SR 14 AND DOG MOUNTAIN CONGESTION AND SAFETY STUDY

Dog Mountain Concept Refinement

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

DRAFT

Prepared by:
David Evans and Associates, Inc.
2100 South River Parkway, Suite 100
Portland, OR 97201

2021

CONTENTS

FIGURES

TABLES

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

DRAFT

INTRODUCTION

BACKGROUND

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 an 80-mile stretch of Washington State Route 14 (SR 14) and the Dog Mountain Trailhead. The purpose of the assessment at Dog Mountain is to identify potential for relocation of the existing parking lot that is directly adjacent to SR 14. David Evans and Associates, Inc. (DEA) is the Consultant responsible for the planning analysis preparation of conceptual design materials.

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 53.7 serves this trail system. Currently, the parking is an undeveloped gravel lot 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 parking scheme that is used by USFS on-site staff to manage parking during peak visitation.

Interagency partners (Skamania County, WSDOT, Washington State Patrol (WSP), USFS, and BNSF) met in 2015 to explore safety mitigation measures which included: early warning signs, no parking signs, law enforcement, parking lot reconfiguration from approximately 120 to 70-80 cars, shuttle bus to reduce congestion and a VMS warning sign directing visitors to use the shuttle. While this interagency effort has improved the situation, recreation use has increased to the point where it now has overwhelmed the measures that have been implemented. Despite the enforcement of no parking signs and towing and increasing ridership of the shuttle bus, unauthorized parking along SR 14 near the trailhead still occurs. This has prompted the USFS to implement an entry permit to reduce the number of cars that can access the site during peak season.

Projected growth is likely to continue its upward trend and managing congestion in the long run under the existing situation will continue to be a challenge. 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 trailhead, while "grandfathered" in under the CRGNSA Management Plan, would not meet scenic quality standards or recreation site intensity class standards.

PURPOSE OF CONCEPT REFINEMENT REPORT

The primary purpose of this Concept Refinement Report is to provide agencies responsible for the development and implementation of the project the information needed to refine project scope. This information includes clarification of 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.

DRAFT

EXISTING CONDITIONS

GENERAL CONDITIONS

The existing Dog Mountain Trailhead parking lot is located along the north side of SR 14 near milepost 54 with an uncontrolled ingress/egress 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 east of the trailhead, which limits sight distance for vehicles traveling west on SR 14 and for vehicles attempting to turn onto SR 14 eastbound from the parking lot.

SR 14 Dog Mountain 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 its panoramic views of the CRGNSA or to train for other more difficult climbs. When parking overflows onto the shoulder of SR 14, visitors walk along the narrow shoulder of SR 14 and BNSF railroad corridor to access the trailhead. A review of crash data between 2015-2019 documented 7 crashes between milepost 53.3 and 54, 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 (WFLHD) 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 obtained from the U.S. Army Corps of Engineers' Portland District office. Land use based on interpretation of the photographs is described below in Table 1.

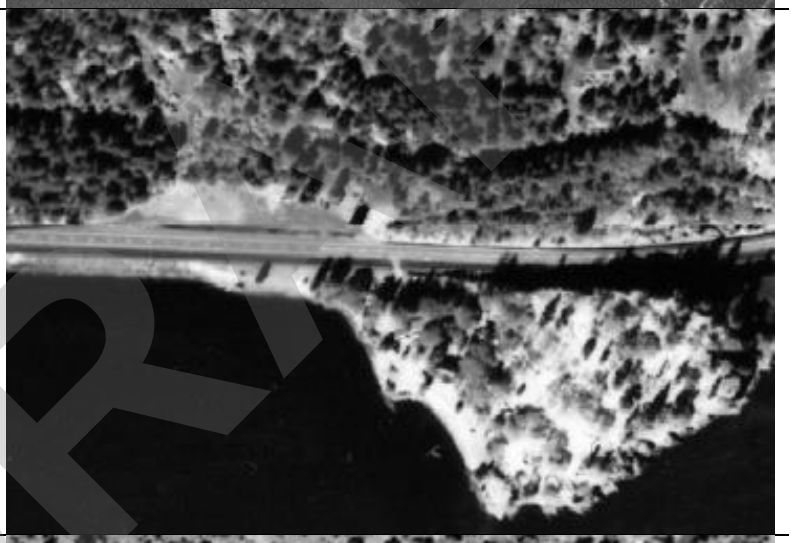
Table 1. Historic Aerial Documentation

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.	

DRAFT

Date	Comments	Aerial Photograph
1948	The cleared area has been enlarged to 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 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.	
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.	

DRAFT

Date	Comments	Aerial Photograph
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.	
1995	No significant changes were noted on the project site or in the surrounding area.	

