crashes exceed the average. The following highway sections of SR 14 were flagged for further review:

- West end of CRGNSA to Cape Horn Trailhead (Segment A)
- Doetsch Ranch Road to West Bonneville (Segment B)
- Wishram to east end of the CRGNSA (Segment H)

The most common types of crashes in the corridor were collisions with a guardrail along rural sections of SR 14. Rear-end collisions were the second most common crash type, often in the location of popular recreation access roads or features along SR 14. These crash types are consistent with the character of SR 14 character as a scenic, winding highway with many cross streets, turnouts, access points, and trailheads. An added safety concern along the corridor is the continued rockfall hazards in some sections along SR 14.

The most common contributing factors to crashes were drivers exceeding reasonable speeds and inattention.

GEOMETRIC ROADWAY CONDITIONS

Some sections of SR 14 traverse a combination of vertical and horizontal curves that restrict visibility and can pose safety hazards, particularly on the west end of the study area along the stretches of SR 14 through Cape Horn (Segment A) and Beacon Rock State Park (Segment B). Observed speed differentials between drivers along SR 14 is a source of reported driver frustration and a potential safety hazard.

ENVIRONMENTAL SETTING

An environmental scan of the study area was completed based on readily available geographic information system (GIS) mapping data and reported studies and does not include site information verified through a site visit. Potential access and safety improvement options identified in the congestion and safety study will inform later project development in compliance with the National Environmental Policy Act (NEPA) and other applicable federal and state regulations.

The CRGNSA Management Plan contains specific protections, including avoidance buffers and mitigation measures, for natural resources. Proposed developments in the CRGNSA are required to inventory natural resources and prepare plans to protect, manage, and/or mitigate impacts to them in consultation with the appropriate state and federal agencies.

Resources with specific preservation directives in the CRGNSA Management Plan include:

- Wetlands, lakes, and ponds
- Streams and riparian habitats
- Priority habitats and sensitive wildlife sites
- Rare plants and natural areas
- In the SMAs, forest resources through the review of forest practices

CONTEXT

INTRODUCTION

The Federal Highway Administration (FHWA) is partnering with the United States Forest Service (USFS) and the Washington State Department of Transportation (WSDOT) to complete a congestion and safety study of Washington State Route (SR) 14 and the Dog Mountain Trailhead.

This Existing Conditions Report identifies roadway conditions and areas of concern for the study area. The existing conditions analysis performed includes a review of previous studies, adopted plans and policies, and a desktop planning-level examination of the corridor based on historic traffic data, collision history, field observations, aerial imagery, Geographic Information System (GIS), and input from project partners.

This report also includes a scan of environmental resources within the study area that may be affected by potential improvements arising from the SR 14 and Dog Mountain Congestion and Safety Study. The planning-level environmental overview is based solely on a desktop research of data, reports, and plan documents and may be used to support future environmental documentation required for any improvements forwarded from this planning process.

BACKGROUND

SR 14 serves the Washington side of the Columbia River Gorge National Scenic Area (CRGNSA), connecting communities and providing access to recreational sites. An increased use of trails and other recreation destinations along SR 14 has impacted user experiences, particularly on weekends and holidays between May and October. As the population of the region and its popularity continues to grow, the large number of people who use SR 14 to access Columbia River Gorge (the “Gorge”) recreation sites and pass through the corridor places a strain on the transportation facilities in the CRGNSA.

The high vehicular demand on the transportation system into and through the Gorge creates traffic delays and safety concerns for both motorists and other users, especially pedestrians and bicyclists using the roadway to access recreation sites. Traffic volume and site data indicate that the trend will be continued growth in user activity. To prevent further degradation of SR 14 and key CRGNSA accesses, strategies need to be developed to address crowding and congestion.

The intent of the study is to develop a comprehensive package of strategies to address the transportation and safety needs of those using SR 14 to access the CRGNSA. The study will help facilitate early coordination with local, state, and federal agencies; the public; and other stakeholders and to screen possible improvement options.

FEDERAL LANDS ACCESS PROGRAM

In 2018, two applications to the Federal Lands Access Program (FLAP) resulted in funding for the study. The FLAP was established to improve transportation facilities that provide access to, are adjacent to, or are located within federal lands. FLAP supplements state and local resources for transportation facilities and emphasizes high-use recreation sites and economic generators.

STUDY AREA

The study area (Figure 1) includes SR 14 within the CRGNSA and connecting access roads and parking lots, including facilities that provide access to recreation sites. The study will give a special focus to the Dog Mountain Trailhead and its existing parking lot.

Figure 1. Study Area

SR 14

The SR 14 corridor in the study area is an 80-mile stretch of SR 14 beginning at mile post (MP) 18 near the eastern boundary of the city of Washougal in Clark County and extending east through Skamania County to MP 98 in Klickitat County, just west of the unincorporated community of Maryhill.

SR 14 connects the Portland and Vancouver metro area at its west end with the Washington Gorge communities of North Bonneville, Stevenson, Home Valley, White Salmon, Bingen, Lyle, Dallesport, and Wishram. The SR 14 corridor is part of the Lewis and Clark Trail Scenic Byway, which follows the north bank of the Columbia River and provides access to dozens of recreational sites. The SR 14 corridor has historically carried substantial tourist and recreational traffic and is a key economic link for the rural communities in the Gorge.

Lewis and Clark Trail Scenic Byway

The central portion of this 572-mile byway, which traces the route taken by Lewis and Clark's famous Corps of Discovery Expedition, runs through the CRGNSA. The byway follows the twists, turns, and hills of the Columbia River, offering glimpses of lush Oregon slopes and providing numerous roadside stops, including several historic markers.

DOG MOUNTAIN FOCUS AREA

The Dog Mountain and Augspurger Mountain Trail System (commonly referred to as Dog Mountain) is accessible from SR 14 at MP 53.7 on the north side of the highway, approximately 10 miles east of Stevenson, Washington (see Figure 2). The Dog Mountain focus area includes the existing gravel parking lot and adjacent USFS lands that could potentially serve as a site for relocation of the trailhead and parking lot.

Figure 2. Dog Mountain Focus Area

RELEVANT PLANS AND PROJECTS

This section summarizes the plans and projects relevant to the study area and the Study.

GORGE REGIONAL TRANSIT STRATEGY

The Gorge Regional Transit Strategy is currently in Phase I of planning, which includes strengthening partnerships, completing foundational assessments of transit in the Gorge, and developing a regional vision. This bi-state effort includes participation by representatives from the Oregon Department of Transportation (ODOT), WSDOT, the Mid-Columbia Economic Development District and Columbia Area Transit (CAT). Phase II (not currently funded) will focus on a more detailed implementation strategy and deeper operational assessments.

> **Relevance:** The Gorge Regional Transit Strategy encourages coordination between transit agencies in the CRGNSA. Transit is anticipated to be a component of any potential solution at Dog Mountain and an important tool for providing access and managing congestion at other recreation sites in the CRGNSA.

BEACON ROCK ENTRANCE ROAD REALIGNMENT PLANNING PROCESS

Washington State Parks and Recreation Commission is undertaking a planning process to renovate the main park entrance at Beacon Rock State Park. The project primarily addresses traffic and visitor safety where SR 14 intersects the entrance to Beacon Rock State Park. The purpose of the project is to design safer parking, realign or relocate the vehicle entrance, and analyze how to best separate pedestrian and vehicle traffic. The current road alignment and campground entrance were designed in the 1930s. Park access improvements are needed to address an expected increase in park visitation, the volume and speed of SR 14 traffic, and the lack of sufficient separation of pedestrian and vehicle traffic entering and leaving the park.

> **Relevance:** The preferred concept from the Beacon Rock Entrance Road planning process will be considered in the analysis of options for the Study.

SR 14 AT WIND RIVER ROAD - INTERSECTION IMPROVEMENTS

In 2019, WSDOT worked with Skamania County to construct a roundabout at the intersection of SR 14 and Wind River Road. The roundabout was the preferred design to improve safety, traffic flow, and access between Carson and SR 14.

Relevance: Other intersections in the SR 14 corridor exhibit deficiencies like the intersection of SR 14 at Wind River Road.

1997 SR 14 CORRIDOR MANAGEMENT PLAN

In the mid-1990s, WSDOT worked with various stakeholders on the Washington side of the Gorge to define and guide highway improvement projects through the CRGNSA. The SR 14 Corridor Management Plan consists of three independent reports: SR 14 Corridor Strategy and Action Plan, SR 14 Supplemental Highway Design Guidelines, and SR 14 Route Development Plan.

Relevance: The SR 14 Corridor Management Plan remains applicable and is referenced by the WSDOT Highway System Plan for guidance today. The deficiencies and needs identified in the 1997 plan informed the development of this Existing Conditions Report.

GOALS AND OBJECTIVES

The goals and objectives provide a framework for shaping the Study and will be the basis for the formation of evaluation criteria to determine which potential strategies, projects, programs, and pilot projects best meet the needs of the Study. Goals provide broad direction for what the Study hopes to achieve; corresponding objectives provide more detail on how to achieve the goal or articulate the desired specific outcomes related to the goal. Table 1 summarizes the goals and objectives of the Study.

Because the Study focuses on two study area elements (SR 14 and Dog Mountain), vision statements were developed that clarify the overall mission for each:

SR 14 Vision

To promote safe access to high-use recreational areas in the Columbia River Gorge National Scenic Area through the identification of opportunities to address congestion and safety concerns while protecting scenic, natural, cultural, and recreational resources.

Dog Mountain Vision

To manage congestion at, and promote safe access to, the Dog Mountain Trailhead through the identification of design alternatives that are consistent with the CRGNSA Management Plan.

Table 1. Plan Goals and Objectives

Goals	Objectives
Safety Enhance safety for all transportation modes.	a. Reduce conflicts among highway and recreational site users. b. Address existing safety issues at locations with a history of fatal and severe injury vehicle, bicycle- and/or pedestrian-related crashes. c. Support technology applications that improve safety. d. Improve the visibility of transportation users in constrained areas, such as on hills and blind curves. e. Improve pedestrian safety at trailheads.
Congestion Management Reduce or mitigate congestion along the corridor.	a. Develop a program to systematically implement improvements for all modes that enhance mobility at designated high-priority locations. b. Reduce reliance on single-occupancy vehicle trips c. Improve travel reliability and efficiency of SR 14. d. Increase awareness of availability of park-and-ride opportunities. e. Identify opportunities to spread out visitation along the entire corridor.
Strategic Investment Develop a fiscally sustainable plan for the corridor through responsible stewardship of financial resources.	a. Prioritize improvements with a higher return on investment. b. Pursue grants and collaboration with other agencies to efficiently fund transportation improvements and supporting programs. c. Preserve and maintain existing assets to extend their useful life.
Access Maintain access to destinations within the corridor.	a. Preserve and maintain the existing transportation system in a state of good repair. b. Encourage intermodal transportation linkages within the highway corridor. c. Provide access to multiple modes and transportation options to the extent practicable through planning and design guidance and coordination. d. Provide clear and comprehensive information about transportation options programs, services, and modes. e. Enhance access to recreation sites for low-income and minority populations
Future Provide a plan that considers expected changes in future use.	a. Accommodate existing and future capacity demands. b. Reduce maintenance needs. c. Provide connectivity to residents and regional users accessing recreational lands along the corridor. d. Improve accessibility to better distribute recreational use.
Resource Protection Protect the scenic, natural, cultural, and recreational features. *Note: Any potential solution must meet CRGNSA goals.*	a. Ensure consistency with the Management Plan for the CRGNSA and state, regional, and local planning rules, regulations, and standards. b. Avoid or minimize impacts to the scenic, natural, and cultural resources. c. Maintain the rustic character and scenic integrity of the SR 14 corridor. d. Coordinate proposed improvements with tribal governments to ensure that tribal treaty rights are protected.

POLICY AND REGULATORY ENVIRONMENT

COLUMBIA RIVER GORGE NATIONAL SCENIC AREA MANAGEMENT PLAN

The CRGNSA is the largest National Scenic Area in the United States. The National Scenic Area Act, which was passed into law by Congress in 1986, protects the Columbia River Gorge preservation and growth. Under the National Scenic Area Act, the National Scenic Area Management Plan (CRGNSA Management Plan) was created to ensure that the land in the CRGNSA is used consistently with the purposes and standards of the National Scenic Area Act.

The Columbia River Gorge Commission approved the revised 2020 CRGNSA Management Plan on October 13, 2020, and the revised plan has been transmitted to the USFS for concurrence. Following USFS review, the Columbia River Gorge Commission will transmit the CRGNSA Management Plan to the counties in the National Scenic Area to incorporate into their respective county ordinances.

LAND USE IN THE CRGNSA

The Gorge Commission and counties within the CRGNSA grant land use approvals jointly according to uses outlined the CRGNSA Management Plan. The CRGNSA includes three distinct areas: General Management Areas (GMAs), Special Management Areas (SMAs), and Urban Areas (see Figure 3). The 13 Urban Areas (9 in Washington and 4 in Oregon) are exempt from regulations that apply to the GMAs and SMAs. USFS is the principal landowner for SMAs, whose uses are more restricted than those of designated GMAs.

Land use varies throughout the study area, although land uses are primarily classified as one of the following four land use designations:

1. Agriculture
2. Forest/Woodland
3. Open Space
4. Urban Area/Rural Center

Figure 4 shows the land use designations within the study area. Along the western portion of the study area, the primary land use designation is Forest/Woodland and is managed by the USFS. Though the entire study area falls within the CRGNSA, the western portion runs through Beacon Rock State Park as well. Nearer the center of the study area, around the cities of Stevenson and Carson, land use designations primarily include Urban Area/Rural Center and Commercial Forest classifications. East of the community of Lyle, land use designation becomes primarily Agriculture, with small towns along SR 14 classified as Rural Center and several allotments to the Bureau of Indian Affairs (BIA).

Figure 3. General Management Areas and Special Management Areas in the CRGNSA

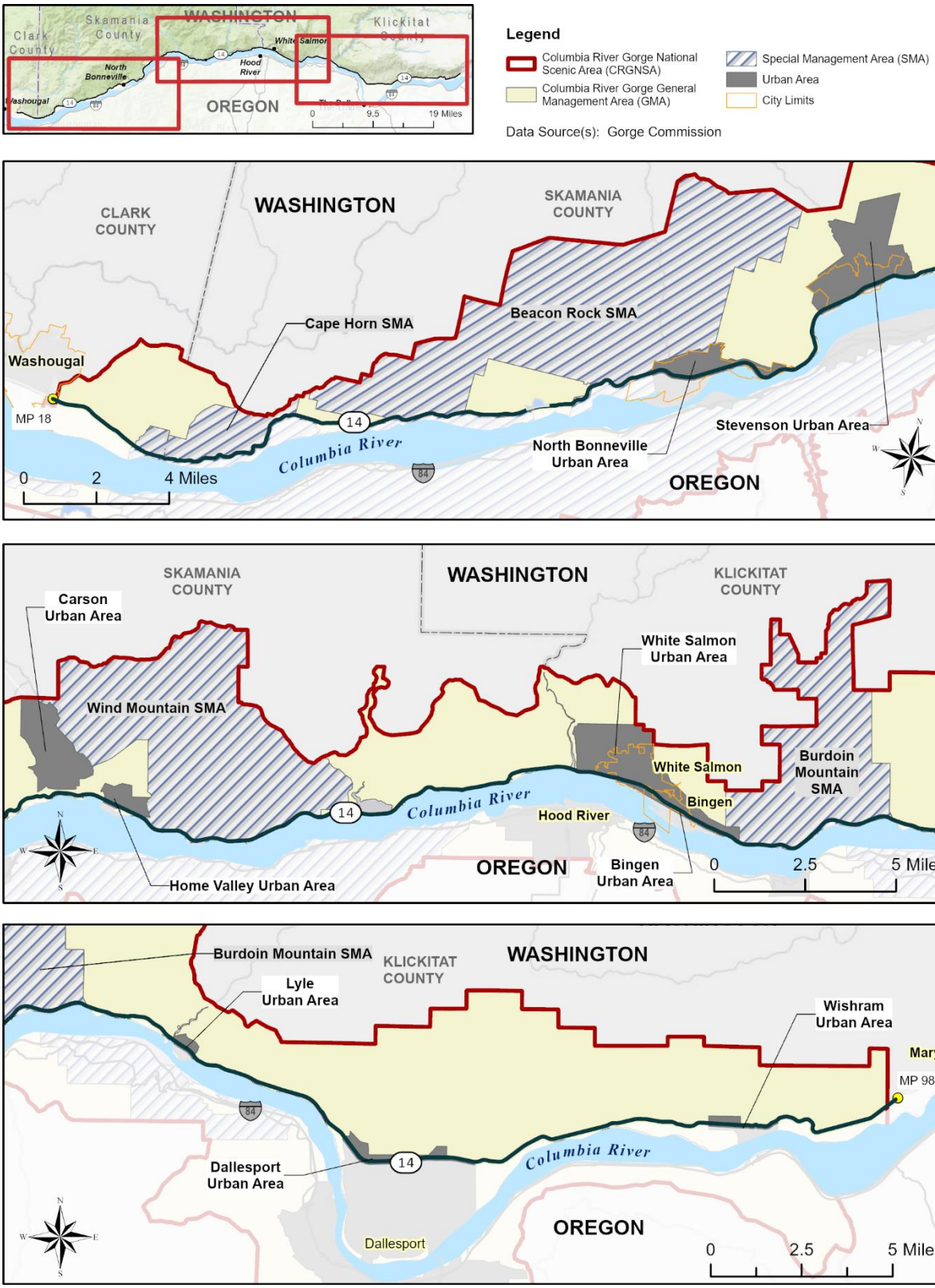


Figure 4. Land Use in the CRGNSA Adjacent to SR 14

Legend

Land Use Designation

- Public Recreation
- Commercial
- Commercial Forest
- Urban Area
- Rural Center
- Residential
- Bureau of Indian Affairs
- Open Space
- Forest/Woodland
- Agriculture
- Ag Special
- Commercial Rec
- County Line

Data Source(s): USFS, Columbia River Gorge Commission

POLICY AND REGULATIONS RELATED TO TRANSPORTATION FACILITIES

The CRGNSA Management Plan further designates policies and provisions related to development for four recreation intensity classes (RICs) in GMA and SMA lands. The RIC dictates the allowable recreation uses of the land. A RIC of 1 indicates that the area is suitable for very low intensity recreation and has more stringent guidelines than, at the other end of the recreation intensity classes, a RIC of 4, which indicates the area is suitable for high intensity recreation. With respect to the development of the Study, the RIC of a recreation site will play an important role in alternatives development and selection. Table 2 describes the parking provisions for each recreation intensity class in SMA and GMA lands.

Table 2. Special Management Area and General Management Area Parking Provisions

	RIC 1 (Very Low Intensity)	RIC 2 (Low Intensity)	RIC 3 (Moderate Intensity)	RIC 4 (High Intensity)
General Management Area Lands	• Parking for a maximum of 10 vehicles • Mass transit accommodations should be considered (e.g., bus parking)	• Parking for a maximum of 25 vehicles • Mass transit accommodations should be considered (e.g., bus parking)	• Parking for a maximum of 75 vehicles • Mass transit accommodation is required (e.g., bus parking)	• Parking for a maximum of 250 vehicles • Mass transit accommodation is required (e.g., bus parking)
Special Management Area Lands	Parking for a maximum of 10 vehicles	Parking for a maximum of 25 vehicles	• Parking for a maximum of 50 vehicles (Parking for 75 vehicles may be provided with enhanced mitigation) • Mass transit accommodation is required (e.g., bus parking)	• Parking for a maximum of 200 vehicles (Parking for 250 vehicles may be provided with enhanced mitigation) • Mass transit accommodation is required (e.g., bus parking)

Source: Draft Management Plan for the Columbia River Gorge National Scenic Area, September 2020

Other parking requirements included in the CRGNSA Management Plan relevant to the SR 14 corridor include:

- Parking areas must be designed to fit existing topography to the extent possible.
- Parking areas with more than 50 spaces must be divided into discrete, landscaped parking islands.
- Landscape buffers are required, with a greater buffer for larger parking lots.
- Parking areas must be set back from the Columbia River and major tributaries by at least 100 feet.

Additional relevant transportation policies and provisions include:

- Alternative forms of transportation, such as transit, are strongly encouraged.
- New development and reconstruction of scenic routes must include provisions for bicycle lanes.

Washington State Policy and Plan Oversight

Every four years the Washington Transportation Commission is required to prepare or update a comprehensive and balanced statewide transportation policy plan, currently reflected in the Washington Transportation Plan 2040 and Beyond (WTP 2040). The Washington State Transportation Commission and Washington State Department of Transportation (WSDOT) developed goals and objectives based on agency and public input. WTP 2040 includes recommendations to increase revenues dedicated to transportation system safety education and enforcement activities, increases in reliable multimodal travel for people and goods in communities across the state, and encouraging the design and development of communities that make walking and biking more viable for more people and increase opportunities for active travel for all ages.

WSDOT develops and administers multiple long range modal, safety, infrastructure and community engagement plans supporting the goals of WTP 2040. Plans most relevant to the SR 14 and Dog Mountain Congestion and Safety Study are noted here.

2007-2026 Washington State Highway System Plan: Element of WTP 2040 that addresses current and forecasted highway needs, administers policy on highway functional classification and access management. The HSP plan identifies all needs consistent with the WTP as set by the Legislature, and is constrained to available revenue projections. The HSP is updated every two years includes constrained lists of identified congested highway segment needs, specific prioritized strategies for addressing them, and performance measurements to determine the effectiveness of these strategies.

The current HSP update is expected to be completed and adopted by the Washington State Transportation Commission in 2022.

Strategic Highway Safety Plan (2019 Target Zero): 2019 Target Zero supplements the HSP with a focus on safety and includes recommendations to reduce highway speeds in select areas through design and speed limits, addressing highway crossings, and providing infrastructure that reduces the likelihood of a crash occurring and the severity of a crash if one does occur.

2020 Washington State Active Transportation Plan (ATP): The ATP assesses the statewide needs of active transportation users: people who walk, run, use a mobility assistive device such as a wheelchair, cycle, or use scooters or skateboards. The ATP focuses on multimodal network connectivity and describes effects of infrastructure decisions on safety and mobility. The ATP provides criteria for prioritizing and evaluating investments, and recommends strategies for each of its five goals of connectivity, safety, opportunity, participation, and partnerships.

2016 Washington State Public Transportation Plan (PTP): The PTP places particular priority on the need to increase the person-carrying capacity of key Washington transportation corridors to decrease congestion, support special needs transportation, connect communities with transit and expand local options for transit funding authority. To better connect Washington communities, the PTP supports the integration of local and state human services transportation plans, regional and local transportation and comprehensive plans, and regional and local transit plans in order to increase mobility options within an integrated and accessible system.

State Highway Design Standards: The design of potential intersection or highway segment projects along SR 14 as implementation from the SR 14 and Dog Mountain Congestion and Safety Study will follow the

2021 Washington Design Manual. The Design Manual provides policies, procedures, and methods for developing and documenting the design of improvements to the state highway transportation network. The Design Manual emphasizes practical design as a means to produce environmentally conscious, sustainable, context-based designs that achieve the purpose and need for the lowest cost. Practical design considers the needs of all users, fostering livable communities and modally integrated transportation systems used safely by all, including motorists, freight haulers, transit, pedestrians, and bicyclists.

RECREATIONAL SETTING

The Columbia River Gorge is a valuable resource to residents and tourists of the Portland and Vancouver metropolitan areas and communities in the Gorge. The Gorge has become a popular tourism destination that attracts both national and international visitors. The National Scenic Trail known as the Pacific Crest Trail runs from Mexico all the way north to Canada and crosses the Columbia River Gorge at the Bridge of the Gods, which is one of the many attractions in the area. On the Washington side of the Columbia River, SR 14 provides access to recreational activities such as hiking, mountain biking, fishing, wind surfing, bird watching, picnicking, and sightseeing. The landscape along SR 14 and throughout the Gorge is dramatic and varying, including mountains, fields, wildflowers, marshlands, wildlife refuges, and the Columbia River Gorge itself.

Dog Mountain Trail Spring Wildflowers

As the Columbia River Gorge continues to gain national and international recognition as a popular recreation and tourism destination, and as the surrounding metropolitan areas continue to grow, it is expected that the Gorge will continue to see an increase in recreation and tourism visitors, activities, and services.

RECREATION SITES

Various recreation activities are available within the study area along SR 14. Though overnight camping areas exist along the corridor and overnight camping is a popular activity throughout the Gorge, the trailheads within the study area primarily accommodate day-use recreational activities, and may include paved parking, picnic areas, water, restrooms, and other day-use amenities.

Given the rural location of most of the trailheads, the primary mode of transportation is a personal vehicle, maintaining a need for adequate trailhead parking or accommodation of shuttle service vehicles. Parking area capacity and conditions vary depending on the trailhead location, ranging from gravel surfaced, shoulder parking with limited amenities, to an asphalt paved parking lot with covered picnic areas and abundant day-use amenities. Regardless of the capacity and conditions, most trailhead parking areas reach maximum capacity on the weekend throughout the summer season, with an increasing number of days in which little to no parking may be available most of the day.

Table 3 summarizes the popular recreation sites accessible within the study area, access location along SR 14, the agency that operates the site, parking details, and important land use information.

Table 3. Study Area Recreation Sites

Site	SR 14 MP	County	Operated By	Fee/Parking	RIC[1]	Land Use	Parking Overflow[2]
Steigerwald National Wildlife Refuge	18.2	Clark	USFWS	No fee/Paved parking area	3	GMA	No
Ozone Climbing	23.8	Skamania	Informal	No fee/Park on SR 14 shoulder	1/2	SMA	Yes
Cape Horn Lookout (Viewpoint)	25	Skamania	WSDOT	No fee/Park on SR 14 shoulder	1	SMA	Yes
Cape Horn Trailhead / Salmon Falls Park and Ride	26.4	Skamania	USFS / Skamania County	No fee/Paved parking area	2	GMA	Yes
St. Cloud	29.9	Skamania	USFS	Fee/Paved parking area	2	SMA	No
Franz Lake Overlook	31.5	Skamania	USFWS	No fee/Park on SR 14 shoulder	1	GMA	No
Sams Walker Day Use	32.9	Skamania	USFS	Fee/Gravel parking area	2	SMA	No
Doetsch Ranch Day Use Area	34.1	Skamania	WA State Parks	Fee/Paved parking area	4	SMA	No
Beacon Rock State Park (Kueffler Rd)	34.8	Skamania	WA State Parks	Fee/Gravel parking area	4	SMA	Yes
Beacon Rock Trailhead/Hamilton Mountain Access	34.9	Skamania	WA State Parks	Fee/Gravel and paved parking areas	3-4	SMA	Yes
Bonneville Discovery Trails	37.6	Skamania	Bonneville Trails Foundation	No fee/Paved parking areas	N/A	UA	No
Ft. Cascades Trailhead	38.6	Skamania	USACE	No fee/Paved parking area	N/A	UA	No
Bonneville Trailhead	39.8	Skamania	USFS	Fee/Paved parking area	N/A	UA	No
Pacific Crest Trail	41.5	Skamania	USFS	None	1	GMA	No
Bridge of the Gods Historical Marker	41.6	Skamania	USACE	No fee/Paved parking area	1	GMA	No
Home Valley Park/Campground	50.1	Skamania	Skamania County	Fee/Paved parking areas	4	SMA	No
Dog Mountain Trail	53.7	Skamania	USFS	Fee & Seasonal Permit/Gravel parking area	1/2/4	SMA	Yes
Dog Creek Falls	55	Skamania	USFS	No Fee/Gravel parking area	1/2	SMA	No
Little White Salmon National Fish Hatchery	56.9	Skamania	USFWS	No fee/Paved parking area	1	GMA	No
Drano Lake Boat Ramp	57.3	Skamania	Skamania County	Fee/Paved parking areas	2/4	GMA	Yes
Swell City	61.1	Skamania	Private/ WSDOT	No fee/Paved parking area	4	GMA	Yes
Spring Creek Fish Hatchery State Park	61.4	Skamania	WA State Parks	Fee/Paved parking area	4	GMA	No

Site	SR 14 MP	County	Operated By	Fee/Parking	RIC[1]	Land Use	Parking Overflow[2]
Coyote Wall Trailhead	69.7	Klickitat	USFS	No fee/Paved parking area	2	SMA	Yes
East Syncline Trailhead / Rowland Lake	70.9	Klickitat	USFS	No fee/Gravel shoulder	1/2	SMA	Yes
Catherine Creek (Old Hwy 8)	N/A	Klickitat	USFS	No fee/Gravel parking area	2	SMA	Yes
Chamberlain Lake Safety Rest Area	74	Klickitat	WSDOT	No fee/Paved parking area	1	GMA	No
Balfour-Klickitat Trailhead (Old Hwy 8)	N/A	Klickitat	USFS	No fee/Paved parking area	2	GMA	No
Klickitat River Delta (Klickitat Spit)	75.7	Klickitat	Informal	No fee/Gravel shoulder	2	GMA	Yes
Lyle Trailhead	75.9	Klickitat	USFS	No fee/Paved parking area	N/A	UA	No
Lyle Cherry Orchard Trailhead	77.2	Klickitat	Friends of the Columbia River Gorge	No fee/Gravel parking area	1	GMA	No
Doug's Beach State Park	78.6	Klickitat	WA State Parks	Fee/Gravel parking area	4	GMA	No
Columbia Hills Historical State Park	85.1	Klickitat	WA State Parks	Fee/Paved and gravel parking areas	4	GMA	No
Horsethief Butte Trailhead	86.4	Klickitat	WA State Parks	Fee/Paved parking area	2	GMA	No
Crawford Oaks Trailhead	87.2	Klickitat	WA State Parks	Fee/Paved parking area	2	GMA	No
Avery Recreation (State Park) Boat Launch	89.6	Klickitat	USACE	No fee/Gravel parking area	BIA	GMA	No

Acronyms: USFWS = United States Fish and Wildlife; USFS = United States Forest Service; WSDOT = Washington Department of Transportation; USACE = United States Army Corps of Engineers; SMA = Special Management Area; GMA = General Management Area; UA = Urban Area; BIA = Bureau of Indian Affairs

Notes:

1. The RIC identified is for the parking area; the RIC of the recreational area may be different.
2. Indicates recurring parking lot overflow resulting in parking on shoulder of adjacent county roads or SR 14.

SITES WITH RECURRING CONGESTION

Of the recreation sites summarized in Table 3, several experience recurring instances of parking overflow that result in visitors parking on the shoulder of the adjacent county road or along SR 14. These locations are described in further detail below.

Cape Horn Lookout

Recreation:

The Cape Horn Lookout provides panoramic views of the Gorge from the south shoulder of SR 14 near MP 25. There is space for approximately eight vehicles to park in the shoulder, adjacent to eastbound SR 14 traffic. There is no physical barrier between highway traffic and vehicles parked in the shoulder. People often exit their vehicles to take photos. A guardrail provides the only barrier between the roadway shoulder and the sheer drop below.

Looking east from Cape Horn Lookout

Existing Conditions:

The lookout at Cape Horn Lookout is accessed from SR 14 and is within WSDOT right of way. The stretch of highway leading to and from the lookout contains steep grades and curves that limit sight distance. In the area where vehicles park in the shoulder and pedestrians move about to take photos, the shoulder width varies between approximately 10 feet and 15 feet. There is no advance signage to indicate vehicles may be suddenly entering and leaving the highway. In addition to congestion at the lookout, freight vehicles traveling westbound may slow due to the grade, and the area is known for rockfalls that may land on the roadway and remain there.

Parking along south side of SR 14 at Cape Horn Lookout

Cape Horn Trailhead / Salmon Falls Park and Ride

Recreation:

The Cape Horn Trail system provides approximately 8 miles of moderate hiking on both sides of SR 14 through a forest of coniferous and deciduous trees, with spring wildflowers, autumn foliage, and breathtaking views of the Gorge. The trailhead is developed, and parking is shared with the Salmon Falls Park and Ride. Skamania County manages the parking lot, which includes 25 paved parking spaces and two dedicated Americans with Disabilities Act (ADA) spaces. There is a gravel area that can accommodate approximately six additional vehicles. An information kiosk and restrooms are provided for visitors' use.

Existing Conditions:

The main parking lot is accessed from two roads that are owned and maintained by Skamania County: Salmon Falls Road and Canyon Creek Road. The trail is extremely popular year-round, and the parking lot frequently fills up by mid-morning. When this occurs, vehicles will park on the shoulder of both Salmon Falls Road and Canyon Creek Road, creating a situation in which trail users must walk in the roadway, potentially in conflict with vehicles. On the busiest days, dozens of cars line the county roads, hindering through

Salmon Falls Park and Ride / Cape Horn Trailhead parking
Source: USFS

traffic and degrading the visitor and neighborhood experience. Due to the COVID-19 pandemic, other nearby trails have been closed, and the Cape Horn Trailhead has experienced additional use.

The existing parking lot is in a GMA with a RIC of 2, thus limiting the ability to expand the existing parking lot beyond its present size in the current location. The 2009 Cape Horn Trail Recreation Plan Environmental Assessment identified opportunities to provide additional parking.

Beacon Rock State Park and Beacon Rock Trailhead

Recreation:

Beacon Rock State Park is a 4,458-acre, year-round park near its namesake attraction, Beacon Rock. The rock is the core of an ancient volcano, rising more than 800 feet over the Columbia River, detached from the surrounding rocks. The state park provides opportunities for camping, hiking, wildlife viewing, picnicking, boating, biking, equestrian use, fishing, and rock climbing. The trailhead of the popular hike to the top of Beacon Rock is primarily accessed from a paved parking lot located just off the south shoulder of SR 14. There are 27 striped parking spaces and 2 dedicated ADA spaces, public restrooms, an information kiosk, picnic tables, and a water station for visitors' use. A secondary parking lot is just west of the paved lot along the SR 14 shoulder and has approximately 25 informal, unpaved parking spaces and shoulder access to the main parking lot and trailhead. A day pass or annual Discovery Pass is required for parking.

Existing Conditions:

Though there are many popular areas within Beacon Rock State Park, the most significant congestion is at the base of Beacon Rock along SR 14 between MP 34.7 and MP 35. In addition to the recreational activities on the south side of SR 14, the north side provides access to the park's Ranger Station and popular Hamilton Mountain trails. When the parking lots along SR 14 fill up, cars find places to park on the shoulder of the highway. The existing alignment of the roads limits the sight lines of pedestrians crossing the highway and of vehicles traveling in the area, where the posted speed is 55 miles per hour (mph) on SR 14. The accesses to SR 14 are undefined in many areas, making it difficult for vehicles on SR 14 to anticipate where traffic will be entering and exiting the highway.

Looking west from south shoulder of SR 14 near Beacon Rock Trailhead, depicting potential visibility concerns.

Staff from Washington State Parks and Skamania County note that some park visitors mistakenly use Guptil Road while trying to locate the Hamilton Mountain Trailhead due to errors in cell phone navigation. Guptil Road is a gravel road not suited for heavy vehicle traffic. A small sign has been installed on Guptil Road near SR 14 to direct travelers back toward Beacon Rock State Park.

The existing parking lot is in an SMA with a RIC of 4 and adjacent to RIC 3. Washington State Parks has been undergoing a planning process to renovate the main park entrance at Beacon Rock State Park to address traffic and visitor safety. Some potential solutions from that process include improvements to the intersection of SR 14 at Kueffler Road and the intersection of SR 14

at Hamilton Mountain Road, additional signage, and improvements to the parking areas. The preferred alternative from the Washington State Parks Beacon Rock Entrance Road Realignment project will be included as an alternative in the SR 14 and Dog Mountain congestion and safety planning process.

Dog Mountain Trail

Recreation:

Dog Mountain has become one of the most popular hikes in the CRGNSA. Dramatic wildflower displays and views of the Gorge draw hikers from around the region and beyond to this moderately difficult hike. Currently, the parking is an undeveloped gravel lot immediately adjacent to SR 14. Vault toilets are located a short walk up a hill, and there is an information kiosk for visitors' use.

Existing Conditions:

Over the years, WSDOT and USFS have worked together to mitigate congestion and highway safety-related issues associated with the trailhead by developing a parking scheme that is used by USFS on-site staff to manage parking during peak visitation. The parking scheme, while initially effective, proved to be inadequate with the increasing use the site has experienced. Overflow parking has spilled onto the narrow shoulder of SR 14, and parking lot congestion has negatively impacted the egress, ingress, and flow of traffic in the parking lot.

SR 14 Dog Mountain parking lot
Source: USFS

When parking overflows onto the shoulder of SR 14, recreationists walk along the narrow shoulder of SR 14 and the BNSF Railway (BNSF) railroad corridor to access the trailhead.

Vehicles parked along SR 14 near Dog Mountain Trailhead
Source: USFS

In 2015 during peak visitation, it was not uncommon to count more than 200 cars at any one time at this general parking area and along the shoulder of SR 14. This overwhelming situation may have contributed to several motor vehicle accidents (one fatal) along this stretch of the highway. This situation prompted the Skamania County Sheriff's Office to convene a meeting of interagency partners to explore safety mitigation measures, which included: early warning signs, no parking signs, law enforcement, parking lot reconfiguration to accommodate 70 to 80 cars, a shuttle bus to reduce congestion, and Variable Message Signs directing visitors to use the shuttle. Skamania County applied for and received an extension to its FLAP West End Transit Project, which included additional funding to implement these measures.

While these interagency efforts improved the situation, recreation use has increased to the point where it now has overwhelmed the measures that have already been implemented. Despite the enforcement of no parking signs and towing. and increasing ridership of the shuttle bus, unauthorized parking along SR 14 of up to a mile from the trailhead continued. This situation prompted USFS to implement an entry permit program to reduce the number of cars that can access the site. The permit system requires each hiker to carry a permit or digital proof of permit each year on Saturdays and Sundays during peak spring wildflower season (typically mid-April to mid-June). Initial reports indicate user satisfaction of the permit system and the frequency and number of parking overflow events have decreased, but it is not expected to meet the long-term needs of the site.

The existing parking lot is in an SMA that spans RICs of 1, 2 and 4, which may limit the ability to improve the parking lot in its current location and still maintain its current capacity. The land that serves the parking lot also spans three separate owners: WSDOT, USFS, and BNSF.

Drano Lake Boat Ramp

Recreation:

Drano Lake is located where the Little White Salmon River flows into the Columbia River and is bordered on its south bank by SR 14. Drano Lake is a popular trolling fishery for Chinook salmon and steelhead trout. Skamania County manages the Drano Lake Boat ramp, which is accessed from the parking lot off SR 14. The parking lot is paved and has 45 striped spaces and 3 dedicated ADA spaces, as well as public restrooms. The parking lot is exclusively designated for tow vehicle and boat trailer combinations; single vehicles are not allowed to park in the lot unless a valid handicap permit is displayed.

Existing Conditions:

The Drano Lake parking lot is the only location to launch boats. During peak fishing seasons, the parking lot can fill up, and vehicles park on the south shoulder of SR 14, resulting in pedestrians crossing the highway. The existing parking lot is in a GMA, the majority of which is classified as RIC 4. There is a section of the parking area on the east edge that is classified as RIC 2, which is the same classification as the lake.

Swell City

Recreation:

Swell City to Spring Creek Hatchery is a popular windsurfing location in the Gorge. Windsurfers and spectators flock to this area, particularly on days with strong west winds and weekends. There is privately owned parking at the Swell City windsurfing launch area for approximately 400 feet along the south side of SR 14 near MP 61.1. The parking lot has a daily fee per person, and there are portable toilets and a small seating/picnic area available for viewing. Just east of Swell City is another launch area for windsurfing, with less parking and no amenities or fees. This location is also on private land along the south side of SR 14. There is more parking for river activities off Spring Creek Hatchery Road on the south side of SR 14 near MP 61.4. This launch area is managed by Washington State Parks, and there is a fee to park. There are also pit toilets and picnic tables at this site.

Existing Conditions:

On windy days and particularly on weekends, parking at Swell City fills up quickly. Vehicles will park wherever space is available, and vehicles are continually entering and exiting the highway. If parking fills up at the Spring Creek Hatchery Road parking area, visitors have been observed to park on the north side of SR 14 in a gravel area opposite Spring Creek Hatchery Road, resulting in pedestrians crossing the highway. The existing parking lots are in a GMA and classified as RIC 4.

