APPENDICES

Photography by: Jesse Barham/FWS

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APPENDIX A:
AGENCY PROFILES

BUREAU OF LAND MANAGEMENT AGENCY PROFILE:

TRANSPORTATION IN OREGON AND WASHINGTON

Night sky over Oregon Badlands Wilderness (Source: BLM)

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Pueblo Mountain Wilderness Study Area, Harney County, Oregon (Source: BLM)

INTRODUCTION

The U.S. Department of the Interior's Bureau of Land Management (BLM) administers 16.1 million acres of public land in Oregon and Washington. These lands represent a diversity of landscapes throughout the region, including grasslands, rivers, forest, and high desert ecosystems.

Pivotal to the BLM's strategy for managing these lands is maintaining and improving the BLM's transportation network—which includes roads, bridges, trails, and related facilities—in a manner that enhances accessibility, connectivity, and safety, while at the same time addressing public needs, preserving ecological functions, and fostering economic development.

BLM MISSION:

To sustain the health, diversity, and productivity of America's public lands for the use and enjoyment of present and future generations.

The BLM's transportation network in Oregon and Washington supports access to BLM lands for a variety of uses, including:

- Natural and cultural resource protection;
- Timber and special forest products;
- Grazing;
- Mineral and energy development;
- Recreation, such as hiking, mountain biking, equestrian, off-highway vehicle (OHV) use, rafting, and skiing;
- Hunting, foraging, and fishing;
- Permitted uses, such as rights of way and guided travel; and
- Access to private inholdings and inter-community travel.

These values contribute to local quality of life, as well as local and regional economic development. The BLM collaborates with neighboring FLMAs, private land owners and businesses, and a wide range of Federal, Tribal, State, and local governments to ensure that the BLM's transportation network supports the BLM's mission and the many values that BLM lands provide for the region.

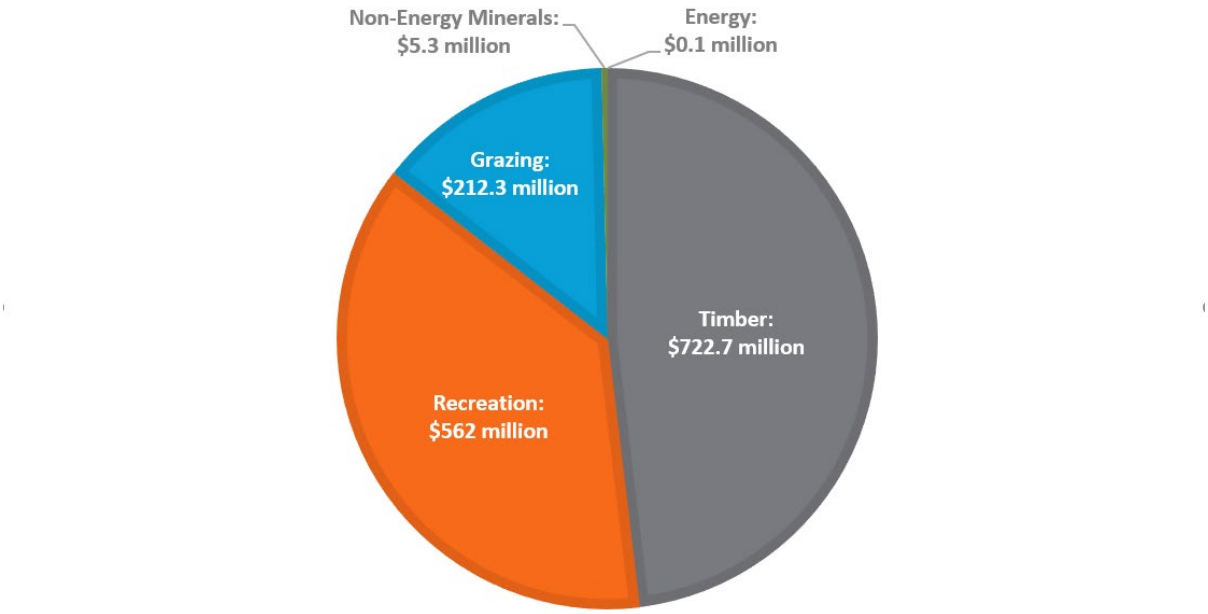
The BLM transportation network reinforces the regional economy and communities throughout the region for a total economic output of approximately $1.5 billion per year.[1] It provides the following benefits:

- Supporting approximately 8 million to 9 million recreation visits to BLM lands in Oregon and Washington each year.[2], [3]
- Contributing to the regional economy in Oregon and Washington every year.
- Directly employing approximately 1,400 people in Oregon and Washington, and indirectly supporting approximately 14,000 jobs in recreation, forestry, grazing, non-energy minerals, and energy production

[1] BLM, 2016: *The BLM: A Sound Investment for America 2016*. https://www.blm.gov/sites/blm.gov/files/AboutUs_SoundInvestmentsocioeconomicreport_lettersize.pdf
[2] BLM Facts, Oregon and Washington, 2014.
[3] BLM Facts, Oregon and Washington, 2016.

Figure A-1 shows the economic output by sector on BLM lands in Oregon and Washington in 2015. The primary economic benefits from BLM lands in the region are timber, recreation, and grazing. Each of these sectors relies on the BLM's roads, bridges, trails, and other transportation infrastructure to provide access for these economic activities.

Figure A-1: Economic output by sector on BLM lands in Oregon and Washington, Fiscal Year 2015



Source: BLM, The BLM: A Sound Investment for America 2016.

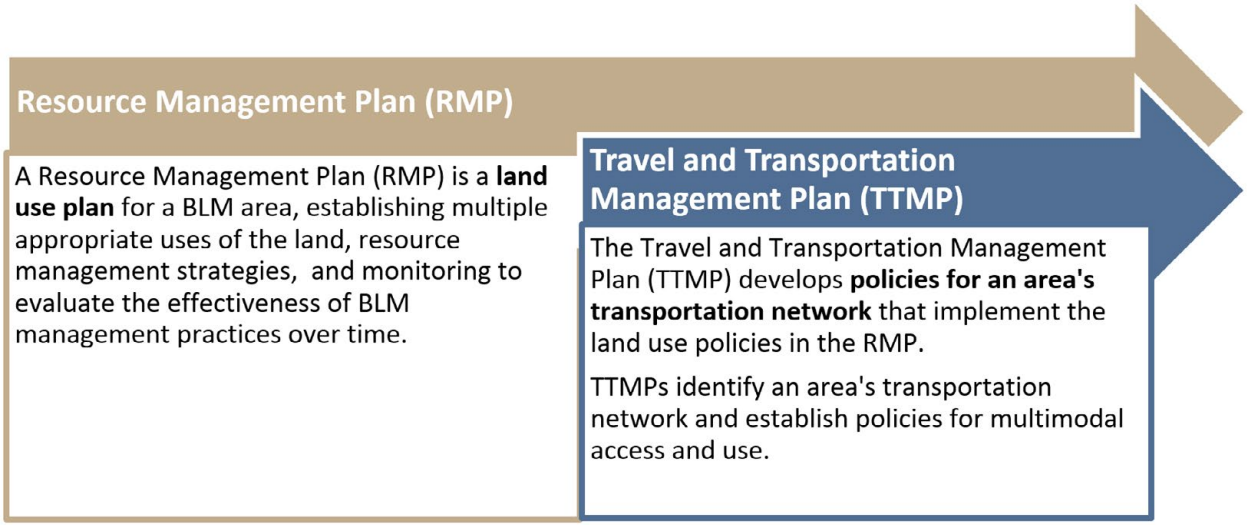
Ryegrass Butte, Sheepshead Mountains Wilderness Study Area (Source: BLM)

BLM'S TRANSPORTATION PROGRAM IN OREGON AND WASHINGTON

BLM TRANSPORTATION PLANNING

The BLM conducts the following levels (Figure A-2) of planning for those public lands it manages, all of which relate to and are compatible with this LRTP.

Figure A-2: BLM Land Use and Transportation Planning Processes



The BLM develops RMPs and TTMPs for geographic areas with similar resource characteristics, such as the scale of the Field Office, District Office, or Resource Area. The BLM must complete an area's RMP before developing the TTMP, since the TTMP implements the RMP's prescriptions.

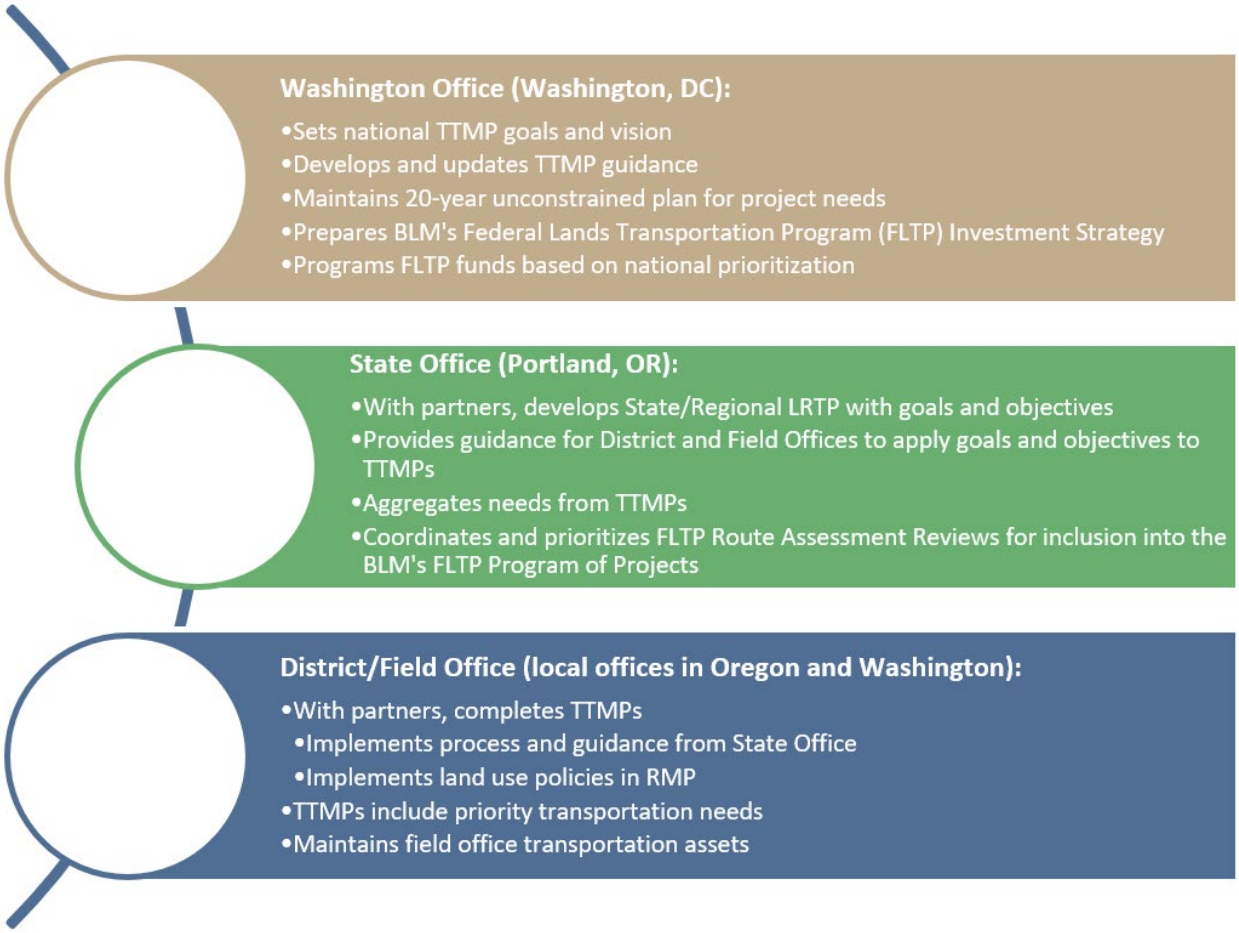
The statuses of the RMPs and TTMPs in Oregon and Washington are available on the BLM's Planning website.[4]

[4] https://www.blm.gov/programs/planning-and-nepa/plans-in-development/oregon-washington

BLM'S TRANSPORTATION PROGRAM ROLES

The BLM manages its transportation program at the national level through its Washington Office in Washington, DC. BLM State Offices and Field Offices also play critical roles in managing the BLM's transportation program, as shown in Figure A-3. The State Office for Oregon and Washington is based in Portland, Oregon. Figure A-4 shows the location of District and Field Offices in Oregon and Washington.

Figure A-3: Relationship between BLM national, State, and field office planning processes



BLM Transportation Partners

The BLM collaborates with Federal, Tribal, State, county, and other local partners to manage its transportation program. Partners include other FLMAs, Tribes, Oregon Department of Transportation (ODOT), Washington State Department of Transportation (WSDOT), county governments, and other local governmental or non-governmental organizations. The BLM recognizes the value of cooperative transportation partnerships and seeks to leverage BLM funds with other Federal, State, and local agencies, Tribes, user groups (e.g., timber harvesting, outfitters/guides, hunter associations, OHV user groups, mountain bike associations, and environmental conservation groups), and other non-governmental partners. Through these partnerships, the BLM aims to achieve the greatest benefit for the largest number of goals and objectives held by multiple agencies and organizations for shared projects that will benefit the greatest number of land users.

Figure A-4: Map of the BLM in Oregon and Washington

BLM'S TRANSPORTATION NETWORK IN OREGON AND WASHINGTON

BLM TRANSPORTATION SYSTEMS AT A GLANCE

The BLM's *Travel and Transportation Management Handbook*[5] distinguishes between the BLM's transportation network and transportation system with the following definitions:

- *Transportation Network: The network of roads, primitive roads, and trails (motorized and non-motorized) that are selected (recognized, designated, or authorized) for use through the comprehensive travel and transportation planning process.*
- *Transportation System: The roads, primitive roads, and trails designated as facility assets and maintained by the BLM.*

The BLM's multimodal transportation system assets in Oregon and Washington consist of roads, trails, and bridges, as summarized below. These system quantities are derived from the BLM's Facilities Asset Management System (FAMS). In addition, there are many additional miles of linear features on BLM-managed public lands that travelers use as part of the travel network but that are not assets in FAMS and are not included in the totals in Table A-1.

Table A-1: Summary Information on the BLM's Transportation Systems in Oregon and Washington

BLM Transportation Facility	Quantity	FY2013-2017 BLM Transportation Appropriations
Roads	19,171 miles	$65,093,000
Trails	1,404 miles	$6,017,000
Bridges	478	$2,994,000
Total	**—**	**$74,103,000**

Roads

The BLM defines a "road" as a linear route declared a road by the owner and managed for use by low-clearance vehicles having four or more wheels and maintained for regular and continuous use. The BLM characterizes its roads by three Functional Classes:[6]

- Collector Roads, which normally provide primary access to large blocks of land and connect with or are extensions of a public road system and typically receive the highest volume of traffic on the BLM's road system;
- Local Roads, which normally serve a smaller area than collectors and connect to collectors or public road systems and receive lower volumes of traffic than Collector Roads; and
- Resource Roads, which normally are spur roads that carry very low traffic volume and typically accommodate only one or two types of use.

OR/WA BLM also has 14 designated Back Country Byways in Oregon and Washington. The National Back Country Byway Program was developed by the BLM to complement the National Scenic Byways program. As an integral part of the larger Scenic Byway network, Back Country Byways show enthusiasts the best the West has to offer in a trip off the beaten path.[7] Many of these byways are native surface or gravel surfaced roads tracing across vast stretches of land.

[5] BLM. 2012. ***Travel and Transportation Management Handbook (H-9342-1).*** Page 50. https://www.ntc.blm.gov/krc/uploads/750/8342%20-%20TTM%20Planning%20Handbook.pdf.

[6] BLM Manual MS-9113 – Roads, http://www.blm.gov/style/medialib/blm/wo/Information_Resources_Management/policy/blm_manual.Par.91393.File.dat/MS%209113_.pdf

[7] BLM. 2018. Transportation Brochure: https://www.blm.gov/sites/blm.gov/files/BLM-TranspoBrochure-InDesign-Feb2018-BookletPrint%20%281%29.pdf.

Source: BLM, Transportation in the Bureau of Land Management, 2018.

Primitive Roads

The BLM defines a "primitive road" as a linear route managed for use for four-wheel drive or high-clearance vehicles. Primitive roads do not normally meet any BLM road design standards.[8]

Trails

The BLM defines a trail as a linear route managed for human-powered, stock, or off-highway vehicle forms of transportation. Trails are not generally managed for use by four-wheel drive or high-clearance vehicles.

Linkages to Partner Transportation Systems

The BLM's transportation system elements are highly connected to the transportation systems of its partners, including those facilities owned and maintained by other FLMAs, ODOT and WSDOT, county governments, and private landowners. These linkages include connections to partners' road networks, but also to multimodal transportation networks, including trails and partner-operated buses and ferries. This is true throughout the Pacific Northwest but is especially prevalent in those areas of Western Oregon where BLM land is arranged in a "checkerboard" pattern closely intermixed with adjacent private landowner parcels. For this reason, the BLM in Oregon and Washington collaborates with a diverse set of partners

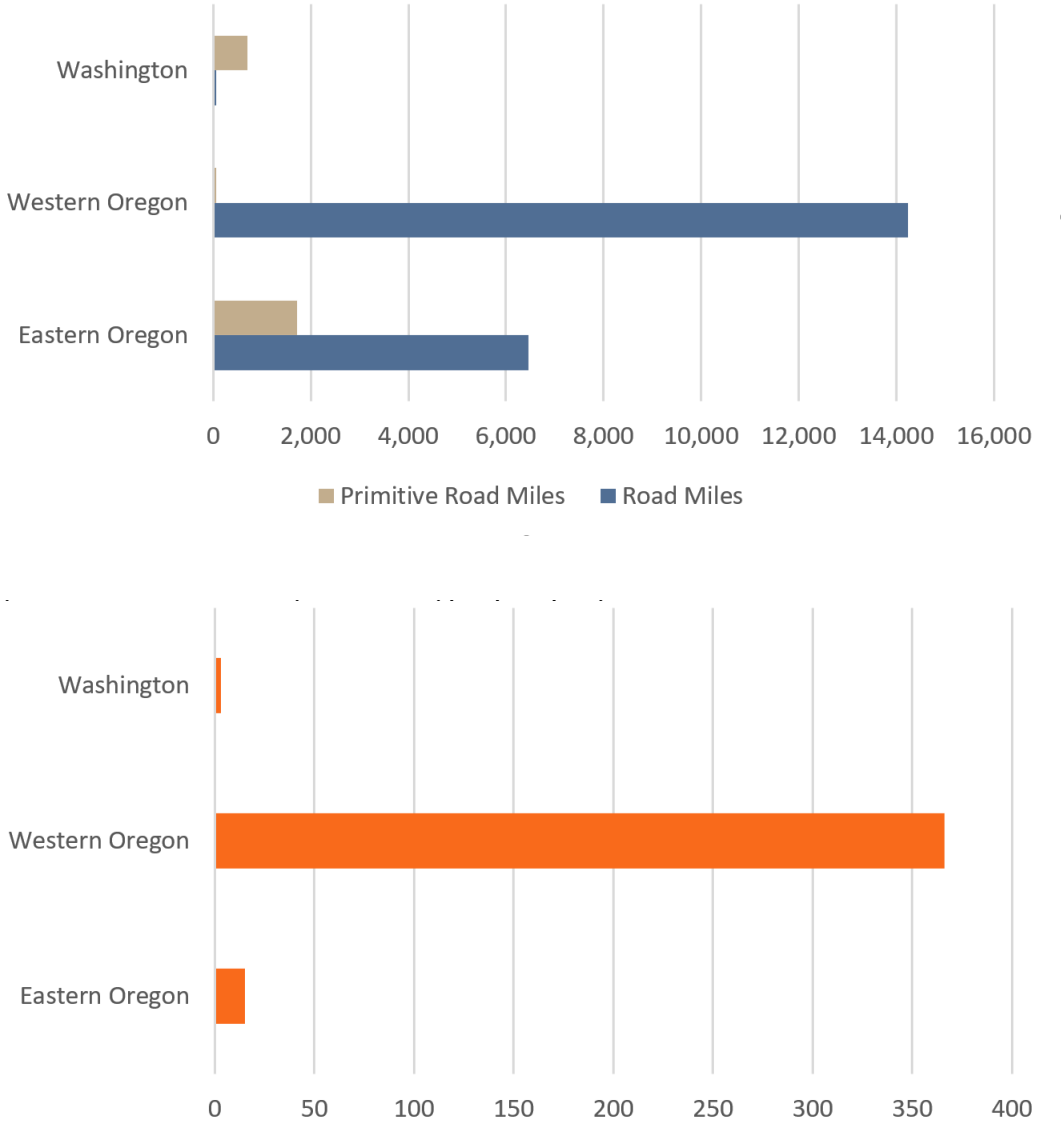
8 BLM Oregon Fact Sheet, 2014.

to manage a joint network of transportation systems by coordinating transportation data collection, planning, and asset management across jurisdictions.

BLM SUBREGIONS IN OREGON AND WASHINGTON

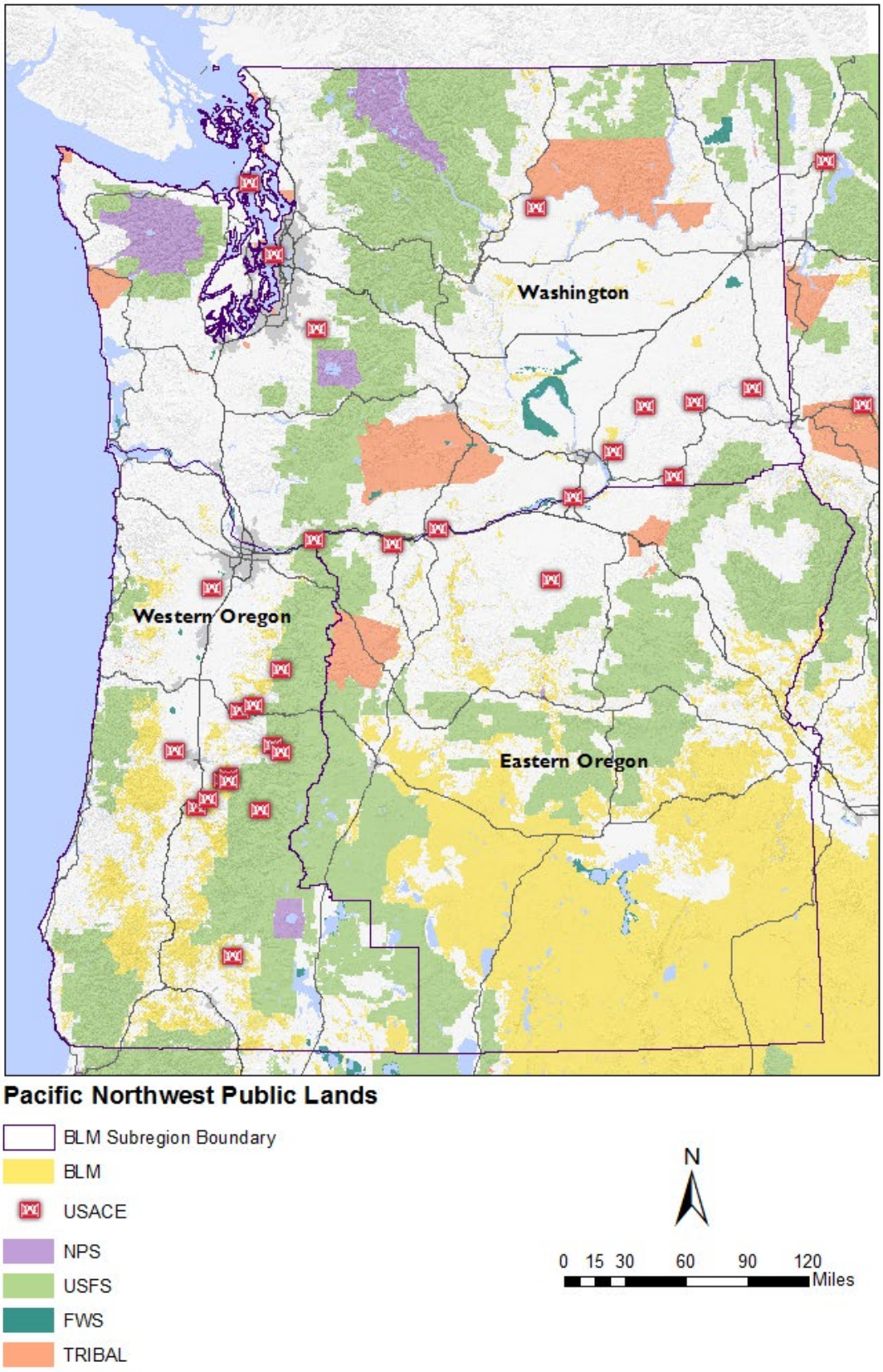
For the BLM in Oregon and Washington, there are three defined administrative subregions: Western Oregon, Eastern Oregon, and the entirety of the State of Washington. These subregions are very distinct landscapes that are managed for different purposes, and in accordance with the land use plans in effect on each district. As shown below, the large majority of the BLM's transportation systems are in Western Oregon.

Figure A-5: BLM Roads and Primitive System Roads in FAMS by Subregion



Source: BLM Facts Oregon and Washington, 2016

Figure A-7: BLM Subregions in the Pacific Northwest



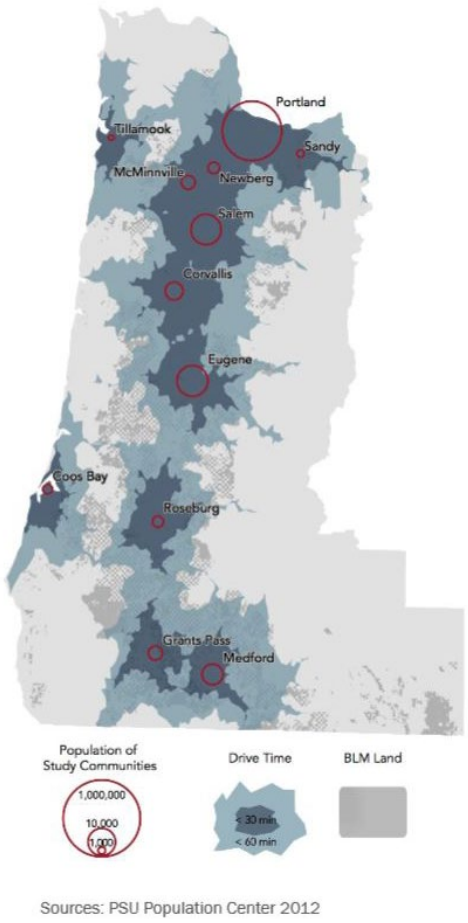
WESTERN OREGON

The BLM manages approximately 2.6 million acres of land in Western Oregon. These lands include front-range river valleys and hills that provide valuable forest habitat, timber harvest, and recreational opportunities close to the population centers of the Portland metropolitan area, Salem, Eugene, Medford, and other communities along the Interstate 5 (I-5) Corridor.

The BLM's lands in Western Oregon feature many popular recreation sites for hiking, mountain biking, off-highway vehicles, rafting, and fishing on the area's 11 designated Wild and Scenic Rivers, as well as recreational auto and bicycle travel on the area's six BLM back country byways.

Western Oregon BLM lands also are important for their timber harvests and mining leases. The tourism and commercial industry uses of these lands are both important economic drivers for many of the gateway communities in Western Oregon

Figure A-8: Travel times from Western Oregon Communities to BLM Lands



Sources: PSU Population Center 2012

History and Land Use Policies for BLM Lands in Western Oregon

The history of much of the BLM-managed public lands in western Oregon has its roots in the Oregon and California Railroad Act of 1866, which granted 3.7 million acres of forest land in western Oregon to railroad companies to incentivize the construction of a rail line between San Francisco and Portland. The Act required the railroad companies to sell the land along the rail line in 160-acre parcels for $2.50 per acre. However, the rail companies realized they could make more money by logging the land themselves or selling it in larger parcels for logging. In 1916, after a land fraud scandal, Congress legislatively transferred the land that the rail companies had not yet sold back to the control of the U.S. Department of the Interior, compensating the affected rail companies and counties for the revestment.

The result of this history was that the BLM came to manage approximately 2.6 million acres of land in a checkerboard pattern interspersed with privately held timberland. The BLM manages its land in this area based on the authority in the Oregon and California (O&C) Revested Lands Sustained Yield Management Act (O&C Lands Act) of 1937, which directs that the timberlands be managed:

> *… for permanent forest production, and the timber thereon shall be sold, cut, and removed in conformity with the principal of sustained yield for the purpose of providing a permanent source of timber supply, protecting watersheds, regulating stream flow, and contributing to the economic stability of local communities and industries, and providing recreational facilities… (43 USC §1181a)*

The O&C Lands Act also required that 50 percent of the revenue generated from management of the lands be returned to the 18 counties that contained these revested lands. The revenues are divided annually by the percent of the assessed value of the lands in each county as they were determined to be in 1915.

BLM lands in Western Oregon contain important natural resources, including riparian zones and late successional forests, which provide habitat for threatened and endangered species, such as salmon and the Northern Spotted Owl.

THE PURPOSE OF THE WESTERN OREGON RMPS REVISION IS TO:

- Provide a sustained yield of timber;
- Contribute to the conservation and recovery of threatened and endangered species;
- Provide clean water in watersheds;
- Restore fire-adapted ecosystems;
- Provide recreation opportunities; and
- Coordinate management of lands surrounding the Coquille Forest with the Coquille Tribe.

In August 2016, the BLM signed the Records of Decision for revised RMPs of Western Oregon. The completion of these plans marks the end of a four-year effort by the BLM to use new science, policies, and technology to protect natural resources and support local communities. These revised RMPs will spur updates to the TTMPs for these areas to implement the transportation elements of the BLM's adopted land use policies.

Transportation in Western Oregon

Transportation plays an important role in Western Oregon. The BLM's transportation network provides access to the large number of recreational and economic opportunities on BLM land, and it provides access for BLM administrative activities, including forest management, fire response, and conservation and restoration activities.

This area of the State contains approximately 14,000 miles of BLM-owned roads and 380 miles of trails within its boundaries. In addition, BLM and adjacent road owners in Western Oregon manage a complex joint network of roads and trails across BLM-managed public lands, other public lands, and interspersed private lands using reciprocal right-of-way agreements and memoranda of understanding. The complexity of this joint network makes travel management planning a unique challenge in Western Oregon compared to other BLM lands throughout the U.S.

O&C Reciprocal Rights of Way Agreements and Public Access

The BLM-administered land in Western Oregon is predominantly intermingled with privately owned land parcels. Intermingled private lands are owned primarily by timber companies and are managed for commercial timber production. Legal access to Federal and private timberlands is provided through long-term or perpetual reciprocal right-of-way agreements between the United States and private timberland owners as authorized by the Federal Land and Policy Management Act of 1976 (FLPMA) and Federal regulation in 43 CFR 2812.

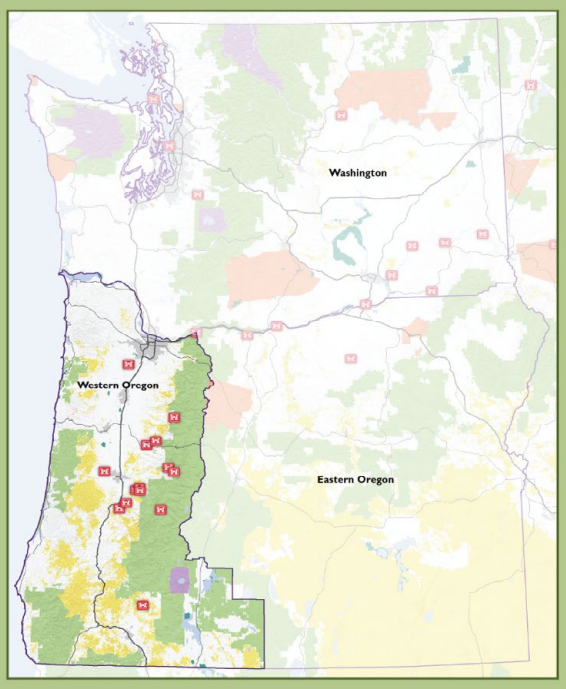
A reciprocal right-of-way agreement provides both the United States and the private landowner with a non-exclusive right to use, construct, and maintain logging roads on each other's property for forest management and removal of forest products. Nearly 85 percent of the public lands in Western Oregon are available for road construction and commercial timber use under reciprocal right-of-way agreements. These reciprocal right-of-way agreements do not always grant rights for public access and recreational use of roads constructed under these agreements.

BLM typically negotiates exclusive easements with private landowners to obtain access for forest management activities when a reciprocal agreement is not needed. Unlike reciprocal right-of-way agreements, exclusive road easements typically grant rights for public use.

Legal public access can vary greatly because a majority of BLM-administered lands in Western Oregon are intermingled with private lands. Reciprocal right-of-way agreements and exclusive and non-exclusive easements across adjacent private lands have a determining effect on public access.

Legal public access includes public access rights that have been secured by the United States, including roads constructed by the BLM on public lands. Additionally, public access rights typically are included in the acquisition of exclusive road easements on private roads where the United States has acquired control of the right of way. While administrative access is legally available to the BLM, reciprocal right-of-way agreements do not include legal access rights for the public. All roads tributary to roads without legal public access also do not have legal public access.

BLM IN WESTERN OREGON: *QUICK FACTS*



Geography: Near population centers, major transportation corridors. Spans from Pacific Ocean to the Cascade Mountain Range.

Land Ownership: "Checkerboard" mixture of small parcels with Federal and private ownership.

Primary Partners: USFS, USACE, ODOT, Oregon Department of Forestry, 18 O&C counties, private timber companies, tribes

Transportation Systems: 14,242 road miles, 9 primitive road miles, 380 trail miles, 11 Wild and Scenic Rivers

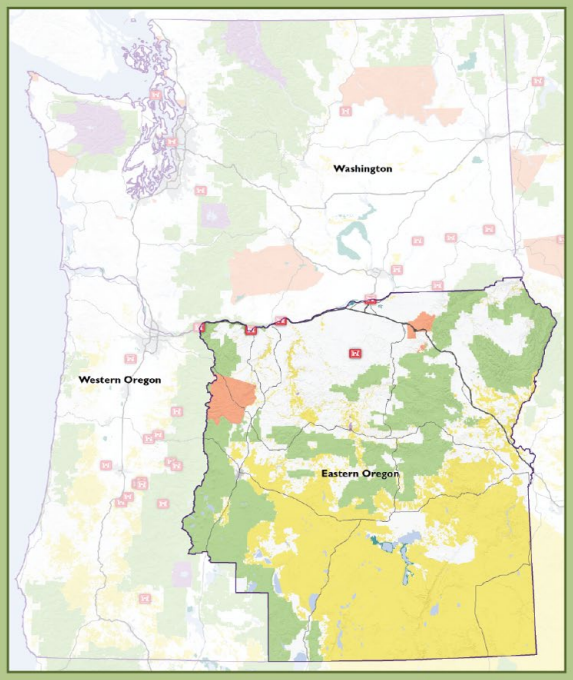
Economic Uses: Timber harvest, mining, tourism and recreation

Popular Recreation Sites: Sandy Ridge, Wildwood Recreation Area, Yaquina Head Outstanding Natural Area, Rogue River, North Umpqua River

Natural Resource Issues: Northern spotted owl, late successional forests, water quality, fish passage

Hazards: Tsunamis, flooding, wildfires, earthquakes, volcanic hazards, landslides

BLM IN EASTERN OREGON: *QUICK FACTS*



Geography: Mostly rural, remote. Most BLM lands near BLM are on the wildland-urban interface.

Land Ownership: Large, contiguous BLM parcels

Primary Partners: USFS, USFWS, ODOT, counties, tribes, ranchers, mining companies

Transportation Systems: 6,455 road miles, 1,721 primitive road miles, 16 Wild and Scenic Rivers

Economic Uses: Ranching, mining, tourism and recreation

Popular Recreation Sites: John Day Fossil Beds, Steens Mountain Wilderness, John Day River

Natural Resource Issues: Greater Sage-grouse conservation

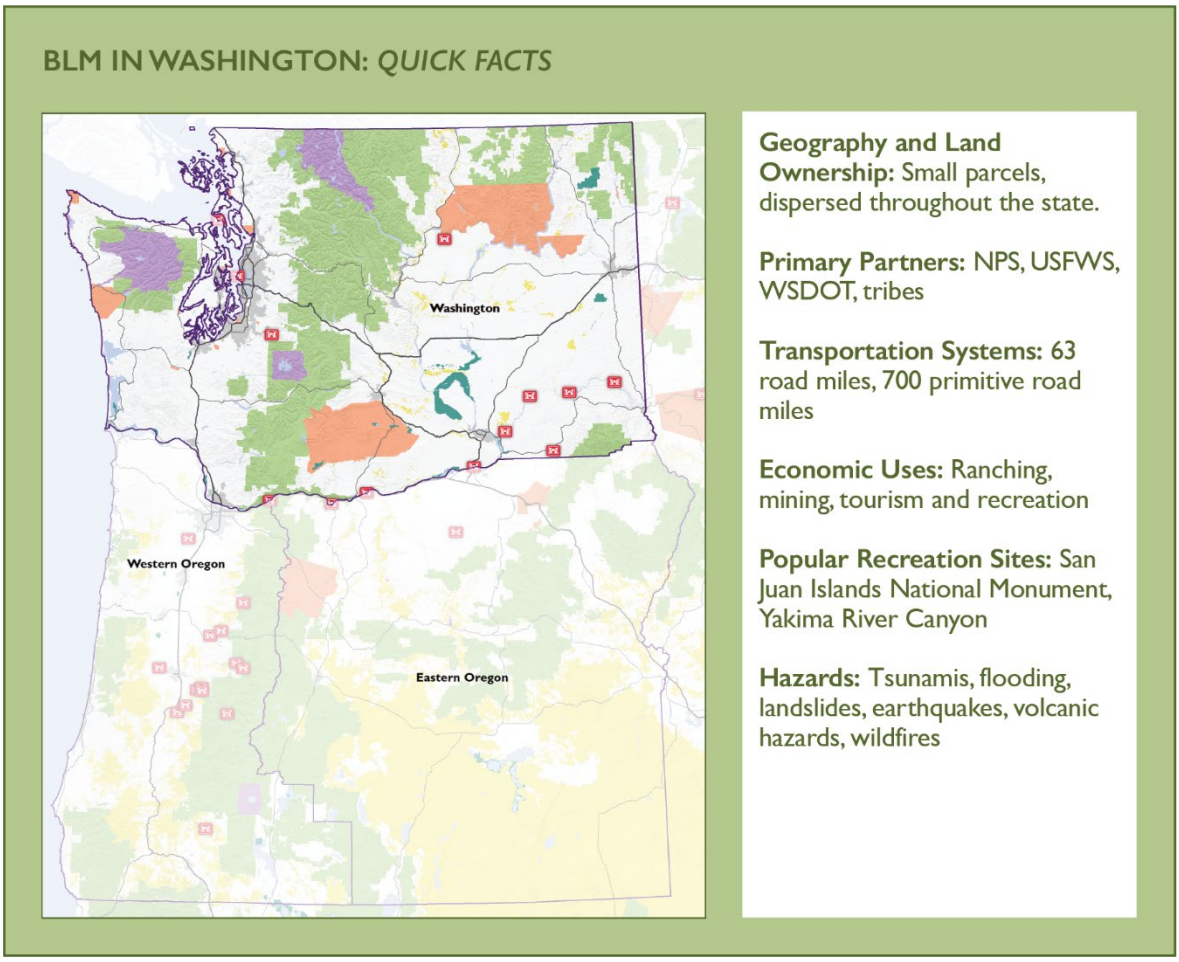
Hazards: Landslides, earthquakes, volcanic hazards, wildfires

EASTERN OREGON

The BLM manages approximately 13.1 million acres of land in Eastern Oregon. These lands are administered through four District Offices: Prineville, Burns, Vale, and Lakeview. These Districts span a geographic area from the Cascade Range and the Klamath region to the Wallowa Range and the high desert fault blocks of Steens Mountain.

With the exception of Bend—Oregon's fastest-growing city, with a U.S. Census-reported population growth rate of 47 percent from 2000 to 2010—most of Eastern Oregon is rural and remote. Many of these small, remote communities benefit economically from activities on BLM land, including ranching, mining, and tourism. Recreation sites in Eastern Oregon, such as the Steens Mountain Wilderness, receive fewer visitors than Western Oregon sites near metropolitan areas, but they provide an experience of solitude and wilderness that is unique and highly prized by many visitors and local residents. Eastern Oregon is home to 207,833 acres of BLM wilderness areas and 2.6 million acres of Wilderness Study Areas. BLM lands in Eastern Oregon received approximately 2.4 million recreational visits in 2014—approximately 28 percent of all recreational visitation to BLM lands in Oregon and Washington.

BLM-managed public lands in Eastern Oregon have several unique characteristics. Unlike the patchwork nature of land ownership in Western Oregon, the BLM-managed public lands in Eastern Oregon are largely contiguous. Many of the primary access routes to BLM-managed lands in Eastern Oregon are via county roads, so county governments are key partners in managing the network of roads within or providing access to BLM lands. BLM-managed lands in Eastern Oregon also have a comparatively large number of user-generated roads, primitive roads, and trails, and there is a significant mileage of roads, primitive roads, and trails that are not recorded as systems in FAMS. As such, the FAMS transportation system data for Eastern Oregon do not capture all of the routes that travelers use, particularly rural community members.



WASHINGTON

The BLM manages 435,691 acres of land in the State of Washington—a much smaller area than the 16 million acres of land the BLM manages in Oregon. Most of the BLM-managed public lands in Washington are in the eastern part of the State. The BLM's lands in Washington tend to be in the form of relatively small parcels dispersed throughout the State. The BLM's transportation network in Washington consists of networks of 63 miles of roads and 700 miles of primitive roads—a much smaller network than in Oregon.

One notable BLM site in Washington is the San Juan Islands National Monument, a group of 450 islands, rocks, and pinnacles in the northwest corner of Washington State.[9] The San Juan Islands are a popular destination within close proximity to the Seattle metropolitan area. Access to the San Juan Islands is by a network of passenger and vehicle ferries managed by WSDOT.[10] The BLM is currently developing a Resource Management Plan for the San Juan Islands National Monument.[11]

[9] Presidential Proclamation 8947, "Establishment of the San Juan Islands National Monument," http://www.blm.gov/or/resources/recreation/sanjuans/files/sanjuan-proclamation.pdf
[10] http://www.wsdot.com/ferries/schedule/ScheduleDetailByRoute.aspx?route=ana-sj
[11] http://www.blm.gov/or/plans/sanjuanislandsnm/index.php

U.S. FOREST SERVICE AGENCY PROFILE:

TRANSPORTATION IN THE PACIFIC NORTHWEST REGION

Columbia River Gorge National Scenic Area (Source: USFS)

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Deschutes National Forest (Source: USFS)

INTRODUCTION

The U.S. Forest Service (USFS) Pacific Northwest Region consists of approximately 24.7 million acres of land across Washington and Oregon (see Figure A-1) and includes 16 National Forests, one National Scenic Area, and one National Grassland. These lands represent a diversity of landscapes throughout the region, including forests, volcanic mountain landscapes, grasslands, rivers, canyons, and high desert.The USFS's transportation systems in Oregon and Washington support the agency's multiple-purpose mission by providing access for a variety of different uses, including:

AGENCY MISSION:

The mission of the U.S. Department of Agriculture Forest Service is to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations.

- Natural and cultural resource protection
- Forestry
- Mineral and energy development
- Recreation, such as hiking, bicycling, horseback riding, off-highway vehicle (OHV) use, scenic driving, rafting, and skiing
- Hunting, foraging, and fishing
- Administrative purposes
- Permitted uses, such as rights of way and guided travel
- Access to private inholdings and inter-community travel

These values contribute to local quality of life as well as regional economic development. The USFS collaborates with neighboring Federal Land Management Agencies (FLMAs), private landowners and businesses, and a wide range of

Colville National Forest (Source: USFS)

Rowena Crest Viewpoint, Historic Columbia River Highway (Source: USDOT Volpe Center)

Federal, Tribal, State, and local governments to ensure that the USFS's transportation system supports the many values that USFS lands provide to the region.

