

**ROGUE RIVER - SISKIYOU NATIONAL FOREST  
ROADS ANALYSIS**

**APPENDIX C  
ROAD MAINTENANCE COSTS**

**January 2004**

## **Maintenance - Rogue River National Forest**

Maintenance is “the act of keeping fixed assets (fixed asset; a constructed feature such as a building, dam, road, trail or other item of infrastructure) in acceptable condition. A fixed asset includes preventative maintenance for normal repairs, replacement of parts and structural components, and other activities needed to preserve a fixed asset so that it continues to provide acceptable service and achieves its expected life. Maintenance excludes activities aimed at expanding the capacity of an asset or otherwise upgrading it to serve a different purpose from, or significantly greater than, that originally intended.” (USDA Forest Service, Instructions to Determine Forest Development Road System, Annual Maintenance, Deferred Maintenance and Capital Improvement Needs, September 1998, page nine). Maintenance includes work needed to meet laws, regulations, codes and other legal direction as long as the original intent or purpose of the fixed asset is not changed (USDA Forest Service, Instructions To Determine Forest Development Road System, Annual Maintenance, Deferred Maintenance and Capital Improvement Needs, September 1998, page nine).

Road maintenance surveys are typically conducted yearly on maintenance level 4, level 3, and some of the maintenance level 2 roads. The amount of annual maintenance work needed can vary from different perspectives such as soils, geology, elevation, slope aspect, road gradient and surfacing type.

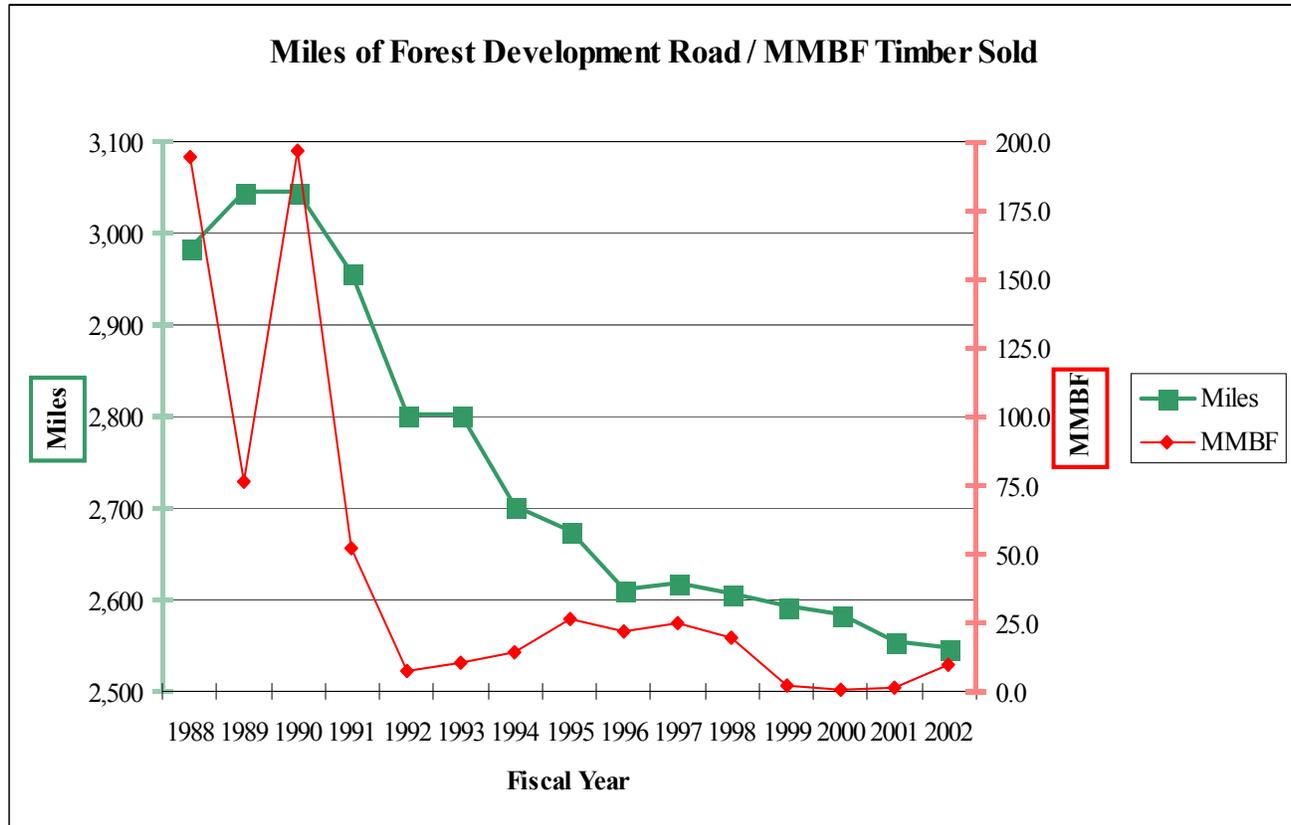
A road is considered fully maintained when the completed maintenance activities leave the road in a condition that meets the maintenance criteria established by the Road Management Objectives. Road Management Objectives (RMOs) define the intended purpose of an individual road based on management area direction and access management objectives. Road Management Objectives include design criteria, operation criteria and management criteria (FSH 7709.55, section 30, Forest Transportation Planning Handbook, 11-17-97, page 21).

