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Deschutes National Forest

Forest-wide Travel Analysis Report



Deschutes National Forest, Oregon

For more information, contact:
Deschutes National Forest
63095 Deschutes Market Road
Bend, OR 97701
541-383-5300

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Executive Summary

The travel analysis process is intended to identify opportunities for the national forest transportation system to meet current and future management objectives, and to provide information that allows integration of ecological, social, and economic concerns into future decisions. The travel analysis process is tailored to local situations and landscape/site conditions as identified by forest staff members and coupled with past public input. It is a critical first step towards identifying the minimum road system needed for safe and efficient travel and for the protection, management, and use of National Forest Service Lands. Along with identifying roads that are no longer needed to meet forest resource management objectives and which therefore should be scheduled for decommissioning or considered for other uses.

The outcome of the travel analysis process is an identification of potential opportunities for changing the way certain parts of the forest transportation system are managed to address administrative and public issues. A thorough travel analysis supports subsequent National Environmental Policy Act (NEPA) processes, allowing individual projects to be more site-specific and focused, while still addressing cumulative impacts.

Beginning in May of 2013, Interdisciplinary Teams (ID Teams) assigned to this project met to discuss the travel analysis process. After reviewing previous Roads Analysis Reports for the Forest, and considering available resources, it was determined that the appropriate scope of analysis was all roads within the Deschutes National Forest System, separated by district, Bend/Ft. Rock R.D., Sisters R.D. and Crescent R.D. Combining the results of these analysis in this one report.

Summary of Issues

Issues were identified using previous public involvement (i.e. project comments, public concerns, collaboration, legacy issues) and internal Forest Service input.

- Economics – Low maintenance funding affects our ability to maintain key access routes.
- Community Impact – People depend on Forest roads for safe travel and Forest access.
- Aquatics and Water Quality – Roads influence hydrologic function and stream dynamics.
- Fisheries – Roads affect fish habitat and fish passage.
- Terrestrial Wildlife – Motorized use of roads affect wildlife through habitat fragmentation and disturbance.
- Vegetation Management – In the short-term road access is critical for restoring desired forest characteristics.
- Noxious Weeds – Roads and people can increase the spread of noxious weeds.
- Wildfires and Fire Suppression – Fire-Agency Access for suppression & vegetation mgmt, public safety (egress).

Analysis Performed

The ID Team used a risk-benefit assessment to rank roads based on risks (wildlife disturbance, impacts on cultural resources etc.) and benefits (access to facilities, recreational opportunities, and etc.). The road risk/benefit issues were identified by the working group. The working group was then asked to review the questions pertinent to their specialty and use them to build issue statements and evaluation criteria for evaluating the risk or benefit for each road on their specialty resource.

Key Results and Findings

Through the travel analysis process, the working group ranked routes based on their risks to natural and cultural resources and their benefits to recreation use, forest product access, agency and permittee access, vegetation management, and emergency (primarily for fire management and suppression) access.

- Approximately 2673 road miles, or 33% of the road system, are likely needed for future access but could be managed as intermittent use roads (ML1) and put into storage between project uses, (2,348 miles of these roads are already in ML1 status so there is an opportunity to move an additional 325 miles to ML 1 following appropriate NEPA analysis).
- 543 miles or 7 percent of roads in the current system have been assessed to have low benefit and high risk and should be considered for decommissioning, and mitigated to reduce resource risk.
- 4,934 miles or 60 percent of the current system are roads with high to medium benefits and should be considered for continued routine maintenance, and any deferred maintenance to mitigate resource risk.

Step 4 includes a section on opportunities for making changes to the road system and the map in Appendix E shows the opportunities identified by the working group. A complete list of the individual rankings for each road can be found in Appendix A. A breakdown of miles and percent of miles for the transportation system are shown in the Scoring and Rating section of Step 4 (p. 19).

How the Report Will Be Used

Travel analysis process results will assist the Deschutes National Forest in addressing issues related to roads. It will be used to inform future analyses, decisions, and specific actions.

Project Introduction

The Deschutes N.F. chose to complete the analysis at a Forest Wide Scaling including the Bend/Ft. Rock District, Sisters District & Crescent District totaling all 1.6 million acres. This travel analysis process analyzed all 8,153 mile of roads on the Deschutes National Forest.

The Deschutes National Forest will use this travel analysis process as a guide/reference for future NEPA projects involving transportation issues and/or concerns. This travel analysis process will assist Forest Line Officers in their proposals and analysis of future NEPA projects. Future NEPA projects include combinations of vegetation management treatments, including commercial thinning, prescribed burning and both mechanized and non-mechanized fuels treatments that will reduce hazardous fuels. Additional NEPA projects may include transportation access to mining activities, access to recreation sites and areas, access to authorized users of special use permits including easements.

Step 1: Setting up the Analysis

Purpose

The purpose of this section is to:

- Identify the project area and state objectives
- Clarify the roles of technical specialists
- Develop a process plan and an analysis plan
- Address information needs

Project Area and Objectives

The travel analysis process will be conducted for all Maintenance Level (ML) 1 to 5 roads on the Deschutes National Forest, inclusive of the 1.6 million acres. (For additional information on the definition of Forest Service maintenance levels, please see Appendix D, Glossary of Travel Management Terminology). The objective of the analysis is to provide scientific information for managing a transportation system that is safe and responsive to public needs, , efficiently administered, in balance with funding available for needed management actions, and has minimal negative ecological effects on the land.