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

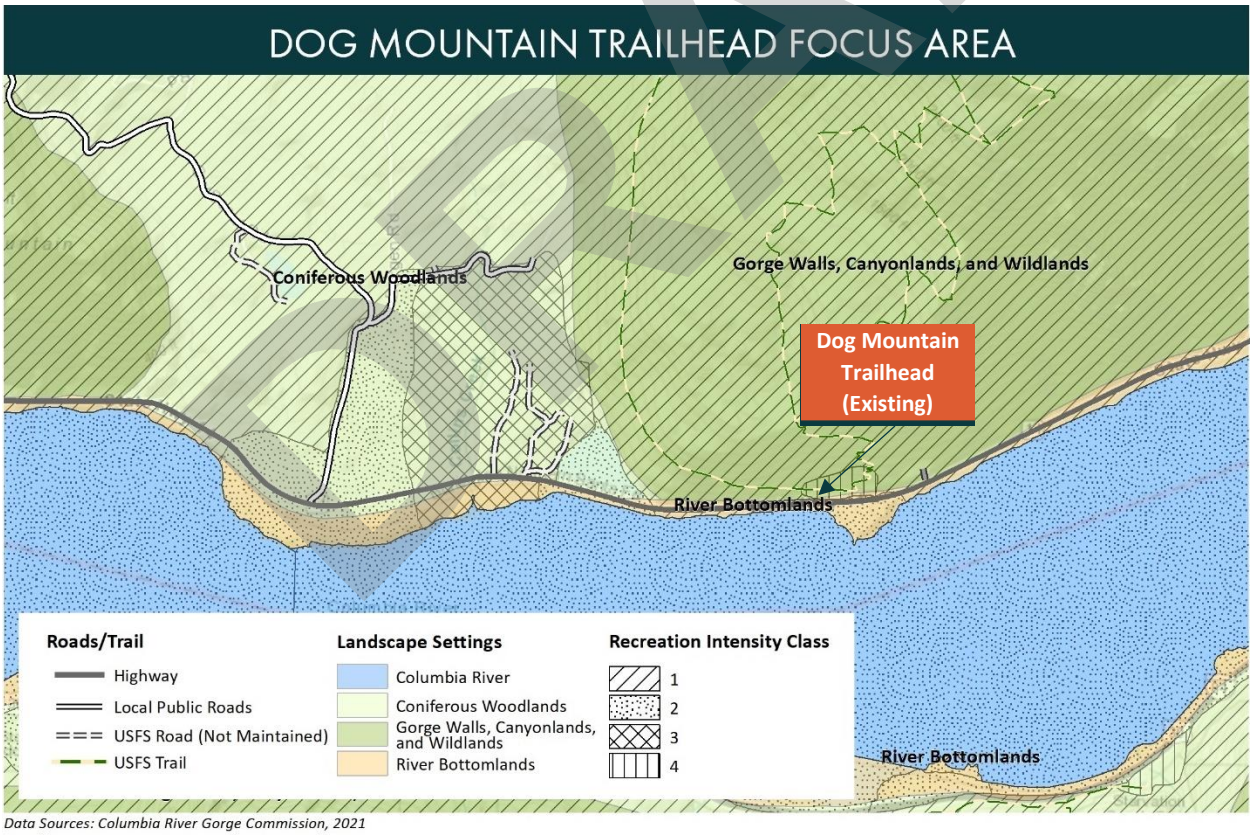
DRAFT

LAND USE

The Columbia River 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 (GMA), Special Management Areas (SMA), and Urban areas. The Dog Mountain and Augspurger Trail system and the lands with potential to house the relocation of the existing trailhead are designated as SMA. The USFS is the principal landowner for SMAs, whose uses are more restricted than designated GMAs.

The CRGNSA Management Plan further designates policies and provisions related to development for four "recreation intensity classes" (RIC) in General Management Area and Special Management Area lands. The RIC dictates the allowable recreation uses. A RIC of 1 indicates the area is suitable for very low intensity recreation and has more stringent guidelines than a RIC of 4, which indicates the area is suitable for high intensity recreation. Related to the potential trailhead and parking lot development or relocation, the RIC, as shown in Figure 1, will play an important role in alternatives development and selection. The existing parking lot spans RICs of 1, 2 or 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 BNFS (shown in Figure 3, page 11).

Figure 1. Land Use



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

ENVIRONMENTAL CONDITIONS

The environmental screening exercise is a scoping-level effort that includes information available through desktop studies. If improvement options from the study are moved forward 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 used as guidance for the NEPA process at that time.

Physical Environment

Geologic Hazards

The National Earthquake Hazards Reduction Program (NEHRP) 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–F) based on vertical shear wave velocity profile, thickness and liquefaction potential, where earthquake hazard potential generally increases from Class A to Class E. Much of Dog Mountain and the area west of Dog Mountain and east of Wind Mountain is classified D, indicating 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 - 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 is classified as such with a high landslide susceptibility.

Projects forwarded from this study will need to account for nearby geologic hazard potential in the project design. Geotechnical investigations will likely be required to support project design and construction.

Streams, Riparian Habitats, and Wetlands

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, intermittent) and the vegetation community type (i.e. forest, shrub, herbaceous). Field surveys will be required to determine potential impacts to any streams and associated riparian areas. Coordination with the appropriate state or federal wildlife agency (WDFW, USFWS, and/or USFS) will determine the appropriate width for proposed protective buffers and develop plans for protection or mitigation as necessary.