The USFS transportation network supports the regional economy and communities throughout the region in multiple ways. In 2017, the USFS transportation network supported 15.3 million recreational visits to USFS lands and contributed to the regional economy by supporting economic activities in the following ways:[1]

- Recreational visitors spent $738 million and supported 6,080 year-round jobs in nearby communities.
- USFS roads supported the harvest of 581 board feet of timber harvested from USFS lands; this activity supported 7,000 private-sector jobs and contributed $13 million to Washington and Oregon.
- More than $1.8 million worth of special forest products—such as Christmas trees, firewood, foliage, mushrooms, and berries—were collected from USFS lands.USFS lands provided approximately 190,000 tons of rocks and mineral materials, for a value of approximately $560,000.

Each of these business sectors rely on the USFS roads, bridges, trails, and other transportation infrastructure to provide access to these economic activities.

[1] USFS. Pacific Northwest Region Annual Report 2017. https://www.fs.usda.gov/detailfull/r6/home/?cid=fseprd570812&width=full.

Figure A-1: Map of the USFS Pacific Northwest Region

THE USFS TRANSPORTATION PROGRAM IN THE PACIFIC NORTHWEST

USFS TRANSPORTATION PROGRAM ROLES

The USFS Transportation Program requires collaboration between several groups within the USFS and its partners (see Figure A-2), listed below:

- USFS Washington Office (Washington, D.C.)
- USFS Regional Office (Portland, Oregon)
- Forest-Level Staff (Throughout Oregon and Washington)
- Potential Partners, including:
  - Other FLMAs
  - State Departments of Transportation (DOTs)
  - Local governments
  - Tribal governments
  - Non-governmental partners, such as non-profit organizations or private businesses
- USFS visitors and the general public

Figure A-2: USFS Land Use and Transportation Planning Processes

USFS Transportation Partners

The USFS collaborates with Federal, Tribal, State, county, and other local partners to manage its transportation program. Partners include other FLMAs, Tribes, ODOT, WSDOT, county governments, and other local governmental or non-governmental organizations. The USFS recognizes the value of cooperative transportation partnerships and seeks to leverage USFS funds with other Federal, State, and local agencies, Tribes, and user groups (e.g., timber harvesting, outfitters/guides, hunter associations, off-highway vehicle (OHV) user groups, mountain bicycling associations, and environmental conservation groups). Potential non-governmental partners include, but are not limited to, groups such as Washington Trails Alliance, International Mountain Bicyclists Association, and Travel Oregon. Through these partnerships, the USFS aims to achieve the greatest benefit to the largest number of goals and objectives held by multiple agencies and organizations for shared projects.

Transportation Planning for the USFS

USFS Strategic Plan: FY 2015-2020

The USFS regularly develops five-year national strategic plans to increase transparency to the people the agency serves and to create accountability for making progress on its goals and objectives. The Strategic Plan covers all aspects of the USFS, including, but not limited to, transportation. The goals of the FY 2015-2020 Strategic Plan are to:

- Sustain our Nation's Forests and Grasslands
- Deliver Benefits to the Public
- Apply Knowledge Globally
- Excel as a High-Performing Agency[2]

This Collaborative Long-Range Transportation Plan (CLRTP) supports the Strategic Plan by focusing on protecting resources, improving seamless public access and visitor experience, and partnering with a wide range of Federal, State, and local partners.Forest-Level Land Use and Transportation Planning

National Forests and Grasslands are required to develop land use management plans consistent with the National Forest Management Act (NFMA) of 1976, often known as Forest Plans. The NFMA requires Forests to amend and revise their Forest Plans as necessary, but at least every 15 years. The USFS-developed 2012 Planning Rule (36 Code of Federal Regulations [CFR] 219) includes more specific requirements for how to implement the NFMA. Forest Plans include the following decisions:

- Establishment of Forest multiple-use goals and objectives, including desired future conditions
- Establishment of Forest-wide management requirements
- Establishment of management areas and prescriptions for future activities in that area
- Specific limitations on timber harvest in accordance with NFMA
- Recommendations to Congress for wilderness or other special areas
- Establishment of monitoring and evaluation requirements[3]

National Forests develop Forest Plans through a public process, including public input and collaboration with Forest partners, as well as the preparation of an Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA) of 1976.

[2] USFS. 2015. USDA Forest Service Strategic Plan: FY 2015-2020. http://www.fs.fed.us/strategicplan.
[3] USFS, Planning Rule 101: http://www.fs.usda.gov/main/planningrule/101.

In addition to Forest Plans, National Forests must conduct travel management processes in accordance with USFS Travel Management Regulations (36 CFR 212). These regulations include three related subparts, described in Figure A-3. Like Forest Plans, Travel management planning is conducted by National Forests with guidance and review from the Regional Office. Forest-level travel management should be based on the land use management goals, objectives, and policies in the Forest Plans.

Figure A-3: USFS Travel Management Regulations

Subpart A: Travel Analysis Process

- Forests provide a recommendation for the minimum necessary road network based on environmental, social, and economic criteria
- Helps Forests provide a recommendation for what is possible to remove
- Planning tool, no decisions
- No NEPA review required

Subpart B: Motor Vehicle Use Map

- Forests designate roads, trails, and areas for motor vehicle use and publish maps showing where motorized vehicles are allowed
- Requires public involvement and coordination with Federal, State, local, and Tribal entities
- Requires NEPA review, usually an Environmental Assessment (EA) or EIS

Subpart C: Use by Over-Snow Vehicles

- Forests designate roads, trails, and areas for over-snow vehicle use and publish maps showing where over-snow vehicle use is allowed
- Public involvement and NEPA requirements are similar to Subpart B
- Required for areas with adequate snowfall
- On hold until additional national direction is provided

Hells Canyon Overlook, Wallowa-Whitman National Forest (Source: USFS)

USFS TRANSPORTATION NETWORK IN THE PACIFIC NORTHWEST

The USFS transportation network in the Pacific Northwest includes a total of approximately 60,000 miles of publicly accessible roads (maintenance levels 2 through 5), of which about 5,000 miles are designated as being eligible for the use of Federal Lands Transportation Program (FLTP) funding.The USFS's land in Oregon and Washington covers diverse landscapes, including the Pacific Coast and Coastal Mountains, the Cascade Mountain Range, and the high desert landscape of eastern Oregon and Washington. The USFS manages the landscapes in these regions for multiple compatible uses in accordance with the land use plans in each Forest.

USFS Transportation Network at a Glance

The USFS's multimodal transportation network in the Pacific Northwest consists of roads, trails, and bridges, as summarized below in Figure A-4.

Figure A-4: Summary Information on the USFS Transportation Network in the Pacific Northwest

USFS Transportation Facility	Quantity
Roads	Approx. 90,000 miles
Publicly Accessible Roads	Approx. 60,000 miles
Road Bridges	1,483
Trail Bridges	1,227

Source: USDA Transportation Management Brochure, 2018

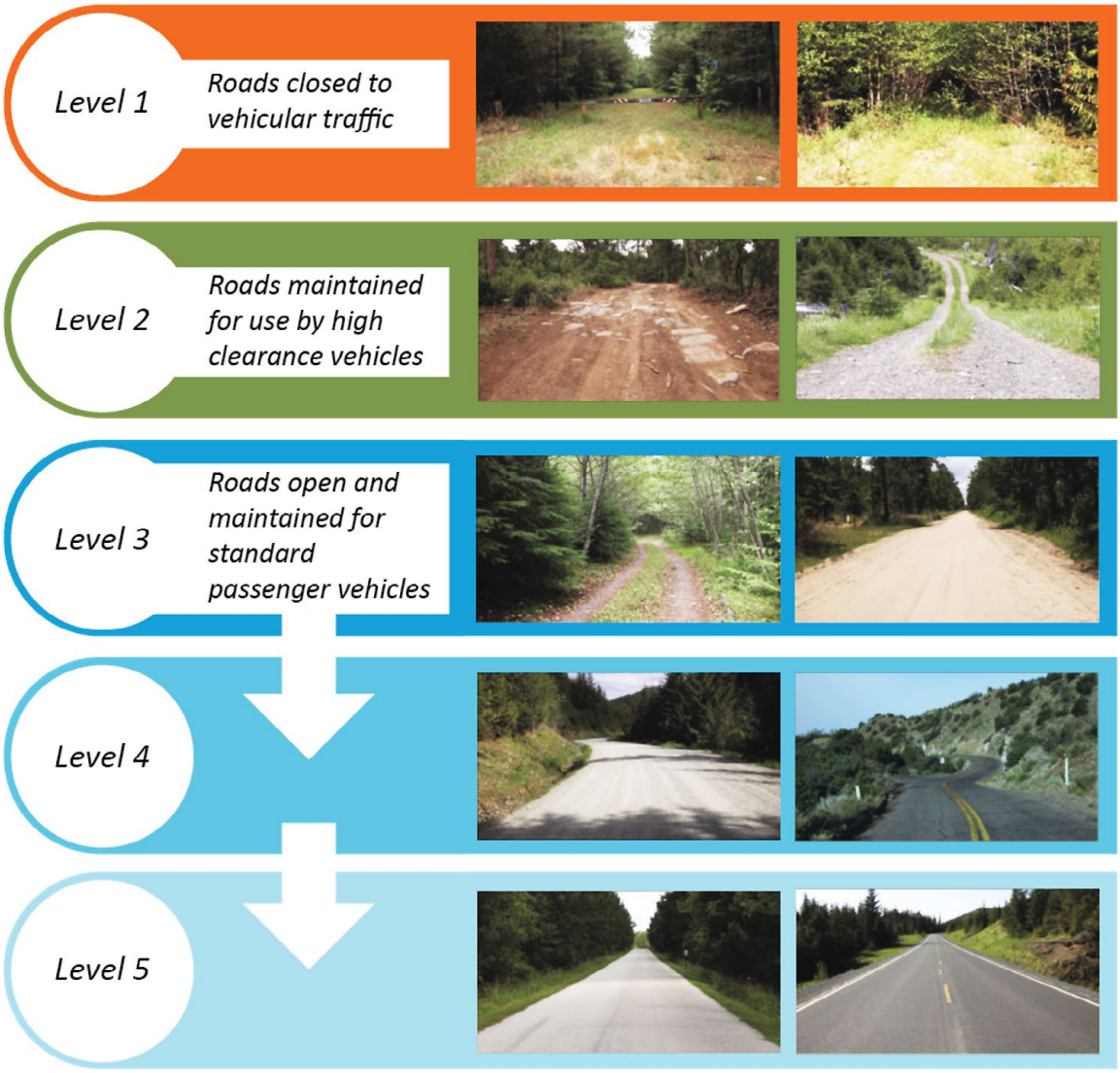
Roads

The USFS Pacific Northwest Region owns and maintains approximately 60,000 miles of publicly accessible roads. This road network is unique, because the majority of USFS roads are unpaved. The USFS categorizes roads into five maintenance levels (see Figure A-4):

- Maintenance Level 1: Roads closed to vehicular traffic (not open to the public)
- Maintenance Level 2: Roads maintained for use by high clearance vehicles
- Maintenance Level 3, 4, and 5: Roads open and maintained for standard passenger vehicles

Off-highway vehicle users, Deschutes National Forest (Source: USFS)

Figure A-5: Illustration of USFS road maintenance levels



The official inventory of USFS roads, trails, and associated management objectives is documented in the Forest Transportation Atlas, as recorded in the agency's Infra database and corresponding GIS transportation dataset. The atlas is updated as needed to reflect changes in inventory, status, and management objectives.

FLTP Roads

The USFS has designated approximately 5,000 miles of road in the Pacific Northwest Region as eligible for FLTP funds. These high-priority assets were selected for assessment and investment from all USFS roads through a selection process conducted by the Region in coordination with individual Forests and Grasslands and based on guidance from the USFS Washington Office. Administrative roads, roads not maintained for passenger cars, and assets not maintained by the USFS were excluded from the selection process. The USFS then applied a recreation and economic generation filter that prioritized roads that provide access to high-priority recreation sites or a designated Special Place according to the Framework for Sustainable Recreation; are designated scenic routes or scenic byways; or are important to rural community access or economic health. The USFS verified the filter results through mapping analysis and vetting with staff.

Trails

The USFS manages 24,291 miles of trails in the Pacific Northwest. Trails are important to the USFS mission, because they serve multiple purposes, including recreation; motorized and non-motorized transportation; and access to foraging, hunting, and fishing resources. There are three main types of USFS trails in the Pacific Northwest:


Visitors on an accessible trail, Mt. Hood National Forest (USFS)

- Standard Terra Trail: A trail that has a surface consisting primarily of the ground and that is designed and managed to accommodate use on that surface.
- Snow Trail: A trail that has a surface consisting predominantly of snow or ice and that is designed and managed to accommodate use on that surface. In the Pacific Northwest, many Standard Terra Trails are managed as Snow Trails seasonally.
- Water Trail: A trail that has a surface consisting predominantly of water (but may include land-based portages) and that is designed to accommodate use on that surface. In the Pacific Northwest, several Wild and Scenic Rivers are managed as water trails, facilitating water-based travel and recreation.

The Pacific Northwest also has several iconic long-distance trails, such as the Pacific Crest Trail, that pass through USFS lands.

FLTP Trails

The USFS has designated a national network of FLTP trails. The Pacific Northwest Region's FLTP trails network is 4,263 miles. These trails represent the highest priority trails for transportation funding based on the following criteria:

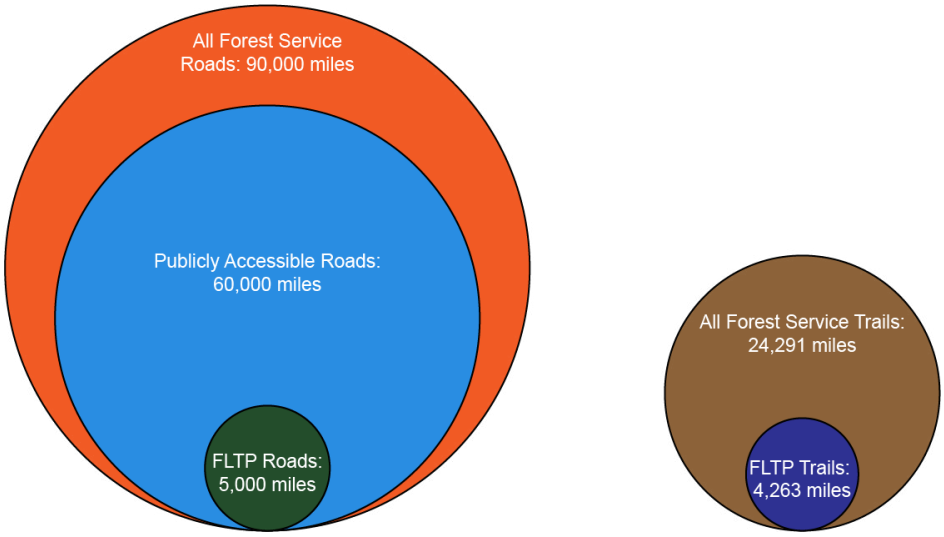
- Provide access to special places, recreation sites, or communities
- Experience high visitation/use
- Support local economy
- Connect to FLTP road network
- Connect to other FLMA, State, or local trails or facilities


Winter mule packers, Wallowa-Whitman National Forest (USFS)

Overall Size of the USFS Transportation Network in the Pacific Northwest

Figure A-6 shows the relative size of the USFS road and trail networks in the Pacific Northwest. As shown below, the USFS FLTP roads and trails represent a small portion of the overall network—5.6 percent of roads and 17.6 percent of trails, respectively. These FLTP networks represent funding eligibility, but they do not provide a holistic travel network without consideration of the larger network of USFS roads and trails and their connections to partner-owned transportation systems.

Figure A-6: USFS Transportation Assets in the Pacific Northwest



Transit

The USFS does not own or operate any transit systems in the Pacific Northwest Region. However, the Federal Lands Multimodal Catalog records 28 transit systems owned and maintained by partners, such as local transit agencies, that provide access to National Forests in the Pacific Northwest. In addition, many ski areas and other recreational businesses on National Forests run their own shuttle systems on National Forest roads.

Notable examples of transit services that provide access from urban transit hubs to USFS lands—in partnership with State and local transportation agencies—include:Mount Hood Express (administered by Clackamas County, Oregon)

- Columbia River Gorge Express (administered by ODOT)
- Gorge WET shuttle (administered by Skamania County, Washington)

These three transit systems—which expand access to recreation sites for urban residents without vehicles and provide congestion relief and safety improvements at some of the region's most popular trailheads—also have received Federal Lands Access Program (FLAP) funds for vehicle purchase or start-up operational costs during their initial trial periods. Some of these shuttle services also include bicycle racks or trailers to support passengers' multimodal trips.

Linkages to Partner Transportation Networks

The USFS's transportation system elements are highly connected to the transportation networks of its partners, including those facilities owned and maintained by other FLMAs, ODOT and WSDOT, county governments, and private landowners. These linkages include connections to partners' road systems, but also to multimodal transportation systems, including trails and partner-operated buses and ferries. For this reason, it is crucial for the USFS to collaborate with a diverse set of partners to coordinate transportation data collection, planning, and asset management across jurisdictions.This CLRTP is meant to support enhanced collaboration with USFS partners by:

- Providing information and guidance to USFS staff in how to collaborate with partners
- Institutionalizing collaboration within existing USFS planning processes while maintaining consistency with USFS planning requirements
- Facilitating better understanding between the USFS and its partners
- Helping partners recognize opportunities for mutual benefit

Gorge WET shuttle, Skamania County, WA (Source: Skamania County Transit Services)

Columbia River Gorge National Scenic Area (Source: USFS)

U.S. ARMY CORPS OF ENGINEERS AGENCY PROFILE:

TRANSPORTATION IN OREGON AND WASHINGTON


Photography by:. USACE

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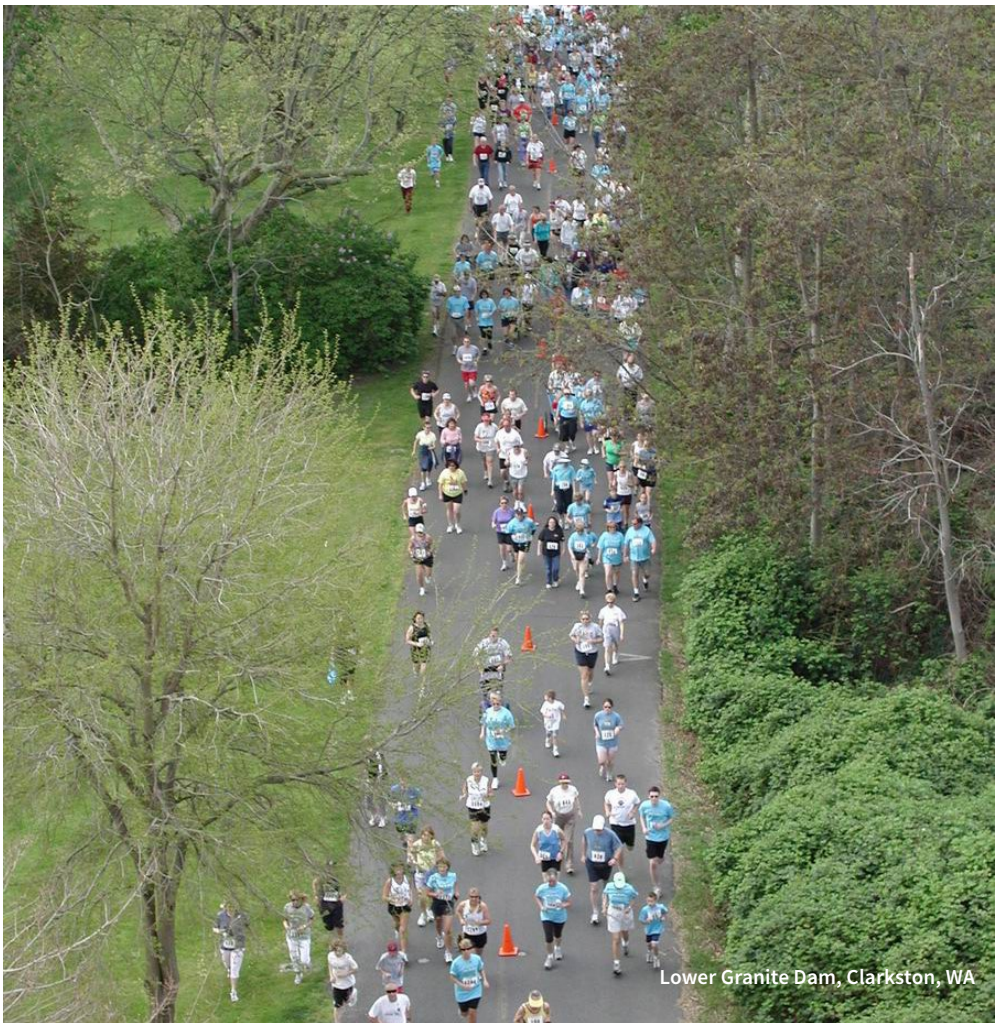


Lower Granite Dam, Clarkston, WA

INTRODUCTION

USACE MISSION:

To provide vital public engineering services in peace and war to strengthen our Nation's security, energize the economy, and reduce risks from disasters.

The U.S. Army Corps of Engineers (USACE) has jurisdictional boundaries made up by both Divisions and Districts. All of the Pacific Northwest exists in the Northwestern Division (NWD) and three primary districts serve Oregon and Washington: Seattle District, Walla Walla District, and Portland District (see Figure A-1). In addition, while both the Sacramento and San Francisco Districts extend into extreme southern Oregon, they do not contain any Corps recreation facilities, known as Projects.

As the nation's largest Federal provider of water-based outdoor recreation, USACE manages nearly 12 million acres of Federal lands and waters at Corps water resource development projects in 43 states. USACE-managed recreation areas receive more than 250 million visits per year, and it is estimated that visitor spending at these recreation areas is $11 billion. Ultimately, 80 percent of that spending is captured by the local economy through direct sales to visitors who live within 30 miles of the given recreation area, supporting almost 100,000 jobs in surrounding communities.

The underlying regional transportation network is critical in providing access to Corps land and water resources. Within the states of Oregon and Washington, the Corps operates 27 projects that encompass more than 240 recreation areas (not all recreation areas are operated by the Corps) that receive in excess of 18 million visits annually (approximate 7 percent of the national visitation). It is estimated that visitor spending at these recreation areas exceeds $605 million and supports more than 5,000 jobs. Corps Projects in Oregon and Washington are important economic drivers, both in the region and nationally.

The Seattle District covers the north and central portions of Washington State, and contains both the Chittenden Locks and Lake Washington Ship Canal.

The Walla Walla District covers southeastern Washington State and eastern Oregon. It is noteworthy for its many Projects as part of the Columbia River navigation system.

The Portland District is the largest district in the region by area, covering central and western Oregon. The Portland District has 18 lakes and reservoirs representing Projects located on the Columbia River, in the Willamette Valley (see Figure A-2), and in the Rogue River Basin that provide a variety of recreation opportunities. There are 131 recreation sites at these 18 Corps Projects alone. Among these, there are more than 1,000 Corps-managed and outgranted campsites that generate nearly $600,000 in revenue annually.

Figure A-1: Pacific Northwest USACE Districts

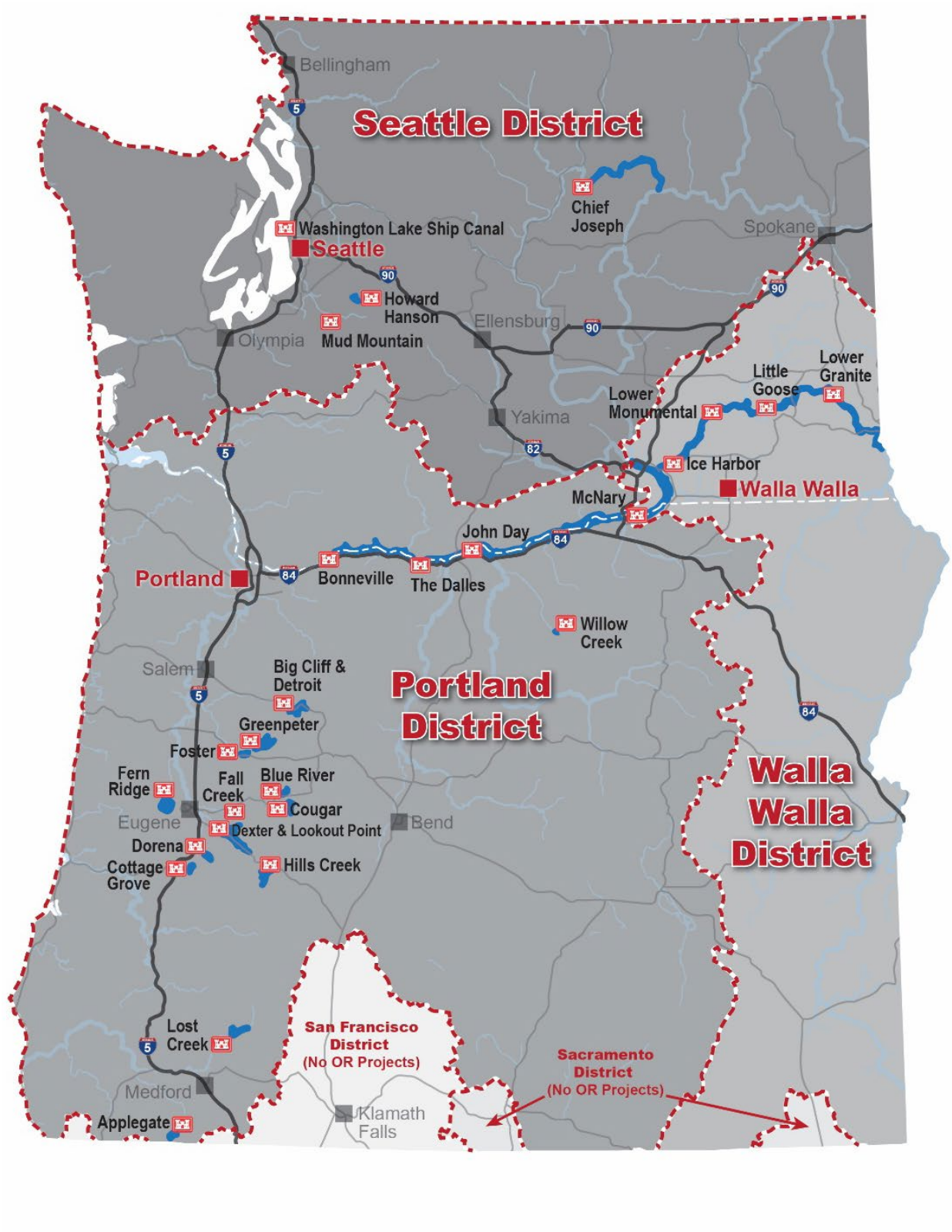


Figure A-2: Projects in the Willamette Basin

USACE serves a vital role in navigation and flood protection in the Pacific Northwest, allowing such metropolises as Portland and Seattle to thrive, while enabling myriad recreational opportunities within a day's drive. This contributes to quality of life and brings economic prosperity to the region.

Essential to USACE's management of these lands is maintaining and improving upon the USACE transportation system—which includes roads, bridges, trails, and related facilities—in a manner that enhances accessibility, connectivity, and safety, while at the same time addressing public needs, ensuring safe passage and water navigation, and ensuring economic development.

These values contribute to local quality of life, as well as local and regional economic development. USACE collaborates with neighboring Federal Land Management Agencies (FLMAs), private land owners and businesses, and a wide range of Federal, Tribal, State, and local governments to ensure that the USACE's transportation system supports the USACE mission and the many benefits that USACE recreation sites provide for the region.

USACE'S TRANSPORTATION PROGRAM

USACE TRANSPORTATION PLANNING

USACE management is guided by a series of planning documents, and while these documents do not address surface-based transportation directly, there are indirect references. The Campaign Plan is produced by the USACE Commanding Engineer's team and focuses on a strategic outlook for the way the Corps does business. Goal Two of the Campaign Plan focuses on the Corps Water Resource Solutions, which include the Civil Works program, through which the Corps surface transportation assets are operated. The goal's fourth objective to focus on the life-cycle of water resources infrastructure systems will influence the maintenance and management of USACE roads, bridges, and other surface transportation infrastructure.

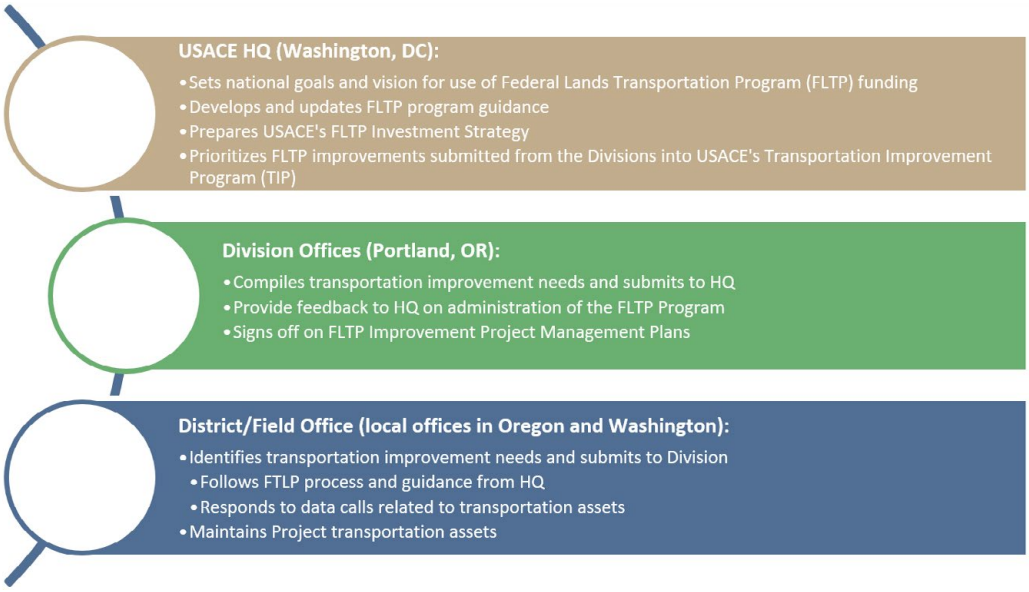
USACE has multiple missions that include military support, civil works, and emergency management. In its military support role, USACE has responsibility for military construction and other support functions for the Department of Defense (DOD). This includes a Transportation Center of Expertise focused on supporting military needs for high-performing specialized transportation assets and surfaces. Through its emergency management role, USACE is a partner with the Federal Emergency Management Agency (FEMA) in aiding domestic recovery efforts, with a focus on those situations that require specialty engineering skills. Through the Civil Works directorate, USACE provides navigation, flood risk reduction, hydropower, water supply, resource management, and recreation nationally through the operation of domestic water resource projects. In addition, the Civil Works Program supports environmental restoration and shoreline protection, while also performing regulatory activities.

The Civil Works Program is guided by the Civil Works Strategic Plan. Like the Campaign Plan, the current strategic plan (FY14-18) focuses on transforming the business practices of the organization to better achieve the agency's mission. Goal 2, improving the safety and resilience of communities and water resources infrastructure, and Goal 5, managing the life cycle of water resources infrastructure systems, influence the management of USACE surface transportation infrastructure. The next iteration of the Civil Works Strategic Plan is due to be released soon..

USACE TRANSPORTATION PROGRAM ROLES

USACE operates in a decentralized manner at the Project level, and consequently manages its transportation program in the same way. The USACE budget is structured with funding per USACE Project, so Projects are responsible for the operation and maintenance of their transportation assets. However, the management of the Federal Lands Transportation Program (FLTP) is operated centrally at the national level through its Headquarters in Washington, DC. USACE Division and District offices also play critical roles in USACE's implementation of the FLTP program. USACE's funding level under the Federal Lands Transportation Program is small compared to the deferred maintenance needs of the surface transportation assets. Project-level decisions have the strongest influence on the day-to-day management of transportation, with the FLTP program providing funding for high-priority transportation assets that are not funded through the traditional budget process.

Figure A-3: Relationship between USACE National, Division, and District Office Planning Processes



USACE Transportation Partners

The nature of the USACE transportation assets limits collaboration opportunities to some degree. The USACE fee land boundary is quite narrow around the water resource. In essence, USACE roads tend to be the "last mile to the water." This creates a dependent relationship on local- and State-maintained roads to ensure access to USACE parks or other areas at a Project. At some Projects, USACE has maintenance responsibility for bridges that provide critical water crossings connecting communities and providing continuity for important transportation corridors. In these cases, collaboration with State and local DOTs is necessary.

USACE has a strong track record of partnering with Federal, Tribal, State, and local government and local community groups to develop trails and other recreation facilities. In the states of Washington and Oregon, there are a number of Projects that are adjacent to other Federal agency lands, which creates opportunities to collaborate with those agencies on transportation improvements. Also, USACE has Challenge and Handshake partnership programs that allow USACE to leverage the capabilities of partners in providing recreation facilities and services.

Moving forward under the FLTP, USACE will have increased opportunities to collaborate with Federal, Tribal, State, county, and other local partners to manage its transportation program and ensure access to Federal lands and waters is maintained. In particular, there are opportunities to leverage Federal funding with other funding sources to make transportation improvements via shared projects that achieve the greatest benefit to the largest number of goals and objectives held by multiple agencies and increase benefits to the public.

USACE TRANSPORTATION NETWORK IN OREGON AND WASHINGTON

USACE TRANSPORTATION NETWORK AT A GLANCE

USACE's multimodal transportation network in Oregon and Washington consists of roads, trails, and bridges, as summarized below.

Figure A-4: Summary Information on the USACE Transportation Network in Oregon and Washington

USACE Transportation Facility	Washington	Oregon
Roads	94 miles	76 miles
Trails	92 miles	59 miles
Bridges	31 bridges	20 bridges

Roads

USACE has identified two classes of public roads: Area roads and Project roads. Area roads are those found within designated recreation areas. They include the primary access road from the Federal boundary to the various circulation roads that deliver visitors to their desired recreation facilities. Project roads are those found within the Federal boundary, but are not within designated recreation areas. These may be roads that cross engineered structures (e.g., locks, dams, levees), portions of a road associated with a bridge or Project crossing, or roads that run the length of the Project. Often, higher functional class roads, based on Federal Highway Administration (FHWA) classifications, that are located on USACE Federal land are maintained by local governments.

Trails

Trail use is one of the most popular visitor activities at Corps lakes and rivers. The water-based nature of these sites provides opportunities for trails with excellent water views. USACE has documented 151 miles of trails at lakes located in Oregon and Washington, with approximately two-thirds of this mileage managed by the Corps. Of the trail mileage managed by the Corps, the majority is water, multi-purpose, and hiking trails. The remainder is of various types, including equestrian trails, interpretative hikes, or trails that are specific to other modes such as bicycles or snow mobiles. Visitors to Corps lakes and rivers can use these trails to explore the area, and as a connection to other trail systems or to improve their personal fitness.

Linkages to Partner Transportation Networks

USACE's transportation system elements are highly connected to the transportation networks of its partners, including those facilities owned and maintained by other FLMAs, ODOT and WSDOT, county governments, and private landowners. These linkages include connections to partners' road systems, but also to multimodal transportation systems, including partner-operated buses and ferries. It is crucial for USACE to collaborate with a diverse set of partners to coordinate transportation data collection, planning, and asset management across jurisdictions.

RESOURCES

For more information about USACE in the Pacific Northwest, please visit the following websites:

- USACE Headquarters: https://www.usace.army.mil/
- USACE Northwestern Division (NWD): https://www.usace.army.mil/
- USACE Seattle District: https://www.nws.usace.army.mil/
- USACE Walla Walla District: https://www.nww.usace.army.mil/
- USACE Portland District: https://www.nwp.usace.army.mil/
- USACE Sacramento District: https://www.spk.usace.army.mil/
- USACE San Francisco District: https://www.spn.usace.army.mil/

NATIONAL PARK SERVICE AGENCY PROFILE

National Park Service
US Department of the Interior

National
Long Range Transportation Plan

July 2017

Grand Teton National Park

Summary of Goals, Objectives and Performance Measures

See Glossary for definitions of acronyms

ASSET MANAGEMENT

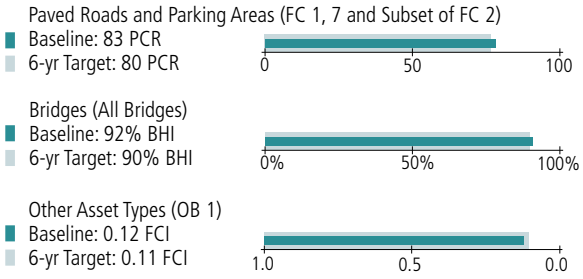
Goal – Sustainably manage NPS transportation assets and services

Objectives

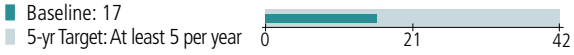
- Maintain critical assets and services in good operating condition through targeted investment
- Adapt transportation systems to climate change impacts

Performance Measures*

Condition of Highest Priority Transportation Assets



Number of Park Units That Have Completed a Transportation Infrastructure Vulnerability Assessment



* Arlington Memorial Bridge and other large-scale projects which cannot be addressed with annual transportation funding are not included in the asset management performance measures.

TRANSPORTATION FINANCE

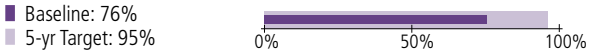
Goal – Allocate available transportation funding wisely

Objectives

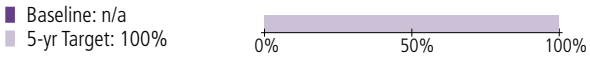
- Identify and prioritize investments based on the NPS mission, anticipated life-cycle costs and consideration of likely available future funding
- Maintain flexible use of transportation funding sources while improving identification of investments and needs

Performance Measures

Percentage of Transportation Funds Invested in Highest Priority Transportation Assets



Percentage of Park Units that Meet Preventive Maintenance Targets for Highest Priority Transportation Assets



RESOURCE PROTECTION

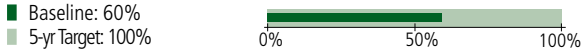
Goal – Protect and preserve natural and cultural resources

Objectives

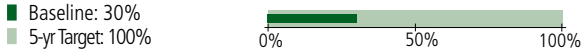
- Incorporate natural and cultural resource considerations into all aspects of transportation decision making and operations to avoid, minimize or mitigate negative impacts on these resources
- Minimize and mitigate the greenhouse gas emissions of the NPS transportation system

Performance Measures

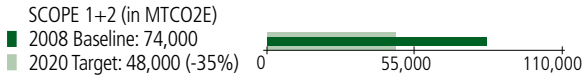
Completion of the INSTEP Tool

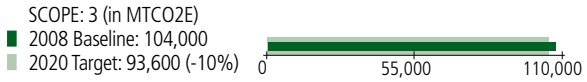


Develop a System for Tracking and Forecasting the Condition of Culturally Significant Transportation Assets



Percentage Decrease in NPS Transportation System Emissions





VISITOR EXPERIENCE

Goal – Maintain and enhance the quality of visitor experiences

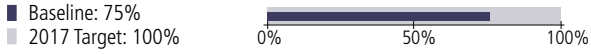
Objectives

- Improve ease of access to and within national park units for all people
- Create a range of appropriate transportation options that support a network of seamless connections within each park unit and to surrounding communities
- Provide state-of-the-art traveler information and wayfinding and, where appropriate, interpretation and education opportunities that complement transportation options

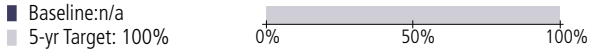
Performance Measures

Percentage of Park Unit Websites that Provide Nine Elements of Essential Traveler Information

Completion of Phase II of the NPS Congestion Management Program



Percentage of Transportation Contracts and Projects that Include Accessibility Language and Are Compliant with Accessibility-Related Laws, Regulations and Policies



SAFETY

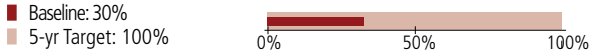
Goal – Provide a safe transportation system for all users

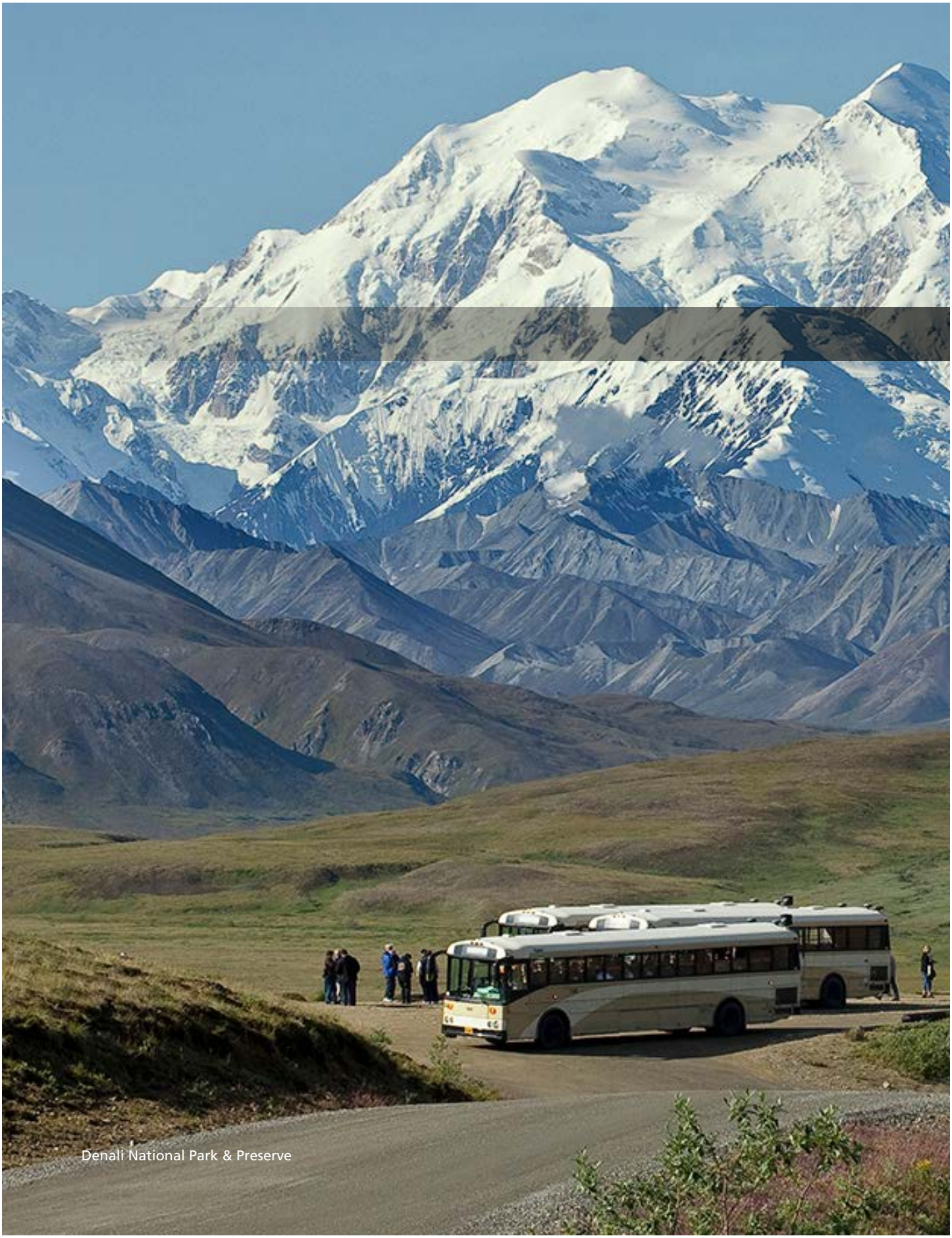
Objectives

- Institute a comprehensive, performance-based transportation safety program that addresses engineering, education and enforcement
- Reduce serious and fatal transportation-related injuries
- Maximize safety without impairing park resources and values
- Enable effective emergency response

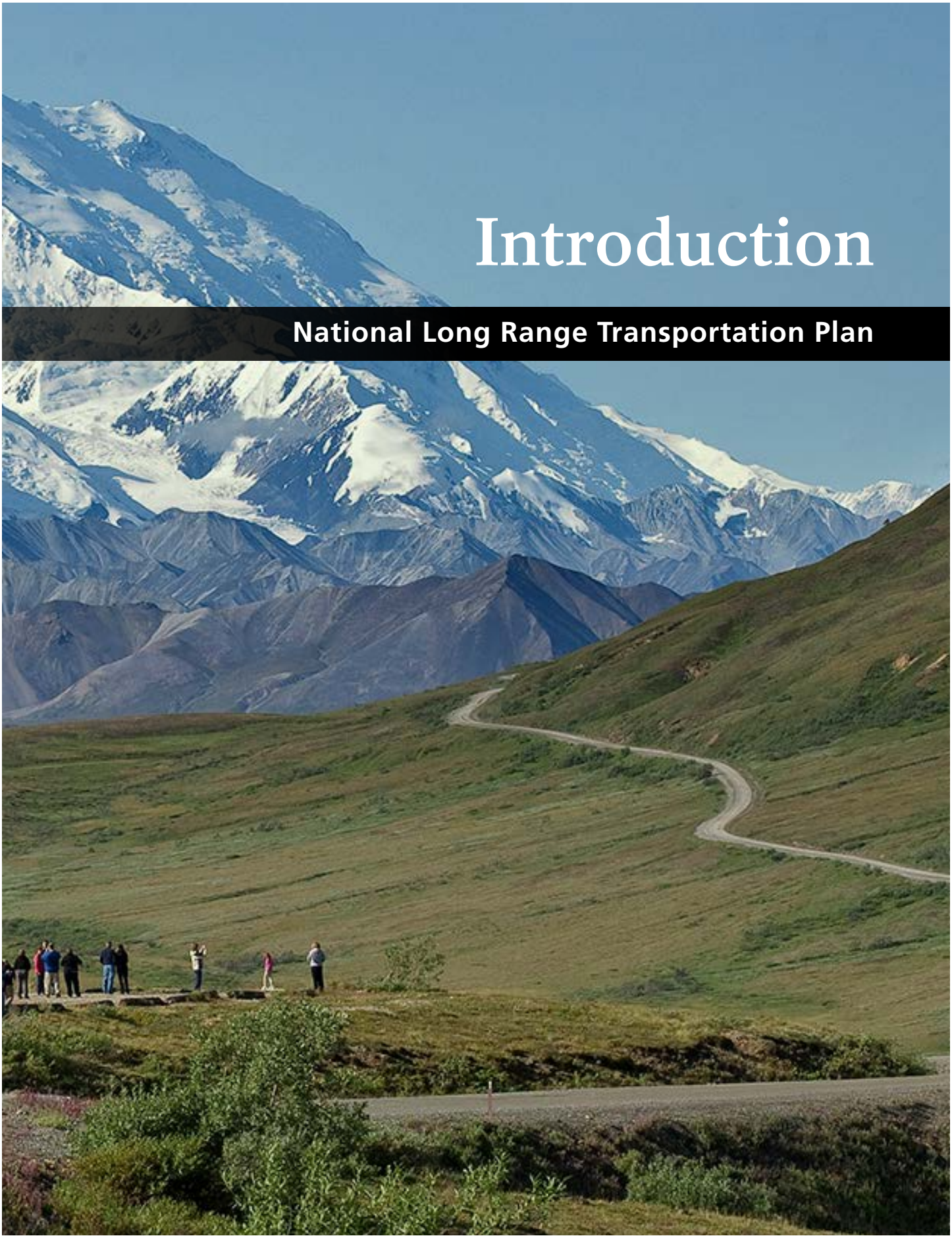
Performance Measure

Completion of the NPS Transportation Safety Management System





Denali National Park & Preserve



Introduction

National Long Range Transportation Plan

The Role of Transportation in the National Park Service

Transportation systems play a critical role in fulfilling the National Park Service (NPS) mission by providing people access to America's national treasures. Transportation planning in the National Park Service is fundamentally about providing sustainable, appropriate, enjoyable visitor access while also protecting resources and visitor safety. These goals are ingrained in the NPS mission, and they are part of what makes the National Park Service a unique agency.