The travel analysis process is intended to be a broad scale comprehensive look at the transportation network. The main objectives of the travel analysis process are to:

- Identify opportunities for making changes to the forest transportation system that balance the need for access while minimizing risks by examining important ecological, social, and economic issues related to roads;
- Develop maps, tables, and narratives that display transportation management opportunities and strategies that address current and future access needs, and environmental concerns;
- Identify the need for changes by comparing the current road system and areas to the desired condition;
- Identify opportunities for change that will inform travel management decisions in subsequent NEPA documents; and to
- Provide a list of opportunities and analysis background necessary for the identification of the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest System (NFS) lands per 36 CFR 212.5(b)(1).

The analysis area for this travel analysis process encompasses the entire Deschutes National Forest (1.6 million acres). See maps in Appendix E.

Roles of Specialists

A multi-disciplinary working group (working group) of forest specialists were assigned to the travel analysis process. The team members and their primary analysis role are listed below:

Resource	Bend/Ft. Rock	Sisters	Crescent
Leader	Steve Bigby	Don Walker	Ken Kittrell
Hydrology	Sarah Hash	Peter Sussman	Kyle Wright
Transportation	Steve Bigby	Don Walker	Ken Kittrell JR Ashcraft
Wildlife	Justin Hadwen	Julie York Monte Gregg	Joan Kittrell Carina Rosterolla
GIS	Sarah Barnett	Sarah Barnett	
Fire/Fuels	Kevin Stock Dave Robertson	Daryl Davis	Jeff Dillon
Range	Don Sargent	All	All
Silviculture / Timber	Jim Summers Matt Deppmeier Ross Scrocca	Bobbie Rankin- Bates	Joe Bowles Kelley Shaw
Recreation	Kevin Foss	Kirk Flannigan	Robert Gentry
Heritage Resources	Erin Woodard	Adam Clark Penny Borghi	Leslie Hickerson
Soils	Sarah Hash	Peter Sussman	All
Fisheries	Tom Walker	Nate Dachtler	Paul Powers
Botany	Charmane Powers	Maret Pajutee	Christina Veverka
Special Uses	Rick Wesseler	All	All
Writer/Editor	Marcos Romero Ken Kittrell	Marcos Romero Ken Kittrell	Marcos Romero Ken Kittrell

Process Plan

The travel analysis process will follow the six-step process outlined in Forest Service Handbook 7709.55 Chapter 20, Travel Analysis.

Analysis Plan

The ID Team followed these steps in order to carry out the analysis:

- Review and assemble existing data.
- Verify accuracy of system road locations on maps.
- Identify and document discrepancies between on-the-ground conditions, the Forest's INFRA database, and current management direction.
- Where possible, verify the current conditions of roads and associated features including surface type and impacts on other resources.
- Identify preliminary access and resource issues, concerns, and opportunities.

- Identify road safety issues.
- Identify additional issues, concerns, and opportunities through previous public involvement and internal resource staffs.
- Identify opportunities for making changes to the road system based on the findings of this analysis in response to the issues identified.

Information Needs

The following information was required to proceed with the analysis.

- Accurate location of all system roads within the analysis area. For each road, the following information is needed:
 1. Any existing public, permittee, or agency use.
 2. Any right-of-way dedication to the FS.
 3. Any additional right-of-way required.
 4. Maintenance responsibility for the road.
- Assessment of current opportunities, problems, and risks for all roads in the analysis area.
- Soil, water resources, invasive species, environmental issues, and biological communities.
- Public access and recreational needs and desires in the area, including access for nearby landowners.
- Current observed road uses.
- Current road management objectives.
- Areas of special sensitivity, resource values, or both.
- Best management practices for the area.
- Current forest plan and other management direction for the area.
- Agency objectives and priorities.
- Interrelationship with other governmental jurisdictions for roads.
- State laws that regulate motor vehicle use on and off public roads.
- Applicable federal, state, and local laws.
- Public and user group values and concerns.
- Forest scale and any project level roads analysis process.
- Cultural resources.

Step 2: Describing the Situation

Purpose

The purpose of this step is to:

- Describe the existing road system
- Describe the existing direction
- Describe road maintenance levels

Existing Road System

Currently the Deschutes National Forest has an extensive system of roads.. This travel analysis process will review and analyze the ML1 through ML5 roads on the Deschutes National Forest. These roads are shown in Appendix E.

Existing Direction for Roads

A. General

Travel analysis is focused on identifying needed changes to the forest transportation system; identifying the existing direction is an important first step. The existing direction includes the National Forest System roads currently managed for motor vehicle use. Restrictions, prohibitions, and closures on motor vehicle use are also part of the existing direction. Existing direction from laws and regulations, official directives (Travel Management, Implementation of 36 CFR, Part 212, Subpart A-36 CFR 212.5(b), forest plans, forest orders, and forest-wide or project-specific roads decisions, determine the motorized routes and areas open to public motorized travel. This information about the managed system is documented in road management objectives, maps, recreation opportunity guides, tabular databases, and other sources.

B. Roads

Open Road

Existing roads open to the public for motorized use are forest system roads, which are currently in the Forest's INFRA database (an Oracle Database containing information on all roads and improvements on Forest Service lands) with the following attributes:

- System = National Forest System Road
- Jurisdiction = Forest Service
- Route Status = Existing
- Operational Maintenance Level = 2-5

Closed Road

Closed roads have been closed to vehicle traffic for at least a year but are necessary for future activities. They appear in the Forest's INFRA database under the following categories:

- System = National Forest System Road
- Jurisdiction = Forest Service
- Route Status = Existing
- Operational Maintenance Level = 1

Decommissioned Road

Decommissioned roads are no longer part of the forest transportation system. They may have some type of physical closure at their entrance (berm, etc.) or may be completely obliterated. They appear in the Forest's INFRA database under the following categories:

- System = National Forest System Road
- Jurisdiction = Forest Service
- Route Status = Decommissioned
- Operational Maintenance Level = 1-5¹

In order to return a decommissioned road to service as a system road the NEPA process must be followed even when no physical work is required to allow motorized traffic back on the road

Unauthorized Road

An unauthorized road is a road, which exists on the forest, but is not included in a forest transportation atlas or database. These roads are usually established by various users over time. They were not planned, designed, or constructed by the Forest Service to be used as roads. Currently, these roads are not in the Forest's INFRA database, nor are they part of the NFS roads.

