22. Maintenance of Roads (PRACTICE: 2-22)

a. Objective: To maintain roads in a manner which provides for water quality protection by minimizing hydrologic connectivity and grading of hydrologically connected road reaches, road surface rutting, drainage failures, side-casting material, and blockage of drainage facilities, while considering maintenance equipment operator and road user safety, other affected resources, and funding availability.

b. Explanation: Every road requires some level of maintenance, due to deterioration from use and weather. The rate of deterioration varies greatly, depending on numerous factors: volume and type of vehicle traffic, amount, type and duration of precipitation, soil characteristics, road surfacing, road grade, number and type of drainage features, topography, adjacent vegetation, and frequency of maintenance operations. There is no such thing as a "self maintaining road" as even the most properly designed and constructed road needs the occasionally maintenance, however minor. Roads that appear to be "self maintaining" most likely possess drainage features that are properly located and installed to address expected use and weather, or are located in areas where impacts are negligible. Roads that appear to be "maintenance nightmares" most likely are located in areas susceptible to erosion regardless of use, and regular heavy maintenance may be necessary to keep them available for use. Road management objectives include the objective and operational maintenance level of each road.

The decision to keep or decommission a road requiring heavy maintenance is influenced by meeting land management objectives and project specific travel analysis. An annual road maintenance plan is prepared each year, based in part from: road condition surveys; historical maintenance needs; response to natural events (plugged culvert or downed trees); in conjunction with specialists and program managers. The plan is discussed with and submitted for Line Officer approval. The plan reflects forest priorities for roads to receive maintenance within expected funding availability. Approved road maintenance plans provide the general guidance for the annual activities, while at the same time acknowledging that unforeseen events may require deviation from the approved plan, such as landslides, fire, washout, etc.

Minimum goals of road maintenance are to keep drainage features working properly, allow for safe and efficient use, protect water quality and other forest resources, and protect the road investment. Higher levels of maintenance are implemented when use activity and forest management goals dictate them, such as stabilizing surfaces for resource extraction, or maintaining a smooth surface for high levels of passenger vehicle use.

c. Implementation: Road maintenance funds are not sufficient to allow for annual maintenance on every road every year. Typical maintenance may include clearing debris, grading roadway surface and dips, cleaning lead-off ditches and culverts, hazard tree removal, brush clearing for safe sight distance, replacement of failed traffic controls, placement of spot rock, and filling potholes. These tasks are reflective of road management objectives and the assigned operational maintenance level. Forest scale travel analysis may provide opportunities to modify the assigned operational

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Comment [WW1]: The meaning of "drainage failures" is unclear. In all these items they need to be more specific. Thus they might want to minimize culvert plugging and stream crossing washout, eliminate stream crossing diversion potential, eliminate sidecasting on stream sideslopes where sediment could enter a watercourse, reduce or eliminate hydrologic connectivity between roads and streams, etc. Their wording in this objective is not concise or accurate as it stands.

Comment [WW2]: Minimizing sidecasting does not necessarily result in water quality improvements or protection. Lots of areas can have sidecasting with no adverse effect. It should read "minimizing sidecasting where soil could enter a watercourse."

Comment [WW3]: Not all blocked drainage structures result in sediment delivery. Lots of blockages of ditch relief culverts have no real consequence. Perhaps what they really mean is to minimize stream crossing culvert plugging.

Comment [WW4]: Here's the crux of the problem: if you have a road you must inspect it and maintain it! Period. If you are to protect water quality there is no other option. The USFS has routinely ignored their road maintenance requirements because they do not have sufficient funds to maintain their road network. It is true and it is an agency-wide problem. It ultimately speaks to the issue that the USFS has too many roads for their available budget. It also implies that it is imperative that the FS identify their minimum road network, one which they can effectively maintain and that has a minimum impact on aquatic resources and water quality. This has to be step #1. They then need to aggressively ... [1]

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Comment [WW5]: It should also be influenced by 1) the long term cost of maintaining the road, and 2) the environmental impact and threat p ... [2]

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Comment [WW6]: This reads more like the Objectives, not Goals.

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Comment [WW7]: Road maintenance should include two elements: 1) inspection, and 2) maintenance. Although they do not maintain "every road e ... [3]

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maintenance level while still meeting land management objectives, providing for safe use, and minimizing resource impacts.