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 may only be allowed when they are unavoidable, in the public interest, and all practicable measures to minimize impacts have been applied. 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 NMFS as applicable) to determine appropriate impact mitigation or compensation approaches.

DRAFT

Biological Resources

Vegetation (Rare Plants and Natural Areas)

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. Dog Mountain is a designated Natural Area. The vegetation/terrain is east-west transition; fir and hemlock, oak, and ponderosa pine forests, with talus slopes and grasslands.

The CRGNSA Management Plan stipulates that Natural Areas shall 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 consulting with WDFW and USFS biologists.

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. Priority Habitats in the CRGNSA are identified by the USFS and state wildlife agencies as part of State Wildlife Action Plan efforts and are revised 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 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 be evaluated for adverse effects in coordination with WDFW and USFS, as applicable.

"Sensitive wildlife sites" is a generic term 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 if a proposed project is located within 1000 feet of a sensitive wildlife site.

Threatened and Endangered Species

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).

DRAFT

Direct impacts to listed fish species and their critical habitat in the Columbia River would not be expected because 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 above section, 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; USFS Survey and Manage species (on National Forest lands only); and species protected under the Bald and Golden Eagle Protection Act (BGEPA) and Migratory Bird Treaty Act (MBTA).

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

There is an October 28, 2018 Memorandum of Understanding (MOU) between the Washington State Department of Fish and Wildlife (WDFW) and the U.S. Department of Agriculture Forest Service (USFS) for management of western pond turtle (WPT) that may be relevant to the proposed Dog Mountain trailhead relocation project. The October 2018 MOU between USFS/WDFW specifically covers the Collins/Bergen Western Pond Turtle Area, which lies in the vicinity 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 MOU contents into account. Additional discussion on considerations of the MOU as it relates to potential concepts is outlined further in this report in the section discussing the refined conceptual parking relocation sites (page 15).

Visual Resources

Scenic quality is a fundamental element of recreation experiences and this is especially true 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 include:

- Washington State Route 14
- Dog Mountain Trail
- Highway I-84

EXISTING AND PROJECTED TRAFFIC VOLUMES

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

CRASH HISTORY

A safety analysis was conducted to determine whether any significant, documented safety issues exist within the study area and to inform future measures or general strategies for improving overall safety. The crash 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

DRAFT

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

As it relates to Dog Mountain trailhead focus area, the crash analysis reviewed crashes along SR 14 for MP 52.3 – MP 54.3, which are summarized in Table 2 and shown in Figure 2. There were 14 crashes reported in this segment within the 5-year analysis period, seven of which were within ½-mile east and west of the existing Dog Mountain trailhead 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 pedestrian crash resulted in the serious injury and the fatality was due to 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.

DRAFT

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

CONCEPT REFINEMENT

Five locations for the Dog Mountain trailhead relocation were originally identified by the Consultant team through information available in the Federal Lands Access Program (FLAP) application and reviewing existing topography:

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

The general location of these sites is depicted in Figure 3.

Figure 3. Draft Concepts Vicinity

DRAFT

PROJECT VISION

The purpose of 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.

Project Purpose

- Minimize/eliminate hazardous conditions along SR 14 as it relates to accessing the Dog Mountain Trail.
- Discourage parking on SR 14
- Support the land management strategies of USFS
- Maintain the trail experience of the Dog Mountain Trail

Project Need (Conditions Requiring Relief)

The assumption is that the visitor parking capacity at the existing facility is acceptable and appropriate when within the defined parking area. The defined parking area accommodates 70-80 vehicles. The parking capacity is not acceptable/appropriate when vehicle parking exceeds this 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 on the shoulder of SR 14.
- Pedestrians will walk down the north shoulder of SR 14 when parking overflows from the parking lot.
- Crashes (seven recorded within approximately ½-mile from parking lot from 2015-2019, including one fatality and one pedestrian-related).
- Sight distance is limited to the east
- There is no controlled access point for traffic entering/exiting the existing Dog Mountain parking lot.

Regardless of where the trailhead is located, 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 as listed below:

- Minimize additional length of trail to Dog Mountain to maintain the trail level of difficulty and encourage parking at the designated lot.
- Minimize impacts to biological and water resources.
- Consider location that minimizes impacts to Key Viewing Areas (KVAs).
- At minimum, provide same visitor amenities as the existing trailhead.
- Utilize existing two-track road system where feasible.

PRELIMINARY SCREENING

The five conceptual locations shown in Figure 3 were distributed to the Core Project Team (CPT) 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 it makes progress toward addressing the project purpose or if the agencies have other jurisdictional concerns. The feedback aided the project team in determining whether that deviation was substantial enough to remove the concept from further consideration or warrant refinement before more detailed analyses are completed.

DRAFT

The preliminary screening is summarized in Table 3 and the recommendations for further consideration of specific concepts are included.