C. Motorized Trails

Currently, the designated motorized trails on the Deschutes National Forest are shown on the Motor Vehicle Use Map – dated 2015.

D. Areas

Currently, the designated motorized areas on the Deschutes National Forest are shown on the Motor Vehicle Use Map – dated 2015.

E. Previous Travel Management Decisions

The 2011 Subpart B-Travel Analysis and FEIS has been used by the Deschutes National Forest Line Officers to add to their understanding of the transportation system on the Forest. Modifications to the transportation system were made as a result of forest level NEPA analyses. Designations of roads open to different types of motor vehicles, including off-highway vehicles were made as a result of implementation of 36 CFR 212, Subpart B – Designation of Roads, Trails, and Areas for Motor Vehicle Use, through the above referenced report, FEIS, and Record of Decision. In addition, other project level travel analysis reports have been produced on all 3 districts to inform NEPA decisions related to travel management.

Road Maintenance Levels

The Forest Service differentiates forest roads into five maintenance levels, which define the level of service, and maintenance required. Refer to Appendix D for a more detailed description of the maintenance levels.

Road Maintenance Level 5 (ML5) – roads are managed and maintained for a high degree of user comfort. These roads are generally paved and are suitable for passenger vehicles.

¹ The maintenance level of decommissioned roads is the level they were maintained at prior to decommissioning.

Road Maintenance Level (ML 4) – roads are managed and maintained for a moderate degree of user comfort. These roads are generally paved, but sometimes may be surfaced with stabilized aggregate surfacing and are suitable for passenger vehicles.

Road Maintenance Level (ML3) – roads are managed and maintained for a moderate degree of user comfort. These roads are generally gravel surfaced and are suitable for passenger vehicles.

Road Maintenance Level 2 (ML2) – roads are managed and maintained for use by high-clearance vehicles; passenger car traffic is not a consideration.

Road Maintenance Level 1 (ML1) – roads are kept on the transportation system for intermittent project uses and are closed to vehicular traffic between projects. The closure period must exceed 1 year for the road to be ML 1 status.

Table 1. Road summary of miles by type for the analysis area

Maintenance Level	Number of Roads	Miles of Road
1 – Basic Custodial Care (Closed)	3727	2349
2 – High Clearance Vehicles	4967	5381
3 – Suitable For Passenger Vehicles	186	264
4 – Moderate Degree of User Comfort	55	121
5 – High Degree of User Comfort	9	39
Totals	8944	8153

Step 3: Identifying Issues

Purposes

The purposes of this step are to:

- Identify resource concerns
- Identify key issues related to management of existing road system

Resource Concerns

Motor vehicle use on the Deschutes National Forest has increased in recent years as local and out of area visitor use increased. Increased use has increased the maintenance needs for all road Maintenance Levels (ML). Maintenance costs have increased and allocated maintenance funds have been significantly reduced, causing a disproportionate shift of maintenance funds to the ML 3-5 roads, which require a higher cost due to the higher degree of maintenance. The increased use coupled with the decreased funds has resulted in degraded soil, water, vegetation, and wildlife habitat conditions, in and around the transportation system.

Increased road use has resulted in more disturbance or displacement of wildlife, habitat fragmentation, habitat loss, reduction of habitat productivity, and in some cases, wildlife mortality from collisions, along with adverse impacts to at risk fish or their habitat. In some places, improper user rerouting of eroded road portions, non-compliance with the Motor Vehicle Use Map, and use of ML 1 roads has led to loss or reduced productivity of important wildlife habitats.

Heritage resources are a concern throughout the Deschutes N.F. as they are important considerations in all management activities on the Forest. There has been human occupation in the local area for thousands of years. Roads can significantly impact heritage sites.

There is fire risk wherever people use the National Forest. This risk can come from many sources, including smoking, vehicles, and campfires.

Motor vehicle use on roads can also facilitate the spread of invasive plants and aquatic species and put floral and faunal diversity at risk.

Key Issues

The key issues were identified through past public involvement and comments that addressed the Deschutes National Forest road system (previous project specific Road Analysis Reports) as well as input from Forest Service personnel familiar with the legacy and new issues the transportation system has in reference to their resource concerns. The following roads issues were identified and are in random order and do not represent a hierarchy of importance.

1) Insufficient resources for maintenance of the existing system roads

Inadequate maintenance reduces access for National Forest users and management. Funding for road maintenance is not adequate to maintain the existing system and perform needed monitoring. See Appendix F for more information on Road Maintenance Costs.

2) Need for access to private lands for landowners

Many of the private lands on the Deschutes National Forest are currently accessed by National Forest System roads.

3) Increased risk of human-caused fire

Roads are used by the public to access public lands. The increased public use of an area may lead to a higher probability of human caused fire starts. In the event of a public emergency such as a wildfire, the need for good egress/ingress is important for public safety.

4) Need for access to firewood and other forest products gathering areas

Firewood, traditional materials, and plant gathering are all important activities, especially for Native American communities. Decommissioning or closing roads may affect access for traditional gathering activities.

