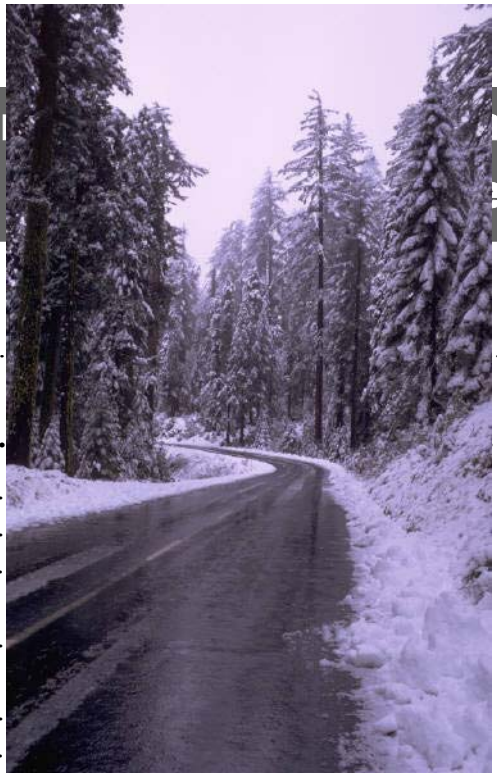
Chapter 6 Describing Oppo ng es



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Problems and Risks Posed by the Current Road System

Introduction

To assess the problems and risks posed by the current road system, the IDT evaluated the primary transportation system on the Umatilla National Forest using the following tools: a GIS assessment, a road matrix, and a road management graph. There were some inherent limitations in the data used.

GIS Assessment: The effect of roads on the watershed and aquatic resources was analyzed using GIS computer technology combined with the Forest transportation inventory and cartographic feature files.

The Road Matrix (Appendix B) lists every road considered part of the primary transportation system. This includes all of the objective maintenance level 3, 4 and 5 roads on the Forest as well as the objective maintenance level 2 collector roads. The matrix assigns low, moderate, or high values to resources, and includes annual and deferred maintenance costs. This is a broad assessment, so the detail and accuracy for road risk and values contain a degree of subjectivity and potential for inaccuracies. However, this road matrix provides road-specific information that will help define the potential minimum road system, identify roads that pose high risk to other resources, and prioritize sub-forest-scale projects. As more information becomes available, the road matrix information should be validated and updated.

The Road Risk-Value Graph (Figure 2) was developed to display the information in the road matrix. It categorizes the values and risks of the current road system and helps identify opportunities for managing the road system and prioritizing expenditures of Forest road maintenance and improvement funds. This graph is only a management guide; it is not firm direction as it combines many of the road matrix risk and value variables.

Resource Risks versus Road Use Values

The risks and values from the road matrix (Appendix B) and the road management graph are defined below.

Road-Related Risks

Watershed: Watershed risk was developed through GIS analysis (Appendix A) using 5th level watersheds. Road segments in each watershed were assigned the appropriate risk level (high, medium or low). This was intended to guide sub-forest-scale analysis.

Aquatic Species: Watershed risk was developed through GIS analysis using 5th level watersheds. Road segments in each watershed were assigned the appropriate risk level (high, medium or low). This was intended to guide sub-forest-scale analysis.

Wildlife Species: Many scientific studies have documented impacts to wildlife, including direct mortality, habitat fragmentation, edge effects, viability and sustainability, and nesting and rearing disturbances. The IDT utilized these studies as well as the Forest's annual monitoring reports to evaluate wildlife risks. The monitoring reports clearly demonstrated that the current road system has minimal effects on the management indicator species listed in the Forest Plan. Most of the wildlife risk values assigned to each road on the Forest were low, a few were moderate, and none were in the high category.

The nearness to roads of important habitat characteristics was used as the main criteria in determining the rating. Each road segment was rated as having a High (H) = serious risk; Moderate (M) = moderate risk; or Low (L) = low, or no known risk to federally listed endangered and threatened species, and Forest Service sensitive species. The important habitat characteristic for bird species with a relative low tolerance for disturbance was nests near a roadway. For plant species, it was the occurrence of the plant in or immediately adjacent to the roadway.

More information about road impacts to wildlife on the Umatilla National Forest can be found in the TW section (Chapter 4) of this report.