Table 3. Concept Refinement: Preliminary Screening Feedback

Concept 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 resources buffer)
	• Visual:
	  • Visible from multiple KVAs in the foreground, middleground, and background
	  • If this option is selected, some potential mitigation could include the restoration of the existing parking area to a natural appearing state.
		Further refinement needed

2. Mountain Glade West	• RIC: North of road: 1, 2 & 3; South of road: 2 & 3, USFS Property • Near private dwellings • Biology: Significant, unmitigable natural resources concerns • Hydrology: Close to ponds • Visual: Least visible from KVAs	**Remove from further consideration;** unmitigable natural resources concerns.
3. Mountain Glade East	• RIC: North of road: 1; South of road: 3, Friends of the Gorge Property • Mountain Glade Rd needs improvements to serve new users • Significant, unmitigable natural resources (biology) concerns • Biology: Significant, unmitigable natural resources concerns • Hydrology: Close to large pond • Visual: Least visible 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 utilizes this resource for their operations	**Remove from further consideration;** does not satisfy project goals.

5. Existing	• RIC 1, 2 & 4; BNSF, WSDOT and USFS Property
	• Previous study noted concerns for potential hazardous materials
	• Visual:
	  • Scenic Standard: Not Visually Evident (not currently meeting this standard)
	  • Visible from multiple KVAs in the foreground, middleground, and background
		Further refinement needed

DRAFT

USFS INTERDISCIPLINARY TEAM SITE VISIT

As a follow-up to the concerns expressed during the preliminary screening, the Consultant 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 4. The findings are summarized below, and the detailed notes are provided in Attachment A.

Reviewed the preliminary draft 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 due to distance from trail, likelihood of similar safety concerns (pedestrians and SR 14), WSDOT would like to keep their maintenance yard
- Grant Lake: KVA concerns, but with opportunities for refinement. This site visit explores possible options
- Existing Trailhead: Congestion amplifies existing safety concerns (sight distance, uncontrolled access, proximity to SR 14). Spans 3 different Recreation Intensity Classes (RIC) and 3 different land owners.

Figure 4. Site Visit Route

Site Visit Notes

- Reminder that the KVA impacts need to imagine the landscape as if there were no vegetation.

DRAFT

- 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 "directness" of potential parking lot and trail connection. In addition to the actual distance, the user needs to feel like they're close.
    - The location near Grant Lake is closer to existing trailhead and provides visual of Dog Mountain (helpful for encouraging folks to use the new trailhead)
- Oak canopy (particularly on the site furthers to the west) could limit size of parking lot.
    - Site would be very limited in development potential / space (usually by the oak drip lines)
- Layout work needed 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.

REFINED CONCEPTUAL PARKING RELOCATION SITES

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

- Parking capacity for 50-75 vehicles to maintain desired user experiences at Dog Mountain and avoid site overcrowding.
- Capability of accommodating transit shuttle.
- Amenities: Transit shelter, interpretive sign(s), and vault toilet(s)
- Utilities are not required at parking lots

Conceptual layouts of the potential parking locations for the proposed sites are shown below.

Conceptual Layouts

The Consultant team prepared two unique conceptual layouts to illustrate possible configurations near Grant Lake. The layouts are meant to serve as a launching point for future reconnaissance and design refinement.

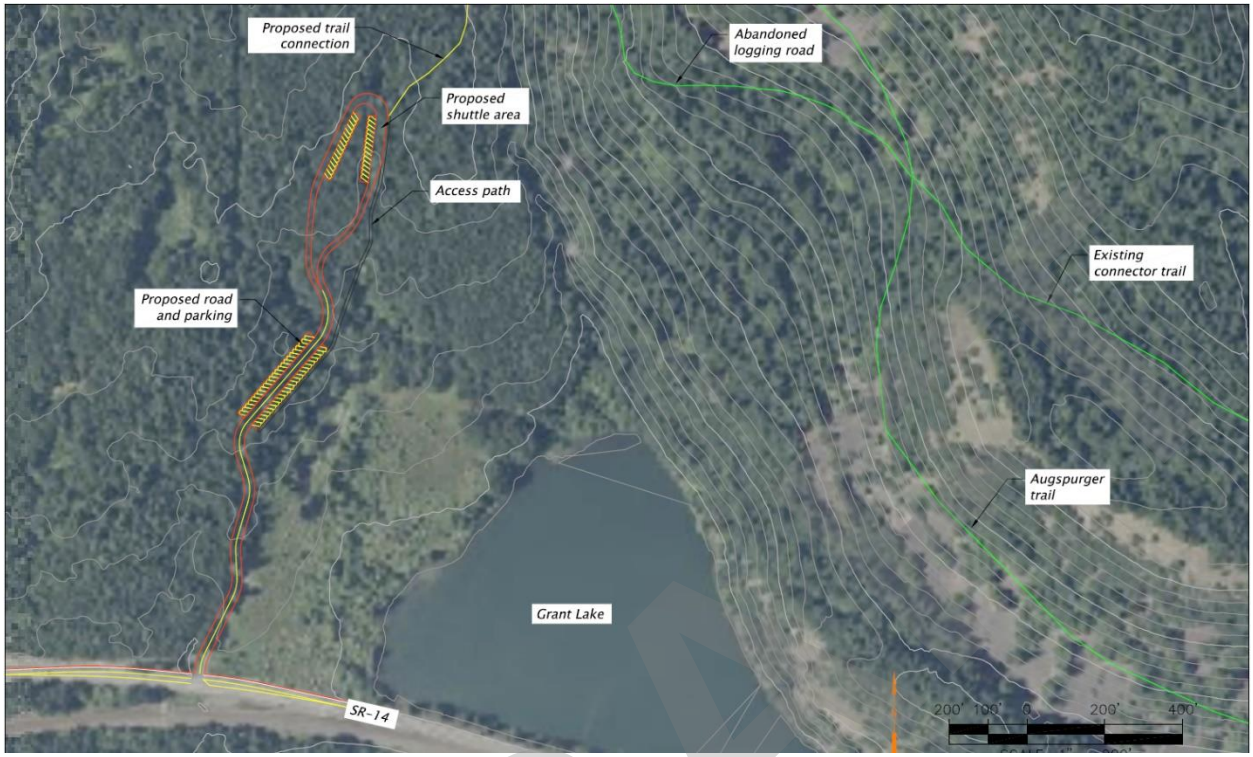
Both layouts provide the maximum 75 parking stalls allowed under the CRGNSA Management Plan standards for RIC 3, assuming enhanced mitigation. Both layouts also assume vault toilets and space is provided to accommodate a shuttle bus. The distinguishing features of each are summarized below.