5) Known Cultural Resources and Tribal Use/Traditional Cultural Property

Public access to Traditional Cultural Properties can result in damage to the properties. Access across public lands to tribal lands contributes to trespass concerns.

6) Roads have effects on Wildlife Habitat

Reduced maintenance, new construction, improper user rerouting of eroded road portions, and non-compliance with road closures causes a reduction of habitat productivity.

7) Roads have effects on Watershed Conditions.

Erosion and sediment from improperly maintained roads reduces watershed conditions and introduces sediment into streams, affecting fish and aquatic species. Poorly designed stream crossing structures on roads may prevent aquatic organism passage at some or all life stages.

8) Roads provide access to the public for recreational purposes

Forest roads access developed recreation sites, and are used for a variety of recreational purposes such as camping, hunting, fishing, hiking, mountain biking, horseback riding, etc.

9) Access to for general forest administration

Access to the forest is needed by the agency for general forest management reasons such as vegetation management and forest monitoring.

Step 4: Assessing Benefits, Problems and Risks

Purposes

The purposes of Step 4 are to:

- Describe the analysis process
- Describe the criteria used in the risk and benefit analysis process
- Describe the scoring and rating
- Summarize the risk and benefit of existing motorized routes
- Describe the costs of maintaining the current road system

The Analysis Process

The issues described in Step 3 were addressed by the ID Team in the following assessment. The risk and benefit criteria categories were developed by considering the issues from Step 3 and the suggested resource questions for roads analysis described in FS-643 Roads Analysis: Informing Decisions about Managing the National Forest Transportation System . The ID Team reviewed these resource questions (see Appendix B of this report) and used them to develop criteria to use in ranking the risks and benefits of each road. Each road was then evaluated against the identified risks and benefits. There are sub-criteria within each resource risk/benefit, see Appendix B.

Criteria Used in the Risk and Benefit Analysis Process

Roads provide access for many uses. They also provide the infrastructure to facilitate motorized recreation and vegetation management. However, their presence has possible negative effects on the natural and cultural resources of the National Forest. The following categories (Table 2) for risks and benefits were identified by the working group as the most important resource issues for managing the forest transportation system.

Table 2. Resource categories for roads

Risk	Benefit
The presence or conditions of the transportation system present potential risks associated with these categories:	The presence of the transportation system benefits Forest management because roads provide motorized access opportunities for these categories:
Wildlife Habitat & TES species	Fire —Agency Access for suppression & vegetation mgmt, public safety (egress)
Heritage – Archaeological resource protection	Heritage - Access to Traditional Cultural Properties
Botany - Sensitive & invasive plant species	Timber- Vegetation Management Access
Aquatics – sediment, fisheries, wetlands, etc.	Public Uses- Recreation, Range, special uses, agency access (facilities), etc.

The road risk/benefit issues which were identified by the team were assigned to individual specialists based on the resource area affected. Roads were scored with values of high, medium, or low risk combined with high, medium, or low benefit. Forest level resource specialists developed criteria for

characterizing high, medium, or low values for roads in their resource area. Appendix B shows in detail these criteria.

Scoring and Rating

The overall risk and benefit assessment for each road was based on scores aggregated from separate risk and benefit assessments completed by specialists on the ID Team. Each road generated a high, medium, or low rating based on the criteria stated in the previous section, which produced the road's score. The scores were totaled to find the overall risk and benefit ranking of each road.

There are 4 primary resource risk criteria and primary benefit criteria represented as the category named "Access" for each road analyzed. Each resource criteria also includes sub-criteria evaluating elements of resource risk/benefit. Scores were based on a 3 level system with rankings of high, medium, or low for each risk/benefit.

An overall ranking of risk or benefit was established for each road based on an average of the combined rankings(values). These rankings did not always reflect the severity of the impact beyond the criteria presented in the previous section. When specialists identified a particular or severe concern that indicated that the road considered may need further mitigation or may require a different kind of action than those typically recommended for its risk-benefit category, the ID Team revised the recommendation to address that concern.

The Risk and Benefit Matrix (Tables 3 and 4) list a summary of miles and percent of miles for all miles of road analyzed.

Table 3. Distribution for the overall score for a risk

RISK	Overall Score	Miles of Roads	Percent of Total Miles
	Low Risk	7375	90%
	Medium Risk	598	7%
	High Risk	179	3%

Table 4. Distribution for the overall score for a benefit

BENEFIT	Overall Score	Miles of Roads	Percent of Total Miles
	Low Benefit	2674	33%
	Medium Benefit	3677	45%
	High Benefit	1801	22%

Distribution of Risk and Benefit

Risk and Benefit Matrix for Roads (ML1 to ML 2)

Of the 8,153 miles of roads that constitute existing National Forest System roads (ML1 – ML5) on the Deschutes National Forest, approximately 67 percent of the roads rated as a medium or high benefit, meaning that these roads have several purposes that are important to Forest Service management or public

use. Of these same 8,153 miles of road, 7% of the roads were also a high risk due to resource concerns, most of these high risk roads are operational maintenance levels 1 or 2.

The high risk/medium benefit and high risk/high benefit roads should be the focus of road maintenance funds because mitigating their adverse effects will be the most efficient way to lower the impact of the forest transportation system on the surrounding natural resources.

Table 5. Road Miles Risk Rating by Operational Maintenance Level

Maintenance	Risk Criteria Rating	Miles of Road
Level 5	High	0
	Med	3
	Low	44
Level 4	High	0
	Med	18
	Low	113
Level 3	High	8
	Med	12
	Low	256
Level 2	High	122
	Med	313
	Low	4952
Level 1	High	54
	Med	268
	Low	1989

Table 6. Road Miles Benefit Ratio by Operational Maintenance Level

Maintenance	Benefit Criteria Rating	Miles of Road
Level 5	High	36
	Med	2
	Low	10
Level 4	High	91
	Med	25
	Low	18
Level 3	High	225
	Med	23
	Low	17
Level 2	High	1397
	Med	3160
	Low	833
Level 1	High	74
	Med	470
	Low	1771

Road Maintenance Costs

Forest Service road budgets have been steadily declining for the past 20 plus years. Region-wide, the amount of funding for road work including both appropriated funding and work contributed by commercial users is less than 20 percent of what it was 20 years ago. Appropriated road funds to the Pacific Northwest Region (Region 6) have been reduced 40% in the past 5 years alone. Current levels of funding for road work on the Deschutes National Forest are shown in Table 7 below.

Table 7. Five year average road funding

Deschutes NF - 5 Year Average Budget								
BLI	Forest Operational Budget (x1000)					5 Year Average	% to Rd Maintenance	Average Mtc Budget
	2011	2012	2013	2014	2015			
CMRD	1212	952	807	847	788	921	45%	\$415
CMLG	10	8	10	10	10	10	100	\$10
CWF2	29	40	40	40	40	38	100	38
Purchaser Mtce	55	55	33	28	31	40	100	40
Total								\$502
<i>Amount from appropriated funds:</i>								\$502
5YR Ave Mtc Budget	Range							
	-	+20%						
\$462	\$402	\$603						

With funds being far below what is necessary to keep the road system properly maintained, many roads do not get the maintenance treatments they need on schedule and are falling into a severe state of disrepair.

Deferred Maintenance is defined as “maintenance that was not performed when it should have been or when it was scheduled and which, therefore, was put off or delayed for a future period. When allowed to accumulate without limits or consideration of useful life, deferred maintenance leads to deterioration of performance, increased costs to repair, and decrease in asset value”, (Financial Health - Common Definitions for Maintenance and Construction Terms, July 22, 1998).

Annual Maintenance is defined as “work performed to maintain serviceability, or repair failures during the year in which they occur. Includes preventive and/or cyclic maintenance performed in the year in which it is scheduled to occur”, (Financial Health - Common Definitions for Maintenance and Construction Terms, July 22, 1998).

Since 1999, the Forest Service has been tracking the amount of the deferred maintenance backlog. Based on national estimates (from 2013), the Deschutes NF, would need approximately \$80 million to bring their entire road system back up to standard, and about \$7.5 million per year to keep it that way. (Please note that the unit costs used to arrive at the figures above are made up of national averages to restore and maintain the road system in a like new condition. They also include the cyclical items necessary to replace gravel surfacing, pavement overlays, bridges/structures, and major culverts on schedule, and include a 40% overhead rate.)

Our local estimate, (using regional unit rates and not including the national burden rate) indicates that the Deschutes NF would still require about \$4.5 million per year to keep the current road system fully maintained to standard. Table 7 above, shows that on average, the Deschutes N.F. only receives about \$502,000 dollars in appropriated funds per year that can be applied toward road maintenance work, that is only about 10% of the funding necessary to address the estimated annual maintenance needs to fully maintain the road system.

Financial Analysis Process

The goal of the financial analysis step in the overall Travel Analysis Process is to identify opportunities to help move the road system to a more affordable state.

Based on the figures in the previous section, if the Deschutes National Forest were to focus their available appropriated funds on a given set of roads to fully maintain to standard, they would only be able to maintain about 50 miles of roads if they were all paved, or about 95 miles of roads if they were all gravel surfaced. That size of road system would not meet the needs of the forest or the public, and does not meet the requirements of the 2005 Travel Management Rule as it would not allow the forest to meet resource management objectives in the Forest Plan and would not allow the forest to meet statutory and regulatory requirements.

Given the enormous gap between available appropriated funding for road work and the cost to maintain the road system fully to standard, the Region recognized that it would not be possible to balance the size of the road system with the cost of maintaining all roads fully to standard and still be able to meet resource management needs or the needs of the public. Since the requirement in the Travel Management Rule to “reflect long-term funding expectations” was not defined in regulation or policy, Region 6 defined

it in the *R6 Guidance for Preparing a Travel Analysis Report* document to mean that “average annual funding” is reasonably in balance with the “average annual cost of routine road maintenance”, where:

Average annual funding is defined as the average amount of funding available for each NFS unit for routine annual maintenance from appropriations, collection accounts, commercial users, cooperators, and other partners during the 2011-2015 timeframe, plus or minus 20%. It does not include funding from the American Recovery and Reinvestment Act (ARRA) or the Capital Improvement Program (CIP). Only the modest amounts specified for “routine maintenance” in Legacy Roads and Trails funding allocations are included.

Average annual cost of routine road maintenance is defined as the average yearly need for basic road maintenance. This includes log out, drainage maintenance, erosion control, blading, brushing, traffic signs, etc. It does not include cyclical replacement costs (such as bridge replacement every 50 years, asphalt overlays, etc.), which are covered by funding beyond the individual NFS unit budgets (e.g., Regional Capital Investment Program).

The Deschutes National Forest utilized the *Region 6 Financial Analysis Template*, which is based on the definitions above, to perform the financial analysis. A full discussion of the Financial Analysis Process is provided in Appendix F. In summary, the first steps of the financial analysis process lead to a determination of the current road maintenance costs for routine annual maintenance items, (which does not include things like replacing gravel surfacing, replacing pavements, or replacing bridges and structures), the current cost of keeping up the existing road system to this standard for the Deschutes NF would be about \$973,533 dollars per year, or roughly twice the amount of currently available funding for this type of work. The second part of the financial analysis process helps identify what types of changes to the size and composition (pavement vs gravel surfacing, maintain for passenger car vs only maintain for high clearance vehicles, etc.) of the road system would be needed to bring the average annual costs in balance with the average annual funding expectations. The results of the financial analysis show that the forest would need to make some significant changes to reduce the number of miles of open roads, (by decommissioning any that are no longer needed, and by closing those that are only needed for intermittent project uses), and by lowering the maintenance standards of the roads that remain open year around. Further discussion of available options is provided in Appendix F.