Invasive Plant Species: For each road segment, noxious weed risk was evaluated by four key factors that control or strongly influence the introduction, spread, and impact of noxious weeds. These include: (1) seed availability and consequences of further spread (areal extent of existing weed infestations for high and low risk weed species), (2) habitat potential (vegetation and climatic conditions), and (3) spread potential (level of grazing activity). Data sources used in the model incorporate GIS coverages and databases of current (2001) noxious weed inventories, Forest transportation layer, grazing allotments, existing vegetation, and potential vegetation groupings

Financial Risks: Annual and deferred maintenance costs were included in the risk/value categories for the road management graph. These costs were included to reflect the Forest's financial commitment to maintain the road system and to identify the link between maintenance and resource protection. If basic annual road maintenance (such as drainage maintenance) is not performed, roads have an increased potential for loss of investment and environmental damage. The same is true for deferred maintenance, such as replacing major culverts in perennial streams at the end of their service life. A catastrophic drainage failure will have a direct negative impact on the associated watershed and aquatic health.

Engineering Concerns: Factors such as geology, soils, slope, and past development activities affect the costs and difficulties of maintaining or improving a road. These factors become concerns when they lead to excessive erosion of the road surface and prism, tendency for rutting, recurring maintenance, or slope failure that could damage or remove portions of a road. Engineering concerns are rated high, medium, and low. Development of redundant alignments is also considered an engineering concern. Such conditions occur in areas of timber development, high recreation, or OHV use.

Road-Related Values

Resource Management Values: This value was based on two factors: road length and the variety of land and resource management access needs provided by the road. Initially, each road was given a default value rating based on its length.

Roads 10 miles in length or greater, received a high value rating. Roads from 0.0 to 7.0.9 miles in length were given a low value. Roads greater than 7 and less than 22.0 miles long were rated moderate. Roads greater than 22 miles long were rated high. For the second step, the following seven criteria were used on a road-by-road basis to adjust the default values. They were access to the suitable timber base, rangelands, private land, electronic sites, administrative facilities, water production or storage facilities, and minerals exploration and extraction. These criteria were used either alone, in cases where one use was very important for management of that resource, or in combination where the road served two or more access needs.

Recreation Use Values: The value of recreation use of the road system was rated separately. High values were assigned to roads that provided direct access to developed recreation sites or were key recreation access roads to the Forest. Moderate to high values were assigned to dispersed recreation areas along roads with heavy summer and fall use. Low values were often assigned to roads that provided only seasonal dispersed recreation use.

Road Management Categories and Graph

After performing a road-by-road rating of risk and value based on the established criteria, the following road management categories and graph were developed to display the information and present opportunities for road management. The matrix and watershed assessment provide a basis for sub-forest-scale roads analyses. The following four categories of roads were identified based on value and risk. Within each category, there are possible management options for the roads.

Category 1: High Value and Low Risk – Ideal Situation

Options:

- Focus road maintenance funds on these roads to keep them in this category.
- High priority for the Public Forest Service Road designation.
- These roads form part of the potential minimum road system for the Forest.

Category 2 – High Value and High Risk – Priorities for Capital Improvements

Options:

- High priority for sub-forest-scale roads analysis to identify opportunities to reduce high risks. High priority for capital improvement funding, PFSR designation, road improvement, deferred maintenance and capital improvement funding. Shift road maintenance funds to these roads to keep their resource risks from increasing.
- These roads are the remainder of the potential minimum road system for the Forest.

Category 3 – Low Value and High Risk – Priorities for Analysis and Action to Reduce Risk

Options:

- High priority for sub-forest-scale roads analysis to identify opportunities to reduce high risks and confirm use value.
- High potential for reducing traffic and use load, functional classification, and/or maintenance level. Options include decommissioning, storm-proofing techniques, or heavy maintenance.