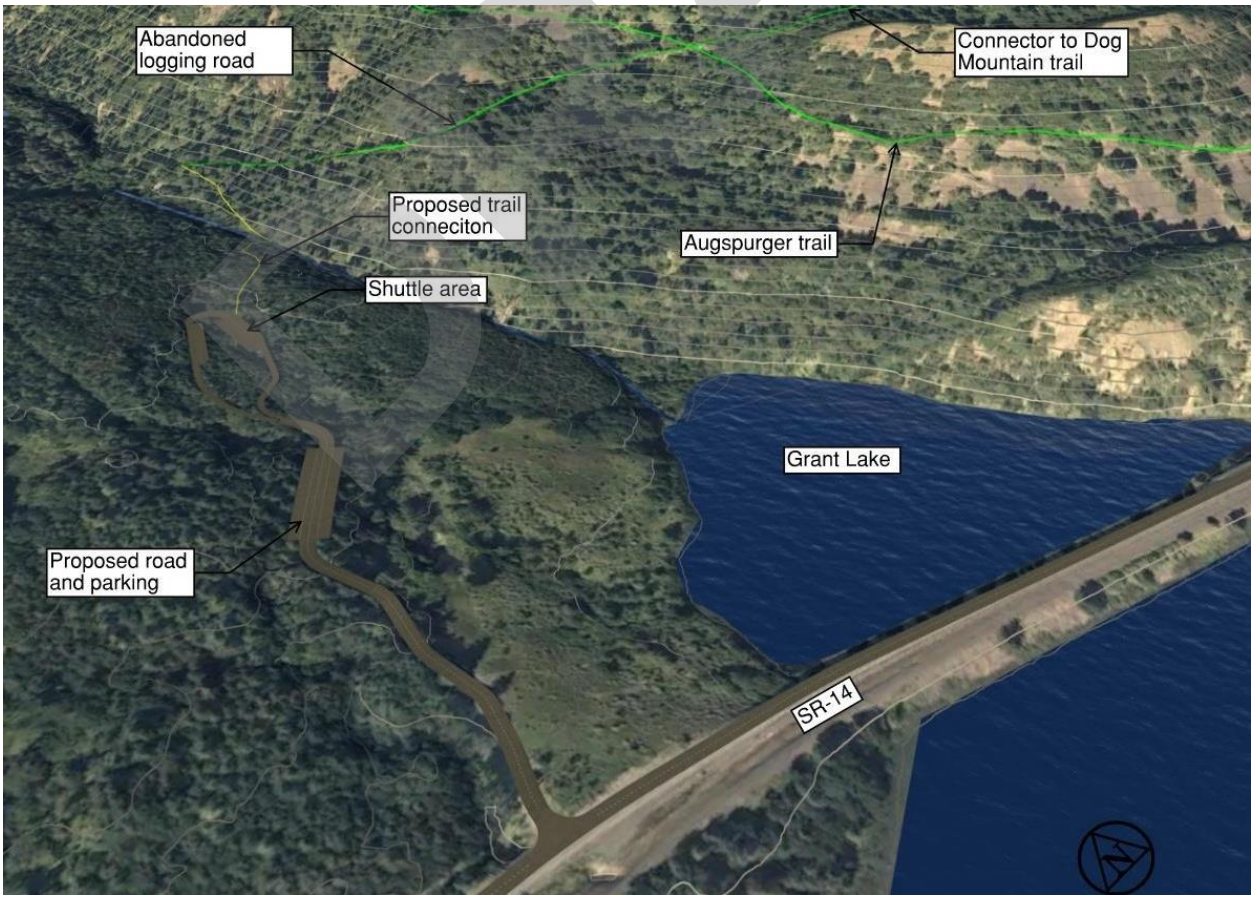
Concept 1: NW Grant Lake Sprawl

This concept is depicted in Figure 5. The distinguishing feature of this concept is that its northern lot minimizes the distance between the parking lot and the existing trail system.