Step 5: Describing Opportunities and Priorities

Purpose

The purpose of this step is to:

- Identify management opportunities and priorities and formulate proposals for changes to the forest transportation system that respond to the issues, risks, and benefits identified previously in the analysis.
- Compare existing motor vehicle use with desired conditions, and describe options for modifying the forest transportation system that would achieve desired conditions.
- Develop guidelines for mitigating road risks

Opportunities for Roads

Management opportunities for roads were identified through the risk/benefit rating evaluation for each resource in Step 4 of the analysis. Each road in the low benefit category was considered individually by the working group resulting in a specific opportunity which can be located in Appendix A. Final decisions on the disposition of roads are site-specific and require the appropriate level of NEPA analysis. A complete list of the roads, overall rankings, and the specific opportunity are located in Appendix A.

Table 8 summarizes some general management opportunities and priorities, with miles and percent of miles, for all roads analyzed under the Step 4 risk/benefit assessment.

Table 8. Roads risk and benefit matrix for existing National Forest System roads

ROADS - OPERATIONAL ML1 TO ML5				
RISKS ¹	BENEFITS ²			
	Scores	Low	Medium	High
	High	(HL) Decommission, Lower ML, or Mitigate – Highest Priority (105)³ or (1%)⁴	(HM) Decommission, Mitigate, Close or Lower ML – High Priority (21) or (.20%)	(HH) Maintain and Mitigate - Highest Priority, close or Decommission (51) or (.60%)
	Medium	(ML) Close, Mitigate, Decommission or Lower ML (119) or (1.4%)	(MM) Mitigate and Maintain – Second Priority (333) or (4%)	(MH) Mitigate and Maintain - Second Priority (141) or (2%)
	Low	(LL) Mitigate, Lower ML, Close or Decommission, (2,567) or (31%)	(LM) Maintain Third Priority (3,263) or (40%)	(LH) Maintain Third Priority (1,553) or (19%)
TOTAL OPERATIONAL ML1 TO ML5 = 8,153 MILES				

¹ Risks represent the range of total risk scores assigned to each category.

² Benefits represent the range of total benefit scores assigned to each category.

³ Road miles assigned to each cell in the matrix.

⁴ Percent of road miles in each cell.

Guidelines for Mitigating Road Risks

The general guidelines for mitigating the risks discussed in previous sections of this report are listed below. These guidelines should be used for existing roads or when a road needs to be relocated due to unacceptable resource risks.

Low Risk/Low Benefit

Roads that have a combined Low Risk/Low Benefit and no compelling administrative or public need in the long-term, should be considered for decommissioning or conversion to other uses such as trails. If there is a future need for the road but no immediate need, then it should remain on the system as a closed (ML1) road. Closed roads are closed for at least a year and are most effectively managed for short-term uses. If a road is primarily used for motorized recreation, then consider conversion to a motorized trail. The low risk associated with these routes indicates low priority for investment of time and funds to mitigate risk. Drainage features should be inspected before each closure to prevent resource impacts.

Low Risk/Medium Benefit

Roads that have a combined Low Risk/Medium Benefit should remain open for administrative use or open for the general public, depending on which type of access is appropriate to meet resource management objectives. The low risk associated with these routes indicates low priority for investment of time and funds to mitigate risk. For roads in this category that are important for public access, the Forest Service should work with cooperating agencies or user groups to provide adequate maintenance. Maintenance of drainage features and preventing erosion are the highest priority issues for these roads.

Low Risk/High Benefit

The low risk associated with these routes indicates a low priority for investment of time and funds to mitigate risk. For roads in this category that are important for public access, the Forest Service should work with cooperating agencies to provide adequate maintenance, where appropriate.

Medium Risk/Low Benefit

General public motorized access is not recommended for these roads. Most of these roads should be closed or restricted to administrative use only, depending on the access needs. If there is no compelling administrative or public need for the road in the long-term, then it should be considered for decommissioning.

Medium Risk/Medium Benefit

The majority of these roads should remain open for an administrative use or open for the general public, depending on which type of access is appropriate to meet resource management and recreation objectives. The risks associated may require some mitigation. Mitigation depends upon the specific risks and may include, but is not limited to: additional maintenance, reconstruction, relocation, seasonal road closure. The scale and frequency of these activities will depend on the severity of the risk and the availability of funds. Roads that are ranked within the Medium Risk/High Benefit and High Risk/High Benefit categories take a higher priority in the allocation of mitigation and maintenance funding.

Medium Risk/High Benefit

The majority of these roads should remain open for administrative and general public use. The risks associated may require some mitigation. Mitigation depends upon the specific risks and may include, but is not limited to: additional maintenance, reconstruction, relocation, seasonal maintenance restriction, and seasonal road closure. The scale and frequency of these activities will depend on the severity of the risk and the availability of funds. Roads that are ranked within the High Risk/High Benefit categories take a higher priority in the allocation of mitigation and maintenance funding.