Coyote Wall Trailhead and East Syncline Trailhead

Recreation:

Coyote Wall is a spectacular diagonal band of cliffs in the Columbia River Gorge east of the city of Bingen, also known around the Gorge as "The Syncline." Coyote Wall Trailhead provides mountain bikers and hikers with access to more than 30 miles of trails with panoramic views of the Gorge and connects to the Catherine Creek trail system. The trail does not require any fees to visit, and the main trailhead provides a small, paved parking lot with approximately 25 striped parking spaces. A vault toilet and an information kiosk are also present at the trailhead for visitors' use.

Coyote Wall can also be accessed from a trailhead approximately 1 mile to the east, at the junction of SR 14 and Old Highway 8. This trailhead is known as the Syncline Trail East Trailhead. Informal parking is available on the gravel shoulder. There are no other amenities at this site.

Existing Conditions:

The parking lot to Coyote Wall Trailhead is accessed from Courtney Road, which intersects with SR 14 near Look Lake. Courtney Road is maintained by Klickitat County. The Coyote Wall Trail is extremely popular, especially in the spring. The parking lot frequently fills up, and when this occurs, vehicles park on the shoulder of Courtney Road and SR 14. This creates a situation in which trail users must walk in the roadway, potentially in conflict with vehicles. Courtney Road is narrow and winding, and when vehicles are parked on the shoulder, freight trucks have difficulty navigating the road.

Courtney Road near the Coyote Wall Trailhead parking lot.

Gravel shoulder at Syncline Trail East Trailhead

The existing parking lot is in an SMA with a RIC of 2. This designation and the existing topography limit the ability to expand the existing parking lot beyond its present size in the current location.

The Syncline Trail East Trailhead is becoming more popular as an alternate parking and trailhead to the Coyote Wall Trailhead parking. Its proximity to SR 14 and Old Highway 8 and the lack of delineation could result in future safety issues if this location continues to grow in popularity. This informal Syncline Trail East Trailhead parking area is within an SMA and is classified mostly as RIC 2 but transitions to RIC 1 on the northern corner.

Conversations with USFS staff indicate that there have been instances when visitors unfamiliar with the area have parked in the SR 14 shoulder between Courtney Road and Old Highway 8 to try to access the Coyote Wall trail system. Visitors follow cell phone map information that falsely assumes there is a trailhead accessible from the side of the highway.

Catherine Creek Day Use Area

Recreation:

Connected to Coyote Wall, the Catherine Creek trail system is one of the best areas in the eastern Gorge for spring wildflower viewing and includes a network of multi-use trails for biking, hiking, and equestrian use. Amenities at the trailhead, which is open year-round, include approximately 20 to 25 informal, non-striped parking spaces in a gravel lot and an information kiosk for visitors.

Facing east toward Catherine Creek Trailhead on south side of Old Highway 8

Existing Conditions:

The trailhead to the Catherine Creek Day Use Area and system of trails is located on Old Highway 8, approximately 1.5 miles northwest of the intersection of Old Highway 8 and SR 14. Old Highway 8 is owned and maintained by Klickitat County, and the existing parking lot straddles county and USFS land. There are trails on each side of Old Highway 8 and no formalized pedestrian crossing of the road. On the busiest days, vehicles line the county road, hindering through traffic and degrading the visitor experience.

The existing parking area is within an SMA and is classified as RIC 2, thus limiting the ability to expand the existing parking lot beyond its present size in the current location.

Pedestrians crossing Old Highway 8 from Catherine Creek gravel parking lot, facing west

Klickitat River Delta

Recreation:

Klickitat River Delta is near the community of Lyle, where the Klickitat River flows into the Columbia River, near the Balfour-Klickitat Trail and the Lyle Trailhead. The Lyle sandbar is known to locals as an ideal location for kitesurfing due to the expansive sandbar, shallow waters, and consistent winds. Because the sandbar is not maintained by a specific agency, visitors tend to park wherever they can. The gravel area on the north side of SR 14 west of the Klickitat Bridge serves as informal parking for visitors to the recreation opportunities in the area.

Existing Conditions:

The Lyle sandbar at Klickitat River Delta can be accessed only via an informal path system that crosses BNSF property and is becoming a safety concern. In addition to the safety concerns of pedestrians crossing

an active rail line and busy highway, the gravel parking area on the north side of SR 14 fills up and can overflow onto Old Highway 8, blocking access for heavy vehicles. A public process separate from this study will be needed to fully address the breadth and complexity of concerns at this location.

The existing parking area is within a GMA and is classified as RIC 2.

RECREATIONAL OPPORTUNITIES

Regional population and recreation are likely to continue to grow rapidly and managing congestion in the CRGNSA will continue to be a challenge. However, the pace of development or reconstruction of recreational opportunities and facilities (e.g., campgrounds, trails, picnic areas, trailheads) in the study area has not matched the pace of growth and increased use. As mentioned previously, many trailheads experience parking overflow. As a result, visitors park along nearby roadways, thus constricting traffic and causing unsafe highway driving and crossing conditions. The Study aims to identify opportunities to spread demand throughout the CRGNSA and provide a menu of potential strategies to mitigate congestion and enhance safety.

Dog Mountain

At Dog Mountain, although safety mitigation is the primary driver of any potential solution, USFS is also concerned about the overall parking and trailhead capacity of the site. USFS has documented impacts to the sensitive meadows that draw visitors to this hike; for example, encroachment of invasive weeds such as dandelions has been documented. The visitor experience may also be degraded, judging from the casual comments of visitors complaining that the Dog Mountain site was “really crowded.” The trailhead, though it is “grandfathered” in under the CRGNSA Management Plan, would not meet current scenic quality standards or RIC standards.

The SR 14 and Dog Mountain congestion and safety study process will explore options to either redesign the existing trailhead or relocate the trailhead to another site.

Emerging Hot Spots

During the evaluation of safety and congestion concerns at CRGNSA recreation sites along SR 14, certain locations were flagged as areas to watch for future recurring congestion or safety concerns. These sites may exceed their capacity a few times a year, but not so often that it is possible to anticipate when it will occur. These emerging hot spots may benefit from strategies developed for the sites that currently experience recurring congestion and/or safety concerns; therefore, it is helpful to identify these emerging hot spots now. These emerging hot spot recreation sites are:

- Ft. Cascades Trailhead
- Bonneville Trailhead
- Lyle Cherry Orchard Trailhead
- Horsethief Butte Trailhead
- Crawford Oaks Trailhead

TRANSPORTATION CONDITIONS

The following analysis of transportation conditions includes a desktop planning-level examination of the corridor based on online databases, field observations, historical traffic data, vehicle crash history, aerial imagery, and GIS data.

PHYSICAL FEATURES AND CHARACTERISTICS OF TRANSPORTATION FACILITIES

SR 14 traverses five different topographical areas. Most of the corridor is abutted by rock escarpments on the north side, and embankments to the Columbia River or railroad tracks on the south side. Between Washougal and North Bonneville, the route is elevated above the Columbia River, passing through rolling and mountainous terrain. From North Bonneville to Stevenson, SR 14 descends to the same elevation as the Columbia River. Between Stevenson and Home Valley, the route is again elevated above the river, passing primarily through forest land. From Home Valley to Dallesport, the route again descends to travel alongside the river. And finally, between Dallesport to the eastern edge of the CRGNSA, the route ascends onto a plateau overlooking the river, traversing primarily grasslands.

SR 14 is a paved, two-lane roadway managed by WSDOT. The pavement width varies throughout the study area to accommodate sections with passing lanes and to provide turnouts and turn lanes. Within the study area, WSDOT classifies SR 14 as a rural principal arterial, and the highway is part of the National Highway System. An important objective of a principal arterial is to connect rural communities and efficiently move traffic over long distances. Posted speeds vary from 25 mph within more populated urban areas to 60 mph in less populated areas (see Table 5).

Some of the recreation sites in the SR 14 corridor are accessed via county roads. These county roads are generally two-lane rural roads that connect SR 14 and the recreation sites.

BRIDGES AND CULVERTS

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

The bridge condition is classified based on 23 Code of Federal Regulations 490.40911. 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.” A “poor” classification is the new rating term for bridges previously described as “structurally deficient,” and these bridges are prioritized for future work as part of WSDOT’s Bridge Preservation Program. The GCRs are useful to identify potential issues and needs for planning purposes.

Table 4 lists the bridges and culverts along the SR 14 corridor in the study area, their location, what feature they cross, and when they were built. This table also lists the curb-to-curb width of each bridge, its length, condition, and who owns and maintains the structure.

Table 4. Inventory of Study Area Bridges and Culverts

Bridge No.	Facility	MP	Feature Crossed	Year Built	Curb-to-Curb Width (feet)	Length (feet)	Condition	Owner
0009275B	SR 14	18.09	Gibbons Creek	1972	40	65	Good	WSDOT
0009275C	SR 14	18.77	BNSF Railroad	1972	40	381.9	Fair	WSDOT
0000902A	SR 14	20.90	Lawton Creek	1925	24	44	Good	WSDOT
0017977A	SR 14	24.80	Ped X-ing	2011	N/A	12	Good	WSDOT
0001444A	SR 14	24.92	Half Bridge	1930	30.8	75.1	Poor	WSDOT
0001151A	SR 14	25.04	Cape Horn Slide	1930	24	479	Fair	WSDOT
0017977B	SR 14	26.35	Ped X-ing	2011	N/A	12	Good	WSDOT
08647320	Doetsch Ranch Road	N/A	BNSF Railroad	2006	27.9	174.9	Good	WA State Parks
08647310	Moorage Road	N/A	Woodard Creek	1998	29.9	25.9	Good	WA State Parks
0001236A	SR 14	34.24	Woodard Creek	1928	24	129.9	Fair	WSDOT
000120CE	SR 14	37.43	Hamilton Creek	1978	44	270	Fair	WSDOT
000064CE	SR 14	37.89	Cascade Drive	1978	44	160.1	Fair	WSDOT
000034CE	SR 14	40.48	BNSF Railroad	1978	44	318.9	Fair	WSDOT
0002355A	SR 14	43.90	Rock Creek	1938	24	200.1	Fair	WSDOT
0012630A	SR 14	49.34	Wind River	1985	40.4	663.1	Good	WSDOT
0014259A	SR 14	56.87	Little White Salmon River	1994	36.1	410.1	Good	WSDOT
0002042A	SR 14	59.03	Gulch	1937	24	214.9	Good	WSDOT
0002058A	SR 14	59.44	BNSF Railroad	1936	24	126	Fair	WSDOT
0001915A	SR 14	61.62	BNSF Railroad	1934	24	158.1	Good	WSDOT
0008842A	SR 14	63.45	White Salmon River	1971	40	295.9	Good	WSDOT
0015470A	SR 14	65.98	Jewett Creek	1999	N/A	20	Good	WSDOT
0001727A	SR 14	75.76	Klickitat River	1933	24	265.1	Fair	WSDOT
0001492A	SR 14	86.03	Half Bridge	1931	27.9	42	Fair	WSDOT
0001492B	SR 14	86.12	Horsethief Canyon	1931	24	91.9	Good	WSDOT
00200140	SR 14	91.83	Cattle Crossing	1965	36	10	Good	WSDOT

Source: National Bridge Inventory

PAVEMENT CONDITION

The Washington State Pavement Management System (WSPMS) maintains an online database available to WSDOT employees known as WebWSPMS. This database is WSDOT's principal application for pavement asset management and includes information on maintenance activities, construction costs, and pavement condition as well as imagery. WSDOT evaluates the condition of asphalt and concrete pavement on state-managed roadways annually using three indicators: smoothness, surface cracking, and rutting. These criteria are used to classify pavement conditions into five categories: very good, good, fair, poor, and very poor. The categories very good, good, and fair indicate pavement conditions that are considered

adequate. Pavement in poor condition is deficient and needs repair, while very poor condition indicates failure and the need for substantial restoration and possibly reconstruction.

Pavement condition is not currently available for the entire SR 14 corridor throughout the CRGNSA, because some sections have not been fully evaluated (WSDOT 2021). Where pavement condition is available, it is summarized as follows:

- SR 14, MP 58.92 – MP 58.97: Good
- SR 14, MP 59.03 – MP 59.07: Good
- SR 14, MP 61.62 – MP 61.65: Good
- SR 14, MP 86.03 – MP 86.04: Fair
- SR 14, MP 86.12 – MP 86.13: Fair

Although specific pavement condition ratings are not available for the entire length of the SR 14 corridor, conversations with WSDOT staff indicate that significant pavement issues are being addressed as they arise. During the field visit in October 2020 for this existing conditions analysis, it was clear that patching and spot fixes have been made to SR 14 between Cape Horn and Beacon Rock, which is a known slide area. Driver experience during the field visits suggests that the remainder of the pavement in the SR 14 corridor is generally in good condition, but severe weather events could create new problems if the underlying roadway structure is damaged.

POSTED SPEEDS

Posted speeds vary along SR 14. Outside of urban areas, posted speed ranges from 50 mph to 60 mph. As SR 14 travels through various communities, the speed reductions vary from 25 mph to 40 mph. Table 5 summarizes the posted speeds for SR 14 through the CRGNSA.

Table 5. SR 14 Posted Speeds in the CRGNSA in the Study Area

Approximate Location	MP Begin	MP End	Posted Speed (mph)	County
Washougal East City Limit to SE Jody Road	18.1	21.5	55	Clark
SE Jody Road to Cape Horn Road	21.5	26.5	50	Skamania
Cape Horn Rd to 1st St (west)	26.5	43.9	55	Skamania
1st Street (west) to 1st Street (east)	43.9	44.6	25	Skamania
1st Street (east) to Carson Depot Road	44.6	48.0	50	Skamania
Carson Depot Road to Cook-Underwood Road	48.0	63.2	55	Skamania
Cook-Underwood Road to Charters Road	63.2	65.8	40	Klickitat
Charters Road to Willow Street	65.8	66.15	30	Klickitat
Willow Street to Cedar Street	66.15	66.6	25	Klickitat
Cedar Street to Bingen East City Limit	66.6	67.1	35	Klickitat
Bingen East City Limit to Canyon Road	67.1	75.7	60	Klickitat
Canyon Road to Tacoma Avenue	75.7	76.0	40	Klickitat
Tacoma Avenue to Eighth Street	76.0	76.5	30	Klickitat
Eighth Street to Rowena Gap #2	76.5	76.9	40	Klickitat
Rowena Gap #2 to Mt. Hood Street	76.9	81.4	60	Klickitat
Mt. Hood Street to Schreiner Farms Road	81.4	82.4	55	Klickitat
Schreiner Farms Road to Maryhill	82.4	98	60	Klickitat

Source: State Highway Log, WSDOT

CLIMBING LANES

Climbing lanes are normally associated with truck traffic but are considered in recreation areas that are subject to slow-moving traffic and are often designed independently for each direction of travel. There are three climbing lanes on SR 14, each in the eastbound direction:

- MP 27.40 – MP 28.12
- MP 29.31 – MP 29.84
- MP 47.62 – MP 48.01

ROADWAY GEOMETRICS ON SR 14

Existing roadway geometrics were evaluated and compared to current standards. Available horizontal and vertical alignment data were reviewed for SR 14 within the study area.

The American Association of State Highway and Transportation Officials (AASHTO) Green Book specifies general design principles and controls that determine the overall operational characteristics of the roadway such as design speed. AASHTO's manuals provide guidance for design speed based on facility and operating characteristics; however, some judgment is necessary. Design criteria for the SR 14 corridor in the study area are based on current AASHTO standards as described in the following sections.

Design Criteria

The project team developed design criteria for various roads within the study area. Table 6 lists the design criteria developed from AASHTO design manual. The design criteria depend on terrain, area context (i.e., urban or rural), and daily traffic volumes. In the study area, SR 14 traverses mostly rural, rolling terrain on the west end and level terrain on the east end, and it has projected traffic volumes of over 2,000 vehicles per day. These characteristics correlate to a design speed of 50 mph on the west end and 60 mph on the east end.

Table 6. SR 14 Geometric Design Criteria

Design Element			Design Criteria: Over 2,000 vehicles/day		
Design Control	Design Speed	Level	60 mph		
		Rolling	50 mph		
		Mountainous	40 mph		
Alignment Elements		**Design Speed:**	**40 mph**	**50 mph**	**60 mph**
	Maximum Grade	Level	5%	4%	3%
		Rolling	6%	5%	4%
		Mountainous	8%	7%	6%
	Vertical Curvature (K-value)	Crest	44	84	151
		Sag	64	96	136
	Stopping Sight Distance (SSD) (feet)		305	425	570
	Radius (feet)		444	758	1,200

Sources: David Evans and Associates, Inc., AASHTO Geometric Design of Highway and Streets 2018 (Green Book)

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. Standards for horizontal curves are defined in terms of curve radius, and they vary based on design speed.

The controlling design criteria for the horizontal curves are radius and stopping sight distance (SSD). SSD for a horizontal curve is evaluated based on the ability to see through the inside of the corner.

There are 305 existing horizontal curves along SR 14 in the study area. Only one recreation access point with overflow parking conditions is found within a horizontal curve of SR 14 with reduced travel speed warning: Beacon Rock State Park (40 mph eastbound, 45 mph westbound).

Vertical Alignment

Vertical alignment is a measure of the rate of 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.

According to AASHTO, the maximum allowable grades for a 50 mph design speed are 4 percent for level terrain, 5 percent for rolling terrain, and 7 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 50 mph design speed (rolling terrain), minimum K-values of 84 and 96 are recommended for crest and sag vertical curves, respectively.

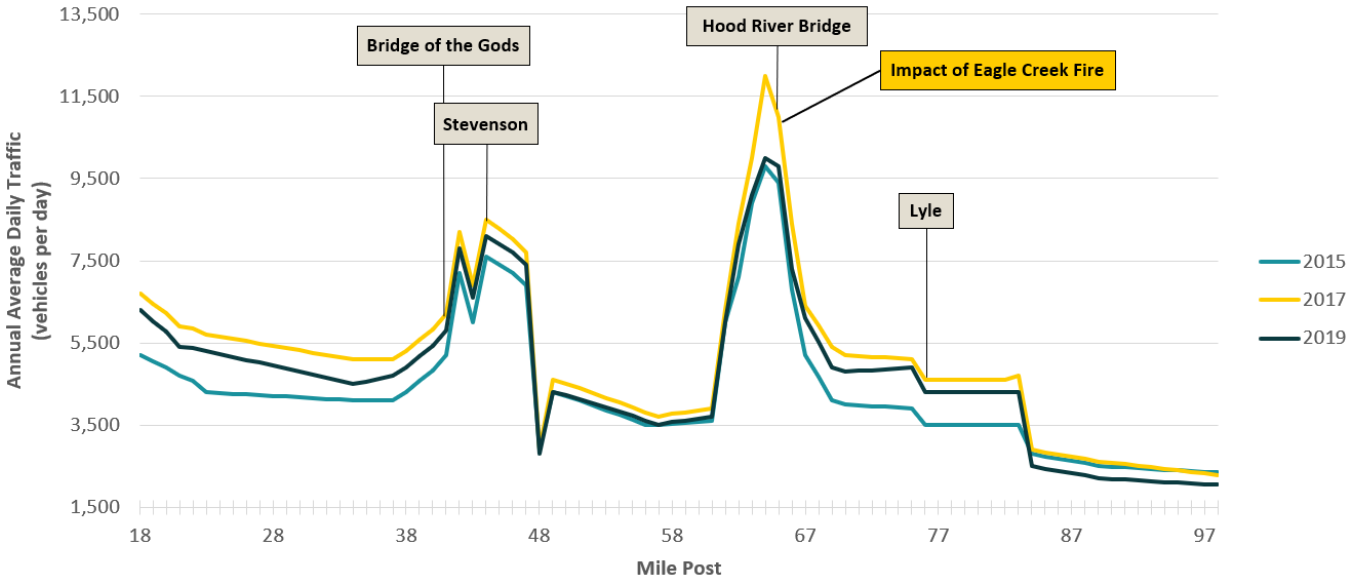
Of the 292 vertical curves on SR 14 in the study area, 71 fail to meet the 5 percent maximum grade for a 50 mph design speed (rolling terrain). None of the recreation access points or intersections with overflow parking conditions on SR 14 are found on vertical curves that exceed 5 percent grade.

TRAFFIC CONDITIONS

Due to the COVID-19 pandemic, new traffic volume data were not collected as part of the original existing conditions analysis developed in 2020.[1] The traffic analysis relies on historical data available from WSDOT. Existing annual average daily traffic (AADT) varies from approximately 2,000 to 12,000 vehicles per day along SR 14 in the study area. Figure 5 summarizes the historical traffic volumes by mile post from 2015 to 2019 (WSDOT 2020). The highest traffic volumes are consistently near MP 65, where the Hood River Bridge meets SR 14 in White Salmon. The Hood River Bridge is one of the main connections in the region between Washington and Oregon.

[1] New traffic counts collected in 2021 (Attachment A) and supplement the findings in the final SR 14 and Dog Mountain Congestion and Safety Study

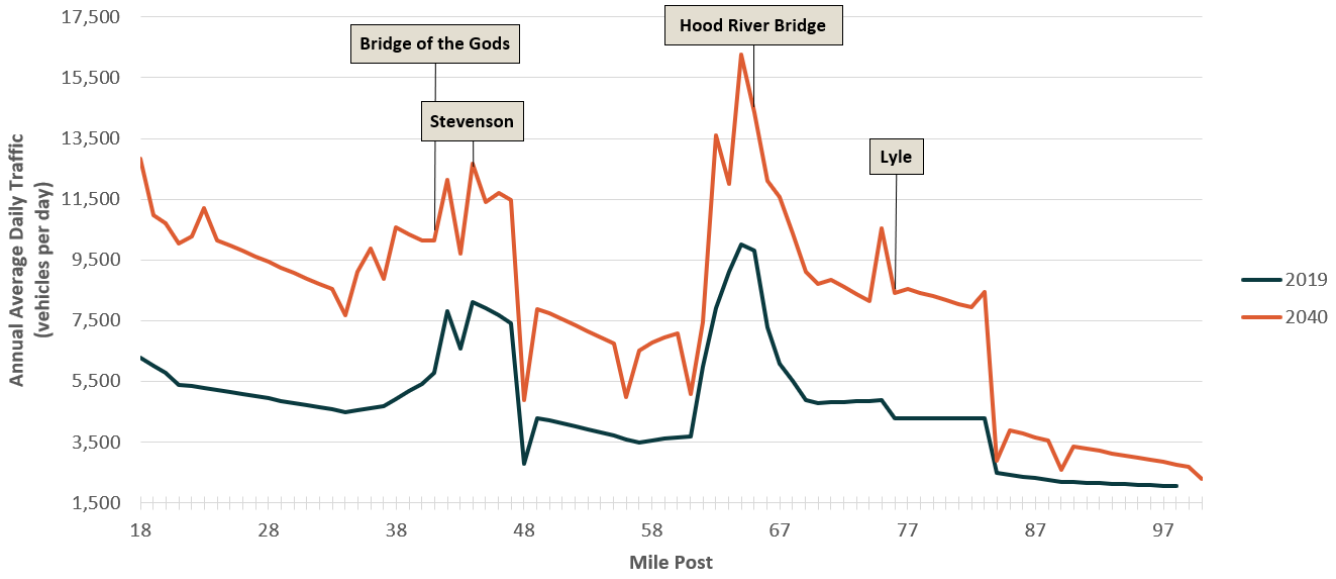
Figure 5. SR 14 Annual Average Daily Traffic (AADT), 2015–2019



Projected Traffic Volumes

Future traffic volumes on SR 14 are estimated based on historic AADT trends summarized by WSDOT. On average, SR 14 traffic volumes are estimated to increase by 60 percent by the year 2040. Figure 6 illustrates the increase relative to the most recent complete five-year historical traffic volumes. The highest increase is expected to occur in the White Salmon and Bingen areas near the Hood River Bridge. SR 14 would expect to see a consistent background growth for the length of the corridor, with higher growth in urban areas and between neighboring urban areas.

Figure 6. SR 14 Forecasted Year 2040 Annual Average Daily Traffic (AADT)



Seasonal Variation

Given that SR 14 is the gateway to many tourist activities, with local and non-local visitors, the corridor sees significant seasonal variation. Though transit options do exist, they are very limited, resulting in the primary mode of access being the single-occupancy vehicle. Therefore, traffic volumes closely follow the tourism seasonality within the study area.

WSDOT reports the top 200 highest traffic volume hours for the year from permanent traffic recorders (PTR) around the state. Historic AADT data on SR 14 is available from two PTR stations immediately west and east of the study area (at MP 17.7 and MP 100.64). On the west end of the study area, the peak hour, or design hourly volume (DHV), is estimated to be 11.5 percent of the AADT, with approximately 66 percent of the traffic heading westbound toward Washougal. The most congested conditions on SR 14 at this location are likely to occur in the late afternoon or evening on a weekend (Friday through Sunday) between May and September, particularly in June.

At the east end of the study area, the DHV is estimated to be 14 percent of the AADT, with approximately 58 percent of the traffic heading westbound toward Lyle. The most congested conditions on SR 14 at this location are likely to occur in the early to mid-afternoon on summer weekends (Friday through Sunday) between July and August.

As previously mentioned, the landscape consists of mountains, fields, wildflowers, marshlands, wildlife refuges, and the Columbia River Gorge itself. Recreational activities include hiking, mountain biking, fishing, wind surfing, bird watching, picnicking, and sightseeing, all of which are outdoor activities. It should be noted that the peak traffic along SR 14 doesn't always align perfectly with peak use times at recreational sites. Each recreation site has its own unique features that draw visitors at various times of the year, as summarized above. For recreation, the peak in the eastern part of the study area is observed to be spring, mainly due to the endless wildflowers in bloom and active bird watching. During the hot and dry summer months, sites in the eastern portion of the study area receive less use. Along the western part of the study area, peak activity occurs during the spring and summer months due to the various sporting activities and ideal outdoor weather.

Throughout the entire study area, the low season tends to be winter, primarily January and February, due to the inclement weather, including heavy rains, high winds, and muddy hiking trails.

Heavy Vehicle Traffic

The Freight and Good Transportation System (FGTS) in Washington State classifies freight corridors by modes based on annual freight tonnage moved, including truck, rail, and waterway freight corridors. Each modal network is classified into five tiers (T-1 through T-5), each of which has annual tonnage thresholds as follows:

- T-1 corridors: more than 10 million tons
- T-2 corridors: 4 million tons to 10 million tons
- T-3 corridors: 300,000 tons to 4 million tons
- T-4 corridors: 100,000 tons to 300,000 tons
- T-5 corridors: at least 20,000 tons in 60 days and less than 100,000 tons per year

According to the FGTS, SR 14 is classified as a T-3 corridor for most of the study area, except for the segment between the Bridge of the Gods and Wind River Road, which is classified as a T-2 corridor. Due

to the narrow, single lane in each direction, Oversized and/or overweight restrictions apply to the SR 14 corridor throughout the study area due to its narrow lane widths and limited passing lanes. As such, pilot cars are required to assist trucks that are more than 10 feet wide. Given these restrictions, truck traffic is minimal along SR 14, as summarized in Table 7 below.

Table 7. Truck Percentages on SR 14 by Mile Post

Begin MP	End MP	Annual Tonnage	Truck Percentage
17.05	21.77	3,640,000	14.5%
21.77	41.55	3,640,000	14.5%
41.55	47.47	5,010,000	13.6%
47.47	63.48	3,640,000	15.3%
63.48	83.53	3,640,000	15.3%
83.53	101.02	2,460,000	19.3%

Source: 2019 Washington State FGTS Corridor Classifications by State Routes

MULTIMODAL TRANSPORTATION FACILITIES AND USE

BICYCLE

There are no separate bicycle facilities that provide continuous non-highway connections between communities in the study area other than SR 14. Because of the prevailing traffic speed and lack of shoulders or bike lanes, SR 14 offers only limited appeal to the most avid cyclists. SR 14 also has several unlit tunnels where cyclists are forced to share the road with vehicles in areas with limited visibility due to lack of illumination. These conditions make cycling prohibitive for many along SR 14 in the CRGNSA.

Some recreation opportunities in the study area feature mountain bike trails. Trail users typically drive their personal vehicles to access area recreation sites, rather than cycle along SR 14. Some recreational road cyclists ride a loop within the eastern end of the CRGNSA, traveling east along SR 14 between the Hood River Bridge and the Dalles Bridge, and then west along the Historic Columbia River Highway and Trail.

Cyclists are required to share the travel lane along most sections of SR 14 travel along the SR 14, or travel separated from traffic on the highway shoulders when available. However, existing shoulders are often narrow and in places, frequently filled with for overflow or illegal parking. Other corridor features that limit cycling along SR 14 include tight curves that block site distance, and guardrail and rock walls that limit shoulder widths.

PEDESTRIAN

Pedestrian activity in the study area is limited to urban areas and within or near recreation sites and trailheads along SR 14. There is seasonal pedestrian traffic on approximately 500 feet of SR 14 where the Pacific Crest Trail crosses the highway near the Bridge of the Gods. Pedestrians are also prevalent at recreation sites where the trailheads or recreational resources are adjacent to SR 14. Pedestrians walking from parked vehicles to trailheads share shoulders and roadway where space is limited, sometimes crossing SR 14 in hazardous areas with limited sight distance and high vehicular speeds.

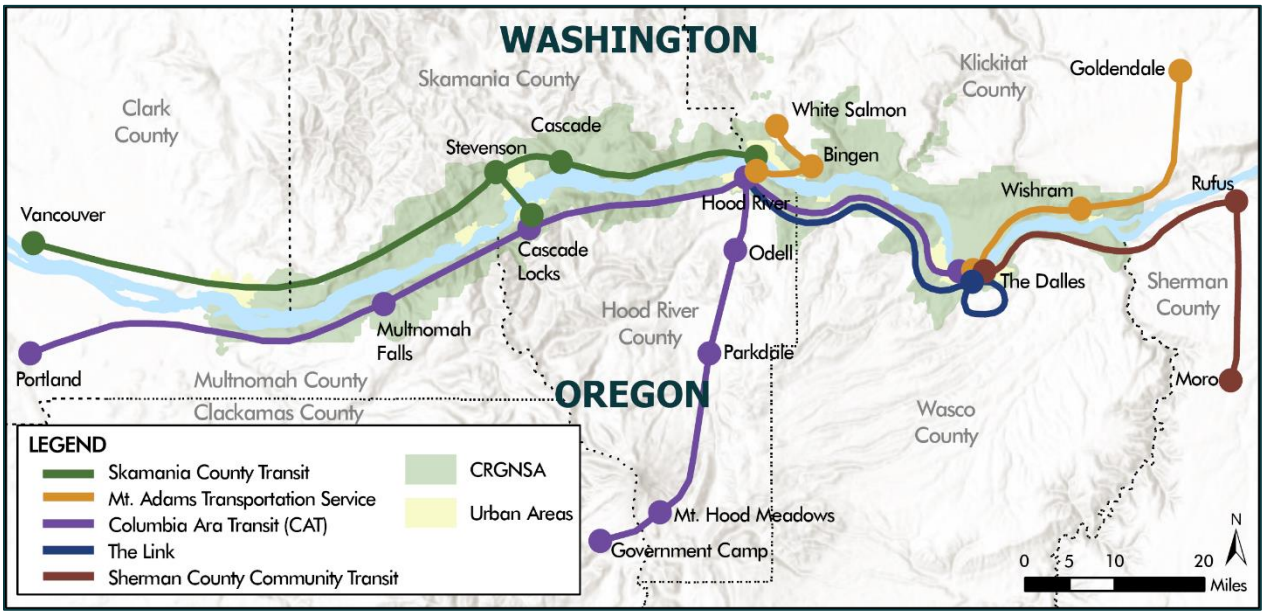
TRANSIT

There are multiple public transportation service providers within the Columbia River Gorge area. Each provider is a member of Gorge Translink, an alliance of rural transportation providers, human service

organizations, and public planning agencies. The objective of Gorge Translink is to enhance connectivity and develop a seamless network of transportation services within the Mid-Columbia River Gorge area while linking services to the metropolitan cities of Portland, Oregon, and Vancouver, Washington.

Figure 7 maps the various public transportation services in the Columbia River Gorge area. Five transportation providers form the Gorge TransLink alliance: Mt Adams Transportation Service (Klickitat County), Skamania County Transit, Columbia Area Transit (Hood River County), the Link (Wasco County), and Sherman County Community Transit. Public transportation services offered by each provider are summarized below, by state.

Figure 7. Map of Public Transportation Services



	Transit Provider	Service Area	Fixed-Route Bus Service				Typical Fare
			Monday-Friday	# Daily Trips	Saturday-Sunday	# Daily Trips	
Washington	Mount Adams Transit Service (MATS)	White Salmon – Bingen - Hood River (OR)	X	10	-	-	$1.00 (1-way)
		Goldendale – Wishram – The Dalles	X	2	-	-	$1.00 (1-way)
	Skamania County Transit	Vancouver – Stevenson – Carson	X	2	X	2	$1.00 (1-way)
Oregon	Columbia Area Transit	City Route	X	17	-	-	$1.00 (1-way)
		Upper Valley Route	X	4	-	-	$1.00 (1-way)
	The Link	The Dalles Loop	X	hourly	-	-	$1.50 (1-way)
	Sherman County Transit	Moro – Rufus – The Dalles	Dial-A-Ride Only				$5 per DAR round trip
	Columbia Gorge Express	Portland – Multnomah Falls – Cascade Locks – Hood River	X	8	X	6	$10 (1-way)

Map Source: Gorge Translink.

Washington Transit Service Providers

Mt. Adams Transportation Service

Mt. Adams Transportation Service (MATS) is a community transportation service provided by Klickitat County, largely for seniors. Services provided by MATS include two fixed bus routes (see Figure 7): Dial-A-Ride (DAR) and Non-Emergent Medical Transportation (NEMT). DAR services are available for seniors and people with disabilities and the general public, with priority service to riders with medical and essential needs.

MATS operates bus and DAR services Monday through Friday, from about 8 a.m. to 5 p.m. MATS operates two daily round trips on the Goldendale-The Dalles route, and ten daily round trips on the White Salmon-Hood River route. The two fixed-route bus lines are open to the public. There is no transit service on holidays or weekends.

Transit fares are $1.00 (each way) on the two bus routes. Fares vary for DAR service depending on trip location.

Senior transportation is funded in part by the Area Agency on Aging and Disabilities of Southwest Washington and by Klickitat County. Other funding is provided by WSDOT and Federal Transit Administration (FTA) grants, and through fare revenue.

Skamania County Transit

Skamania County Transit is a community transportation service provided by Skamania County. Its services include one fixed bus route (see Figure 7), DAR, and NEMT. DAR services are available for seniors, people with disabilities, and low-income riders.

The fixed-route bus service operates between Carson and the Fisher's Landing Transit Center in Vancouver (with connecting bus service via C-Tran to various Clark County and Portland, Oregon destinations). The fixed-route bus line is open to the public and provides two round trips daily. During summer months, Skamania County Transit provides shuttle service to a few trailheads along the Gorge within Skamania County. With 24 hours' notice, the transit bus will deviate up to 3/4 mile off Wind River Highway and SR 14 to accommodate persons with disabilities.

Skamania County Transit operates bus and DAR services Monday through Friday, from about 8 a.m. to 4:30 p.m. There is no transit service on holidays or weekends.

Transit fares are $1.00 (each way) for bus and DAR trips within Skamania County, and $2.00 for trips outside Skamania County. Funding is provided by WSDOT and FTA grants, and through fare revenue.

At present, there is no public transportation service connection between Carson and Bingen, or between Bingen and Wishram.

Oregon Transit Service Providers

Hood River County Transportation District

Hood River County Transportation District is a special transportation service district that operates fixed bus route and DAR services as **Columbia Area Transit (CAT).** Services provided by CAT include three fixed bus routes (see Figure 7), DAR, and NEMT. DAR services are available for seniors and people with disabilities and the general public.

CAT operates localized service on two local routes: the Hood River City Route and the Upper Valley Route. The Hood River City Route operates every 45 minutes between 7 a.m. and 7 p.m., Monday through Friday. The Upper Valley Route operates four daily round trips between Hood River city center and Parkdale, Oregon, near Oregon Highway 35.

Transit fares are $1.00 (each way) on the local CAT bus routes. Fares vary for DAR service depending on trip location, but they are generally $2.00 within Hood River with special pass options.

Funding for local CAT Hood River City Route and Upper Valley Route service is provided by the state and FTA grants and local property taxes, and through fare revenue.

Through a special funding agreement with ODOT in 2019, CAT assumed operations of the Columbia Gorge Express. Columbia Gorge Express operates eight round trips per day (about every 90 minutes) along the I-84 corridor and has stops at Gateway Transit Center, Multnomah Falls, Cascade Locks, and Hood River. Some buses continue east to The Dalles, Oregon. Weekday service is generally from 7 a.m. to 6:30 p.m. (eight round trips), and weekend service is from 7 a.m. to 4 p.m. (six round trips). From the Gateway Transit Center in Portland, the Columbia Gorge Express provides connections to multiple parks and trailheads in the Gorge along I-84 and the Historic Columbia River Highway in Oregon.

As shown in Figure 8, Columbia Gorge Express riders are mostly visitors from out of state who use the bus primarily for sightseeing and hiking or biking activities in the Gorge.

One-way trip fares for the Columbia River Gorge Express are $10.00. Annual passes are also available.

The Link Public Transit

The Link Public Transit is a community transportation service provided by Wasco County through the Mid-Columbia Economic Development District. Services provided by The Link include fixed-route bus (see Figure 7), DAR, and NEMT. DAR services are available for seniors and people with disabilities and the general public.

The Link operates bus and DAR services in The Dalles urban area Monday through Friday, from about 6 a.m. to 6 p.m., and on Saturday from about 9 a.m. to 4 p.m. Transit fares are $1.50 (each way) for the bus and DAR services.

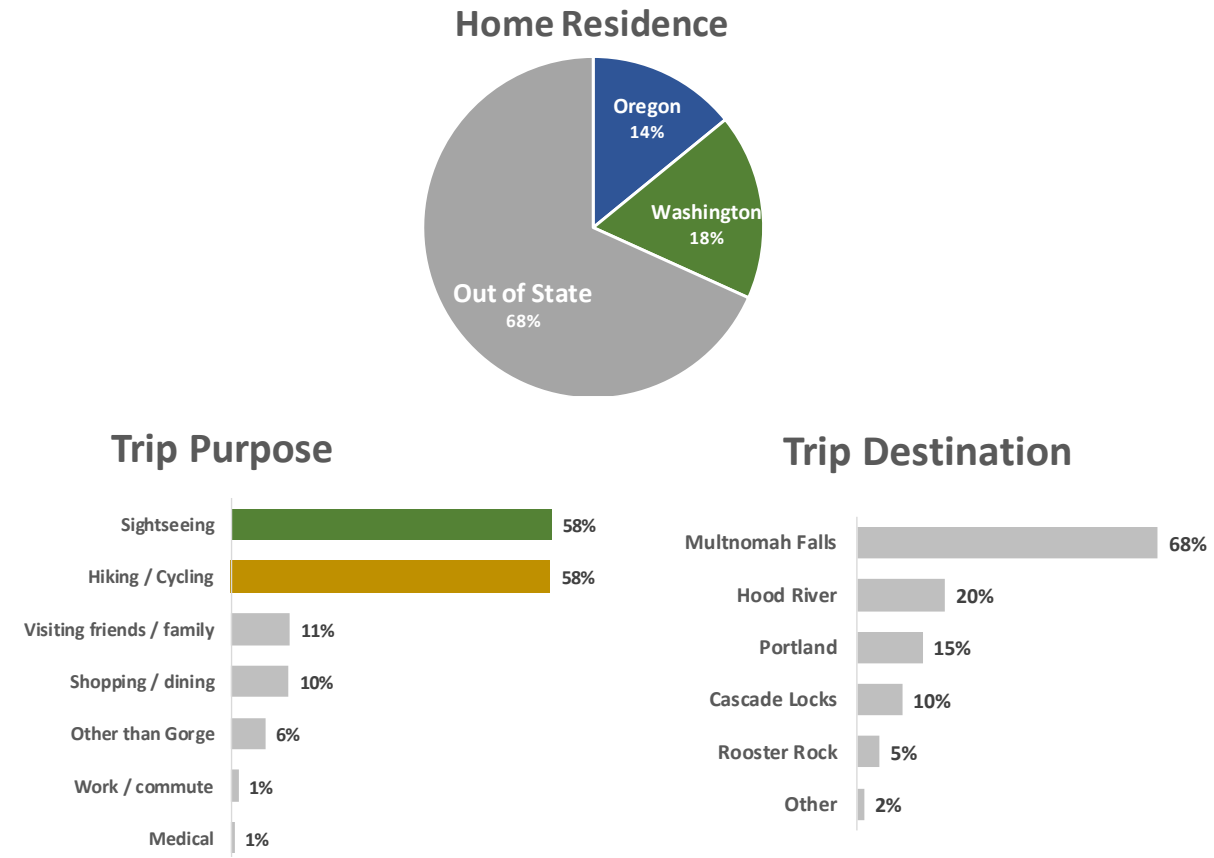
Sherman County Community Transit

Sherman County Community Transit (also known as Sherman Transit) is a community transportation service provided by Sherman County that provides DAR and NEMT services. DAR services are available for seniors and people with disabilities and the general public.

Sherman Transit DAR services are offered Monday through Thursday, from about 8 a.m. to 5 p.m. Transit fares are $5.00 per round trip.

Sherman County receives ODOT Special Transportation Funds, Statewide Transportation Improvement Funds, FTA Capital Investment Grant funds, and state/federal discretionary grant funding to provide priority transportation to seniors and disabled persons.

Figure 8. Travel Characteristics of Columbia Gorge Express Riders



Data Source: Oregon Department of Transportation, 2019.

SAFETY HISTORY AND TRENDS

This section provides an analysis of the most recent five-year crash history within the study area. Crash data was obtained from WSDOT's Crash Data and Reporting Branch. The crash records were provided in a GIS shapefile and included all reported crashes from January 1, 2015, to December 31, 2019, within Clark, Skamania, and Klickitat counties. The analysis trimmed the data to include crashes within a 500-foot radius of SR 14 in the study area (from MP 18 to MP 98). In addition to reported crashes, this report discusses any unreported crashes during the five years of 2015 to 2019 that were discovered during this existing conditions analysis.[2]

CRASH HISTORY AND TRENDS

A total of 768 reported crashes occurred in the study area from January 1, 2015, to December 31, 2019. Approximately 92 percent of these crashes occurred on SR 14, and 8 percent occurred on an adjacent street or intersecting roadway. The analysis summarized the crashes in tabular format and graphed them

[2] *Disclaimer: Under 23 U.S. Code § 148 and 23 U.S. Code § 409, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.*

to look for trends. The following characteristics were reviewed and are presented in the following sections:

a. Number of crashes by severity and year
b. Crash frequency (number) by crash type
c. Crash frequency (number) by driver circumstance (contributing factor)
d. Crash frequency (number) by vehicle type and number of vehicles involved

The analysis included a detailed review of crashes that occurred within 500 feet of any study area trailhead. The following discussion also provides a summary of all crashes that resulted in a fatality.

Number of Crashes by Severity and Year

Of the 768 reported crashes, 65 percent (498) resulted in no apparent injury/property damage only, 18 percent (218) resulted in a minor injury, 3 percent (22) in a serious injury, 1.7 percent (13) resulting in a fatality, and 2 percent (17) were unknown. Figure 9 summarizes the crash frequency by severity and year. Figure 10 shows each crash along the corridor labeled by severity level.

Figure 9. Number of Crashes by Severity and Year

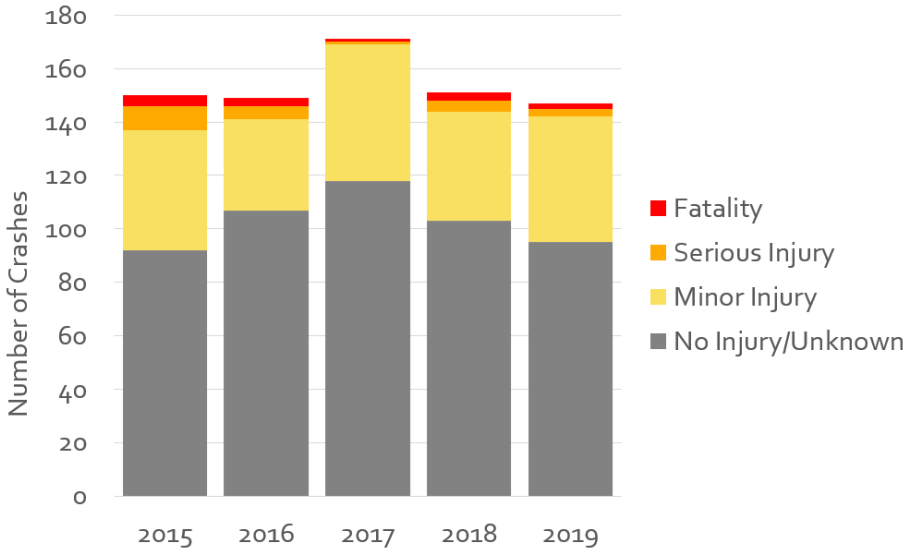


Figure 10. Crashes by Severity

Data Source: WSDOT

Legend

Crash Type

- Fatality
- Serious Injury
- Minor Injury
- No Injury/Unknown

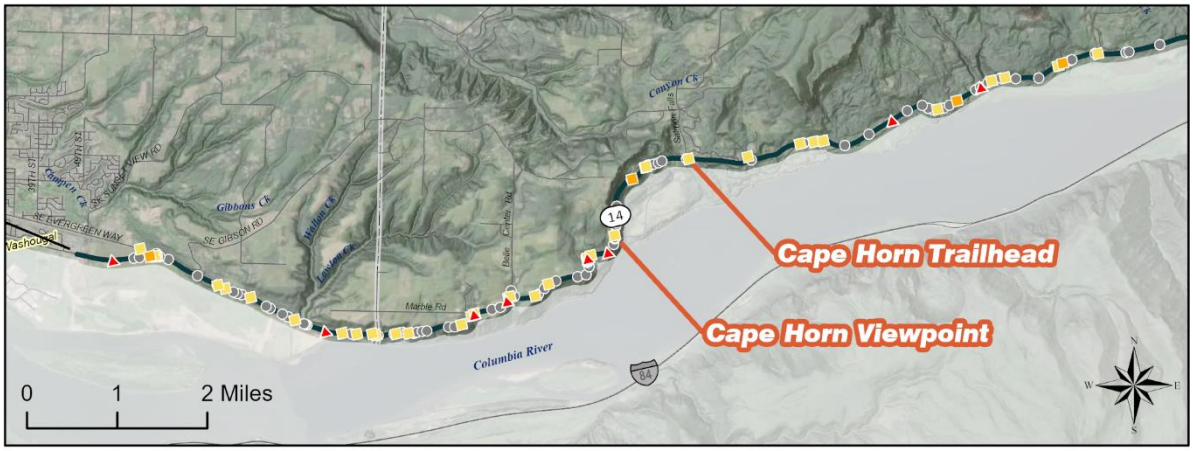


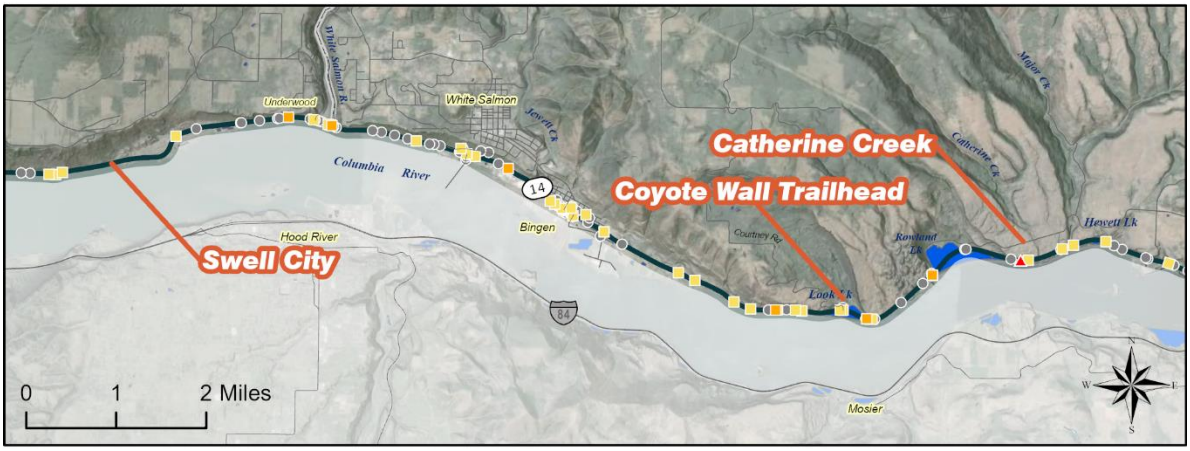
Figure 11. Crashes by Severity

Data Source: WSDOT

Legend

Crash Type

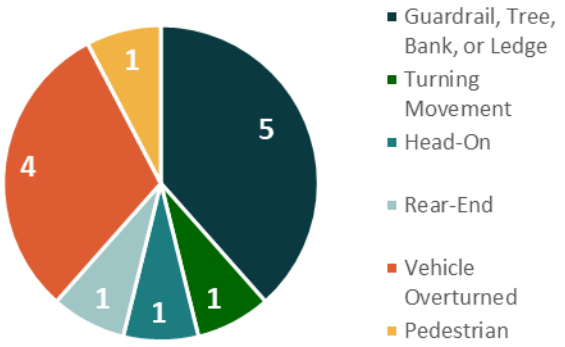
- Fatality
- Serious Injury
- Minor Injury
- No Injury/Unknown



FATALITIES

Thirteen fatalities occurred within the study area from January 1, 2015, to December 31, 2019, none of which occurred within 500 feet of a trailhead. Figure 12 summarizes the crash type for crashes that resulted in a fatality. Approximately 38 percent of fatal crashes were a result of a collision with a fixed object such as a guardrail, tree, bank, or ledge, and for which all crash reports documented that the vehicle was going straight ahead, not navigating a turn.

Figure 12: Collision Type of Fatal Crashes



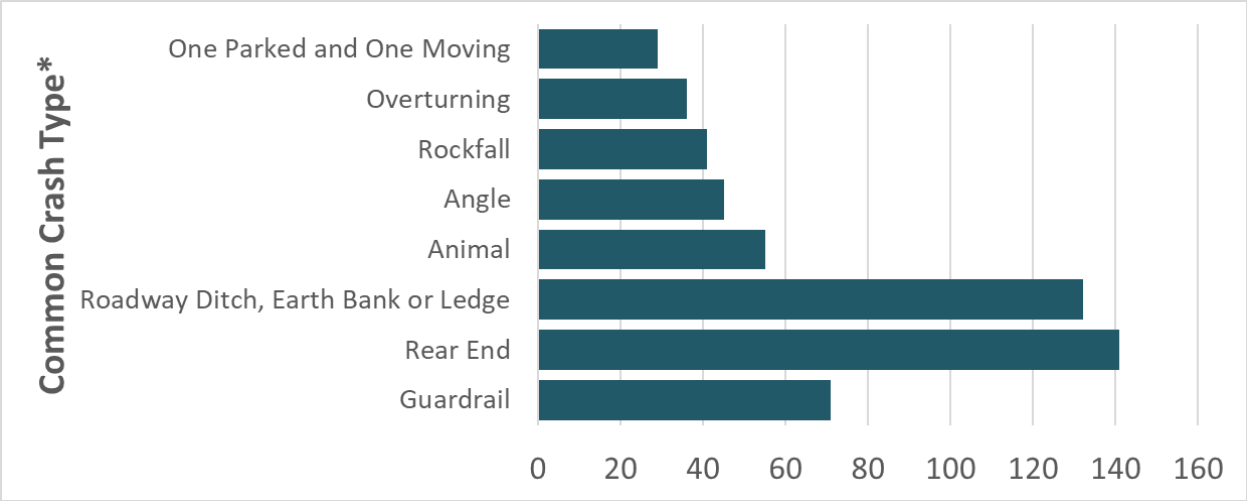
Each fatality occurred in a unique location along the corridor, indicating no geographical hot spots for fatalities. Eleven fatal crashes (85 percent) occurred in clear or partly cloudy conditions with dry pavement. Ten fatal crashes (77 percent) occurred in the daylight, one occurred at dusk, and the other two in the dark without streetlights. One of the fatalities that occurred in the dark without streetlights included a pedestrian.

Crash Frequency (Number of Crashes) by Crash Type

There are 59 documented crash types in the crash dataset. Figure 13 summarizes crash frequency by crash type for those types that had more than 20 crashes, equating to a total of 513 crashes. Thus, the remaining 255 crashes appear randomly distributed over 47 other crash types.

Rear-end collisions were the most common throughout the study area, followed by collisions with a roadway ditch, earth bank or ledge, and then guardrail. These crash types are consistent with a scenic, winding highway with many cross streets, turnouts, access points, and trailheads, especially during the peak tourism season in which thousands of visitors from out of state visit, many of whom may not be familiar with the corridor.

Figure 13. Crash Frequency (Number of Crashes) by Common Crash Type



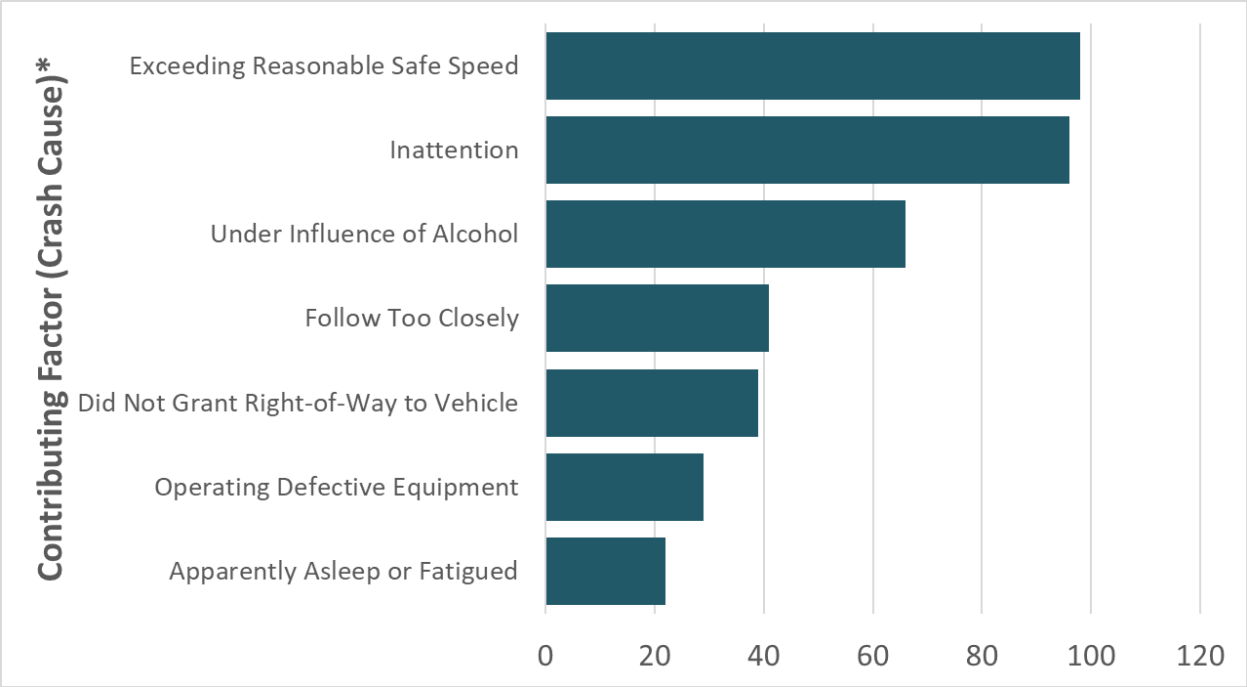
**Includes crash types with at least 20 occurrences*

Crash Frequency (Number of Vehicle-crashes) by Driver Circumstance (Crash Cause)

The crash dataset records 29 documented crash causes. In this section, these data are summarized by number of vehicle-crashes, rather than number of crashes, because many crashes involved more than one vehicle and therefore, more than one primary contributing factor – one from each driver. Figure 14 summarizes crash frequency (number of vehicles involved in crashes) by crash cause for causes that had more than 20 vehicle-crashes (excluding unknown causes), equating to a total of 391 vehicle-crashes. The remaining 377 vehicle-crashes were split between 20 other crash causes with 262 crashes with unknown crash causes.

The most common contributing factor to crashes throughout the corridor was user-related, where drivers exceeded reasonable, safe speeds and the next most common contributing factor was driver inattention. More than 60 vehicle-crashes involved drivers under the influence of alcohol.

Figure 14. Crash Frequency (Number of Vehicle-crashes) by Contributing Factor (Crash Cause)

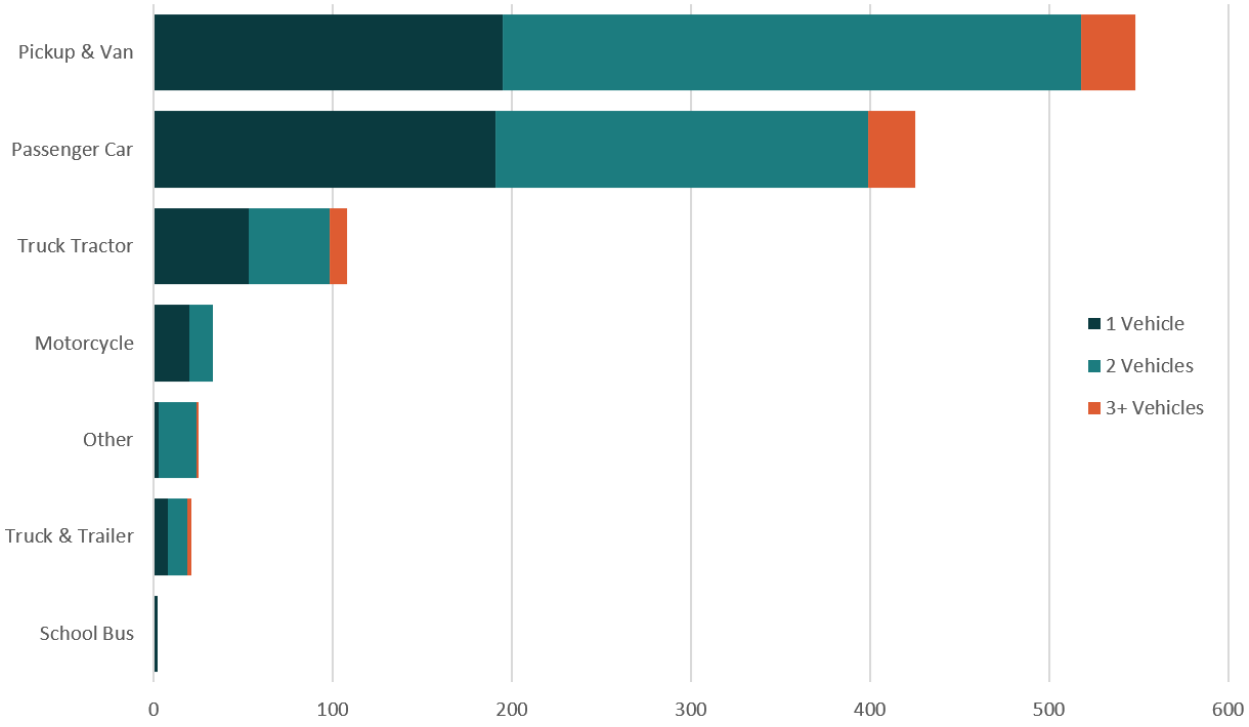


Includes crash causes with at least 20 occurrences (excluding those recorded as "None")

Crash Frequency (Number of Crashes) by Vehicle Type and Number of Vehicles Involved

The crash dataset includes 7 documented vehicle types, including "other." Figure 15 summarizes crash frequency by vehicle type and number of vehicles involved. Most crashes involved a passenger car or pickup truck, with most crashes involving two vehicles, followed by one-vehicle crashes. There were 33 crashes involving a motorcycle, 20 of which involved no other vehicles, and 13 of which involved another vehicle.

Figure 15. Crashes by Vehicle Type and Number of Vehicles Involved



Crash Density

Figure 16 shows the crash densities along the corridor. As shown, concentrations of crashes tend to be within city limits, around sharp curves, or near trailheads and other stopping points along the highway. These crash patterns are consistent with a single-lane state highway and are not unusual.

Figure 16. Crash Density (1 of 2)

Legend

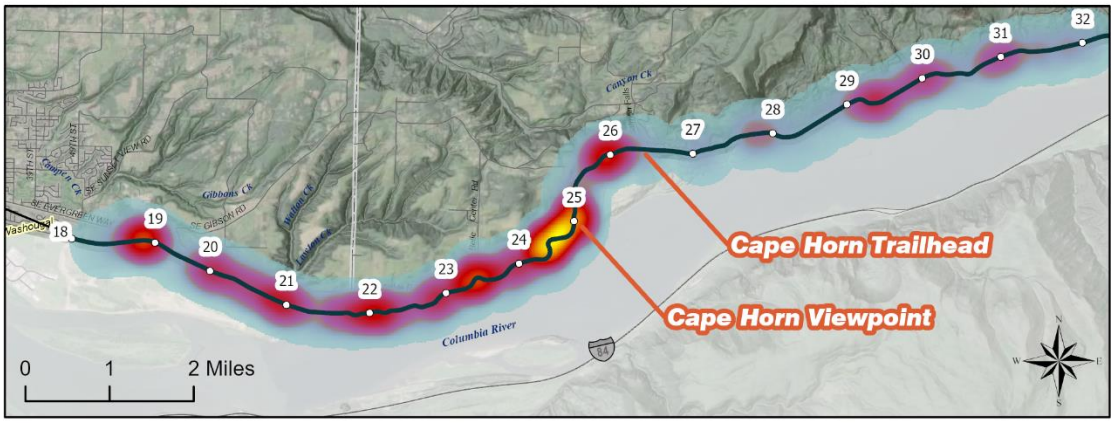
MP

Crash Density

Sparse

Dense

Data Source: WSDOT



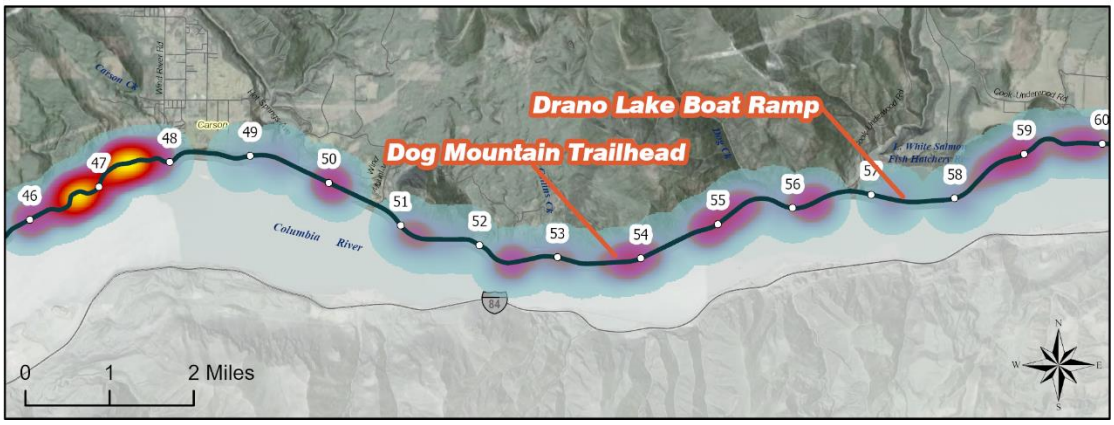


Figure 16. Crash Density (2 of 2)

Legend

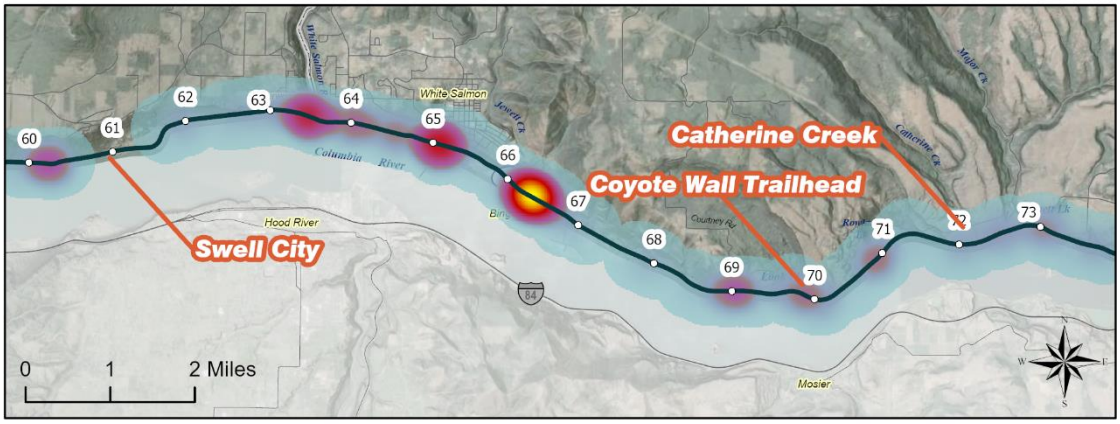
MP

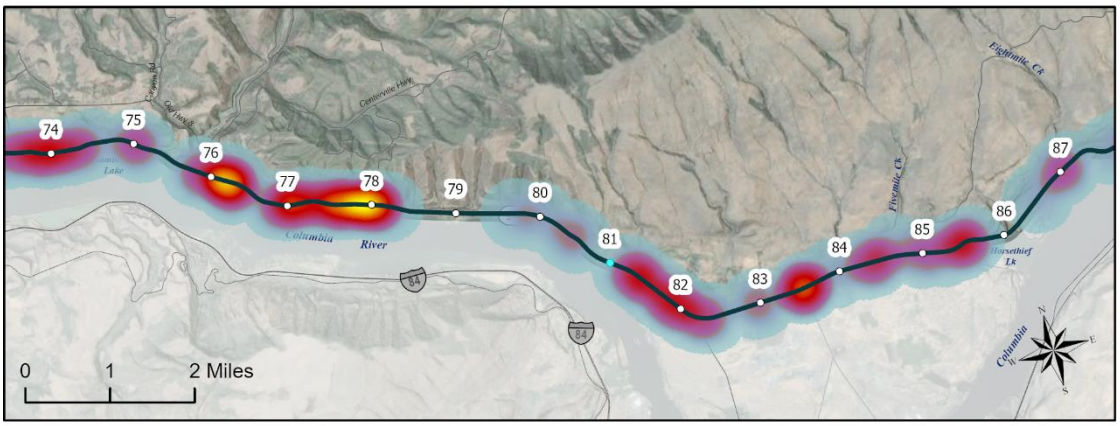
Crash Density

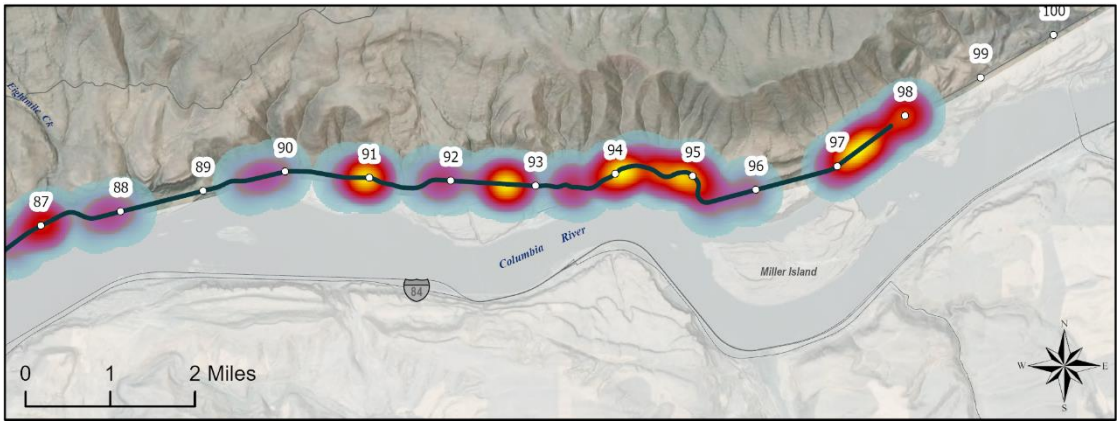
Sparse

Dense

Data Source: WSDOT





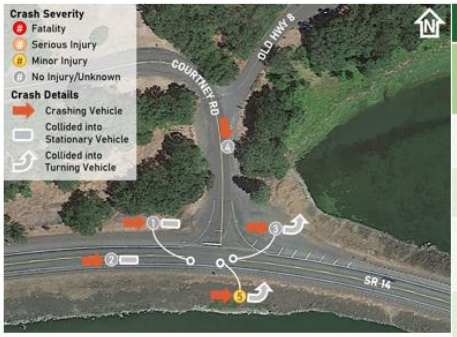


CRITICAL CRASH RATES

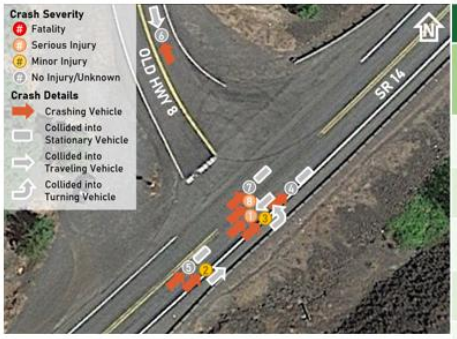
The Highway Safety Manual Part B describes the critical crash rate method as a means of identifying locations that warrant further investigation. The critical crash rate is specific to the study area and considers average crash rates at comparable sites, traffic volume, and a confidence interval.

Critical intersection crash rates were calculated for the study intersections. Intersection crash rates are calculated based on number of crashes per Million Entering Vehicles (MEV) for the analysis period (in this case, five years). Table 8 lists the study intersections that exceeded the critical crash rate for their reference populations and summarizes the related crash rates, most notably the SR 14 intersections with access to Coyote Wall (Courtney Road) and East Syncline Trailhead (Old Highway 8). Crash diagrams at both intersections can be seen in Figure 17. At the Courtney Road intersection, all the crashes on SR 14 were rear-ends, indicating that a left-turn lane onto Courtney Road to provide refuge for left-turning vehicles may improve safety. While there is no singular collision type at the Old Hwy 8 intersection, the type of crashes also indicates a left-turn lane on SR 14 may improve safety.

Figure 17. Crash Diagram at Coyote Wall (Top) and Syncline Trailhead (Bottom)



EVENT SUMMARIES						
#	Date – Time	Highest Severity	Collision Type	Driver Contributing Factor	Weather	Lighting
1	9/25/2019 – 9:59 am	No Injury	Rear-end	Inattention	Clear or Partly Cloudy	Daylight
2	6/28/2019 – 4:32 pm	Unknown	Rear-end	Distractions outside vehicle	Clear or Partly Cloudy	Daylight
3	9/28/2018 – 3:00 pm	No Injury	Rear-end	Exceeding reasonably safe speed	Clear or Partly Cloudy	Daylight
4	2/3/2017 – 6:34 am	No Injury	Over Embankment – No Guardrail Present	None	Snowing	Dark-No Street Lights
5	1/25/2015 – 12:35pm	Minor Injury	Rear-end	Other	Clear or Partly Cloudy	Daylight



EVENT SUMMARIES						
#	Date – Time	Highest Severity	Collision Type	Driver Contributing Factor	Weather	Lighting
1	6/5/2020 – 4:50 pm	Serious Injury	Head-on	Operating cell phone	Clear	Daylight
2	2/18/2020 – 2:29 pm	Minor Injury	Sideswipe	Improper passing	Clear or Partly Cloudy	Daylight
3	6/2/2019 – 3:10 pm	Minor Injury	Tried to pass as someone turned left	Improper passing	Clear or Partly Cloudy	Daylight
4	11/4/2017 – 2:44 pm	No Injury	Sideswipe	Other distractions inside vehicle	Overcast	Daylight
5	9/7/2017 – 5:08 pm	No Injury	Rear-end	Inattention	Overcast	Daylight
6	12/8/2016 – 3:09 pm	No Injury	Head-on	Inattention	Snowing	Daylight
7	9/20/2016 – 9:30 am	No Injury	Rear-end	Inattention	Clear or Partly Cloudy	Daylight
8	8/28/2016 – 7:12 pm	Serious Injury	Earth bank or ledge	Improper passing	Clear or Partly Cloudy	Daylight

Critical segment crash rates were also calculated for the study area. A segment crash rate is calculated based on the total number of vehicles traveling on the road segment during the specified period. This is called Vehicle Miles of Travel (VMT). VMT is usually expressed as Million Vehicle Miles (MVM). Table 9

lists the segments in the study area that exceed the critical crash rate and summarizes the related crash rates. Of note is the high crash rate along SR 14 in the Cape Horn segment.

Table 8. SR 14 Intersections Exceeding Critical Crash Rate (2015–2019)

Access to SR 14	5-Year Crash Total	Intersection Crash Rate (crashes/MEV)	Intersection Critical Crash Rate
Access Serves Recreational Site			
Bridge of the Gods	8	0.56	0.30
Coyote Wall (Courtney Road)	4	0.45	0.36
Syncline Trail (Old Highway 8)	5	0.57	0.36
Access Serves Public			
SE Evergreen Boulevard	5	0.43	0.32
Belle Center Road	4	0.41	0.34
Cook-Underwood Road	4	0.61	0.41
SR 141	7	0.49	0.29
6th Street	3	0.34	0.34
US 197	7	1.53	0.48

Sources: WSDOT Crash Data (2015-2019); David Evans and Associates, Inc.

Table 9. SR 14 Segments Exceeding Critical Crash Rate (2015–2019)

Segment Description	Beg. MP	End MP	5-Year Crash Total	Segment Crash Rate (crashes/MVM)	Segment Critical Crash Rate
West end of CRGNSA	18.00	23.42	66	1.24	1.08
Cape Horn	23.42	26.38	54	1.89	1.16
Doetsch Ranch Road to West Bonneville	34.08	37.04	37	1.49	1.19
Wishram	44.13	44.65	11	1.43	1.09
East end of CRGNSA	94.38	98.07	18	1.34	1.31

Sources: WSDOT Crash Data (2015-2019); David Evans and Associates, Inc.

The Cape Horn segment includes both the Cape Horn Viewpoint and the Cape Horn Trailhead. Sixty percent of the crashes in this section are a combination of vehicles striking guardrails, driving off the highway or overturning. As noted in the SR 14 Corridor Plan (1991), this section of SR 14 is suited for continued evaluation for the placement of additional guardrail and shoulder rumble strips.

The east end of CRGNSA segment had fifty-three percent the of crashes are vehicles striking animals (the majority of which are at night) or striking a guardrail or barrier. As noted in the SR 14 Corridor Plan (1991), this section of SR 14 is suited for continued evaluation for the placement of shoulder rumble strips and wildlife crossing treatments.

ENVIRONMENTAL SCAN

The information contained in this section provides a planning-level overview of environmental resources and identifies potential constraints and opportunities for the SR 14 and Dog Mountain Congestion and Safety Study. The scan is not a detailed environmental investigation; rather, it is a screening exercise is a planning-level effort that includes information available through desktop studies and does not include site information verified through a site visit. If improvement option projects are forwarded from the 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.

The CRGNSA Management Plan contains specific protections, including avoidance buffers and mitigation measures, for natural resources. These protections are most restrictive in areas designated SMA and in some cases are slightly less restrictive in areas designated GMA, where some level of human development is allowed. In either case, proposed developments in the CRGNSA are required to inventory natural resources and prepare plans to protect, manage, and/or mitigate impacts to them in consultation with the appropriate state and federal agencies.

Resources with specific preservation directives in the CRGNSA Management Plan include the following:

- Wetlands, lakes, and ponds
- Streams and riparian habitats
- Priority habitats and sensitive wildlife sites
- Rare plants and natural areas
- In the SMA, forest resources through the review of forest practices

PHYSICAL ENVIRONMENT

GEOLOGIC HAZARDS

The National Earthquake Hazards Reduction Program seismic site classification system provides a measure of the potential for strong shaking in an area during an earthquake. This approach categorizes soils into six soil site classes (A–F) based on vertical shear wave velocity profile, thickness, and liquefaction potential, where earthquake hazard potential generally increases from Class A to Class E. Site class F is reserved for unusual soil conditions where prediction of earthquake shaking can only be determined by a site-specific evaluation (FEMA 2003). Much of the study area from its western terminus to the Dog Mountain Trailhead is classified as Site Class D or E, indicating high potential for earthquake shaking and liquefaction. East of Dog Mountain Trailhead to the study area's eastern terminus, and most of the study area is classified as Site Class B, denoting relatively lower potential for earthquake shaking and liquefactions. Interspersed, isolated areas within this stretch are classified as Site Classes C, D, and E (see Figure 18).

The Washington Geological Survey maintains a clearinghouse of geologic hazard information, including mapped landslides and landslide hazard potential. Figure 19 shows the extent of historic landslide deposits along the length of the study area, along with landslide potential.

Shallow landslides are those that occur at depths of less than approximately 6 feet to 10 feet. Although they are typically minor, their potential speed and long runout can make them dangerous to humans (City

of Seattle 2019). Deep-seated landslides occur at depths of more than 6 feet to 10 feet and are typically ancient landslides that have been on the landscape for centuries or longer. Most deep-seated landslides are slow, allowing people to escape them without issue. However, some can be dangerous if they go undetected and can cause considerable damage to buildings and infrastructure (City of Seattle 2019).

Generally, the potential for earthquake shaking, liquefaction, and landslides appears to be lower in the eastern portion of the study area. Projects forwarded from this study will need to account for nearby geologic hazard potential in the project design. Depending on the nature of a proposed project, geotechnical investigations may be required to support project design and construction.

STREAMS, RIPARIAN HABITATS, AND WETLANDS

The abundance of streams and other aquatic habitats is one of the defining traits of the CRGNSA, from both the perspective of scenic quality and the perspective of natural resources. The CRGNSA Management Plan policies emphasize protecting and enhancing aquatic and riparian systems. This includes expanding stream buffers, requiring vegetation enhancement, protecting cold water refuge habitats, and other approaches. Activities that impact streams, riparian habitats, wetlands (including ponds and lakes), and their buffers must be avoided or offset through mitigation and restoration to the greatest extent practicable.

Streams and Riparian Areas

Healthy functioning stream ecosystems provide society with many benefits, including water purification, flood control, nutrient recycling, waste decomposition, fisheries, recreation, and aesthetics (USGS 2020). The riparian areas associated with streams and other waterbodies throughout the study area are a key contributing element to the health of stream ecosystems. Riparian areas represent the transition from aquatic to terrestrial ecosystems and provide numerous benefits including energy flow, nutrient cycling, water cycling, hydrologic function, and refuge, foraging, and breeding habitat for a multitude of wildlife species (USDA NRCS 1996). Riparian areas in the study area are commonly home to species such as turtles, neotropical bird species, and raptors such as the bald eagle (CRGC and USFS 2020).

The study area parallels the Columbia River throughout its extent. Large tributary streams located within the study area include the White Salmon River, Klickitat River, Wind River, and Little White Salmon River. Numerous other tributary streams of varying sizes, together with their associated riparian areas, are located throughout the extent of the study area (see Figure 20). A total of approximately 34.49 miles of streams and their associated riparian areas intersect with the study area. The CRGNSA Management Plan stipulates that proposed uses adjacent to streams, ponds, and lakes must preserve an undisturbed buffer zone that is wide enough to protect both the aquatic and riparian areas. Buffer zones are based on the characteristics of the individual stream (i.e., perennial or intermittent) and the vegetation community type (i.e., forest, shrub, or herbaceous). For projects forwarded from this study, field surveys would be required to determine potential impacts to any streams and associated riparian areas. Coordination with the appropriate state or federal wildlife agency (Washington Department of Fish and Wildlife [WDFW], United States Fish and Wildlife Service [USFWS], and/or USFS) would be required to determine the appropriate width for proposed protective buffers and to develop plans for protection or mitigation as necessary. For any unavoidable in-stream impacts, coordination with WDFW, the U.S. Army Corps of Engineers (USACE), and other state and federal agencies, as applicable, would be required.

Wetlands

Wetlands are abundant throughout the CRGNSA, providing a multitude of ecological, economic, and social benefits. They provide habitat for fish, wildlife, and plants, many of which have commercial or recreational value. Wetlands also recharge groundwater, reduce flooding, provide clean drinking water, offer food and fiber, and support cultural and recreational activities (USFWS 2020a).

The USFWS National Wetlands Inventory (USFWS 2020a) identifies approximately 1,616.3 acres of wetlands within the study area. The extent of mapped wetlands within and adjacent to the study area is shown in Figure 20. For any projects that are forwarded as a result of this study, on-site wetland delineations will need to be conducted according to the Level 2 Routine On-Site Method (USACE 1987; USACE 2010) in order to verify the presence of wetlands and identify any potential impacts.

The CRGNSA Management Plan stipulates that new uses must be sited to avoid wetlands to the greatest extent possible. Impacts to wetlands may be allowed only when they are unavoidable, in the public interest, and all practicable measures to minimize impacts have been applied. Projects forwarded from this study would need to assess the potential for wetland impacts and provide sufficient buffer zones to avoid impacts. Project proposals that could affect wetlands would require coordination with the appropriate agencies that regulate wetland impacts (USACE, Washington Department of Ecology) and impacts to wildlife habitat (USFWS, WDFW, and USFS and/or National Marine Fisheries Service [NMFS] as applicable) to determine appropriate impact mitigation or compensation approaches.

FLOODPLAINS AND FLOODWAYS

Floodplains provide flood risk reduction benefits by slowing runoff and storing floodwater. They also provide other economic, social, and environmental benefits that are often overlooked when local land use decisions are made. Floodplains frequently contain wetlands and other important ecological areas that directly affect the quality of the local environment. Some of the benefits of floodplains to a functioning natural system are:

- Fish and wildlife habitat protection
- Natural flood and erosion control
- Surface water quality maintenance
- Groundwater recharge
- Biological productivity
- Higher quality recreational opportunities (fishing, bird watching, boating, etc.) (FEMA 2020)

Figure 21 shows the extent of floodplains associated with the Columbia River and its tributaries along the extent of the study area. Approximately 1,822.7 acres of the study area are located within the Special Flood Hazard Area (SFHA). No regulatory floodways are identified within the boundaries of the study area. The SFHA throughout the study area is primarily characterized as areas subject to inundation by the 1-percent-annual-chance flood event (i.e., the 100-year floodplain) with base flood elevations undetermined. A small portion of the study area near the western terminus is characterized as areas subject to inundation by the 0.2-percent-annual-chance flood event (i.e., the 500-year floodplain) (FEMA 2020). The study area encroaches on the 100-year floodplain in numerous, interspersed locations throughout its extent from the western terminus to Horsethief Lake. The study area does not encroach into the floodplain between Horsethief Lake and its eastern terminus.

Most counties and major cities have floodplain regulations within their local codes, as do all the jurisdictions within the study area. Typically, these regulations are consistent with the Federal Emergency Management Agency (FEMA) Model Floodplain Code. Under FEMA regulations (Executive Order [EO] 11988, Floodplain Management, 1977), no alteration of flood zones shall result in an increase in the base flood elevation (BFE) or an increase in the velocity of floodwaters without FEMA approval. The BFE is defined in the FEMA regulations as "the area subject to flooding by the flood or tide having a one percent chance of being exceeded in any given year," which is also referred to as the 100-year floodplain. EO 11988 directs all federal agencies to refrain from conducting, supporting, or allowing an action in a floodplain unless it is the only practicable alternative. U.S. Department of Transportation Order 5650.2, Floodplain Management and Protection, describes policies and procedures for "ensuring that proper consideration is given to avoidance and mitigation of adverse floodplain impacts in agency actions, planning programs and budget requests." Projects forwarded from this study would need to determine during the planning phase whether development would take place within the 100-year floodplain. If it is not possible to avoid development within the 100-year floodplain, projects would be required to comply with floodplain regulations of the specific jurisdiction or jurisdictions in which the project is located.

Figure 18. Seismogenic Hazards in the Study Area (1 of 2)

Legend

NEHRP Seismic Site Class

- B
- C
- D
- E

Increasing Seismic Risk

Active Faults, Known or Suspected

- Visible fault trace
- Concealed fault trace

Seismogenic Folds, Known or Suspected

- Visible fold trace

Data Source: Washington Geological Survey (WGS)

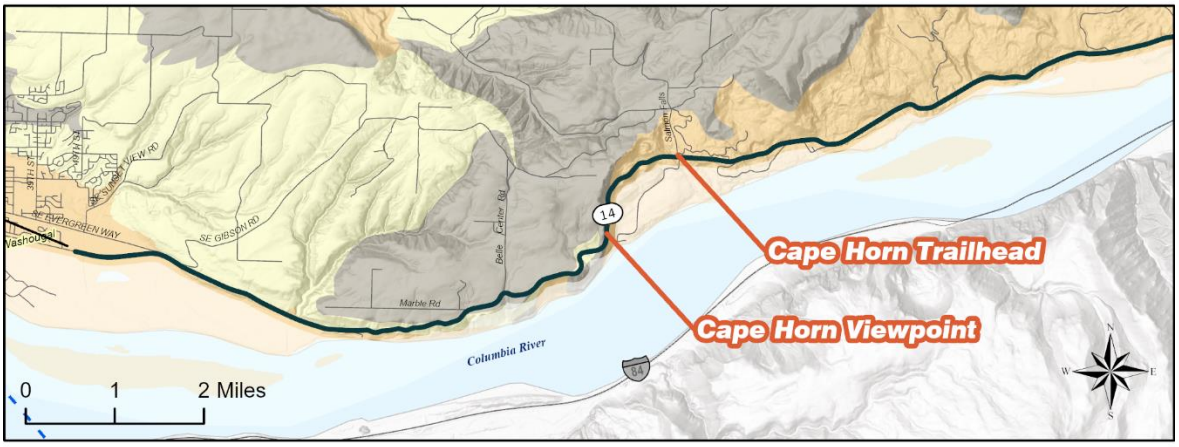


Figure 18. Seismogenic Hazards in the Study Area (2 of 2)

Legend

NEHRP Seismic Site Class

- B
- C
- D
- E

Increasing Seismic Risk

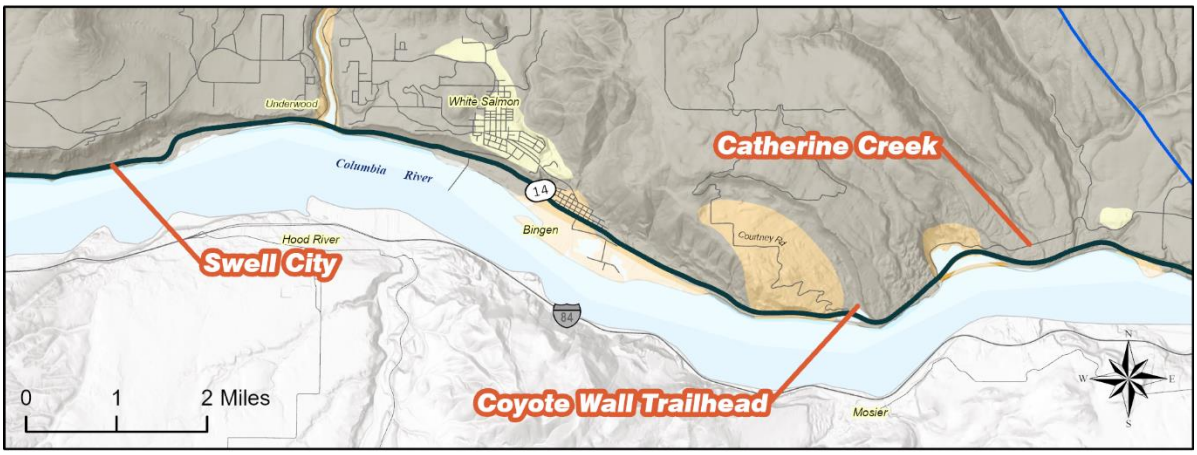
Active Faults, Known or Suspected

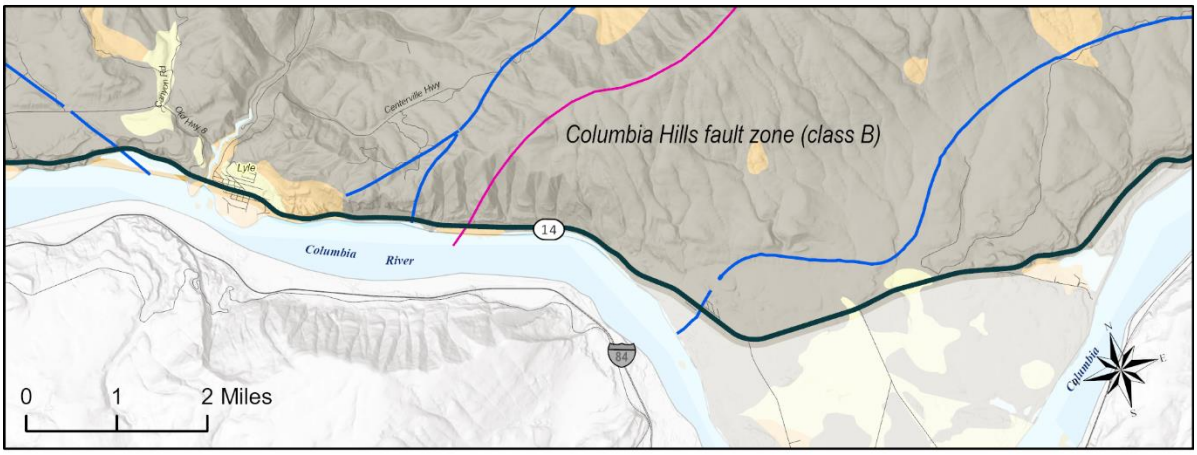
- Visible fault trace
- Concealed fault trace

Seismogenic Folds, Known or Suspected

- Visible fold trace

Data Source: Washington Geological Survey (WGS)





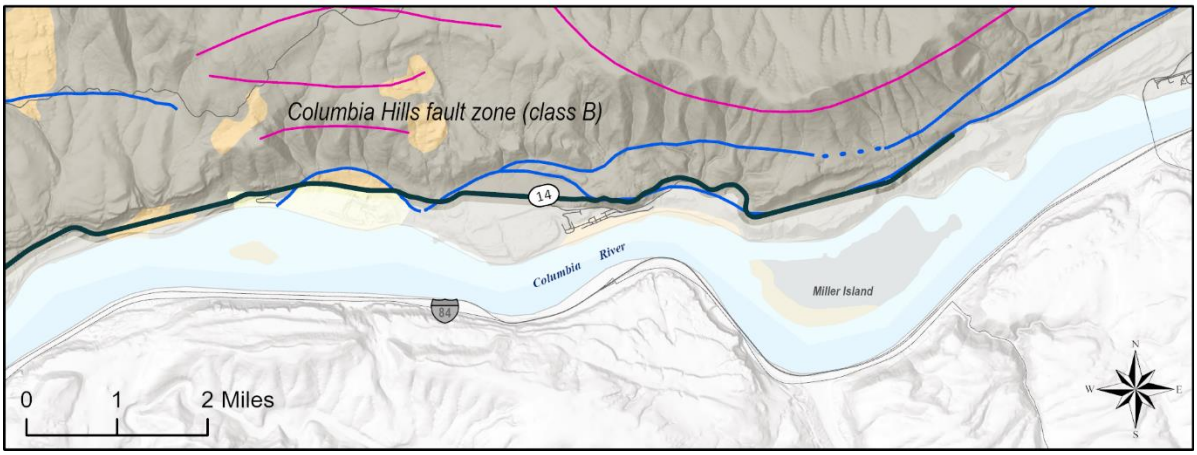


Figure 19. Landslide Hazards in the Study Area (1 of 2)

Legend

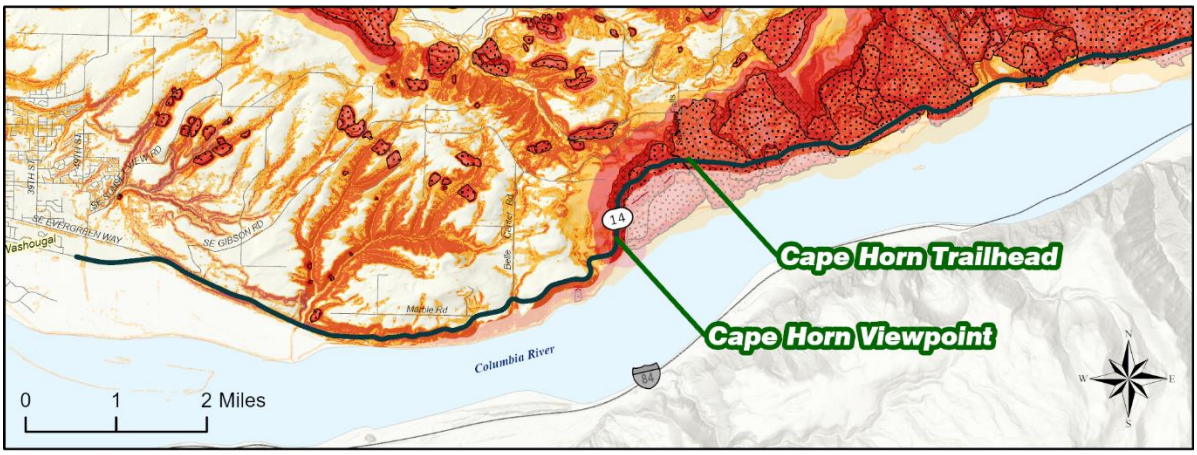
- Landslide Deposits
- Scarps and Flanks

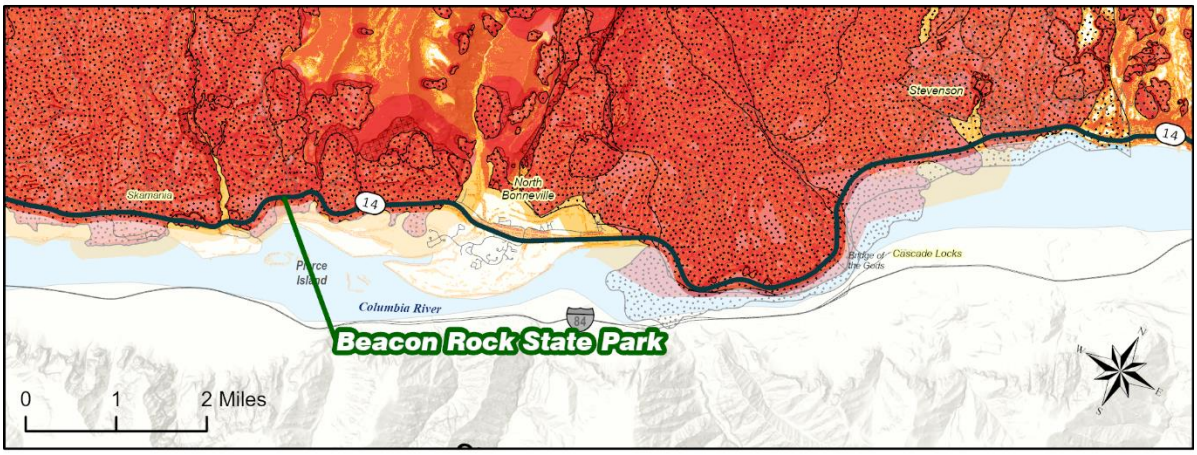
Landslide Susceptibility*

- Moderate
- High

* Landslide susceptibility is shown for both deep and shallow landslides; high susceptibility is prioritized

Data Source(s): Washington Geological Survey (WGS), WSDOT





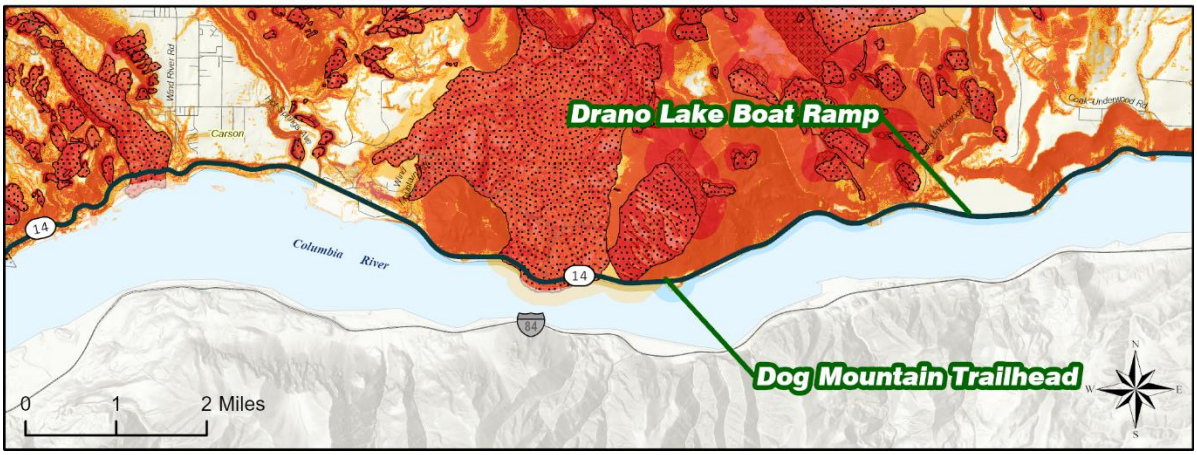


Figure 19. Landslide Hazards in the Study Area (2 of 2)

Legend

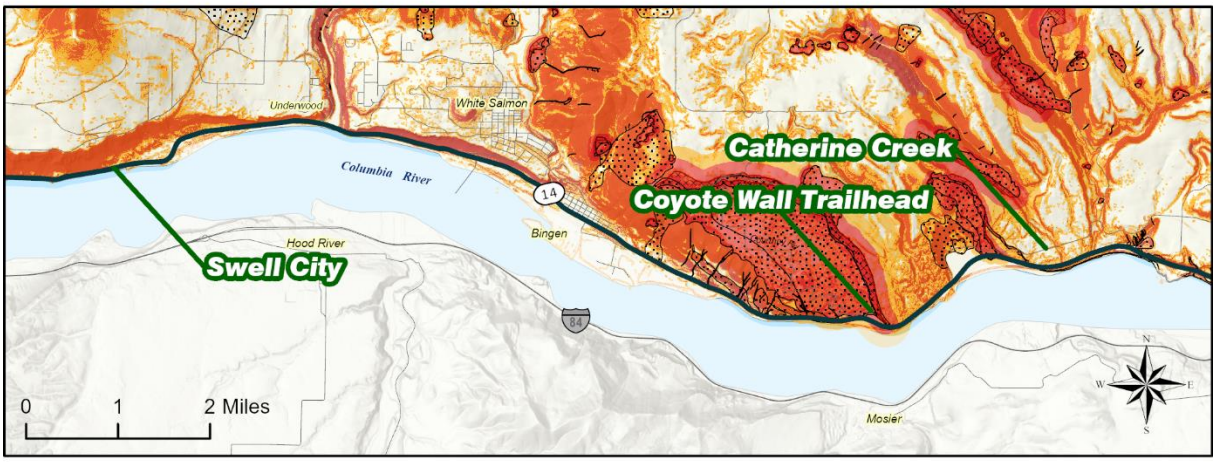
- Landslide Deposits
- Scarps and Flanks

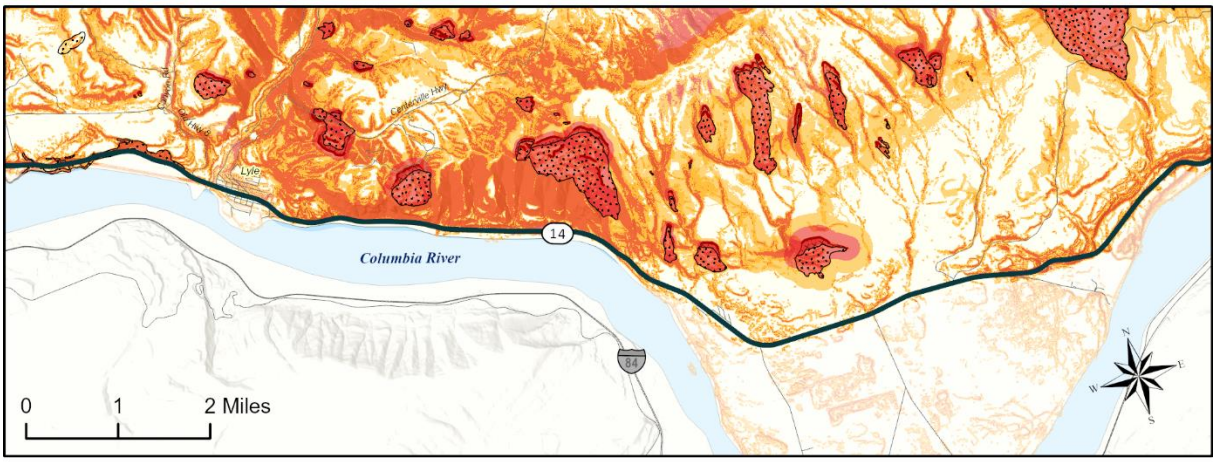
Landslide Susceptibility*

- Moderate
- High

* Landslide susceptibility is shown for both deep and shallow landslides; high susceptibility is prioritized

Data Source(s): Washington Geological Survey (WGS), WSDOT





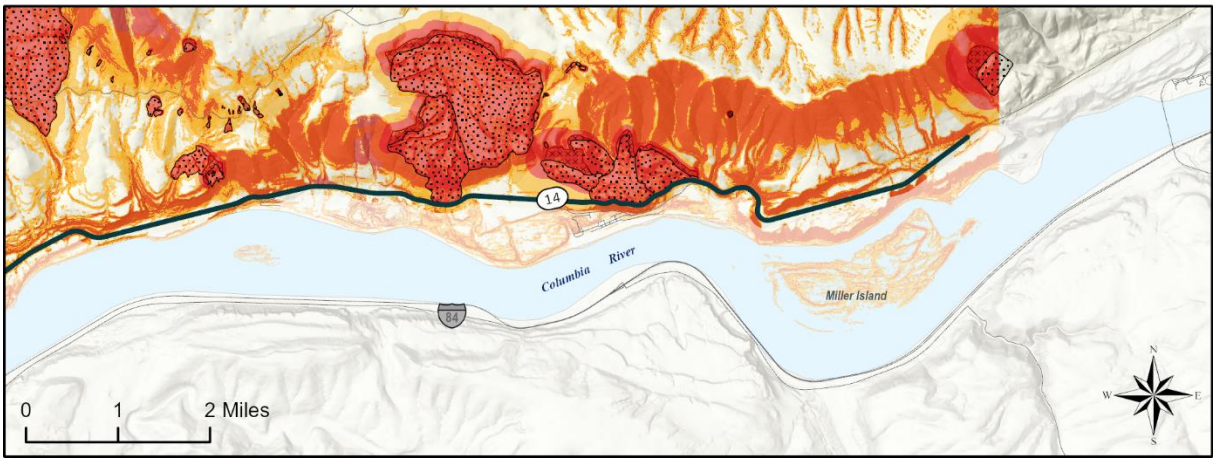


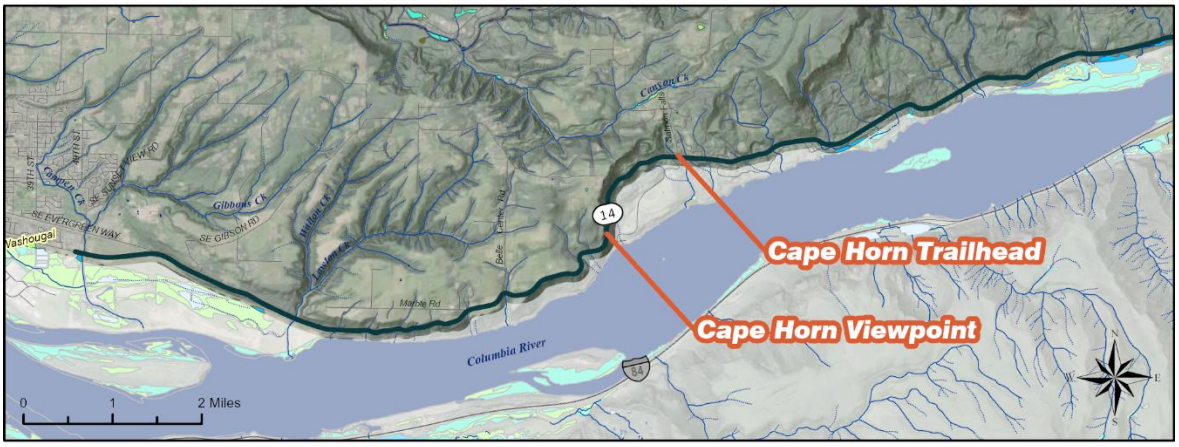
Figure 20. Wetlands and Waters in the Study Area (1 of 2)

Legend

USFWS NWI Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/ Shrub Wetland
- Freshwater Pond
- Lake
- Riverine

USGS NHD
- Lake/Pond
- Reservoir
- Swamp/Marsh
- Stream/Creek (perennial)
- Stream/Creek (intermittent)

Data Source(s): USFWS, USGS



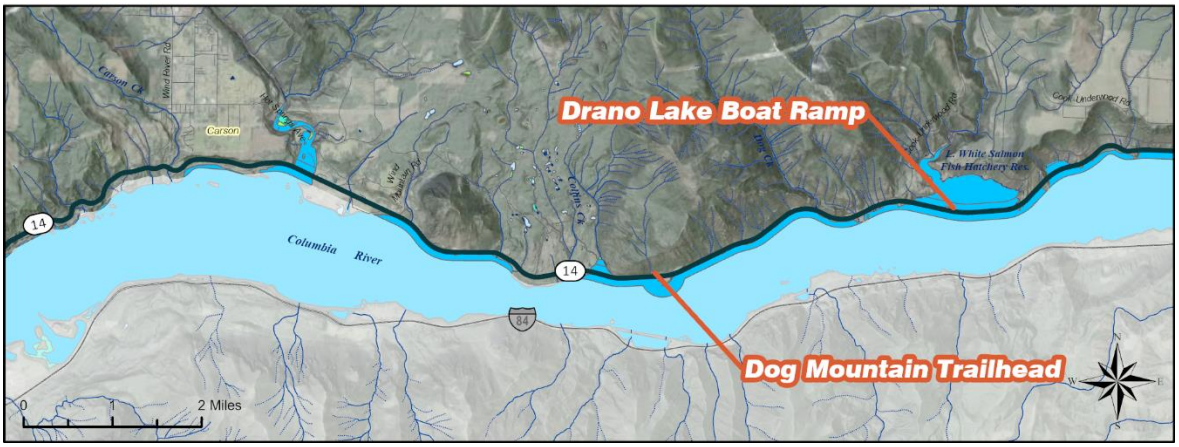


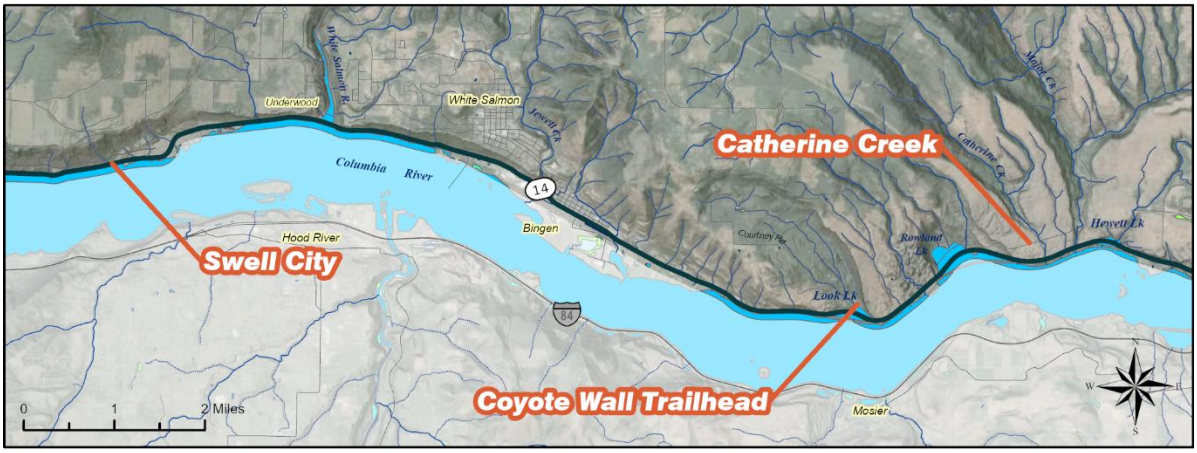
Figure 20. Wetlands and Waters in the Study Area (2 of 2)

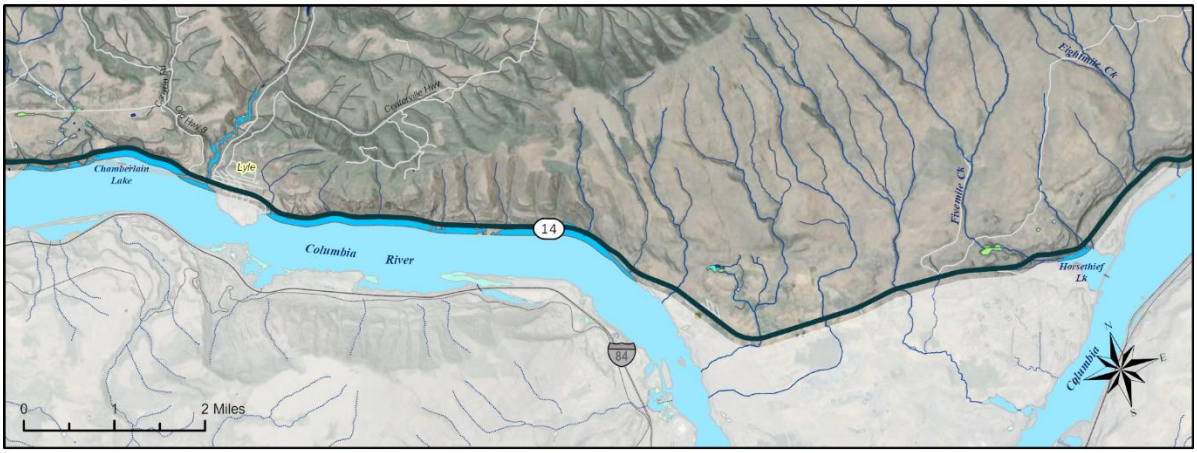
Legend

USFWS NWI Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/ Shrub Wetland
- Freshwater Pond
- Lake
- Riverine

USGS NHD
- Lake/Pond
- Reservoir
- Swamp/Marsh
- Stream/Creek (perennial)
- Stream/Creek (intermittent)

Data Source(s): USFWS, USGS





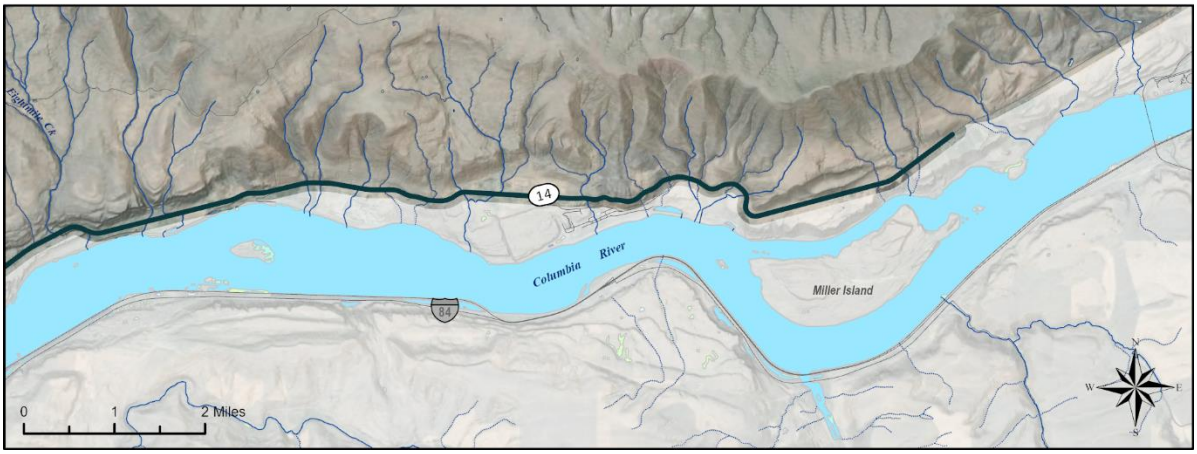


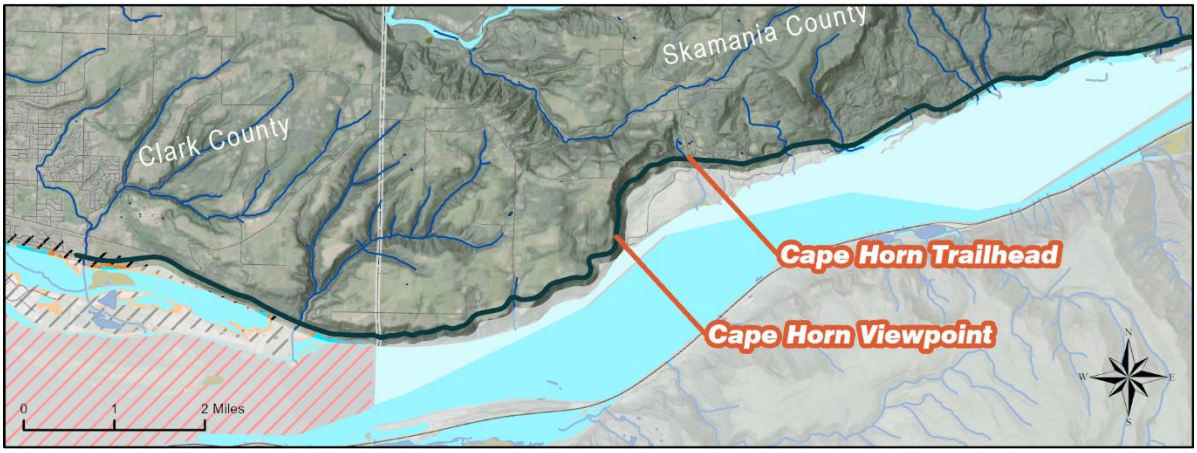
Figure 21. FEMA Floodplains and Floodways in the Study Area (1 of 2)

Legend

Flood Hazard
- 1% Annual Chance Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Regulatory Floodway
- Area with Reduced Risk Due to Levee

USGS NHD
- Stream/Creek (perennial)

Data Source(s): FEMA, USGS



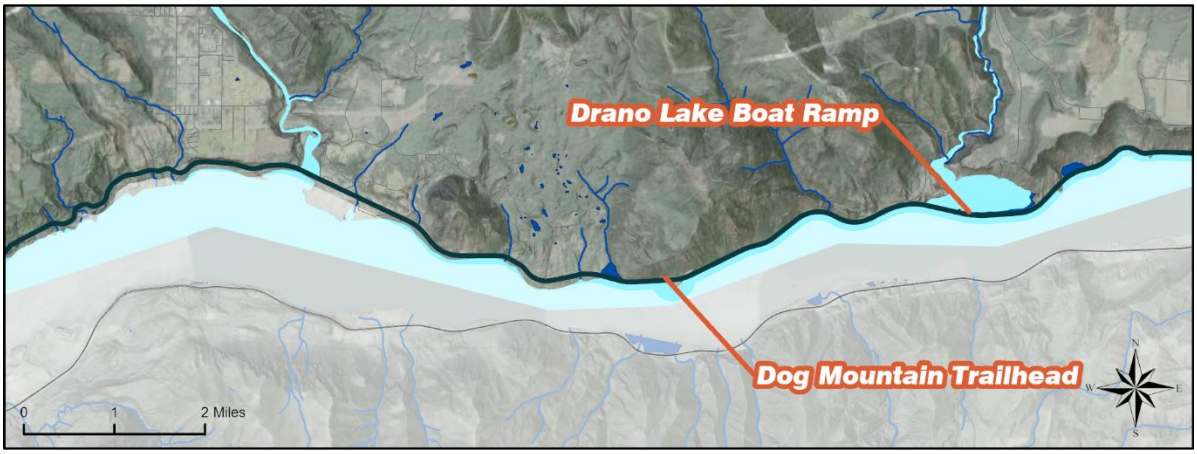


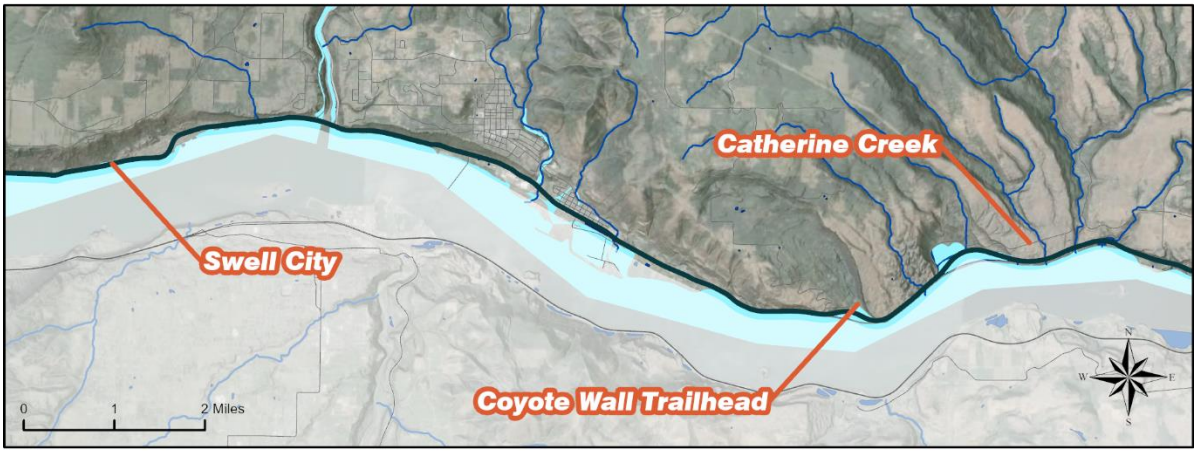
Figure 21. FEMA Floodplains and Floodways in the Study Area (2 of 2)

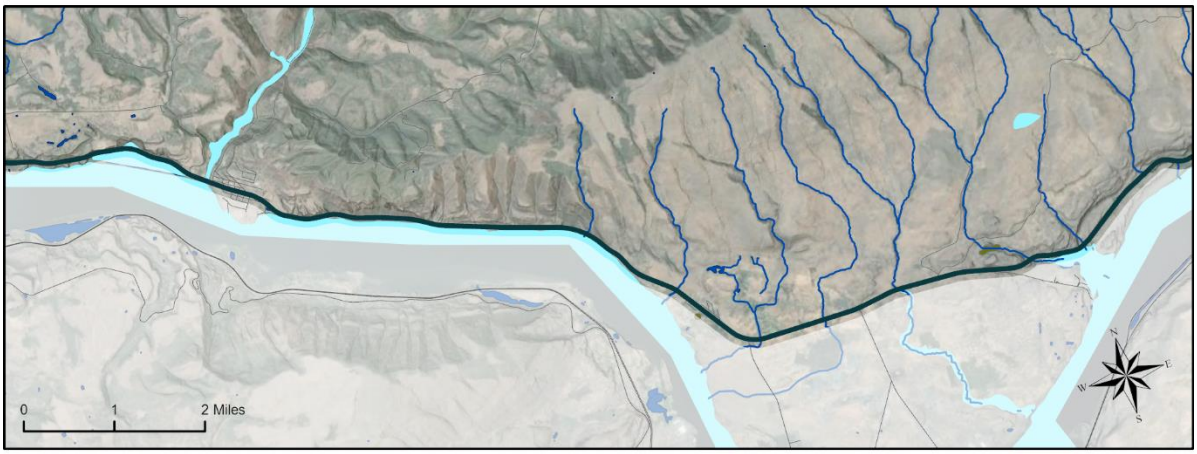
Legend

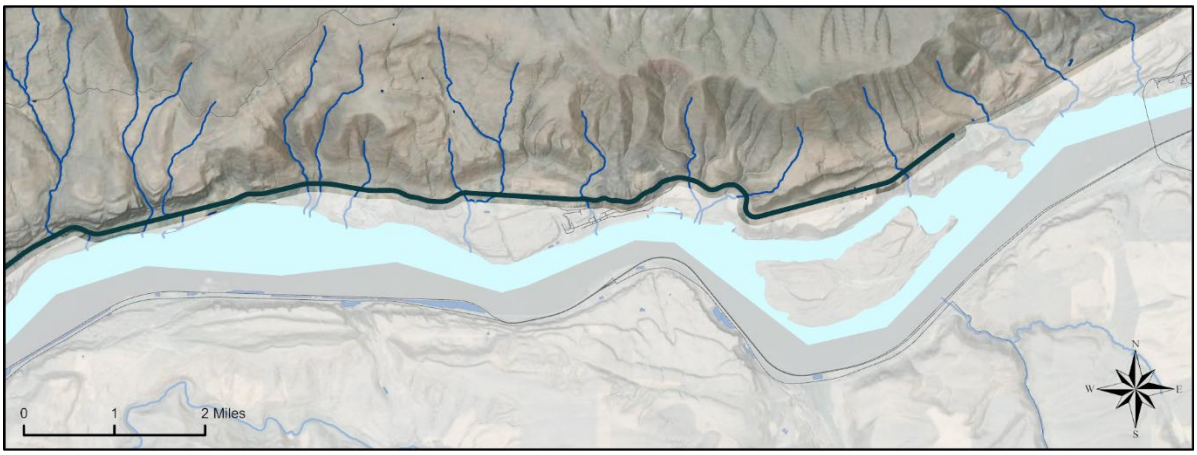
Flood Hazard
- 1% Annual Chance Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Regulatory Floodway
- Area with Reduced Risk Due to Levee

USGS NHD
- Stream/Creek (perennial)

Data Source(s): FEMA, USGS







BIOLOGICAL RESOURCES

VEGETATION (RARE PLANTS AND NATURAL AREAS)

Vegetated habitats along the extent of the study area are highly diverse, ranging from old growth coniferous forests at the western end of the study area to prairie and steppe at the eastern end of the study area. The varied landscape provides habitat for numerous species of rare plants, many of which are endemic to the CRGNSA. The CRGNSA Management Plan policies require new development to ensure that rare plants are not adversely affected.

Several ecologically and scientifically significant areas, designated in the CRGNSA Management Plan as Natural Areas, have been identified as outstanding examples of the diversity of the landscape and ecosystems throughout the CRGNSA. The CRGNSA Management Plan requires these areas to be protected from adverse effects.

Rare Plants

An initial assessment of rare plants potentially occurring within the study area was performed using the WDFW Priority Habitats and Species (PHS) web mapping tool (WDFW 2020) and the USFS Sensitive Species List for the CRGNSA (USFS, no date). This information was cross-checked with a GIS-based analysis using data provided by the Washington Natural Heritage Program (WNHP) detailing rare plants documented within or adjacent to the study area. Rare plants potentially occurring within the study area, along with their typical habitats, are listed below in Table 10. The CRGNSA Management Plan requires site plans to be prepared and reviewed by the appropriate state and federal government agencies for any proposed use within 1,000 feet of a rare plant site. For projects forwarded from this study, consultation with WDFW and USFS would be required to determine any potential impacts on rare plants and develop appropriate avoidance and mitigation strategies.

Table 10. Rare Plants Potentially Occurring in the Study Area

Species	Common Name	State Status	Habitat
Leptosiphon bolanderi	Baker's linanthus	S	Found in dry open areas in the eastern Columbia River Gorge.
Penstemon barrettiae	Barrett's beardtongue	T	Grows on rocky substrates of basaltic origin with little soil development, including crevices in basalt cliffs, ledges of rock outcrops, open talus, and occasionally well-drained roadsides. Occurs at elevations below 3,000 feet.
Montia diffusa	Branching montia	S	Found in upturned root disturbances within forested areas of the Cascade Mountains.
Leptogium burnetiae	Burnet's skin lichen	E	Found in mid-elevation moist western hemlock stands, old-growth Douglas-fir, moist Pacific silver fir or noble fir forests.
Rorippa columbiae	Columbia yellowcress	T	Grows in moist to wet, sandy habitat types at elevations from 700 feet to 6,100 feet.
Githopsis specularioides	Common bluecup	S	Grows in dry, open areas at lower elevations such as thin soils over bedrock outcrops, grassy balds, talus slopes, and gravelly prairies.

Species	Common Name	State Status	Habitat
Hackelia diffusa var. diffusa	Diffuse stickseed	T	Found in rocky places in sagebrush-steppe and ponderosa pine forests, on cliffs, and on talus slopes in the Columbia River Gorge.
Collinsia sparsiflora var. sparsiflora	Few-flower blue-eyed Mary	T	Found on low-elevation dry slopes with sparse vegetation on the east side of the Cascade Mountains.
Erigeron oreganus	Gorge daisy	T	Found in wet environments on basalt outcroppings and moist, shady basalt cliffs and ledges, often beneath overhangs or near waterfalls. Occurs at elevations between 50 feet and 1,700 feet.
Aphyllon californicum ssp. grayanum	Gray's broomrape	E	Parasitic flowering plant typically found in vernally inundated sites, which are favored by its host plant, the western mountain aster (*Symphyotrichum spathulatum*) later in the year.
Corispermum villosum	Hairy bugseed	S	Found on inland dunes or other sandy sites in the eastern Columbia River Gorge.
Packera bolanderi var. harfordii	Harford's ragwort	S	Found on coastal bluffs and beaches and moist woodlands west of the Cascade Mountains.
Navarretia tagetina	Marigold navarretia	T	Found in open, rocky areas, scablands, vernal pools, grasslands, and stony washes with standing water in spring, becoming dry in summer. Occurs at eastern end of Columbia River Gorge.
Isoetes nuttallii	Nuttall's quillwort	S	Found in seasonally wet ground, seepages, temporary streams, and mud near vernal pools at elevations of 200 feet to 345 feet.
Bolandra oregana	Oregon bolandra	T	Found in moist, wooded, rocky, low-elevation sites in deep shade, such as near streams or on basalt cliffs near waterfalls.
Eryngium petiolatum	Oregon coyote-thistle	T	Obligate wetland species of wet prairies, swales, shallow ditches, and low ground, especially in places submerged in spring and dry in summer.
Sullivantia oregana	Oregon sullivantia	E	Endemic to the western Columbia River Gorge. Found in dense, damp coniferous forest on moist basalt cliffs, seepy rock faces, and spray zones of waterfalls. Microsites remain wet to moist much of the year.
Lomatium tamanitchii	Ribseed biscuitroot	S	Found on open slopes and valleys, typically in clay-rich, volcanic ash-derived soils at low elevations. Occurs at the eastern end of the Columbia River Gorge. Endemic to Klickitat County.
Scribneria bolanderi	Scribner's grass	T	Found in dry, sandy to rocky soils, seepages, vernal pools, and sometimes along roadsides, at elevations from 1,640 feet to 9,800 feet.
Plectritis brachystemon	Shortspur seablush	S	Found on coastal bluffs, lowland prairies, and balds at low elevations.
Trillium albidum ssp. parviflorum	Small-flowered trillium	S	Found in moist lowland forests, oak-ash woodlands, and thickets in the western Columbia River Gorge.
Lomatium laevigatum	Smooth desert-parsley	T	Found on ledges and crevices of basalt cliffs along the Columbia River and adjacent rocky slopes of sagebrush steppe. Adapted to dry, rocky habitats, where it faces a minimal amount of competition.

Species	Common Name	State Status	Habitat
Actaea elata var. elata	Tall bugbane	S	Found in moist, shady, low elevation forested habitat characterized by Douglas-fir, bigleaf maple (*Acer macrophyllum*), western redcedar (*Thuja plicata*), and red alder (*Alnus rubra*).
Cirsium remotifolium var. remotifolium	Weak thistle	S	Found in meadows, along stream banks, in open forest, and on brushy slopes, in low to mid-elevation areas.
Spiranthes porrifolia	Western ladies'-tresses	S	Found in wet meadows, bogs, streams, and seepage slopes at elevations of 10 feet to 6,800 feet.
Meconella oregana	White meconella	E	Found primarily in open grassland; sometimes within a mosaic of forest and grassland on gradual to almost 100% slopes. Habitats are wet to moist in spring, but dry by early summer.
Penstemon wilcoxii	Wilcox's beardtongue	T	Grows in a range of habitats, including shrubby areas, forested slopes, moist soil, and open rocky sites.
Leymus flavescens	Yellow wildrye	S	Found on coarse textured soils, primarily in the Columbia Plateau. May occur in sand dune ecosystems in the eastern Columbia River Gorge.

E = Endangered
T = Threatened
S = Sensitive

Sources: WNHP 2020; WDFW 2020; USFS, no date; Camp and Gamon 2011.

Natural Areas

In the CRGNSA there are 45 designated Natural Areas, which are ecologically and scientifically significant areas that are representative of the diverse native ecosystems of the Columbia River Gorge. There are 21 Natural Areas located on the Washington side of the CRGNSA. Several of these are located partially within or adjacent to the study area, as shown in Table 11. Figure 22 identifies the Natural Areas that are located within the study area. The CRGNSA Management Plan stipulates that Natural Areas must be protected from adverse effects. Uses that would adversely affect native plant communities and rare plants are prohibited in Natural Areas. Projects forwarded from this study would need to address any potential impacts on Natural Areas, including consultation with WDFW and USFS biologists.

Table 11. Natural Areas Within or Adjacent to the Study Area

Natural Area	Acres	Vegetation/Terrain	Within/Adjacent to Study Area
Beacon Rock State Park	35	Douglas-fir/red alder forest with open areas; rare plants	Yes
Burdoin Mountain	60	Old-growth Douglas-fir with scattered ponderosa pine	No
Cape Horn	55	Topographic bench, basalt cliffs and slopes; rare plants	Yes
Columbia Falls	765	Basalt cliffs, valleys and ridges with 120-foot to 175-foot waterfalls; old-growth Douglas-fir, grand fir, and red cedar; rare plants	No
Columbia Hills	2,600	Ridge with moist draws, bunch grass prairies, scablands; rare plants	No
Columbia Tunnels	15	High-quality oak woodland with native grasses	Yes
Dog Mountain	2,700	East-west transition; fir and hemlock, oak, and ponderosa pine forests, with talus slopes and grasslands	Yes

Natural Area	Acres	Vegetation/Terrain	Within/Adjacent to Study Area
East Fork of Major Creek	640	Intact, original forest in eastern Columbia River Gorge; Douglas-fir, ponderosa pine, grand fir, scattered old-growth trees	No
Hamilton Creek	1,280	Old-growth patches of Douglas-fir and riparian communities	No
Horsethief Ponds	280	Mound/swale topography with ponds; rare plants	No
Little Wind River	1,150	Drainage basin, including riparian areas and steep slopes; Douglas-fir and western hemlock forest with old growth stands and rare plants	No
Lower Klickitat River Canyon	145	Oak woodland with native grasses; rare plants	No
Lower Major and Catherine Creeks	3,000	Oregon white oak/ponderosa pine forests, with grassland and riparian areas; rare plants	Yes
Miller Island	130	Sand dunes and basalt cliffs; rare plants	No
Mosley Lakes	110	Wetlands	No
Pierce Island	200	One of the least-disturbed Columbia River islands; cottonwood-Oregon ash and shoreline plant communities; rare plants	No
Prindle Mountain	130	Douglas-fir forests, meadows; rare plants	No
Table Mountain/ Greenleaf Basin	2,300	Bluffs, meadows, wetlands, old-growth forest; rare plants	No
Underwood Mountain	120	Douglas-fir forest with rare plants	No
West Fork of Sasquatch Creek	430	Remnant old-growth stand of Douglas-fir; rare plants	No
Wind Mountain	290	Intact, original Douglas-fir and Oregon white oak forests	Yes

Sources: CRGC and USFS 2016; WNHP 2020.

FISH AND WILDLIFE (PRIORITY HABITATS AND SENSITIVE WILDLIFE SITES)

The CRGNSA Management Plan emphasizes wildlife habitat protection by requiring projects to ensure that new uses do not adversely affect Priority Habitats or sensitive wildlife sites. Priority Habitats are important for providing nesting, roosting, denning, foraging, and other life cycle needs for wildlife species in the CRGNSA. In many cases, they are vulnerable to alteration or limited in availability on the landscape. Sensitive wildlife sites are identified by wildlife management agencies on a site-specific basis, based on their known use by sensitive wildlife species. In addition to avoiding adverse impacts to these resources, proposed projects are directed by the CRGNSA Management Plan to enhance wildlife habitat that has been altered or destroyed by past uses.

Priority Habitats

USFS and state wildlife agencies identify Priority Habitats in the CRGNSA as part of State Wildlife Action Plan efforts and revise them from time to time. Table 12 lists Priority Habitats in the CRGNSA and whether they are present within or adjacent to the study area, along with the respective defining characteristics of each. Figure 22 shows the location of mapped priority habitats within the study area. Some priority habitat types, for example, snags and logs and old growth forest, are not specifically mapped, because these habitat types could be present in many of the forested areas adjoining the study area and would require more detailed field verification to reliably identify. Projects forwarded from this study would be required to identify any Priority Habitats within the project vicinity via field survey and maintain adequate buffer

zones in order to protect them. Any proposed development within 1,000 feet of a Priority Habitat would need to be evaluated for adverse effects in coordination with WDFW and USFS, as applicable.

Table 12. Priority Habitats in the CRGNSA

Priority Habitat	Criteria	Within/Adjacent to Study Area
Aspen stands	High fish and wildlife species diversity, limited availability, high vulnerability to habitat alteration.	No
Caves	Significant wildlife breeding habitat, limited availability, dependent species.	No
Old-growth forest	High fish and wildlife density, species diversity, breeding habitat, seasonal ranges, and limited and declining availability, high vulnerability.	Yes
Oregon white oak woodlands	Comparatively high fish and wildlife density, species diversity, declining availability, high vulnerability.	Yes
Prairies and steppe	Comparatively high fish and wildlife density, species diversity, important breeding habitat, declining and limited availability, high vulnerability.	No
Riparian	High fish and wildlife density, species diversity, breeding habitat, movement corridor, high vulnerability, dependent species.	Yes
Wetlands	High species density, high species diversity, important breeding habitat and seasonal ranges, limited availability, high vulnerability.	Yes
Snags and logs	High fish and wildlife density, species diversity, limited availability, high vulnerability, dependent species.	Yes
Talus	Limited availability, unique and dependent species, high vulnerability.	Yes
Cliffs	Significant breeding habitat, limited availability, dependent species.	Yes
Dunes	Unique species habitat, limited availability, high vulnerability, dependent species.	Yes
Winter range	Provides important deer and elk wintering habitat.	Yes

Sources: CRGC and USFS 2020

Sensitive Wildlife Sites

The generic term “sensitive wildlife sites” is used in the CRGNSA Management Plan to refer to sites that are used by species that are: (1) listed as endangered or threatened pursuant to federal or state endangered species acts, (2) listed as endangered, threatened, sensitive, or candidate by the Washington Wildlife Commission, (3) listed as sensitive by the Oregon Fish and Wildlife Commission, or (4) considered to be of special interest to the public (limited to great blue heron, osprey, golden eagle, and prairie falcon) (CRGC and USFS 2016; CRGC and USFS 2020). The CRGNSA Management Plan requires site-specific plans for development proposed near sensitive wildlife sites. Buffer zones must be established, which are determined on a case-by-case basis depending on the biology of the affected species, the characteristics of the project site, and the proposed use. If proposed new development could alter habitat, resource rehabilitation and mitigation are required to reduce and offset effects. For projects forwarded as a result of this study, consultation with WDFW would be required to determine whether a proposed project is located within 1,000 feet of a sensitive wildlife site.

Figure 22. Natural Areas and Priority Habitats in the Study Area (1 of 2)

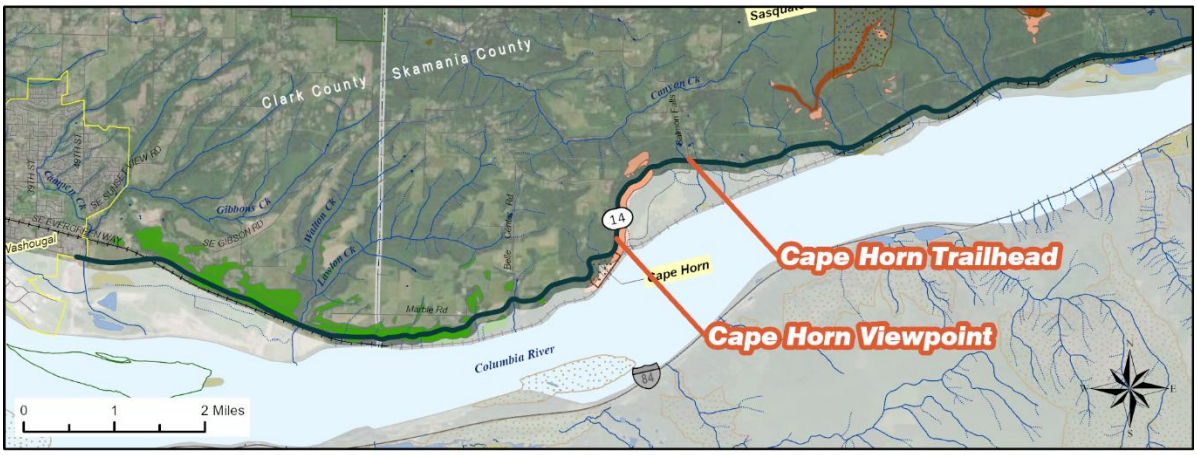
Legend

Priority Habitat

- Black-tailed Deer Winter Range
- Oak Woodland
- Sand Dunes
- Talus Slopes
- Cliffs/Bluffs

Natural Areas

Data Source(s): WDFW PHS, Columbia River Gorge Commission



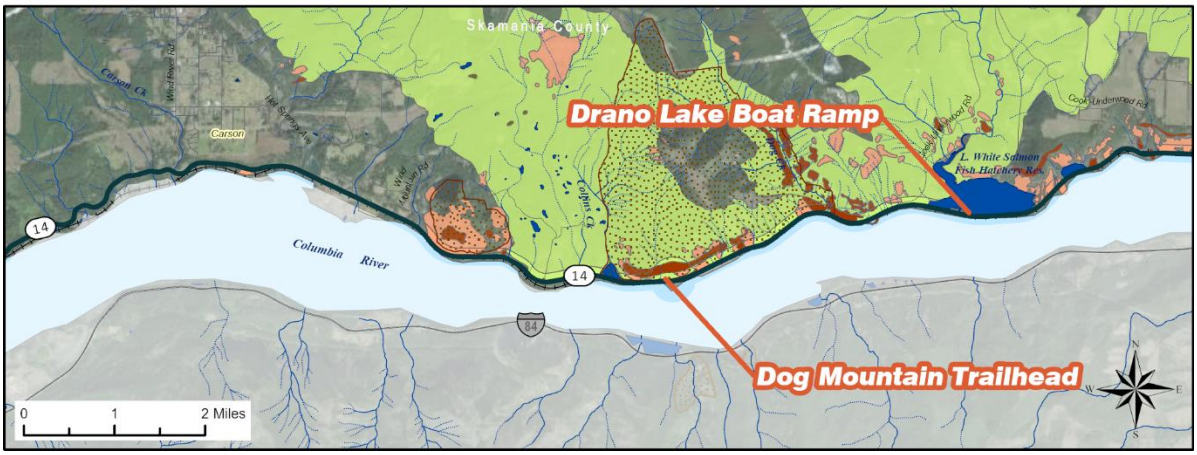


Figure 22. Natural Areas and Priority Habitats in Study Area (2 of 2)

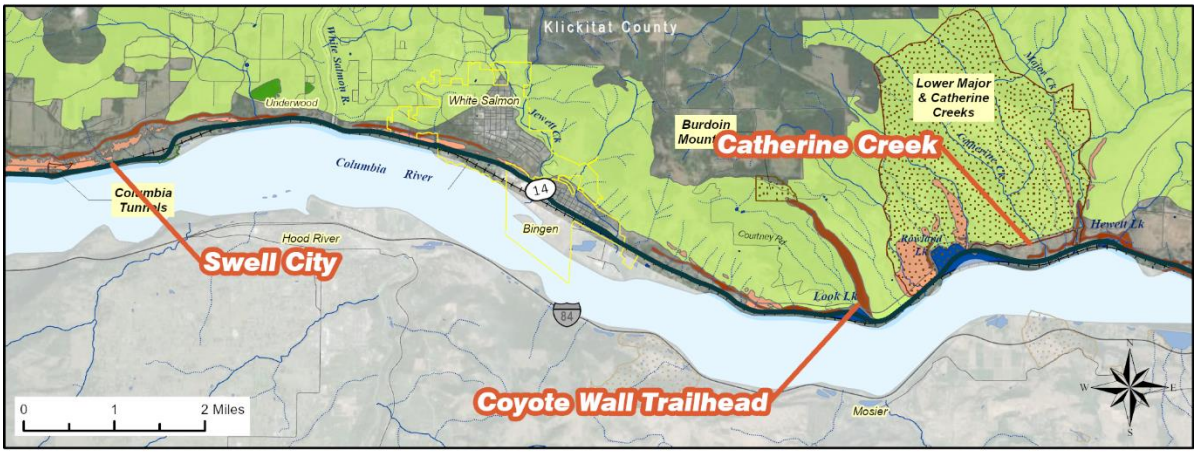
Legend

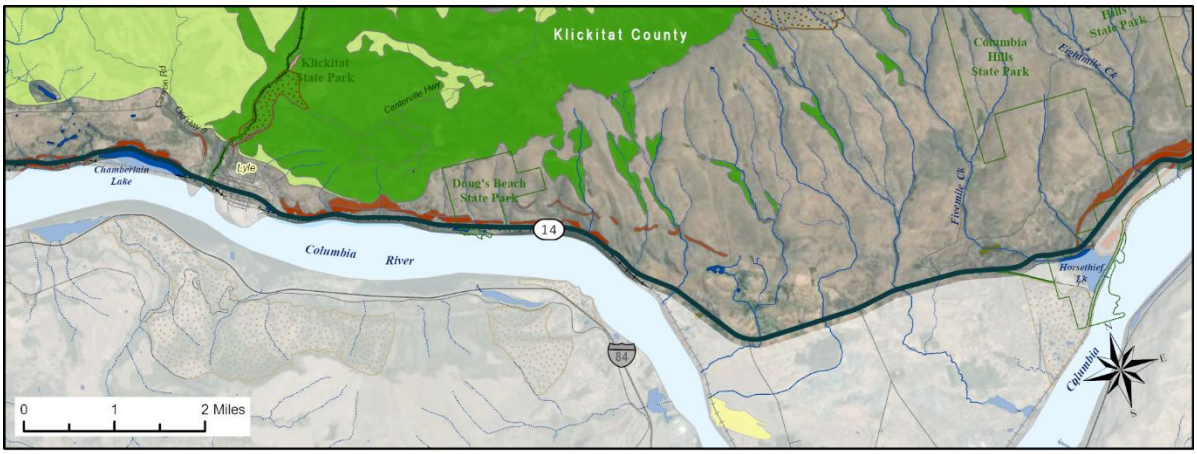
Priority Habitat

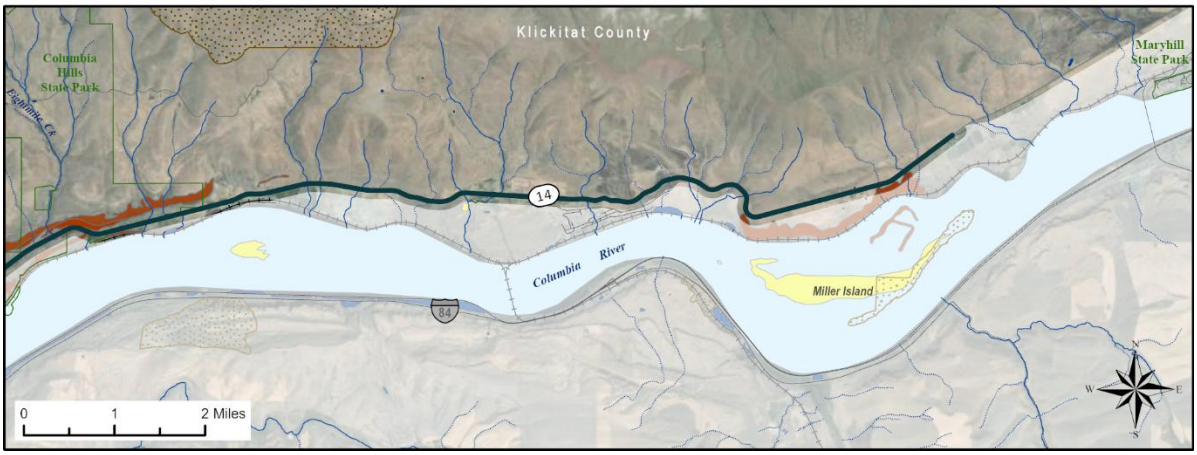
- Black-tailed Deer Winter Range
- Oak Woodland
- Sand Dunes
- Talus Slopes
- Cliffs/Bluffs

Natural Areas

Data Source(s): WDFW PHS, Columbia River Gorge Commission







THREATENED AND ENDANGERED SPECIES

A query of federally listed threatened, endangered and sensitive species and their habitats regulated by the USFWS was conducted using the USFWS Information for Planning and Consultation (IPaC) database (USFWS 2020b). The results of the IPaC query includes species protected under the federal Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA), and the Bald and Golden Eagle Protection Act (BGEPA). The IPaC system also identifies Critical Habitat, if present. The IPaC query was supplemented with desktop research using the USFWS Critical Habitat for Threatened and Endangered Species online GIS tool (USFWS 2020c). Species identified by the IPaC database have the potential to occur in the area; however, their presence is dependent on many factors, such as suitable habitat. Therefore, the IPaC query results were cross-checked with the USFS sensitive species list for the CRGNSA to determine which species have the potential to be present in the study area (USFS, no date).

To determine fish species distribution and the potential presence of any federally protected anadromous fish species and/or habitat regulated by NMFS within the study area vicinity, a query was conducted using the StreamNet fish data mapper (StreamNet Mapper 2020) and the NMFS Protected Resources App online GIS viewer (NMFS 2020). Table 13 shows the federally listed threatened, endangered, and sensitive species identified as potentially occurring in or near the study area.

Table 13. Federally Listed Threatened and Endangered Species Potentially Occurring in the Study Area

Species	Common Name	Federal Status	USFWS	NMFS	Critical Habitat	Likelihood of Occurrence
Birds						
Strix occidentalis caurina	Northern spotted owl	LT	•		Yes	Generally found in closed-canopy mature to old-growth forests (USFWS 2020d). Potentially present.
Fish						
Salvelinus confluentus	bull trout	LT	•		Yes	Assumed present.
Oncorhynchus kisutch	Coho salmon, Lower Columbia River Evolutionary Significant Unit (ESU)	LT		•	Yes	Assumed present.
Oncorhynchus keta	Chum salmon, Columbia River ESU	LT		•	Yes	Assumed present.
Oncorhynchus tshawytscha	Chinook salmon, Lower Columbia River ESU	LT		•	Yes	Assumed present.
Oncorhynchus tshawytscha	Chinook salmon, Upper Columbia River spring-run ESU	LE		•	Yes	Assumed present in Columbia River.

Species	Common Name	Federal Status	USFWS	NMFS	Critical Habitat	Likelihood of Occurrence
Oncorhynchus tshawytscha	Chinook salmon, Snake River fall-run ESU	LE		•	Yes	Assumed present in Columbia River.
Oncorhynchus nerka	Sockeye salmon, Snake River ESU	LE		•	Yes	Assumed present in Columbia River.
Oncorhynchus mykiss	Steelhead, Lower Columbia River Distinct Population Segment (DPS)	LT		•	Yes	Assumed present west of White Salmon River.
Oncorhynchus mykiss	Steelhead, Middle Columbia River DPS	LT		•	Yes	Assumed present in Columbia and White Salmon rivers.
Oncorhynchus mykiss	Steelhead, Upper Columbia River DPS	LT		•	Yes	Assumed present in Columbia River.
Oncorhynchus mykiss	Steelhead, Snake River Basin DPS	LT		•	Yes	Assumed present in Columbia River.
Thaleichthys pacificus	Eulachon	LT		•	Yes	Potentially present in Columbia River below Bonneville Dam.

LE = Listed Endangered
LT = Listed Threatened

Sources: USFWS 2020a; USFWS 2020b; NMFS 2020; StreamNet Mapper 2020.

Designated critical habitat for six federally listed species regulated by NMFS, including six Evolutionary Significant Units (ESUs) of listed salmon and four Distinct Population Segments (DPSs) of listed steelhead, is located within or adjacent to the study area throughout its extent (NMFS 2020). Designated critical habitat for USFWS-regulated, federally threatened bull trout is located in the Columbia, White Salmon, and Klickitat Rivers (USFWS 2020b). Designated critical habitat for USFWS-regulated federally threatened northern spotted owl is present in the western portion of the study area and is concentrated in the portion of the study area between Beacon Rock State Park and the Dog Mountain Trailhead (USFWS 2020b). See Figure 23 for the location of critical habitat for ESA listed species in the vicinity of the study area.

To determine potential direct impacts to ESA-listed fish species from projects forwarded under this study, it will be necessary to review the species potentially present within a given stream and describe on-site conditions for any in-stream construction work. For projects that would not have potential direct impacts to stream habitat but could generate additional stormwater runoff, potential impacts from stormwater runoff would need to be evaluated in coordination with WDFW. Projects that could have impacts in or adjacent to forested habitat would need to ensure that terrestrial fieldwork is conducted to determine the presence of suitable northern spotted owl habitat in order to satisfy ESA compliance requirements.

Direct impacts to listed fish species and their critical habitat in the Columbia River would not be expected as a result of projects forwarded from this study. However, potential impacts from stormwater runoff from the study area would need to be evaluated on a project-by-project basis in coordination with WDFW.

OTHER SPECIES OF CONCERN

In addition to the species listed under the federal ESA that are referenced in the section above, proposed projects and management activities in the CRGNSA must consider several other species that are protected by state or federal law or by agency management policy. These include species identified as sensitive by USFS and WDFW, what are called USFS Survey and Manage species (on National Forest lands only), and species protected under the BGEPA and MBTA.

USFS and WDFW Sensitive Wildlife Species

USFS maintains a list of sensitive species that is specific to National Forest lands within the CRGNSA. The list includes federally listed species (including but not limited to those listed in Table 13 above) as well as USFS Region 6 sensitive species with potential to occur on National Forest lands within the CRNGSA (see Table 14 below).

Because of direction included in the CRGNSA Management Plan, USFS is also required to manage for WDFW sensitive wildlife species on National Forest lands. These include some additional sensitive species identified by WDFW that are not already included on the USFS Sensitive Species List. Projects must consider potential impacts to WDFW sensitive species irrespective of whether a project is located on National Forest land. However, USFS sensitive species that are not otherwise considered sensitive by WDFW must be considered when only projects are proposed on National Forest land.

A GIS-based query of WNHP PHS data was used to identify species included on the USFS and/or WDFW sensitive species lists for the CRGNSA that have been documented within or adjacent to the study area (WNHP 2020). These species could have potential to be affected by projects forwarded from this study. Sensitive species that could potentially occur within the study area are detailed in Table 14 below. Projects forwarded from this study that are proposed to take place on National Forest lands would require consultation with USFS and WDFW to identify and address potential impacts to these species and possibly others, in addition to any necessary impact avoidance and/or mitigation actions. In portions of the study area that are not located on National Forest lands, development activities would still need to consider potential impacts to species included on the WDFW sensitive species list as well as the federally listed species detailed in Table 13 above.

Table 14. Sensitive Species Potentially Occurring within the Study Area

Species	Common Name	Federal Status	State Status	USFS Sensitive	Habitat
Birds					
	American white pelican		T	Yes	Nests in large colonies on islands within shallow water and marshes free of human disturbance and mammalian predators. Post-breeders sometimes seen in the Columbia River (Klickitat Delta, below The Dalles Dam).
Pelecanus erythrorhynchos	Bald eagle	SOC		Yes	Found near shoreline (generally within 1 mile of large water bodies) with large trees and prey base of primarily fish. Diet also includes some waterfowl, turtles, and carrion.

Species	Common Name	Federal Status	State Status	USFS Sensitive	Habitat
Haliaeetus leucocephalus	Great blue heron		Monitored		Found in a variety of wetland habitats including marshes, flooded meadows, lake edges, or shorelines. Breeds within the study area.
Ardea Herodias	Golden eagle		C	Yes	Uses a variety of habitats in open country/forests; often nests on steep cliffs or large trees.
Aquila chrysaetos	Lewis' woodpecker		C	Yes	Found in open pine/oak woodland, conifer forests, and riparian woodland in eastern portions of the CRGNSA. Regionally displays seasonal migration to lower elevations during non-breeding season, although in the CRGNSA, it is often resident year-round in same location. Nests in cavities of trees and snags.
Melanerpes Lewis	Purple martin		C	Yes	Found in the western portion of the study area eastward to Bingen. Nests in cavities and crevices, often near water. Forages over open water/fields/ forest canopy.
Progne subis	Western grebe		C	Yes	Found in open lakes and marshes with rushes and tules. Winters in coastal estuaries/bays.
Aechmophorus occidentalis					
Lampetra tridentata	Pacific lamprey	SOC		Yes	Anadromous. Documented in the Columbia River. Information on current distribution and abundance is developing.
Reptiles and Amphibians					
Actinemys marmorata	Western pond turtle	SOC	E	Yes	Found near streams, large rivers, slow sloughs, and quiet waters with nesting habitat (open meadow) within ½ mile. Occurs at elevations below 3,000 feet.
Plethodon larselli	Larch Mountain salamander		S	Yes	Largely found in moss-covered talus slopes or other rocky substrate, at low to middle elevations.
Anaxyrus boreas	Western toad		C	Yes	Most common near marshes and small lakes (breeding sites in midspring); can travel readily overland and be found along streams/seeps. Known to occur near White Salmon, Major, and Catherine creeks.

Species	Common Name	Federal Status	State Status	USFS Sensitive	Habitat
Contia tenuis	Sharp-tailed snake		C	Yes	Found on rocky slopes, often in open pine/oak woodland with prey species of small slugs present. Often in moist riparian area east of the Cascade Mountains.
Sceloporus graciosus	Sagebrush lizard		C	Yes	Found on eastern end of Columbia River Gorge. Associated with sagebrush, but also conifer habitats.
Mammals					
Sciurus griseus	Western gray squirrel	SOC	T	Yes	Associated with open mixed oak/conifer woodland, typically within ½ mile of water source. The CRGNSA is in the northernmost portion of its range, with core habitat in Klickitat County.
E = Endangered T = Threatened S = Sensitive	C = Candidate SOC = Species of Concern				

Sources: USFS, no date; WNHP 2020.

USFS Northwest Forest Plan Survey and Manage Species

In addition to the sensitive species list discussed above, the USFS maintains a list of "Survey and Manage" species identified by the Northwest Forest Plan. These species include rare and little-known species thought to be associated with late-successional and old growth forests. The Northwest Forest Plan prescribes a set of management standards and guidelines requiring surveys before initiating management actions and limits the actions that can be taken if these species found. These species are applicable only on National Forest lands where old growth or late-successional forest conditions exist. Therefore, the areas where these species are most likely to require consideration would be in the vicinity of Dog Mountain, if relocation of the trailhead and parking lot were to result in tree removal and ground disturbance in areas that may exhibit old growth forest characteristics. Some terrestrial mollusk species could potentially be present in leaf litter in other forested areas adjacent to the roadway corridor (Carré 2020, pers. comm.). For projects on National Forest land that are forwarded from this study, consultation with USFS is recommended to determine whether Survey and Manage species could apply.

Migratory Bird Protection Act/Bald and Golden Eagle Protection Act

The bald eagle and golden eagle are protected under the BGEPA, which prohibits the taking or possession of, or commerce in, bald and golden eagles, with very limited exceptions. Migratory bird species are protected under the MBTA, which prohibits the destruction, or take, of migratory birds or their active nests. USFWS can issue a take permit for a project, but early coordination with USFWS is recommended to avoid take. Any projects forwarded because of this study would need to comply with the MBTA and the BGEPA.

If projects have the potential to take place during the nesting season for bald or golden eagles, an eagle nest survey may need to be conducted for compliance with the BGEPA. If nests are present, coordination with USFWS would be necessary to determine appropriate measures to avoid disturbing nesting eagles.

If proposed project construction cannot take place outside of the nesting season for migratory bird species, nesting bird surveys would be required before any removal of vegetation (tree or shrub) to comply with the MBTA. If nests are present, the MBTA allows nest removal if eggs or young are not yet present. If active nests are located during construction and cannot be avoided, construction activities in the area must stop until young have fledged from the nest.

Figure 23. ESA Critical Habitat in the Vicinity of the Study Area (1 of 2)

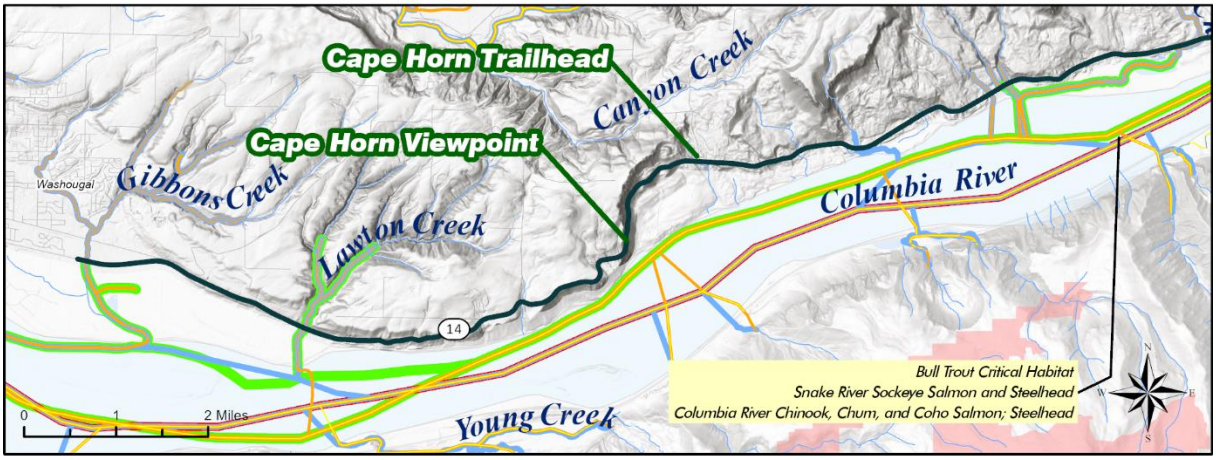
Legend

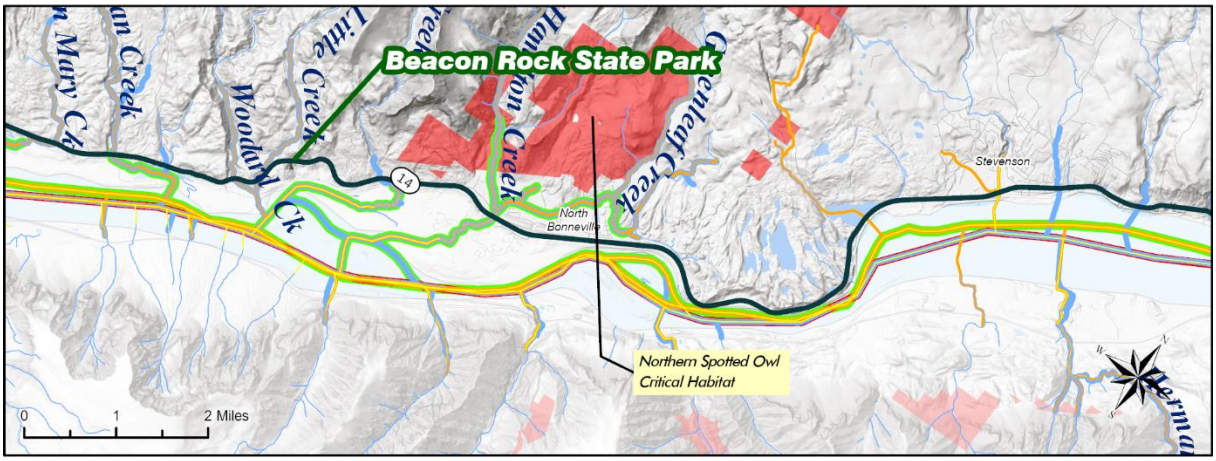
Critical Habitat

- Chinook Salmon
- Steelhead
- Coho Salmon
- Bull Trout
- Chum Salmon
- Northern Spotted Owl

Sockeye salmon and eulachon critical habitat extent (not shown) is limited to the Columbia River below the Bonneville Dam.

Data Source(s): WDFW PHS, Columbia River Gorge Commission





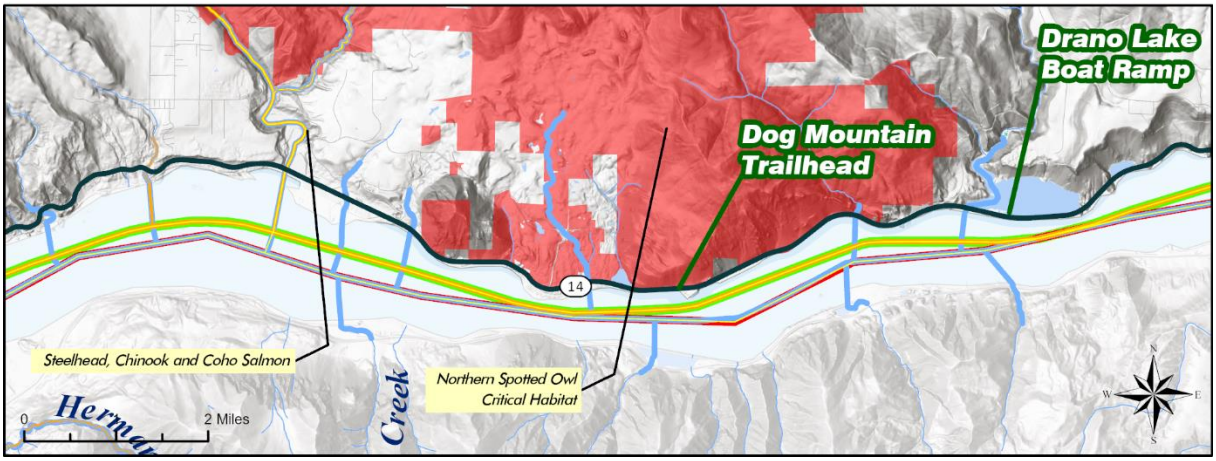
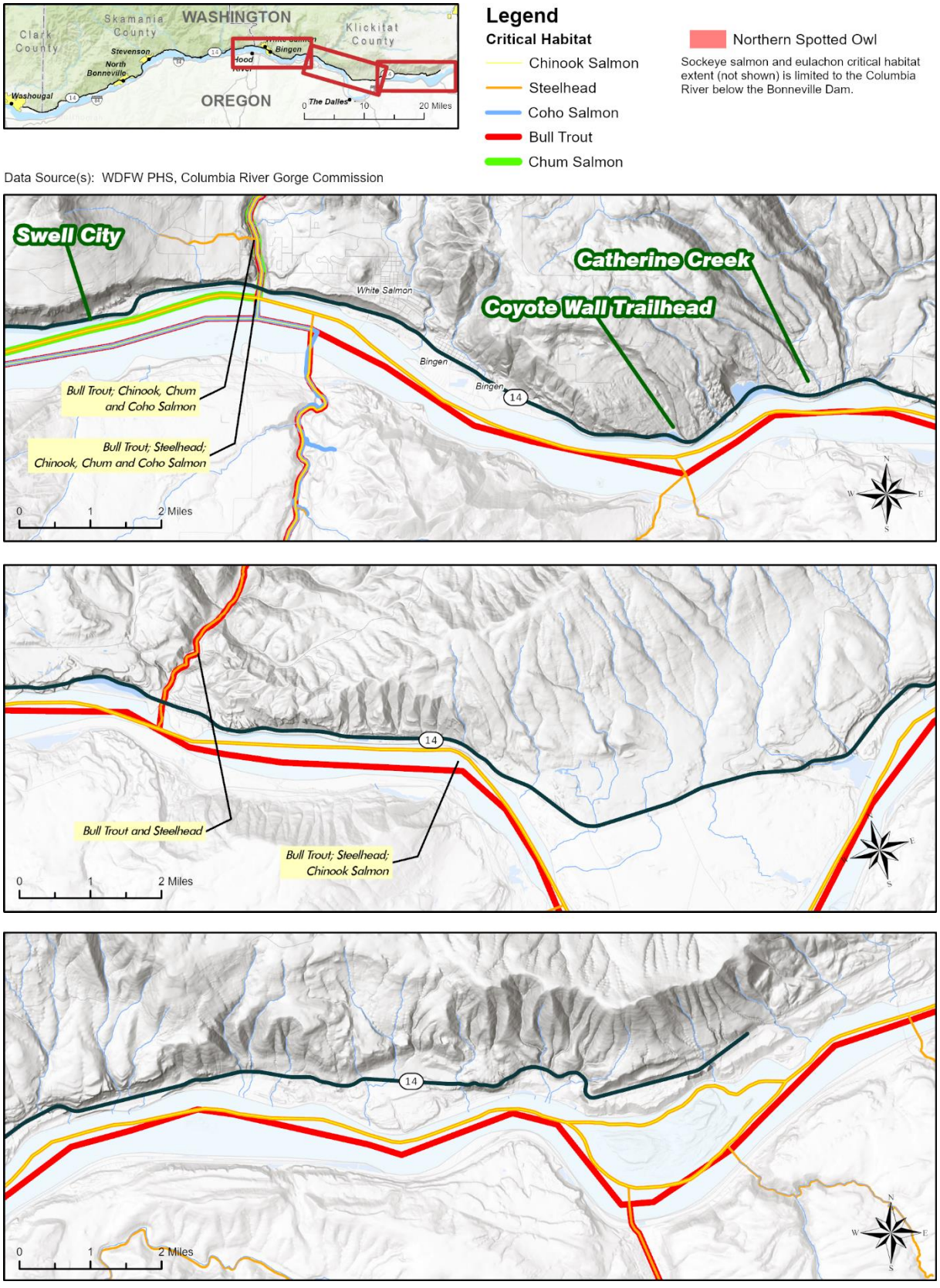


Figure 23. ESA Critical Habitat in the Vicinity of the Study Area (2 of 2)



SOCIAL AND CULTURAL RESOURCES

DEMOGRAPHIC AND ECONOMIC CONDITIONS

Racial and ethnic diversity varies throughout the study area. Table 15 through Table 17 summarize the racial/ethnic and economic characteristics of multiple cities and the three counties in the study area compared to those characteristics in the state.

The racial diversity and ethnic diversity in Clark, Skamania, and Klickitat counties are lower than the statewide levels, although the cities of Bingen and Lyle have higher racial and ethnic diversity than statewide; those cities have Hispanic or Latino populations of 43 percent and 36 percent, respectively, as shown in Table 17. Table 15 shows that Clark County has a median household income that is slightly higher than the Statewide median and has a lower poverty rate, likely due to the concentration of people living in Vancouver and surrounding cities of Clark County, who have higher incomes than the state median.

The cities of North Bonneville, Stevenson, and Carson all have similar racial and ethnic characteristics as Skamania County as a whole; the percentages of racially and ethnically diverse populations in Skamania County are still lower than state levels, as shown in Table 16. North Bonneville has a much lower poverty level, and Stevenson and Carson have slightly higher poverty levels than the state. The median household income levels of the three cities and the county are lower than the state median household income, likely due to the rural nature of Skamania County, which offers fewer economic opportunities than Washington's larger cities. Both the cities of Stevenson and Carson have higher poverty levels than Skamania County and the state.

Of the five cities within Klickitat County listed in Table 17, Dallesport is the only one that has lower racial/ethnic diversity levels than Klickitat County as a whole. The city of Wishram has a Native American population of 15 percent, which is significantly higher than Klickitat County and state levels because of the presence of the Wishram Tribe, which is part of the Confederated Tribes of Warm Springs. The cities of Lyle, Dallesport, and Wishram have poverty levels significantly higher than those of Klickitat County or the state, at 39 percent, 29 percent, and 27 percent, respectively, in comparison to 16 percent countywide and 10 percent statewide. Median household incomes are lower in all listed cities than they are in Klickitat County or the state. Wishram has the lowest median household income, at $31,250.

Table 15. Demographic and Economic Data near Study Area - Clark County

		Clark County	Washington State
Population (2019)		**488,241**	**7,614,893**
Racial/Ethnic Characteristics	White (not Hispanic or Latino)	77%	67%
	Hispanic or Latino	10%	13%
	Black or African American	2%	4%
	Native American	1%	1%
	Asian	4%	9%
	Islander	1%	1%
	Two or more races	4%	5%
Economic Characteristics	Median household income, 2019	$80,555	$78,687
	Persons below poverty level	9.2%	9.8%

Source: Census Reporter, 2021. Summary of US Census – American Community Survey. Censusreporter.org.

Table 16. Demographic and Economic Data near Study Area - Skamania County

		North Bonneville	Stevenson	Carson	Skamania County	Washington State
Population (2019)		**1,126**	**1,530**	**2,830**	**11,753**	**7,614,893**
Racial/Ethnic Characteristics	White (not Hispanic or Latino)	89%	91%	83%	88%	67%
	Hispanic or Latino	7%	7%	11%	6%	13%
	Black or African American	0%	0%	0%	0%	4%
	Native American	0%	1%	4%	2%	1%
	Asian	1%	1%	2%	1%	9%
	Islander	1%	0%	0%	0%	1%
	Two or more races	2%	1%	0%	2%	5%
Economic Characteristics	Median household income, 2019	$64,952	$57,500	$55,819	$65,181	$78,687
	Persons below poverty level	3.7%	15.7%	20.7%	12.8%	9.8%

Source: Census Reporter, 2021. Summary of US Census – American Community Survey. Censusreporter.org.

Table 17. Demographic and Economic Data near Study Area - Klickitat County

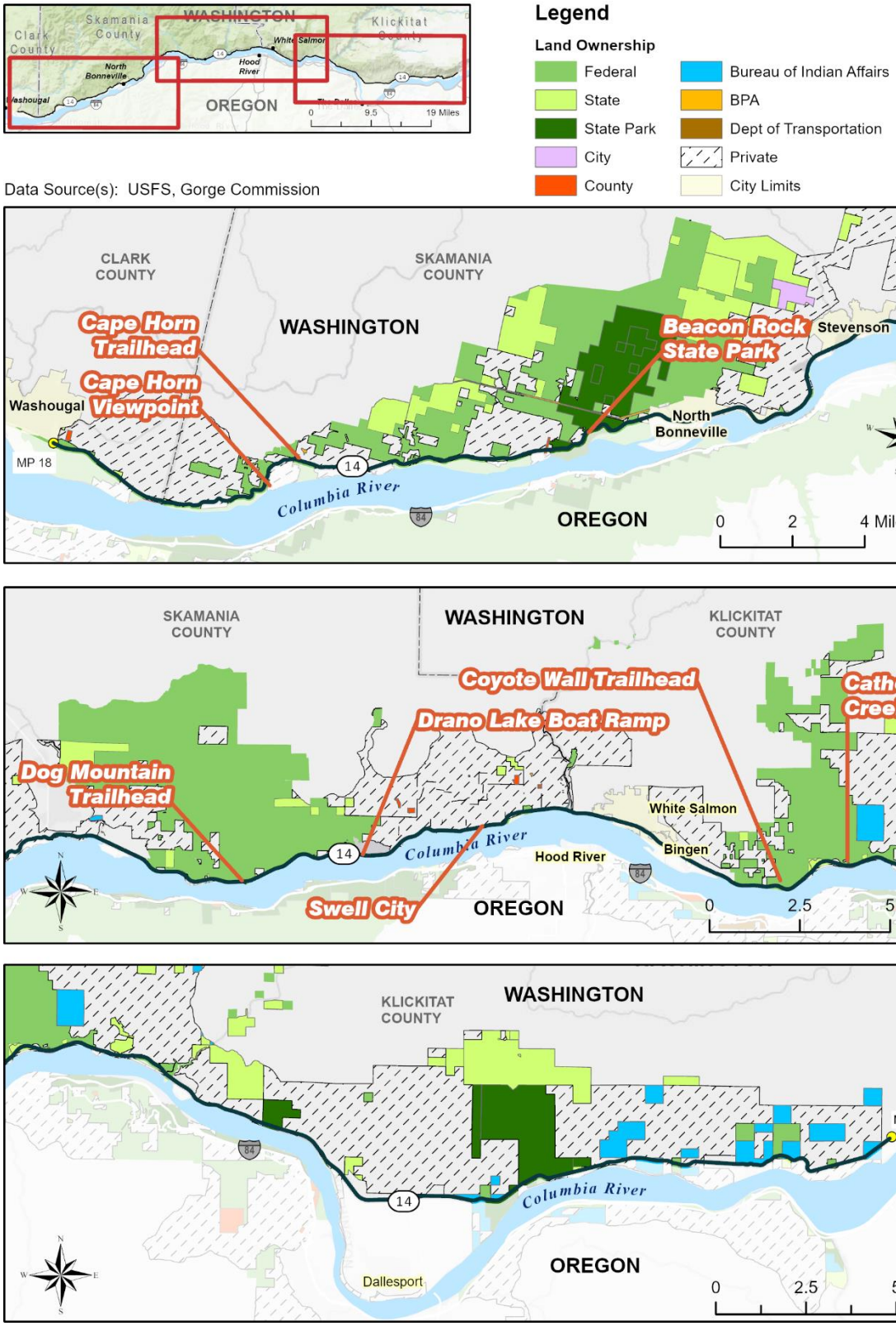
		White Salmon	Bingen	Lyle	Dallesport	Wishram	Klickitat County	Washington State
Population (2019)		**2,554**	**644**	**464**	**1,515**	**529**	**21,721**	**7,614,893**
Racial/Ethnic Characteristics	White (not Hispanic or Latino)	77%	56%	64%	92%	82%	82%	67%
	Hispanic or Latino	20%	43%	36%	0%	2%	12%	13%
	Black or African American	0%	0%	0%	0%	0%	1%	4%
	Native American	0%	0%	0%	0%	15%	2%	1%
	Asian	0%	1%	0%	2%	0%	1%	9%
	Islander	0%	0%	0%	0%	0%	0%	1%
	Two or more races	3%	0%	0%	6%	1%	2%	5%
Economic Characteristics	Median household income, 2019	$55,652	$54,327	$42,143	$54,609	$31,250	$55,773	$78,687
	Persons below poverty level	6.7%	13.4%	39%	28.7%	26.5%	15.6%	9.8%

Source: Census Reporter, 2021. Summary of US Census – American Community Survey. Censusreporter.org.

LAND OWNERSHIP

Lands adjacent to the study area are owned primarily by either USFS or private parties. Other owners include other federal agencies, Washington State Parks, and the State of Washington. There are small pockets of land owned by counties, but the total area of county-owned is minor in comparison to the other ownership. Figure 24 shows land ownership near the study area.

Figure 24. Land Ownership in and Adjacent to the Study Area



CULTURAL RESOURCES

The National Historic Preservation Act (16 United States Code 470) is the primary federal law governing the preservation of cultural and historic resources in the United States. The National Historic Preservation 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 (NRHP), 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 U.S. Department of Transportation Act of 1966. Section 106 of the National Historic Preservation Act requires federal agencies to consider the effects of their undertakings (including funding, licensing, or permitting of 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 (Revised Code of Washington [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. In the study area, the CRGNSA consults with federally recognized tribes that are culturally and historically affiliated with and have ongoing interest in management of CRGNSA-administered lands. These tribes include the Confederated Tribes of the Warm Springs, the Yakama Nation, the Nez Perce Tribe, and the Confederated Tribes of Umatilla Indian Reservation. The Warm Springs and Yakama Tribes have ceded lands within the CRGNSA, but all four have strong ties to the Columbia River.

USFS also consults with the Confederated Tribes of the Grand Ronde, the Cowlitz Tribe, and the Siletz Tribe. Members of local tribes use SR 14 for access to traditional hunting, fishing, and gathering areas.

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

- American Indian Religious Freedom Act
- Antiquities Act of 1906
- Archaeological Resources Protection Act of 1979
- Native American Graves Protection and Repatriation Act of 1990
- EO 13175 (Consultation and Coordination with Indian Tribal Governments)
- EO 11593 (Protection and Enhancement of the Cultural Environment)

DAHP maintains a GIS database of buildings, structures, and sites that have been evaluated for inclusion in the NRHP 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, there are two areas in the study area that are on the state and/or national registers: The Bonneville Dam Historic District and the Klickitat River Bridge. There are also several sites that are in the study area or are accessed from the study area that are eligible for listing on the registers or for which a determination of eligibility has yet to be made.

It is unlikely that the study area has been completely surveyed for historic and archaeological resources. Before any ground-disturbing actions can occur in the study area, an archaeological field investigation must be completed.

Washington State Historic Highway Bridges

Table 18 shows the bridges in the study area that are listed in the NRHP (NR), have been determined eligible for listing in the NRHP (NR DE), or have been nominated or recommended eligible for inclusion in the NRHP.

Table 18. Historic Highway Bridges in the Study Area

County	Structure ID	Bridge No.	Bridge Name	Year Built	Owner	Inventory
Skamania/ Hood River (Oregon)	8712700	259228300	Bridge of the Gods	1926	Port of Cascade Locks	NR DE
Klickitat	0001727A	14/212	Klickitat River	1933	WSDOT	NR DE
Klickitat	0001492B	14/222	Horsethief Canyon	1931	WSDOT	NR DE
Klickitat-Hood River (Oregon)	000000PH	6645	Hood River-White Salmon	1924	Port of Hood River	NR DE

Source: WSDOT

There are also seven tunnels and several stone walls along SR 14 through the CRGNSA. All but one of the tunnels (at MP 59.61) are listed as having historical and engineering interest to the state.

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 roadway horizontal or vertical alignments, increase the number of through lanes, provide passing lanes, or increase 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 modeled 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, one or more of the following:

- Modifying the existing or proposed roadway horizontal or vertical alignment
- Constructing noise barriers such as sound walls or earthen berms
- Decreasing traffic speed limits

Noise abatement measures must be considered reasonable and feasible and be supported by the members of the public who would be affected.

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

VISUAL RESOURCES

Scenic quality is a fundamental element of recreation experiences, and this is especially true within the CRGNSA. The CRGNSA Management Plan defines Key Viewing Areas (KVAs) as "those portions of important public roads, parks, or other vantage points within the Scenic Area from which the public views Scenic Area landscapes." Knowing the locations of the KVAs in the study area will help to identify potential underlying contributing factors to the current traffic patterns as well as the crash history along the SR 14 corridor in the study area. The following KVAs have been identified that are within the SR 14 study area specifically or in the Gorge overall:

Washington

- SR 14
- Beacon Rock
- Dog Mountain Trail
- Washington SR 141
- Washington SR 142
- Cook-Underwood Road

Oregon

- Oregon Highway 35
- Historic Columbia River Highway
- Crown Point
- Highway I-84, including rest stops
- Rowena Plateau and Nature Conservancy Viewpoint
- Panorama Point Park

Bi-State

Bonneville Dam Visitor Centers
Columbia River

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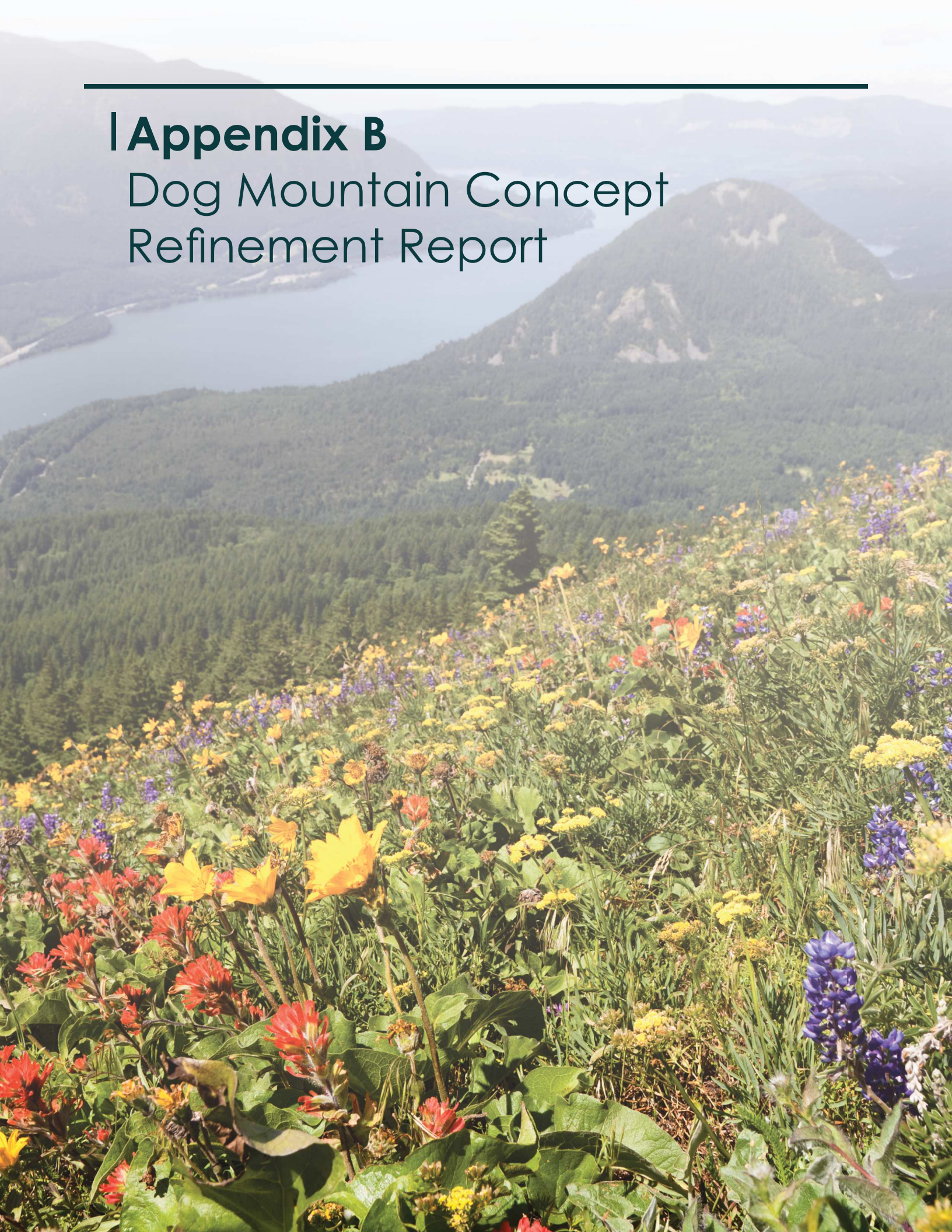

Appendix B
Dog Mountain Concept Refinement Report

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SR 14 AND DOG MOUNTAIN CONGESTION AND SAFETY STUDY

Dog Mountain Concept Refinement Report

Contract No. DTFH7015D00002, Task Order No. 69056720F000058:
WA DOT 14(4), Congestion and Safety Mitigation Plan
WA DOT 14(3), Dog Mountain Trailhead Study

Prepared for:
Western Federal Lands Highway Division

Prepared by:
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November 2022

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FIGURES

TABLES

Note: The SR 14 and Dog Mountain Congestion and Safety Study (Existing Conditions Chapter) provides a comprehensive review of the SR 14 corridor component of the study area.

INTRODUCTION

Background

The Federal Highway Administration (FHWA) is partnering with the United States Forest Service (USFS) and the Washington State Department of Transportation (WSDOT) (referred to as the "project partners") to develop a congestion and safety plan for an 80-mile stretch of Washington State Route (SR) 14 and an assessment of existing and projected future conditions at the Dog Mountain Trailhead. One of the results of this partnering effort is the preparation of the SR 14 and Dog Mountain Congestion and Safety Study (referred to as the "study"). The study was guided by a Core Project Team (CPT), which included representatives from FHWA, USFS, WSDOT, and the consultant David Evans and Associates, Inc. (DEA).

The purpose of this specific assessment at Dog Mountain (which is also Appendix B to the SR 14 and Dog Mountain Congestion and Safety Study, the "study") is to identify the potential for relocation of the existing parking lot at the Dog Mountain Trailhead that is directly adjacent to SR 14. DEA is the consultant responsible for the planning analysis and preparation of conceptual design materials, hereafter referred to as the "project".

Problem Statement

The Dog Mountain and Augspurger Trail system has become one of the most popular hikes in the Columbia River Gorge National Scenic Area (CRGNSA). Dramatic wildflower displays and views of the Gorge draw hikers from around the region to this hike. The Dog Mountain Trailhead, located on SR 14 near milepost (MP) 53.7, serves this trail system. Currently, the parking lot at the Dog Mountain Trailhead is an undeveloped gravel area immediately adjacent to SR 14. Over the years WSDOT and the USFS have worked together to mitigate congestion and highway safety-related issues associated with the trailhead by developing a permit system and shuttle options used to manage parking during peak visitation.

In 2015, representatives from partnering agencies (Skamania County, WSDOT, Washington State Patrol (WSP), USFS, and BNSF Railway (BNSF)) met to explore safety mitigation measures at Dog Mountain Trailhead, which included: early warning signs, no parking signs, law enforcement, parking lot reconfiguration from approximately 120 to 70 to 80 cars, shuttle bus to reduce congestion, and a warning sign (using variable message sign technology) directing visitors to use the shuttle. While this interagency effort has improved the situation at the trailhead, recreation use has increased so much that it now has overwhelmed the measures that were implemented. Despite enforcement of no parking signs and towing of vehicles parked in violation of those signs, as well as increased ridership of the shuttle bus, unauthorized parking along the shoulders of SR 14 near the trailhead still occurs. This continued unauthorized parking has prompted USFS to implement a required entry permit in order to reduce the number of cars that can access the site during peak season.

Projected use is likely to continue its upward trend and managing congestion in the long run under the existing configuration will continue to be a challenge. Complexities of the underlying land ownership and preliminary results from an environmental study at the existing parking lot have limited previous efforts to improve and enhance the situation.

The CRGNSA Management Plan was created to ensure that the land within the CRGNSA is used consistently in accordance with the purposes and standards of the National Scenic Area Act.

Purpose of Concept Refinement Report

The primary purpose of this Concept Refinement Report is to provide the agencies responsible for the development and implementation of the project the information needed to refine project scope. This information includes the project purpose and need and establishes a reasonable range of conceptual layouts. As such, this report will also serve a secondary purpose to support subsequent National Environmental Policy Act (NEPA) analysis by providing an account of project purpose and need, and a rational basis for the reasonable range of concepts.

EXISTING CONDITIONS

The existing condition section examines the Dog Mountain Trailhead and lands west of the trail system as depicted in Figure 1, hereafter referred to as the "focus area".

General Conditions

The existing Dog Mountain Trailhead parking lot is located along the north side of SR 14 near milepost 54 and has an uncontrolled ingress/egress that is approximately 600 feet wide. The parking lot is generally flat and at the same level as SR 14. There is a horizontal curve and steep topography on SR 14 east of the trailhead that limits sight distance for vehicles traveling west on SR 14 and for vehicles attempting to turn left onto SR 14 eastbound from the parking lot.

SR 14 Dog Mountain Trailhead parking lot
Source: USFS

Dog Mountain is most popular in the spring between April and June, when wildflowers are blooming, although recreationalists visit throughout the year for the trail's panoramic views of the CRGNSA or to train for other more difficult climbs. When vehicle parking overflows onto the shoulder of SR 14, visitors walk along the narrow shoulder of SR 14 and the BNSF railroad corridor to access the trailhead. Crash data between 2015 and 2019 documents seven crashes between milepost 53.3 and milepost 54 in that time frame, including one fatality and one suspected serious injury involving a pedestrian.

Historical Use Information

In February 2007, a report prepared for FHWA Western Federal Lands Highway Division by GRI Geotechnical & Environmental Consultants summarized the historical use information of the existing site. GRI reviewed aerial photographs dated 1935, 1948, 1957, 1968, 1971, 1989, and 1995 that were obtained from the U.S. Army Corps of Engineers (USACE) Portland District office. Land is described below in Table 1 below describes land use at the site, based on interpretation of those photographs.

Table 1. Historic Aerial Documentation

Date	Comments	Aerial Photograph
1935	No structures are visible on the project site or in the immediate vicinity. The site is a small, cleared area surrounded by trees. An unpaved road leads from the cleared area to the east. The site is north of a roadway and railroad. A wide strip of vegetated land separates the roadway from the Columbia River. Power lines are visible in a cleared right-of-way lying in a northwest-southeast line east of the project site.	
1948	The cleared area has been enlarged to the approximate dimensions of the current parking lot. A structure is visible in the center of the site. Three vehicles are visible parked near the eastern end of the cleared area. A small structure is visible along the unpaved road at the eastern end of the site. Much of the wide strip of land adjoining the Columbia River has been eroded, leaving a point of land southeast of the project site. Buildings are visible on the point.	
1957	Three additional structures are visible in the cleared area around the central structure: a medium building to the northwest, a smaller building to the north, and a small, elongated building to the east. Two cars are parked adjacent to the central structure, which appears to be a commercial building. A beacon is present on the tip of the point. No significant changes were noted in the surrounding area.	

Date	Comments	Aerial Photograph
1968	The small building at the north of the cleared area and the small, elongated building have been removed. Utility poles and an object that appears to be a flagpole are located in the cleared area. An object resembling a gas pump is present south of the central building. The building at the northwest border of the site appears to be commercial. Three cars and a larger truck are present. No significant changes were noted in the surrounding area.	
1971	Four shed-like structures are visible along the eastern and northern border of the cleared area. Uncovered equipment is visible in the vicinity of these structures. Landscaping is visible surrounding the central building. Two objects resembling large trucks or mobile homes are visible near the western end of the project site. No significant changes were noted in the surrounding area.	
1989	All structures appear to have been removed from the project site. The unpaved dirt road appears to have become overgrown. Four vehicles are parked near the northern border of the cleared/parking area. No significant changes were noted in the surrounding area.	

Date	Comments	Aerial Photograph
1995	No significant changes were noted on the project site or in the surrounding area.	
2022	Site under current parking lot configuration	

Source: WA PFH 185-1 (7) SR-14, Dog Mountain Trailhead, Skamania County, Washington, Phase I Initial/Environmental Site Assessment, GRI, April 3, 2007.
Google Aerial Imagery, 2022

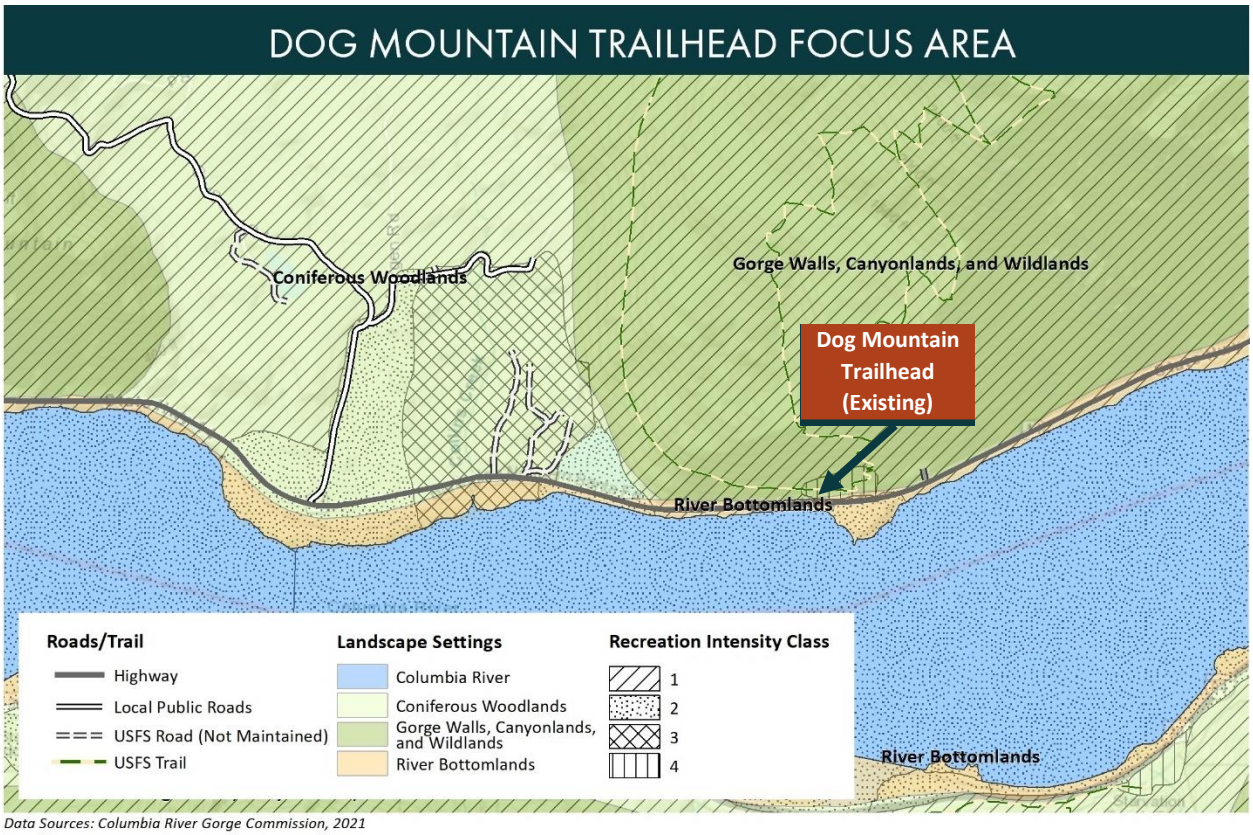
Land Use

The Columbia River Gorge Commission and counties within the CRGNSA have the authority to jointly grant land use approvals according to uses outlined the CRGNSA Management Plan. The CRGNSA includes three distinct areas: General Management Areas (GMAs), Special Management Areas (SMAs), and Urban Areas. The Dog Mountain and Augspurger Trail system and the lands with potential to accommodate the relocation of the existing trailhead are designated as SMAs. USFS is the principal landowner for SMAs, whose uses are more restricted than those of designated GMAs.

The CRGNSA Management Plan further designates policies and provisions related to development for four "recreation intensity classes" (RICs) in GMA and SMA lands. The RIC dictates the allowable recreation uses for the land. RIC 1 indicates that the area is suitable for very low intensity recreation and has more stringent guidelines than RIC 4, which indicates that the area is suitable for high intensity recreation. Related to the potential trailhead and parking lot development or relocation, the RIC of the trailhead/parking lot site, as shown in Figure 1, will play an important role in the development and selection of alternatives. The existing parking lot includes portions with RICs of 1, 2, and 4, which may limit

the ability to improve the area in its current location and still maintain current capacity. The land that serves the parking lot also spans three separate owners: WSDOT, USFS, and BNSF (see Dog Mountain Trailhead Initial Conceptual Locations in Figure 4, page 12).

Figure 1. Land Use



Data Sources: Columbia River Gorge Commission, 2021
http://www.gorgecommission.org/scenic-area/maps

Environmental Conditions

The environmental screening exercise for the Dog Mountain Concept Refinement Report is a scoping-level effort that includes information available through desktop studies and project site visits. If improvement options from the study or refinement report are advanced into project development, a detailed analysis for consistency with the Management Plan for the Columbia River Gorge National Scenic Area (CRGNSA Management Plan) and 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 used as guidance for the planning process at that time.

Physical Environment

Geologic Hazards

The National Earthquake Hazards Reduction Program seismic site classification system provides a measure of the potential for strong shaking in an area during an earthquake. This approach categorizes soils into six classes (A through F) based on vertical shear wave velocity profile, thickness, and liquefaction potential. Earthquake hazard potential increases from Class A to Class E soils. Much of Dog Mountain and the area

west of Dog Mountain and east of Wind Mountain have Class D soils, indicating a high potential for earthquake shaking and liquefaction.

The Washington Geological Survey maintains a clearinghouse of geologic hazard information, including mapped landslides and landslide hazard potential. Deep-seated landslides occur at depths of more than 6 feet to 10 feet and are typically ancient landslides that have been on the landscape for centuries or longer. Much of Dog Mountain and the area west of Dog Mountain and east of Wind Mountain are classified as such with a high landslide susceptibility.

Access and parking projects advanced from the study will need to account for nearby geologic hazard potential in their design. Geotechnical investigations will likely be required to support project design and construction.

Streams, Riparian Habitats, and Wetlands (Water Resources)

The CRGNSA Management Plan policies emphasize protecting and enhancing aquatic and riparian systems. Activities that impact streams, riparian habitats, wetlands (including ponds and lakes), and their buffers must be avoided or offset through mitigation and restoration to the greatest extent practicable.

STREAMS AND RIPARIAN AREAS

The CRGNSA Management Plan stipulates that proposed uses adjacent to streams, ponds, and lakes must preserve an undisturbed buffer zone that is wide enough to protect both the aquatic and riparian areas. Buffer zones are based on the characteristics of the individual stream (i.e., perennial or intermittent) and the vegetation community type (i.e., forest, shrub, or herbaceous). Field surveys will be required to determine potential impacts to any streams and associated riparian areas. Coordination with the appropriate federal and state wildlife agency U.S. Fish and Wildlife Service (USFS), and Washington State Department of Fish and Wildlife (WDFW), will determine the appropriate width for proposed protective buffers, and the results of that coordination will lead to development of plans for protection or mitigation.

WETLANDS

For any potential trailhead and parking relocation, on-site delineations will need to be conducted according to the Level 2 Routine On-Site Method (USACE 1987; USACE 2010) in order to verify the presence of wetlands and identify any potential impacts.

The CRGNSA Management Plan stipulates that new uses must be sited to avoid wetlands to the greatest extent possible. Impacts to wetlands are allowed only when they are unavoidable, in the public interest, and all practicable measures to minimize impacts have been applied. Any proposed project that could affect wetlands requires coordination with the appropriate agencies that regulate wetland impacts (USACE and Washington Department of Ecology) and impacts to wildlife habitat (USFWS, WDFW, and USFS and/or National Marine Fisheries Service, as applicable) to determine the appropriate approaches for impact mitigation or compensation.

Natural Resources

Vegetation (Rare Plants and Natural Areas)

The varied landscape at and around the trailhead provides habitat for numerous species of rare plants, many of which are endemic to the CRGNSA. The CRGNSA Management Plan policies require that any new development to have no adverse effects on rare plants.

Several ecologically and scientifically significant areas, designated in the CRGNSA Management Plan as Natural Areas, have been identified as outstanding examples of the diversity of the landscape and ecosystems throughout the CRGNSA. Dog Mountain is a designated Natural Area. The vegetation and terrain of this Natural Area features fir and hemlock in the west, transitioning to oak and ponderosa pine forests in the east, as well as talus slopes and grasslands.

The CRGNSA Management Plan stipulates that Natural Areas must be protected from adverse effects. Uses that would adversely affect native plant communities and rare plants are prohibited in designated Natural Areas. Projects advanced from the SR 14 and Dog Mountain Congestion and Safety Study would need to address any potential impacts on Natural Areas and include consultation with USFS botanists.

Fish and Wildlife (Priority Habitats and Sensitive Wildlife Sites)

The CRGNSA Management Plan emphasizes wildlife habitat protection by requiring projects to ensure that new uses do not adversely affect Priority Habitats or sensitive wildlife sites.

Priority Habitats are those habitats that are important for providing nesting, roosting, denning, foraging, and other life cycle needs for wildlife species in the CRGNSA. USFS and state wildlife agencies identify the Priority Habitats in the CRGNSA as part of State Wildlife Action Plan efforts and revise them from time to time. In addition to avoiding adverse impacts to these resources, proposed projects are directed by the CRGNSA Management Plan to enhance wildlife habitat that has been altered or destroyed by past uses. Projects advanced from the study would be required to identify any Priority Habitats within the project vicinity via field survey and to maintain adequate buffer zones in order to protect them. Any proposed development within 1,000 feet of a Priority Habitat would need be evaluated for adverse effects in coordination with WDFW and USFS, as applicable.

The CRGNSA Management Plan uses the generic term “sensitive wildlife sites” to refer to sites that are used by species that are: (1) listed as endangered or threatened pursuant to federal or state endangered species acts, (2) listed as endangered, threatened, sensitive, or candidate by the Washington Wildlife Commission, (3) listed as sensitive by the Oregon Fish and Wildlife Commission, or (4) considered to be of special interest to the public (limited to great blue heron, osprey, golden eagle, and prairie falcon) (CRGC and USFS 2016; CRGC and USFS 2020). The CRGNSA Management Plan requires site-specific plans for development proposed near sensitive wildlife sites. Buffer zones must be established, which are determined on a case-by-case basis depending on the biology of the affected species, the characteristics of the project site, and the proposed use. If proposed new development could alter habitat, resource rehabilitation and mitigation are required to reduce and offset the alterations and effects. For projects advanced as a result of the study, consultation with WDFW would be required to determine whether a proposed project is located within 1,000 feet of a sensitive wildlife site.

Threatened and Endangered Species

As it relates to the Dog Mountain Trailhead focus area, designated critical habitat for USFWS-regulated federally threatened northern spotted owl (*Strix occidentalis caurina*) is present in the western portion of the CRGNSA and is concentrated in the portion of the study area between Beacon Rock State Park and the Dog Mountain Trailhead (USFWS 2020b). Critical habitat is the specific areas within the geographic area, occupied by the species at the time it was listed, that contain the physical or biological features that are essential to the conservation of endangered and threatened species and that may need special management or protection.

Any concepts advanced from this refinement report would not be expected to have direct impacts to listed fish species and their critical habitat in the Columbia River. However, potential impacts from stormwater runoff would need to be evaluated on a project-by-project basis in coordination with WDFW.

Other Species of Concern

In addition to the species listed under the federal Endangered Species Act referred to above, proposed projects and management activities in the CRGNSA must consider several other species that are protected by state or federal law or by agency management policy. These other species of concern include species identified as "Sensitive" by USFS and WDFW, USFS "Survey and Manage" species (on National Forest lands only), and species protected under the Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act.

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

There is an October 2018 Memorandum of Understanding (MOU) between the WDFW and USFS for management of western pond turtle (WPT) (*Actinemys marmorata*) may be relevant to the proposed Dog Mountain Trailhead relocation project. The October 2018 MOU between WDFW and USFS specifically covers the Collins/Bergen Western Pond Turtle Area, which is near Grant Lake, west of the existing Dog Mountain Trailhead and parking lot. Any new parking lot/trailhead relocation designs will need to take the contents of the MOU into account. Considerations of the MOU as they relate to potential parking lot/trailhead concepts are discussed further in this report in the section titled "Refined Conceptual Parking Relocation Sites" (page 17).

Visual Resources

Scenic quality is a fundamental element of recreation experiences, especially within the CRGNSA. The CRGNSA Management Plan has defined Key Viewing Areas (KVAs) as "those portions of important public roads, parks, or other vantage points within the Scenic Area from which the public views Scenic Area landscapes." Identified KVAs of relevance to the Dog Mountain Trailhead Focus Area are:

- Washington State Route 14
- Dog Mountain Trail
- Interstate 84
- Historic Columbia River Highway State Trail

Existing and Projected Traffic Volumes

Estimated existing Annual Average Daily Traffic (AADT) along this section of SR 14 is 3,600 vehicles per day, with a year 2040 projected AADT of 5,250 vehicles per day based on a trendline of the previous 10 years of growth. The truck percentage of total AADT is 7 percent for single unit trucks, 8 percent for double unit trucks, and 1 percent for triple unit trucks.[1]

Crash History

The study conducted a safety analysis to determine whether any significant, documented safety issues exist within the focus area and to inform future measures or general strategies for improving overall safety. The safety analysis included a review of crash history data supplied by the WSDOT Crash Data and

[1] https://www.wsdot.wa.gov/mapsdata/tools/trafficplanningtrends.htm

Reporting Branch. The crash records were provided in a Geographic Information System shapefile and included all reported crashes from January 1, 2015, to December 31, 2019.

As it relates to the Dog Mountain Trailhead Focus Area, the crash analysis reviewed crashes along SR 14 from MP 52.3 to MP 54.3, as summarized in Table 2 and shown in Figure 2. There were 14 crashes reported in this segment within the five-year analysis period, seven of which were within 0.5 mile east and west of the existing Dog Mountain Trailhead parking lot (the "influence area" of the parking lot).

Of those seven crashes within the influence area of the parking lot, one resulted in serious injury, and one resulted in a fatality. The serious injury was the result of a pedestrian crash, and the fatal injury was the result of a rear end collision.

Table 2. SR 14 Crash History (2015–2019): MP 52.3 – MP 54.3

	Crash Type						Severity					
SR 14 Segment	Fixed Object	Animal	Fallen Rock	Pedestrian	Rear End	Other	Property Damage Only	Possible Injury	Minor Injury	Serious Injury	Fatal Injury	**Total**
MP 52.3 – MP 52.8	3	1					2	1	1			4
MP 52.8 – MP 53.3			1			1	2					2
MP 53.3 – MP 53.8				**1**	**3**			2	1	1		4
MP 53.8 – MP 54.3			3		1		2	1			**1**	4
Total:	**3**	**1**	**4**	**1**	**4**	**1**	**6**	**4**	**2**	**1**	**1**	**14**

Source: WSDOT Crash Data and Reporting Branch[2]

[2] Under Section 409 of Title 23 of the United States Code, any crash data furnished is prohibited from use in any litigation against state, tribal or local government that involves the location(s) mentioned in the crash data.

Figure 2. Dog Mountain Crash History (2015–2019)

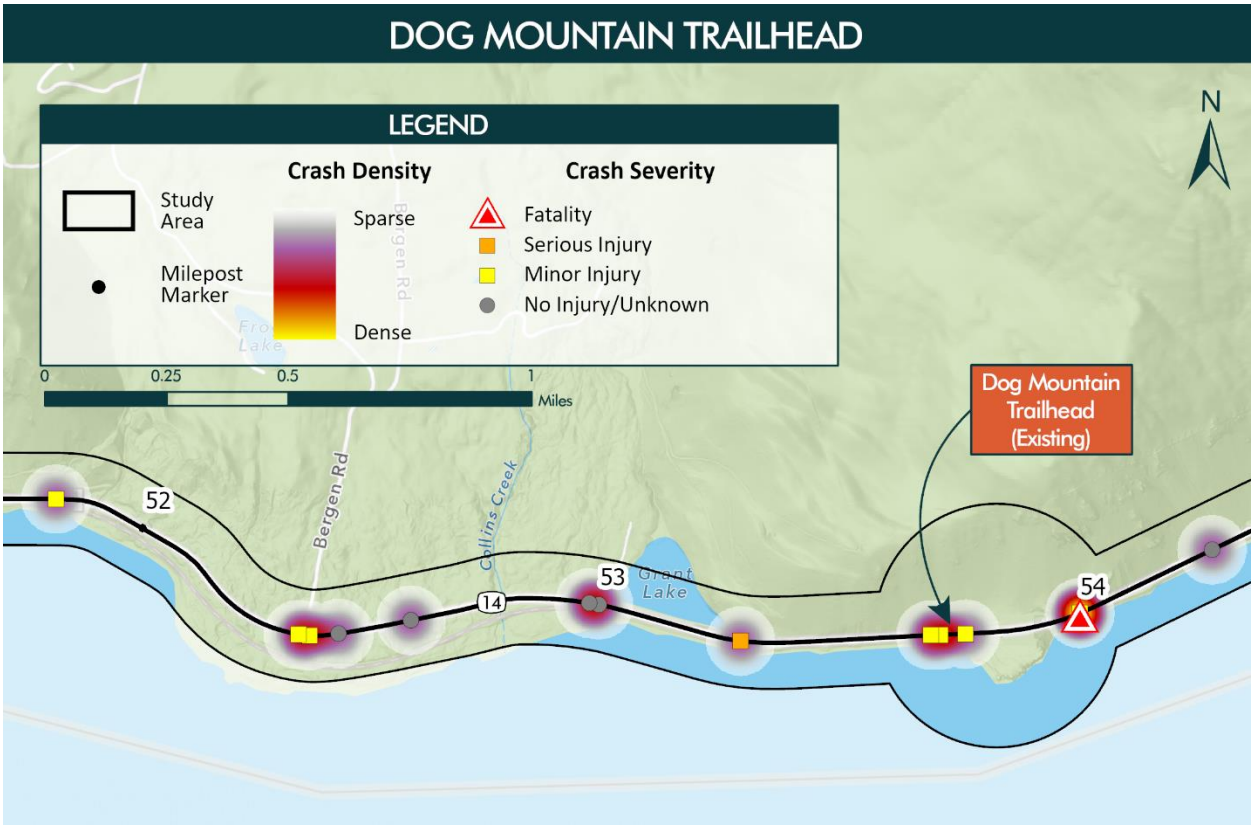
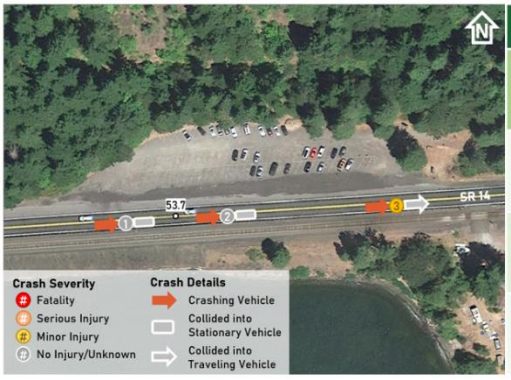


Figure 3 illustrates the crashes immediately fronting of the Dog Mountain trailhead parking lot. It shows that all the recent crashes in the area were rear-ends. This indicates a need for a dedicated left-turn lane, especially with 2 out of the 3 crashes being rear-ends into stationary vehicles (likely turning into the parking lot).

Figure 3. Dog Mountain Crash Diagram



EVENT SUMMARIES

#	Date – Time	Highest Severity	Collision Type	Driver Contributing Factor	Weather	Lighting
1	6/30/2019 – 1:37 pm	Unknown	Rear-end	Inattention	Clear or Partly Cloudy	Daylight
2	7/3/2018 – 1:48 pm	Unknown	Rear-end	Exceeding reasonably safe speed	Clear or Partly Cloudy	Daylight
3	5/10/2015 – 1:25 pm	Minor Injury	Rear-end	Follow too closely	Clear or Partly Cloudy	Daylight

Crashes within mileposts 53.6 and 53.8.

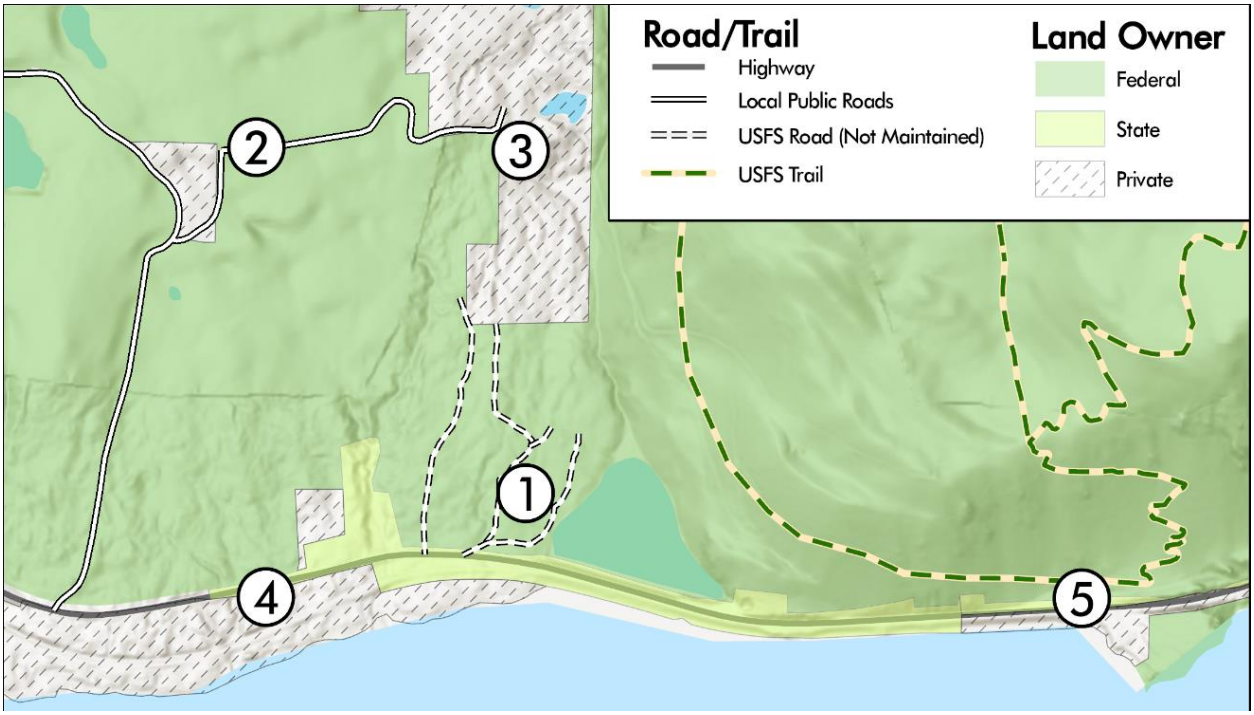
PROJECT CONCEPT REFINEMENT

The study originally identified five conceptual locations for the Dog Mountain Trailhead relocation based on information available in the Federal Lands Access Program (FLAP) application[3] for the project and review of the existing topography:

1. Grant Lake
2. Mountain Glade West
3. Mountain Glade East
4. Maintenance Yard
5. Existing

The general locations of these sites are depicted in Figure 4.

Figure 4. Dog Mountain Trailhead Initial Conceptual Locations



(#) Conceptual Location: 1. Grant Lake; 2. Mountain Glade West; 3. Mountain Glade East; 4. Maintenance Yard; 5. Existing

Project Vision

The vision statement for this Dog Mountain component of the SR 14 and Dog Mountain Congestion and Safety Study is: To manage congestion at, and promote safe access to, the Dog Mountain Trailhead through the identification of design concepts that are consistent with the CRGNSA Management Plan.

[3] The Federal Lands Access Program (Access Program) was established to improve transportation facilities that provide access to, are adjacent to, or are located within Federal lands.

Project Purpose

The purpose of the project is to:

- Minimize/eliminate hazardous conditions along SR 14 as they relate to accessing the Dog Mountain Trailhead
- Discourage parking on SR 14 and walking along SR 14 and railroad tracks
- Ensure protection of natural, cultural, and scenic resources while providing visitor access.
- Offer high-quality recreation opportunities of the Dog Mountain Trail

Project Need (Conditions Requiring Relief)

The current, defined trailhead visitor parking area accommodates 70 to 80 vehicles. The assumption is that the visitor parking capacity at the existing facility is acceptable and appropriate when parking occurs within the defined parking area. However, the parking capacity is not acceptable or appropriate when vehicle parking exceeds the current capacity amount and spills over to the highway. The current problems comprising the Project Need relate to transportation safety.

There are existing hazardous road conditions for visitors accessing the current Dog Mountain Trailhead parking area:

- Parking occurs on the shoulder of SR 14.
- Pedestrians walk along the north shoulder of SR 14 when parking overflows from the parking lot.
- Crashes (in the five-year from 2015 to 2019, seven crashes recorded within approximately 0.5 mile of the parking lot, including one fatal crash and one pedestrian-related crash).
- Sight distance is limited to the east.
- There is no controlled access point for traffic entering/exiting the existing Dog Mountain Trailhead parking lot.

Regardless of where the project locates the trailhead, the parking lot will incorporate space for the current fleet of shuttle buses that serve the trailhead.

Considerations

There are other considerations for determining the feasibility of the trailhead relocation, as follows:

- Minimize the additional length of the trail to Dog Mountain in order to maintain the trail level of difficulty and encourage parking at the designated lot
- Minimize impacts to scenic, natural and cultural resources
- Consider location that minimizes visual impacts to KVAs
- At minimum, provide the same visitor amenities as at the existing parking lot/trailhead
- Use the existing two-track road system where feasible

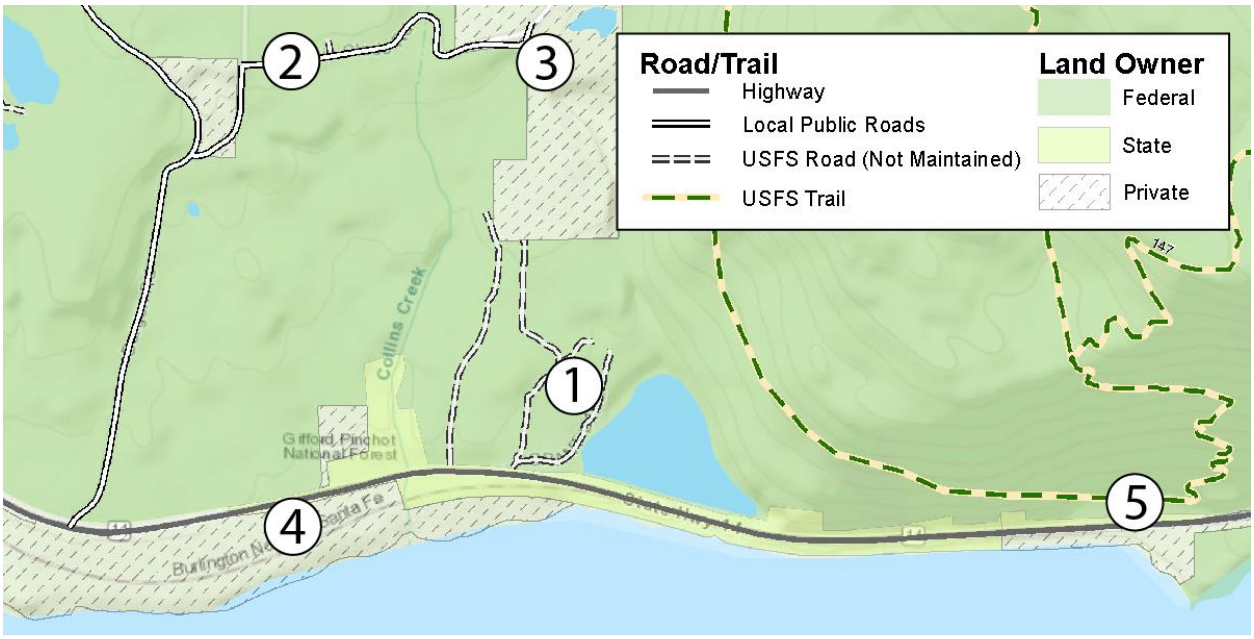
Preliminary Screening

The five conceptual locations shown in Figure 4 were distributed to the project partner agencies to share with their respective staff for preliminary feedback. The intent was to screen out any concepts unlikely to be implemented due to “red flags,” such as whether the concept would make progress toward addressing the project purpose or whether the agencies have other jurisdictional concerns. The feedback aided the

project team in determining whether any deviation of the concept from the project purpose was substantial enough to remove the concept from further consideration or warrant refinement before more detailed analyses are completed.

Figure 5 summarizes the preliminary screening results and Table 3 summarizes the detailed feedback, including recommendations for further consideration of specific concepts/conceptual locations in the "Outcome" column.

Figure 5. Dog Mountain Trailhead Initial Conceptual Locations Screening Outcome S



#	Parking Lot Options	Screening Outcome: Further Refinement	Screening Outcome: Remove from Further Consideration	Finding
1	Grant Lake	✔		
2	Mountain Glade West		✘	Unmitigable natural resource impact
3	Mountain Glade East		✘	Unmitigable natural resource impact
4	Maintenance Yard		✘	Does not meet study purpose and need
5	Existing		✘	Does not meet study purpose and need

Table 3. Concept Refinement: Preliminary Screening Feedback

Conceptual Location	Feedback	Outcome

1. Grant Lake	• RIC 3; USFS property
	• Biology: Potential sensitive species habitat
	• Hydrology: Need to confirm pond and wetland locations (there are regulations for development within water resource buffer areas)
	• Visual:
	  ◦ Visible from multiple KVAs in the foreground, middle ground, and background
	  ◦ If this concept is selected, some potential mitigation could include the restoration of the existing parking area to a natural appearance
		Further refinement needed

2. Mountain Glade West	• RICs: North of road: RICs 1, 2, and 3; South of road: RICs 2 and 3, and USFS property • Near private dwellings • Biology: Significant, unmitigable natural resources concerns • Hydrology: Close to ponds • Visual: Less visible of the five conceptual locations from KVAs	**Remove from further consideration;** unmitigable natural resources concerns
3. Mountain Glade East	• RICs: North of road: RIC 1; South of road: RIC 3 and Friends of the Gorge property • Mountain Glade Rd needs improvements to serve new users • Biology: Significant, unmitigable natural resources concerns • Hydrology: Close to large pond • Visual: Less visible of the five conceptual locations from KVAs	**Remove from further consideration;** unmitigable natural resources concerns
4. Maintenance Yard	• RIC 3; WSDOT property • Would require crossing of SR 14 and is adjacent to SR 14, which would not be a significant improvement over the current parking situation • WSDOT uses this resource for its operations	**Remove from further consideration;** does not satisfy project goals.

5. Existing Trailhead	• RICs 1, 2, and 4; BNSF, WSDOT, and USFS property
	• Previous study noted concerns for potential hazardous materials. Ground penetrating radar analysis conducted in 2022 did not flag any underground storage tanks.
	• Visual:
	  ◦ Scenic Standard: Not Visually Evident (does not currently meet this standard)
	  ◦ Visible from multiple KVAs in the foreground, middle ground, and background
		Remove from further consideration; landowner/RIC concerns and does not satisfy project goals.

USFS Interdisciplinary Team Site Visit

As a follow-up to the concerns expressed during the preliminary screening, the project team organized a site visit on Tuesday, July 27, 2021, with USFS natural resource and recreation staff to further vet potential site locations in the area west and north of Grant Lake, as shown in Figure 6. The findings of this site visit are summarized below, and the detailed notes are provided in Attachment A.

Reviewed the preliminary conceptual locations:

- Mountain Glade West: Not desirable due to natural resource concerns – mitigation not feasible.
- Mountain Glade East: Not desirable due to natural resource concerns – mitigation not feasible.
- Maintenance Yard: Not desirable because of distance from trail and the likelihood of similar safety concerns (pedestrians and SR 14) as existing, and because WSDOT would like to keep its maintenance yard.
- Grant Lake: KVA concerns, but with opportunities for refinement. This site visit explores possible options.
- Existing: Congestion amplifies existing safety concerns (sight distance, uncontrolled access, proximity to SR 14). Spans three different RICs and three different landowners.

Figure 6. July 27, 2021, Site Visit Route

Note: Locations A, B, C and D were evaluated during the site visit as potential locations for Dog Mountain Trailhead parking lot relocation

Site visit notes:

- Reminder that the impacts to the KVAs need to imagine the landscape as if there were no vegetation.
- There are seasonal sag ponds in the area. A parking lot or trail within 100 feet of a pond requires a mitigation plan.
- Need to consider direct connection between potential parking lot and trailhead. In addition to the actual distance, the users need to feel like they are close.
    - The location near Grant Lake is closer to the existing trailhead and provides a view of Dog Mountain (helpful for encouraging people to use the new trailhead).
- Oak canopy (particularly on the site farther west) could limit the size of the parking lot.
    - Development potential/space at the site would be limited (particularly by the oak drip lines).
- Layout work needed in order to determine best place to cross the creek (first) and then can determine the trail route from proposed parking lot.

Next Steps

- DEA to draft conceptual drawings considering the input from the site visit in combination with LiDAR topographic mapping.

Refined Conceptual Parking Relocation Sites

The project team considered the feedback from the preliminary screening and USFS interdisciplinary team site visit to refine potential conceptual parking relocation sites near Grant Lake. The project team also reconsidered keeping the existing trailhead in its current location, however the team determined that even with improvements to the existing parking lot, it would not meet the purpose and need.

The relocated Dog Mountain parking lot will need to accommodate year-round recreational users, such as hikers. To meet the needs of the current and projected usage, the parking lot should account for the following features:

- Parking capacity for 50 to 75 vehicles to maintain desired user experience at Dog Mountain and avoid site overcrowding
- Capability of accommodating a transit shuttle
- Amenities: Transit shelter, interpretive sign(s), and vault toilet(s)

Utilities are not required at parking lots.

Conceptual Layouts and Planning-Level Cost Estimates

The Consultant team prepared two unique conceptual layouts to illustrate possible trailhead and parking configurations near Grant Lake. The layouts are meant to serve as preliminary plans that will inform future project development in the final Dog Mountain parking lot and trailhead design. Both of the conceptual layouts provide the maximum 75 parking stalls that are allowed under the CRGNSA Management Plan standards for RIC 3, assuming enhanced mitigation. Both layouts also assume that vault toilets and space to accommodate a shuttle bus are provided. The distinguishing features of each conceptual layout are summarized in the following sections.

Rough order of magnitude cost estimates were prepared based on the conceptual layouts. These planning-level cost estimates are preliminary and primarily aid in the comparison of the two conceptual layouts. The estimates can also help decision-makers make informed choices regarding the scope and resources required to pursue future phases of project implementation. The cost estimates do not include cost for rehabilitation or mitigation of the existing parking lot or costs for a pedestrian bridge and trail connection.

The project team reviewed the FHWA National Highway Construction Cost Index (NHCCI) during the finalization of this report and discovered highway construction costs increased by 20 percent between 2021 and 2022.[4] As such, the initial cost estimates prepared in fall of 2021 and shared with stakeholders at that time were revised in fall of 2022 to reflect these rising construction costs. If the Dog Mountain Trailhead relocation is pursued for further project development and implementation, more detailed cost estimates should be developed.

Comparable Project Work – Mirror Lake Trailhead Relocation Project

The Mirror Lake Trailhead Relocation Project (Mirror Lake), completed in 2018, has many similarities to the potential Dog Mountain Trailhead Relocation Project, both in scope and need. The primary purpose of the Mirror Lake project was relocating the existing trailhead and parking area that was adjacent to a state highway to improve safety for pedestrians and vehicles. Like the Dog Mountain Trailhead, USFS and WFL were project partners.

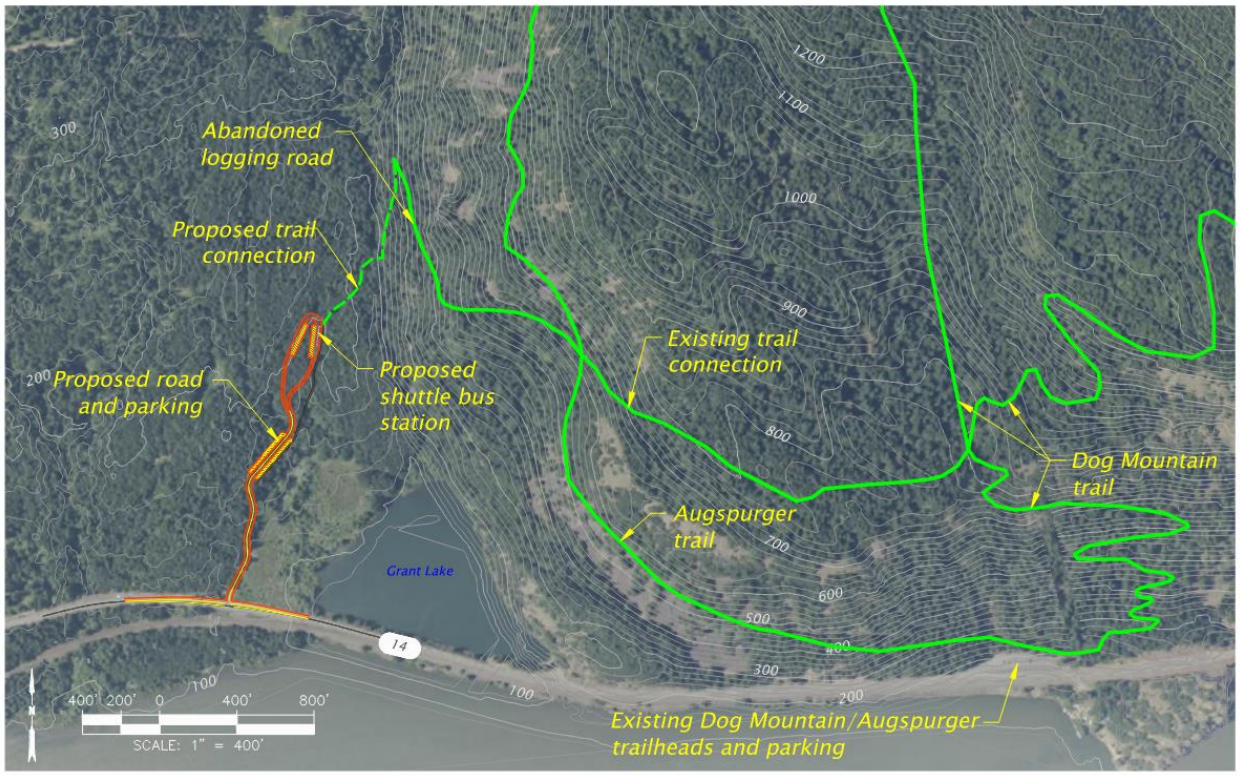
The costs for preliminary engineering and construction of the Mirror Lake Project were referenced for comparison when developing the cost estimates for the two Dog Mountain conceptual layouts. Completed in 2017, the total cost of the preliminary engineering for Mirror Lake was $1,203,234. That same year, the construction bid for the project was $5,460,018.

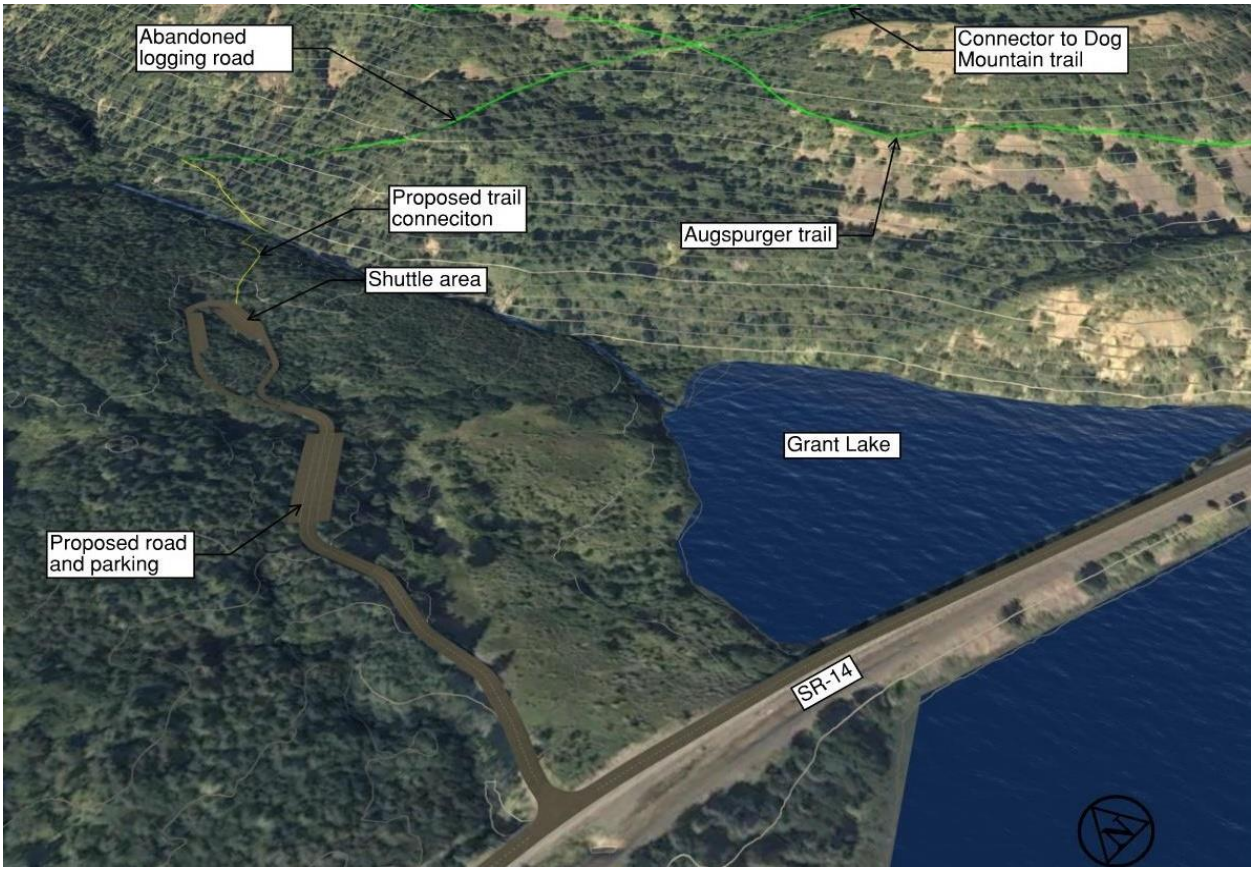
Concept 1: NW Grant Lake Dispersed

Figure 7 depicts Concept 1, NW Grant Lake Dispersed. The distinguishing feature of Concept 1 is that the northern parking lot minimizes the distance to the existing trail system.

[4] National Highway Construction Cost Index: https://www.fhwa.dot.gov/policy/otps/nhcci/

Figure 7. Concept 1: NW Grant Lake Dispersed





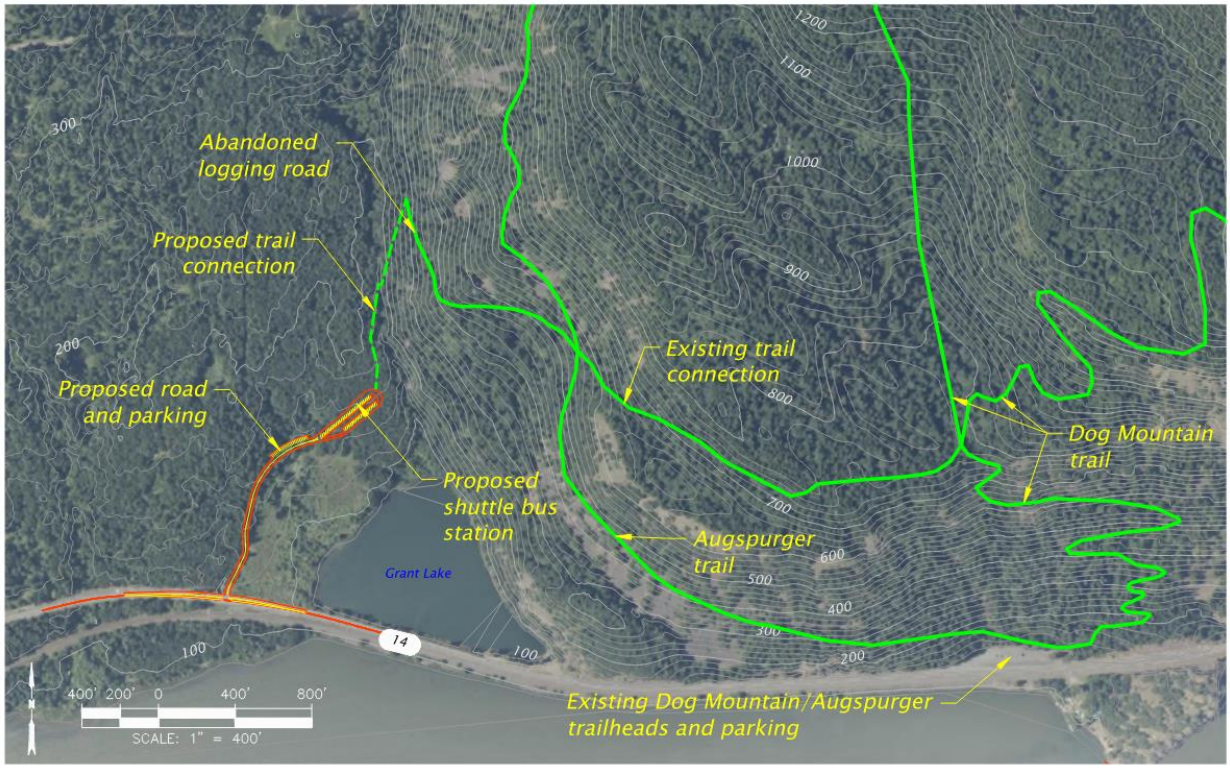
The preliminary, rough order-of-magnitude cost estimate for Concept 1 ranges from $2.3 million to $3 million, depending on design features, and includes a 50 percent contingency for construction costs (2022 dollars). If design, project management, and construction engineering design support is needed, the estimate increases to a total of approximately $3.2 million to $4.1 million.

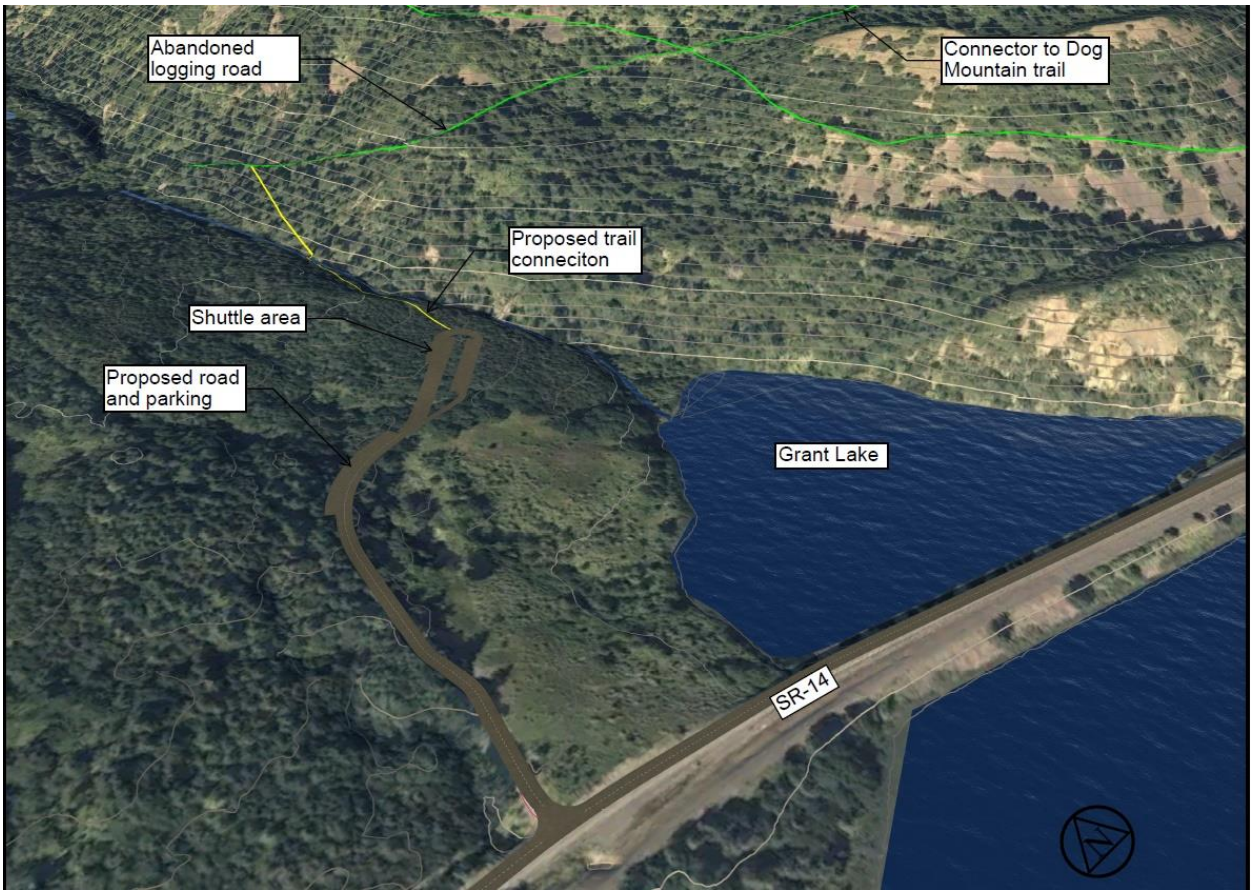
Concept 2: NW Grant Lake Compact

Figure 8 depicts Concept 2, NW Grant Lake Compact. The distinguishing feature of Concept 2 is that the distance between the north and south lots is minimized in order to reduce the overall footprint and limit the extents of new road pavement.

The preliminary, rough order-of-magnitude cost estimate for Concept 2 ranges from $1.9 million to $2.5 million, depending on design features, and includes a 50 percent contingency for construction costs (2022 dollars). If design, project management, and construction engineering design support is needed, the estimate increases to a total of approximately $2.7 million to $3.6 million.

Figure 8. Concept 2: NW Grant Lake Compact





Natural Resource Impacts

The conceptual layouts were developed based on information available through desktop studies and two site visits. If concepts are advanced into project development, an analysis for compliance with NEPA and other applicable federal and state regulations will be completed as part of the project development process.

Biological Considerations

The October 2018 MOU between USFS/WDFW (referred to in this section as "the Agencies") specifically covers the Collins/Bergen WPT Area (C/B Area), which lies west of the proposed location for the relocated trailhead and parking lot. However, the Agencies have previously raised concerns related to WPT in the vicinity of the proposed trailhead and parking improvements. Any parking lot/trailhead designs will need to take the WPT into account.

The following four points from the MOU are most relevant to the proposed trailhead relocation and are paraphrased in some cases for brevity.

1. ***Identify management objectives that will lead to the maintenance and enhancement of WPT habitats in the C/B Area*.** Such objectives could include: "promote expansion of WPT populations" or "provide safe movement between habitats." These management objectives have likely already been identified by the Agencies. Follow-up with the Agencies should be conducted, and a list of the management objectives developed in response to the October 2018 MOU should be obtained from the Agencies, if it has not already been obtained.
2. ***Coordinate design with all other management programs*.** Cultural and recreational programs may have very different goals than those assigned to WPT habitats in the C/B Area. Coordination with these programs should be undertaken so that the needs of all relevant management programs are considered in the trailhead and parking lot relocation design.
3. ***Supportive documentation should be used to guide actions*.** The Agencies may wish to provide input regarding which management documents represent the most recent and most relevant guidance. However, these documents are likely to include the "Washington State Recovery Plan for the Western Pond Turtle" (1999) as well as more recent documents, some of which may be currently unpublished. Oregon has a wealth of documentation resources, such as "Conservation Assessment of the Western Pond Turtle in Oregon" (2009), and "Guidance for Conserving Oregon's Native Turtles including Best Management Practices" (2015).
4. ***Make available to the USFS expertise necessary to accomplish objectives for the benefit of WPT management*.** This part of the MOU appears to imply that WDFW is amenable to working with other partners where expertise is needed, including work with consultants or designers who are familiar with WPT habitat needs or survey techniques.

