

Willamette National Forest Pilot Road Analysis

Appendix M

Current Road Status Process Paper

October 1998

Current Road Status

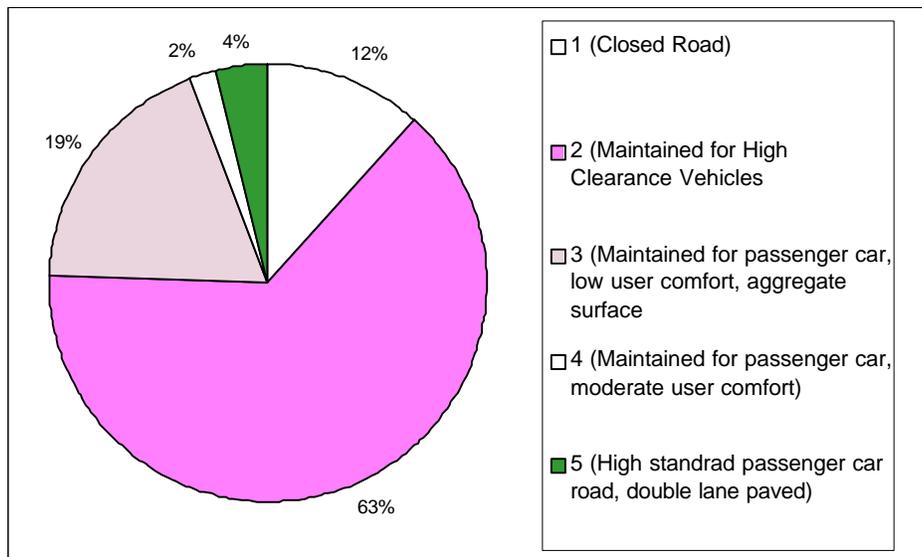
Miles by Maintenance Level

There are 6,364 miles of Forest Development Roads (FDR) in the Willamette National Forest transportation inventory. Twenty five percent (25%) of the road system is in the Maintenance Level 3, 4, and 5 categories (maintained for standard passenger cars). The Maintenance Level 2 category (maintained for high clearance vehicles) accounts for 64%, and 11% are intermittent use roads closed to vehicular traffic.

Table 3. Miles of Forest Development Roads by Maintenance Level

Maintenance Level	Miles	Error (+ or -)
1 Closed Road	736	15%
2 Maintained for High Clearance Vehicles	4067	10%
3 Maintained for passenger car, low user comfort, aggregate surface	1191	5%
4 Maintained for passenger car, moderate user comfort	124	2%
5 High standard passenger car road, double lane paved	246	2%
Total	6364	

Figure 2



. Miles of Road by Maintenance Level

Unclassified Roads

There are 360 miles of unclassified wheel tracks documented as GIS line segments on the TRAN Layer. It is thought that the actual miles of undocumented wheel tracks on the forest are probably double that amount. In general, it is thought that unclassified roads have a low impact in terms of erosion and sedimentation. A recent road survey of Coffeepot Head BGEA supports this assumption (see Table 4 and Table 5).

Unclassified roads typically result from low-standard temporary roads built within the scope of timber sale contracts. Temporary roads are not recorded or mapped in the Forest database. After intended use, such roads are typically decommissioned but are often visible as primitive wheel tracks or show up as features in aerial photos. Unclassified roads also result from unauthorized off-road vehicle use to access dispersed recreation sites.

Table 4. Summary of Coffeepot Head BGEA Road Inventory

Location	Miles FDR	Miles of Unclassified Roads (<i>Ghost</i>)	Total Miles of Road	Percent increase in road miles
Coffeepot Head BGEA	85.19	5.91	91.11	+6.9%
Mean Length of Unclassified Road: 0.145 mile			Total area covered: 15,200 acres	

Table 5. Condition of Unclassified Roads in Coffeepot Head BGEA

Unclassified Road	Length	Closure Priority	Comments
2118-479/ O.S.	0.043	low	no culverts
2118-479/ O.S.	0.08	low	no culverts/ old cross trenches
2118-479/ O.S.	0.048	medium	no culverts/ landing is failing/stream crossing problem
2118-479/ O.S.	0.066	medium	no culverts/tension cracks present/sag near jct with 479
2118-479/ O.S.	0.151	low	no culverts/ no berm
2118-481/ O.S.	0.161	low	no culverts/ ridge road /landing stable
2118-478/ O.S.	0.114	low	no culverts
2119-O.S.	0.057	low	no culverts
2119-O.S.	0.095	low	no culverts/ entrance being used as a waste area
2119-O.S.	0.092	low	no culverts/ used as waste area/650ft O.S. found on road
2119-O.S.	0.114	low	no culverts
2119-O.S.	0.142	low	no culverts
2119-452/462/O.S.	0.165	low	no culverts/passes quarry
2119-452/466/O.S.	0.104	low	no culverts/ crossed bermed

Unclassified Road	Length	Closure Priority	Comments
2119-452/O.S	0.066	low	no culverts
2119-452/O.S.	0.095	low	no culverts/ripped
2119-452/O.S.	0.18	low	no culverts
2119-452/O.S.	0.047	low	no culverts/ bermed entrance
2119-452/O.S.	0.152	low	no culverts/ bermed entrance/ roadcut sloughing
2119-478/O.S.	0.246	low	no culverts/ trenched/
2119-478/O.S	0.088	low	no culverts/road closed
2119-478/O.S.	0.138	low	no culverts/road closed
2119-478/O.S.	0.15	low	no culverts
2119-478/O.S.	0.208	low	no culverts/entrance bermed/ripped & cross trenched
2307-O.S.	0.019	low	no culverts/ old road
2307-O.S.	0.068	low	no culvert/ road recovering
2307-O.S.	0.057	low	no culverts/ road recovering
2307-O.S.	0.114	low	no culverts/ road recovering
2307-O.S.	0.455	medium	culvert stream crossing removed at .379 miles.Check i
2307-O.S.	0.157	low	no culverts/ road recovering
2307-475/ O.S.	0.038	low	no culverts/ road recovering
2307-475/ O.S.	0.131	medium	no culverts/ road goes to old quarry/ stone mountain
2307-484/ O.S.	0.044	low	no culverts/ campfire ring
2307-484/ O.S.	0.19	low	no culverts
2307-484/ O.S.	0.25	low	no culverts
2307-483/ O.S.	0.131	low	no culverts/ large bare soil area needs machine fert
2307-473/ O.S.	0.115	low	no culverts
2307-476/ O.S.	0.063	low	no culverts/ steep road cut

Data Accuracy

Numerous corrections and revisions have been made to the Transportation database since 1992. However, mapping and database errors do exist. Table 3 gives an estimate of the current status of errors in transportation data (i.e. where GIS map locations, mile totals, open or closed status, or road existence differs from actual field conditions).

About 100 miles of road in the transportation database (TMS) do not have corresponding line segments on the GIS transportation map. Many of these roads are no longer apparent on the ground.

Key Forest Travel Routes

The primary/secondary road system was identified in a Forest-wide Access and Travel Management analysis in 1995. These consist of 2,130 miles providing the key travel-routes needed for long-term management of the National Forest. They provide vital linkages to local communities, State and County Highways, private land ownerships as well as furnishing inter-forest connections to trailheads and major recreation sites.

Table 6. Forest ATM Route Designation

ATM Designation	Miles
Primary (High standard through-routes, arterial linkages, Scenic Byways)	430
Secondary (Key inter-forest connections to interior recreation, forest management, fire response)	1,700
Local (Candidates for reduction of maintenance standards, decommissioning or obliteration)	4,234

The remaining roads not designated as primary/secondary (4,234 miles) are generally local routes whose long-term status will be analyzed at the watershed or project scale. These routes are considered candidates for reduction of maintenance standards, decommissioning or obliteration.

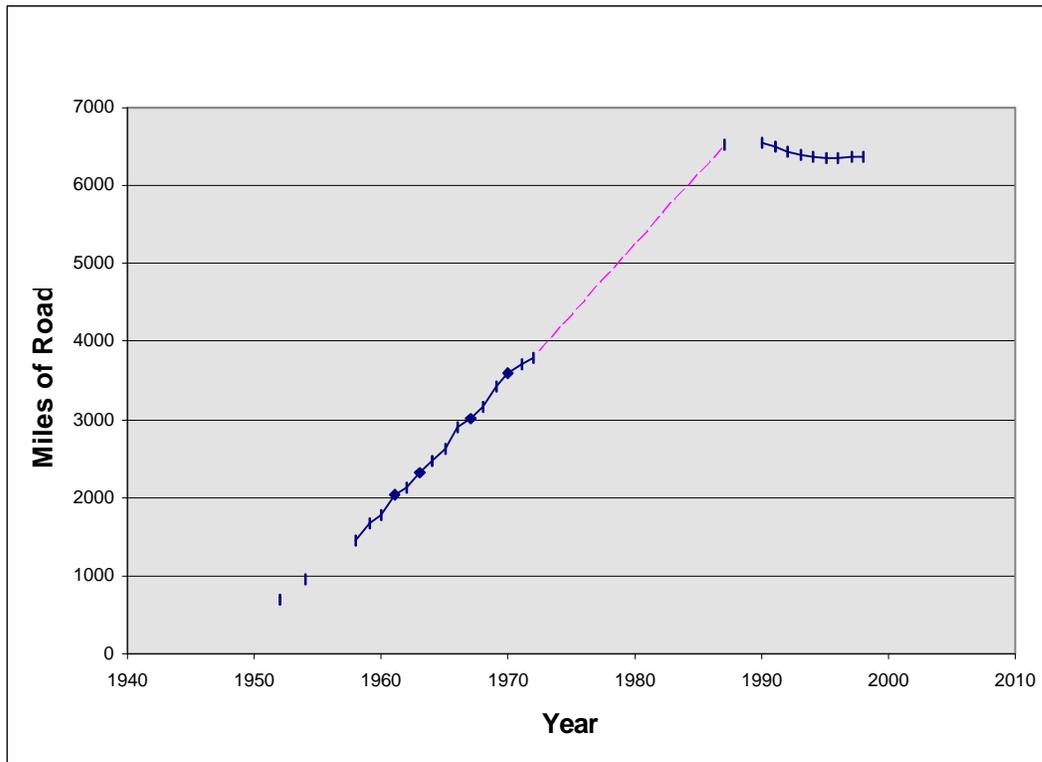
Economic Situation

Economics Question # 3.*What are the maintenance costs of the existing road system? How does that compare to recent forest road budgets and projections of future forest road budgets?*

Direct costs for roads such as maintenance, repair, closing, etc. are given in large ranges because actual costs are directly dependent on unique characteristics of that road or road system such as topography and soil type.

Background

Figure 3 shows the road building trend on the Willamette National Forest from 1953 to 1998.



New road construction averaged over 100 miles per year between 1953 and 1989. These roads were primarily constructed for the accomplishment of the timber related land management objectives prior to the 1990 Willamette Forest Plan as amended by the NW Forest Plan. Each mile of constructed road is dependent on the performance of annual maintenance to keep the road safe, to keep environmental risks to an acceptable level, and to protect the investment in the road. These roads were constructed with the idea that the timber based land allocations would generate funding for annual road maintenance on a long term basis. However lands suitable for timber harvest declined by 75% when the 1990 Willamette Forest Plan was amended by the NW Forest Plan. As a result, along with the timber program, the road maintenance budget declined substantially within a short time frame. Figure 4 shows funding declined from \$7.25MM in 1989 to \$3.25MM in 1992, or \$4MM in three years. This was largely due to the rapid decline of the CWFS trust fund which was funded by deposits generated from log haul. Even though traffic volumes related to log haul have decreased substantially, non traffic generated road maintenance associated with erosion, sedimentation, brushing, and public safety still remain.

Figure 3. Miles of Forest Development Road from 1953 to 1998

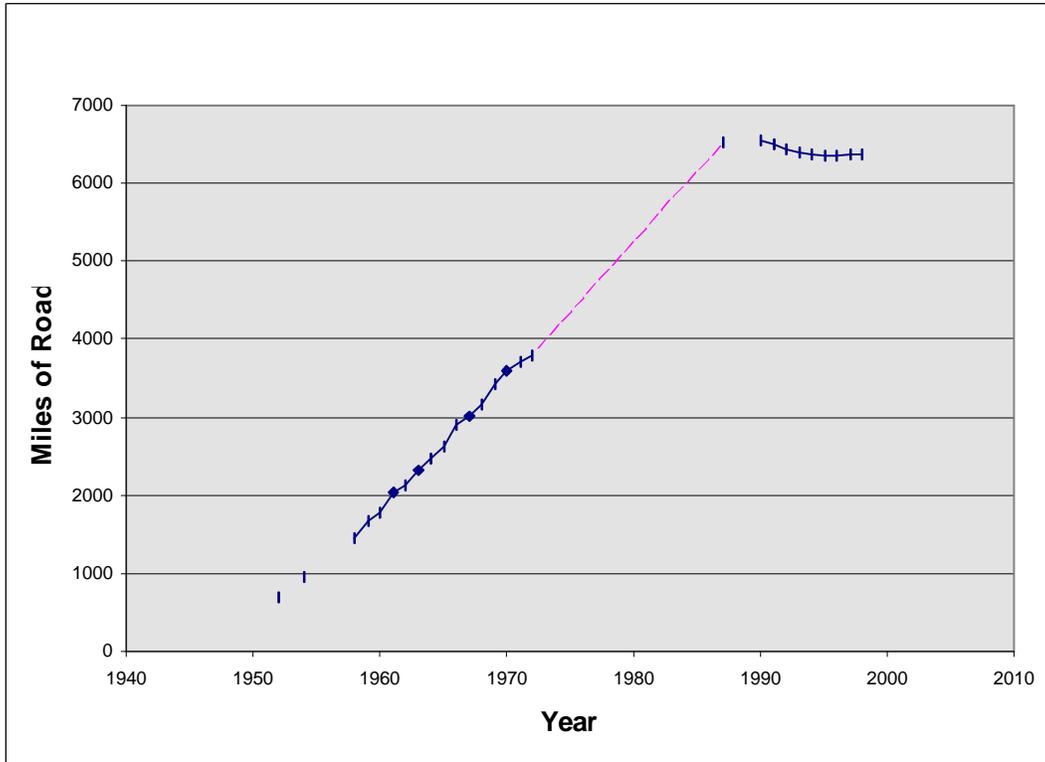
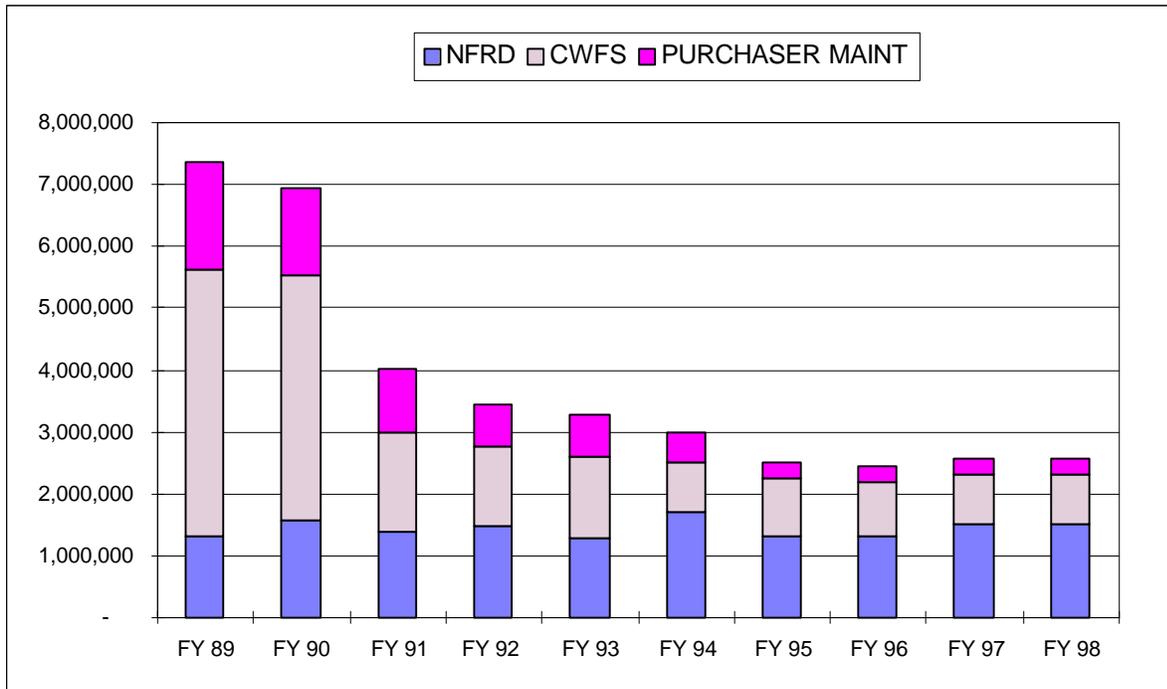


Figure 4. Road Maintenance Funding Levels



The current annual road maintenance budget is about \$2.4MM Figure 4. The \$2.4MM budget amount is reduced by a near 40% for overhead costs. Thus \$1.4MM is available to perform annual road maintenance. .

Estimated Annual Maintenance Costs to Maintain Existing Road System to Programed Maintenance Levels

Because of the substantial costs associated with downsizing the Forest road system, the miles of Forest Development Roads have not decreased significantly since 1989

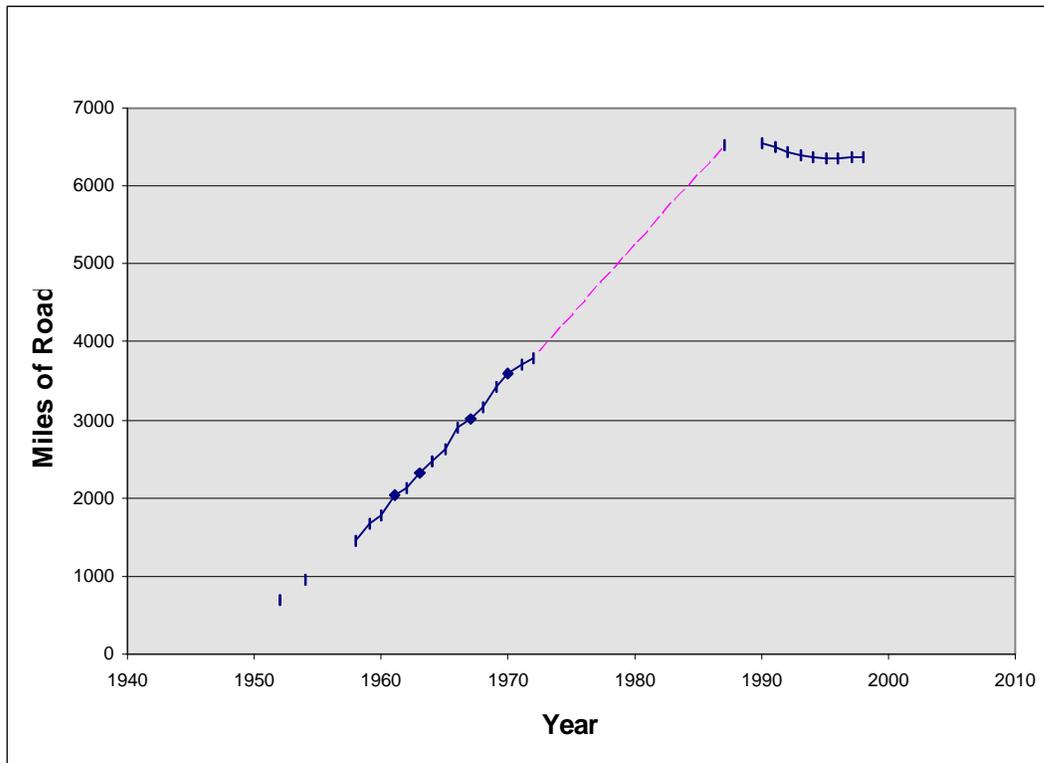


Figure 3). With the decline of the maintenance budget (but not a corresponding reduction of miles of roads needing annual maintenance) today there are insufficient funds to maintained the road system in a safe and environmentally sound condition.

Table 7 shows that an estimated \$3.4MM per year is needed "on the ground" to perform the necessary annual maintenance. The total funding to the Districts is \$1.4MM per year. There is thus an estimated "on-the-ground" budget shortfall of \$2MM per year.

Table 7. Estimated Annual Maintenance Costs for Road Maintenance to Standard

Maintenance Level	Low Cost/mile	High Cost/mile	Average Cost/mile	Total Funding Needs	Total Funding to Districts	Funding Shortfall
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1 (736 miles)	\$25	\$75	\$50	\$36,800	\$1,400,000	Distribution to Districts
					to perform maintenance for all roads	
2 (4,067 miles)	\$100	\$400	\$250	\$1,016,750		
3 (1,191 miles)	\$500	\$1,500	\$1,000	\$1,191,000		
4 (124 miles)	\$800	\$3,000	\$1,900	\$235,600		
5 (246 miles)	\$2,500	\$5,000	\$3,750	\$922,500		
Total Annual Maintenance Costs				\$3,402,650/yr	\$1,400,000/yr	-\$2,000,000/yr

The estimated funding to fully maintain the Primary/Secondary road network (those key travel routes the

Forest identified to remain open for the long term) is \$2.4MM. The network of key travel routes is thus underfunded by \$1.0 million if no funding was directed towards the remaining roads.

(Note: Note that this estimate does not include overhead costs, deferred maintenance or capital improvement needs. It is based on current contract costs and district force account costs for annual maintenance.)

Road Decommissioning Costs Scenario

Preliminary estimates indicate that the Forest is under-funded by more than 50% to maintain the road network to full standard. Over 3,000 miles of the Forest road network would have to be reduced to a near self-maintaining condition (or zero maintenance cost) to be in line with current funding levels. Typical costs for decommissioning (based on contract estimates) for the average road range from \$5,000 to \$15,000 per mile. Thus on-the-ground costs to decommission 3,000 miles of forest development roads could be in the \$30,000,000 range. This cost does not include planning, public involvement, or NEPA related analysis.

Appendix

Back-up Costs

A. Decommissioning Unit Costs :

Environmental Risk	Type of decommissioning	Cost per mile
Low Risk	ML 1 or 2 roads, flat slope, waterbars, no live stream culvert removal, no large fills	\$2,000/mile to \$5,000/mi
Moderate Risk	Removal of some small culverts, minor to moderate live stream channel restoration, waterbars, some moderate fill restoration	\$5,000 to \$15,000/mi
Severe Risk	large fills, Large culvert removal, some sidecast pullback, major stream channel restoration	\$15,000 to \$30,000 mile

Note: Site specific conditions can lead to decommissioning costs much higher than indicated above.

B. New Road Construction and Reconstruction Unit Costs

Estimated Unit Road Construction Cost (*on-the-ground contract costs, does not include FS planning, contract prep. administration*)

Type of Road	Cost per mile
Unsurfaced single lane, minimum standard road built on abandoned spur or skid trail, flat to gentle slope	\$9,000/mile

Single lane maintenance level 2, Traffic Service Level D, turnout spacing 1,000 feet	
❖ Flat to gentle slope, no drill and shoot,	\$15,000 to \$20,000/mi
❖ Moderate slope, generally balanced section	\$25,000 to \$40,000/mi (rocky ground)
❖ Full Bench, rocky ground, some drill and shoot	\$100,000/mi
	<i>Add \$10,000/mile for crushed rock surfacing</i>

C. Road Construction, Reconstruction, and Decommissioning Trends 1991 - 1996

New road construction has averaged about 7 miles per year and road reconstruction 123 miles for the past 3 years. Planned activities levels in Forest Plan were 40 miles of new construction and 174 miles of reconstruction per year.

Table 1. Road Construction, Reconstruction, Decommissioning.

Year	Constructed	Reconstructed	Decommissioned(obliterated)
1997	7.0	203.4	18.9(non-system)
1996	6.9	95.7	2.7
1995	7.7	69.6	4.5
1994	0.2	2.7	44
1993	8.9	37.6	40
1992	2.3	20.7	52
1991	23.1	101.8	51.8
Totals	56.10	531.5	213.9

References

- USDA Forest Service, Forest Service Handbook 7709. 1991a. Transportation Systems Operations Handbook, Travel Management. 7709.59-91-1.
- USDA Forest Service, Forest Service Handbook 7709. 1988. Transportation Handbook, Process for Access Management, 7709.55.
- USDA Forest Service, Forest Service Handbook 7709. 1992. Transportation System Maintenance Handbook, Maintenance Level Descriptions, Maintenance Activities and Maintenance Standards, and Maintenance Sharing. WO Amendment 7709.58-92-1.
- USDA Forest Service, Forest Service Manual 7700. 1994a. Transportation System. WO Amendment 7700-92-6.