The NPS transportation landscape is diverse and includes an extensive inventory of transportation assets:

- Roadway systems, including approximately 5,500 miles of paved roads, 7,000 miles of unpaved roads, 1,460 bridges and tunnels and 6,100 parking areas
- Nonmotorized systems, including approximately 4,600 miles of bicycle and pedestrian multiuse trails and 950 trail bridges
- Approximately 130 transit systems, including buses, trolleys, trains, streetcars, snowcoaches and maintenance facilities
- Marine systems, including ferries, boats, docks, marinas and waterfronts, representing more than 1,000 individual assets
- Intelligent transportation systems (ITS), such as variable message signs and traveler information systems
- Transportation management systems, including systems for managing congestion, safety, roadway and bridge condition and facilities.

The NPS Mission

The National Park Service preserves unimpaired the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations. The Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.

Rocky Mountain National Park

What Is the National Long Range Transportation Plan?

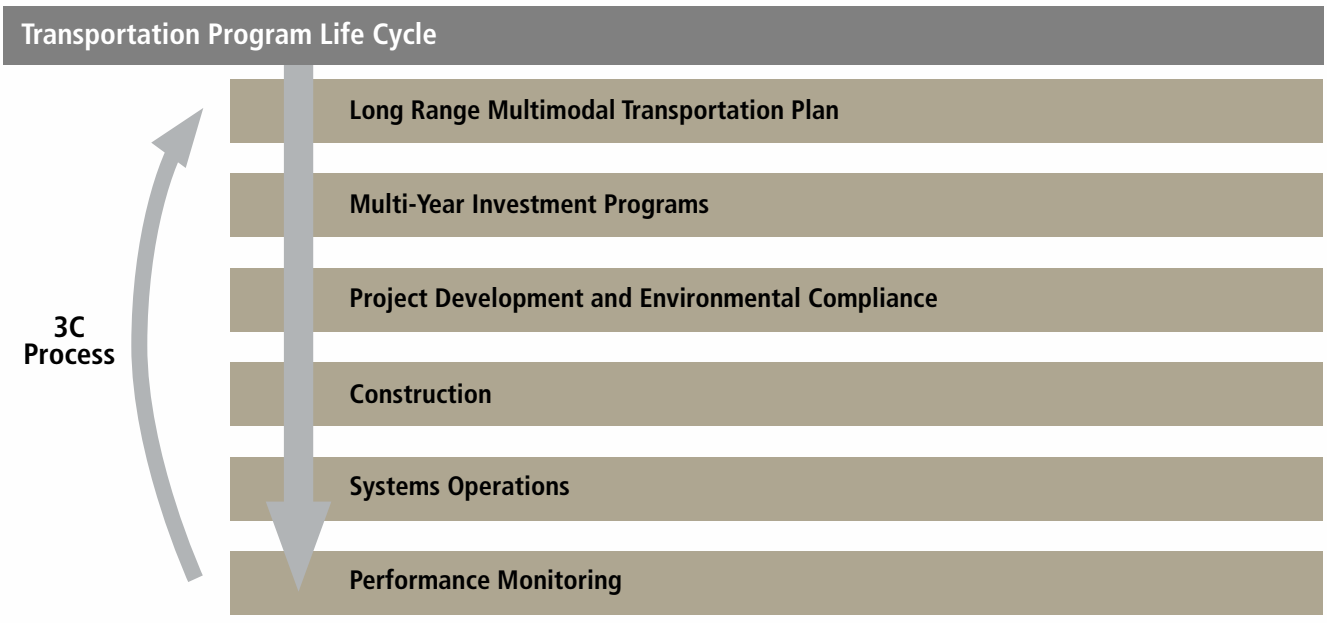
The NPS National Long Range Transportation Plan (LRTP) establishes a strategic framework for transportation investment servicewide over the next 20 years. It provides guidance to regional and park unit staff who make transportation investment and maintenance decisions every day. Because transportation touches all directorates and program areas, the National LRTP reflects the input of subject matter experts from across the agency, our partners and the public. It defines common goals that transcend traditional NPS administrative program boundaries. These goals are reflected in the overall vision for NPS transportation.

The National LRTP Vision

The National Park Service provides a mission-focused transportation system that is safe and seamless, enabling high-quality access to essential park unit experiences. The agency responsibly plans and effectively manages the transportation system to accommodate changing environmental, social and financial conditions.

The National LRTP is consistent with statewide and metropolitan transportation planning practices as part of a continuing, comprehensive and cooperative (3C) transportation planning process. The LRTP is the first step in the transportation life cycle as shown in Figure 1-1, guiding the investment decisions program managers make and document in multiyear investment programs. Funded projects are developed and engineered according to best management practices, and environmental reviews are performed when needed, followed by construction and systems operations. The National LRTP also establishes a framework for performance monitoring, which as part of the 3C process, feeds into future LRTP updates, informing future planning priorities.

Figure 1-1. The Life Cycle of a Transportation Program



National LRTP Development Process

This National LRTP was developed through a servicewide, multidisciplinary effort. A wide variety of NPS staff, including more than 80 subject matter experts at the directorate, region, park unit and program levels, as well as external stakeholders and the general public, provided critical input to the development of this plan. The National LRTP was developed in six phases (Figure 1-2).

Figure 1-2. The National LRTP Development Process

PHASE 1: ESTABLISH VISION, GOALS AND OBJECTIVES

The planning team, with input from NPS staff, established a 20-year vision for the NPS transportation system and developed associated goals and objectives (page iv–v). The vision, goals and objectives serve as the organizational framework for the National LRTP planning process; each future phase is aligned to these elements to ensure that this plan achieves the desired outcomes.

PHASE 2: IDENTIFY BASELINE CONDITIONS AND MACRO TRENDS

The current performance level and condition of the NPS transportation system, in terms of transportation asset management, financial condition, resource protection, visitor experience and safety, was established. The planning team also considered macro-level trends that affect the management and delivery of the transportation system, such as demographics, climate change and technology. The baseline and macro trends assessment highlighted the critical areas of focus and provided a foundation for the subsequent phases.

PHASE 3: IDENTIFY TRANSPORTATION NEEDS

The findings from the baseline conditions and macro trends stage were used to identify the most crucial needs in meeting the transportation vision, goals and objectives.

PHASE 4: DEVELOP STRATEGIES

Short- and long-term actions and strategies were identified to address the transportation needs and meet the stated goals and objectives. As part of this step, the National Transportation Investment Strategy was also developed to articulate a framework for how limited transportation funding can be best aligned with the goals and objectives of the plan, based on rigorous modeling and analysis of potential options.

PHASE 5: ESTABLISH PERFORMANCE MEASURES

National-level performance measures and targets were developed to monitor the progress of the National LRTP over time. The performance measures were developed in coordination with the particular NPS directorates and program areas that will ultimately implement the strategies to achieve the plan's goals and objectives. The National LRTP does not include performance measures for each specific objective; rather, it includes a limited set of measures that the National Park Service will use to monitor progress and gauge whether the plan is on track to achieving established goals and objectives.

PHASE 6: CONDUCT OUTREACH AND FINALIZE PLAN

Drafts of the National LRTP were shared broadly with NPS staff and the public. As part of the outreach process, the team created a page on the Planning Environment and Public Comment website, which made general information and plan documents available for review. The team also conducted numerous presentations with NPS subject matter experts to collect feedback on the plan. The team made iterative revisions in response to subject matter expert feedback and public comments.

National LRTP Goals

The goals of the National LRTP are rooted in the NPS mission. The National LRTP sets goals that address both traditional transportation topics, such as asset management, transportation finance and safety, and broader mission-focused topics, such as visitor experience and natural and cultural resource protection.

Goal Areas and Goal Statements of the National LRTP

ASSET MANAGEMENT
Sustainably manage NPS transportation assets and services

TRANSPORTATION FINANCE
Allocate available transportation funding wisely

RESOURCE PROTECTION
Protect and preserve natural and cultural resources

VISITOR EXPERIENCE
Maintain and enhance the quality of visitor experiences

SAFETY
Provide a safe transportation system for all users

Alignment with Planning Requirements and Existing Plans

Consistency with State and Metropolitan Plans

Federal surface transportation legislation, as reauthorized in the FAST Act, requires federal land management agencies such as the National Park Service to develop LRTPs that are consistent with the 3C planning processes required of state departments of transportation (DOTs) and metropolitan planning organizations (23 United States Code [USC] §201; 23 USC §134 and §135). This plan is consistent with those processes and legal requirements. Table 1-1 demonstrates how the National LRTP aligns with US Department of Transportation (USDOT) planning factors.

Table 1-1. Comparison of NPS and USDOT Planning Factors

	National LRTP Goal Areas				
USDOT Planning Factors[1]	**Asset Management**	**Transportation Finance**	**Resource Protection**	**Visitor Experience**	**Safety**
Economic Vitality	●	●	●	●	
Safety				●	●
Security					●
Accessibility & Mobility	●			●	●
Environment	●		●		
Connectivity	●	●		●	
Efficiency	●	●		●	
System Preservation	●	●			
Resiliency & Reliability	●		●		●
Travel & Tourism				●	

[1] 23 USC §134(h) and §135(d).

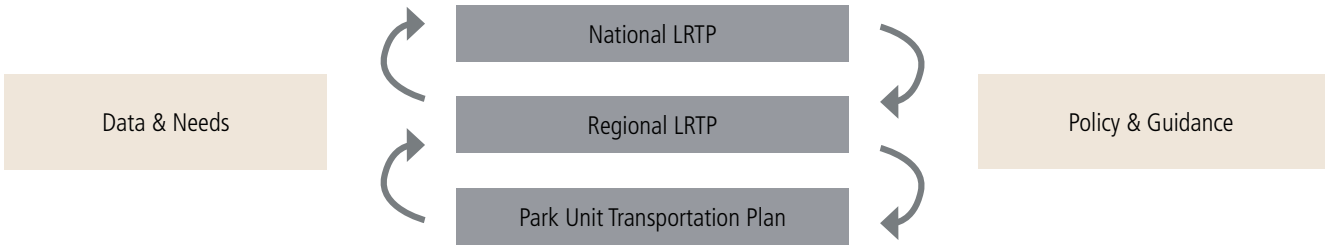
Alignment with Other Plans

The National LRTP is also aligned with other NPS and Department of the Interior (DOI) plans, policies and management tools, such as the *NPS Management Policies 2006* (NPS 2006) and others including the following:

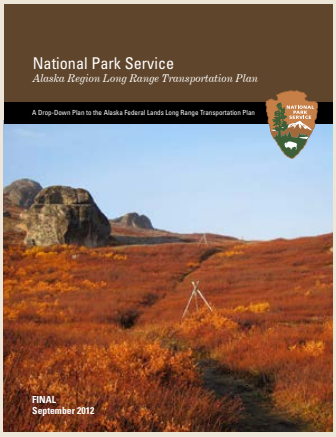
- *A Call to Action* (NPS 2015)
- *NPS Capital Investment Strategy* (NPS 2012a)
- *Healthy Parks Healthy People Strategic Action Plan* (NPS 2011a)
- *Green Parks Plan* (NPS 2012b)
- *America's Great Outdoors* (CEQ et al. 2011).

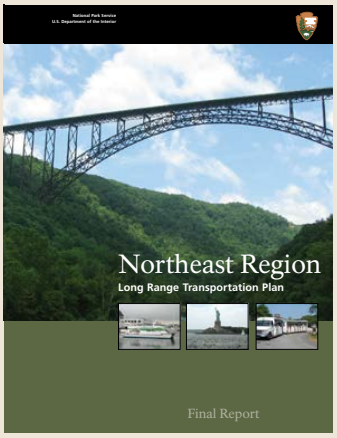
The National LRTP also serves as a strategic guide to inform long range transportation planning at the regional and park unit levels. Future regional and unit LRTPs will be consistent with the goals and objectives established in the National LRTP but customized to evaluate and respond to regionally unique needs and challenges and to identify more detailed strategies to support NPS shared goals, objectives, strategies and performance measures. Iterative feedback among the national, regional and park unit levels will inform and strengthen future updates to each plan (Figure 1-3).

Figure 1-3. The Iterative Feedback Loop of NPS LRTPs



The National LRTP aligns with existing NPS regional LRTPs, such as the Alaska, Northeast and Intermountain Region LRTPs. Other regional LRTPs already developed or under development will similarly be aligned with the National LRTP.





A Comprehensive, Fiscally Constrained Plan

The National LRTP includes the most comprehensive analysis of NPS transportation finance ever completed (Figure 1-4). The plan cuts across NPS programs, offices and disciplines to look at all assets, fund sources and stages in the transportation life cycle. It is a fiscally constrained plan, meaning that only funds reasonably expected to be available for transportation are included[2] (Figure 1-5). The plan looks at all stages in the life cycle of investment needs for transportation assets and all programs that have historically contributed to planning, building, operating and maintaining the transportation system. It is multimodal, including every mode of transportation in the financial analysis. The result of this in-depth, comprehensive examination of NPS transportation finance is the National Transportation Investment Strategy. This framework articulates how the National Park Service can make the best use of limited funding, focusing on the most important parts of the system and making smart, long-term investments in operations and maintenance activities to extend the life of transportation investments.

Figure 1-5. Illustration of NPS Estimated Annual Transportation Funding Gap

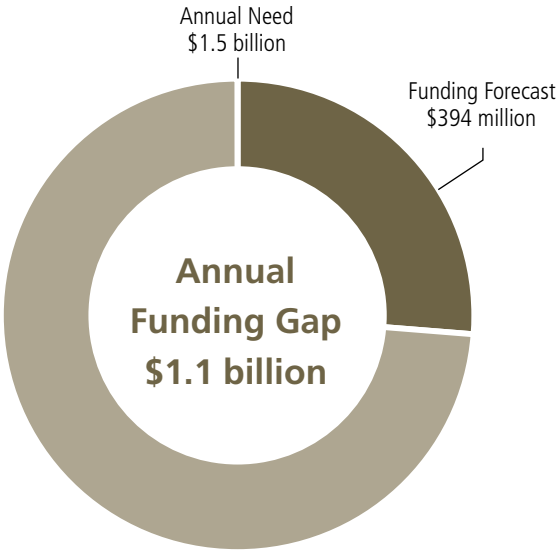


Figure 1-4. Illustration of Comprehensive National Park Service Long Range Transportation Planning Approach

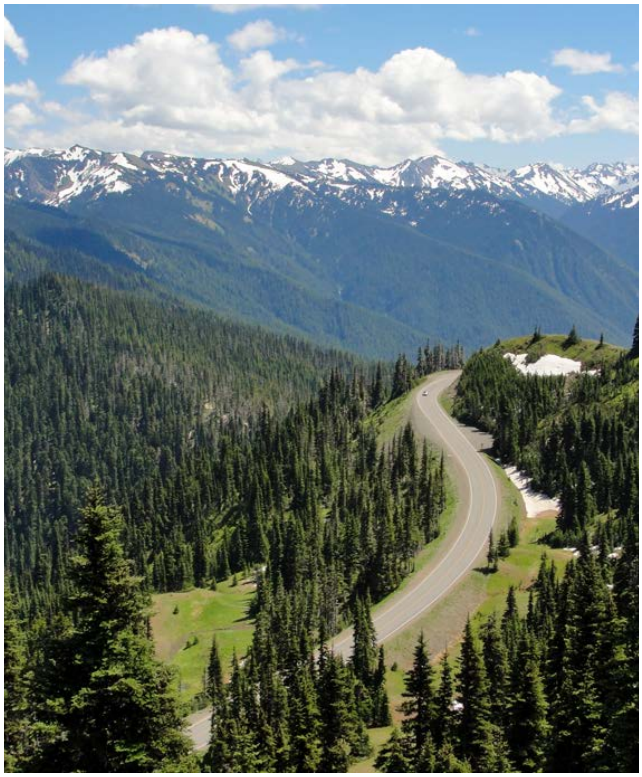
*Historical focus of many transportation plans

[2] The financial analysis for the National LRTP was completed before the passage of the Fixing America's Surface Transportation (FAST Act) and the fiscal year (FY) 2016 Consolidated Appropriations Act, both of which increased future available funding for NPS transportation assets. Although these increases will help the National Park Service care for its transportation system, they are not large enough to cover even the highest priority investment needs identified in this plan.

Putting the Plan into Action

The National LRTP is a strategic, long-range plan that provides guidance to programs and managers throughout the National Park Service. It does not replace decisions made at the directorate, regional, park unit or program levels. The National LRTP will be implemented through the actions of existing programs and managers in alignment with their priorities and procedures.

Following the plan's release, the National Park Service will organize action planning and reporting teams and establish performance monitoring protocols. A performance report will be published approximately two years after the plan is released, with a second performance report after four years. These reports will inform the first National LRTP update, which will be an opportunity for the National Park Service to re-examine and re-evaluate transportation priorities servicewide. The first National LRTP update is targeted for release five years after this plan is published.



Olympic National Park

How to Read the Plan

The National LRTP begins by presenting the National Transportation Investment Strategy. This chapter articulates how limited transportation funding can be best applied to meet the goals of the National LRTP and describes the anticipated outcomes of following the investment strategy.

The following five chapters are organized around the five strategic goal areas:

- **Asset Management**
- **Transportation Finance**
- **Resource Protection**
- **Visitor Experience**
- **Safety**

Each goal area chapter follows the same format:

- Goal area chapters begin with a brief overview and **introduction** to the chapter.
- Next, the chapters present the **baseline conditions and macro trends**, providing context and introducing key concepts in transportation related to the goal.
- The chapters discuss the **objectives** of the goal area and lay out **recommended strategies** for achieving them.
- The chapters conclude by listing the **performance measures** and targets that the National Park Service will use to gauge progress in the goal area.

The Conclusion closes the National LRTP, discussing next steps for putting the plan into action, monitoring and reporting progress and releasing future plan updates.

Technical reports and methodology are available on request. For more information, please visit the National Park Service LRTP website.

NATIONAL PARK SERVICE • U.S. DEPARTMENT OF THE INTERIOR

Pacific West Region

Long Range Transportation Plan

A 20-year plan for guiding transportation infrastructure management and investment in the Pacific West Region

2015 - 2035

PWRO JUNE 2015

Executive Summary

This plan identifies existing and future transportation needs for national parks in the Pacific West Region (PWR) through the year 2035. Significant gaps are expected between projected funding and estimated needs, in particular for preventive maintenance and operations, rehabilitation of roadways and parking areas, and recapitalization of transit vehicles. Insufficient past funding has left transportation infrastructure in need of extensive repairs and major investments just to maintain existing facilities and levels of service. Very few major capital investments or new construction projects have been built in recent years to either add new roadway capacity or provide for new transit service connections, despite increasing congestion problems at a number of park sites. Ninety-nine percent of the cost for work identified in PWR's current transportation project priority lists is for maintenance, repair or recapitalization of existing roadway, parking and transit assets, as opposed to new construction or new service.

By 2035 the total gap between projected annual funding ($132 million) and estimated annual needs ($194 million) for the Pacific West Region will be $62 million. Implementation of the Capital Investment Strategy (CIS) will help to lengthen the service life for transportation assets that are identified as high priority, and keep annual maintenance requirements in balance by matching the core asset portfolio to the amount of operational funds available. Roadway rehabilitation is the largest element of the transportation program that is projected to be underfunded. However, there are other important future needs that won't be fully met, which include

- efforts to proactively address climate change impacts to facilities;
- implementing environmentally beneficial facility improvements such as providing for better fish passage and reducing wildlife-vehicle collisions;
- providing maintenance for future, as yet un-built capital projects;
- providing for transit recapitalization;
- adopting evolving communication technologies to relieve transportation congestion problems;
- providing for accessibility to comply with the *Architectural Barriers Act* standards;
- rehabilitating aging and dilapidated roadway features on historic roads and bridges; and
- removal of facilities that are decommissioned either due to lack of funding for operation and regular maintenance, or susceptibility to frequent, recurring damage from floods, landslides or rising seawaters.

This document offers a fiscally constrained plan aimed at maintaining safe and enjoyable visitor access to essential experiences in PWR parks. The investment strategy focuses on high priority assets for rehabilitation and preservation, and is aligned with the CIS for reinvesting in assets that superintendents have committed adequate operational and annual maintenance dollars. The current gap between funding and identified need will grow mainly as a result of steady increases in deferred maintenance, as calculated if there is no increase in PWR's purchasing capacity for rehabilitation and regular maintenance. Even with full investment in bridge and pavement preservation programs, roadway conditions will continue to decline as inevitable aging and deterioration outpaces the

financial capacity to rehabilitate all the facilities for which there is a need. Costs for transit operations and recapitalization of vehicles may also pose a challenge for managers at some parks.

Maintaining access and providing for visitor enjoyment under these conditions will depend on several key strategies:

- Priority will remain on functional class one and two roadways.
- Recapitalization will be focused on assets in CIS optimizer bands one and two.
- Prioritization for funding will go to projects that serve visitor areas and activities that are closely linked to the park's purpose and can't be substituted at another location within the park.
- Capital investments/new construction will be very limited in order to conserve funds for repairs to existing facilities.
- Roads, parking areas and transit systems may need to be removed or downsized in order to bring inventory in line with budgets.
- With regard to global climate change, careful consideration, including life-cycle cost analysis, must be made before major reinvestment in transportation facilities. This is especially applicable to those facilities that are vulnerable to increasingly severe or frequent storm damage or sea-level rise.


Pacific West Region
National Park Service
U.S. Department of the Interior
Pacific West Region Central Offices
NPS Pacific West Region Parks, Trails, and Other Areas
NB National Battlefield
NM National Monument
NP National Park
NS National Seashore
NGT National Geologic Trail
NHP National Historical Park
NHS National Historic Site
NHT National Historic Trail
NRA National Recreation Area
NMEM National Memorial
NRES National Reserve
NHRES National Historical Reserve
NPRES National Preserve
Background line data based on USGS digital data 1:2,000,000
Shaded relief from USGS
NPS boundaries from NPS national boundary layer.
Projection: Lambert Azimuthal Equal Area
Map Number: 121933
CANADA
MONTANA
WASHINGTON
OREGON
IDAHO
WYOMING
NEVADA
UTAH
ARIZONA
CALIFORNIA
PACIFIC OCEAN
MEXICO
HAWAI'I
San Juan Island NHP
Ross Lake NRA
North Cascades NP
Ebey's Landing NHRES
Lake Chelan NRA
Olympic NP
Lake Roosevelt NRA
Seattle
Klondike Gold Rush NHP
Wing Luke Museum
Ice Age Floods NGT
Mount Rainier NP
Manhattan Project NHP (Authorized)
Lewis and Clark NHP
Fort Vancouver NHS
Nez Perce NHP
Whitman Mission NHS
Big Hole NB
Ice Age Floods NGT
John Day Fossil Beds NM
Craters of the Moon NM and NPRES
Crater Lake NP
Hagerman Fossil Beds NM
Minidoka NHS
Oregon Caves NM
City of Rocks NRES
World War II Valor in the Pacific NM
Tule Lake Unit
Redwood NP
Lava Beds NM
Whiskeytown NRA
Lassen Volcanic NP
Rosie the Riveter WWII Home Front NHP
Great Basin NP
John Muir NHS
Port Chicago Naval Magazine NMEM
Point Reyes NS
Yosemite NP
Muir Woods NM
Eugene O'Neill NHS
San Francisco
Golden Gate NRA
Fort Point NHS
San Francisco Maritime NHP
Devils Postpile NM
Manzanar NHS
Kings Canyon NP
Death Valley NP
Tule Springs Fossil Beds NM
Pinnacles NP
Grand Canyon - Parashant NM
Sequoia NP
Lake Mead NRA
Honolulu
World War II Valor in the Pacific NM
Honouliuli NM
Kalaupapa NHP
Juan Bautista de Anza NHT
César E. Chávez NM
Haleakala NP
Mojave NPRES
Santa Monica Mountains NRA
Pu'ukohola Heiau NHS
Joshua Tree NP
Kaloko-Honokohau NHP
Channel Islands NP
Pu'uhonua o Honaunau NHP
Ala Kahakai NHT
Hawai'i Volcanoes NP
Cabrillo NM
1 AMERICAN SAMOA: NP of American Samoa
2 GUAM: War in the Pacific NHP
3 NORTHERN MARIANA ISLANDS: American Memorial Park
Produced by the Pacific West Region GIS Program
March, 2015
N:\GIS_Maps\Region\Pacific West Region Map\pwrmap_v27.mxd

U.S. FISH AND WILDLIFE SERVICE AGENCY PROFILE

U.S. Fish & Wildlife Service

PLAN 2035

The National Long Range Transportation Plan

Moving People, Conserving Wildlife

July, 2016

Executive Summary

Siletz Bay NWR

Oregon

Why Transportation?

The primary function of any transportation system is the simple movement of people, goods or equipment across time and space. However, in the realm of federal land management, the transportation system of the U.S. Fish and Wildlife Service (FWS or the Service) must be so much more. Transportation touches every aspect of the Service from the public that relies on safe access networks to the land managers that need to be able to move freely about the landscape, transportation is indispensable.

The purpose of this document is to illuminate the best known practices to manage a transportation system for a resource conservation agency.

In the face of changing climates, shrinking budgets and increased visitation, defining priorities for a national transportation program is a challenge. This Long Range Transportation Plan (LRTP or PLAN 2035) will help guide programmatic decisions while ensuring the transportation program supports the Service mission:

Working with others to conserve, protect and enhance fish, wildlife, plants and their habitats for the continuing benefit of the American people.

- FWS Mission

To help balance this dual-purpose (resource conservation and public benefit) mission, this plan proposes a vision and six strategic goals that the transportation program will uphold through the actions and policies in this plan. The centerpiece of the plan is a performance based project selection process that will directly link the goals of the program with the way transportation projects are planned, designed and delivered.

While it is difficult to put a price on the ecological services the FWS provides (like habitat conservation, outdoor education, critical species protection and improvements in environmental quality), the financial dividends that the Refuge and Hatchery systems pay to local economies are well documented in national reports like Banking on Nature (October, 2013).

These outcomes, both monetary and nonmonetary, are predicated on safe, sustainable and resilient mobility and access networks that are the direct purview of the transportation program.

Thanks to nearly two decades of dedicated funding, the transportation program has been able to determine inventories, collect condition data, address the most pressing safety issues and fix the highest priority assets. Looking forward, the program must take a more strategic approach to demonstrate program stewardship while maintaining the Service's commitment to leadership in the federal lands transportation arena. This document is a first step in meeting that commitment while helping to build a world class and context-sensitive transportation network that services our lands.

PLAN 2035 is written for Service project leaders at individual units, Regional Service leadership, national level decision-makers, non-Service partners, and stakeholders.

It should be noted that PLAN 2035 focuses on public use transportation facilities that connect to or are within Service lands. There are other Service programs relating to non-public use (or admin. only) transportation facilities as well as efforts within the federal-aid transportation system that are not eligible for Federal Lands Transportation Program (FLTP) funding. Being beyond the scope of this effort, those systems and programs generally are not covered in this plan.

Transportation Vision

'To work collaboratively for future planning and stewardship of a context sensitive, multi-modal transportation system that helps conserve natural resources, provides a superior level of safety, delivers cost effective and environmentally sustainable transportation options, generates local economic opportunities and enhances the visitation experience for all visitors including underrepresented and mobility limited-populations.'

Program Principles

Consistent with Department of Transportation (USDOT) and national transportation policy (Fixing America's Surface Transportation and Moving Ahead for Progress in the 21st century, see page 62) guidance, the transportation program has adapted these three principles that guide this plan:

[T] - Transportation - The most basic function of any transportation network, the safe and efficient movement of people and equipment is essential to the program. The Refuge System is also mandated to operate and maintain a safe and functioning transportation network to service wildlife dependent recreational uses as provisioned in the National Wildlife Refuge Improvement Act of 1997.

[RM] - Resource Management - Transportation infrastructure, if not designed in the proper way, can fragment habitat, disrupt wildlife and even cause irreparable damage to an ecosystem. Parking lots, roads and trails must be thoughtfully planned, designed and constructed to preserve, conserve and enhance Service lands.

[EG] - Economic Generation - Parks, refuges and other public lands are economic drivers for local communities. Not only do they provide increased quality of life for nearby residents, but they draw visitors and tourists domestically and internationally that support local/regional economies and add to the tax base. Safe and efficient access to and within Refuges and Hatcheries, bolsters visitation and supports economic generation for the United States.

Investment Strategy

The national investment strategy is a high level framework for complying with the policy directives in Executive Order 13327 (Federal Real Property Asset Management), guidance from the Office of Management and Budget, asset management principles at the Department of Interior, policy priorities of the Fish and Wildlife Service and current transportation legislation (FAST Act).

Transportation improvement plans and regional LRTPs should be consistent with this national investment strategy framework:

- Develop connections to people and urban refuges.
- Maintain state of good repair on high priority (mission dependent) transportation assets.
- Decommission or phase out low-priority (non-mission dependent) transportation assets.
- Improve safety.
- Support high-use recreation areas.
- Support financial sustainability.
- Seek partnerships for project implementation.

The Six Strategic Goals

The six strategic goals are the framework for the policy guidance in this plan. Individually, they represent the ideal state of one aspect of the transportation program. Collectively they represent the 20 year transportation vision.

Goals are defined on pages 16–17. Each goal has specific objectives and performance measures to help the transportation program track and demonstrate progress over time. The six strategic goals are:


Coordinated Opportunities


Asset Management


Safety


Environmental


Access, Mobility and Connectivity


Visitor Experience

Selection Process

The project selection process, built around the six strategic goals, is the outline for a data driven and performance based planning process to develop capital improvement plans at the regional level.

The framework is intended to be flexible and can be tailored to individual regions based on differing needs and priorities.

Each strategic goal is associated with an evaluation criteria element in the project scorecard (Step 3). The scoring process is meant to help determine a project's consistency with the strategic goals in this plan and a project's priority relative to other proposals through a consistent, quantitative ranking formula.

Project Selection Framework Steps:

1. Region Solicits Projects From Units

2. Region Prepares Applications for Scoring

3. Scoring and Project Scorecard

4. Ranking and Prioritization

5. Determine Projects for Regional Program

6. Eligibility Check and Program

7. Adapt for Next Cycle

Funding

Funding for the FWS public-use transportation network can either come from Federal Lands Transportation Program (FLTP) base allocations (authorized in national transportation policy, currently FAST Act), the Service's base appropriation, or supplemental sources like grants and non-governmental partnerships.

FLTP base funds are sub-allocated to the individual regions based on a formula that was established in the early days of the FLTP. This plan does not propose any change to the current formula.

The project selection process is intended to be used (or adapted) for projects programmed with FLTP base funds. To give the program consistency, demonstrate performance management, and advance strategic goals, PLAN 2035 proposes the selection process for scoring, prioritizing, and programming FLTP base allocations.

Because the needs of the program far outweigh the funds available through FLTP base allocations, the program must actively seek supplemental funds. Programs like the Federal Lands Access Program (FLAP) are key in leveraging the limited dollars available to address transportation needs in Service lands.

Low priority and administrative transportation assets are not eligible for FLTP funding. Instead, these assets should be maintained with deferred maintenance (DM) funds and/or general station funds on a case by case basis.

U.S. Fish & Wildlife Service

Long Range Transportation Plan for Fish and Wildlife Service Lands in Region 1

Final Version

April 2012

Executive Summary

Transportation infrastructure provides critical links and resources in connecting people with nature on all U.S. Fish and Wildlife Service (Service) lands, specifically, at national wildlife refuges and national fish hatcheries. To this end the Service seeks to optimize transportation funding decisions and leverage its transportation dollars wisely, for the next 20 years and beyond.

Why was the Long Range Transportation Plan for U.S. Fish and Wildlife Service Lands initiated?

This long range transportation plan (LRTP) was initiated within the Service to achieve the following:

- Establish a defensible structure for sound transportation planning and decision-making.
- Establish a mission, goals, and objectives for transportation planning in Region 1.
- Implement coordinated and cooperative transportation partnerships in an effort to improve the Service's transportation infrastructure.
- Bring the Service into compliance with the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) that requires all Federal land management agencies (FLMA) to conduct long range transportation planning in a manner that is consistent with metropolitan planning organization (MPO) and State department of transportation (DOT) planning.
- Integrate transportation planning and funding for wildlife refuges and fish hatcheries into existing and future Service management plans and strategies (e.g., comprehensive conservation plans [CCPs] and comprehensive hatchery management plans [CHMPs]).
- Increase awareness of Alternative Transportation Systems (ATS) and associated benefits
- Develop best management practices (BMP) for transportation improvements on Service lands.
- Serve as a pilot project for the implementation of a region-level transportation planning process within the Service.

Changes made to the Long Range Transportation Plan based on received comments

Comments were received from the public and within the Service on the public draft of the LRTP. Based on comments received, changes to the LRTP made between the public draft and this final version were editorial in nature and did not result in significant changes.

What are the Goals for this Long Range Transportation Plan?

As defined by the Region 1 core planning team, the primary goals of this LRTP are to:

- Ensure that the transportation program helps to conserve and enhance fish, wildlife, and plant resources and their habitats.
- Provide a safe and reliable transportation network to and within Service lands.
- Develop and maintain a transportation network that welcomes and orients visitors.
- Integrate transportation planning into Service plans and processes.
- Develop partnerships to leverage resources and develop integrated transportation solutions.
- Adopt and promote sustainable transportation practices.

Region 1 at a Glance

Within Region 1 there are:

- **270 million acres** managed or co-managed by the Service (throughout five states and outlying Pacific Islands)
- **421 road miles**
- **342 parking lots**
- **160 trail miles**
- **63 National Wildlife Refuges**
- **15 National Fish Hatcheries**
- **23 other fish facilities**

Who is Leading This Effort?

Region 1 of the Service is leading the development of this LRTP. The region's refuge and fisheries programs have been the principle leads in this effort, supported by the Division of Planning and Visitor Services.

Federal Lands Highway Division (FLH) of the Federal Highway Administration (FHWA) has also played an important role in this LRTP. In addition to helping establish the framework for the Service's transportation planning process, FLH has assisted in identifying potential partner agencies at the Federal, State, and local levels that may provide leveraging opportunities to advance future transportation projects.

Why is Transportation Planning Important to the Service?

Although often overlooked, transportation infrastructure supports U.S. Department of Interior initiatives by connecting people with nature, improving the condition of parking areas, public and service roads, and trails assets all while meeting the mission of the Service. Understanding the connection between transportation and conservation, the Service has established a transportation-related mission statement, goals, and objectives to serve as benchmarks for evaluating improvements to the transportation system within Region 1 as part of this LRTP. Together with an understanding of existing transportation infrastructure deficiencies in the region, this plan enables the region to make better decisions regarding its most critical transportation needs.

At a time when resource and infrastructure funding is scarce, this LRTP provides leaders with a toolkit to use in working with gateway communities, counties, MPOs, other FMLAs, and stakeholder agencies outside Service boundaries, many of whom could potentially contribute funding or in kind services to advance priority projects.

FHWA

USFWS

What Value Does This Plan Provide for the Service?

The LRTP brings multiple benefits to the Service, such as:

- Provides a platform for individual units to communicate needs and opportunities to regional and national decision makers.
- Enables leaders to make informed decisions based on long-term transportation mission, goals, and objectives.
- Provides the Service with a better picture of future transportation needs and information for discussion regarding transportation reauthorization.
- Provides a long-term view of transportation in relation to core operations and Service priorities.
- Enables leaders to direct funding to the most beneficial and highest priority transportation projects.
- Enables leaders to find alternative funding from Federal sources that are administered by States (DOTs) or MPOs.
- Enables leaders to synchronize transportation planning with other refuge and hatchery planning efforts such as refuge CCPs, CHMPs, and other regional planning efforts outside Service boundaries.
- Provides current data on multimodal transportation issues and needs across the region.
- Provides an opportunity for Region 1 and individual refuges and hatcheries to partner and discuss areas of mutual interest with the public and regional entities such as minimizing carbon footprint, the potential for alternative transportation systems, and improved transportation systems linkages.

How Will This Plan Be Implemented?

This plan outlines how to quantify and communicate needs and opportunities in the areas that best align with Service goals and objectives, and thereby is more likely to receive funds. The plan provides a project selection framework that improves the defensibility of transportation funding decisions. The framework improves confidence in funding decisions by allowing decision makers to view transportation system needs throughout the region, and compare how these needs rank against predefined evaluation criteria and benchmarks that represent the long-term interests of the Service, as established in the mission, goals, and objectives. This decision-making framework allows projects to be compared and ranked according to their merits.

What are the Key Findings of This Plan?

Since the inception of the Refuge Roads Program in 1998, Region 1 has completed over 100 projects improving public roads, trails, and parking lots. These improvements have improved the experience for millions of visitors to National Wildlife Refuges in Region 1.

The fisheries program has also demonstrated mission critical need for transportation improvements that currently can only be met through deferred maintenance. Because deferred maintenance funds are used to address deficiencies in all real property assets, transportation projects must compete with other mission critical projects such as water delivery systems and fish rearing infrastructure. This LRTP demonstrates the fisheries program mission critical need to allocate transportation funding specifically for fisheries.

Funding for the Service's transportation program (including refuges and fisheries) does not meet current or anticipated future needs. A well-defined funding and investment strategy is critical to maintain Service transportation assets. The Service must also seek opportunities outside the traditional funding sources in order to keep up with its aging infrastructure. Forming partnerships with local and State agencies will become increasingly critical to address these needs.

APPENDIX B:
REGULATORY TECHNICAL REPORT DRAFT

1. INTRODUCTION

As they relate to Federal lands in Oregon and Washington, transportation planning, funding, and investment are guided by numerous regulations at the Federal, State, and local level. Understanding the role of these regulations and their jurisdictional authority is an important part of the long-range planning process for Federal Land Management Agencies (FLMAs). This technical report is compiled to support the Pacific Northwest Federal Lands Long-Range Transportation Plan, which may help guide agencies in making future funding and policy decisions.

This regulatory technical report documents:

- Federal regulations and programs;
- Washington State regulations and programs;
- Oregon regulations and programs; and
- Bi-state agreements negotiated or administered by the states of Washington and Oregon.

2. FEDERAL REGULATIONS AND PROGRAMS

Federal regulations and programs provide guidance, funding, and the regulatory framework for the management of transportation on Federal lands in Washington and Oregon. For the purpose of this report, these fall into four broad categories:

- Fixing America's Surface Transportation (FAST) Act, the Federal surface transportation funding bill and related Codes of Federal Regulations,
- Regulations, guidance, and programs administered by USDOT,
- Regulations and programs administered through FLMAs, such as the Bureau of Land Management (BLM) and United States Forest Service (USFS), and
- Specific environmental and transportation legislation passed by Congress, such as the National Environmental Policy Act and the Columbia River Gorge Act.

These Federal programs are detailed in the following section.

2.1 FAST ACT

The FAST Act is the Federal surface transportation funding bill signed into law in 2015 that authorizes $305 billion of support for fiscal years 2016 through 2020. The FAST Act renews many of the programs and requirements in the Moving Ahead for Progress in the 21st Century (MAP-21) Act, signed into law in 2012. The FAST Act provides two primary funding programs for transportation systems offering access to and within Federal lands. These include the Federal Lands Transportation Program (FLTP) and the Federal Lands Access Program (FLAP). Regulations to implement provisions of the FAST Act still are being adopted.

2.2 FEDERAL LANDS TRANSPORTATION PROGRAM

The FLTP was established in 23 United States Code (USC) 203 "… to improve multi-modal access within national parks, forests, wildlife refuges, Bureau of Land Management lands, and U.S. Army Corps of Engineers facilities." The Federal Highway Administration (FHWA) oversees the FLTP. The FLTP encompasses all modes of transportation for public travel on Federally owned lands. The FLTP provides a set annual funding amount to the National Park Service (NPS), the U.S. Fish and Wildlife Service (FWS), and the USFS. The BLM, the Bureau of Reclamation (BOR), the U.S. Army Corps of Engineers (USACE), and other FLMAs

are eligible to compete for funding on an annual basis. Table 1-1 shows the annual distribution of funds. Eligible activities for FLTP funds include "… any transportation project eligible under Title 23 of the USC that is within or adjacent to, or that provides access to Federal lands open to the public." Such projects could include road facilities such as vehicular parking areas, pedestrian and bicycle facilities, congestion mitigation, and environmental mitigation. When applying for FLTP funds, FLMAs must demonstrate the extent to which their proposals support a state of good repair, asset management goals, and sites considered to be Federal economic generators and/or high-use visitation sites.[1]

Table A-1: Federal Lands Transportation Program Annual Authorization Amounts, FY16-FY20

	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	Total
NPS	$268 M	$276 M	$284 M	$292 M	$300 M	$1.42 B
FWS	$30 M	$30 M	$30 M	$30 M	$30 M	$150 M
USFS	$15 M	$16 M	$17 M	$18 M	$19 M	$85 M
BLM, USACE, BOR, and Independent Federal Agencies	$22 M	$23 M	$24 M	$25 M	$26 M	$120 M
Total	$335 M	$345 M	$355 M	$365 M	$375 M	$1.775 B

2.2.1 Federal Lands Access Program

The FLAP, established in 23 USC 201 and 204, allows local and State governments to compete for funding for transportation projects that provide access to Federal lands. Local and State governments that own or maintain transportation systems operating within or directly adjacent to Federal lands are eligible applicants, and applications must have the approval of the FLMA being accessed. Competition for funds at the State level is based on the quantity of Federal lands and roadways in the State, with 80 percent of funds going to States that contain at least 1.5 percent of the total of public lands. Individual projects are selected by a Programming Design Committee (PDC) made up of officials from the Federal Lands Highway Division (FLHD), FHWA, the respective State Departments of Transportation (DOT), and other State and local representatives. Funds are made available through contract authority from the Highway Trust Fund but require matching funds from the State. Oregon's match requirement is 10.27 percent and Washington's match requirement is 13.50 percent. FLTP funds may be used as matching funds for FLAP and these funds may be used for public roads, transit systems, and other transportation facilities. Preference is given to sites that are considered to be economic generators or are high-use recreation facilities.[2]

2.2.2 Statewide and Metropolitan Planning Processes

Because State and locally owned transportation systems provide access to and within Federal lands, the statewide and metropolitan planning processes are a key part of the regulatory environment in which Federal lands transportation programs operate. FLMAs are one of several organizations with which State DOTs are required to coordinate when developing their Statewide Transportation Improvement Programs (STIPs) and their Long-Range Statewide Transportation Plan. State DOTs also must coordinate with Metropolitan Planning Organizations (MPOs), Tribal Governments, and local elected and appointed officials with responsibilities for transportation. 23 USC 201(c) requires FLMA projects within metropolitan areas to be planned in accordance with metropolitan and statewide planning and programming processes. FAST Act guidance states that regionally significant projects should be included in appropriate Federal lands transportation plans, State and metropolitan plans, and the STIP.[3] FLHD must approve FLMA transportation projects before they are added to the STIP.