High Risk/Low Benefit

Vehicle access is not recommended based on the Risk/Benefit Analysis. Roads in this category should be administratively closed or considered for decommissioning. The majority of these roads are not appropriate for administrative use in their current location or condition. If a road is needed for administrative reasons, it should be closed or remain open for administrative uses only. If access to facilities is provided by the route, it is a high priority to evaluate the potential for mitigating risks on these roads. Coordinate with county government or private landowners to determine maintenance responsibility on roads needed for access to private lands. If a road's primary use is access to communities, request public roads agencies (county, towns, state government) to assume road operational jurisdiction. If a road is needed exclusively for access to private land or needed to manage activities under special use permits, issue a permit for the road. If roads or road segments are not needed for public access and not under permit, consider decommissioning the road.

High Risk/Medium Benefit

For routes within this category that do not have a public benefit, restrict access to administrative use. The risks associated with these routes may require some mitigation activities. Mitigation depends upon the specific risks and may include, but is not limited to: additional maintenance effort, reconstruction, relocation, seasonal maintenance restriction, and seasonal road closure. The scale and frequency of these activities will depend on the severity of the risk and the availability of funds.

High Risk/High Benefit

Most of these routes are appropriate for general public access to the Forest. Some routes may be open for administrative use only in order to control access to sensitive cultural or biological resources. The risks associated with them may require some mitigation activities. Mitigation depends upon the specific risks and may include, but is not limited to: additional maintenance effort, reconstruction, relocation, seasonal maintenance restriction, seasonal road closure. The scale and frequency of these activities will depend on the severity of the risk and the availability of funds.

Actions that Respond to the Issues

The following section describes strategies that the Forest may choose to employ in projects and situations where the issues occur (see Step 3). The scale at which these actions may be implemented is dependent on the site and the compatibility of the action with the overall management focus of the surrounding area. The list below is intended to provide options that project leaders and decision-makers may consider when implementing changes to the road system.

Issue 1: Insufficient resources for maintenance of the existing road system

Action: Reduce the number of road miles that need to be maintained or reduce the maintenance level to reduce maintenance costs.

Action: Leverage funds/efforts to increase maintenance capabilities. Continue to seek opportunities within the Forest, with other Forests, with counties and private individuals to increase the amount of maintenance accomplished through cooperative efforts. For trails there are opportunities to work with volunteers to maintain them.

Action: Prioritize roads that are good candidates for transfer of jurisdiction to counties, which reduces the number of road miles requiring maintenance with NFS funds. NFS roads that provide access to private inholdings would be good candidates to transfer to county jurisdiction.

Issue 2: Need for access to private lands for landowners and state lands

Action: Maximize cooperation from landowners by proposing to issue a reciprocal easement.

Action: Transfer road jurisdiction to the county.

Action: Enter into a special use agreement with the landowner, stipulating that the permittee has maintenance responsibilities.

Issue 3: Human-caused fire and need for roads as evacuation routes during wildfires.

Action: Instead of decommissioning roads in high fire risk areas, close them for use as fire line roads during prescribed burns and wildfires in consultation with the fire staff.

Action: Restrict motorized vehicle use on the forest to a designated road system through travel management.

Action: Monitor unauthorized roads after the installation of barriers and other mitigation measures. Keep records of successful and unsuccessful strategies for discouraging travel to improve future rehabilitation projects.

Issue 4: Need for access to firewood and other forest products gathering areas.

Action: Identify areas with supplies of suitable firewood or forest products along open system roads, and provide maps to the public to reduce the use of closed or unauthorized roads.

Issue 5: Known Cultural Resources and Tribal Use/Traditional Cultural Property

Action: After consultation with tribal leaders, identify roads that can be gated to control access. Access may be managed under permits rather than a publicly open road.

Action: Transfer jurisdiction and maintenance to permit holders.

Action: Reroute existing roads that impact important heritage sites.

Issue 6: Roads have effects on Wildlife Habitat

Action: Reduce the number of roads located in habitat for species-of-concern and species-of-interest.

Action: Place seasonal restrictions on roads going through critical habitat.

Action: Reduce the road width and maintenance level to minimum needed for safe vehicle passage and to meet the intended need in sensitive wildlife areas.

Issue 7: Roads have effects on Watershed Conditions.

Action: Implement the guidelines for mitigating road risks to reduce soil and drainage impacts from roads.

Action: Provide information and education about motor vehicle regulations and responsible use of motorized vehicles on the National Forest. Install information boards at area trailheads, recreation sites, and parking areas.

Action: Install route numbers on all system roads at junctions with system and unauthorized routes to assist users with compliance of motor vehicle use regulations.

Action: Educate the public to create an understanding of the problems created by off road driving. Implement an ongoing effort to educate forest users of the motorized travel policy.

Action: Utilize enforcement to curtail off-road driving. Implement patrols and field presence at appropriate times of year (such as hunting season, holidays, weekends, etc.) in identified areas. This effort is also used to educate users of the travel policy.

Action: Rehabilitate areas damaged by off-route driving.

Issue 8: Roads provide access to the public for recreational purposes

Action: Maintain access to recreation sites that are provided by the Forest Service for public use.

Action: Maintain and update the Motor Vehicle Use Map.

Action: Maintain road signage in accordance with handbook direction.

Issue 9: Roads provide access for general forest management.

Action: Focus maintenance funds on the high priority roads identified in Step 4 of the analysis to provide long-term service on the roads that are needed the most.

Action: During the NEPA process for management activities, consider closing (ML1) other open roads in the project area where a reduced maintenance cost would be realized.

Action: Maintain and update the Motor Vehicle Use Map as roads are closed to administrative use only.

Step 6: Reporting

Purpose

The purpose of this step is to report the key findings of the analysis.