Category 4 – Low Value and Low Risk – Priorities for Reducing Maintenance Level

Options:

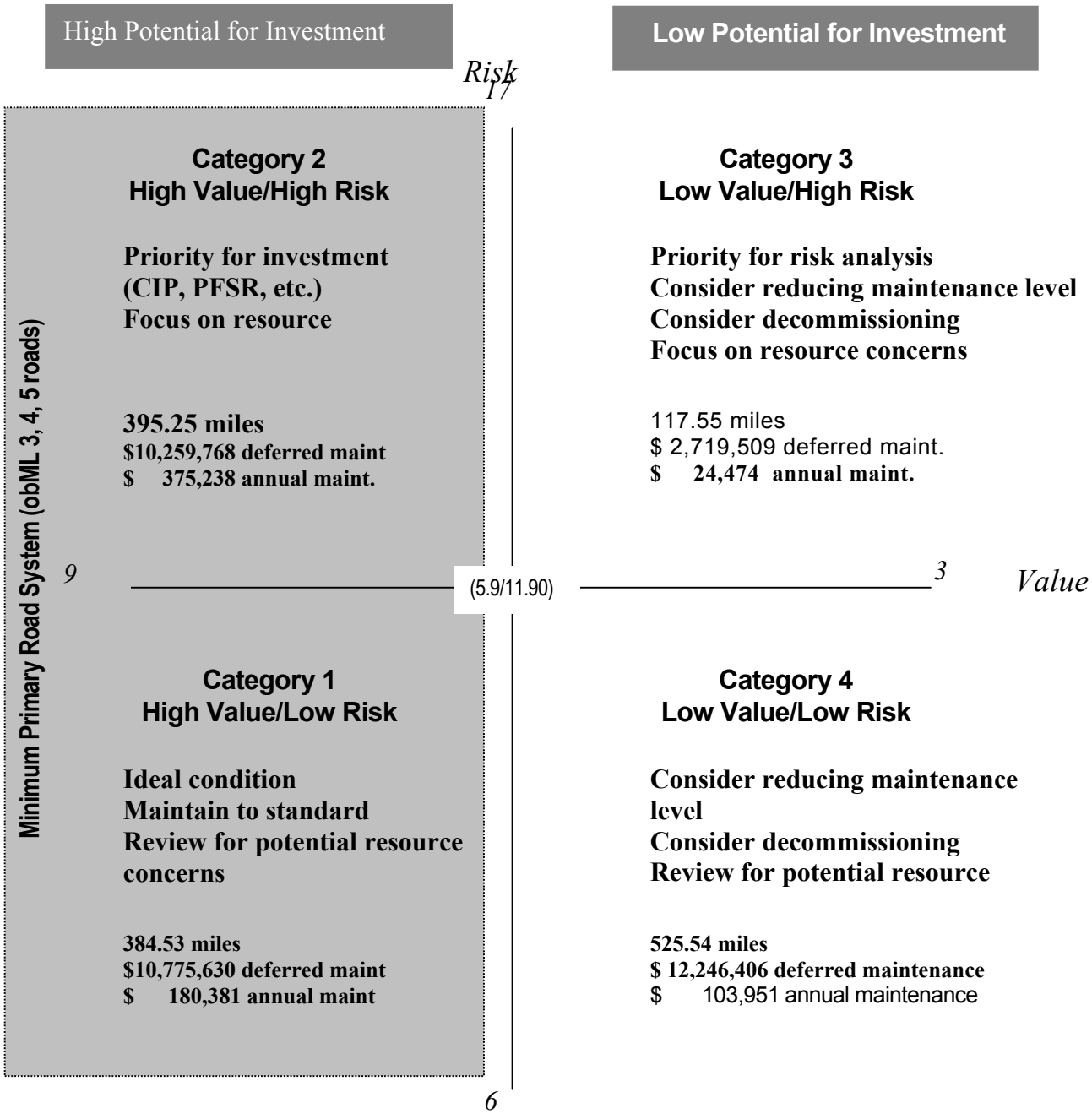
- Lowest priority for expending annual road maintenance funding.
- Moderate potential for reducing maintenance level and/or functional classification.
- Moderate potential for decommissioning following sub-forest-scale risk/value analysis.
- High potential for converting some of these roads to trails where there is a recreational demand.

The Road Risk-Value Graph (see following page) was the tool used to identify roads for the road management categories (above). Several factors must to be understood to correctly interpret this graph and the identification of roads in the different categories.

Roads with a value of more than 6 (left side of the vertical axis), represent those roads that constitute the Potential Minimum Road System for management and use of the Umatilla National Forest by passenger cars. Those roads with a value of 5.9 or less are roads that are potentially not needed for use by passenger cars on the Forest, at least possibly not needed at their current maintenance level. The situation is similar for the horizontal axis. Those roads with a risk rating 12 or more represent roads that may be causing unacceptable resource impacts, while those with a rating of less than 11.9 are not as much of a resource concern.

Of special note: it needs to be emphasized that just because a road falls below the horizontal axis does not mean it is not causing resource impacts. The risk rankings are a sum of the wildlife, watershed, aquatic, noxious weeds, maintenance costs, and engineering concerns. Low costs and higher resource risks could still result in an overall ranking of less than 12 (low risk) on the graph. The road matrix (Appendix B) needs to be used with the graph to identify the actual risks and values that have been assessed through this analysis.

Figure 2. Road Risk Value Graph



Note: Not to Scale

Value **= Recreation value + Resource management + Upland Forest Value (minimum value = 3, maximum = 9)**

Risk **= Watershed risk + Wildlife risk + Aquatic Risk + Noxious Weeds + (Deferred+Annual maintenance)/2 + Engineering Concerns (maximum=17)**

Horizontal axis: =< 5.9 = low potential for investment (low value). Vertical axis: =< 11.9 = low risk.

=> 6 = high potential for investment (high value). =>12 or greater = high risk

Road Maintenance Costs – Identification of the Potential Minimum Road System

One purpose of a roads analysis is to identify ways to more efficiently spend the limited road maintenance dollars allocated to the forests. One approach is to reduce or eliminate expenditures on roads that are not needed or not needed at their current maintenance level. The process described above identifies the Potential Minimum Primary Road System.

Some conclusions can be made by comparing annual road maintenance funding needed for each road to the road maintenance graph. If all of the roads to the right of the vertical axis were to be decommissioned, the needed annual road maintenance funding for just the primary road system on the Forest would be reduced from $656,863 to $555,619. The actual allocated road maintenance funding for the entire combined Umatilla National Forest has been dropped from $1,440,000 in 2001 to $719,000 in 2004. This amount pays for salaries, vehicles, materials and supplies, overhead, and actual road maintenance. More road maintenance funding is needed to support the road system infrastructure.

Decommissioning Guidelines

Discussion

Road decommissioning results in the removal of a road from the road system. The impacts of the road on the environment are eliminated or reduced to an acceptable level. To accomplish this a number of techniques can be used, such as posting the road closed and installing waterbars, posting and installing barriers and barricades, ripping and seeding, converting the road to a trail, and full reclamation by restoring the original topography. There is a different cost associated with each of these techniques, and their effectiveness for deterring unauthorized motorized vehicle use varies as well.

Decommissioning level 1 and 2 roads can consist of removing the few culverts, ripping and seeding, posting closed with signs, and installing waterbars to discourage unauthorized motorized vehicle use and ensure proper drainage occurs over time.

Decommissioning level 3, 4, and 5 roads is more expensive than decommissioning most level 1 and 2 roads. When choosing a technique for road decommissioning, the objective is to eliminate the need for future road maintenance.

When roads to be decommissioned have adequate surfacing, reclaiming the aggregate for use elsewhere may be advantageous.

Level 3, 4, and 5 roads are usually wider than level 1 and 2 roads, have culverts installed at designed intervals to cross drain the road, are ditched, have better sight distances designed on horizontal and vertical curves, have larger cuts and fills, and are designed through the topography rather than with the topography. Given the cost, it may be cheaper to maintain level 3, 4, and 5 roads than to decommission them. However, future maintenance costs may not be the only factor to consider; other resource considerations may outweigh the cost. For a particular road (level 3, 4, or 5), high deferred maintenance costs may exceed the costs of decommissioning.

Guidelines

- Balance cost with resource risk and effectiveness of the treatment when selecting methods for decommissioning roads.
- Convert roads to trails as a decommissioning method when analysis of recreation demand indicates a need to expand, connect, or improve the existing trail system in the area. Provide adequate trailhead parking as part of this treatment method.
- Decommission by restoring the road to original contours when the Forest Plan requires mitigating visual impacts or when necessary to assure the elimination of vehicular traffic.

Capital Improvement Guidelines

Discussion

This analysis does show there is a need to reconstruct existing roads to correct deferred maintenance work items or to improve some roads to meet increasing use and traffic requirements. Funding limitations require prioritization of reconstruction work. The Road Risk-Value Graph (Figure 1) provides a starting point for developing priorities. The following guidelines are to be used in conjunction with the graph when selecting, prioritizing, and implementing road reconstruction and construction projects.

Guidelines

- Conduct road location reviews before all new construction and road relocations. Assure the location meets public and agency needs while mitigating environmental impacts identified in the analysis. Responsible line officers and resource and engineering specialists should participate in the review.
- Continue with the traffic counting program to identify high use roads and traffic patterns.
- Roads with seasonal average daily traffic volumes exceeding 100 vehicles per day should be considered for reconstruction to two lanes.
- Use motor vehicle accident safety investigations and reports to help identify road safety hazards.
- Use the following categories to prioritize road investments planned to reduce deferred maintenance backlog on roads: 1 – Critical Health and Safety; 2 – Critical Resource Protection; 3 – Critical Forest Mission. Data for these work items can be found in the Infrastructure database.
- Coordinate reconstruction and construction work with other agencies whenever possible. Utilize interagency agreements to develop investment and maintenance partnerships.

Road Management Guidelines

- If a road's operational maintenance condition has decreased, consider the need for the road and the historic use, as well as alternative roads in the area before permanently changing the maintenance level.
- Reduce the operational maintenance level on identified low value level 3, 4, and 5 roads being analyzed in sub-forest-scale roads analyses. This can be a cost effective alternative. Reduced maintenance should not result in any increased watershed risks from these roads, as the most basic road maintenance will focus on maintaining road drainage. The reduced maintenance should only result in reduced user comfort, and hence, reduced use over time will further reduce the potential for road related watershed risks.
- It is important for travelers to have the sort of information necessary to make a decision about the road on which they are about to travel. When appropriate, utilize entrance treatments, warning signs, route markers, and information bulletin boards to advise travelers of conditions ahead.
- Do not post speed limit and other regulatory signs on roads under Forest Service jurisdiction without a Forest Supervisor's order and a law enforcement plan.
- To reduce annual maintenance costs, implement seasonal travel restrictions on roads susceptible to damage during wet or thawing conditions.
- Collect road maintenance and surface rock replacement deposits (as appropriate) on all commercial use of classified roads (include timber haul).

General Guidelines

The following are general road-related guidelines:

- Require authorized, permitted operations utilizing NFS roads to pay their fair share of road maintenance costs.

- Consider road decommissioning when planning projects that involve the construction and use of short-term, single resource roads. For example, roads planned for mineral projects that undergo exploration, development, and abandonment phases. By incorporating decisions to decommission the single resource roads at the end of the project, rather than not addressing this issue up front, the Forest will better demonstrate a commitment to managing its road system toward the minimum road system needed. Document planned decommissioning in road management objectives, as well as databases and GIS.
- Develop an annual maintenance plan to prevent deferred maintenance costs from accruing on high value rated roads
- Update the road system databases and keep them current.
- Use an interdisciplinary process to develop, update, and implement road management objectives for all system roads. Assure that information in the transportation atlas and inventory conforms to approved road management objectives.
- At appropriate intervals, update the data contained in the Road Matrix (Appendix B). Analyze the changes to determine new opportunities that may have developed as new information is collected.
- Incorporate yearly Forest road changes into the annual Forest Plan Monitoring Report (via the forest plan revision process). These road changes can include miles of road decommissioned (classified and unclassified), miles of road converted to trail (motorized and non-motorized), miles of road reconstructed (by maintenance level), and miles of road constructed (also by maintenance level).
- Continue performing road condition surveys on a two-year rotation per current Washington Office direction on objective maintenance level 3, 4, and 5 roads. Continue with condition surveys on the random sample of maintenance level 1 and 2 roads per Washington Office direction.

Opportunities for Addressing Problems and Risks

Travel Management: For roads in the low value rating, either decommission, reduce maintenance level, or consider ways to raise this value. For example, provide recreation opportunities along the road. Overall recreation use on the Forest is increasing, and road related opportunities exist to better disperse this use and lessen recreation impacts that are occurring elsewhere. An example of increasing recreation use on a low value road would be to develop a trailhead and trail system at the end of the road. There are many opportunities on the Forest to convert unclassified and level 1 and 2 roads to motorized and non-motorized trails.

Watershed: The following opportunities could remedy road impacts for specific watershed or aquatic situations such as surface/subsurface hydrology and surface erosion.

Reword these Opportunities/recommendations to consider if roads are likely to modify surface and subsurface hydrology:

- Design roads to minimize interception, concentration, and diversion potential.
- Design measures to reintroduce intercepted water back into slow subsurface pathways.
- Use outsloping and drainage structures to disconnect road ditches from stream channels rather than delivering water in road ditches directly to stream channels.
- Evaluate and eliminate diversion potential at stream crossings.

Opportunities to address concerns in riparian areas include:

- Relocate roads out of riparian areas.
- Limiting clearing distances in riparian areas during construction, reconstruction, and maintenance.
- Restore the hydrology in riparian areas that have been dewatered by the road system.

Opportunities to reduce surface erosion include:

- Increase the number and effectiveness of drainage structures.
- Improve the road surface by either gravelling or adding a binding material to those roads that have native surfaces with no inherent binder.

Opportunities to address existing roads in areas with mass wasting potential include:

- Relocation to an area with more stable soils.
- Relocation of drainage structures so outlets are on less sensitive areas which may include flatter slopes and better-drained soils.
- Additional drainage structures to reduce the concentration of water at any given location.
- Reducing the maintenance and service level of the road.

Opportunities to reduce the effects of the road system on wetlands include the following:

- Relocate roads out of wetland areas.
- Where relocation is not an option, use measures to restore the hydrology of the wetland. Examples include raised prisms with diffuse drainage such as french drains.
- Set road crossing bottoms at natural levels of wet meadow surfaces.

Opportunities to improve road/stream crossings include:

- Design crossings to pass all potential products including sediment and woody debris, not just water.
- Realign crossings that are not consistent with the channel pattern.
- Change the type of crossing to better fit the situation. For example, consider bridges or hardened crossings on streams with floodplains, and consider bottomless arch culverts in place of round pipe culverts
- Add cross-drains near road-stream crossings to reduce the length of road ditch discharging into the stream system.

- Reduce the number of road-stream crossings to minimize the potential for adverse effects

Opportunities to address road-stream crossings that restrict migration and movement of aquatic organisms include:

- Eliminate the culvert, through road decommissioning.
- Improve aquatic passage with stream simulation. Replace the culvert, using state-of-the-art techniques such as Stream Simulation.

Forest Plan Revision: This roads analysis can be used to identify needs for change during forest plan revision.

Fuel Reduction: Anticipated funding related to the Healthy Forest Initiative and the Healthy Forest Restoration Act for the next several years presents another opportunity to address growing risks to communities from unwanted wildland fire. The IDT placed high resource management values on many of the level 3 and 4 roads that provide primary access to areas around and within the Forest with high densities of cabins, homes, and other structures. These roads may be important access routes for fuel reduction projects, especially any commercial projects that could involve log hauling, provide important access for wildfire suppression, and evacuation egress. The IDTs for fuel reduction planning projects can use the road matrix (Appendix B) to begin identifying the existing access/egress situation to help define the road related project proposals.

Deferred Maintenance Backlog: This Umatilla National Forest Roads Analysis clearly demonstrates that annual maintenance funding is inadequate to maintain the road system on the Forest. Over time, these roads will continue to incur additional deferred maintenance costs and degrade unless significant road reconstruction funding becomes available. The agency is addressing this issue nationally by proposing a new funding category for the 2004 federal highway transportation funding authorization called Public Forest Service Roads (PFSR). The road matrix table (Appendix B) displays those roads that are potential PFSR's. The Forest currently has a good working relationship with the counties

in regards to shared road maintenance. The Forest should continue to pursue additional formal road maintenance agreements with the counties interested in sharing maintenance to more efficiently use taxpayer funds.

Areas Needing Additional Access: The Umatilla National Forest is adequately roaded, from an overall transportation perspective. Small areas may need road access for timber harvest, but, when possible, should be accessed by temporary roads that can be decommissioned when finished.

NEPA Analysis Needs

This roads analysis is not a federal action under the National Environmental Policy Act. It does provide information and opportunities to be considered during forest plan revision, sub-forest-scale roads analyses, and site-specific project analyses. Road related activities identified during sub-forest-scale roads analyses, that are taken into the NEPA process, will be required to be supported by the appropriate level of NEPA.