The FAST Act strongly encourages FLMAs to take part in the development of State long-range transportation plans. Likewise, States and MPOs are required, at a minimum, to provide the opportunity for FLMAs to comment on proposed long-range plans. FLMAs that are involved early in the planning process can better ensure that their goals are adequately represented. The Federal planning regulations require these plans to have a minimum 20-year outlook at the time of adoption. MPOs must update their plans every four to five years, depending on air quality attainment status. States do not have a mandated update schedule.

1 FHWA, Federal Lands Transportation Program: http://flh.fhwa.dot.gov/programs/fltp/.
2 FHWA, Federal Lands Access Program: http://flh.fhwa.dot.gov/programs/flap/.
3 FWHA. 2016. Implementation Guidance for the Federal Lands Transportation Program: http://www.fhwa.dot.gov/map21/guidance/guidefltp.cfm.

2.2.3 Performance Measurement

The FAST Act calls for States and MPOs to adopt performance measures as part of their planning process; the USDOT is leading rulemaking related to the performance management provisions in the FAST Act, and, as such, FHWA has developed measures for Federal-Aid Highway programs related to safety, bridge and pavement condition, system performance, traffic congestion, mobile source emissions, and freight movement.[4] Reflecting the central theme of performance management, FLMAs must provide an application (Investment Strategy) that proposes programs at different levels of funding, along with a description of how the programs support the following goals:

- Maintaining transportation facilities in a state of good repair, reducing bridge deficiencies, and improving safety;
- Providing access to high-use Federal recreation sites or high-use Federal economic generators; and
- Meeting resource and asset management goals of the Secretary of the respective FLMA.

The FLHD is working with FLMAs to help them develop joint performance measures that help meet FLMA and USDOT goals.

2.3 FEDERAL LAND MANAGEMENT AGENCY GUIDANCE

Each of the FLMAs included in the FLTP has a transportation program dedicated to planning, developing, and delivering transportation systems on its lands. The FLMA transportation programs vary based on agency mission, funding levels, and maturity, but all programs follow requirements and guidance listed in the FAST Act or provided by FHWA. The section below briefly summarizes the transportation programs of each FLMA; additional detail will be available in individual agency Long-Range Transportation Plans (LRTPs).

2.3.1 Bureau of Land Management

The BLM manages more than 200,000 miles of linear features across the United States, including more than 45,858 miles of roads, 13,000 miles of trails, and 891 bridges. Oregon and Washington have 19,171 miles of roads, 1,404 miles of trails, and 478 bridges. Starting in 2013, the BLM Roads Team has been using a data-driven process to nominate, verify, and select roads projects for BLM-owned roads. The BLM uses Travel Management Plans (TMPs) to guide management of linear features, roads, and trails across its field offices. The BLM also grants right of way for various public and private transportation and infrastructure projects. These projects can include, but are not limited to, roads, trails, canals, railroads, electric and communication transmission lines, and pipelines. Organizations or individuals desiring to build such facilities on any public land must apply for and receive a grant from a BLM State office before beginning construction. BLM grants are not required for what it defines as "casual uses," which do not cause disturbance or damage to public lands. This includes driving on existing roads, sampling, surveying, marking routes, and collecting data for a ROW grant application.

2.3.2 U.S. Fish and Wildlife Service

The FWS manages approximately 5,400 miles of roads and 2,100 miles of trails across more than 600 national wildlife refuges, national fish hatcheries, and wetland management districts. FWS has had a formal roads program, receiving funding from FHWA, since 1999; under the FAST Act, FWS receives $30 million annually as part of the FLTP. In 2016, the Service published its first National Long Range Transportation Plan, known as Plan 2035, which outlines FWS's vision for transportation during the next 20 years.[5] The plan also gives guidance for investment strategies for transportation infrastructure, the selection process for regional projects, and available funding mechanisms. Additionally, FWS has completed several regional LRTPs, including one in the Pacific Region that was completed in 2012.[6] The Pacific Region LRTP, which includes Washington and Oregon, was developed as a pilot for future regional LRTPs. The Pacific Region contains a total of 421 road miles, 342 parking lots, and 547 trail miles (this includes Oregon, Washington, Idaho, and Hawaii).

[4] FHWA, Transportation Performance Management: https://www.fhwa.dot.gov/tpm/.

[5] U.S. Fish and Wildlife Service. 2016. Plan 2035: The National Long Range Transportation Plan: https://flh.fhwa.dot.gov/programs/flpp/lrtp/documents/2035-national-lrtp.pdf.

[6] U.S. Fish and Wildlife Service. 2012. Long Range Transportation Plan for Fish and Wildlife Service Lands in Region 1: http://www.fws.gov/pacific/planning/main/docs/Transportation/LRTPFinal.pdf.

2.3.3 U.S. Forest Service

The USFS's transportation system supports the agency's mission by providing access to and within National Forests and Grasslands for natural resource management purposes, public recreation, and subsistence uses of the USFS land. The USFS transportation program is administered by staff from the Forest Service's Departments of Engineering and Recreation. USFS transportation systems include roads, bridges, trails, transit systems, and water-based transportation assets. USFS manages a transportation network with approximately 373,417 miles of roads throughout the country, 30,000 of which are designated as part of the USFS FLTP network.

Oregon and Washington comprise USFS Region 6, where USFS manages 39,000 square miles of land. The Region 6 transportation network includes 90,000 miles of roads, of which 4,500 are designated FLTP roads; transportation trails; and water-based transportation systems.

USFS cites the following laws and regulations that govern their transportation and travel management:

- The National Forest Roads and Trails Act of October 13, 1964, as amended (16 USC 532-538) authorizes road and trail systems for the national forests, including easements across USFS lands, construction and financing of maximum economy roads, and requirements on road users for maintaining and reconstructing roads.
- The Highway Safety Act of 1966 (23 USC 402) authorizes State and local governments and participating Federal agencies to identify and survey accident locations; to design, construct, and maintain roads in accordance with safety standards; to apply sound traffic control principles and standards; and to promote pedestrian safety.
- The USFS Travel Management Regulations (36 CFR Part 212, Subparts A, B, and C) establishes requirements for administration of the forest transportation system, contains provisions for acquisition of rights of way, and requires identification of the minimum road system needed for safe and efficient travel and for administration of USFS lands. It also describes the requirements for designating roads, trails, and areas for motor vehicle use and provides for regulation of use of over-snow vehicles on USFS roads, trails, and lands.
- Prohibitions on USFS lands (36 CFR Part 261, Subpart A) establish prohibitions on use of USFS lands, including possession and operation of motor vehicles on USFS roads and trails.
- The Sale and Disposal of USFS Timber (36 CFR Part 223) governs road construction related to Forest Service timber sale appraisals and contracts.[7]

2.3.4 National Park Service

The role of the FLTP within the NPS is to maintain "… an efficient transportation system comprised of roads, bridges, parking lots, and shuttles." It is pivotal to the balancing act between providing access for millions of annual visitors and protecting the natural and cultural resources of the currently 401 parks. The NPS has a facilities planning program that includes the development of a national long-range plan (due Spring 2015) and regional transportation plans (three completed and two in progress, the Pacific Northwest Region LRTP has not yet started). The NPS transportation program manages construction and maintenance of infrastructure within the parks. Funds are allocated through the FLTP and are used to maintain approximately 5,500 miles of roads and 1,505 bridges and tunnels.[8]

[7] Other relevant regulations include the National Bridge Inspection Standards (23 CFR Part 650, Subpart C); Minerals (36 CFR Part 228); Procedures for Federal Agencies for Federal Roads (23 CFR Part 668, Subpart B); and Value Engineering (48 CFR Part 48).

[8] NPS, Transportation Program website: http://www.nps.gov/transportation/index.html.

2.3.5 U.S. Army Corps of Engineers

The USACE is based within the Department of Defense and provides public engineering, design, and construction management services for both domestic and international projects that have national security implications. One of the USACE's primary domestic missions as it relates to transportation is the construction and maintenance of navigable waterways, including locks, dams, and the dredging of shipping channels.[9] USACE also has permitting authority over projects that cross or otherwise impact these waterways, such as highway or rail bridge crossings.

Transportation plays a pivotal role in providing access to more than 4,000 recreation areas at more than 400 lakes in 43 states. The Corps estimates that it holds more than 7,000 miles of public roads—these tend to be short segments where State or county roads cross over into the Federal boundary or are circulation roads within designated recreation areas. These public roads lead to more than 2,600 Corps-managed recreation areas that provide access to lakes and rivers via 3,484 boat ramps, in excess of 95,000 campsites, more than 7,700 miles of trails, and 962 swimming areas.[10] USACE is divided into 10 divisions; Washington and Oregon fall almost entirely in the Northwestern Division.[11]

As a new member of the FLTP under MAP-21, USACE competes with BLM, BOR, and other Independent Federal Agencies for a share of competitive FLTP funding. FLTP funds are used primarily to preserve and expand recreation opportunities for the public at USACE sites, thus advancing the transportation-related goals of USACE's Recreation Strategic Plan.[12]

2.4 OTHER FEDERAL LEGISLATION

While some of the following Federal Acts do not directly legislate transportation planning or FLMA activities, they do affect how FLMAs and their partners plan, construct, and manage transportation and other activities in and around Federal lands.

2.4.1 National Environmental Policy Act

NEPA requires Federal agencies to consider the environmental impacts of their proposed actions, as well as reasonable alternatives to those actions. These include, but are not limited to, effects on natural resources, and impacts on social, cultural, and economic resources. All major Federal construction projects, such as federally funded highways, and any infrastructure project on federally owned lands must undergo an environmental review process under NEPA. In addition to construction projects, NEPA procedural requirements apply to the issuing of regulations, issuing of permits for private actions, Federal funding of private actions, and Federal land management decisions. The intent of the NEPA process is to ensure that decision makers are informed of the environmental impacts of their actions, though NEPA does not require that the decision makers choose the action or alternative determined to have the least environmental impact.

Two key steps in the NEPA process are the Environmental Assessment (EA) and the Environmental Impact Statement (EIS), which are undertaken by the agency leading a project or action.[13] Through comparing multiple alternatives, the EA determines whether the environmental impacts of an action are significant. If the EA determines that the agency's intended action will cause significant effects to the environment, NEPA then requires the preparation of an EIS. The EIS is an in-depth analysis of the anticipated environmental effects of the action. The EIS analysis includes evaluation of the effects by subject matter experts as well as input from public and private stakeholders and the general public. The agency makes a final record of decision regarding the environmentally preferred alternative for the action as well as all other options considered.

Transportation planning under 23 USC Sections 134 and 135 are NEPA FHWA categorical exclusions as per 23 CFR §771.117.

[9] USACE, Mission Overview: http://www.usace.army.mil/Missions.aspx.
[10] USACE, Recreation Overview: http://www.usace.army.mil/Missions/CivilWorks/Recreation.aspx.
[11] USACE, Where We Are: http://www.usace.army.mil/Locations.aspx.
[12] USACE. 2011. *Recreation Strategic Plan*: https://www.swl.usace.army.mil/Portals/50/docs/planningandenvironmental/Recreation%20Strategic%20Plan%20FINAL%201Apr2011.pdf.
[13] Some actions fall under a "Categorical Exclusion," which does not have a significant effect on the environment and is, therefore, not subject to an EA or an EIS. FLMAs often have agency-wide standards for actions that are or are not considered "Categorical Exclusions."

2.4.2 Columbia River Gorge Legislation

The Columbia River Gorge National Scenic Act of 1986 was passed by Congress with the intent to "protect and enhance the scenic, natural, cultural, and recreational resources of the Columbia River Gorge; and to protect and support the economy of the area by encouraging growth to occur in urban areas and allowing future economic development consistent with resource protection." The Columbia River Gorge National Scenic Area created by the Act is managed jointly by the states of Oregon and Washington, the USFS, the bi-state Gorge Commission, and the counties lying within the gorge area. The Gorge Commission Land Use Ordinance of 2005 provides guidance for the maintenance and improvement of transportation facilities within the gorge. The Gorge Commission—in partnership with Oregon DOT, the U.S. Department of Agriculture (USDA), and FHWA—also has developed long-range strategy and design standards for the Interstate 84 (I-84) corridor to ensure that future investments and improvements in the corridor protect cultural, recreational, and natural resources.[14] Examples of these types of strategies, including geometric and landscape design goals, can be found in the I-84 corridor strategies.[15]

2.4.3 National Trails

The National Trails System was created by the National Trails System Act of 1968 with the goal of establishing a national network of trails to promote preservation of and access to outdoor areas of the United States. The National Trails System Act created well-known trails, such as the Appalachian Trail in the eastern United States and the Pacific Crest Trail in the western United States, which has sections in Washington and Oregon. The creation of new National Historic Trails and National Scenic Trails must be authorized by Congress and established by the Secretary of the USDA or the Secretary of the Department of the Interior. The National Trails System relies on a number of partnerships with other Federal and State agencies, including NPS, BLM, FWS, USDA, FHWA, as well as individual State administrators and local non-profit organizations.[16]

2.4.4 Wild and Scenic Rivers

The National Wild and Scenic Rivers Act of 1968 preserves "… certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations."[17] Designated rivers are managed through a partnership of the BLM, NPS, FWS, and USFS. The Act classifies rivers under one of three categories: wild river areas, scenic river areas, and recreational river areas. Designated rivers or segments of rivers are administered either by a Federal or State agency. The Act also prohibits Federal support of activities such as dam construction or other in-stream activities that would compromise the free flow of the river. Oregon has 40 rivers designated under this act as Wild and Scenic Rivers while Washington has six rivers designated as such, with an additional 100 rivers eligible for this designation. The Gorge Commission—in partnership with Oregon DOT, USDA, and FHWA—also has developed long-range strategy and design standards for the I-84 corridor to ensure that future investments and improvements in the corridor protect cultural, recreational, and natural resources.[18]

3. WASHINGTON REGULATIONS AND PROGRAMS

Transportation plans are required by local ordinances, State laws, and Federal regulations and are developed by Federal, State, local, and Tribal governments. Some transportation plans prepared at the State level (Statewide Long-Range Transportation Plan, Strategic Highway Safety Plan, State Rail Plan, State Freight Mobility Plan, and Aviation System Plan) are a prerequisite to receiving Federal funds from the USDOT. In addition, metropolitan transportation plans are a federal requirement.

[14] Columbia River Gorge Commission (CRGC), Legal Authorities, Columbia River National Scenic Area: http://www.gorgecommission.org/national_scenic_act.cfm.
[15] ODOT, CRGS, USFS, and FHWA. 2005. *I-84 Corridor Strategy*: http://gorgevitalsigns.org/Misc/I84_201201.pdf.
[16] NPS, National Trails System: http://www.nps.gov/nts/info.html.
[17] National Wild and Scenic Rivers System: https://www.rivers.gov/.
[18] Columbia River Gorge Commission, Legal Authorities, Columbia River National Scenic Area: http://www.gorgecommission.org/national_scenic_act.cfm.

3.1 PLANNING PROCESSES

3.1.1 Washington Statewide Long-Range Transportation Plan (LRTP)

The 2017-2040 Washington Transportation Plan is Washington's statewide LRTP.[19] The plan lays out key policy recommendations for six goal areas: Economic Vitality, Preservation, Safety, Mobility, Environment, and Stewardship. The plan applies to all modes of transportation and guides the creation of each of the modal plans.

3.1.2 Washington Statewide Transportation Improvement Program

Projects listed in the STIP are the only projects that can be approved by the FHWA and the Federal Transit Administration (FTA). Each year, Washington coordinates with Western Federal Lands Highway Division (WFLHD) to obtain a new WFLHD Transportation Improvement Program (TIP) for the upcoming STIP development. WFLHD projects are listed separately when the lead agency coordinates the project's inclusion with WSDOT, and the applicable MPOs, Regional Transportation Planning Organizations (RTPOs), and/or county lead agencies. WSDOT provides a link to the WFLHD TIP on the Washington STIP web page. The STIP includes transportation projects funded with revenues from both Federal and State/local sources. Washington State forecasts its FY 2014 transportation revenues at $1.95 billion, of which 55 percent comes from the State fuel tax and the remainder comes from taxes, fees, permits, tolls, and other sources. Additionally, local revenues for cities, counties, and transit total $4.04 billion funded primarily through property taxes for local projects and sales taxes for transit projects. Federal funds distributed to Washington State annually between 2014 and 2017 are estimated at $714 million per year, including $45 million per year designated for transit and the balance for highway projects. WSDOT also uses a number of other financing methods to fund the STIP, including GARVEE grants and TIFIA loans.[20]

3.2 MODAL PLANS

WSDOT is required by State law to develop separate plans for modes the State owns (Highways, Ferry System, State Airports, Intercity Passenger Rail) and modes the State has an interest in (Public Transportation, Rail System, Freight System, Aviation System, Bicycle and Pedestrian, and Marine Ports and Navigation). Each plan assesses the current state of the mode in Washington State, identifies future goals and necessary investments and improvements, and identifies potential funding strategies.[21] Sometimes these plans are combined with plans required for Federal funding eligibility. These plans can provide guidance and potential funding sources for FLMAs planning to pursue modal projects on or near their lands. FLMA planners also can consult modal plans to better understand how their own transportation systems will operate in the overall State context.

3.3 TRIBAL PLANNING

In 1989, Washington State's Governor entered into the Centennial Accord with 35 Tribes, thus establishing government-to-government relationships. WSDOT follows written protocols for consulting and cooperating with Tribal governments and has two forums for coordination. One is the formal Washington Indian Transportation Policy Advisory Committee and the second is the informal Tribal Transportation Planning Organization (TTPO). The TTPO provides the opportunity for Tribes to take an active role in statewide transportation planning. The TTPO is made up of Tribal, State, and Federal transportation policy, planning, and administration professionals with the goal of promoting Tribal transportation planning in Washington State. The TTPO conducts research and analysis of Tribal transportation needs in support of the STIP and Washington LRTP.[22] WSDOT provides support for the TTPO, including administrative assistance and partial reimbursement for Tribal members to attend TTPO meetings. The TTPO is an appropriate forum for FLMAs to discuss plans and processes.

19 WSDOT, Washington Transportation Plan: https://washtransplan.com/.
20 WSDOT, Statewide Transportation Improvement Program (STIP): http://www.wsdot.wa.gov/localprograms/programmgmt/stip.htm.
21 WSDOT, Multi-modal Planning: http://www.wsdot.wa.gov/planning/.
22 WSDOT, Tribal Transportation Planning Organization: http://www.wsdot.wa.gov/planning/tribal/.

3.4 REGIONAL TRANSPORTATION PLANNING ORGANIZATIONS (RTPOS)

Washington has 14 RTPOs that cover 37 of its 39 counties. An RTPO is an association of local governments within a county or counties. The function of RTPOs is similar to that of MPOs: they develop long-range plans, coordinate within their respective regions, and develop a Transportation Improvement Plan. However, RTPOs are different from MPOs in that RTPOs receive planning funding from the State instead of the Federal government. In Washington State, WSDOT provides administrative and technical support for RTPOs.[23] RTPOs are often the best contact for FLMAs at the unit or field office to coordinate on transportation plans and projects. Washington's RTPOs follow State laws and rules and are not the same as the RTPOs allowed for in the FAST Act.

3.5 TOURISM, RECREATION, AND NATURAL RESOURCES

State land is managed by the Department of Natural Resources (DNR), Department of Fish and Wildlife (WDFW), and Parks and Recreation Commission.[24] State environmental regulatory agencies[25] include the DNR (forest practices, road maintenance and abandonment plans[26], surface mining, natural gas/oil exploration, mining, burn permits, and wildfire suppression); WDFW (hydraulic permits, T&E species); Department of Ecology (air and water quality); Department of Agriculture (pesticide management); and the Department of Archaeology and Historic Preservation (State Historic Preservation Officer, excavation permits, and cultural database[27]). Washington no longer has a State tourism office; however, the Washington Tourism Alliance is a Section 501(c)(6) that carries out a mission to "… advocate, promote, develop, and sustain the economic well-being of the Washington tourism industry."[28] The Washington Recreation and Conservation Office (RCO) "… manages grant programs to create outdoor recreation opportunities, protect the best of the State's wildlife habitat and farmland, and help return salmon from near extinction."[29] FLMAs may consult these agencies in cases where transportation projects intersect with their areas of jurisdiction.[30]

4. OREGON REGULATIONS AND PROGRAMS

The State of Oregon is responsible for administering several transportation programs legislated at the Federal level in addition to administering programs initiated at the State level. Similar to Washington, Oregon's statewide planning process includes development of a Long-Range Transportation Plan, Transportation Improvement Program, and plans specific to the different transportation modes. These plans and programs are supported not only through Oregon's MPOs but also Area Commissions on Transportation.

4.1 STATEWIDE PLANNING PROCESS

4.1.1 Oregon Statewide Long-Range Transportation Plan (LRTP)

The Oregon Transportation Plan (OTP) is Oregon's 25-year Long-Range Transportation Plan, adopted in 2006 by the Oregon Transportation Commission (OTC). The plan is multi-modal and contains seven key goals that emphasize maintaining and optimizing existing transportation assets, making strategic investments in capacity enhancements, integrating transportation with land use, the environment and economic development, integrating the different transportation modes and jurisdictions, and creating a sustainable funding mechanism for the future. While Oregon legal statute does not give OTC the ability to impose goals or projects in the LRTP onto other State agencies, it does require that those agencies use the OTP to "… guide and coordinate transportation activities."[31]

[23] WSDOT, Regional Transportation Planning: http://www.wsdot.wa.gov/planning/regional/.
[24] Washington Department of Natural Resources, State Trust Lands and Other Major Public Lands in Washington State: http://www.dnr.wa.gov/Publications/eng_rms_trustlands_map_nu2.pdf.
[25] These agencies regulate environmental rules on non-Federal and non-Tribal lands.
[26] Washington Department of Natural Resources: http://www.dnr.wa.gov/.
[27] Washington Department of Archaeology and Historic Preservation: http://www.dahp.wa.gov/.
[28] Washington Tourism Alliance: http://watourismalliance.com/.
[29] Washington State Recreation and Conservation Office: http://www.rco.wa.gov/.
[30] Access Washington: http://access.wa.gov/.
[31] ODOT, Planning and Technical Guidance: http://www.oregon.gov/ODOT/TD/TP/pages/otp.aspx.

4.1.2 Oregon Statewide Transportation Improvement Program

Oregon's Statewide Transportation Improvement Program (STIP) is a four-year capital improvement program that identifies funding and scheduling for transportation projects throughout the State. Oregon's STIP is divided broadly into two categories: Fix-It and Enhance. The Fix-It program focuses on fixing and preserving the existing transportation system—this includes pavement, bridges, culverts, and other assets. In addition, the Fix-It program addresses safety and operations projects (signals, Intelligent Transportation Systems, etc.). The Enhance program is focused on enhancing the transportation system, which generally includes adding new features such as new lanes, climbing lanes, new trails, new transit systems (Bus Rapid Transit, light rail, etc.). The current STIP covers federal fiscal years 2018 to 2021. ODOT is currently in the process of developing the next STIP, which will cover federal fiscal years 2021 to 2024. Local agencies, MPOs, and FLMAs can request STIP funding resources primarily in the area of safety and operations. In Oregon, the safety program is called ARTS (All-Road Transportation Safety), which means any entity eligible to receive Federal funding can apply for funds to correct safety problems if it meets the program eligibility criteria. Local agencies, MPOs, and FLMAs also can work with their ODOT Regional offices to partner around operations projects that also can include items such as rock fall stabilization and slide repairs. Finally, projects included in the Oregon WFLHD TIP are included in the STIP.

STIP funds are divided into two groups based on the stage of project development: Construction-STIP (C-STIP) and Development-STIP (D-STIP) funds. Approximately 95 percent of funds are C-STIP funds, which apply to most construction projects, while the remaining 5 percent are D-STIP funds, which can be made available for planning of long-term projects. Projects are eligible for D-STIP funds if they are expected to take more than four years to develop and construct.

4.1.3 Other Funding Programs

In addition to the STIP, Oregon administers a number of other funding programs for transportation. ConnectOregon funds multi-modal projects statewide using lottery-backed bonds. The Oregon legislature authorized the program in 2005, 2007, and 2009. The most recent authorization was in 2011 for $40 million.[32]

The Transportation and Growth Management Program is a partnership between the Oregon Department of Land Conservation and Development and the Oregon Department of Transportation. It links land use with transportation planning through planning grants, education, and outreach workshops, speakers and publications, design assistance, and Transportation System Plan assessments.[33]

The State Planning and Research (SPR) program uses Federal funds to support State transportation planning and research. The SPR program is administered through the Transportation Development Division of ODOT, and it provides policy and technical direction, and data and information for comprehensive decision-making. It also conducts project development activities.[34] FLMA planners and agencies can work with ODOT Headquarters and or Region managers to partner on planning projects that can leverage these funds.

4.1.4 Modal Plans

In addition to the multi-modal Oregon Transportation Plan, Oregon has developed specific mode and topic plans for nearly all modes of transportation, including aviation, rail, transit, and walking/biking. In addition, Oregon has developed topic plans for safety, transportation options, and freight. Several of these plans have been updated in the past few years with the update of the Public Transit plan anticipated to be adopted in the fall of 2018. Each plan provides a vision and policy framework for the specified mode or topic area and builds on the broader goals laid out in the Oregon Transportation Plan. The development of the plans was supported at the State level through ODOT, the Oregon Transportation Commission, and the development of technical memoranda and advisory committees, policy advisory committees, and public outreach.[35] These plans can provide guidance and potential

[32] ODOT, Connect Oregon: http://www.oregon.gov/ODOT/TD/TP/pages/connector.aspx.
[33] ODOT, Transportation and Growth Management Program: http://www.oregon.gov/LCD/TGM/Pages/index.aspx.
[34] ODOT, Planning and Technical Guidance: http://www.oregon.gov/odot/td/tp/pages/spr.aspx.
[35] ODOT, Planning and Technical Guidance: http://www.oregon.gov/ODOT/TD/TP/Pages/Modes.aspx.

funding sources for FLMAs planning to pursue modal projects on or near their lands. FLMA planners also can consult modal plans to better understand how their own transportation systems will operate in the overall State context.

4.2 AREA COMMISSIONS ON TRANSPORTATION

Area Commissions on Transportation (ACTs) are authorized by the Oregon Transportation Commission as regional advisory commissions to enhance public participation in Oregon transportation planning. The Commission authorizes a total of 11 ACTs with memberships ranging from 15 to 30 individuals; they generally meet monthly or semi-monthly. They focus on all aspects of the State transportation system, including surface, marine, air, and safety. Their primary role is working with local organizations and constituents to establish a public process that advises the development of the STIP and prioritizing projects in their respective districts.[36] Therefore, the ACTs are a natural starting point for unit or field office FLMA staff looking to coordinate with local governments on transportation plans and projects.

4.3 MPOS AND RURAL PLANNING

Oregon has 10 Metropolitan Planning Organizations (MPOs). As is the case for MPOs in other states, Oregon's MPOs were created through Federal legislation and comprise appointed and elected officials representing Federal, State, and local governments and agencies. MPOs are responsible for a number of planning initiatives, including the LRTP, the TIP/STIP, and the Unified Planning Work Program (UPWP). Oregon also has a number of local initiatives and requirements enacted through State legislation that affect transportation planning. Cities and counties are required to adopt comprehensive plans, policies, and codes that reflect statewide planning goals. These land-use and zoning regulations affect the development of transportation projects.[37] FLMAs should coordinate primarily with MPOs regarding land use and transportation questions and project development.

[36] ODOT, Area Commissions on Transportation: http://www.oregon.gov/ODOT/COMM/pages/act_main.aspx.
[37] ODOT, Rail and Public Transit: http://www.oregon.gov/odot/pt/pages/stakeholders/mpo.aspx.

Figure A-1: MPOs and RTPOs in Oregon and Washington

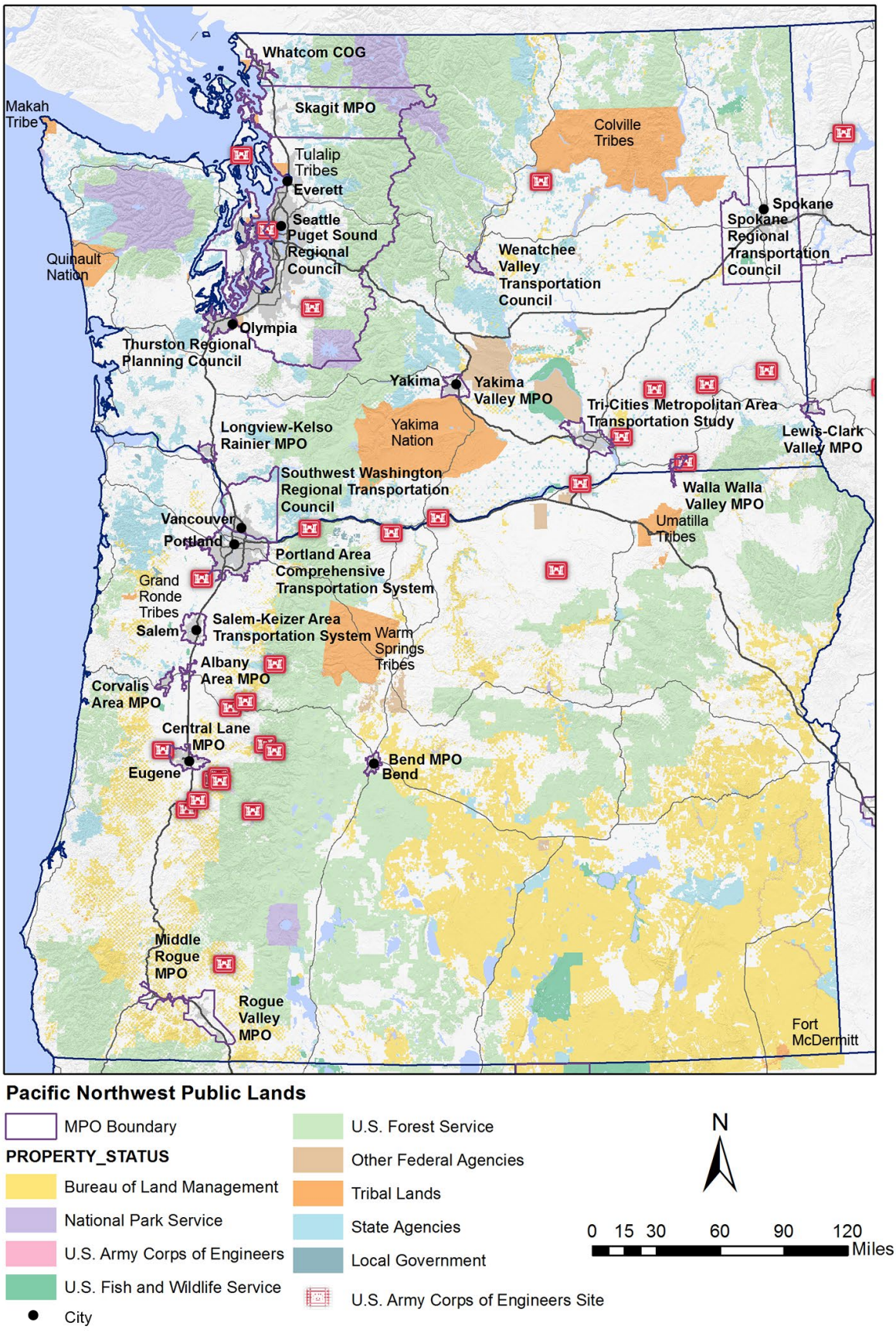


Table A-2: MPOs and RTPOs in Oregon and Washington

State	Major City	MPO/RTPO	2010 Population	FLMA units within or adjacent to MPO
OR	Albany	Albany Area MPO	54,721	
OR	Bend	Bend MPO	84,249	Deschutes NF, BLM Prineville District
OR	Eugene	Central Lane MPO	249,601	BLM Eugene District, USACE Fern Ridge Lake
OR	Corvallis	Corvallis Area MPO	64,951	BLM Salem District
OR	Grants Pass	Middle Rogue MPO	56,501	BLM Medford District
OR	Portland	Portland Area Comprehensive Transportation System (Metro)	1,499,844	BLM Salem District, Mt. Hood NF, Ridgefield NWR
OR	Central Point	Rogue Valley MPO	154,081	BLM Medford District, Rogue River NF
OR	Salem	Salem-Keizer Area Transportation Study	241,598	BLM Salem District
OR, WA	Walla Walla (WA)	Walla Walla Valley MPO	56,239	USACE Mill Creek PSA
WA, ID	Asotin (WA)	Lewis-Clark Valley MPO	52,535	BLM Spokane District, Umatilla NF
WA	Kelso	Longview-Kelso-Rainier MPO	64,164	Ridgefield NWR
WA	Seattle	Puget Sound Regional Council	3,690,866	Mount Rainier NP, Gifford Pinchot NF, Wenatchee NF, Mt. Baker/ Snoqualmie NF
WA	Mt. Vernon	Skagit MPO	116,901	San Juan Islands National Monument (BLM), Mt. Baker/ Snoqualmie NF, North Cascades NP
WA	Vancouver	Southwest Washington Regional Transportation Council	425,363	Ridgefield NWR, Gifford Pinchot NF
WA	Spokane	Spokane Regional Transportation Council	471,221	BLM Spokane District, Turnbull NWR
WA	Olympia	Thurston Regional Planning Council	173,829	Olympia Fish Health Center (FWS)
WA	Richland	Tri-Cities Metropolitan Areas Transportation Study	214,704	Hanford Reach NWR, BLM Spokane District
WA	Wenatchee	Wenatchee Valley Transportation Council	66,591	Wenatchee NF, BLM Spokane District
WA	Bellingham	Whatcom Council of Governments	113,063	San Juan Islands National Monument, Mt. Baker/ Snoqualmie NF
WA	Yakima	Yakima Valley Council of Governments		BLM Spokane District, Wenatchee NF

4.4 TOURISM, RECREATION, AND NATURAL RESOURCES

Oregon's Governor's Natural Resources Office (GNRO) implements the Governor's natural resource and environmental agenda. The Oregon Parks and Recreation Department is responsible for land stewardship, marine conservation/rocky shores, several permit programs, department-wide resource policies, and park plants and animals.[38] The Oregon Tourism Commission is a semi-independent agency created by the Oregon Legislature in 2003 to enhance Oregonians' quality of life by strengthening the economic impact of the State's $9.6 billion tourism industry.[39] FLMAs may consult these agencies in cases where transportation projects intersect with their areas of jurisdiction.

4.5 BI-STATE PROGRAMS AND AGREEMENTS

Oregon and Washington have several joint programs and agreements, a few of which relate to Federal lands and transportation. The Columbia River Gorge Act, though initiated through Federal legislation, is managed cooperatively by the States of Washington and Oregon. It provides guidance for the maintenance and improvement of transportation facilities within the gorge. Oregon and Washington have other bi-state agreements that cover joint transportation facilities, such as the Columbia River Crossing and Amtrak Cascades (Pacific Northwest intercity passenger-rail service). Washington has agreements with British Columbia, including operation of Amtrak Cascades and border crossings.

[38] ODOT, Governor's Natural Resources Office: https://www.oregon.gov/gov/policy/Pages/nat_res.aspx.
[39] Travel Oregon: http://traveloregon.com/.

APPENDIX C:

CLRTP VISITATION-DEMOGRAPHICS TECHNICAL REPORT

June 2017

1. INTRODUCTION

The purpose of this report is to describe current visitation characteristics on Federal public lands in the Pacific Northwest and to identify trends in demographics, policy, and transportation that may affect future visitation and use. The demographics, travel patterns, geographic location, and activities of visitors to Washington's and Oregon's public lands can help transportation planners and land management agencies better understand visitors' travel needs and develop appropriate transportation systems. In the context of this Collaborative Long-Range Transportation Plan (CLRTP), the visitation and demographics information provides a broader picture of how Federal lands across the region are being used by the public for recreational purposes and better enables coordination of long-range transportation plans across the Federal Land Management Agencies (FLMAs).

FLMAs in the Pacific Northwest include the Bureau of Land Management (BLM), U.S. Forest Service (USFS), U.S. Fish and Wildlife Service (FWS), National Park Service (NPS), and the U.S. Army Corps of Engineers (USACE). Together, these agencies manage more than 150 units covering more than 44 million acres of public recreational land in Washington and Oregon. With a total of about 43 percent of all land in the Pacific Northwest in Federal ownership, visitation and recreation on these lands has a major impact on transportation, the economy, and quality of life in this region.

The data in this technical report include information on who visits public lands, when they visit, and what activities they tend to enjoy. The data focus primarily on visitors to FLMA sites, but also include more general summary visitation data for Washington and Oregon, recognizing that these visitation patterns may indicate trends for public lands under all types of ownership.

1.1 DATA SOURCES AND ASSUMPTIONS

The FLMAs collect data on their lands through various methods, including traffic counters, visitor surveys, entrance fees, and permit sales. The data are rolled up into local, regional, and national summary reports specific to the FLMA. This Collaborative LRTP compiles and analyzes data from across the FLMAs to identify common trends and divergences and to identify areas of potential coordination.

Each FLMA collects data using different methodologies and time frames.

- NPS uses a combination of entrance fee collection data and traffic count data (when available) to calculate visitation for park units. Mount Rainier and Olympic both have permanent traffic counters whereas other parks use traffic counters for short-term studies if at all.
- USFS uses traffic counts along with visitor surveys to calculate visitation at units. Through the USFS National Visitor Use Monitoring Program (NVUM), each unit is surveyed once every five years.
- FWS visitation is self-reported by individual units that have different methodologies for collecting data. These individual data points are compiled into the Refuge Annual Performance Plan (RAPP) report. The RAPP reports cover visitation to refuges but not to the FWS fish hatchery system.
- BLM uses a combination of recreation fee data (where available) and field surveys to estimate visitation through its Recreation Management Information System (RMIS).
- USACE uses permanent traffic counts for the majority of its Project Site Areas (PSAs), as well as a proxy method known as Recreation Unit Day Availability, or RUDA, for smaller parking areas that are difficult to meter.

In addition, Oregon and Washington each have a State Comprehensive Outdoor Recreation Plan (SCORP) that is updated every five years.[1] The SCORPs are led by the Oregon Parks and Recreation Department (OPRD) and the Washington Recreation and Conservation Office, and require the coordination of a number of other Federal, State, and local agencies. The SCORPs are "… used to identify, prioritize, and establish criteria for selection of individual projects [and ensure] a tangible connection between

[1] The SCORPs are completed in compliance with the Land and Water Conservation Fund Act (LWCF Act) for the States to be eligible for Federal financial assistance for planning, acquisition, and development of needed land and water areas related to outdoor recreation resources.

individual projects and the State's overall outdoor recreation goals."[2] The SCORP development process involves coordination with representatives from Federal, State, and local recreation providers, as well as a comprehensive inventory of the supply of existing outdoor recreation resources and facilities for the State. The inventory data are collected from public and private sector recreational providers, including the FLMAs. The major recreation providers also are asked to report on their recreational roles, including the types of resources, facilities, or services their agency/organization provides. Oregon and Washington also conducted statewide surveys of residents to collect data on outdoor recreation participation for their most recent SCORPs.

Finally, three national surveys provide data updates on a regular basis: the National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (FHWAR); the National Survey on Recreation and the Environment (NSRE); and the National Visitor Use Monitoring program (NVUM). The U.S. Census Bureau and FWS conduct the FHWAR every five years, which uses phone and in-person interviews to gather information on how many people participate in fishing, hunting, and wildlife watching; how often they engage in these activities; and the economic impact of their activities in the U.S. The NSRE is conducted by Interagency National Survey Consortium that is coordinated by the USFS. It uses phone surveys to collect data on a wider range of recreational activities than the FHWAR. The USFS conducts the NVUM program, which collects information about recreational activities within the national forests for four categories of land.[3] The NVUM program samples 25 percent of national forests annually, thus completing a full sample of national forests every four years.

This report recognizes the challenges of reporting national and regional trends in recreational activities given the different sources of data and the data collection methodologies.[4] For instance, recreational activities are defined differently across the agencies—one refers to bird watching and wildlife observation separately while another agency combines these activities. National recreational datasets define and name activities differently as well. The challenge of reporting visitation trends also stems from the fact that participation in activities can vary considerably from year to year.[5] To the degree possible, visitation and use is framed in terms that can be quantified using available datasets and differences in datasets are clearly identified. Additionally, the report identifies where information for a single or a few agencies is used to generalize across all agencies for the region when more robust data are not available.

2. VISITATION

Visitor activity data help land management agencies understand how visitors recreate on Federal, State, and local land resources to plan for their continued use, including how to meet the transportation needs of the recreating public. This report provides visitation information at a high level for national trends, how Pacific Northwest trends compare to national trends, and how visitation impacts transportation planning to and within FLMAs.

Overall, recreational visitation on public lands across the United States has remained constant since the mid-1990s. At the same time, visitation per capita has declined as the population has grown.[6] Additionally, the average amount of time that Americans spend engaging in outdoor recreation overall has declined by about 20 percent between 1993 and 2003.[7]

[2] National Park Service. 2004. *Land and Water Conservation Fund State Assistance Program: 2004 Annual Report*. Page 8. http://www.nps.gov/ncrc/programs/lwcf/lwcf_04_rev.pdf.

[3] The four categories are wilderness, general forest, developed day-use sites, and developed overnight sites.

[4] There are three national surveys that gauge outdoor recreation in the U.S.: USDA Forest Service National Survey on Recreation and the Environment (NSRE); the National Survey of Fishing, Hunting, & Wildlife-Associated Recreation (FHWAR) conducted by the Census Bureau; and the Outdoor Foundation Survey. These use different methodologies and questions and, therefore, cannot be directly compared.

[5] Hall, T.E., H. Heaton, and L.E. Kruger. 2009. *Outdoor Recreation in the Pacific Northwest and Alaska: Trends in Activity Participation.* United States Department of Agriculture. PNW-GTR-778. http://www.fs.fed.us/pnw/pubs/pnw_gtr778.pdf. Viewed January 12, 2015

[6] Walls, M., S. Darley, and J. Siikamaki. 2009. *The State of the Great Outdoors: America's Parks, Public Lands and Recreation Resources. Resources for the Future*. http://www.rff.org/RFF/Documents/RFF-RPT-ORRG-State-of-Outdoors.pdf

[7] Ibid

The types of recreation that visitors engage in are changing. Most sources note an increase in wildlife observation. Walking and hiking has risen or remained stable, while fishing and hunting have remained the same or declined slightly.[8, 9, 10] According to the 2011 FHWAR survey, more than 20 percent of Americans engaged in wildlife watching, while 11 percent participated in fishing and 4 percent participated in hunting.