Desired Condition of the Future Road System

Travel Management Rule, 36 CFR 212.5 (b) states:

“...b) Road system--(1) Identification of road system. For each national forest, national grassland, experimental forest, and any other units of the National Forest System (Sec. 212.1), the responsible Official must identify the minimum road system (MRS) needed for safe and efficient travel and for administration, utilization, and protection of National Forest System lands. In determining the minimum road system, the responsible official must incorporate a science-based travel analysis at the appropriate scale and, to the degree practicable, involve a broad spectrum of interested and affected citizens, other state and federal agencies, and tribal governments. The minimum system is the road system determined to be needed to meet resource and other management objectives adopted in the relevant land and resource management plan (36 CFR part 219), to meet applicable statutory and regulatory requirements, to reflect long-term funding expectations, to ensure that the identified system minimizes adverse environmental impacts associated with road construction, reconstruction, decommissioning, and maintenance.”

Key Findings of the Analysis

This report documents the science-based travel analysis which is a key first step towards identifying a minimum road system per the regulations cited above. The results of this Travel Analysis will be used by the responsible official for identification of the forest's minimum road system following appropriate NEPA analysis. The ID team has identified a variety of opportunities for making changes to current road management practices that would meet the direction in 36 CFR 212.5 (b). The opportunities for change summarized in this report are based on the risk/benefit analysis and road maintenance cost considerations. Prior to any travel management decisions being made, including any roads being added or deleted from the system, site-specific analysis, including public involvement, would be completed through the NEPA process at an appropriate scale.

The ID teams ranked routes based on their risks to natural and cultural resources and their benefits to recreation use, permittee access, firewood-gathering access, and emergency (namely, fire) access. The ID teams identified opportunities where about 543 road miles, or 7% of the road system, are likely not needed for future resource management purposes and should be further analyzed in NEPA for decommissioning. Approximately 2673 road miles, or 33% of the road system, are likely needed for future access but could be managed as intermittent use roads (ML1) and put into storage between project uses, (2,348 miles of these roads are already in ML1 status so there is an opportunity to move an additional 325 miles to ML 1 following appropriate NEPA analysis). Approximately 4934 miles, or 60% of the road system, should remain open to year-round or seasonal administrative and public uses. Any of these roads with high resource risks identified, would be the highest priority for receiving maintenance and mitigation funds. The ID teams did not recommend constructing additional roads on the forest at this time.

The map in Appendix E shows the travel analysis process opportunities. A complete list of the individual rankings of each criterion for each road can be found in Appendix A.

The Financial Analysis in Appendix F includes a scenario using the total mileages from the opportunity categories listed above to examine the potential reduction in maintenance cost needs if these changes were to be made. The results of that analysis show that total routine annual costs with these changes implemented, but keeping the maintenance standards of the remaining open roads roughly the same, would require approximately \$800,000 per year in annual maintenance funding. This is a reduction of approximately \$173,000 per year in routine annual maintenance funding needs, but still doesn't bring the average annual maintenance needs in balance with the average annual maintenance funding expectations. In order to further reduce the maintenance needs, the remaining open roads would require some further reductions to maintenance standards and frequency of work. By implementing those types of reductions, the total annual maintenance costs could be reduced to around \$600,000 per year, which would reflect long-term funding expectations according to Region 6 guidelines.

In addition to the costs of maintaining the road system to these minimum standards, there are also costs associated with any proposed road decommissioning, road closures, and road improvements necessary to address risks and environmental concerns that are identified in the TAP report. These costs are not included in the balancing of road maintenance funds because funding for these activities is not appropriated along with the normal road maintenance funds used in the calculations. Funding for this type of work generally comes through other programs such as capital investment programs, Legacy Roads and Trails funding, Federal Highway programs, partnerships with outside groups and agencies, etc. The estimated costs to implement the opportunities described above are:

Table 9. Estimated capital costs of improvement and decommissioning work

Category	Miles	Cost / Mile	Total Cost
Estimated Cost to put roads in storage	325	9,000	\$2,925,000
Estimated Cost to decommission roads	543	11,000	\$5,973,000
Estimated Cost for improvement work	1,500	5,200	\$7,800,000
			\$16,698,000

For example, the cost to prepare 325 miles of road for storage as ML 1 roads is estimated to be around \$3 million dollars. The cost to decommission 543 miles of road would be about \$6.0 million and the cost to perform a variety of road improvement work to mitigate resource concerns identified in the TAP would cost somewhere in the neighborhood of \$8 million.

Given the current trend in reduced funding for road maintenance work, and the enormous gap between current funding and need, it does not appear possible to identify a future road system where the entire cost of annual maintenance work necessary to fully maintain the roads to standard would be in balance with available funding, (i.e., to include annual maintenance items and cyclic capital costs for replacement of gravel surfacing, pavements, structures, bridges, etc.). In the Pacific Northwest Region, the size of road system to meet that requirement would be less than 100 miles per National Forest and would not allow forests to meet resource management objectives in their Forest Plans or to meet statutory and regulatory requirements. Because we will not have enough funding available to keep all road surfacing materials and structures replaced on schedule, we can expect the deferred maintenance backlog to continue to grow, and we will continue to see a decline in the overall serviceability of our road system.

However, even though we can't alter the road system so much as to be fully affordable and sustainable within today's budget levels, we can certainly take steps to move it in a better direction. By utilizing the opportunities identified from the Deschutes NF Travel Analysis Process, we can certainly move the Deschutes NF road system to a much more affordable and sustainable state.

Literature Cited

USDA Forest Service. 1999. Roads Analysis: Informing decisions about managing the National Forest Transportation System. Misc. Rep. FS-643. Washington, D.C.: U.S. Dept. of Agriculture Forest Service. 222 pp.