DRAFT

Figure 5. Concept 1: NW Grant Lake Sprawl





The preliminary rough order of magnitude cost estimate for Concept 1 ranges from $1.8 million to $2 million, depending on design features, and includes a 40% contingency for construction costs (2021 dollars). If design, project management and construction engineering design support is needed, the estimate increases to a total of approximately $2.4 to $2.6 million.

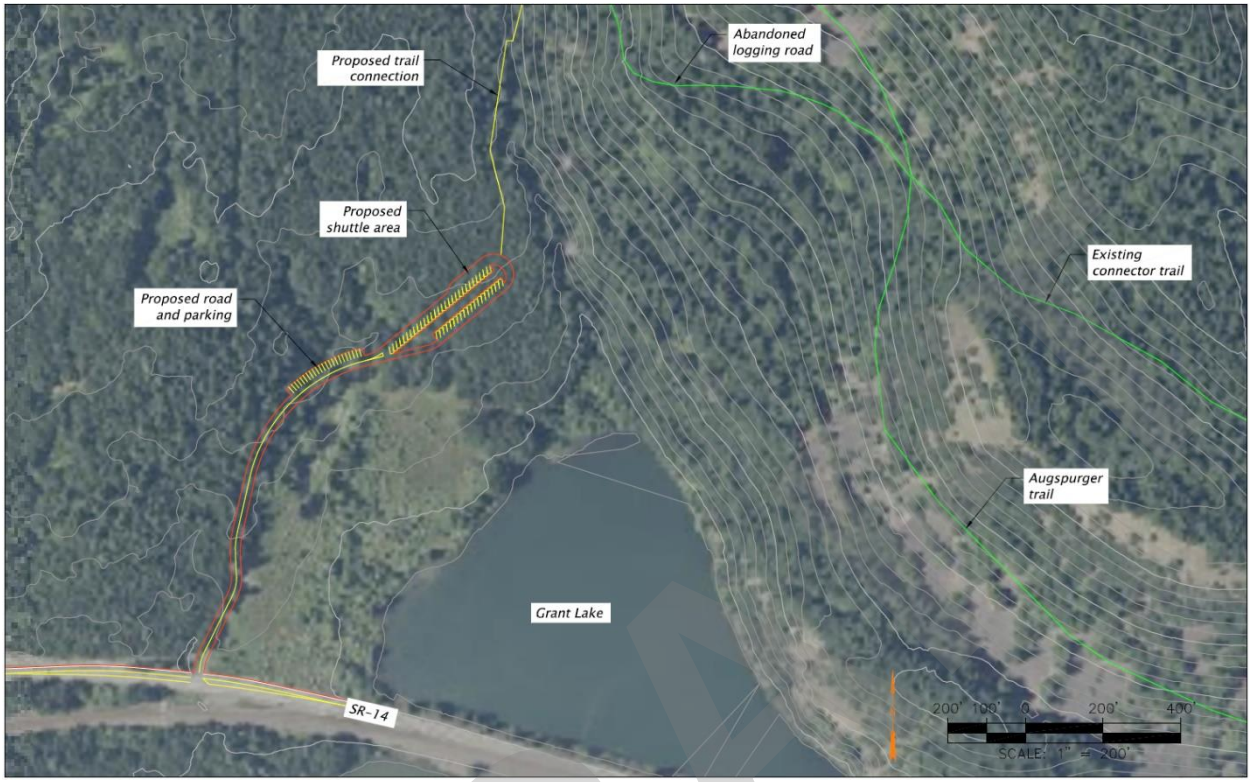
Concept 2: NW Grant Lake Compact

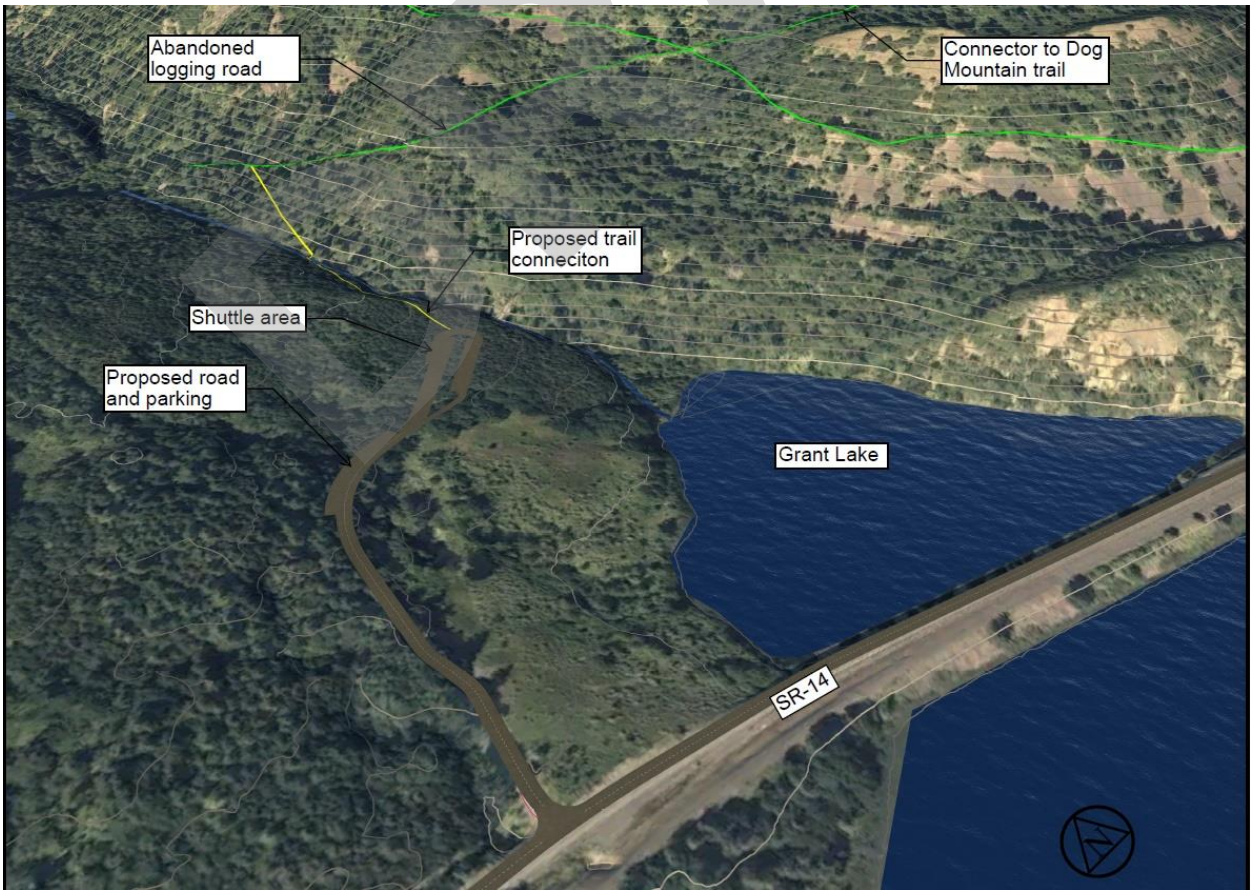
This concept is depicted in Figure 6. The distinguishing feature of this concept is that the distance between the north and south lots is minimized to reduce the overall footprint and limited the extents of new road pavement.

The preliminary rough order of magnitude cost estimate for Concept 2 ranges from $1.5 million to $1.7 million, depending on design features, and includes a 40% contingency for construction costs (2021 dollars). If design, project management and construction engineering design support is needed, the estimate increases to a total of approximately $2 million to $2.2 million.

DRAFT

Figure 6. Concept 2: NW Grant Lake Compact





Natural Resource Impacts

The conceptual drawings were developed based on information available through desktop studies and two site visits. If concepts are moved forward 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 ("the Agencies") specifically covers the Collins/Bergen Western Pond Turtle 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 in the vicinity of the proposed trailhead and parking improvements. Any parking lot/trailhead designs will need to take the turtle into account.

The following four points that seem relevant to the proposed trailhead relocation are paraphrased from the MOU in some cases for brevity. They are followed by additional thoughts from the DEA Biologist related to mitigation opportunities.

1. ***Identify management objectives that will lead to the maintenance and enhancement of WPT habitats in the C/B Area.*** Examples could include objectives such as "promote expansion of WPT populations", or "provide safe movement between habitats." These management objectives have likely already been identified by USFS/WDFW. 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.
2. ***Coordinate design with all other management programs.*** Cultural and recreational programs may have very different goals than those assigned to WPT habitat. 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.*** USFS/WDFW may wish to provide input regarding which management documents represent the most recent and most relevant guidance. However, these likely 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 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 memo appears to imply that WDFW is amenable to working with other partners where expertise is needed. This could include consultants or designers who are familiar with WPT habitat needs or survey techniques.

Although not noted directly in the MOU, the following observations by the DEA Biologist may be useful in considering potential mitigation options:

- 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. This indicates that road crossing

DRAFT

features such as wildlife-friendly culverts or larger undercrossings may need to be incorporated into the road design. Direct coordination with USFS/WDFW 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
- Highway I-84

The DEA team developed preliminary conceptual visualization of Concept 1 and Concept 2 from the Dog Mountain Trail Summit. Figure 7 depicts the view under existing (No Build) conditions, facing southwest toward Grant Lake from the Dog Mountain Trail Summit. Figure 8 depicts Concept 1 from the same viewpoint. The southern parking lot is just visible, as the ridge hides most of the parking lot's footprint. Figure 9 depicts Concept 2, which is even less apparent than Concept 1.

At this stage of conceptual design, the team does not expect the location of the parking lot to be visible in a conceptual simulation from I-84 or SR 14, due primarily to the terrain obscuring both the actual road and the parking area. A refined design with 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 competed to conduct a proper "leaf off" analysis, as those activities and changes may be visible from SR 14, even if the parking lot itself is not visible (tree removal, grading slopes, etc).