Washington and Oregon receive more than 114 million visitors each year,[11] with an estimated 62 million recreation visitors traveling to Federal lands. Relative to national trends, participation in outdoor recreation activities in Oregon and Washington is very high. According to a survey of Washington residents for the State's SCORP, 90 percent of residents engaged in at least one outdoor recreation activity in Washington in the prior 12 months.[12] A survey for Oregon's SCORP revealed nearly the same participation rates, with 92 percent of residents engaging in outdoor recreation in the past year.[13] Looking to the future, Oregon respondents indicated they are more likely to increase rather than decrease their outdoor recreation activities: 45 percent expect to spend more time engaged in outdoor recreation 10 years from now; 41 percent expect to spend about the same amount of time; 14 percent expect to spend less time. While not all the activities captured in the SCORP survey take place on FLMA land, the results are a very strong indication of the importance of outdoor recreation to Pacific Northwest residents and the need to ensure effective transportation options to and within the FLMAs.

2.1 FLMA VISITATION

FLMAs benefit from understanding who is visiting, when, and why they are visiting as they plan resource and transportation management that enables continued access and recreational use.

2.1.1 Total Visitation

Nationally, there are more than 900 million recreational visitors to Federal lands every year.[14, 15, 16, 17, 18] The total visitation for FLMAs in Washington and Oregon is approximately 62 million, or roughly 7 percent of the national total. Figure A-1, below, breaks down annual visitation by FLMA with lands in Oregon and Washington. Note that visitation for USACE includes boat traffic on waterways, which is why its total is significantly higher than the other FLMAs.

8 Ibid

9 Cordell, H.K. 2010. Trends in nature-based outdoor recreation participation in the U.S. — Part I. Internet Research Information Series. USDA Forest Service's Southern Research Station, USDA Forestry Sciences Laboratory, University of Georgia, and the University of Tennessee. http://www.srs.fs.usda.gov/trends/pdf-iris/IRISRec16rptfs.pdf

10 Hall, T.E., H. Heaton, and L.E. Kruger. 2009. *Outdoor Recreation in the Pacific Northwest and Alaska: Trends in Activity Participation*. U.S. Dept of Agriculture. PNW-GTR-778. http://www.fs.fed.us/pnw/pubs/pnw_gtr778.pdf

11 This estimate includes recreational and non-recreation travel; overnight trips for Oregon and Washington as well as day trips to Oregon. Day trips to Washington were not available.

12 Washington SCORP

13 Oregon SCORP

14 Bureau of Land Management. 2013. BLM Recreation Strategy: Connecting with Communities 2014-2019. http://www.blm.gov/style/medialib/blm/wo/Planning_and_Renewable_Resources/recreation_images.Par.8212.File.dat/2014ConnectingWithCommunities.pdf. https://www.fws.gov/refuges/about/pdfs/OverviewFactSheetApril2013.pdf.

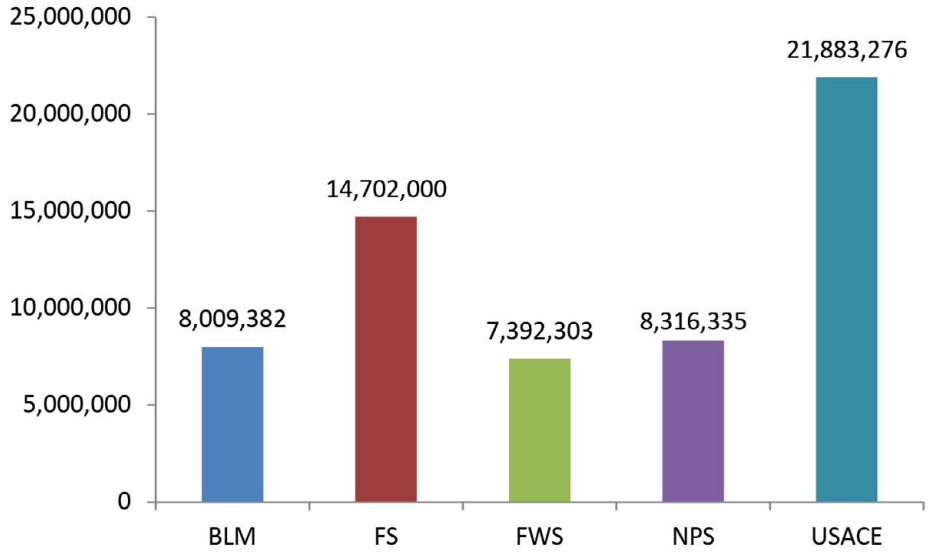
15 National Park Service. 2013. *Annual Summary Report*. https://irma.nps.gov/Stats/SSRSReports/National%20Reports/Annual%20Summary%20Report%20(1904%20-%20Last%20Calendar%20Year)

16 U.S. Army Corps of Engineers. January 2015. "Did you know" portion of the Civil Works: Recreation web page. http://www.usace.army.mil/Missions/CivilWorks/Recreation.aspx.

17 USDA Forest Service. May 2013. National Visitor Use Monitoring Results USDA Forest Service National Summary Report. http://www.fs.fed.us/recreation/programs/nvum/2012%20National_Summary_Report_061413.pdf.

18 US Fish and Wildlife Service. April 2013. National Wildlife Refuge System Overview. https://www.fws.gov/refuges/about/pdfs/OverviewFactSheetApril2013.pdf

Figure A-1: Pacific Northwest Annual Visitation to Federal Lands
Sources: BLM, NPS, USACE, USFS, FWS [19, 20, 21, 22, 23, 24]



NOTE: Figure A-1 generally represents visitation in fiscal year 2012. USFS data are an average of annual visitation from 2008-2012. NPS data are calendar year 2013.

2.1.2 Visitor Demographics

Recreational visitors can be divided into many categories, among them age, race, and income. Each of these categories then can be analyzed for trends in recreational behaviors of the demographic groups. Information about visitor demographics for a region provides insight into their activities and what their transportation needs are. For example, the Census Bureau projects more than 20 percent of the U.S. population will be over the age of 65 by the year 2030 (see Figure A-2).[25] At the same time, researchers believe that older adults are participating in outdoor recreation at higher rates than in the past, and their activities tend to be less active, including picnicking, auto tours, and sightseeing.[26] These two trends combined could translate into greater demand for these activities on all recreational lands, including those managed by the FLMAs. Long-term transportation plans for the FLMAs should recognize the need for greater resources to support increased auto tours or sightseeing groups to better accommodate this demographic.

[19] Bureau of Land Management. 2012. BLM Facts: Oregon & Washington. http://www.blm.gov/or/onlineservices/files/2012_BLM_Facts_web.pdf
[20] National Parks Service. 2013. Recreation Visitation By State and by Park for Year: 2013. https://irma.nps.gov/Stats/SSRSReports/National%20Reports/Recreation%20Visitation%20By%20State%20and%20By%20Park%20(1979%20-%20Last%20Calendar%20Year)
[21] U.S. Army Corp of Engineers. 2012. "State Level Report: Washington." Value to the Nation Fast Facts. http://www.corpsresults.us/recreation/fastfacts/stateReport.cfml?State=14.
[22] U.S. Army Corp of Engineers. 2012. "State Level Report: Oregon." Value to the Nation Fast Facts. http://www.corpsresults.us/recreation/fastfacts/stateReport.cfml?State=9.
[23] USDA Forest Service. May 2013. National Visitor Use Monitoring Results USDA Forest Service National Summary Report. http://www.fs.fed.us/recreation/programs/nvum/2012%20National_Summary_Report_061413.pdf.
[24] U.S. Fish and Wildlife Service. 2012. Refuge Annual Performance Plan: Region 1. Data provided by FWS for report.
[25] U.S. Census Bureau, Population Division. "Table 3: Projections of the Population by Sex and Selected Age Groups for the United States: 2015 to 2060." *2014 National Population Projections: Summary Tables*. Release Date: December 2014. http://www.census.gov/population/projections/data/national/2014/summarytables.html.
[26] Hall, T.E., H. Heaton, and L.E. Kruger. 2009. *Outdoor Recreation in the Pacific Northwest and Alaska: Trends in Activity Participation*. U.S. Dept of Agriculture. Pacific Northwest-GTR-778.

Figure A-2: U.S. Population by Age through 2030

Sources: U.S. Census Bureau, Population Division[27]

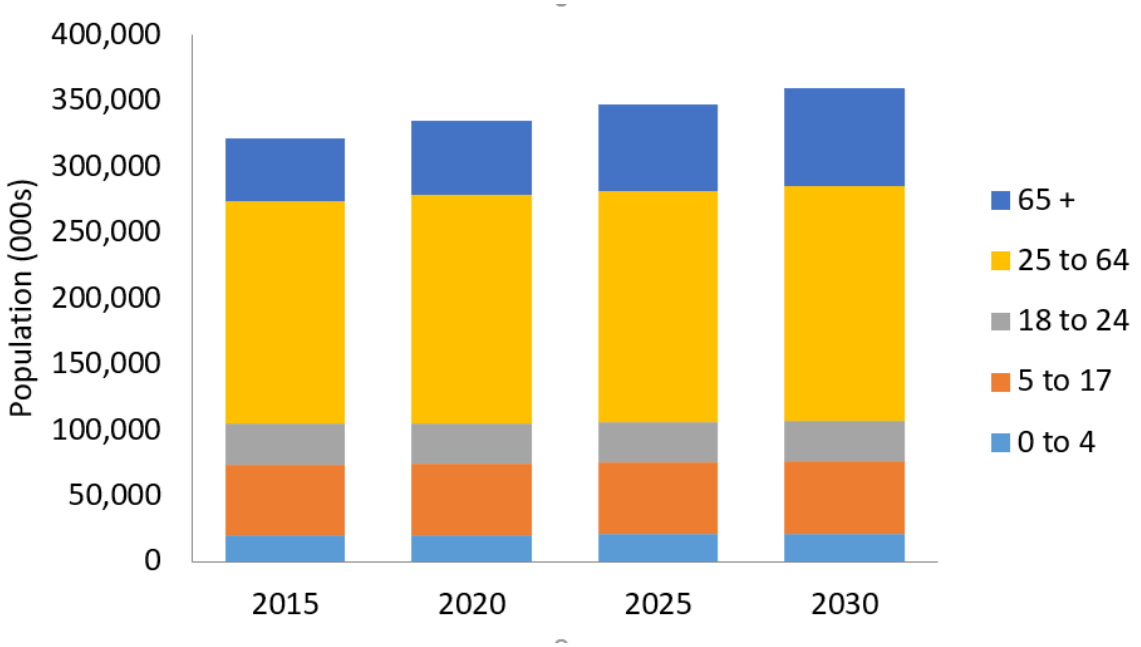


Figure A-3, below, shows the projected change in demographics in the U.S. through 2050. The data show growth in most minority populations. The percent of people identifying as Hispanic is expected to grow from about 18 percent in 2015 to almost 30 percent by 2050. Given this information, it is useful for FLMAs to be aware of preferred outdoor activities among different groups and anticipate potential shifts in recreation. Some racial and ethnic populations tend to participate in certain outdoor activities more than other ethnic populations. For instance, several Forest Service studies report that Latinos are more likely than Native Americans, Whites, or Asian Americans to participate in hiking. The same studies found that Native Americans and Whites were more likely than African Americans and Latinos to participate in off-road driving.[28, 29, 30, 31] Hikers have more alternative transportation options than participants in off-road driving, since they do not need to transport a vehicle to engage in the activity.

[27] U.S. Census Bureau, Population Divisions. 2014. Table 2: Projections of the Population by Selected Age Groups and Sex for the United States: 2015 to 2060 (NP2012-T2). Release Date: December 2014.

[28] U.S. Department of Agriculture, Forest Service [USDA FS]. 2004c. Update Report No. 4: Hispanic participation in land-based outdoor recreation activities. Recreation Statistics Update. Southern Research Station http://www.srs.fs.usda.gov/trends/recupdates.html. (August 10, 2005).

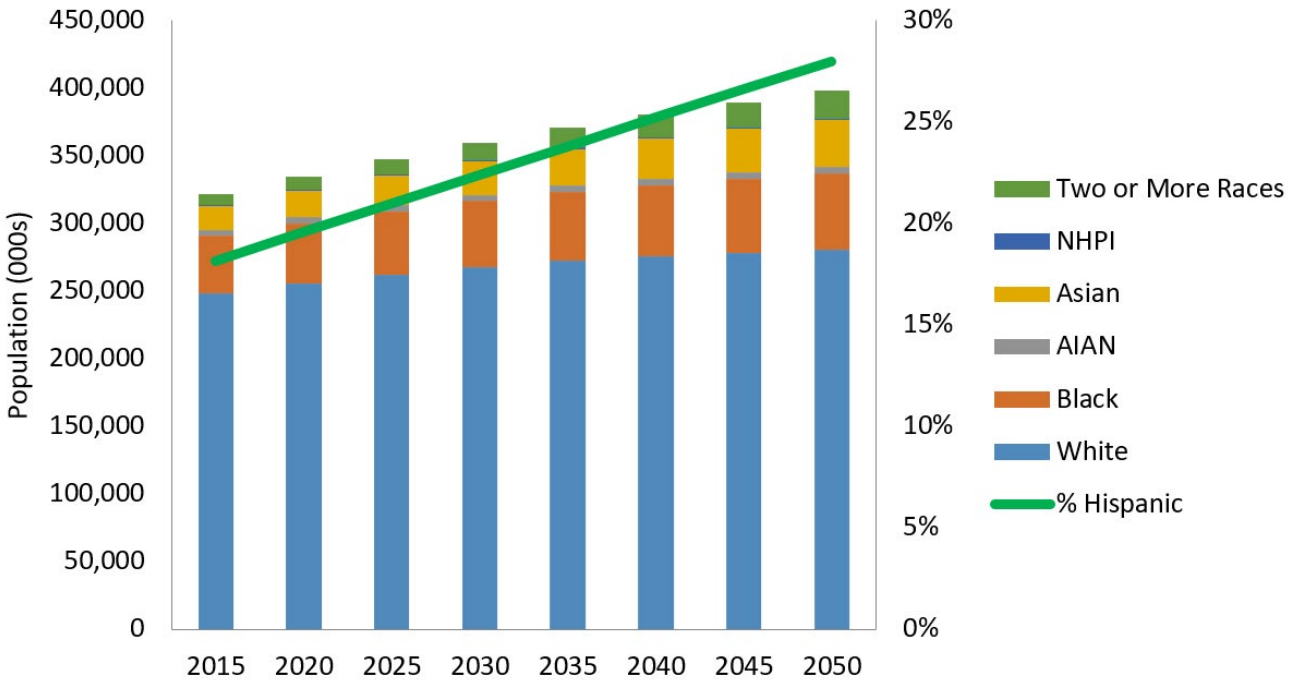
[29] U.S. Department of Agriculture, Forest Service [USDA FS]. 2005a. Update Report No. 6: American Indian and Alaskan Native participation in land-based outdoor recreation activities. Southern Research Station. http://www.srs.fs.usda.gov/trends/recupdates.html. (August 10, 2005).

[30] U.S. Department of Agriculture, Forest Service [USDA FS]. 2005b. Update Report No. 7: Participation in outdoor recreation activities: Asian American, Native Hawaiian, and other Pacific Islanders. Southern Research Station. http://www.srs.fs.usda.gov/trends/recupdates.html. (August 10, 2005)

[31] Hall, T.E., H. Heaton, and L.E. Kruger. 2009. *Outdoor Recreation in the Pacific Northwest and Alaska: Trends in Activity Participation*. U.S. Dept of Agriculture. Pacific Northwest-GTR-778. http://www.fs.fed.us/pnw/pubs/pnw_gtr778.pdf.

Figure A-3: U.S. Population by Race through 2050*

Sources: U.S. Census Bureau, Population Division[32]



**The Census Data did not include Hispanic as a separate option for race. Rather, Hispanic or Non-Hispanic is an option for all races and shown as a percent of the total.*
Abbreviations: Black = Black or African American; AIAN = American Indian and Alaska Native; NHPI = Native Hawaiian and Other Pacific Islander.

Future trends in visitor demographics specific to Oregon and Washington are covered in Section 3, below.

2.1.3 Visitor Origins

The distances recreational visitors travel to reach FLMA lands impacts the transportation modes they are able to use. Local visitors who are within 10 miles of the location may be able to walk, bicycle, or take a bus to the FLMA unit depending on services and infrastructure available. Visitors from farther away are more likely to have to use personal vehicles. A well-maintained road network is required to access the FLMAs for all modes, whether it is buses, bicyclists, or long-distance travelers in their own cars.

The origin locations of recreational visitors to FLMAs in the Pacific Northwest were gathered using a sample of visitor surveys conducted by USFS, FWS, and NPS.[33, 34, 35] Based on this information, FWS lands attract the most locally based visitors. Based on a sample of visitor surveys, an average of 84 percent of FWS visitors live within 50 miles of the refuges.[36] Approximately 40 percent to 60 percent of visitors to NPS and USFS facilities live within 50 miles of the recreational area they are visiting. The neighboring State, either Oregon or Washington depending on which State the FLMA site is within, was the second largest origin for visitors in the Pacific Northwest, followed by California.

[32] U.S. Census Bureau, Population Divisions. 2014. Projections of the Population by Sex, Hispanic Origin, and Race for the United States: 2015 to 2060 (NP2014-T10). Release Date: December 2014.
[33] Compilation of NPS visitor survey results from Mount Rainier (2012), John Day Fossil Beds (2004), and Klondike Gold Rush Seattle Unit (2009) as conducted and documented by the University of Idaho Park Studies Unit. http://www.uidaho.edu/cnr/park-studies-unit
[34] USFS National Visitor Use Monitoring (NVUM). Pacific Northwest Region (R6) (FY 2010, FY 2011, FY 2012, FY 2013)
[35] US Fish and Wildlife Service. 2011 visitor surveys for Finley, Meares, Malheur, McNary, Turnbull and Ridgefield. http://pubs.usgs.gov/ds/643/
[36] Ibid.

The visitor origin data from the visitor surveys were confirmed by tourism data from Oregon's 2011 visitor report.[37] As shown in Figure A-4 and Figure A-5, the majority of day and overnight trips in Oregon originate in the State. Washington and California follow with the most common home locations for visitors to Washington.

Figure A-4: Visitor Origin for Day Trips in Oregon

Sources: Longwoods International, 2011

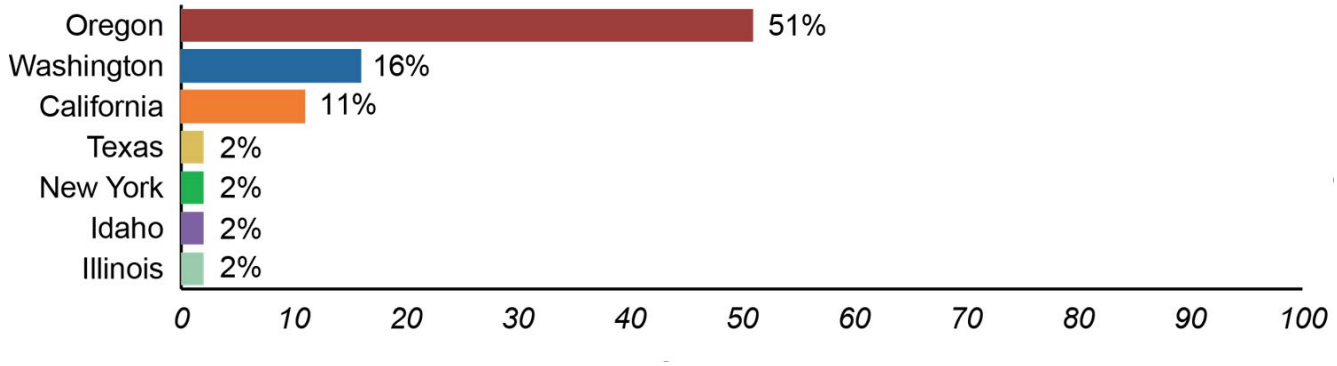
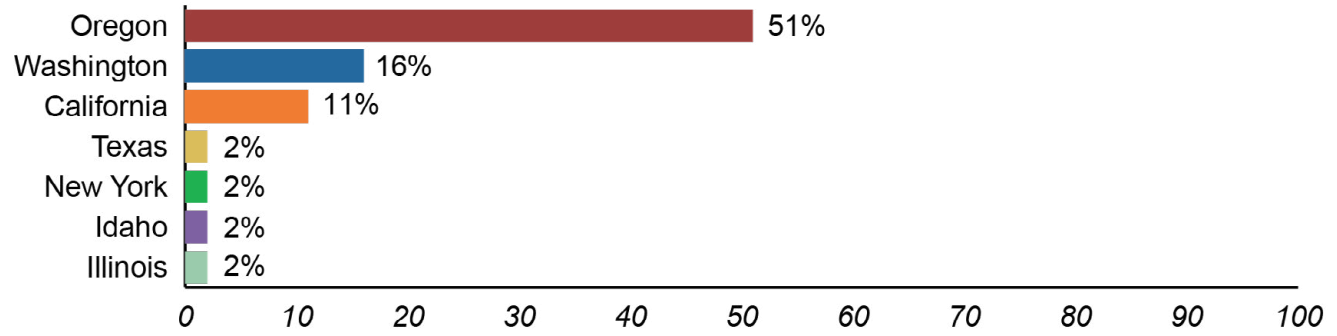


Figure A-5: Visitor Origin for Overnight Trips in Oregon

Sources: Longwoods International, 2011



2.1.4 Timing and Distribution of Visitation

Information regarding the distribution of visitors across months of the year, days of the week, and times of day enable FLMA managers to better plan for demands on staffing and resources. The NPS Public Use Statistics Office (PUSO) collections monthly visitation data for each park unit. As shown in Figure A-6 and Figure A-7, NPS recreational visitation peaks significantly in the summer months in the Pacific Northwest. USACE monthly visitation data for FY2012 shows similar results (Figure A-8), although there are secondary peaks in the spring.

[37] Longwoods International, Longwoods Travel USA. 2011. Oregon 2011 Visitor Final Report. http://industry.traveloregon.com/content/uploads/2013/03/Oregon-2011-Visitor-Final-Report.pdf

Figure A-6: 2012 Monthly Visitation for Pacific Northwest NPS Units

Sources: NPS Public Use Statistics Office

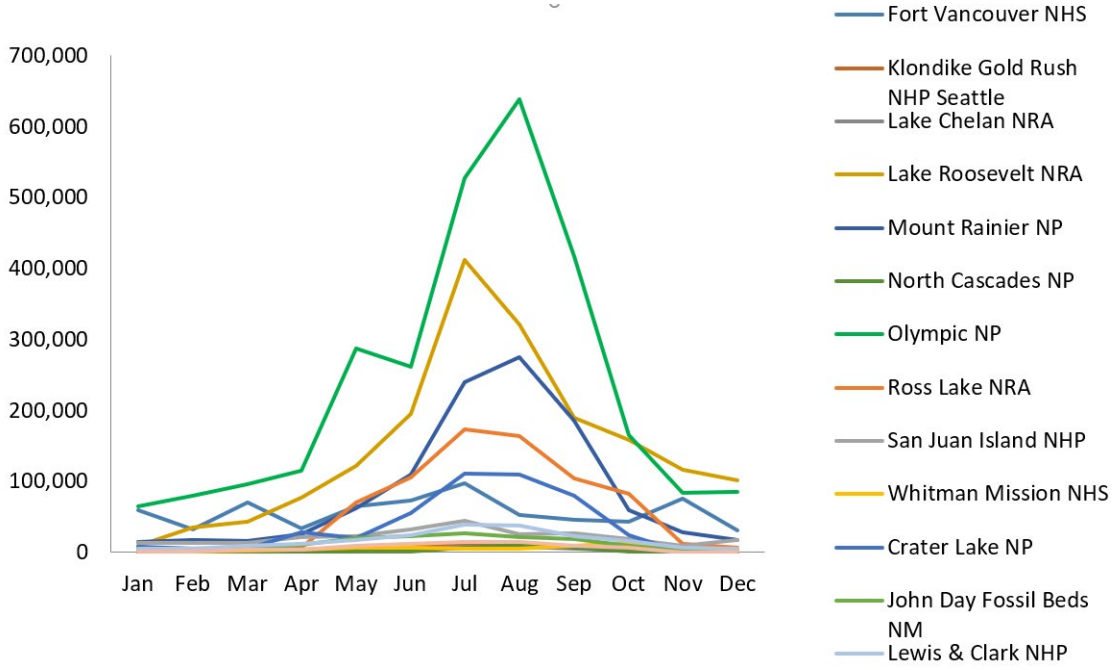


Figure A-7: 2013 and 2012 Total Monthly Recreation Visitation to NPS Lands

Sources: NPS Public Use Statistics Office

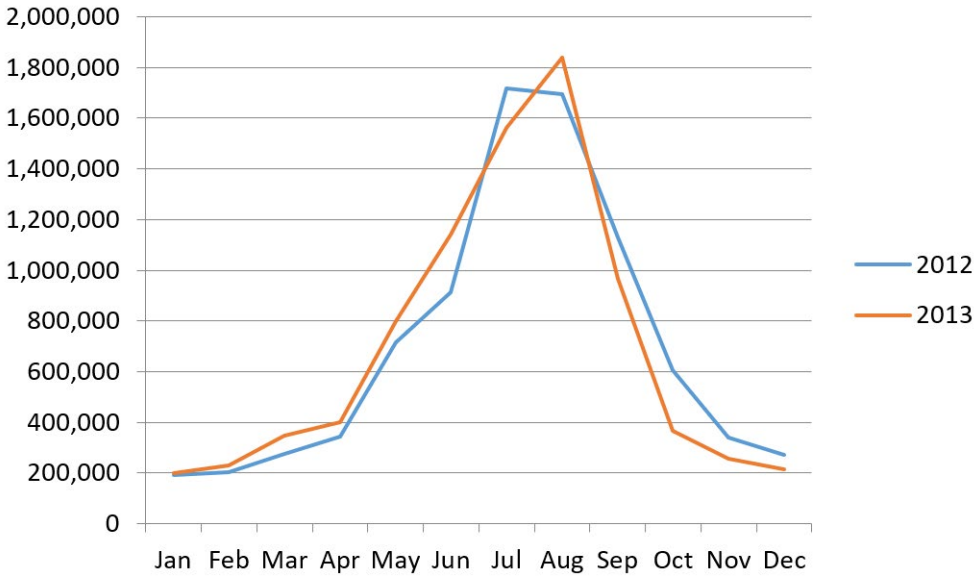
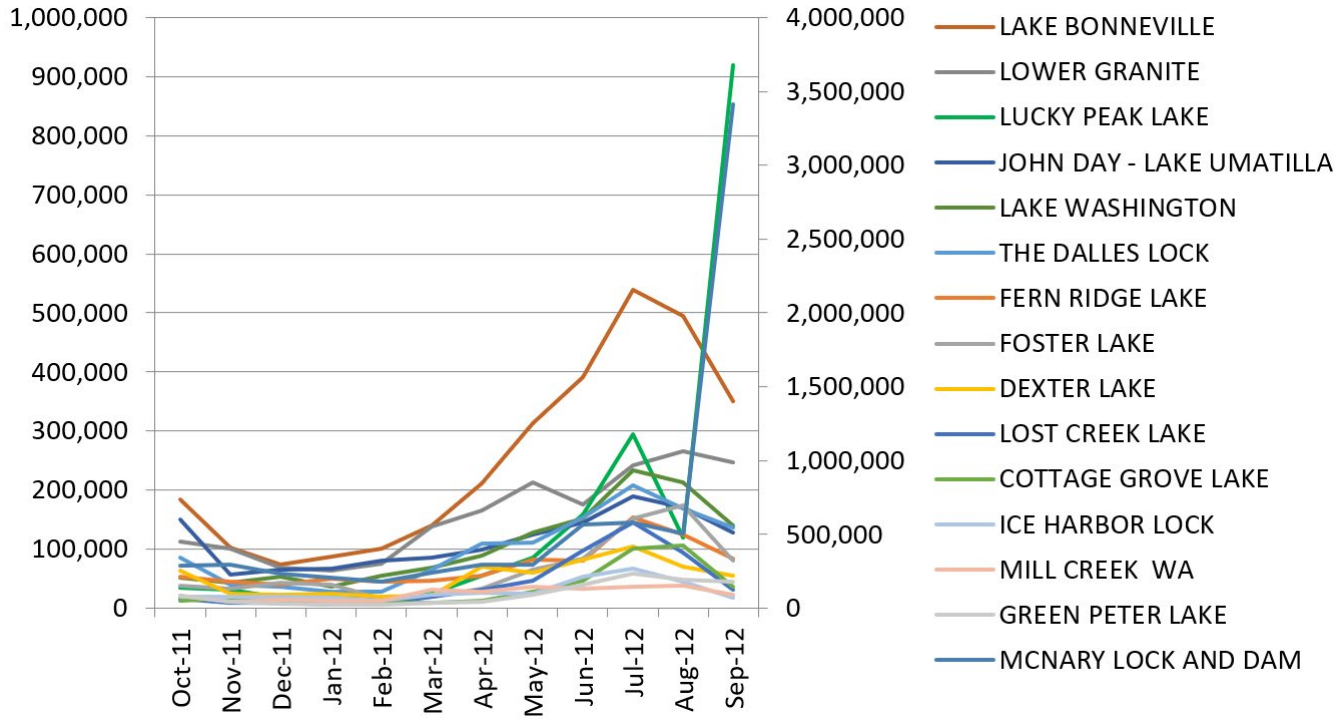


Figure A-8: FY2012 Monthly Visitation for 15 Busiest USACE Locations

Sources: USACE



Notes: The Federal fiscal year (FY) runs from October through September. Lucky Peak Lake data corresponds to the secondary vertical access due to extreme peak in September 2012.

Data are not available from FLMAs regarding distribution of visitation across days of the week and times of day. However, the Oregon SCORP refers to peak visitation on weekends and holidays.[38] Additionally, recent research on youth participation in outdoor activity comparing weekdays and weekends found that youth generally participate in outdoor recreation for longer durations on weekends because "[as] one might expect, school and other activities likely compete more for youths' time during weekdays than during weekends."[39] Finally, nearly 90 percent of non-work trips are taken on Saturdays and Sundays according to the U.S. Department of Transportation (USDOT) Federal Highway Administration (FHWA) 2009 National Household Travel Survey.[40] It is reasonable to presume based on these sources that recreational visitation to Pacific Northwest FLMAs is higher on weekends than on non-holiday weekdays.

The strong seasonal and weekend peaks mean that FLMA staff may have transportation systems (roads, trails, and bus service) that only operate during certain days and months, or that have schedules that fluctuate seasonally. Additionally, in coordinating among agencies, FLMA managers should be aware of when neighboring sites experience peak visitation so that they can coordinate promotion and access opportunities.

[38] Oregon SCORP, page 23.

[39] Cordell, H. Ken. 2010. *Outdoor Recreation Trends and Futures: A Technical Document Supporting the Forest Service 2010 RPA Assessment*. USDA Forest Service's Southern Research Station, USDA Forestry Sciences Laboratory, University of Georgia, and the University of Tennessee. http://www.srs.fs.usda.gov/pubs/gtr/gtr_srs150.pdf. Page 83.

[40] Table 30 on page 53

2.1.5 Visitor Activities

Recreational visitors to FLMAs have the opportunity to participate in a wide range of activities. Some activities require little to no equipment and are able to take place in a wide range of locations, such as picnicking or hiking. Other activities need significant equipment and more specialized locations, such as boating (requiring a vessel, navigable waters, and docks) or hunting (requiring hunting equipment, permits/licenses, and permitted areas). Due to these differences, recreational activities have varied impacts on transportation. FLMAs can better plan for transportation needs of their visitors when they understand these impacts as well as the demands for certain activities.

As mentioned earlier, it is difficult to establish trends in recreational activity due to significant fluctuations from year to year caused by changes in the economy and weather (i.e., heavy rains, droughts), as well as variations in survey methodology for data collection. Currently, the most common outdoor activities in the U.S. are viewing or photographing scenery or wildlife, visiting nature centers, taking scenic drives, and visiting the beach.[41] In general, national trends seem to show increases in swimming, personal watercraft, kayaking, wildlife viewing, and off-highway vehicle (OHV) riding; stable use for canoeing, bicycling, mountain bicycling, primitive camping, RV camping, motor boating, hunting, hiking, and rock climbing; and a decline in downhill skiing, horseback riding, rafting, and water skiing. For the Pacific Northwest, there has been an overall rise in activities on public lands. Figure A-9 to Figure A-14, below, illustrate participation rates in various activities across the FLMAs in the Pacific Northwest.

Figure A-9: Symbol Key for Recreational Activities in Following Figures

Sources: U.S. DOT Volpe Center

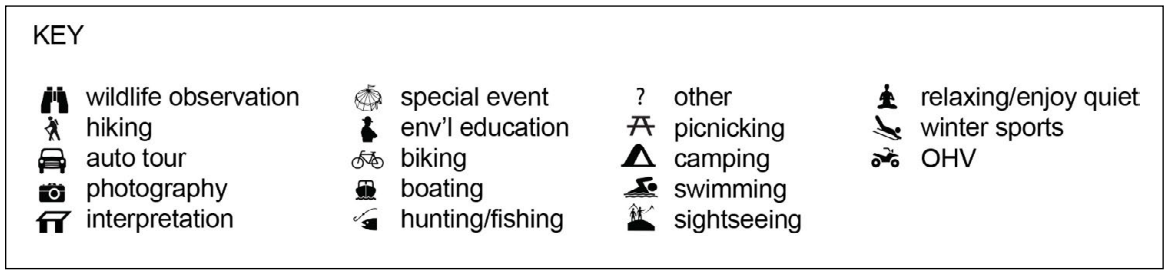
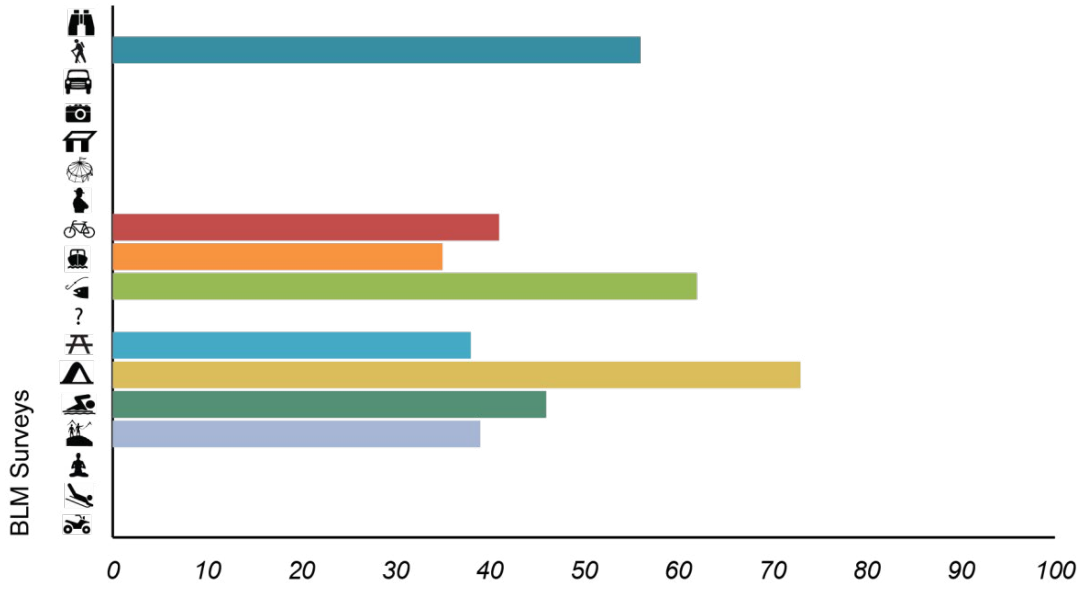


Figure A-10: Percent Participation in Recreational Activities on BLM Lands

Sources: Bureau of Land Management[42]



[41] Hall et al., page 51

[42] Compilation of BLM visitor survey results from Fishermen's Bend (2013), Susan Creek (2013), Hyatt Lake (2012), Umtanum (2007), and Roza (2007) as conducted and documented by the University of Idaho Park Studies Unit. http://www.uidaho.edu/cnr/park-studies-unit

Figure A-11: Percent Participation in Recreational Activities on FWS Lands

Sources: FWS 2013 Refuge Annual Performance Plan

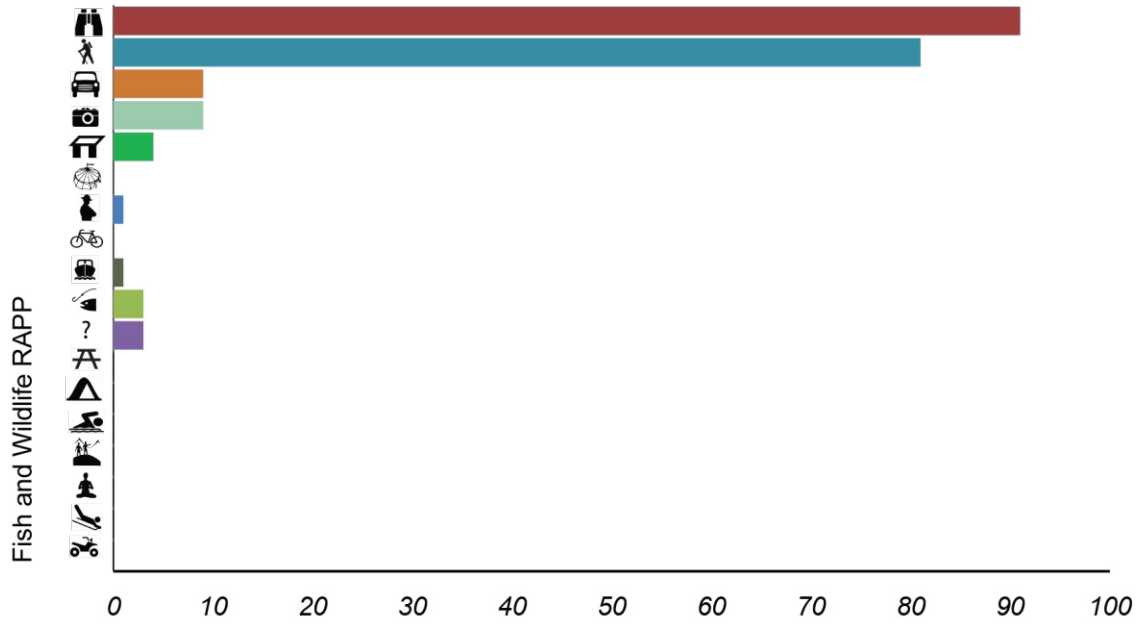
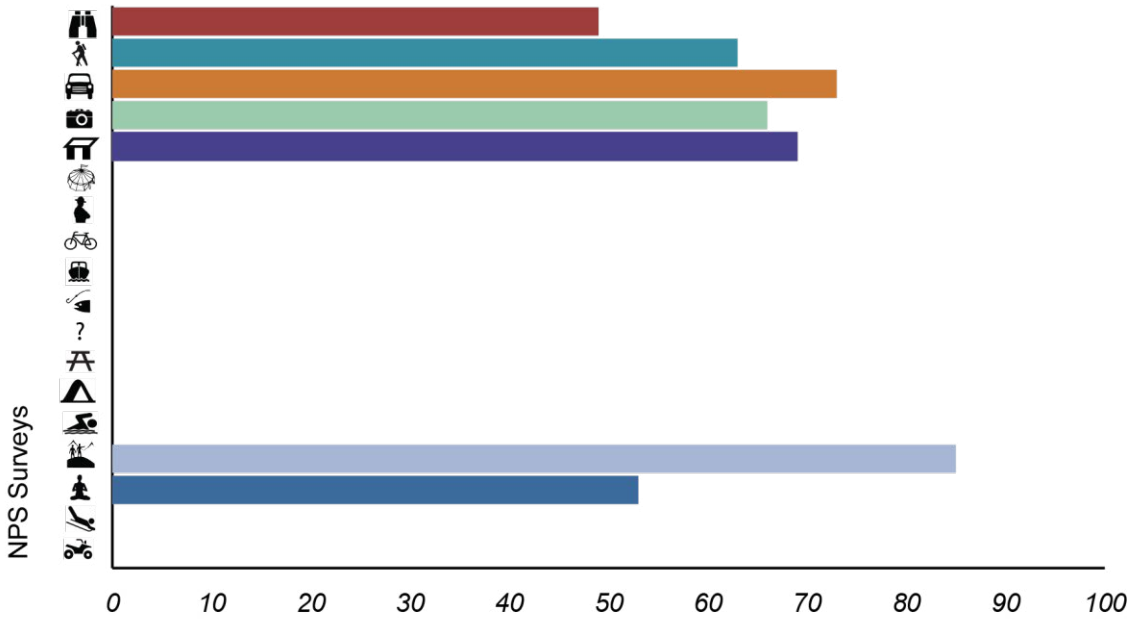


Figure A-12: Percent Participation in Recreational Activities on NPS Lands

Sources: National Park Service[43]



[43] Compilation of NPS visitor survey results from Mount Rainier (2012), John Day Fossil Beds (2004), and Klondike Gold Rush Seattle Unit (2009) as conducted and documented by the University of Idaho Park Studies Unit. http://www.uidaho.edu/cnr/park-studies-unit

Figure A-13: Percent Participation in Recreational Activities on USACE Lands

Sources: USACE[44]

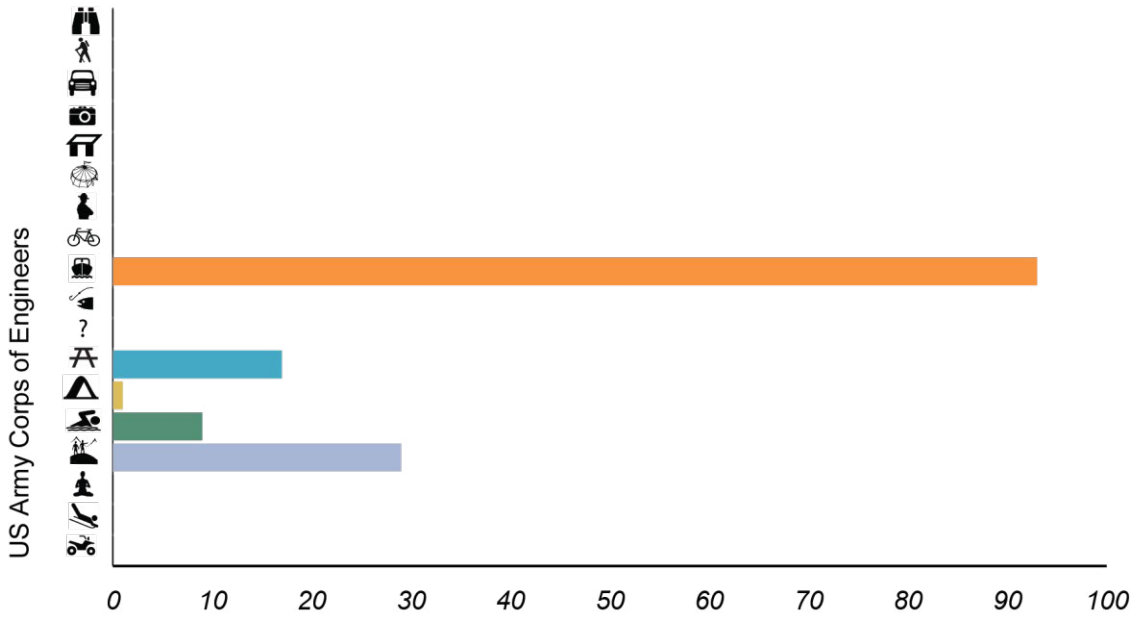
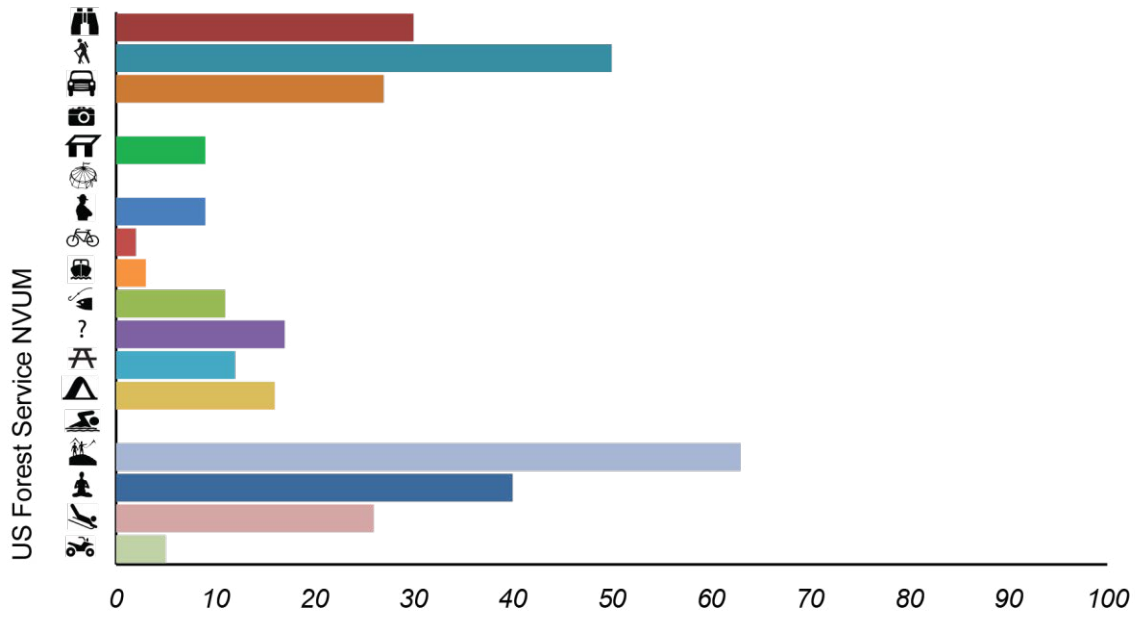


Figure A-14: Percent Participation in Recreational Activities on USFS Lands

Sources: USFS National Visitor Use Monitoring (FY2010, 2011, 2012)



[44] USACE. 2012. Value to the Nation Fast Facts for Oregon and Washington. http://www.corpsresults.us/recreation/fastfacts/stateReport.cfml?State=9 http://www.corpsresults.us/recreation/fastfacts/stateReport.cfml?State=14

Figure A-9 to Figure A-14 illustrate the FLMAs have a niche in certain recreational activities. FWS refuges are clearly a destination for wildlife observation, while USACE locations are prominently used for boating activities. The USFS shows the most diversity in supporting a wide range of recreational opportunities for visitors. The BLM supports the highest percentage of camping. Four of the five agencies register hiking in the top five activities for visitor participation, ranking second for both USFS and FWS. Sightseeing and auto tours are in the top five activities for three of the five agencies, ranking first for NPS locations. In terms of transportation planning, high participation in sightseeing, auto tours, and boating indicate a reliance on motorized vehicles—either large tour vehicles or personal automobiles potentially towing a boat. While wildlife observation and hiking are non-motorized activities, access to the locations still may require a personal vehicle and parking or access by public transportation to reach the trails.