Road maintenance plans are implemented through contract, cooperators, force account, and active timber sale or other authorized activities. Contract, timber sale, and other authorized/permitted operations are bound by specifications and drawings. The COR is responsible for assuring compliance by contractors; ER, TSA, or FSR assures compliance by cooperator, purchaser or permitted operator. Project manager and crew supervisor assures compliance for force account work. Optimally, the forest hydrologist works with the Forest quality assurance personnel to determine if approved maintenance tasks are completed with minimal resource impacts. Adjustments to future maintenance plans and methods are implemented when previous methods fail to prevent significant impacts.

Regardless of whether road maintenance is accomplished with force account crew, contractor, permittee, or cooperator, the road maintenance plan requires Best Management Practices. They are incorporated as specifications, contract or sale clauses, operating plan requirements, permit clauses, and are often shown in the drawings. Where monetary compensation is exchanged for maintenance work, failure to adhere to BMP's can result in withheld payment. Other leverage could be a revoked permit. Adherence to BMP's could be included in road maintenance personnel performance standards.

Reference: Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects , FP-03 Edition
Timber Sale – Road Maintenance T-800 Specifications
FSM 7730 – Road Operation and Maintenance
FSH 7709.59, Chapter 60 – Road Maintenance
Manual on Uniform Traffic Control Devices – 2009 Edition

Comment [WW8]: Past experience across the PNW shows that this management process is problematic. The operational level (maintenance level classification) of roads is lowered so that they fall into a lower use level category and thereby put them in a lower maintenance level. This may accomplish nothing other than to make it look like the Forest is not so far behind in their maintenance needs as they really are. Every road that is reclassified into a lower maintenance level receives less maintenance than before, even though the physical need for maintenance has not actually changed. The most unfortunate part of the downgrading of roads is when a road goes from a Maintenance Level 2 (high clearance vehicles) to a Maintenance Level 1 (closed to vehicles). Level 1 roads receive minimal, infrequent, custodial maintenance; however, even though such roads are used infrequently, they are still subject to problems such as plugged culverts and failures of stream crossings. Here's the USFS definition:

Maintenance Level 1: These roads are closed. Some intermittent use may be authorized. When closed, they must be physically closed with barricades, berms, gates, or other closure devices. Closures must exceed one year. When open, it may be maintained at any other level. When closed to vehicular traffic, they may be suitable and used for nonmotorized uses, with custodial maintenance.

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Comment [WW9]: Why "optimally?" This should always be the case. Maintenance is performed for at least two reasons: 1) to make the road passable and safe for the intended traffic, and 2) to reduce impacts to water quality. To accomplish the latter, an experienced water quality hydrologist should be involved in the maintenance planning and oversight.

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Page 1: [1] Comment [WW4] **Bill Weaver** **3/21/1980 3:16:00 AM**

Here’s the crux of the problem: if you have a road you must inspect it and maintain it! Period. If you are to protect water quality there is no other option. The USFS has routinely ignored their road maintenance requirements because they do not have sufficient funds to maintain their road network. It is true and it is an agency-wide problem. It ultimately speaks to the issue that the USFS has too many roads for their available budget. It also implies that it is imperative that the FS identify their minimum road network, one which they can effectively maintain and that has a minimum impact on aquatic resources and water quality. This has to be step #1. They then need to aggressively decommission high risk, high maintenance roads and relocate their reduced, minimum road network to low risk, low maintenance ridges and upper hillslope areas.

Page 1: [2] Comment [WW5] **Bill Weaver** **3/21/1980 3:16:00 AM**

It should also be influenced by 1) the long term cost of maintaining the road, and 2) the environmental impact and threat posed by the road.

Page 1: [3] Comment [WW7] **Bill Weaver** **3/21/1980 3:16:00 AM**

Road maintenance should include two elements: 1) inspection, and 2) maintenance. Although they do not maintain "every road every year" they should set up a riquired inspection schedule so that all roads on every Forest are inspected at least once every three years (and more extensively after years with significant winter storms), and maintained as dictated by the inspection results (unplugging culverts, etc.). Some years with large peak flow events (e.g., >10 yr recurrence) will require that the Forest mobilize all their available personnel and inspect all their roads for plugged or partially plugged culverts and pending fillslope failures. This should be treated like a large wildfire where everyone drops their normal duties and helps out. Maintennce is then conducted to head off potential and preventable failures.