Although not noted directly in the MOU, the project team biologist had the following observations that may be useful in considering potential mitigation options related to the WPT:

- Roadway improvements related to the new trailhead access and parking areas are likely to fall within the WPT migratory route between Grant Lake and potential nesting habitats. Individuals may move between these habitats seasonally or more frequently. Therefore, road crossing features such as wildlife-friendly culverts or larger undercrossings may need to be incorporated into the road design. Direct coordination with the Agencies to provide design input will be critical.

- The MOU mentions noxious weeds and oak forest, both of which will likely need to be mapped and managed in design of the facilities. These measures, along with the removal of non-native fish and amphibian predators of WPT identified in the MOU (e.g., carp and bullfrogs), could represent viable mitigation opportunities for project impacts.

Visual Considerations

As noted previously, the most likely KVAs of relevance to the Dog Mountain Trailhead Focus Area include:

- Dog Mountain Trail
- Washington State Route 14
- Interstate 84

The DEA project team developed preliminary conceptual visualizations of Concept 1 and Concept 2 from the Dog Mountain Trail Summit.

- Figure 9 depicts the view under existing (No Build) conditions, facing southwest toward Grant Lake from the Dog Mountain Trail Summit.
- Figure 10 depicts Concept 1 from the same viewpoint. The southern parking lot is just visible, because the ridge hides most of the parking lot footprint.
- Figure 11 depicts Concept 2, which is even less visible than Concept 1.

At this stage of conceptual design, the DEA team does not expect the location of the parking lot to be visible in a conceptual simulation from Interstate 84 (I-84) or SR 14, primarily because the terrain will obscure views of the access road and the parking area. However, the parking lot may be visible from the Historic Columbia River Highway State Trail (Oregon). A refined design that includes proposed grading activities and more details about the construction activities, as well as a proper site visit to the location to determine more accurate field conditions, would need to be completed in order to conduct a proper "leaf off" analysis,[5] because those activities and changes (tree removal, grading slopes, etc.) may be visible from SR 14, even if the parking lot itself is not.

Figure 12 (page 27) provides visualizations based on the current preliminary design information, showing potential viewpoints from SR 14 and the conceptual location design (Concept 2 for this example). As shown in Figure 10, the current landscape shields much of the proposed parking lot and trailhead location. Visualizations based on a more refined design, once it is prepared, may show otherwise.

[5] "This term is often used when considering image acquisition through remote sensing and refers to the time of the year during which an image is taken. . . Leaf-off means that there is no foliage or a reduced amount of foliage on the tree or shrub species. Sometimes it is beneficial to have leaf-off imagery so that you can see ground features more distinctly. This is helpful for mapping features such as buildings and roads, which may be obscured by tree foliage during the growing season (https://mapasyst.extension.org/what-is-the-difference-between-leaf-on-and-leaf-off-imagery)."

Figure 9. Existing Conditions Preliminary Visualization from Dog Mountain Trail Summit

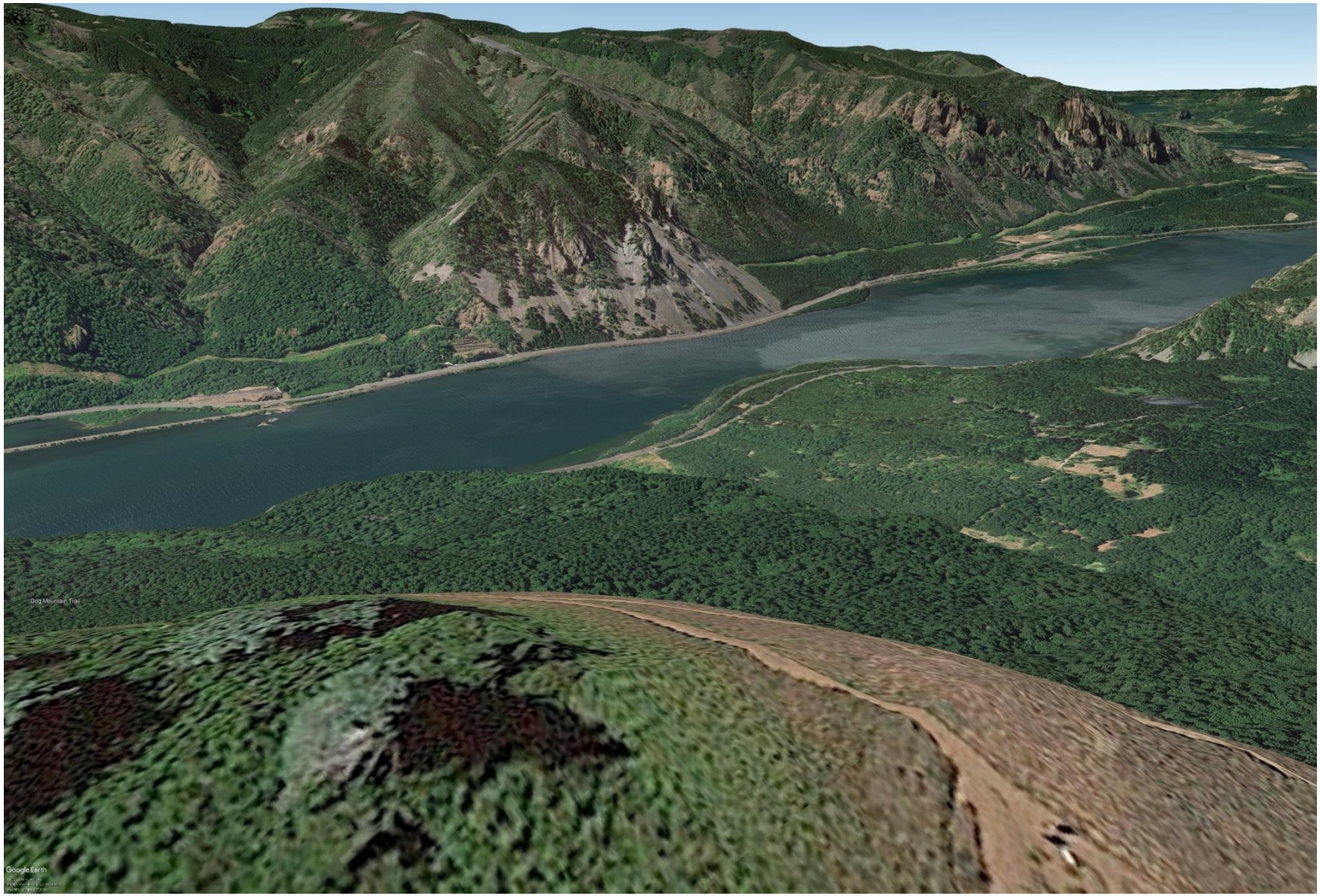


Figure 10. Concept 1 Preliminary Visualization from Dog Mountain Trail Summit

Figure 11. Concept 2 Preliminary Visualization from Dog Mountain Trail Summit

Figure 12. Preliminary Visualization from SR 14

Trails

Construction of a new, or relocated, trail connection is a key component for consideration during the planning process to relocate the Dog Mountain Trailhead parking lot. The specific features of trail construction to be considered are:

- Provide link between trailhead and existing trail
- Maintain trail level of difficulty (length, elevation, etc.)
- Provide for year-round availability
- Consider funding: Other funds may be needed to construct trails

As is done for the parking lot relocation discussion above, preliminary trail alignments and connections have been developed to aid in the evaluation; however, further refinement will be necessary during the detailed design process. A pedestrian bridge will likely be necessary to cross the seasonal creek that flows into Grant Lake.

Access and Safety Improvement Opportunities

Existing Dog Mountain Trailhead Interim Improvements

The study recognizes the Dog Mountain Trailhead relocation project is still in the early stages of analysis and the existing trailhead and parking lot will remain open to the public for the foreseeable future. As described in the Problem Statement, projected trail use is likely to continue its upward trend and managing congestion at the current Dog Mountain Trailhead parking lot under the existing configuration will remain a challenge.

The trailhead, while "grandfathered" in under the CRGNSA Management Plan, does not meet the plan's current scenic quality standards or recreation site intensity class standards. Significant physical changes to the parking lot would need to be designed to meet CRGNSA guidelines and previous efforts to improve and enhance the existing parking lot were limited by complexities with the underlying land ownership and preliminary results from an environmental study.

The next phase in project development will require further discussions with USFS and the other project partners to determine the appropriate mitigations for the existing trailhead parking lot, regardless of whether the parking lot is relocated. Interim strategies for consideration at the existing Dog Mountain Trailhead are summarized below in Table 4.

Table 4. Interim Strategies for Consideration at Existing Dog Mountain Trailhead

Strategy	Description	Considerations
Real-time parking availability	• Use closed-circuit cameras to monitor visitor demand. • The cameras could monitor traffic congestion and parking lot capacity. • WSDOT can also use cameras to view weather and road conditions that affect travel speeds, potentially resulting in slowing. • Use sensors to monitor parking utilization.	• Cameras potentially provide visitors with access to images via a website. • Cameras would require infrastructure for power (battery, solar or hardwire/fiber) and communications (wireless, cellular, hardwire/fiber, local communication tower). • Camera installation and location must be sensitive to the natural surroundings and scenic standards in the CRGNSA Management Plan. • Sensors would require similar infrastructure as cameras and likely additional maintenance costs.

Strategy	Description	Considerations
Expand peak season reservation system	• Expand peak season reservation system throughout spring and summer and/or include weekday permit requirements.	• Regular enforcement would be required to ensure compliance. • Permits are required on weekends and may be extended to Fridays and holidays during peak season (summer). Requiring permits would entail ongoing system management and support.
Extend No Parking sign to east	• Extend no parking/tow away zone signage into shoulder area of SR 14 approximately 300 feet east of the Dog Mountain Trailhead.	• Risk of restricting parking is that visitors may find a less safe way to park.
Guardrail to block access to shoulder	• Install guardrail along north shoulder of SR 14 both east and west of the Dog Mountain Trailhead to prohibit vehicles from parking in shoulder.	• Design exception may be necessary. • Guardrail could be considered as a buffered pedestrian trail to access trailhead. • Design would need to be consistent with CRGNSA Scenic Guidelines.
Congested ahead/slow vehicles warning signs	• Use portable changeable message signs to advise visitors of congestion, delays, or parking conditions during seasonal congestion.	• Dynamic and variable message signs would allow visitors to make more informed decisions. • Signs can display only a limited amount of information. • Signs would need to be designed and placed to be consistent with CRGNSA Scenic Guidelines.
Shuttle expansion	• Provide additional or larger shuttle vehicles. • Reduce the time between bus arrivals (headways). • Add more routes or stops.	• Could decrease congestion if drivers choose to switch travel modes. • Need to identify additional funding for increased capital and operating costs. • Transit vehicle size may be limited by existing parking lot geometry.

Existing Dog Mountain Trailhead Long-Term Mitigation Considerations

As previously mentioned, keeping the primary access to the Dog Mountain trail system at its current location does not meet the purpose and need of this study. The proximity of the existing trailhead and parking lot to SR 14 creates a safety concern for users of the trial system and the state highway. This safety concern will continue to exist without changes to the existing site.

A prior effort to improve the existing parking lot was shelved in 2008 due to complexities with land ownership and preliminary results from environmental studies.[6] Those complexities still exist today and, in combination with the RIC standards, create uncertainty that an upgraded parking lot with adequate capacity is feasible in its current location.

The project team anticipates the fate of the existing Dog Mountain Trailhead parking lot will be reviewed during the next phase of the Dog Mountain Trailhead relocation project. Some preliminary ideas were developed as part of this study area are summarized in Table 5.

[6] WA PFH 185-1 (7) SR 14, Dog Mountain Trailhead Enhancement Project Public Notice, WFLHD FHWA, May 20, 2008.

Table 5. Long-Term Mitigation Considerations at Existing Dog Mountain Trailhead

Strategy	Description	Considerations
Restore parking lot to natural conditions	• Abandon existing parking lot and trailhead and restore to natural conditions.	• Would require that relocated parking lot be operational. • Could be a form of mitigation for the relocated parking lot. • Design would need to deter visitors from attempting to access the existing trail from the abandoned trailhead location.
Repurpose existing parking lot	• Repurpose existing parking lot to transit only. •	• Access to parking lot would need to be managed/controlled, potentially by an automatic gate through limited entry permits. •
Single access point	• Create consolidated access point to existing parking lot through aesthetically appropriate barrier. • Access point should be located at western end to achieve adequate sight distance.	• Could consider wall that mimics historical rock wall in CRGNSA, earth berm, or aesthetic barrier. • Would need to be designed and placed to be consistent with CRGNSA Scenic Guidelines.

Relocated Parking Lot Access

The concept refinement process for the Dog Mountain Trailhead relocation includes considering improvements to SR 14 in the vicinity of the trailhead parking lot. These improvements would address safety issues related to accessing SR 14 and the parking lot, including a review of sight distance, left-turn lane warrants, and right-turn lane warrants, as discussed in the following sections. Assumptions for the relocated parking lot use and traffic counts collected in 2021 provide the basis for the information presented below. Only bidirectional traffic counts of SR 14 on either side of the existing parking lot are used in the assessment summarized below, so data on turns into the parking lot are estimates. This analysis of parking lot access should be revisited during design refinement and should include turn-movement counts during the peak use.

LEFT-TURN WARRANT ANALYSIS

The WSDOT Design Manual, Section 1310.03(2)(a), provides guidelines for consideration in installing a one-way left-turn lane. The following discussion explores each of these guidelines as it applies to the analysis for the relocated SR 14 Dog Mountain Trailhead.

- ***A traffic analysis indicates congestion reduction with a left-turn lane. On two-lane highways, use Exhibit 1310-7, based on total traffic volume (DHV) for both directions and percent left-turn traffic, to determine whether further investigation is needed.***

  The posted speed is 55 miles per hour (mph), and traffic counts were taken on Saturday, July 17, 2021. This date falls outside the time when permit reservations are required for trail use and represents a summer season scenario for turns into the trailhead parking lot. The traffic data was used along with Exhibit 1310-8 to determine whether a left-turn lane would be warranted based

on capacity. Assuming a conservative estimated left-turn volume of 50 vehicles per hour, the left-turn lane is not warranted based on the guidelines indicated in Exhibit 1310-7.

- ***A study indicates crash reduction with a left-turn lane.***
  Current accident data (for the five-year period between 2015 and 2019) was collected from WSDOT, as discussed above (see Table 2 and Figure 2). Two crashes were reported between MP 52.8 and MP 53.3 on SR 14. The crash data does not preclude a left-turn lane; however, the collision types that occurred were caused by a rock fall and an equipment failure, indicating that a left-turn lane would likely not have prevented the collisions.
- ***Restrictive geometrics require left-turning vehicles to slow greatly below the speed of the through traffic.***
  The geometrics of the proposed entrance are not considered restrictive. However, due to the relatively high speed of through traffic on SR 14, it is expected that left-turning vehicles will slow substantially below the speed of through traffic.
- ***There is less than decision sight distance for traffic approaching a vehicle stopped at the intersection to make a left turn.***
  A formal sight distance study was not conducted at this conceptual phase of planning; however, the following estimates of sight distance were prepared based on photos taken during a site visit and consultation of online webmapping tools:
  - Available sight distance from the west to conceptual parking lot access = ~800 feet
  - Available sight distance from the east to conceptual parking lot access = >1,000 feet

  There appears to be adequate decision sight distance for a left-turn lane on SR 14 at the conceptual parking lot access.

RIGHT-TURN LANE WARRANTS

The WSDOT Design Manual, Section 1310(3), provides guidelines for consideration of installing right-turn lanes. The following discussion explores each of these guidelines as it applies to the analysis for the relocated SR 14 Dog Mountain Trailhead.

- ***For two-lane roadways and for multilane roadways with a posted speed of 45 mph or above, when recommended by Exhibit 1310-19.***
  An analysis of the traffic volumes on SR 14 from Saturday, July 17, 2021, and assuming a conservative estimated right-turn volume of 50 vehicles per hour, a right-turn lane is not warranted based on traffic volumes.
- ***A crash study indicates an overall crash reduction with a right-turn lane.***
  Current accident data (for the five-year period between 2015 and 2019) was collected from WSDOT, as discussed above (see Table 2 and Figure 2). Two crashes were reported between MP 52.8 and MP 53.3 on SR 14. The crash data does not indicate that a right-turn lane would provide an overall crash reduction.
- ***The presence of pedestrians requires right-turning vehicles to stop.***
  Low pedestrian activity is expected on SR 14.
- ***Restrictive geometrics require right-turning vehicles to slow greatly below the speed of the through traffic.***

The geometrics of the proposed entrance are not considered restrictive. However, due to the relatively high speed of through traffic on SR 14, it is expected that right-turning vehicles will slow substantially below the speed of through traffic.

- ***There is less than decision sight distance for traffic approaching the intersection.***
  A formal sight distance study was not conducted at this conceptual phase of planning; however, the following estimate of sight distance was prepared based on photos taken during a site visit and consultation of online webmapping tools:
  - Available sight distance from the east to conceptual parking lot access = >1,000 feet

  There appears to be adequate decision sight distance for a right-turn lane on SR 14 at the conceptual parking lot access.

Signing should be added on SR 14 to prohibit parking on the SR 14 shoulders adjacent to the trailhead parking lot. This measure will ensure that adequate sight distance is available and will improve safety on SR 14.

NEXT STEPS: STUDIES AND SITE INVESTIGATIONS NEEDED

To develop the project and move into the NEPA analysis phase, the following studies and site investigations are recommended:

Conceptual Design Package

The next step in developing this project is to develop a set of Conceptual Level (30 percent Design) Plans to clearly identify the project footprint and identify the boundaries of the environmental studies needed for the project. This work would include:

- A Traffic Study to determine proposed circulation patterns and travel demand forecasting at the intersection of SR 14 and the proposed trailhead access road to confirm turn lane warrants
- Field Survey of proposed project footprint
- Horizontal and Vertical Alignment and Typical Section of new access road, parking lot, and highway intersection
- Type, Size, and Location Report for project structures
- A preliminary Geotechnical Report
- Refined Construction Cost Estimate based on 30 percent Design
- Environmental Site Investigations and Identified Permitting Needs (potentially to be completed by USFS
- Delineation of wetlands that could be affected by the project
- Survey and assessment of significant trees within the project footprint
- Work session between the appropriate land management agencies and design team to refine concept location based on additional studies and mitigation needs

Key Issues to be Resolved

During the next phase of the project, several decisions need to be made, including but not limited to:

- The fate of the existing parking lot needs further evaluation.
- Design criteria must be established before beginning design.

Also, since part of the existing Dog Mountain Trailhead parking area is on a BNSF easement, coordination with the railroad should be initiated early in project development.

REFERENCES

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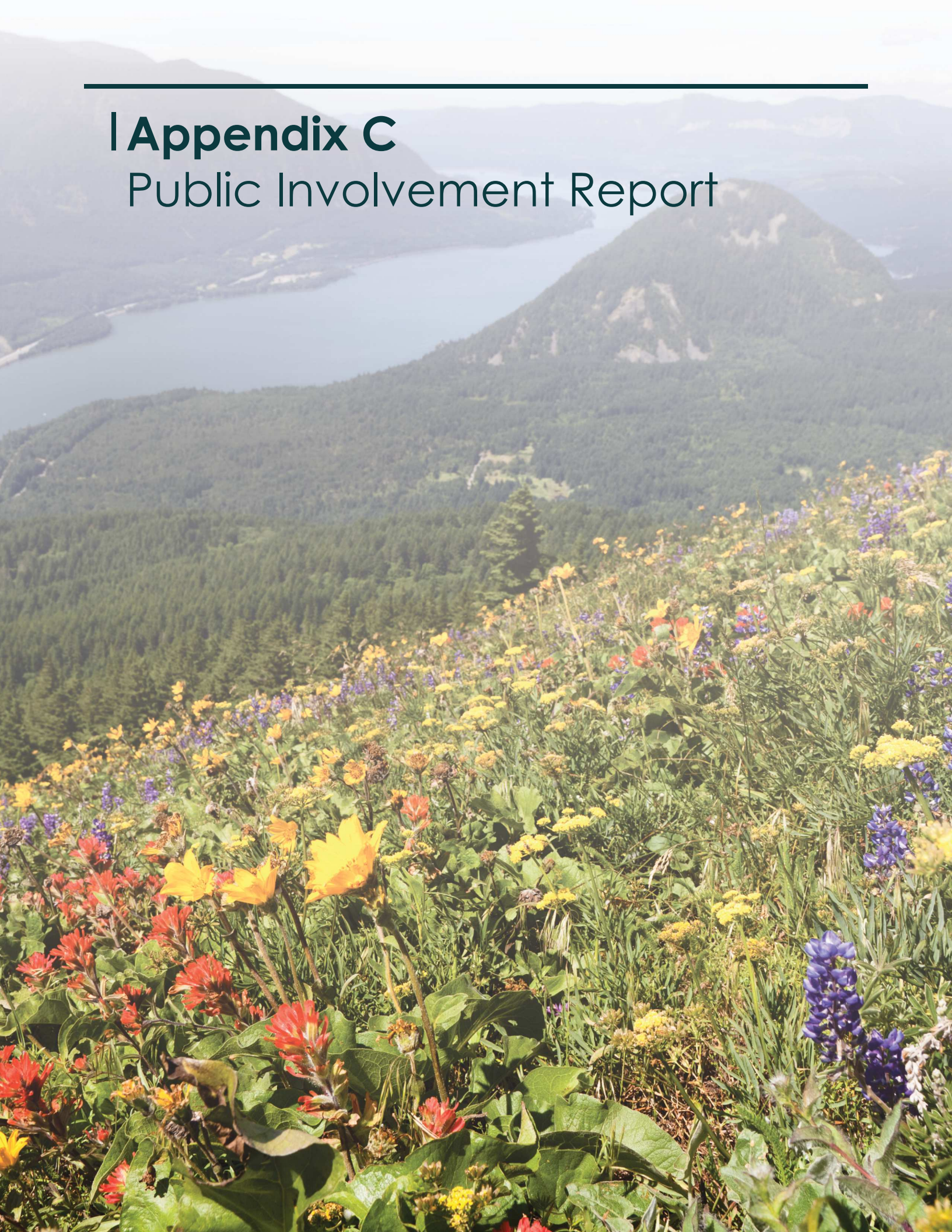

Appendix C
Public Involvement Report

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SR 14 AND DOG MOUNTAIN CONGESTION AND SAFETY PLAN

Public Involvement Summary – June 2020 – March 2022

INTRODUCTION

The Federal Highway Administration (FHWA) is partnering with the United States Forest Service (USFS) and the Washington State Department of Transportation (WSDOT) to develop a congestion and safety plan for Washington State Route 14 (SR 14) and the Dog Mountain Trailhead. As part of developing this plan, the agencies conducted a public involvement process from June 2020 to March 2022 to inform and gain input from stakeholders in the project area.

The public involvement process included:

- Sending materials to resident stakeholders along the SR 14 corridor
- Creating a project website and three additional online open houses to share information and request public comment via surveys
- Hosting virtual stakeholder and community meetings over Zoom

Though initially planned for in-person stakeholder events, the outreach process was moved to virtual events due to COVID-19.

SUMMARY OF VIRTUAL PUBLIC INVOLVEMENT

Website and online open house #1

In January 2021, the project team created a project website (https://sr14study.participate.online/) to host information about the SR 14 and Dog Mountain Congestion and Safety Plan and include resources and materials for interested stakeholders and community members to view. Information presented in the online open house included:

- A background and overview of the Study, explaining the study's purpose for the SR 14 corridor and Dog Mountain Trailhead
- Vision and goals of the study for SR 14 and Dog Mountain
- Plan frameworks and important factors the project teams considered while developing the study
- A map of the study area (fig. 1)
- A timeframe of the public involvement and planning process
- An overview of existing conditions that discusses the environmental setting of the study area, along with existing safety and congestion concerns.

Figure 1 - Map of the study area.

As part of the creation of the website, the project teams also conducted a virtual online open house with an accompanying survey to educate the public about the existing conditions of the project and get their feedback on needs and deficiencies in the SR 14 corridor.

The online open house and survey was open from January 8, 2021 through February 1, 2021 and asked participants about their travel patterns, goals and concerns for the project area. The survey received 42 responses. The survey consisted of an Alchemer survey and Social Pinpoint map, wherein participants could share their thoughts via a map that allowed them to specify the location of their feedback.

Key takeaways from the survey and Social Pinpoint included:

SR 14 Travel Patterns and Concerns

- Most respondents (55%) use the corridor for recreation. The second most common use is commuting (38%).
- Respondents thought the most important goals of the Safety and Congestion Plan were improving safety, protecting resources and managing congestion.
- Respondents noted a variety of safety concerns in the corridor including congestion, unsafe passing, unsafe/illegal parking, rockfall, large trucks and unsafe speeds.
- The sites in the corridor that respondents visit most are Beacon Rock, Cape Horn, Dog Mountain and Catherine Creek.
- Respondents provided several specific suggestions to improving safety and congestion in the corridor including suggestions on parking infrastructure and alternative transportation. These are discussed below in the detailed question summary.

Dog Mountain Trail Access and Congestion

- Respondents are concerned with both parking congestion and hiker congestion at Dog Mountain Trail. They suggested several potential solutions including adding parking in various

locations near the hike, expanding the permit system, expanding shuttle access and/or encouraging visitors to do other hikes.

Online open house #2 and community conversations

In fall 2021, the agencies conducted a second online open house and accompanying survey to share with the public an overview of the types of strategies for consideration as part of the plan study and to gather feedback and concerns on the proposed strategies along the project recreation areas.

The online open house and survey was open from October 11, 2021 through November 1, 2021. The survey received 36 survey responses. The survey consisted of an Alchemer survey and Social Pinpoint map, wherein participants could share their thoughts via a map that allowed them to specify the location of their feedback.

The project teams also hosted two virtual "Community Conversations" Zoom public meetings on October 14 and October 20, 2021. These public meetings invited stakeholders to learn more about the status of the project and ask direct questions to the project team. There were 16 unique attendees across both dates.

Key takeaways from the survey, social pinpoint and community conversations included:

SR 14 Travel Patterns and Concerns

- Most respondents had the highest concern for safety for the Klickitat Spit/Lyle Trailhead. The second highest safety concern was about the Coyote Wall Trailhead.
- Respondents noted a variety of safety concerns in the corridor including unsafe speed and unsafe/illegal parking along the corridor.
- Respondents provided several specific suggestions for improving safety and congestion in the corridor including suggestions on parking infrastructure and alternative access to recreation areas. These are discussed below in the detailed question summary.

Dog Mountain Trail Access and Congestion

- Respondents are concerned with both parking congestion and hiker congestion at Dog Mountain Trail.

Online open house #3

In late January and February of 2022, the agencies conducted a third and final online open house and accompanying survey to share with the public a copy of the SR 14 and Dog Mountain Trailhead Study Draft report and an opportunity to provide public comment. Visitors could comment via a survey on five chapters of the report (Context, Coordination, Needs and Issues, Strategies and Implementations).

The online open house and survey was open from January 28, 2022 through February 4, 2022. The survey received 11 responses.

Key takeaways from the survey include:

- Additional contextual information and reference to other local and regional transportation plans would add value
- A need for greater focus on rural areas in the project corridor

SUMMARY OF EMAIL/STAKEHOLDER COMMUNICATIONS

The project team sent out three stakeholder emails to about 100 recipients on the launch dates of the online open houses to promote the survey. These were sent on January 8, 2021, October 11, 2021, and January 28, 2022.

Press releases with information to promote the online open houses were also sent to local news radio stations and news outlets along the SR 14 corridor.

SUMMARY OF PRINTED MATERIALS

The project team coordinated mailing for two project postcards to send to stakeholders along the SR 14 corridor in promotion of the January 2021 and January 2022 online open houses to around 1,000 addresses each postcard (see fig. 2).

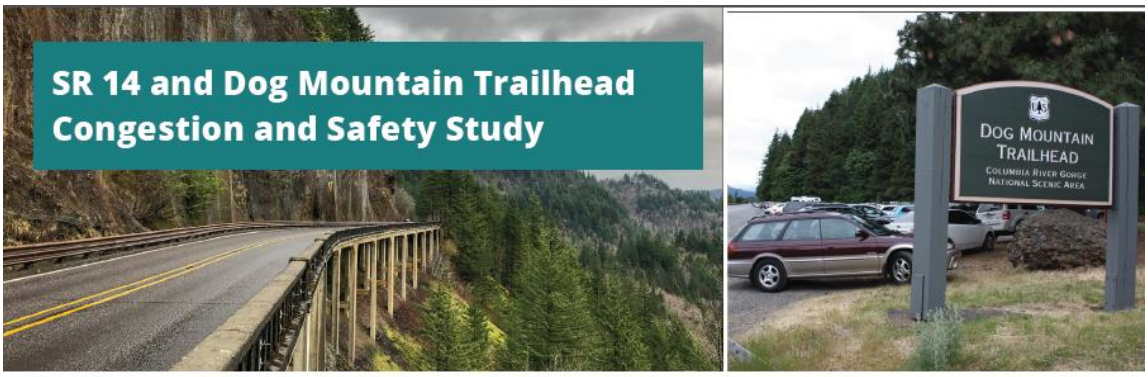

Figure 2 Front side of the January 2022 postcard mailed to stakeholders.

Appendix D
Funding Sources

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Potential Funding Mechanisms

Federal Funding Sources

Federal Lands Access Program

The Federal Lands Access Program (FLAP) was established in 23 United States Code (USC) 204 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 public roads, transit systems, and other transportation facilities, with an emphasis on high-use recreation sites and economic generators. The program is designed to provide flexibility for a wide range of transportation projects.

The program is funded by contract authority from the Highway Trust Fund and subject to obligation imitation. Funds are allocated among the states using a statutory formula based on road mileage, number of bridges, land area, and visitation.

FHWA Western Federal Lands issues a Request for Proposals every two years and agencies may request $100,000 or more in funding. A minimum local match of 13.5 percent is required, although a higher local match amount typically results in a higher-ranked application. The Federal Land Management Agency (FLMA) must support and sign the application.

Federal Lands Transportation Program

The Federal Lands Transportation Program (FLTP) was established in 23 USC 203 to improve the transportation infrastructure owned and maintained by the following FLMAs: National Park Service (NPS), Bureau of Land Management (BLM), Bureau of Reclamation (BOR), USFWS, USFS, U.S. Army Corps of Engineers, and independent federal agencies with land and natural resource management responsibilities.

The FLMAs have considerable responsibility and latitude for managing their program within the FLTP. FHWA, however, is ultimately responsible for ensuring the program is administered according to the statutory and implementing regulations for Title 23 USC, including conformity to highway planning, design, construction, maintenance, and safety standards. The use of FLTP funds does not affect the overall responsibility for construction, maintenance, and operations of the facilities. That responsibility continues to lie with the owner of the facility.

Federal Lands Recreation Enhancement Act

The Federal Lands Recreation Enhancement Act (FLREA) authorizes five agencies to charge and collect recreation fees on federal recreational lands and waters. The five agencies are BOR, BLM, USFWS, NPS, and USFS. The agencies retain the collected fees primarily for operation and maintenance of sites and on-site improvements.

The FLREA authorizes agencies to charge different kinds of fees at recreation sites, outlines criteria for establishing fees, and prohibits fees for certain activities or services. USFS can charge “standard amenity fees” in areas or circumstances where a certain level of services or facilities are available.

FLREA also authorizes all five agencies to charge an “expanded amenity fee” for specialized facilities and services, and special recreation permit fees for specialized uses, such as group activities.

Great American Outdoors Act/Land and Water Conservation Fund

The Great American Outdoors Act (GAOA) was signed into law in 2020 and is intended to fund up to $1.9 billion annually (for five years from energy development) for the National Parks and Public Land Legacy Restoration Fund to provide needed maintenance for critical facilities and infrastructure in our national parks, forests, wildlife refuges, recreation areas, and American Indian schools.

The GAOA will also use royalties from offshore oil and natural gas operations to permanently fund the Land and Water Conservation Fund (LWCF) to a level of $900 million a year to invest in conservation and recreation opportunities throughout the country. The LWCF program is divided into the "State Side," which provides grants to state and local governments, and the "Federal Side," which is used to acquire lands, waters, and interests therein necessary to achieve the natural, cultural, wildlife, and recreation management objectives of federal land management agencies.

Nationally Significant Federal Lands and Tribal Projects

The Nationally Significant Federal Lands and Tribal Projects (NSFLTP) program provides federal funding for the construction, reconstruction, or rehabilitation of transportation projects that provide access to or are located on federal or tribal lands. Under the NSFLTP, the federal share of a project can be up to 90 percent and can be used to improve the condition of a critical transportation facility. Large-scale projects with estimated construction costs of $50 million or more are given priority consideration for selection, but the program accepts projects with estimated construction costs of at least $25 million.

Emergency Relief and Federally Owned Roads

The Emergency Relief and Federally Owned Roads (ERFO) program was established to assist federal agencies with the repair or reconstruction of tribal transportation facilities, federal lands transportation facilities, and other federally owned roads that are open to public travel, which are found to have suffered serious damage by a natural disaster over a wide area or by a catastrophic failure. The intent of the ERFO program is to pay the unusually heavy expenses for the repair and reconstruction of eligible facilities. The ERFO program is not intended to cover all repair costs but rather to supplement FLMA repair programs.

Rebuilding American Infrastructure with Sustainability and Equity

The Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Transportation Discretionary Grant program provides a unique opportunity for the U.S. Department of Transportation (USDOT) to invest in road, rail, transit, and port projects that promise to achieve national objectives. The RAISE program enables USDOT to examine projects on their merits to help ensure that taxpayers are getting the highest value for every dollar invested. The eligibility requirements of RAISE allow project sponsors at the state and local levels to obtain funding for multimodal, multijurisdictional projects that are more difficult to support through traditional USDOT programs.

Surface Transportation Program

The Surface Transportation Program (STP) continues to be the most flexible of all the highway programs and provides the most financial support to local agencies. Projects eligible for STP funding include highway and bridge construction and repair; transit capital projects; and bicycle, pedestrian, and recreational trails. WSDOT allocates STP funds to Metropolitan Planning Organizations and County Lead Agencies for prioritizing and selecting projects that align with their regional priorities and involve all entities eligible to participate in a public process.

Public Transportation

This study defers to the Gorge Transit Strategy to highlight the various federal funding sources to improve public transportation services in the Gorge.

State Funding Sources

State revenue comes from numerous taxes, fees, permits, tolls, and other revenues. Washington's fuel taxes (gasoline, diesel, biodiesel, etc.) comprise the largest share of all transportation revenue in the state. Licenses, permits, and fee revenues comprise the second largest share of all transportation revenues. This revenue is related to motor vehicle registrations, weight fees, license plate replacement fees, title fees, and dealer permits. The remaining revenue consists of ferry fares, toll revenue, and driver-related and other transportation-related revenue.

State Fuel Tax

The Washington state fuel tax is the single biggest source of transportation revenue for state and local governments. Currently the state fuel tax is set by the legislature at 49.4 cents per gallon and generates approximately $3 billion per biennium.

Highway Construction Bonds

Highway Construction Bonds are an important source of funding for transportation capital projects in Washington and are authorized in Chapter 47.10 Revised Code of Washington. Debt service is the periodic payment of principal, interest, insurance, and covenants on a bond. Transportation bonds are typically issued as 25-year or 30-year debt. Bonds are backed by future fuel tax, license, permits, and fee revenue and/or tolls, and the revenue must be collected for the entire 25- or 30-year debt period. The Washington State Treasurer is also authorized to refinance original issues of bonds if conditions warrant this type of transaction. Refunding prior bond issues can reduce total debt service requirements and achieve budgetary savings over the remaining term of the bond.

Regional Mobility Grants

WSDOT manages the Regional Mobility Grant program for projects that improve connectivity between counties and regional population centers as well as to reduce transportation delay. For the 2021-2023 biennium, over $82 million was made available by the Washington Legislature to fund Regional Mobility Grant projects statewide. The program includes four eligible project types: vehicle and equipment purchases, capital construction, operations, and transportation demand management. Applicants must provide matching funds as direct contributions of at least 20 percent of the total project cost. Direct contributions are cash or other assets that directly benefit the project and are fundamental to implementing the project.

Private Funding Sources and Alternatives

Parking Management

Opportunities for parking management, including a coordinated, CRGNSA-wide paid parking system with season passes that consider discounts for locals and disadvantaged communities, should be a high priority for the Core Project Team. These opportunities include options for potential revenue generation through paid parking and reservations. Parking management provides an effective tool for managing the corridor. Its ability to connect with technology and provide real-time information may be beneficial above and beyond potential revenue generation.

It is recommended that a more detailed parking management strategy be developed. Because it is more difficult to add fees years after new improvements are made, paid parking should be considered as new and expanded parking areas are developed.

Because there are several variables to consider, further analysis is needed to explore the topic of parking management. The exploration of revenue options should consider how implementation of these options on the SR 14 corridor could impact other areas around the Gorge. Agencies should consider that fee structures can encourage or reward those who take alternative transportation to recreation sites, thereby reducing VMT and improving the environment. Equitable access should also be a critical component of the proposed program. Free or low-cost transit access is another way to offer equitable access when parking at the recreation site or areas closest to the recreation site are priced higher than transit.

Conversations regarding revenue streams are never easy but are necessary to the success of implementing new strategies and providing a safe quality visitor experience. The SR 14 corridor is a special part of the Gorge. It can offer economic benefits to the local communities and to the region. Both the indirect value and the direct value created by visitors enjoying this corridor must be considered.

Further analysis can also explore the ability to limit parking through permitting systems and then issue permits to shuttles bus services that provide access from community hubs.

Pay for Success

The Pay for Success (PFS) model is a new way of financing public services to help agencies target limited dollars to achieve a positive, measurable outcome. Under the Pay for Success model, a government agency commits funds to pay for a specific outcome that is achieved within a given time frame. The financial capital to cover the operating costs of achieving the outcome is provided by independent investors. In return for accepting the risks of funding the project, the investors may expect a return on their investment if the project is successful. Payment of the committed funds by the government agency is contingent on the validated achievement of results. In this way, the PFS model shifts the burden of investment risk from the government to private investors, effectively creating a social investment market where the government only pays for results.

Fee Collection Modifications – Revenue from Recreation, Permits, Events, etc.

User fees, or revenue from recreation facilities, are generally re-invested by the agency in fee site improvements. Further, agencies rarely operate across jurisdictions to share resources in management of recreational facilities. To break the barriers and work collaboratively to address challenges of shared facilities, such as parking, path systems, and transit, agencies need to shift to a partnership approach. This arrangement should foster collaborative operations and maintenance budgeting, sharing of revenue and expenses, sharing of resources, and monitoring of capacity and operating challenges.

The project partners must explore opportunities to keep revenue within the corridor for infrastructure preservation and annual operations, thus requiring agencies to jointly seek and commit to equitable rate structures for all visitors, understand how a specific facility's fees impact the system and move demand, and develop a corridor-wide approach to fees for shared resources and facilities. It is recognized that using funds across jurisdictions will at a minimum require legal agreements and may require legislative changes. Although implementing this collaborative, corridor-wide approach is not a simple process, it is attainable within a partnership program. For example, California State Parks has entered into joint agreements by which a portion of a fee goes to state parks and a portion goes to transit operations.

Such an agreement among the project partners should require the partnering agencies to study all current and proposed fee structures to determine the best corridor-wide funding approach for providing an excellent visitor travel experience, maintaining capacity at individual facilities, protecting natural and cultural resources, and covering the operating and maintenance costs of a shared corridor transportation system (i.e., parking, path, and transit). This approach may include new fees and structural changes, such as congestion pricing or reservation pricing, within the corridor and must consider equity for all visitors.

Road Districts

Road districts are areas created by a petition of affected landowners that allow for the issuance of bonds for financing local transportation projects.

Private Donations

The private donation of money, property, or services to mitigate identified development impacts is the most common type of private transportation funding. Private donations are very effective in areas where financial conditions do not permit a local government to implement a transportation improvement itself.

SR 14 AND DOG MOUNTAIN CONGESTION AND SAFETY STUDY
DECEMBER 2022