Overall, outdoor recreation activities on public lands in both States are rising.[45] Oregon and Washington each report State-specific activity in their SCORPs, although these are not broken down by Federal, State, and local public lands. Figure A-15 and Figure A-16 illustrate the results. Walking was the top activity reported for both SCORP reports. Picnicking ranked second in Oregon and tied for third in Washington. Oregon has high participation in sightseeing, visiting historic sites, and ocean beach activities. Washington's top five were rounded out with recreational activities (such as non-beach swimming, playground use, and jogging or running), nature activities (such as wildlife viewing, gardening, and visiting nature centers) and water activities (such as beach swimming, boating, and beachcombing). Beyond the top five activities, wildlife observations have increased and hunting and fishing have remained constant in Oregon. Washington also has experienced a dramatic increase in participation in many nature-based activities and notable declines in participation in team-based activities, such as soccer and baseball. Participation in winter sports also was documented for the Washington SCORP.

Figure A-15: op Five Outdoor Recreational Activities in Oregon

Sources: Oregon SCORP, 2013-2017

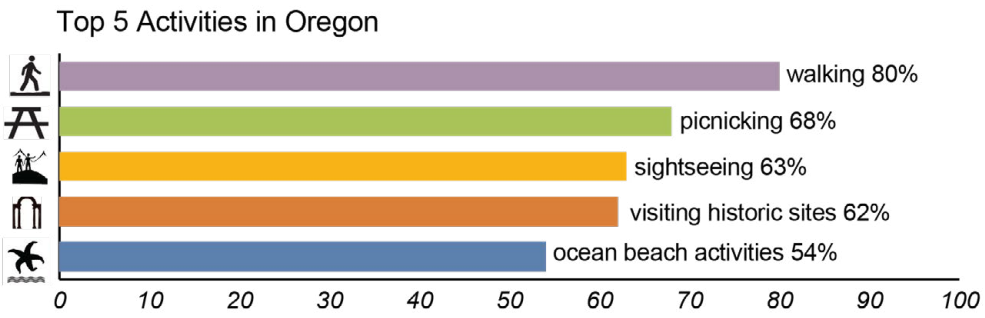
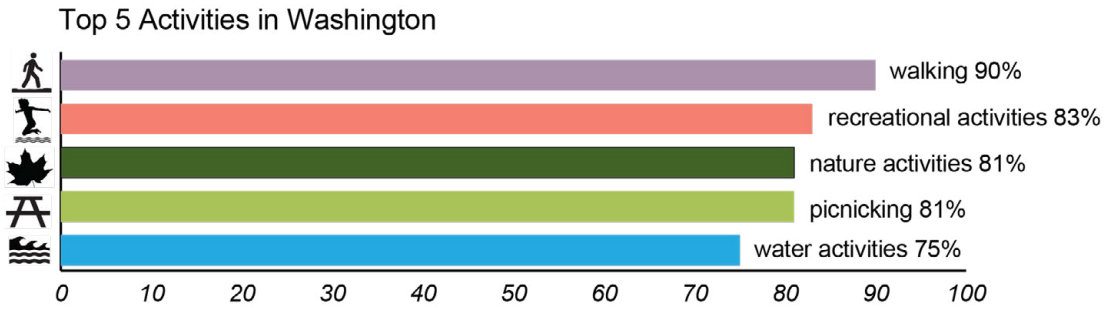


Figure A-16: Top Five Outdoor Recreational Activities in Washington

Sources: Washington SCORP, 2013



[45] Hall et al.

3. DEMOGRAPHIC TRENDS

There are a number of important demographic and social changes occurring in Oregon and Washington that will affect visitation to Federal public lands in future years, including shifts in age cohorts, concentrations of population growth, and diversifying ethnicities. The Washington 2013 SCORP specifically cites "increasing State population" and "changing demographics" among the greatest challenges for recreation providers.[46] These demographic shifts can alter recreational visitation and activities based on the preferences of the changing population, which, in turn, alters transportation needs and demands to and within FLMAs in the Pacific Northwest.

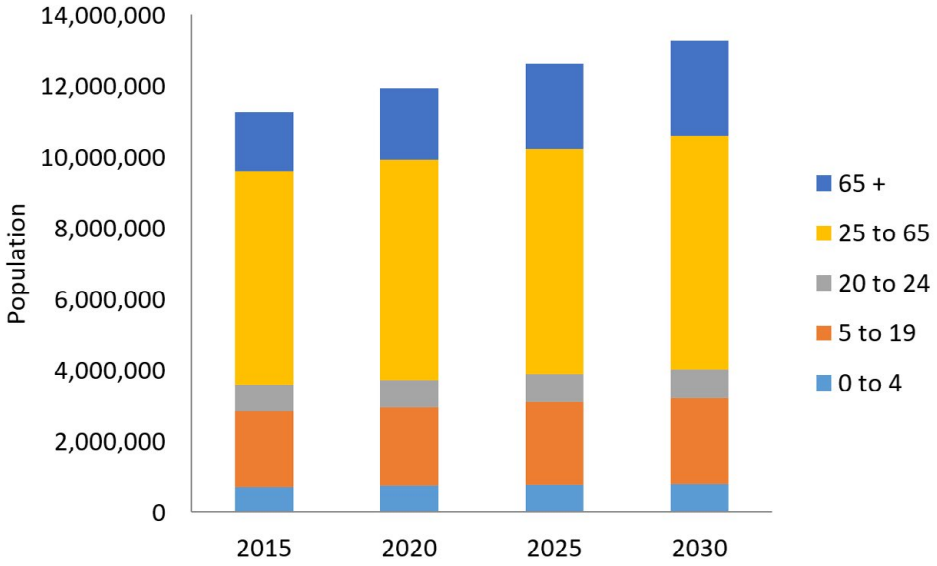
There is a general trend that—as population increases—the demand for recreation rises. As shown in Figure A-17, below, the population of the Pacific Northwest is expected to grow by approximately 18 percent through 2030.[47, 48] In Oregon, this growth is projected to be primarily near Portland. The growth in Washington is expected to occur near Seattle and Tacoma and in the coastal communities. The FLMA lands near to the population growth areas will see increased visitation while growth at lands 100 miles to 200 miles from population centers will have more stable visitation.[49]

Section 2.1.2, above, included discussion about an increase in outdoor recreation activity among older adults. The Pacific Northwest population of residents over the age of 65 is projected to grow by more than 60 percent by 2030, and this population will make up about 20 percent of the total population (see Figure A-17).[50] This population growth trend could translate into greater demand for these passive activities on all recreational lands, including those managed by the FLMAs. The Washington SCORP analyzed activity participation by age and found that older residents had a higher percentage of participation in visiting nature interpretive centers and beach combing than younger groups.[51] A 2007 Oregon SCORP survey asked older residents about their long-term transportation plans. Based on responses to this question, FLMAs may want to incorporate greater resources to support increased accessibility to nature centers, auto tours, or sightseeing groups to better accommodate this demographic.

46 WA SCORP, page 9
47 Oregon Office of Economic Analysis. 2013. Forecasts of Oregon's County Populations and Components of Change, 2010 – 2050. Released March 28, 2013. http://www.oregon.gov/DAS/oea/Pages/demographic.aspx
48 Washington Office of Financial Management. 2007. 2007 county projections by age: 5-year age groupings & 5-year intervals only. http://www.ofm.wa.gov/pop/gma/projections07.asp
49 Hall et al.
50 Ibid.
51 Washington SCORP Table 3.16, page 65

Figure A-17: Pacific Northwest Population by Age through 2030

Sources: Oregon Office of Economic Analysis,[52] Washington Office of Financial Management[53]



Visitors under the age of 16 make up 14 percent to 27 percent of FLMA visitation in the Pacific Northwest (based on data across USFS, NPS, and BLM)[54, 55, 56] Based on the resident survey in the Washington SCORP, the top five outdoor recreation activities for children's participation were picnicking, walking, hiking, playground use, and sightseeing.[57] Families make up the vast majority of groups visiting FLMAs, followed by friends, individuals (alone), and organized groups, such as schools. The low impact and more family-oriented activities have minimal transportation needs but getting to the lands to participate in the activities requires access planning. For example, children may have shorter attention spans for scenic driving and families may want more frequent pullouts or recreation opportunities. Family-friendly amenities like picnic areas, playgrounds, and boardwalks should be clearly signed and easily accessible via multiple modes.

Based on USFS and FWS survey data, visitation to Pacific Northwest recreational areas is predominantly White (>95 percent). Some visitors identify as American Indian (2 percent to 4 percent) or Latino (2 percent to 3 percent).[58] However, areas of the Pacific Northwest are experiencing more rapid growth in Hispanic and Asian populations, which may change these ratios over time (see Figure A-18).[59] The Pacific Northwest is expected to have significant growth in its Latino and Asian/Pacific Islander populations through 2025.[60] Growth has been experienced across all ethnicities from 2000 to 2010, but population growth by White and Native Indian groups has been the smallest.[61] By knowing their regional demographics and the demand for certain activities, FLMAs can better account for those transportation needs during long-range planning.

[52] Oregon Office of Economic Analysis. 2013. *Forecasts of Oregon's County Populations and Components of Change, 2010 – 2050*. Released March 28, 2013. http://www.oregon.gov/DAS/oea/Pages/demographic.aspx

[53] Washington Office of Financial Management. 2007. *2007 county projections by age: 5-year age groupings & 5-year intervals only*. http://www.ofm.wa.gov/pop/gma/projections07.asp

[54] Compilation of BLM visitor survey results from Fishermen's Bend (2013), Susan Creek (2013), Hyatt Lake (2012), Umtanum (2007), and Roza (2007) as conducted and documented by the University of Idaho Park Studies Unit. http://www.uidaho.edu/cnr/park-studies-unit

[55] Compilation of NPS visitor survey results from Mount Rainier (2012), John Day Fossil Beds (2004), and Klondike Gold Rush Seattle Unit (2009) as conducted and documented by the University of Idaho Park Studies Unit. http://www.uidaho.edu/cnr/park-studies-unit

[56] USFS National Visitor Use Monitoring (NVUM). Pacific Northwest Region (R6) (FY 2010, FY 2011, FY 2012, FY 2013)

[57] Washington SCORP, Table 3.3a, page 50

[58] Note: Survey respondents were able to select all ethnicities that apply, and data total more than 100 percent FWS, NVUM

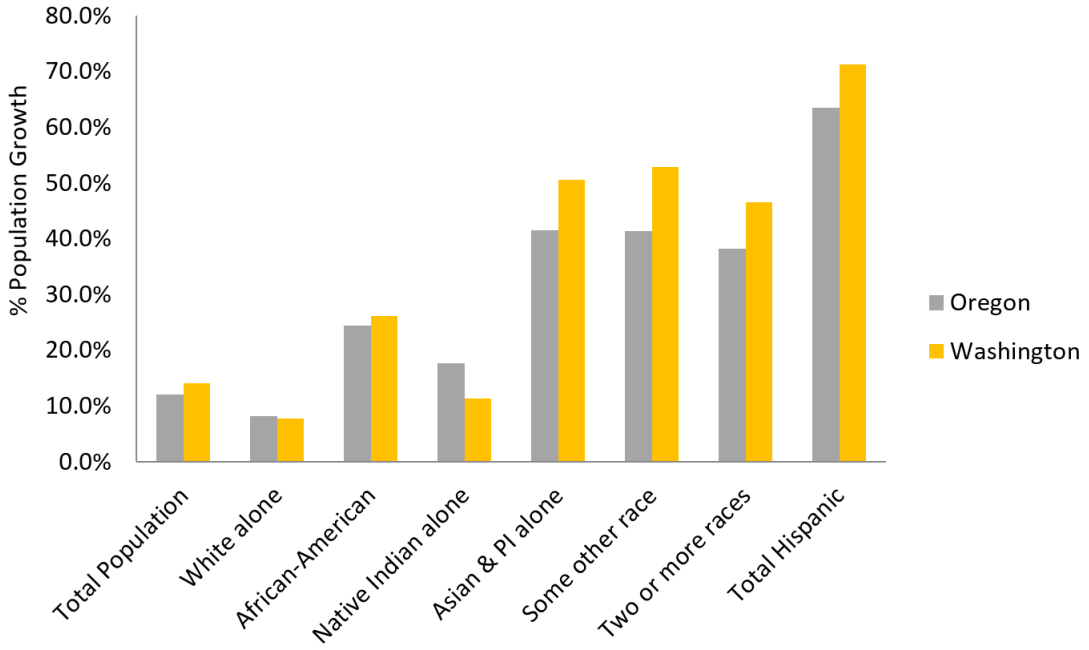
[59] Hall, T.E., H. Heaton, and L.E. Kruger. 2009. *Outdoor Recreation in the Pacific Northwest and Alaska: Trends in Activity Participation*. U.S. Dept of Agriculture. PNW-GTR-778. http://www.fs.fed.us/pnw/pubs/pnw_gtr778.pdf

[60] Ibid.

[61] U.S. Census Bureau, Population Divisions. Profile of General Population and Housing Characteristics: 2000 and 2010 Census Date for both Oregon and Washington States. http://factfinder.census.gov

Figure A-18: Oregon and Washington Population Growth by Race and Ethnicity (2000-2010)

Sources: U.S. Census Bureau, Population Division[62]



4. MODAL TRENDS

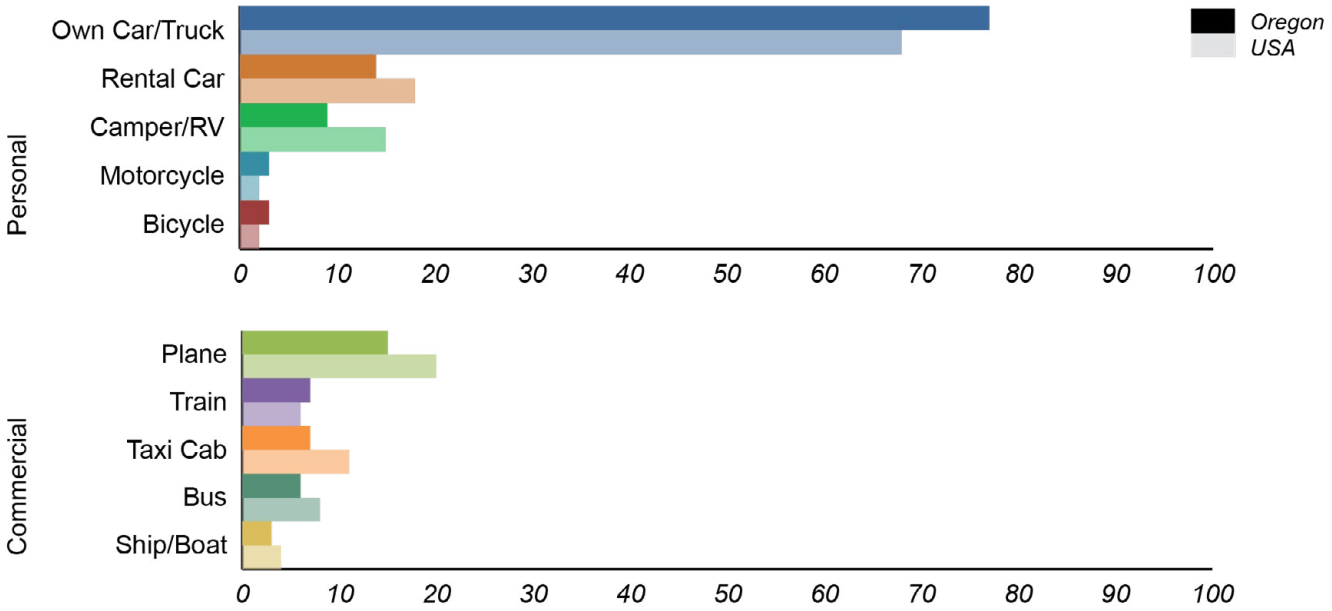
Trends in travel across specific modes may impact the numbers and destinations of future travelers to Federal public lands. FLMAs include 111,000 miles of public access roads in the Pacific Northwest. The presence of such an expansive road network can facilitate a number of modal options for visitors depending on where they are, what condition they are in, and how the road space is allocated across users. For instance, paved roads in more urban recreational areas are more suitable for bus travel whereas gravel roads in more rural areas are less conducive to bus travel. The discussion in this chapter will focus on how visitors use the available networks and how it contributes to long-term transportation planning in the region.

[62] Ibid.

For a majority of recreation visitors in the Pacific Northwest region, private vehicles are likely to be a popular mode of access to and within the FLMAs. A recent set of FWS visitor surveys found that an average of 90 percent of visitors used personal vehicles as their means to get around within the refuges. An average of about one-third of visitors said they walked or hiked to travel within the refuge. Additionally, Figure A-19 illustrates that personal vehicles are the most common form of personal transportation used for overnight trips in Oregon and the U.S. as a whole. While these data are not specific to outdoor recreational travel, they do confirm the trend that personal vehicles are the most common travel choice for overnight trips. It is interesting to note that bicycling registers about 3 percent of overnight trips, indicating a reasonable level of bicycling facilities available in Oregon to make such trips possible.

Figure A-19: Type of Transportation Used on Overnight Trips in Oregon

Sources: Longwoods International[63]



Of course, local residents living within 10 miles of a recreation area may walk or bicycle to the public lands as part of their recreation routine. If the public lands are near an urban area, city residents may be able to take public transportation to them. Closer units may even allow walking as the primary means of access. For instance, a 2009 visitor survey for Klondike Goldrush—Seattle Unit, which is an urban site, found that nearly two-thirds of visitors walked to the site either from their hotel or a public transportation station; only 20 percent of visitors drove in a personal or rental vehicle.[64]

The Oregon and Washington SCORPs found that residents participate most in "close-to-home" activities that can be done almost daily without significant travel time. Residents closest to FLMAs can use these public resources at their own "backyards" to walk their dogs, jog, or bicycle after work and school.

The Oregon SCORP also surveyed non-participants in outdoor recreation to understand why they do not engage in outdoor recreation. The top three reasons for lack of participation were being disabled, too old, or the activities are considered too expensive. The top three limitations to participation were lack of time, poor health, and concerns about safety/crime in parks. Lack of transportation was at the bottom of the list for limitations to participation, indicating it is less of a barrier to recreation in the Pacific Northwest than the previously mentioned issues. This could be due in part to the transportation policies in place in Oregon and Washington to support outdoor recreation as part of the States' tourism industries and to enhance the quality of life.

[63] Longwoods, International. Oregon 2013 Visitor Report. http://industry.traveloregon.com/research/archive/oregon-visitor-report-2013-longwoods-international/

[64] 2009 Klondike Gold Rush visitor survey

The 2006 Oregon Transportation Plan (OTP) includes a policy on "Moving People to Support Economic Vitality," which aims to "… develop an integrated system of transportation facilities, services, and information so that intrastate, interstate, and international travelers can travel easily for business and recreation" (Section 3.2). A portion of this policy includes improving coordination and cooperation among government agencies at all levels to facilitate multi-modal mobility. It also aims to promote tourism by supporting travel by air, bicycle, motor vehicle, rail, and ship and connectivity to recreational trails.[65]

Separate from the OTP, Oregon created the Historic Columbia River Highway State Trail Plan in 2011. The completed plan will "… provide a continuous corridor for bicycle travel and recreation through the Oregon side of the Columbia River Gorge National Scenic Area, generally along the route of the Historic Columbia River Highway."[66, 67] There were an estimated 230,000 recreational bicycle trips within communities located along the Columbia River Gorge in 2013. These trips are expected to increase significantly as more sections of the trail plan are implemented. Completion of the trail plan will eventually connect to the USFS Wyeth Campground, providing greater multi-modal access to the site. Additionally, the Oregon Parks and Recreation Department has the only Scenic Bikeways Program in the country. The program includes a website that provides information on various bicycle routes with different levels of difficulty, bicycle events, and resources across the State (http://rideoregonride.com/). Many of the routes listed on the website have access to public lands and traverse federal roads.

The 2007–2026 Washington Transportation Plan (WTP) also addresses multi-modal improvements, stating "… [b]iking and walking should be regarded as more than recreational pastimes… [t]ransportation must be viewed as, and function as, an integrated network with all modes acting as complementary parts of the whole."[68] The WTP has a specific section on Tourism and Recreation Transportation that include policies to support recreation, such as infrastructure and travel information. Bicycle touring routes, the State ferry system, aviation, and the State's network of 3,500 miles of Scenic Byways were called out in the plan as important components of the transportation system that support recreation and tourism. Finally, Washington's Growth Management Act includes goals related to open space and recreation. The plan aims to "… [r]etain open space, enhance recreational opportunities, conserve fish and wildlife habitat, increase access to natural resource lands and water, and develop parks and recreation facilities."

Oregon's and Washington's statewide policies supporting multi-modal access to recreation areas benefit the FLMAs and should be accounted for in long-range planning by Federal agencies. In addition, FLMAs, WSDOT, and ODOT should invite each other to participate in their respective long-range planning and programming activities.

[65] OTP 2006. Page 56

[66] Dean Runyan Associates. 2014. Columbia River Gorge Bicycle Recreation Economic Impact Forecast for the Communities Along the Historic Columbia River Highway. Page iii. http://industry.traveloregon.com/wp-content/uploads/2014/09/Final-Final-Report.pdf

[67] Quatrefoil, Inc. 2011. The Historic Columbia River Highway State Trail Plan - Wyeth to Hood River. http://www.oregon.gov/ODOT/HWY/HCRH/pages/trail.aspx

[68] WTP 2007–2026, pg 2

APPENDIX D:
ECONOMIC IMPACT OF FEDERAL PUBLIC LANDS

1. INTRODUCTION

The management of public lands for the current and future enjoyment of the American public is a critical and visible part of the missions of Federal Land Management Agencies (FLMAs). As millions of visitors enjoy the resources offered on Federal lands, the FLMAs also are making significant economic contributions on a national, State, and local level. Beyond recreation and tourism, public lands impact the communities around them through other mission-driven uses.

Transportation networks enable FLMAs to have this positive economic effect. Maintaining transportation access and connectivity within and surrounding public lands leads to positive market impacts felt at all levels of the economy.[1] The consideration of economic impacts of Federal lands can help transportation planners recommend transportation investments with the greatest overall market benefits.

The purpose of this report is to provide background information for the Pacific Northwest Collaborative Long-Range Transportation Plan (LRTP) for the five Federal land management agencies that own and manage land in Oregon and Washington. Those five agencies are the Bureau of Land Management (BLM), National Park Service (NPS), U.S. Fish and Wildlife Service (FWS), U.S. Army Corps of Engineers (USACE), and U.S. Forest Service (USFS).

Additionally, the Fixing America's Surface Transportation (FAST) Act emphasizes the use of Federal Lands Transportation Program (FLTP) funding to be used on "…Federal economic generators."[2] Therefore, it is advantageous to understand the various ways in which an FLMA's transportation system acts as an economic generator.

1.1 METHODOLOGY

There are multiple insightful ways to measure the impacts of Federal lands. Three of the most common methods include Cost-Benefit Analysis, Economic Contribution, and Economic Impact:

- Cost-benefit analysis is an examination of changes in social welfare and includes both market and non-market impacts.
- Economic contribution examines the spending impacts of both residents and non-residents in a local community.
- Economic impact only studies the new economic activity brought by non-resident expenditures.

This report examines both the *economic contributions and economic impacts of Federal public lands. These types of analyses were chosen for this report to provide a more comprehensive picture of the market effects of FLMAs.*[3] In several incidences, it was difficult to estimate economic impact data and, therefore, economic contribution data are presented.

Although an economic impact and contribution analysis is used in this report, this does not diminish the importance of non-market impacts—those in which no money changes hands. These impacts include subsistence, traditional Native American uses, non-use value, and ecosystem preservation. While there are many tangible and intangible social and environmental benefits associated with public lands, these are more difficult to quantify and are much broader in scope than the more specific ways in which money cycles through the local economy.

There are three categories of economic impacts and contributions an industry, event, or policy can create: direct, indirect, and induced. This report looks at all three effects to provide a comprehensive view of the economic impacts of Federal public lands.

- *Direct impacts* are experienced after an initial financial transaction.
- *Indirect impacts* occur after the direct impact from the additional purchases that the original payment afforded or required.
- *Induced impacts* result from the expenditure of the wages and salaries supported by the directly and indirectly affected industries.

1 As used in this report, a market impact is the effect of a market participant when buying or selling a good or service on the economy.
2 Federal Highway Administration, 2013.
3 Watson et al., 2007.

To use these concepts in an example, imagine a tourist purchases a meal at a restaurant. The initial expenditure is considered a *direct impact.* From that initial transaction, the *indirect impacts* typically would include the additional produce purchased by the restaurant from their local suppliers. The cooks and servers may go on to spend their wages on other goods and services that will create *induced impacts*. Since a portion of these purchases may remain in the local area, the multiplier effect continues, eventually ending when dollars are spent on goods or services from outside the region or saved rather than spent. In this restaurant example, the multiplier chain might end when the restaurant purchases coffee and tea from a supplier located in another part of the country.

1.2 AGENCY DATA SOURCES

This technical report uses data generated by each FLMA. Agencies vary in their reporting schedules for economic impact and contribution data. Data in this report vary accordingly in terms of year recorded and may not be directly comparable across FLMAs. The following two economic models briefly explained below are the primary sources for most of the data FLMAs report.

1.2.1 Impact Analysis for Planning

Impact Analysis for Planning (IMPLAN), originally developed with support from USFS, is an economic model that is commonly used to measure the economic impacts of activities or policies on a local area. IMPLAN uses an input-output framework that tracks the flow of expenditures among producers and consumers. It also uses county-level economic data to create locally specific multipliers that account for the indirect and induced effects described above.

The BLM, FWS, USACE, and USFS all use IMPLAN to estimate the economic effects of visitor spending, both in terms of direct spending and the total impacts when including estimated indirect and induced effects.

1.2.2 Visitor Spending Effects

Visitor Spending Effects (VSE) is the latest economic impact estimating model developed by the NPS and first used in 2012 reporting. It replaces the Money Generation Model (MGM). To make the MGM more transparent and accurate, the NPS updated its methodology to create the VSE. The main differences between the two models are: (a) the redefinition of local gateway communities to a more inclusive 60-mile radius, and (b) the basis of visitor spending and trip characteristic data on more generic spending profiles[4]. VSE uses multipliers generated by IMPLAN.

1.3 FLMA MISSIONS

The FLMAs each address economic development differently in their missions and permitted activities. Table A-1, below, displays the mission statements of each FLMA.

Table A-1: FLMA Mission Statements

Agency	Mission Statement
BLM	To sustain the health, diversity, and productivity of the public lands for the use and enjoyment of future generations.
FWS	The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people.
NPS	To conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.
USACE	To deliver vital public and military services; partnering in peace and war to strengthen our Nation's security, energize the economy, and reduce risks from disasters.
USFS	To achieve quality land management under the sustainable multiple-use management concept to meet the diverse needs of people.

[4] Thomas, Catherine C., Huber, Christopher, Koontz, Lynne, 2014, page 2.

As shown in Table A-1, some FLMAs have missions that directly call for multiple types of economic activities to take place on their lands. Others have missions that relate to economic impacts more indirectly. For collaborative planning purposes, FLMAs and Department of Transportation agencies should consider the opportunities and constraints afforded by agency missions. For example, leaders in FLMAs with multiple-use missions may focus transportation investments and network connections on freight movement, whereas these investments may be less agreeable among other FLMAs.

2. DIRECT IMPACTS AND CONTRIBUTIONS

Direct economic impacts follow from financial transactions, such as a consumer purchase or employer wage payment. The market impacts examined in this section detail the ways in which public lands have a direct effect on the local, State, and national economy. Not only do tourism and recreational visits contribute greatly to the economy, but also the management and use of natural resources support economic development in regions. The direct impacts of visitor spending, resource development, and employment each have a multiplying effect on the local economy as money cycles through the system. These effects are, for the most part, captured in the economic contribution numbers presented in this report.

2.1 VISITOR EXPENDITURES

Tourism and recreational visit expenditures create demand for goods and services in local areas, thus creating jobs and income for local residents. According to the Federal Interagency Council on Outdoor Recreation (FICOR) report examining economic contribution of outdoor recreation in 2012, more than 910 million visitors visited Federal lands and waterways, spending a total of $44 billion and supporting 719,000 jobs[5]. Table A-2, below, displays the 2012 national outdoor recreation visitor spending at each of the participating Collaborative LRTP FLMAs gathered by FICOR.

Table A-2: 2012 National Outdoor Recreation Visitor Spending by FLMA (Source: FICOR, 2012)

Agency	Recreation Visitation (millions)	Visitor Spending (billion $)	Jobs (thousands)	GDP Added (billion $)
BLM	59,000,000	$ 3,000,000,000	58,000	$ 4,000,000,000
FWS	47,000,000	$ 2,000,000,000	37,000	$ 2,000,000,000
NPS	283,000,000	$ 15,000,000,000	243,000	$ 16,000,000,000
USACE	360,000,000	$ 13,000,000,000	187,000	$ 14,000,000,000
USFS	161,000,000	$ 11,000,000,000	194,000	$ 13,000,000,000
TOTAL	910,000,000	$ 44,000,000,000	719,000	$ 49,000,000,000

While the above national summation of data does not show the more-detailed effects by region, type of activity, party size, and length of stay, it is clear that visitor spending introduces new money into the local economy that would not exist otherwise. In examining economic impacts, the NPS reports that in 2012 non-local visitation accounted for $13.9 billion in local spending[6]. These expenditures supported 139,000 jobs and $4.0 billion in labor income in the surrounding gateway communities. As compared to the NPS numbers presented in Table A-2, it is interesting to note that 93 percent of visitor spending and 74 percent of jobs supported is from non-local visitation. While resident visitors are important, the majority of the market effects stem from non-resident visitors. The primary sectors of a local economy affected by visitor spending include retail, lodging, transportation, and food. For example, USFS has estimated that during an overnight trip a visiting party spends an average amount of $23.54 on retail, $57.56 on lodging, $51.26 on transportation, and $95.49 on food[7].

5 Federal Interagency Council on Outdoor Recreation (FICOR), 2012.
6 Thomas, Catherine C., Huber, Christopher, Koontz, Lynne, 2014.
7 Stynes, Daniel J. and White, Eric M., 2006.; adjusted to $2012

In addition to supporting the hospitality sector, the FLMAs promote different types of recreational uses on their lands and, therefore, create opportunities for various recreational businesses in communities. Visitors to public lands in Washington and Oregon enjoy both consumptive activities (hunting and fishing) and non-consumptive activities (hiking, bicycling, kayaking, camping, and wildlife viewing). The BLM estimates that direct non-resident visitor expenditures per visit on fishing and hunting activities in Oregon are $190.46 and $169.40, respectively[8].

Without a well-maintained transportation system, visitors will have difficulty accessing these activities, which could come with negative market consequences. If visitors are deterred from coming to these recreation sites and communities, local businesses may feel the losses resulting in a less stimulated economy.

2.2 RESOURCE DEVELOPMENT

Many of the lands protected by the FLMAs also oversee the appropriate extraction and use of natural resources. This multi-use mission shows the diverse nature of Federal public lands in America and various ways public lands support the local economy. The maintenance of public and administrative roads within land units is essential for the seamless development and movement of these goods.

2.2.1 Energy—Oil, Gas, and Coal

While not an appropriate use on all Federal lands, energy extraction is an activity with very high economic impact. The BLM manages 248 million surface acres and 700 million subsurface acres. As part of its management activities, the BLM oversees the Federal operations of onshore oil, gas, and coal production. Energy development on BLM lands provides local communities with new job opportunities and income. In 2011, the Department of the Interior reported that the value of oil, gas, and coal produced on BLM lands was $32.32 billion, with an estimated economic contribution of $119.57 billion, and supported approximately 558,976 jobs[9]. These monetary contributions can come in the form of leasing and production right payments such as royalties, rentals, and bonus payments from private companies.

2.2.2 Renewable Energy—Wind, Hydropower, Biomass, and Geothermal

Three of the FLMAs in Oregon and Washington support renewable energy projects: the BLM, USACE, and USFS.

The BLM supports wind developments on its lands by allowing right-of-way grants to private companies. As of June 30, 2013, there were four authorized and one pending wind testing rights of way and one authorized and three pending wind farm rights of way in Oregon.[10] The one wind farm, Lime Wind, has been in operation since December 2011. In Washington, there was one authorized wind testing right of way and one pending wind farm right of way. It is estimated in 2011 that BLM wind energy had a national economic contribution of $0.1 billion and supported 688 jobs.

The top hydropower producing States in 2011 were Washington, Oregon, and California. The BLM and USACE manage hydropower production. The USACE is the largest owner-operator of hydroelectric power plants in the U.S. In 2013, the USACE operated 75 multi-purpose hydropower plants with a total capacity of 21,000 megawatts of which approximately 60 percent is located in the Pacific Northwest.[11] The BLM manages smaller projects in Oregon and Washington.

The by-products of forest management are prime opportunities for the generation of biomass energy. Biomass production creates jobs and can revitalize local economies in rural regions near large forests. Biomass production also supports the health and resiliency of the treated forests.

The Secretary of the Interior has delegated to the BLM the authority to lease public lands and other Federal lands, including National Forests, for geothermal exploration and development. As of May 2013, the agency managed 706 geothermal leases, generating $12 million in Federal royalties each year plus an additional $3 million in rent. Fifty percent of the revenue is shared with

8 Cabe, Loren and Coupal, Roger, 2001.; adjusted to $2012
9 Department of the Interior, 2012, page 17.
10 Bureau of Land Management, accessed August 2014.
11 U.S. Army Corps of Engineers, 2013.

the States and 25 percent with the local counties[12]. Competitive lease sales also generate money; since 2007, these sales have totaled more than $76 million in bonus bids in Colorado, Idaho, Oregon, Utah, Nevada, and California. Seventy-eight Federal geothermal leases are in Oregon and four leases are in Washington on both BLM and USFS lands.

2.2.3 Minerals

Both the USFS and BLM permit mineral mining activities while ensuring sustainable and healthy ecosystems and watersheds. Just as with geothermal development, the BLM manages the leasing rights of minerals (for example: basic minerals such as gravel and dirt or solid minerals such as sodium and potassium) on public and Federal lands. The BLM states the total value of locatable and other minerals on its lands in 2011 was $8.43 billion, supporting an economic contribution of $20.36 billion and 107,493 jobs that year.[13] The BLM gives States, counties, and other government entities free mineral materials for public projects and sells minerals at market value for other projects.

2.2.4 Timber

Timber production is an extremely important activity of the USFS. One of the agency's strategic goals is to provide and sustain benefits to the American people. Under this goal, one of the objectives is to reliably supply forest products to local communities consistent with the desired conditions of the National Forest System lands. USFS lands are used to provide commercial timber and fiber products as well as special forest products such as Christmas trees, floral greenery, herbs, nuts, and decorative wood. The USFS sells timber and special forest products through a number of different contracting mechanisms. In fiscal year 2009, the USFS reported a sold timber value of $159.5 million, of which Oregon comprised $30.9 million and Washington contributed $8.0 million.[14]

2.2.5 Navigation—Ports, Harbors, and Waterways

The USACE encourages economic development through its navigation programs and infrastructure construction and maintenance activities at ports, harbors, and inland waterways that help move cargo in, out, and around the country. The USACE ensures the safe and environmentally friendly movement of goods through Corps-managed waterways and ports. USACE manages several principal coastal ports in Washington and Oregon such as Coos Bay, Portland, Tacoma, Seattle, and Vancouver. Major commodities such as food and farm products, energy products, minerals, and manufactured goods are part of this commercial water activity. In 2012, Oregon ports hosted a total of 30.8 million tons of waterborne cargo and Washington ports saw 115.6 million tons[15]. These ports provide many jobs and promote economic activity in the surrounding area as well as have national and international economic impacts.

2.2.6 Grazing

An increasing population and growing demand for agricultural products make the need for agricultural land more important. The BLM and USFS allow monitored livestock grazing on their lands and this contributes significantly to the local and regional economies.

According to the 2014 BLM Management of Livestock Grazing Fact Sheet, BLM administers nearly 18,000 permits and leases held by ranchers[16]. As of 2013, BLM owns approximately one-fourth (155 million acres) of total U.S. grazing land. In 2007, BLM collected $12.9 million in grazing fees[17]. In 2013, the USFS reported that more than 95 million acres of National Forest System lands is used for livestock grazing[18]. The Forest Service administered and monitors 6,155 permits. In Oregon, the USFS authorized a total of 345 permits totaling 92,922 cattle; 132 horses and burros; and 23, 902 sheep.

12 Bureau of Land Management, accessed August 2014.
13 Department of the Interior, 2012, page 17.
14 USFS, November 2008
15 U.S. Army Corps of Engineer Navigation Data Center, 2012.
16 BLM, March 2014
17 Department of the Interior, 2007.
18 USFS, March 2014

2.3 AGENCY EMPLOYMENT

Each agency directly affects the local economy through added employment and payroll. The creation of jobs and salaries by an FLMA is an important economic impact. The activities on and surrounding the public land units would not be possible without the dedicated staff of each of the agencies. Table A-3, below, shows the national employment and payroll from 2011 for BLM, FWS, and NPS and from 2014 for USFS. Taking a more regional look, in 2014 USFS employed a total of 4,514 employees with a combined payroll of $0.26 billion (almost 15 percent of the national payroll) in Oregon and Washington. This table does not capture the induced impacts of employee spending in the local area and other added benefits of increased employment in the affected communities and regions.

Table A-3: 2011 Employment and Payroll by FLMA

Bureau	Employment (2011)	Payroll ($2011, billions)
BLM	12,065	$0.73
FWS	10,193	$0.71
NPS	26,783	$1.49
USFS[19]	30,288 (2014)	$1.79 (2014)

Source: DOI, 2012

3. OTHER IMPACTS AND CONTRIBUTIONS

While the above section provides information on the direct market impacts of FLMAs, the following section outlines some of the indirect and induced impacts and contributions. Surrounding communities experience numerous positive market effects due to activities on and surrounding public land units. This report only examines property values and job growth as two examples of non-direct impacts and contributions.

3.1 PROPERTY VALUES

Houses in proximity to a Federal land area may command a price premium to the extent that homebuyers place a value on access to desired amenities such as open space and recreational activities. Several studies examined the effect of nearby open spaces and federally protected lands on property values (and therefore on ad valorem property taxes collected by local governments)[20]. In 2012, the FWS published a report outlining the positive property value effects of living near a national wildlife refuge (NWR) based on detailed, confidential U.S. Census Bureau data. This report found that homes located within half a mile of an NWR and within eight miles of an urban center are valued 4 percent to 5 percent higher in the Northeast region, 7 percent to 9 percent higher in the Southeast region, and 3 percent to 6 percent higher in California and Nevada[21]. The report includes the benefits of protection from future development, natural disaster mitigation, and preservation of natural amenities as possible contributors to higher property values, but these are difficult to quantify and, therefore, not included in the analysis.

3.2 VALUE OF NATURAL/RECREATIONAL AMENITIES FOR JOB GROWTH[22]

At least one study has found that Federal lands have been contributors to long-term regional economic growth, with their scenic and recreational value serving as a draw for relocation of high-skill industries and workers. Headwaters Economics studied the correlation between the presence of Federal public lands and economic growth in the Western U.S., which has a higher share of public lands than other regions[23].

19 USFS Human Resource Management internal website
20 National Park Service, 2000.
21 Taylor et al., 2012.
22 Headwaters Economics, 2012.
23 In this study, Western States were defined as Arizona, Colorado, California, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

In key indicators of economic development, the Western U.S.'s economy has outperformed the rest of the U.S. In terms of employment, population, and personal income growth, the West has seen increases for the last four decades. The Headwaters Economics report argues that with high-tech industries and services industries expanding, the West developed an innovative culture that taps into a knowledge-based economy, rather than a commodity and natural resource-based economy. Having federally protected public lands nearby is used to recruit and retain these high-performing companies and workers. With improvements in telecommunications and the ability to work from almost any location, these impacts may be growing over time.

4. CONCLUSION

Federal public lands have significant and diverse contributions to the economies of Washington and Oregon. Transportation plays a large role in allowing economically productive activities to occur on and surrounding public lands. The following economic impacts and contributions would not be possible without the maintenance of the transportation systems within and around the public land units:

- In 2012, more than 919 million visitors traveled to Federal lands and waterways, spending a total of $44 billion and supporting 710,000 jobs.
- Through direct visitor spending and resource development, billions of dollars are circulated through the economies surrounding public lands.
- Additional market benefits are felt with increased property values, greater job growth, and increased income in nearby communities.

With such a wide array of economically significant activities and contributions, public lands are not only very valuable to localities, but also to the State economies. Transportation systems allow visitors to access these naturally and culturally significant places for recreational purposes, and they also provide access for commercial activities like leasing land for sustainable and healthy resource development. Improved coordinated and long-range planning may increase the market effects of public lands locally, State-wide, and regionally.

5. CONTRIBUTING OREGON AND WASHINGTON SPECIFIC- DATA

The tables below provide further detail on Oregon and Washington unit-level data for FWS and NPS units.

FWS Examples (Region 1)[24]

The table pulls information from the *FWS Banking on Nature, 2013 report.*

Table A-4: Oregon and Washington NWRs Economic Contributions

Refuge Name	State	Total Recreation Visitation	Total Final Demand[25] (000s, $2011)	Total Employment Income (000s, $2011)	Total Jobs
Camas NWR	WA	13,513	$250	$68	2
Columbia NWR	WA	51,873	$2,037	$585	16
Conboy Lake NWR	WA	5,605	$466	$58	4
Dungeness NWR	WA	111,628	$2,802	$861	25
Hanford Reach National Monument	WA	33,925	$2,015	$593	17
Hart Mountain National Antelope Refuge	OR	14,962	$942	$325	10
Little Pend Oreille NWR	WA	64,130	$3,883	$1,162	30
Malheur NWR	OR	119,075	$13,399	$1,162	140
McNary NWR	WA	42,095	$1,561	$442	14
Nisqually NWR	WA	203,815	$5,550	$588	41
Ridgefield NWR	WA	164,525	$5,630	$1,682	39
Steigerwald Lake NWR	WA	44,531	$1,361	$407	10
Tualatin River NWR	OR	103,780	$1,627	$703	17
Turnbull NWR	WA	54,196	$1,075	$321	8
Willapa NWR	WA	103,780	$2,563	$720	21

[24] Carver, Erin and Caudill, James, 2013.