### **Historical Perspective on Road Maintenance Funding**

The range for direct road costs (maintenance, repair, closing, etc.) is large because actual costs are directly dependent on the unique characteristics, such as topography and soil type, of a particular road or road system.

Background – The following Figure C-1 illustrates the road-building trend on the Rogue River National Forest from 1988 to 2002. These roads were primarily constructed to support timber-related land management objectives established prior to the 1994 Northwest Forest Plan amendment to Forest Service and BLM land management documents. Each mile of constructed road is dependent on annual maintenance to keep the road safe and the environmental risks to an acceptable level, and to protect the road investment. These roads were constructed with the expectation that timber-based land allocations would generate funding for annual road maintenance on a long-term basis.

**Figure C-1. Road Building Trend from 1988 to 2002 on the Rogue River National Forest**

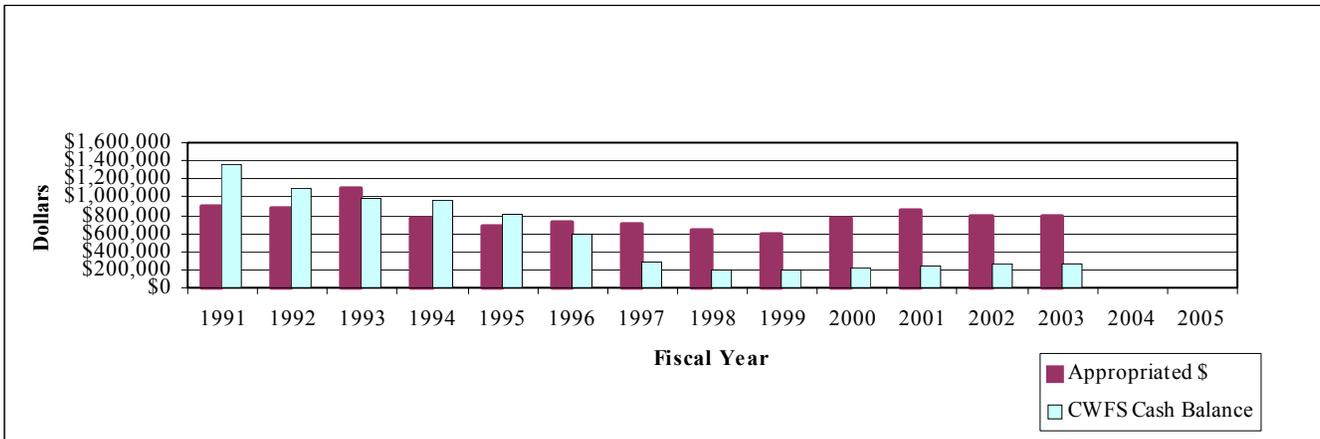


**Source: Rogue River NF annual accomplishment reports - 1988 - 2002**

Lands available for programmed timber harvest declined by 47 percent when the Northwest Forest Plan amended the 1990 Rogue River National Forest Plan. As a result, the road maintenance budget (along with the timber program) declined substantially within a short time.

From 1992 to 2002, the following Figure C-2 shows a funding decline of \$750,650 within that ten-year period, (combining appropriated and, Cooperative Work Forest Service (CWFS) trust funds) resulting in a 38 percent reduction of available road maintenance funding. This was largely due to the rapid decline of CWFS trust funds, which came from deposits generated from log haul. Despite the substantial decrease in traffic volume related to log haul, road maintenance associated with erosion, sedimentation, brushing, public safety, etc., remains.

**Figure C-2. Appropriated Dollars / CWFS Cash Balance for Road Maintenance**



The FY-2002 engineering annual road maintenance budget is about \$972,694. Overhead and support costs reduce this by roughly 17 percent, leaving approximately \$807,336.

In 1990 there were approximately 3,045 miles of Rogue River National Forest System Roads. Today there are approximately 2,550 miles of classified roads remaining, representing a net reduction of about 495 miles or approximately a 16 percent reduction in Forest road miles in the last ten years.

### Annual Road Maintenance Costs

Prior year maintenance accomplishments and yearly maintenance surveys are two of the principal tools used in compiling yearly maintenance plans explained below from a maintenance levels perspective.

Generally speaking, the following maintenance work activities are to be considered when preparing annual maintenance plans: brushing, logging out, slide and/or slough removal, surface rock replacement, bituminous replacement, dust abatement, surface maintenance, ditch and culvert maintenance, and snag/danger tree removal.

Maintenance level 3 and level 4 (see Appendix E - Glossary) roads would typically have the following annual maintenance activities accomplished: grading of roadway, brushing/logging out, slide removal, ditch maintenance, culvert maintenance, sign maintenance, and structure maintenance. Cyclic maintenance (costs incurred on a two-to-five year wear and reapplication basis) could include spot surface rock replacement for aggregate, pit run, cinder, and chip seal or asphalt pavement surfaced roads. It is factored into the annual maintenance costs shown in Tables C-1 and C-2.

Maintenance level 2 (see Appendix E - Glossary) roads would typically have the following annual maintenance activities accomplished: grading of roadway on an intermittent basis (every two years), brushing/logging out; slide removal, ditch maintenance, culvert maintenance, sign maintenance, and structure maintenance.

Cyclic maintenance (costs incurred on a two-to-five-year wear and reapplication basis) could include spot surface rock replacement for aggregate, pit run, cinder, and chip seal or asphalt pavement surfaced roads. It is factored into the annual maintenance costs in Tables C-1 and C-2. Currently, 37 percent of maintenance level 2 roads are composed of aggregate and asphalt surfaced roads.

Maintenance level 1 (see Appendix E -Glossary) roads typically have only basic maintenance performed to keep damage to adjacent resources to an acceptable level and to maintain the road for future management activities. Emphasis is normally given to maintaining drainage and runoff patterns.

Tables C-1 and C-2 denotes estimated annual maintenance costs needed by maintenance levels under normal conditions if all of the general work activities above were implemented, with no deferred maintenance or capital improvements work considered. Maintenance activities and costs include equipment (vehicle fixed ownership rate (FOR) and use), operator, equipment mobilization, etc. Overhead and support costs would increase total costs by 40 percent or more.

**Table C-1. Estimated Annual Maintenance Cost Needs for the Cascade Mountains Area**

<b>Maintenance Level</b>	<b>Cost/Mile</b>	<b>Miles</b>	<b>Sub-Total Costs</b>
4	\$2,935.00	89	\$ 260,335.00
3	2,580.00	232	599,592.00
2	1,585.00	954	1,512,090.00
1	250.00	551	137,775.00
<b>Total Miles &amp; Costs</b>		1,826	\$2,509,792.00

**Table C-2. Estimated Annual Maintenance Cost Needs for the Siskiyou Mountains Area**

<b>Maintenance Level</b>	<b>Cost/Mile</b>	<b>Miles</b>	<b>Sub-Total Costs</b>
4	\$2,935.00	8	\$23,480.00
3	2,580.00	183	\$472,140.00
2	1,585.00	426	\$675,210.00
1	250.00	107	\$26,750.00
<b>Total Miles &amp; Costs</b>		724	\$1,197,580.00

## **Accumulated Deferred Road Maintenance Deferred Road Maintenance Direction and Expectations**

Direction - Washington Office (WO) letters, file code 6400/6500, Financial Health-Common Definitions for Maintenance and Construction Terms and WO letters dated April 19 and 30 of 1999 for Fiscal Year 1999 Financial Management Actions for Real Property and Deferred Maintenance establish initial data collection protocols, reporting, use of the Infrastructure data base and upward reporting.

Expectations - The April letters also refer to enclosure numbers two and three - clarification of expectations, which discuss pooled assets as defined in Chapter 5-Transportation, of the Financial Health Desk Guide used to track the capitalized value of linear features that includes roads and trails.

Enclosure three discusses acceptable levels for a physical inventory of pooled assets. By 2003, within the Infrastructure database, it is expected all maintenance level 4, level 3, level 2, and level 1 roads will be inventoried in accordance with established protocols. As of August 2002, the Rogue River NF has all maintenance level 4 and level 3, and 25 percent of maintenance level 1 and level 2 roads inventoried in the Infrastructure database.

Reporting - When National reports are needed, a copy of all Forest data will be uploaded to the Washington Office using the Infrastructure database. Reports will then be generated using the uploaded data (reports include applicable units and costs). This will be done at least twice a year. The first report would typically be generated in January, and the second six months later, for the annual needs report that Congressional appropriations committee requests concurrently with the President's budget. Reports generated use a national cost guide with Forest inventoried miles of work activities.

Deferred maintenance is "road maintenance that was not performed when it was scheduled, and therefore was put off or delayed to a future period" (September 29, 1998, Financial Health - Common Definitions for Maintenance and Construction terms, file code 6400/6500).

A road is considered fully maintained when the completed maintenance activities (100 percent) leave the road in a condition that meets the maintenance criteria established by the Road Management Objective (RMO). Maintenance level defines the level of service provided by, and maintenance required for, a specific road, consistent with the RMO and maintenance criteria (FSH 7709.54 - Forest Transportation Terminology Handbook and 7709.55, section 30, Forest Transportation Planning Handbook, 11-97).

### **Accumulated Project Level Deferred Road Maintenance Costs**

The following project level deferred road maintenance costs/mile were taken from a Forest-level Infrastructure report of unit costs (Regional level), and then utilizing miles inventoried extrapolated road maintenance costs. Deferred bridge costs were not included in the shown costs.

**Table C-3. Estimated FY-2002 WO Deferred Road Maintenance Costs for the Cascade Mountains Area**

Maintenance Level	Cost/Mile	Miles	Sub-Total Costs
4	\$19,332.00	89	\$1,714,748.00
3	14,911.00	232	3,465,316.00
2	4,440.00	954	4,235,760.00
1	553.00	551	304,758.00
Total Miles & Costs		1,826	\$9,720,582.00

**Table C-4. Estimated FY-2002 WO Deferred Road Maintenance Costs for the Siskiyou Mountains Area**

Maintenance Level	Cost/Mile	Miles	Sub-Total Costs
4	\$19,332.00	8	\$154,656.00
3	\$14,911.00	183	\$2,728,713.00
2	\$4,440.00	426	\$1,891,440.00
1	\$553.00	107	\$59,171.00
Total Miles & Costs		724	\$4,833,980.00

### **Road Decommissioning**

Road decommissioning is defined as activities that result in the stabilization and restoration of unneeded roads to a more natural state (36 CFR 212.1, (FSM 7703). Decommissioning on the Rogue River National Forest has been going on for over twelve years. Decommissioning does not necessarily mean returning a road to its original ground contours. This Forest has been decommissioning, on the average, 20 to 30 miles of classified roads a year. Decommissioning work components can include some or all of the following: removal of culverts, rehabilitating small and large stream channels, constructing drain dips, water bars, cross drains, out sloping roadway, revegetation of roadway cut-and-fill slopes, ripping of road surface and constructing log and earthen road entrance closures.

The cost of decommissioning classified or unclassified roads can vary greatly (\$500 to \$10,000 a mile plus) due to work terrain issues such as soil types, slope gradient, aspect, locality, etc. Some roads will naturally revegetate themselves over time and need no treatment.

## Maintenance Siskiyou National Forest

In the past, the term “maintenance” has had specific meaning to Forest Service engineers and facilities engineers. The implementation of a national reporting system for fixed-assets (INFRA) has called for application of this term by many other areas of work, including fiscal management. In an effort to standardize the interpretation of the term, the Washington Office issued a letter, dated September 29, 1998, and entitled “Financial Health – Common Definitions for Maintenance and Construction Terms,” directing that the following definition would be used:

“The act of keeping fixed assets in acceptable condition. It includes preventative maintenance, normal repairs, replacement of parts and structural components and other activities needed to preserve a fixed asset so that it continues to provide acceptable service and achieves its expected life. Maintenance excludes activities aimed at expanding the capacity of an asset or otherwise upgrading it to serve needs different from, or significantly greater than those originally intended.”

Essentially, maintenance work includes that which is needed to meet laws, regulations, codes and other legal direction, but does not include work that changes the original intent or purpose of the fixed asset.

Historically, all roads intrinsic to the transportation system of the Siskiyou National Forest were evaluated and categorized according to the level of access they provided consistent with the guidelines set forth in Section 7709.55 of the Forest Service Handbook. Roads were initially classified by the general categories of “arterial,” “collector,” and “local.” These categories described the basic function or “service level” of individual roads. An arterial road carries traffic between main destinations, whereas collectors gather traffic from various outlying areas and deposit it onto arterial roads. Finally, a local road describes a short, dead-end road.