What is provided at this time is the images in Figure 10 (page 24) showing potential viewpoints from SR 14 and the location of a conceptual design (Concept 2 for this example). As shown in the figure, the current landscape shields much of the proposed location. A more refined design is needed to have visuals that may show otherwise.

DRAFT

Figure 7. Existing Preliminary Visualization from Dog Mountain Trail Summit

Figure 8. Concept 1 Preliminary Visualization from Dog Mountain Trail Summit

Figure 9. Concept 2 Preliminary Visualization from Dog Mountain Trail Summit

Figure 10. 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 parking lot. The specific features of trail construction for consideration are summarized below:

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

A depicted in previous sections, preliminary trail alignments and connections have been developed to aid in the evaluation, but 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 Safety Improvement Opportunities

Existing Dog Mountain Trailhead

As described in the Problem Statement, projected growth is likely to continue its upward trend and managing congestion at the current Dog Mountain Trailhead parking lot under the existing configuration and system will continue to be a challenge. 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 trailhead, while "grandfathered" in under the CRGNSA Management Plan, would not meet scenic quality standards or recreation site intensity class standards.

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

Table 4. Strategies for Consideration at Existing Dog Mountain Trailhead

Strategy	Description	Considerations
Real-time parking availability	• Use close-circuit cameras to monitor visitor demand management information. • 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. • 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 an additional maintenance cost.

DRAFT

Strategy	Description	Considerations
Expand peak season reservation system	• Expand peak season reservation system throughout spring and summer	• Regular enforcement would be required to ensure compliance. • 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 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 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.
Restore parking lot to natural conditions	• Abandon existing parking lot and trailhead and restore to natural conditions	• Would require 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 • Repurpose existing parking lot to pay-to-park	• Access to parking lot would need to be managed controlled, potentially by an automatic gate and/or pay station. • No-car/pay-to-park access options are only successful in reducing congestion when visitors know about and use these systems; extensive marketing of alternative mode options recommended.

DRAFT

Strategy	Description	Considerations
Single Access Point	• Create consolidated access point to existing parking lot through aesthetically appropriate barrier • Access point should be located at west 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 consistent with CRGNSA Scenic Guidelines.
Implement Preferred Alternative from 2007 Study	• Stripe and pave the parking area with 59 spaces, including 3 accessible spaces • Add landscaped berms to create a buffer and clear zone between the parking area and SR-14 and to create a single access point • Improve drainage and provide swales for treating stormwater runoff from the parking area • Providing a paved plaza with seating areas at the trailhead • Add a sidewalk and low wall along the north edge of the parking area • Provide a new interpretive sign and improved approach signage on SR 14.	• Will require Phase II hazmat assessment (geophysical survey). • Should also test site soil and groundwater to document residual conditions related to historic land use.

Relocated Parking Lot Access

As part of the concept refinement for the Dog Mountain trailhead relocation, improvements to SR 14 in the vicinity of the trailhead parking lot are considered. This section is written to address safety issues accessing SR 14 and the parking lot, including a review of sight distance, left turn lane warrants and right turn lane warrants. The information below is based off assumptions for the relocated parking lot use and traffic counts collected in 2021. Only bidirectional traffic counts of SR 14 on either side of the existing parking lot, so turns into the parking lot are an estimate. It is recommended the analysis be revisited during design refinement and 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. Each guideline is listed as a bulleted item followed by discussion applying 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 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 scenario for turns into the trailhead parking lot. The traffic data was used along with Exhibit 1310-8 to determine if a left-turn lane would be warranted based on capacity. Assuming a conservative estimated left-turn volume of 50 veh/hour, the left-turn lane is not warranted based on the guidelines indicated in Exhibit 1310-7.

DRAFT

- ***A study indicates crash reduction with a left-turn lane.***
  Current accident data was collected from the WSDOT between 2015 and 2019 as discussed previously in this report (Table 2 and Figure 2). Two crashes were reported between MP 52.8 – MP 53.3. The crash data does not preclude a left-turn lane; however, the collisions types were caused by a rock fall and an equipment failure, indicating 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 phase of conceptual planning, however photos taken during a site visit and consulting online webmapping tools estimated the following data:
  - 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

RIGHT TURN LANE WARRANTS

The WSDOT Design Manual Section 1310(3) provides guidelines for consideration of installing right turn lanes. Each guideline is listed as a bulleted item followed by discussion applying 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 veh/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 was collected from the WSDOT between 2015 and 2019 as discussed previously in this report (Table 2 and Figure 2). Two crashes were reported between MP 52.8 – MP 53.3. The crash data does not indicate 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.

DRAFT

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

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 would be to develop a set of Conceptual Level (30 percent) Plans to clearly identify the footprint of this project 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 the forecasted volume 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 structures on project.
- A preliminary Geotechnical Report.
- Refined Construction Cost Estimate based on 30% Design.
- Environmental Site Investigations and Identified Permitting Needs (to be completed by the 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 there are several decisions that need to be made. Some of these include:

- Fate of existing parking lot needs further evaluation.
- Design criteria must be established prior to beginning design.

DRAFT