[25] Final demand is the total spending by recreational visitors when visiting refuges. Expenditure categories include food, lodging, transportation, and other. Expenditure information is based on the 2011 National Survey of Fishing, Hunting, and Wildlife Associated Recreation. (Carver, Erin and Caudill, James, 2013, page 10)

NPS Examples

The table is from the *National Park Service Visitor Spending Profiles 2013 report.*

Table A-5: Oregon and Washington National Park Profiles—Spending and Impacts of National Park Visitors

		Public Use Data		Visitor Spending 2010		Impacts of Non-Local Visitor Spending		
Park Unit	State	2010 Recreation Visits	2010 Overnight Stays	All Visitors (000s, $2011)	Non-Local Visitors (000s, $2011)	Jobs	Labor Income	Value Added (000s, $2011)
Crater Lake NP	OR	448,319	80,467	$34,111	$33,088	540	$13,393	$21,887
Fort Vancouver NHS	OR, WA	786,989	0	$39,146	$36,435	625	$19,724	$32,614
John Day Fossil Beds NM	OR	135,151	5	$6,119	$6,025	75	$1,674	$2,752
Klondike Gold Rush NHP—Seattle Unit	WA	65,870	0	$4,259	$3,964	59	$2,143	$3,568
Lake Chelan NRA	WA	39,249	10,200	$1,555	$1,426	20	$760	$1,272
Lake Roosevelt NRA	WA	1,324,074	159,938	$39,811	$35,121	515	$12,807	$20,755
Lewis and Clark NHP	OR, WA	218,553	0	$10,871	$10,118	154	$3,380	$5,515
Mount Rainier NP	WA	1,191,754	172,838	$35,389	$33,696	484	$14,150	$22,832
North Cascades NP	WA	24,659	17,801	$1,535	$1,474	21	$770	$1,289
Olympic NP	WA	2,844,563	300,891	$103,099	$94,596	1,395	$34,906	$57,102
Oregon Caves NM	OR	86,335	6,560	$4,113	$3,829	62	$1,559	$2,529
San Juan Island NHP	WA	263,370	0	$17,03	$15,851	209	$5,949	$9,819
Whitman Mission NHS	WA	58,521	0	$2,038	$1,897	29	$721	$1,176

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APPENDIX E:
NATURAL HAZARDS TECHNICAL REPORT

NOTE: This technical report was drafted in 2016 and reflects the state of knowledge on natural hazards impacting Pacific Northwest transportation systems at that time. Since then, new research – such as the U.S. Global Change Research Program's (USGCRP) Fourth National Climate Assessment1 and its chapter on the Northwest[2] - has been published. In many cases, this new research provides more current data and projections than provided below, but the main types of natural hazards and impacts to transportation infrastructure described below remain relevant.

[1] USGCRP, 2018: *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 1515 pp. doi: 10.7930/NCA4.2018.*

[2] May, C., C. Luce, J. Casola, M. Chang, J. Cuhaciyan, M. Dalton, S. Lowe, G. Morishima, P. Mote, A. Petersen, G. Roesch-McNally, and E. York, 2018: Northwest. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 1036–1100. doi: 10.7930/NCA4.2018. CH24.*

1. INTRODUCTION

Natural hazards, extreme weather, and changing climate conditions have the potential to affect natural and cultural resources, as well as transportation systems and other infrastructure in the Pacific Northwest. Therefore, understanding and preparing for potential natural hazards is an important part of the long-range transportation planning process, which will help Federal Land Management Agencies (FLMAs) anticipate and prepare for a number of management options. This technical report supports the *Pacific Northwest Federal Lands Long-Range Transportation Plan (LRTP).* Facilitated by the Federal Highway Administration (FHWA) Office of Federal Lands Highway (FLH), the plan will represent a collaborative regional LRTP for the Bureau of Land Management (BLM), National Park Service (NPS), U.S. Army Corps of Engineers (USACE), the U.S. Fish and Wildlife Service (FWS), and the U.S. Forest Service (USFS) for Federal lands in Oregon and Washington. In addition, this planning effort has received essential support from the Oregon Department of Transportation (ODOT), Washington State Department of Transportation (WSDOT), the Association of Oregon Counties (AOC), and the Washington County Road Administration Board (CRAB).

This technical report documents:

- An overview of the natural hazards most relevant to FLMAs in the Pacific Northwest and a discussion of scientific research on expected future trends, where applicable.
- A discussion of the impact of extreme weather and natural hazards on FLMA transportation systems.
- A description of efforts within the Pacific Northwest to reduce the risks posed by extreme weather and other natural hazards.

1.1 NATURAL HAZARDS AND THE *PACIFIC NORTHWEST FEDERAL LANDS LRTP*

The agencies participating in the *Pacific Northwest Federal Lands LRTP* chose not to create a stand-alone multi-agency goal for resilience, but instead to consider it as it relates to other multi-agency goals. This approach allows the agencies to integrate risk management into other goal areas. The relationship between natural hazards and the following goal areas is presented below and documented further in this technical report.

Goal: Protect Resources—Climate forecasts show that changes in temperature, precipitation, and associated environmental conditions will alter or threaten existing ecosystems. These changes will cause some species and ecosystems to migrate, while others may be threatened with extinction. Some threatened and endangered species will experience additional stresses and habitat loss, and other species may become threatened or endangered. In addition, climate change impacts and natural hazards, such as flooding and erosion, may threaten cultural resources. Future FLMA transportation systems will have to adapt to these changing ecosystems and resource impacts through planning and management.

Goal: Ensure Safety—Natural hazards, extreme weather, and changing climate conditions may impact safety on the FLMA transportation system by affecting the physical and safe operating conditions of particular transportation assets. Climate change-related extreme weather events also may affect the safety of the transportation system and have implications for FLMAs' operations, maintenance, emergency response, and communications.

Goal: Protect Assets—Natural hazards, extreme weather, and changing climate conditions—such as flooding, sea level rise, landslides, erosion, heat waves, and wildfires—will increase risks to and may degrade the condition of transportation assets. These impacts may damage transportation infrastructure, increase operations and maintenance costs, or decrease the useful life of existing transportation systems. FLMAs may need to protect assets by changing design standards, exploring adaptation options for existing transportation assets, or changing operations and maintenance practices.

2. OVERVIEW OF NATURAL HAZARDS IN THE PACIFIC NORTHWEST

2.1 THE PACIFIC NORTHWEST'S CHANGING CLIMATE

The U.S. Global Research Institute published *The Third National Climate Assessment in 2014, which includes a chapter analyzing historical climate trends, projections for future climate change in the 21*st century, and potential impacts on natural resources, infrastructure, and the economy for the Pacific Northwest region (Washington, Oregon, and Idaho).[3]

Although specific impacts likely will vary within the region, the report summarizes the following changes to temperature, precipitation, and sea levels:

- Increase in average annual temperature of 3.3°F to 9.7°F by 2070-2099 (relative to the period of 1970-1999), with the greatest increase in the summer
- Change in annual precipitation within a range of an 11-percent decrease to a 12-percent increase by 2030-2059 and a range of a 10-percent decrease to an 18-percent increase by 2070-2099
- Models consistently show a decrease in summer precipitation by as much as 30 percent by 2099
- A reduced percentage of precipitation in the form of snow and a projected shift in snowmelt timing three to four weeks earlier than the 20th century average
- Averaged over the region, a 13-percent projected increase in the number of days with more than one inch of precipitation in 2041-2070, compared with the 1971-2000 period

Although there is a range of predicted impacts, the assessment concludes that the Pacific Northwest will experience marked increases in temperature, seasonal variation shifts in amount and severity of precipitation, and a general trend toward sea level rise. These factors would lead to more extreme coastal storm events, resulting in increased infrastructure impacts due to storm surges. Further impacts would result from the potential shifts in coastal and inland water levels and flooding, as well as potential increases in landslide events due to increased precipitation, and forest fires due to increased heat. These are factors that FLMAs and their partners should incorporate into infrastructure planning.

2.1.1 Implications for Transportation Infrastructure

This section summarizes the projected changes to the Pacific Northwest's climate described in *The Third National Climate Assessment*. These changes have the potential to impact the FLMA transportation systems in the region in the following ways:

- Sea level rise and coastal storm damage for coastal infrastructure
- Increased flooding from heavy precipitation events
- Increased erosion and landslides
- Increased wildfire risk
- Impacts on natural resources and ecosystems

The sections below use the Washington DOT *Climate Change Impacts and Adaptation in Washington State: Technical Summaries for Decision Makers*[4] and the *Oregon DOT Climate Change Adaptation Strategy Report*[5] to summarize projected regional climate changes and how they specifically impact the Northwestern region.

[3] Mote, P., A. K. Snover, S. Capalbo, S. D. Eigenbrode, P. Glick, J. Littell, R. Raymondi, and S. Reeder, 2014: Ch. 21: Northwest. Climate Change Impacts in the United States: The Third National Climate Assessment, J. M. Melillo, Terese (T.C.) Richmond, and G. W. Yohe, Eds., U.S. Global Change Research Program, 487-513. doi:10.7930/J04Q7RWX.

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[5] Hormann, Liz. *ODOT Climate Change Adaptation Strategy Report. April 2012.* http://www.oregon.gov/ODOT/TD/CLIMATECHANGE/docs/odot_adaptation_strategy_final.pdf

2.1.1.1 Coastal Vulnerabilities

Global coastal sea levels have risen about 8 inches since 1880 and are projected to rise from 2 feet to 4 feet by 2100.[6] However, due to a geophysical force known as tectonic uplift, which is a regional increased rise of tectonic plates, much of the Northwest coastline is rising faster than global sea level rise averages. Based on a study done for the Latitude of Newport, Oregon, regional relative sea level rise of up to 4.5 feet could occur by 2100.[7] Other projected changes for the coastal waters include highly variable acidity changes, an increase in surface water temperature, and an increase in the rate of coastal inundation from coastal storms and higher storm surges. These impacts could damage or impede access to coastal roads, bridges, parking lots, standing infrastructure, and emergency evacuation routes through increased flooding and erosion.

2.1.1.2 Shifting Precipitation Events

In general, precipitation models for the Northwest region show inconsistent future projections resulting in potential annual precipitation decreases to potential annual precipitation increases from historic numbers. However, climate change models averaged over the region project extreme daily precipitation to increase between 0 and 20 percent. Some models show the number of days with more than one inch of precipitation to increase by 13 percent from 2041 to 2070.[8] This increase in heavy downpours could increase flood risk in mixed rain-snow and rain-dominant basins and it also could increase stormwater management challenges in urban areas. More flooding could occur from earlier and increased levels of snowmelt, which would increase late winter and early spring stream flow and decrease summer flow. Increased regional flooding could damage or destroy roads and bridges. On the other extreme, decreased precipitation would increase the risk of drought, which could cause pavement cracking and deterioration. Increased incidence of wildfires could damage infrastructure or lead to increased risks from erosion or landslides.

2.1.1.3 Erosion and Landslides

Increased coastal and inland erosion is a major concern for the Northwest region due to climate change. The region has already experienced sea level rise, increased storm frequency, and increased storm magnitude. Historically, Northwest sea levels have been rising by approximately 0.0906 inches per year, with most recent projections estimating a 2-foot to 4-foot (24 inches to 48 inches) increase by 2100, resulting in extreme increases of storm wave heights.[9] Though current wave height and wave height effects are not solely linked to climate change, continued increases due to sea level rise would create increased impacts to coastal areas from flooding and inundation. For example, the current projected long-term rate of coastal wetland loss is greatest for the Pacific Northwest than any other coast in the U.S. In general, increased rates of coastal erosion are expected, particularly for the more than 140,000 acres of coastal lands that lie within the 3.3 feet elevation of high tide.[10]

Changes in precipitation and regional hydrology could result in changes to geology, such as increased landslide events. For example, snowmelt is projected to shift to begin 3 weeks to 4 weeks earlier by 2050, which will increase the rate of winter stream flow and decrease the summer rates.[11] Warming temperatures and changes in extreme precipitation could result in increased inundation events within various drainage basins or watersheds. Specifically, increased temperatures are projected to increase flood risk in most mixed basins, and the increase of heavy downpours could increase flooding in mixed rain-snow and rain-dominant basins.[12] Changes in river flow and increased storm events will result in heavy flooding, which will likely increase the amount of groundwater. With an increased amount of groundwater, there is a greater risk of landslides, which already pose significant risks for much of the Northwest. Furthermore, coastal erosion impacts due to increased storm surges and sea level rise will likely undermine landslide prone areas, which will result in increased landslide frequency and intensity. Increased erosion and landslide events

6 Mote, P., A. K. Snover, S. Capalbo, S. D. Eigenbrode, P. Glick, J. Littell, R. Raymondi, and S. Reeder, 2014: Ch. 21: Northwest. *Climate Change Impacts in the United States: The Third National Climate Assessment, J. M. Melillo, Terese (T.C.) Richmond, and G. W. Yohe, Eds., U.S. Global Change Research Program, 487-513. doi:10.7930/J04Q7RWX.*

7 Ibid.

8 Ibid.

9 Hormann, Liz. *ODOT Climate Change Adaptation Strategy Report. April 2012.* http://www.oregon.gov/ODOT/TD/CLIMATECHANGE/docs/odot_adaptation_strategy_final.pdf

10 Mote, P., A. K. Snover, S. Capalbo, S. D. Eigenbrode, P. Glick, J. Littell, R. Raymondi, and S. Reeder, 2014: Ch. 21: Northwest. *Climate Change Impacts in the United States: The Third National Climate Assessment, J. M. Melillo, Terese (T.C.) Richmond, and G. W. Yohe, Eds., U.S. Global Change Research Program, 487-513. doi:10.7930/J04Q7RWX.*

11 Ibid.

12 Ibid.

have the potential to undermine existing transportation infrastructure, such as undercutting roads and bridges due to erosion, or dumping large amounts of soil and rock during a landslide, particularly in areas that are cut into slope faces.

2.1.1.4 Forest and Rangeland Wildfires

Wildfires are a natural part of most Northwestern ecosystems, although their numbers and extent have been increasing in the western U.S. since 1970 due to temperature increases and drier conditions. The Third National Climate Assessment expects wildfire risk to continue to increase due to the changing climate. Under a 2.2oF global temperature increase scenario, associated precipitation changes and regional temperature increases are projected to result in the quadrupling of the mean annual area and probability of forests burned in the Northwest relative to the 1916 to 2007 period. Though this will vary considerably throughout the region, the mean area burned would rise to more than 2 million acres. Averaged across the Northwest, climate change will increase the probability from 5 percent to nearly 50 percent that more than 2 million acres of forest will burn each year.[13] Increased risk of wildfires could lead to increased road closures in forested and rangeland areas, leading to a disruption in the transportation of goods, people, and services. Furthermore, widespread decrease in vegetation due to wildfires will increase the potential of flooding events and soil erosion, which could damage transportation infrastructure.

2.1.1.5 Impacts on Natural Resources

The projected climate changes will have severe impacts for natural resources. Higher temperatures and drought stress are contributing to the increased outbreaks of forest pests, such as the mountain pine beetle.[14] The suitable habitat for this invasive species is projected to increase by 2030.[15] This increased pest occurrence, coupled with other forest disturbances, such as increased fire rates, temperature increase, and drought, have severe impacts for native species and Northwest ecosystems. Wildfires could wipe out large forested areas that are home to several species, as well as fragment the species' feeding, migration, and breeding routes. Furthermore, climate changes could result in a large-scale shift of habitat in general. Under certain scenario projections, subalpine and alpine forests are projected to undergo almost a complete conversion to other types of vegetation by the 2080s.[16]

For aquatic habitats, region-wide summer temperature increases associated with decreased summer flows, coupled with increased river flooding and winter flows in some basins, will threaten many freshwater species, particularly salmon, steelhead, and trout.[17] Rising temperatures are projected to increase disease and/or mortality in several of these aquatic species. Suitable habitat for trout species of the interior western U.S. are projected to decline by 47 percent by 2080, based on average numbers from 1978 to 1997.[18] Coastal habitats are extremely susceptible to climate impacts as well, with more than 140,000 acres of coastal lands throughout Oregon and Washington lying within 3.3 feet in elevation of high tide. These areas will see increased inundation and salinity due to sea level rise, which would result in the decrease in quality of wetlands, tidal flats, and beaches for associated species. Coastal infrastructure and communities that lie within this area will be at great risk due to increased flooding and coastal storm surges. Finally, increased acidification and temperature of the surrounding coastal waters will have tremendous ecological impacts on the ranges, types, and abundance of marine species. These marine changes could result in an ecological shift that would be detrimental to an area where many humans use the coast for living, working, and recreation. These potential changes to ecosystems could affect the public visitation to Federal lands, particularly lands that are popular for fishing, boating, and other water-based recreation. This shift in visitation levels would impact the transportation to these areas, with potential decreases in visitation or a different dispersal pattern of visitors.

[13] Ibid.

[14] Hormann, Liz. *ODOT Climate Change Adaptation Strategy Report. April 2012.* http://www.oregon.gov/ODOT/TD/CLIMATECHANGE/docs/odot_adaptation_strategy_final.pdf

[15] Mote, P., A. K. Snover, S. Capalbo, S. D. Eigenbrode, P. Glick, J. Littell, R. Raymondi, and S. Reeder, 2014: Ch. 21: Northwest. *Climate Change Impacts in the United States: The Third National Climate Assessment, J. M. Melillo, Terese (T.C.) Richmond, and G. W. Yohe, Eds., U.S. Global Change Research Program, 487-513. doi:10.7930/J04Q7RWX.*

[16] Ibid.

[17] Ibid

[18] Ibid

2.2 NATURAL HAZARDS IN THE PACIFIC NORTHWEST

In addition to the risks associated with changing climate conditions and extreme weather, the Pacific Northwest faces risks from natural hazards, such as volcanic eruptions, earthquakes, and tsunamis. Table A-1 provides a summary of these hazards and resources for more information.

Table A-1: Summary of Natural Hazards in the Pacific Northwest

Hazard	Most Prevalent Geographic Location	Resources for More Information	Implications for Federal Lands Transportation
Volcanic Hazards	Cascades Mountain Range	USGS Volcano Hazards Program—Cascades Volcano Observatory (CVO)	Roads in the Cascades Range could be damaged by volcanic eruptions. They also serve an important role as potential evacuation routes.
Earthquakes	Coastal Oregon and Washington	Pacific Northwest Seismic Network USGS Earthquake Information Washington Oregon	Earthquakes can damage transportation infrastructure.
Tsunamis	Coastal Oregon and Washington	National Tsunami Hazard Mitigation Program Oregon Tsunami Clearinghouse Washington Tsunami Hazards	Tsunamis pose a risk for transportation infrastructure within inundation zones on the Pacific Coast. Roads designated as tsunami evacuation routes also serve an important role in tsunami response.
Wildfires	Northern Washington & central and southern Oregon	Active Fire Information—Incident Information System USFS Wildfire Hazard Potential Mapping Oregon Fire Precaution Levels Washington Department of Natural Resources Fire Precaution Levels	Wildfires can damage road, bridge, and trail infrastructure. Roads also play an important role in evacuation, fire response, and post-fire recovery activities.
Floods	Low-lying areas near water bodies and the Pacific coast	Federal Emergency Management Agency Flood Hazard Mapping FHWA Emergency Relief Program and Emergency Relief for Federally Owned Roads Programs	Floods can damage roads, trails, and bridges. Flood events also pose danger to Federal lands transportation users.
Landslides	Unstable slopes, particularly in steep valleys with heavy precipitation	USGS Landslide Hazards Program	Landslides can damage transportation infrastructure and can pose danger to Federal lands transportation users.

2.3 IMPLICATIONS FOR FLMA TRANSPORTATION SYSTEMS

Natural hazards not only affect the natural environment, but also cause impacts and damages to specific FLMA transportation systems. The high-level summaries below profile areas identified as vulnerable in *The Third National Climate Assessment, the WSDOT Climate Change Impacts and Adaptation in Washington State: Technical Summaries for Decision Makers, and the ODOT Climate Change Adaptation Strategy Report.*

2.3.1 Asset Management

Impacts to transportation assets and asset management were a common theme throughout the WSDOT *Climate Change Impacts and Adaptation in Washington State: Technical Summaries for Decision Makers and the ODOT Climate Change Adaptation Strategy Report. The sections below summarize the main points.*

2.3.1.1 Risks to Transportation Infrastructure

The coastal infrastructure in the Pacific Northwest is particularly at risk with the projected climate changes. Specifically, on Federal lands, high-use areas such as coastal parks, public-use beaches, parking lots, and other built infrastructure could see increased damages from rising sea levels and increased storm surges. Coastal roadways could experience more frequent flooding due to sea level rise and increased storm events, as well as increased damage due to landslides. For example, ODOT identified U.S. Highway 101 as a roadway that currently is experiencing increased risk and damages due to climate change. Roadway and rail deterioration can occur from increased temperatures, which could dry out and crack pavement and warp the rail lines. Increased precipitation events can lead to increased flooding, road undercutting and erosion, and increased landslide events, which could damage or block off transport routes.[19] There is also the potential to completely lose certain infrastructure to sea level rise if it currently exists in an area that may become inundated or wiped out from an intense storm.

2.3.1.2 Maintenance and Operations Impacts

FLMAs and transportation agencies should anticipate greater maintenance and operation costs due to increased infrastructure damage from potential climate impacts. Specifically, areas such as coastal parking lots, roads, bridges, and trails would need to be maintained more frequently due to sea level rise and associated storm surge increases. Any infrastructure on or near severe slopes may need to be bolstered for landslides or rerouted around hazardous areas. In areas that have traditionally drier climates, heavier precipitation occurrences could lead to greater erosion levels, which could increase maintenance on all infrastructure, specifically roads where washouts and cracking may occur. Increased flooding and erosion events will lead to increased soil and waste deposition, which will necessitate more regular cleaning for roadways, culverts, and other draining systems. Culverts and other drainage systems also may be undersized if the magnitude of extreme storms increases. Silviculture and vegetation maintenance techniques likely will see a shift in the future, resulting in new prescribed burning or wildfire prevention plans, with an increased need for emergency response due to wildfires.

ODOT identified the need to inventory all coastal transportation assets and to review the frequency of repair for future maintenance projections and tracking. ODOT also recognized the need to inventory critical freight and lifeline routes, determine how these routes could be impacted, and identify detours and prioritization of infrastructure along the routes.[20] Overall, an increase in infrastructure impacts and maintenance tracking would be appropriate to see how climate impacts are increasing damages over time.

2.3.1.3 Implications for Future Infrastructure Projects

Although it is difficult to predict the exact impacts that will occur due to climate change, FLMAs and transportation agencies can take steps to help ensure future infrastructure projects are as climate resilient as possible. In its *Climate Change Adaptation Strategy Report, ODOT notes that one of the next steps for climate adaptation is to conduct a vulnerability and risk assessment for the State to identify future infrastructure vulnerabilities and the risk that they will be impacted by climate changes. In creating this assessment,*

[19] Hormann, Liz. *ODOT Climate Change Adaptation Strategy Report. April 2012.* http://www.oregon.gov/ODOT/TD/CLIMATECHANGE/docs/odot_adaptation_strategy_final.pdf

[20] Ibid

ODOT plans to use the FHWA Vulnerability Assessment and Adaptation Framework as a guide. ODOT identified the following steps that could be part of the proposed vulnerability and risk assessment:

- Map out high-impact areas that have shown increased coastal flooding or inland flooding, which will need to be maintained or altered in the future.
- Assess the types of pavement and rail lines being used and how they perform under higher temperatures.
- Inventory wetland areas for mitigation potential, and current wildlife corridors and migration patterns.
- Assess areas of high wildfire risk and inventory transportation infrastructure—specifically, high-impact areas for freight and emergency routes.
- Inventory infrastructure potentially vulnerable to increased coastal storm events.
- Identify and inventory the capacity of culverts and stormwater systems, as well as infrastructure that often floods.
- Identify infrastructure near high-slope areas or areas already prone to landslides.[21]

Identifying and inventorying these risks and impacts can help States better prepare for and plan future building projects. Identifying road, rail, and bridge infrastructure that is near high flooding and landslide risk areas, as well as general regions which are most likely going to expect increased temperatures, could help their owners and managers institute better planning and preventative measures. As an example of planning, future pavement technology to increase resistance to temperature and decrease degradation that leads to cracking and potholing would be beneficial.[22]

2.3.2 Safety

Safety was another important transportation aspect identified throughout the WSDOT *Climate Change Impacts and Adaptation in Washington State: Technical Summaries for Decision Makers and the ODOT Climate Change Adaptation Strategy Report.* Emergency response and visitor education strategies could greatly enhance the overall safety of FLMA-managed lands.

2.3.2.1 Emergency Response and Evacuation Routes

All the potential impacts listed above could result in increased emergency response needs for FLMA lands. Impacts such as increased flooding, wildfires, and landslides likely will result in more frequent closures of area resources. Such events are likely to threaten human safety, which would be amplified if areas are less accessible to emergency responders. Land and infrastructure owners will need to develop plans for various natural hazards scenarios that will allow for critical amenities and infrastructure—including evacuation routes—to remain available during climate events, as well as plans on how to respond when emergency events threaten visitor and staff safety.

2.3.2.2 Visitor Education

Visitor education can incorporate education about natural hazards and climate conditions to allow for greater awareness and preparation of park visitors. FLMAs can incorporate information through visitor displays and kiosks, guided tours, web and social media outlets, and/or fliers and brochures. This information can highlight impacts of climate shifts and describe the reasons why the FLMA chose to make certain infrastructure decisions, such as road location or infrastructure material.

FLMAs also should make visitors aware of emergency procedures. FLMAs and DOTs can post signage and maps to communicate alternate and safe access routes in the event of emergency events. They also can use other types of warning systems, such as alarms or announcements, to help keep visitors safe and informed during events and avoid damages to threatened infrastructure. FLMAs also can work with real-time travel information providers to disseminate information about road closures and safety advisories.

[21] Hormann, Liz. ODOT Climate Change Adaptation Strategy Report. April 2012. http://www.oregon.gov/ODOT/TD/CLIMATECHANGE/docs/odot_adaptation_strategy_final.pdf
[22] Ibid

3. NATURAL HAZARDS RISK REDUCTION EFFORTS IN THE PACIFIC NORTHWEST

Adaptation is the adjustment of natural or human systems to a new or changing environment by capitalizing on opportunities and/or moderating negative effects.[23] Adaptation is a course of action that adjusts to predicted change. Federal departments and agencies are responding to natural hazards risks through numerous adaptation initiatives; these efforts are discussed in this chapter.

This section is not meant to be a comprehensive list of adaptation and resilience efforts, but to highlight some efforts and resources that are particularly relevant to increasing transportation infrastructure resilience in the Pacific Northwest.

3.1 FEDERAL EFFORTS TO REDUCE NATURAL HAZARDS RISK

The United States Global Change Research Program (USGCRP) is a Federal program that was established to integrate U.S. global change research to "… assist the Nation and the world to understand, assess, predict, and respond to human-induced and natural processes of global change." The USGCRP is supported by 13 different Federal agencies and conducts scientific research involving the Earth's interactive processes, including the atmosphere, oceans, land, ice, ecosystems, and people. USGCRP acts as a research body to create strong scientific foundations for other agencies, formally conducts U.S. climate assessments, and helps coordinate with international bodies and people. As the leading Federal authority on global change science, the USGCRP works to engage and educate the public and make its research and data accessible to all.

3.1.1 U.S. Department of Transportation

3.1.1.1 Federal Highway Administration

The Federal Highway Administration (FHWA) website for resilience is a site integrated with resources focused on ongoing transportation initiatives to increase transportation resilience. One major resource for climate adaptation is the Vulnerability Assessment and Adaptation Framework,[24] which is a "… manual to help transportation agencies and their partners assess the vulnerability of transportation infrastructure and systems to extreme weather and climate effects. It also can help agencies integrate climate adaptation considerations into transportation decision making." The framework is a detailed document that presents three major steps. Step 1 is to define the proposed study objectives and scope, which creates boundaries for the analysis and can limit extraneous data collection efforts, all while considering the agency's overall goals and objectives. Step 2 is a vulnerability assessment, which involves characterizing relevant transportation assets and identifying the appropriate climate variables for the study. Finally, Step 3 discusses how to incorporate the results of the vulnerability assessment into the agency's decision-making process to ensure that these results are used in practice.

Other important adaptation objectives available on the climate change website include links to the Resilience Pilot Studies,[25] which are pilot programs for State DOTs, metropolitan planning organizations (MPOs), and FLMAs "… to develop and deploy resilience solutions to current and future extreme weather events, reducing future maintenance costs over the full life-cycle of transportation assets." These pilots have successfully been conducted all over the country, identifying risks and vulnerabilities to transportation infrastructure, and identifying potential implementation activities to help deal with these impacts. The FHWA also has links to several risk management publications and tools,[26] which offer a wide variety of resources created by USDOT to help agencies to assess, manage, and implement natural hazards resilience strategies.

[23] National Research Council. *America's Climate Choices: Adapting to the Impacts of Climate Change. Washington, DC: National Academies Press; 2010.*
[24] FHWA. Climate Change and Extreme Weather Vulnerability Assessment Framework. 2014. http://www.fhwa.dot.gov/environment/climate_change/adaptation/publications_and_tools/vulnerability_assessment_framework/page00.cfm
[25] FHWA website. 2013-2014 Climate Resilience Pilot Studies. 2014. http://www.fhwa.dot.gov/environment/climate_change/adaptation/ongoing_and_current_research/vulnerability_assessment_pilots/2013-2014_pilots/index.cfm
[26] FHWA website. Resources and Publications. Updated 2015. http://www.fhwa.dot.gov/environment/climate_change/adaptation/publications_and_tools/

In 2009, Forest Service Research and Development released its 2009–2019 Global Change Research Strategy,[27] with an associated Implementation Plan.[28] The fundamental research focus of the strategy is to increase understanding *of forest, woodland, and grassland ecosystems so that they can be managed in ways that sustain and provide ecosystem services for future generations. The document focuses on four elements:*

(1) Research to enhance ecosystem sustainability (adaptation)

(2) Research to increase carbon sequestration (mitigation)

(3) Research to provide decision support

(4) Shared research needs for infrastructure, scientific collaboration, and science delivery

Other USFS climate efforts include a monthly newsletter that updates the agency on climate-related news,[29] as well as hosting a workshop that opened a dialogue between scientists and managers about the development of climate adaptation tools and strategies, in an effort to help land management agencies take steps to incorporate climate change into management and take advantage of opportunities to balance the negative effects of climate change.[30] The USFS also created the Future of America's Forest and Rangelands: Forest Service 2010 Resources Planning Act Assessment,[31] which summarizes findings about the status, trends, and projected future of forests, rangelands, wildlife and fish, biodiversity, water, outdoor recreation, wilderness, and urban forests, as well as the effects of climate change upon these resources. The four key findings of the assessment were that "(1) land development will continue to threaten the integrity of natural ecosystems, (2) climate change will alter natural ecosystems and affect their ability to provide goods and services, (3) competition for goods and services from natural ecosystems will increase, and (4) geographic variation in resource responses to drivers of change will require regional and local strategies to address resource management issues."

3.1.2 Washington and Oregon State Efforts

3.1.2.1 Washington State Department of Transportation

In 2010, the Washington State Department of Transportation (WSDOT) released its Washington Transportation Plan 2030,[32] which is a "… comprehensive and balanced statewide transportation policy plan that reflects the multi-faceted needs of the State's transportation system." The topics of reducing energy consumption and addressing climate change are highlighted as desired outcomes as part of the plan. Also in 2010, WSDOT was chosen by FHWA to be part of a pilot program to test its climate change vulnerability assessment model. As part of this program, WSDOT used FHWA's vulnerability assessment framework to collect and integrate climate and transportation asset data in a way that would identify critical vulnerabilities. This pilot program helped FHWA to revise their draft framework to what they currently use nationwide. In response to this pilot study, WSDOT created a 2011 report, *Climate Impacts Vulnerability Assessment,* [33] that provided feedback and lessons learned on the FHWA model, while also creating a qualitative assessment of climate vulnerability on its assets in each region and mode across Washington. This qualitative assessment of asset vulnerability was achieved through climate and asset data collection, through appropriate risk management methodologies for climate change, and through expert workshops.

[27] USDA Forest Service. Forest Service Global Change Research Strategy 2009–2019. February 2009. https://www.wilderness.net/toolboxes/documents/climate/FS-Global%20Change%20Research%20Strategy.pdf

[28] USDA Forest Service. Forest Service Global Change Research Strategy, 2009–2019 Implementation Plan. May 2010. Forest Service Research and Development FS-948. http://www.fs.fed.us/research/publications/climate/GlobalChangeStrategy_7.7.pdf

[29] USFWS monthly newsletter. *Engaging a Climate Ready Agency. From Dave Cleaves, Forest Service Climate Change Advisor.* http://www.fs.fed.us/climatechange/updates/June%202014%20Climate%20Update.pdf

[30] USDA Forest Service. Workshop Approach for Developing Climate Change Adaptation Strategies and Actions for Natural Resource Management Agencies in the United States. Copyright © 2011 by the Society of American Foresters. http://www.fs.fed.us/psw/publications/millar/psw_2011_millar001(halofsky).pdf

[31] USDA Forest Service. Future of America's Forest and Rangelands: Forest Service 2010 Resources Planning Act Assessment. United States Department of Agriculture Forest Service Gen. Tech. Rep. WO-87 August 2012. http://www.fs.fed.us/research/publications/gtr/gtr_wo87.pdf

[32] Washington State Transportation Comission. 2010. Washington Transportation Plan 2030. http://wstc.wa.gov/WTP/documents/WTP2030_Final_1210.pdf

[33] Maurer, Mark, Carol Lee Roalkvam, Sandra L. Salisbury. Washington State Department of Transportation. Climate Impacts Vulnerability Assessment. Prepared by the Washington State Department of Transportation for submittal to the Federal Highway Administration. 2011. http://www.wsdot.wa.gov/NR/rdonlyres/B290651B-24FD-40EC-BEC3-EE5097ED0618/0/WSDOTClimateImpactsVulnerabilityAssessmentforFHWAFinal.pdf

In 2013, the Climate Impacts Group at the University of Washington published the document *Climate Change Impacts and Adaptation in Washington State: Technical Summaries for Decision Makers* that outlined the potential climate change impacts and adaptation in Washington State.[34] This report summarizes the existing knowledge about the potential effects of climate change on various aspects of Washington State and the Pacific Northwest, with a particular focus on research since 2007. The study discusses impacts to Washington infrastructure and provides examples where Washington infrastructure is climate resilient or local organizations are preparing for climate change, and also identifies areas that require more detailed studies to determine the potential cost and full implications of impacts toward transportation assets.

In response to its Transportation Plan, WSDOT has undertaken various initiatives to reduce energy consumption and greenhouse gas emissions. In 2011, they released a strategy for reducing greenhouse gas emissions[35] in response to the State Agency Climate Leadership Act, "… which committed State agencies to lead by example in reducing their GHG emissions." This strategy outlines how WSDOT considers and incorporates sustainable practices into its everyday operations, outlining four primary greenhouse gas reduction strategies: (1) improving fuel by lowering carbon content; (2) advancing vehicle and vessel technology to run on non-petroleum products and that are more efficient; (3) maximizing system efficiency and traffic flow; and (4) supporting more efficient transportation options such as carpooling, taking transit, and biking. In 2013, WSDOT released a guidance document[36] that specifically discusses how to address greenhouse gas emissions and climate change in its environmental documents. This guidance was drafted to be "… consistent with draft guidance from the White House Council on Environmental Quality (CEQ) for analyzing project-level GHG emissions and considering future climate change impacts."

3.1.2.2 Oregon Department of Transportation

In 2012, the Oregon Department of Transportation (ODOT) released its Climate Change Adaptation Strategy Report[37] to address potential climate impacts to Oregon's transportation infrastructure and programs. The purpose of the strategy is split into three sections, to:

(1) "provide a preliminary assessment of the climate change impacts to ODOT's assets and systems operations;

(2) underline the need for a vulnerability and risk assessment; and

(3) identify current areas of adaptive capacity and potential long- and short-term actions to be taken by ODOT."

ODOT also participated in the first round of the FHWA Climate Resilience Pilot Studies.[38] The project scope was to develop a corridor-level Coastal Hazards Adaptation Implementation Plan for Highway 101 in the northwest area of the State, which had been identified as vulnerable to climate change predictions. The goal of this plan is to create effective adaptation measures to reduce risk and improve the resilience of transportation assets vulnerable to climate change and extreme weather.

ODOT also has created ways to reduce its GHG emissions for climate mitigation through plans for sustainable transportation. To this end, ODOT created the *Sustainable Transportation System and Climate Change fact sheet*, which identifies current areas in the transportation system that significantly contribute to the release of GHG emissions and what ODOT is doing to make those systems more sustainable. Listed transportation areas currently becoming more sustainable include land use and planning, multi-modal systems, freight, pilot projects, and highway construction.

[34] Snover, A.K, G.S. Mauger, L.C. Whitely Binder, M. Krosby, and I. Tohver. 2013. Climate Change Impacts and Adaptation in Washington State: Technical Summaries for Decision Makers. State of Knowledge Report prepared for the Washington State Department of Ecology. Climate Impacts Group, University of Washington, Seattle. http://cses.washington.edu/db/pdf/snoveretalsok816.pdf

[35] Washington State Department of Transportation. Strategy for Reducing Greenhouse Gas Emissions, June 30, 2011. http://www.wsdot.wa.gov/NR/rdonlyres/1CE39C68-9FBB-4A47-B888-FE7F0F13E0B0/0/wsdot_ghg_strategy_Final.pdf

[36] Washington State Department of Transportation. WSDOT Guidance - Project-Level Greenhouse Gas Evaluations under NEPA and SEPA. December 2014. http://www.wsdot.wa.gov/NR/rdonlyres/8F4C392F-1647-45A7-A2CD-37FB79D45D62/0/ProjectGHGguidance.pdf

[37] Hormann, Liz. ODOT Climate Change Adaptation Strategy Report. April 2012. http://www.oregon.gov/ODOT/TD/CLIMATECHANGE/docs/odot_adaptation_strategy_final.pdf

[38] FHWA. Climate Change Resilience Pilots. November 2014. http://www.fhwa.dot.gov/environment/climate_change/adaptation/ongoing_and_current_research/vulnerability_assessment_pilots/

APPENDIX F:
PROJECT TEAM

PROJECT DELIVERY TEAM

The project delivery team played the primary role in compiling data, facilitating project meetings, and drafting plan content. The core team members over the course of this project are listed below.

Agency	Position	Name
Federal Highway Administration (FHWA), Western Federal Lands Highway Division Office (WFLHD)	Planning Team Leader	Roxanne Bash
FHWA WFLHD	Technology Deployment Engineer	Amit Armstrong
FHWA, Central Federal Lands Highway Division Office (CFLHD)	Planning Team Leader	Elijah Henley
FHWA, Eastern Federal Lands Highway Division Office (EFLHD)	Planning Team Leader	Lewis Grimm
U.S. Department of Transportation, Volpe National Transportation Systems Center (USDOT Volpe)	Community Planner	Erica Simmons
USDOT Volpe	Community Planner	Michael Kay
USDOT Volpe	Community Planner	Haley Peckett
Atkins Global	Transportation Planning Project Manager	Steve Hoover
Atkins Global	GIS Director	Ty Summerville
Atkins Global	Graphic Designer	Tina Brand

CORE TEAM

The core team consisted of agency staff from FLMAs, USDOT, and State and local partner agencies. The core team met regularly to provide plan direction, provided data and content inputs, reviewed LRTP content, and coordinated internal review within their agencies. Core team staff also conducted outreach for the LRTP. The table below lists the agencies and the positions of participating staff members.

Agency	Posistion(s)
FHWA WFLHD	Planning and Program Branch Chief Director of Programming Planning and Programming Specialist Tribal Transportation Program Lead Transportation Specialist Community Planner
FWHA CFLHD	Community Planner
FHWA EFLHD	Road Inventory Program Project Coordinator Asset Manager GIS Specialist
FHWA Office of Federal Lands Highway (Headquarters)	Transportation Planning Team Leader
Bureau of Land Management (BLM) Oregon and Washington State Office	Facility Maintenance Program Civil Engineer Travel and Transportation Management Planner Outdoor Recreation Planner GIS Specialist
BLM Washington Office (National Headquarters)	Transportation Program Manager Trails and Travel Management Coordinator
U.S. Forest Service (USFS)—Pacific Northwest Regional Office	Transportation Planning Group Leader Civil Engineer Regional Pavement / Geotechnical Engineer Regional Landscape Architect Outdoor Recreation Planner Trails, Travel Management, Dispersed Recreation, and Shooting Sports
USFS Washington Office (National Headquarters)	Transportation Systems Development Program Manager
U.S. Army Corps of Engineers	Outdoor Recreation Planner (National headquarters) Outdoor Recreation Planner (Portland District Office)
National Park Service	Long Range Transportation Planning Program Manager Pacific West Regional Transportation Program Coordinator
U.S. Fish and Wildlife Service	Regional Transportation Branch Chief Regional Transportation Coordinator
Oregon Department of Transportation	Region Manager Planning Section Manager Active Transportation Section Programs Manager Transportation Data Section Manager Environmental GIS Program Manager
Washington Department of Transportation	Statewide Planning Unit Manager Policy Planning Manager Environmental Manager, Highways and Local Programs Transportation Planning Specialist
Association of Oregon Counties	County Road Program Manager
Washington County Road Administration Board	Grant Program Manager

APPENDIX G:
MAPS

TABLE OF FIGURES

Figure A-1: FLMA-Managed Road Density

Density grid cells represent 6 square miles.