The transportation system is further classified by projected long-term purpose, and amount of maintenance required for meeting that purpose. Several sub-categories further define specific needs or management criteria (Road Maintenance Objectives: FSH 7709.55, Transportation Planning Handbook, Sec. 30.), and facilitate the distribution of limited maintenance funds. One of these sub-categories is Maintenance Level (ML), (see Appendix E-Glossary) and is most commonly used to describe the status and overall condition of a road. Maintenance Levels range from one-to-five, (one being the lowest priority) and are assigned separately to describe both current (Operational ML) and future (Objective ML) needs. Operational MLs will be used in this analysis as a means to identify the appropriate standard for individual roads within subsequent project area analyses.

Under INFRA all of the components of a road are considered part of one fixed asset, except for dams, bridges and major culverts (over 6’ in diameter) – these are tracked and maintained under a separate category. Most of the road components are pieces of equipment that contribute to the overall function of the road (guardrails, signs, gates, culverts, etc.). A segment of road is considered “fully maintained” when all of these components meet the standard established for the road. The Maintenance Level generally represents the standard.

## Historical Perspective on Road Maintenance Funding

For many years, funds collected from commercial-use fees and timber sales sponsored the majority of the Pacific-Powers maintenance program, and completed both traffic-generated (surfacing) and non-traffic-generated (brushing) maintenance on most roads. Recently, this source of maintenance funding has diminished. Commercial-use contributions amounted to: \$1,180,000 in 1987, \$66,120 in 1993 and \$37,500 in 2001 - a total reduction of approximately 96%. Although the annual Congressional Appropriation stayed fairly consistent (\$600,000 - \$800,000) throughout the 1990s, it was reduced to \$250,000 in 2001.

In 1993, the Siskiyou officially recognized that the loss of commercial-use fees was causing the amount of deferred maintenance to increase every year, and a *Transportation Network Analysis (11/93)* was initiated. This study addressed using this process on a project-based or incident scale, to analyze impacts, prioritize maintenance work, develop funding requirements and cost reduction alternatives, and to decommission roads. Despite these efforts, the overall number of miles within the analysis area has actually increased by 9.78 miles (Table C-5). This may be attributed to land acquisitions, better tracking methods and/or changes in jurisdiction.

**Table C-5. Miles of Road by ML– 2001 and 1994**

Dist. & ML	2001	1994	Difference	DECOM	Total Gain
Chetco					
ML1	9.55	10.38	-0.83		
ML2	358.51	361.79	-3.28		
ML3	140.86	127.71	13.15		
ML4	41.77	7.8	33.97		
ML5	0	0	0		
TOTAL	550.69	507.68	43.01	-15.16	27.85
Gold Beach					
ML1	66.8	39.99	26.81		
ML2	394.86	396.58	-1.72		
ML3	111.66	110.69	0.97		
ML4	30.96	13.98	16.98		
ML5	31.25	21.59	9.66		
TOTAL	635.53	582.83	52.7	-19.16	33.54
Powers					
ML1	39.61	81.2	-41.59		
ML2	360.63	375.61	-14.98		
ML3	88.38	79.74	8.64		
ML4	33.7	11.33	22.37		
ML5	22.93	17.25	5.68		
TOTAL	545.25	565.13	-19.88	-71.49	-51.61
					9.78

\*Galice R.D: no change for those roads incorporated within the Pacific/Powers Analysis Area.

## **Annual Road Maintenance Costs**

The Forest Service does not qualify as a “Public Road Agency” (PRA). PRAs are defined as those strictly in the business of providing public access such as State and County Transportation Departments, Federal Highway Administration, etc. These agencies qualify to receive a share in funding sources such as gas taxes and commercial highway taxes, as well as annual Congressional allocations. Maintenance conducted on roads under Forest Service jurisdiction is funded through the following sources authorized under the Code of Federal Regulations:

Annual Congressional Appropriation – Covers salary, administrative costs and maintenance work. Provided at the highest hierarchical level and distributed through three additional levels prior to the unit level.

Commercial Use Fees – Road Use Permits, Special Use Permits, Timber Sales and a small percentage of the collections from Northwest Forest Passes (Fee Demo Project), Fuel wood, and Forest Product Permits

Agreements, Partnerships and Grants – Cost Share, Commensurate Share Maintenance Agreements, Memorandums of Understanding, or Special Project Grants

Project Cost Sharing – shared costs between various programs of work within the same unit (e.g. Hydrology, Wildlife, Fire)