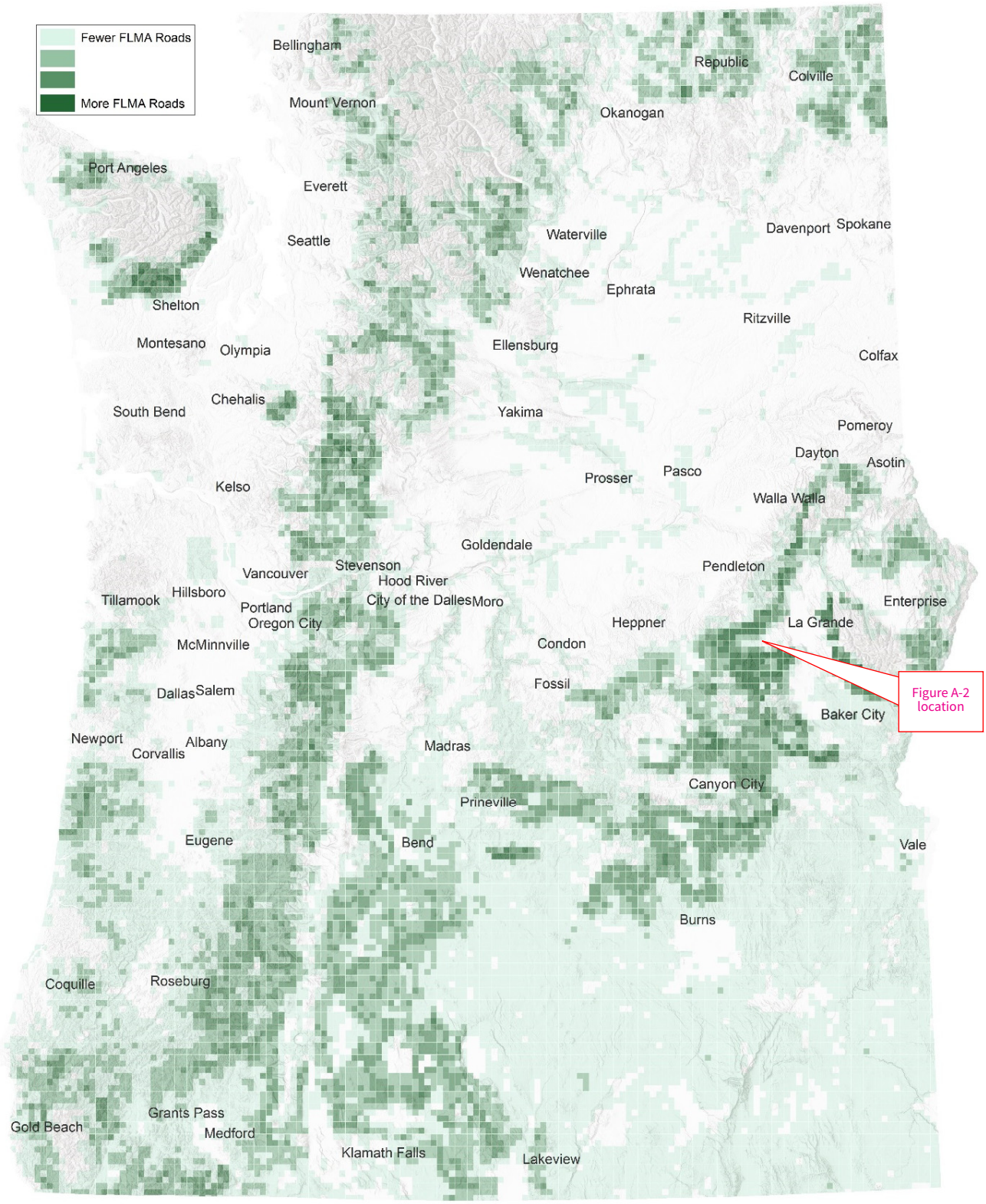
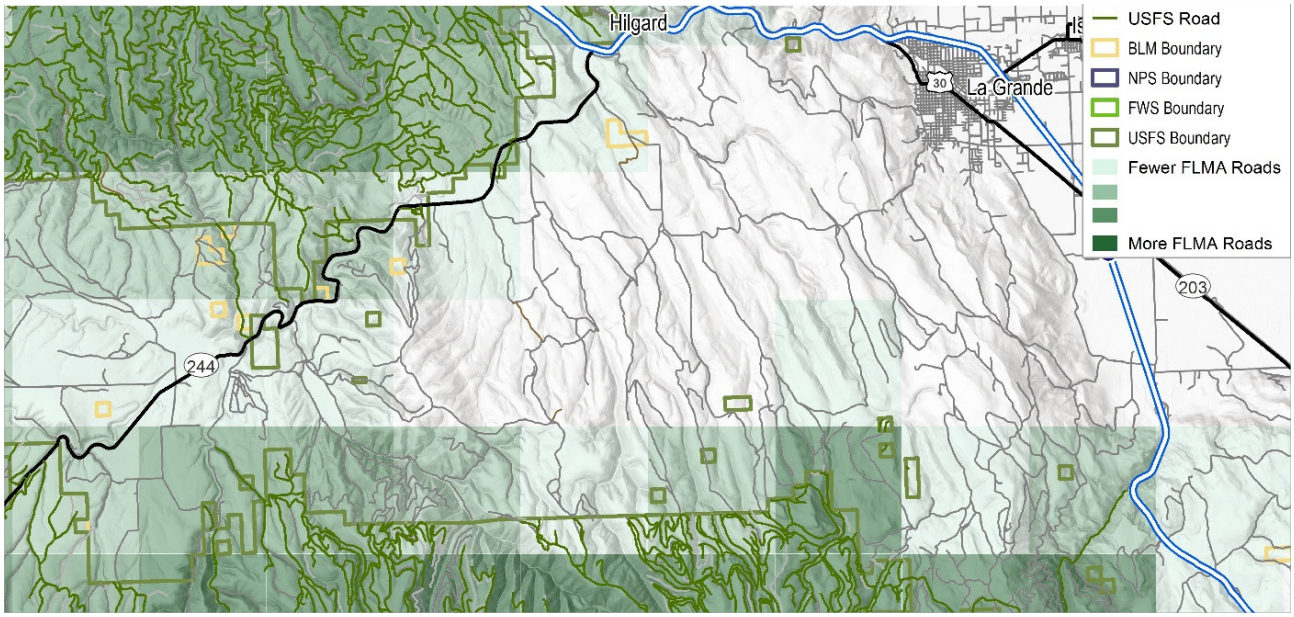


Figure A-2: FLMA Road Density Example: Northeast Oregon

Density grid cells represent 6 square miles.



Density grid cells represent 6 square miles. Pacific Northwest scale maps available in

Figure A-3: Non-FLMA-Managed Road Density

Density grid cells represent 6 square miles.

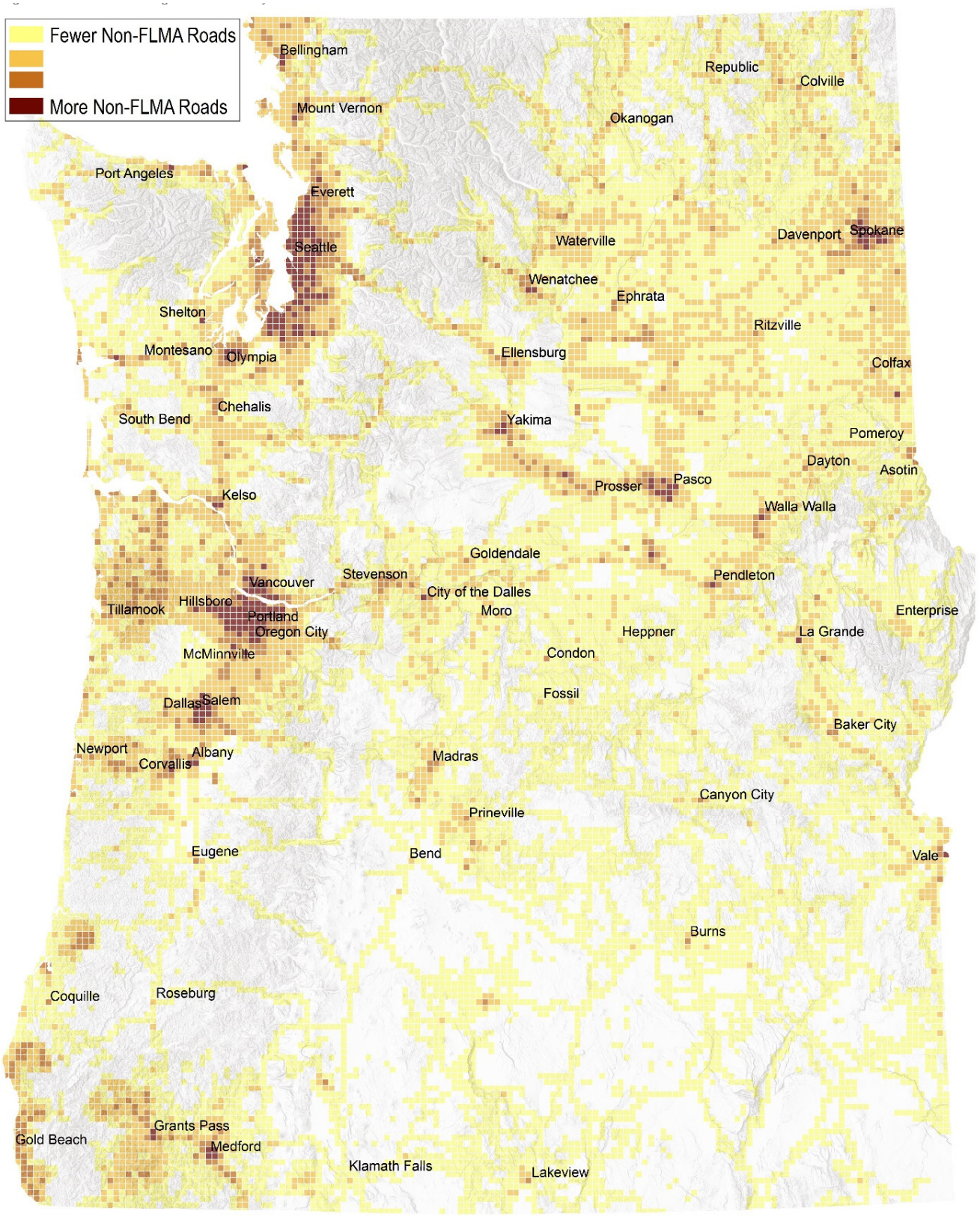


Figure A-4: Road Access Point Density

Density grid cells represent 6 square miles.

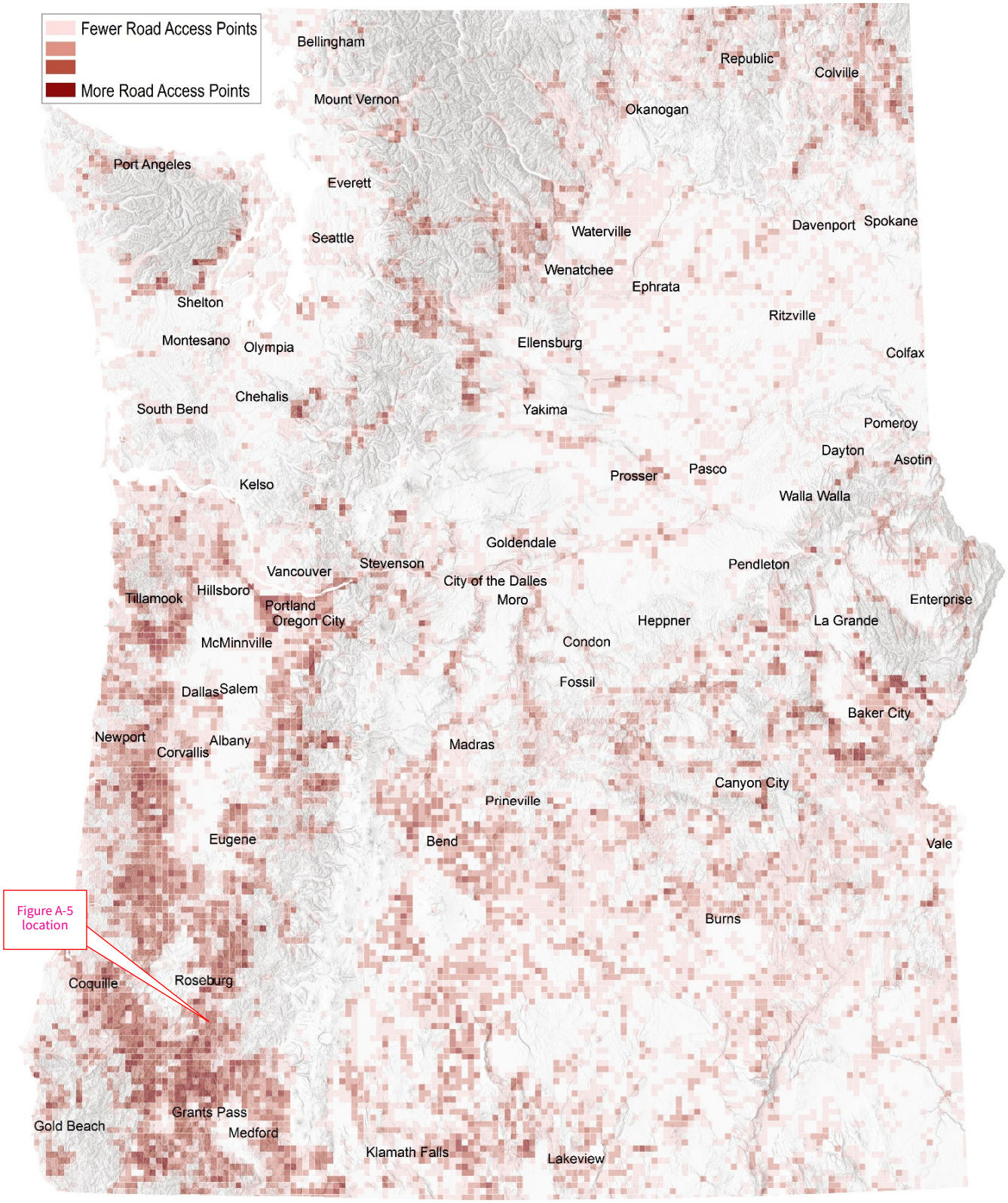


Figure A-5: Road Access Point Example: Southwest Oregon

Density grid cells represent 6 square miles.

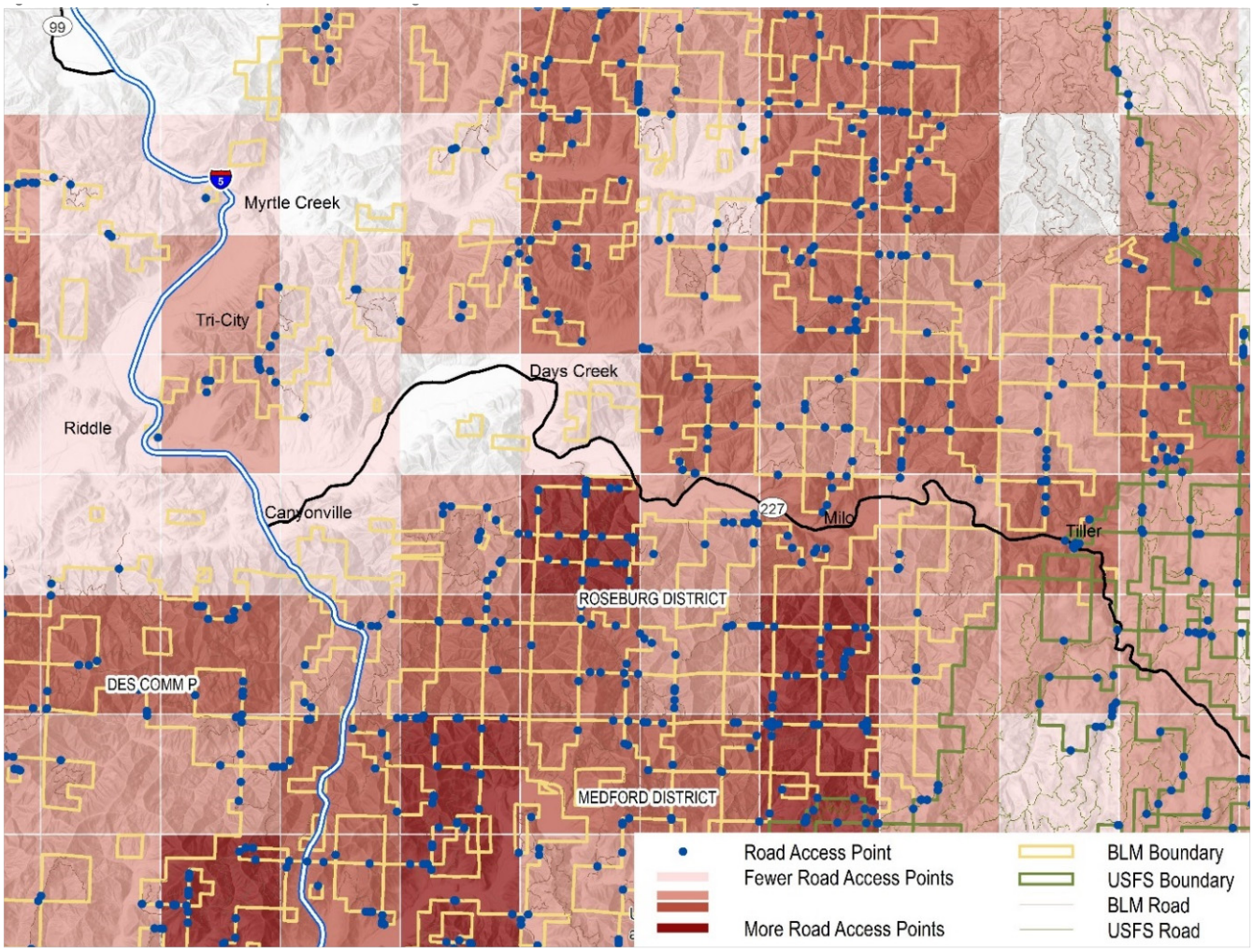


Figure A-6: Trail Access Point Density

Density grid cells represent 6 square miles.

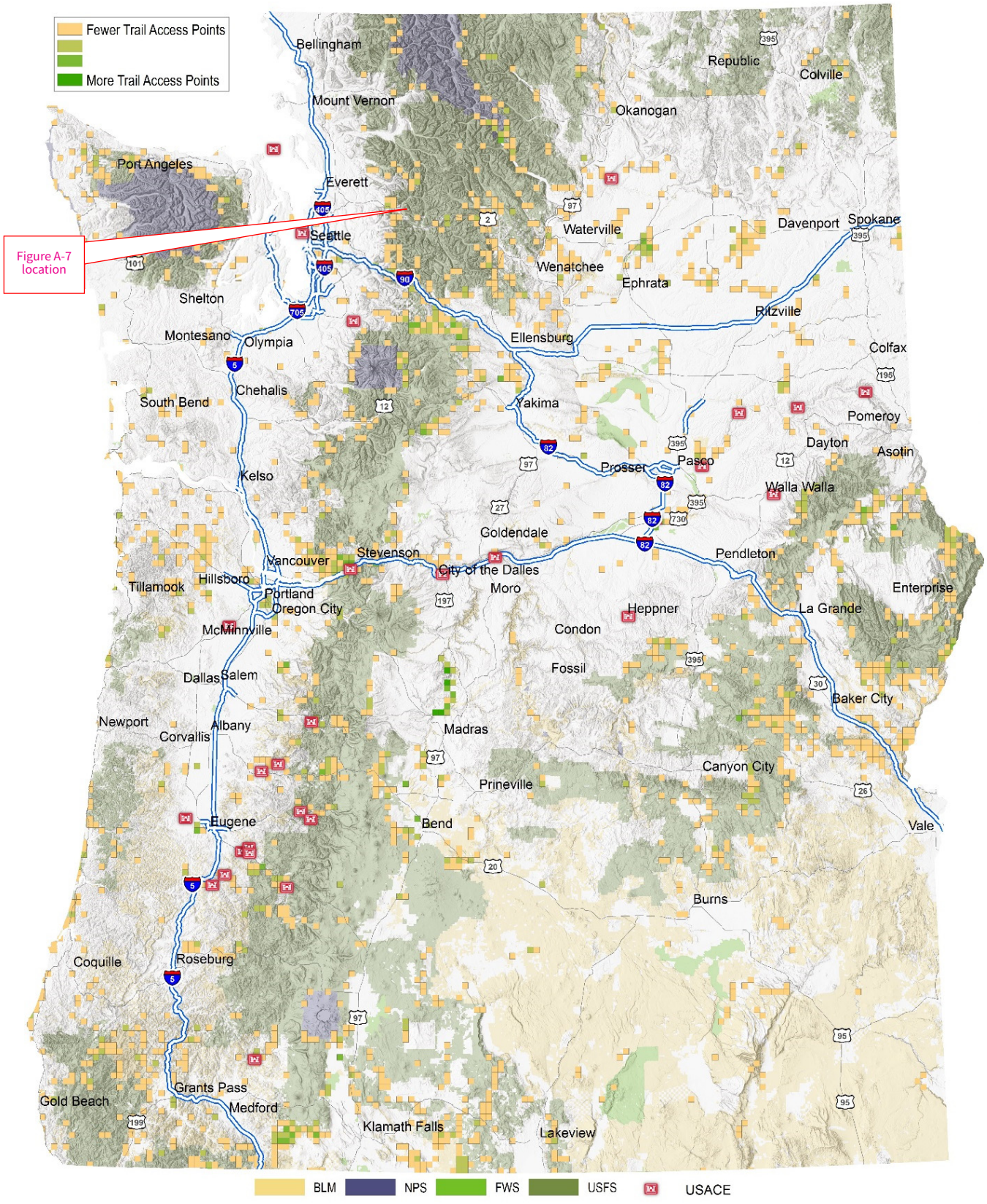


Figure A-7: Trail Access Point Example: Central Washington

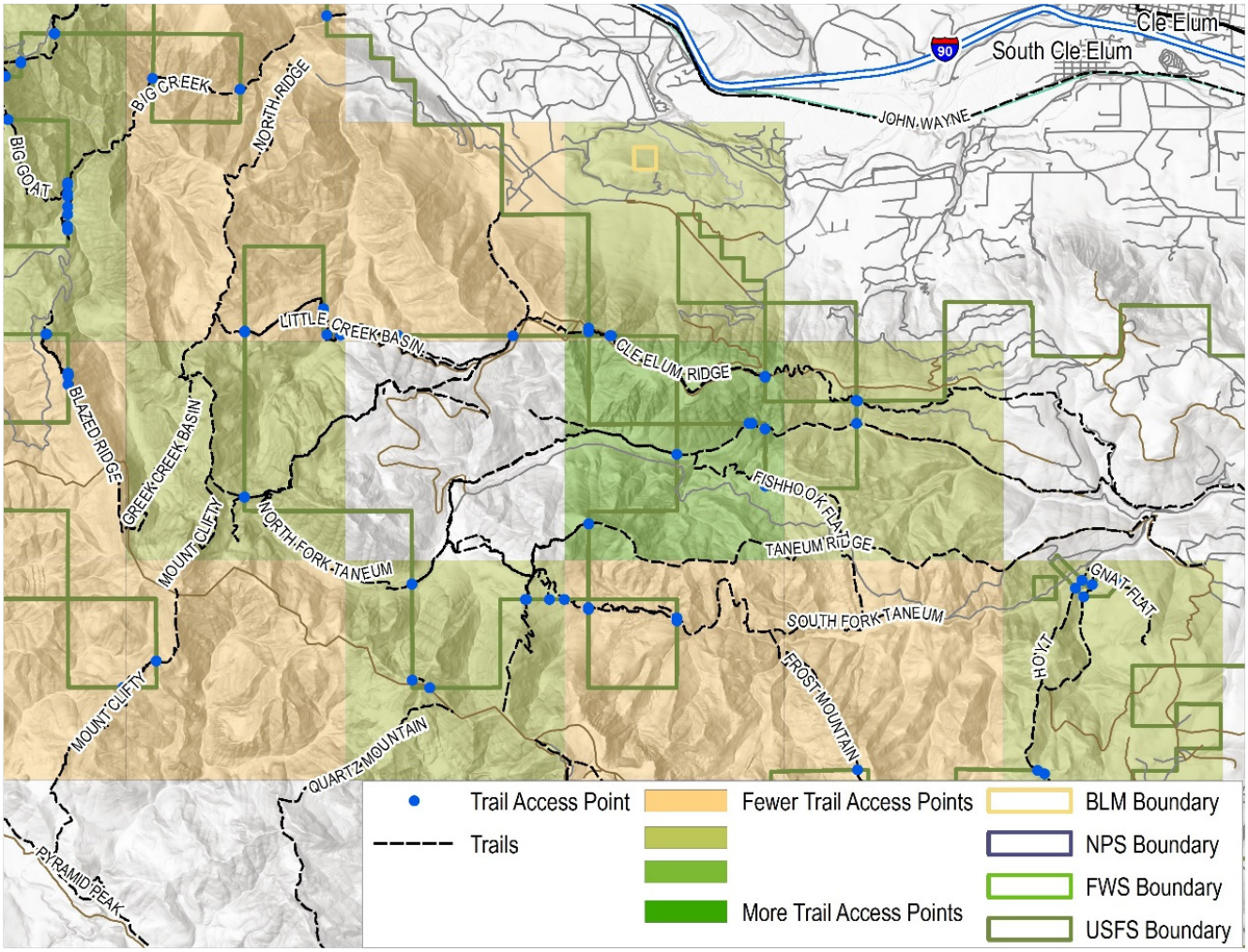


Figure A-8: Trail Density

Density grid cells represent 6 square miles.

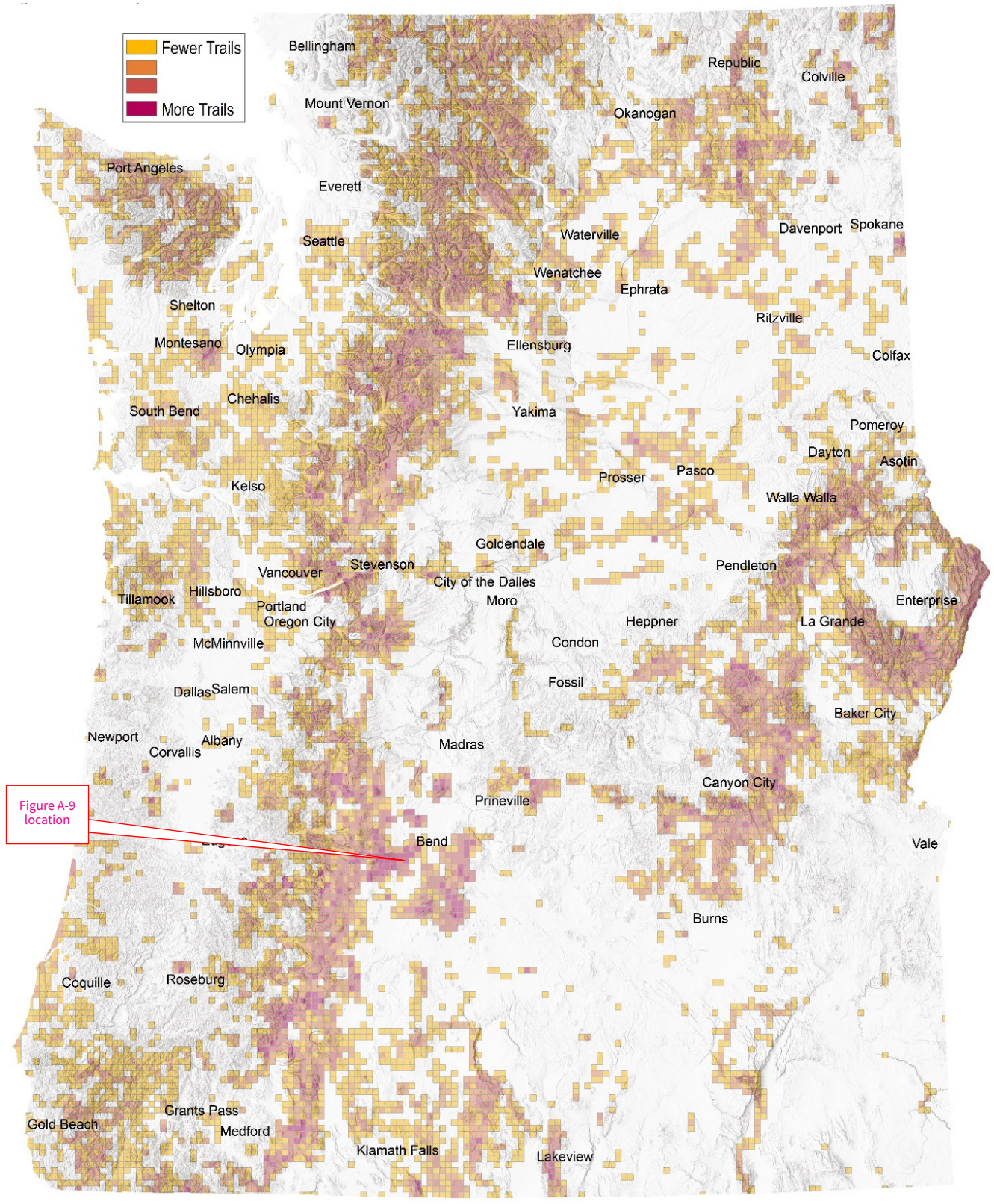


Figure A-9: Trail Density Example: Central Oregon

Density grid cells represent 6 square miles.

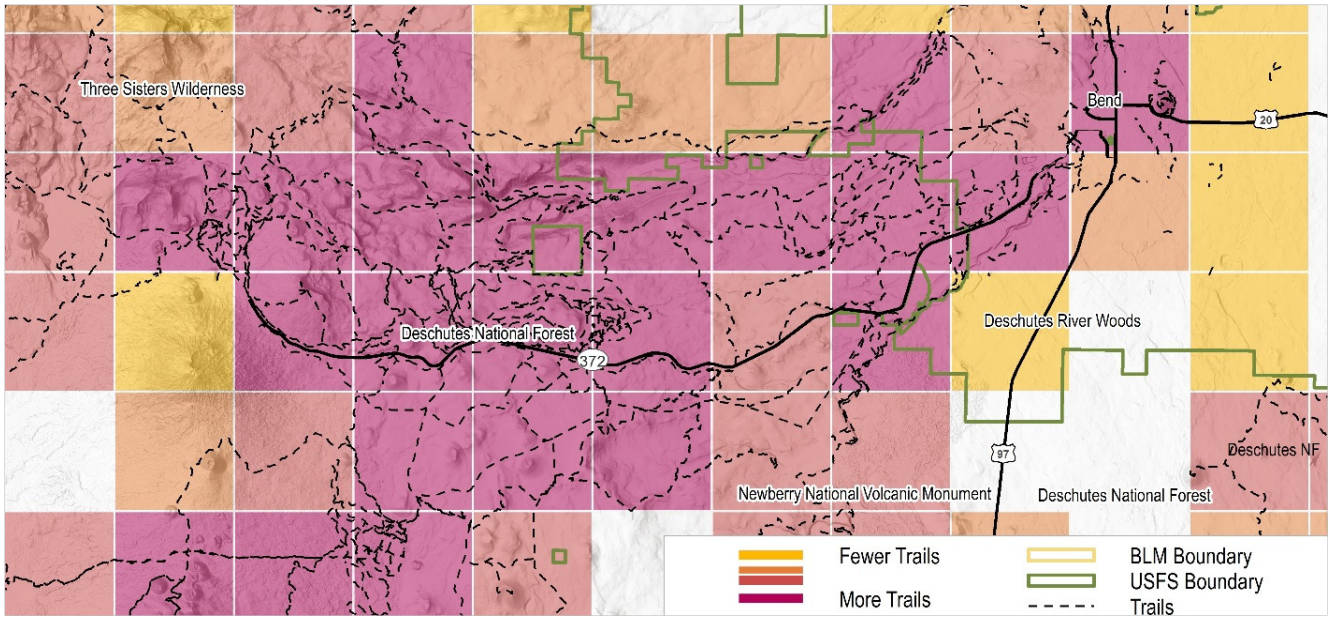


Figure A-10: Transit Route Density

Density grid cells represent 6 square miles.

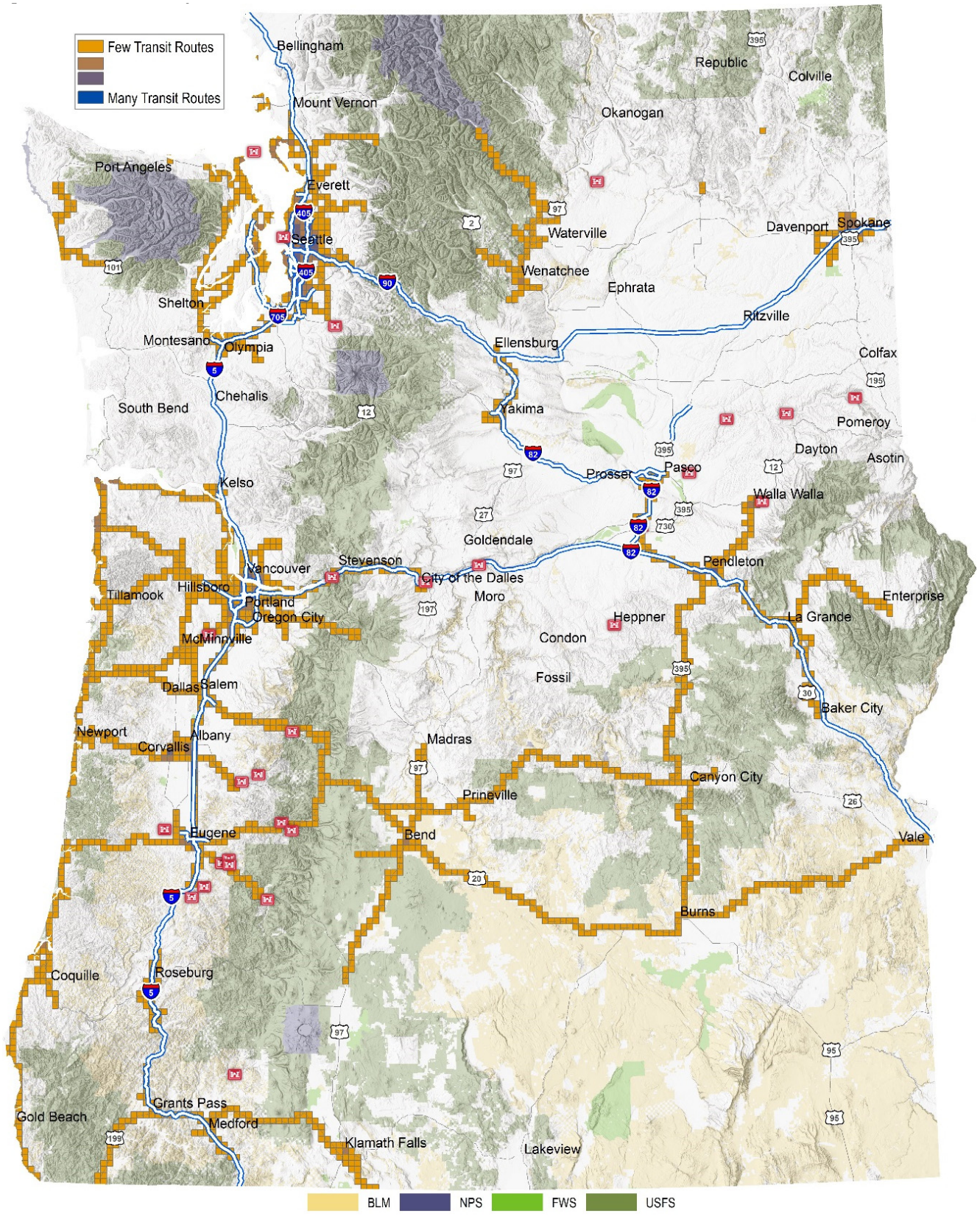


Figure A-11: Ownership Overlap Density

Density grid cells represent 6 square miles.

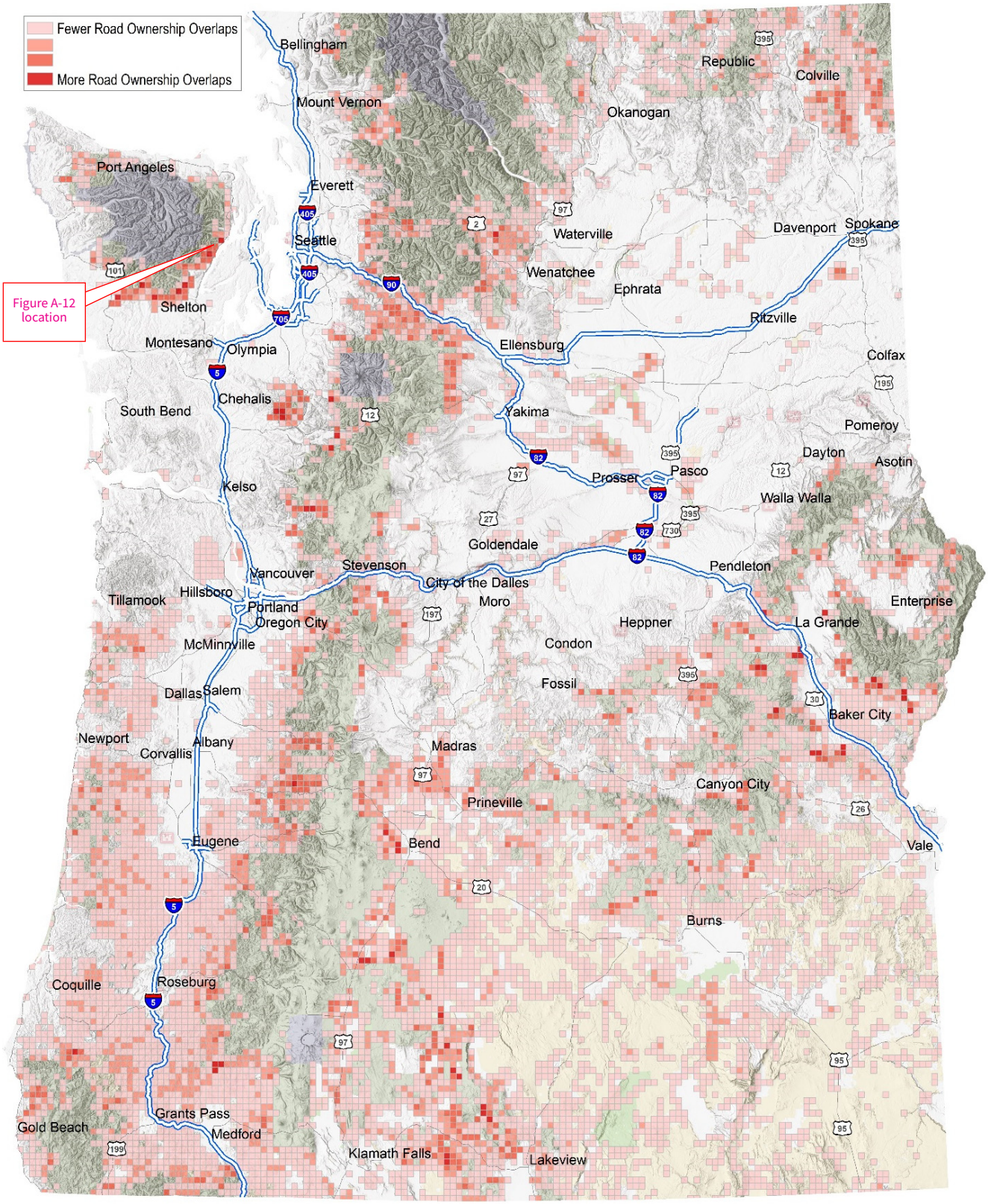


Figure A-12: Road Ownership Overlap Example: North West Washington

The example illustrates USFS managed roads outside of the agency's boundaries

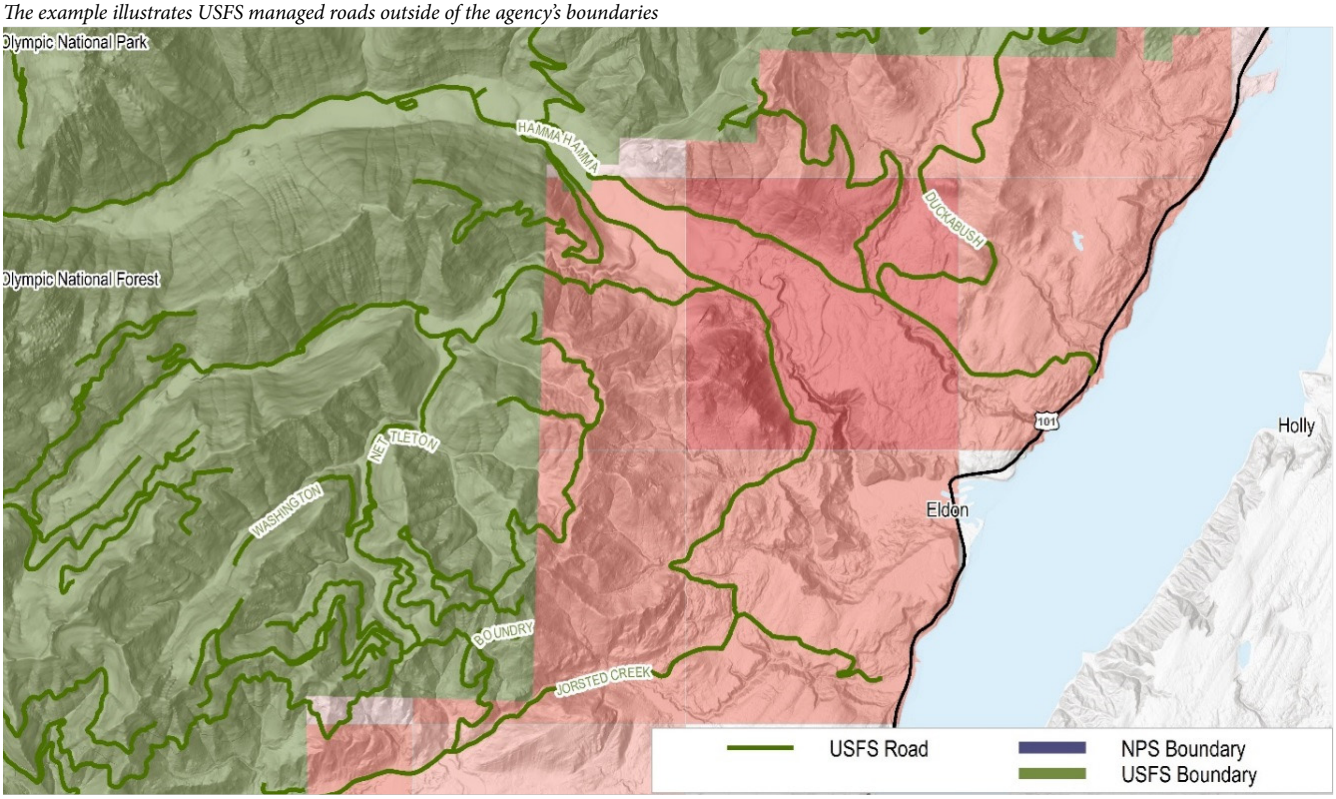
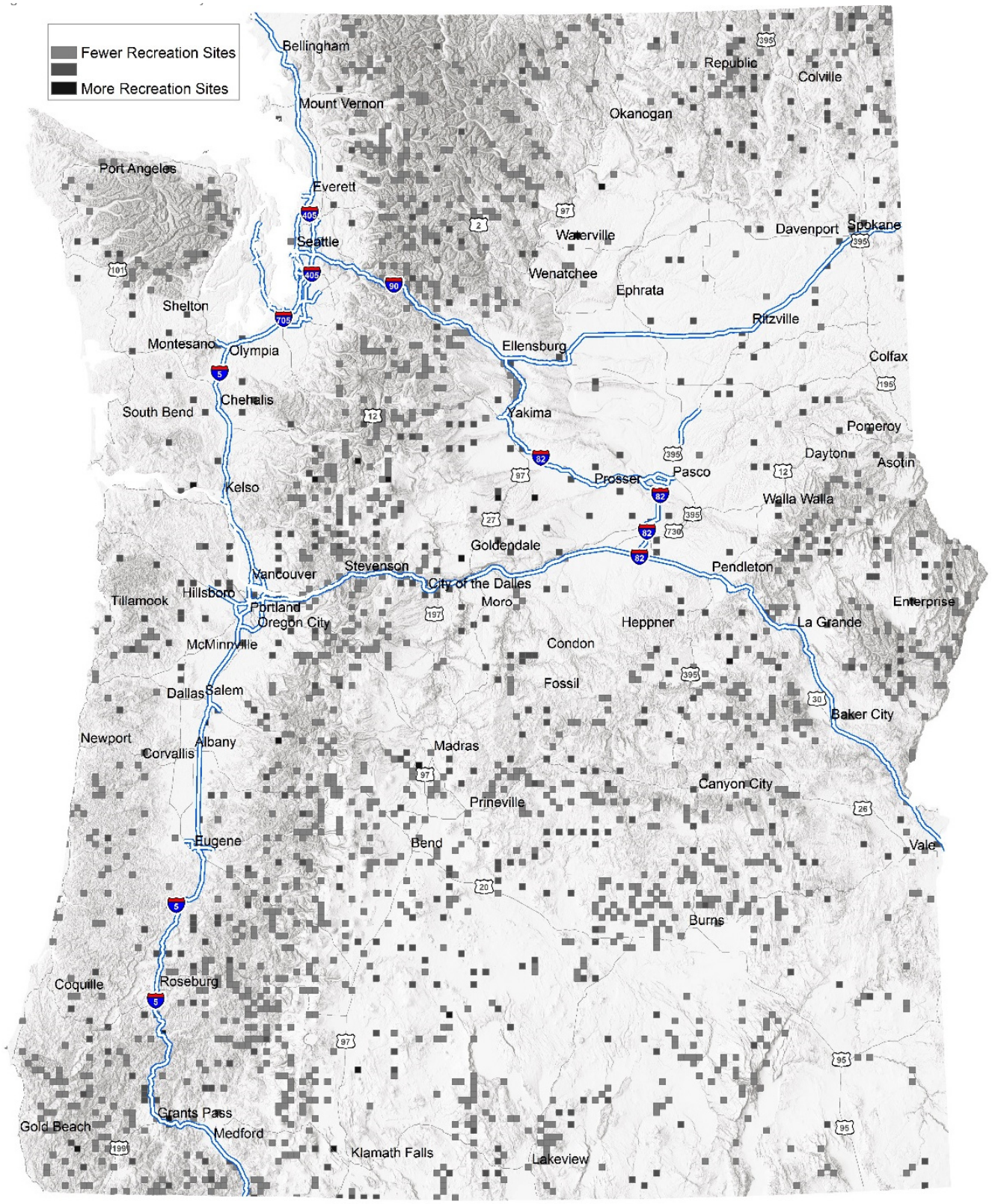


Figure A-13: Recreation Site Density



PACIFIC NORTHWEST FEDERAL LAND MANAGEMENT AGENCY

Long-Range Transportation Plan

March 2019

Photography by: