Road Transportation System

INTRODUCTION

Access to the Monongahela National Forest (MNF) is provided by a complex and integrated transportation system of roads under Forest Service, county, state, and private jurisdiction. The entire system of roads ranges from double-lane paved highways to narrow, native-surface roads. An estimated 1,752 miles comprise Forest roads under the jurisdiction of the Forest Service. This integrated road system connects the Forest road system to towns, communities, and major state and federal highways.

Roads are important facilities on the MNF, providing access for recreation activities, timber removal, resource utilization, wildland fire protection, and for facilities operated under special use authorizations. However, roads also have the potential to adversely affect a number of resources in various ways. Forest road systems are dynamic in that roads may be constructed or reconstructed for needed access, or they may be closed or decommissioned in an effort to reduce impacts to other resources. This analysis describes the potential effects of each alternative's management strategies on the road system rather than the effects of roads on other resources. Analysis of the effects of roads on other resources can be found in the corresponding resource sections in this chapter.

In Forest Plan revision, roads are addressed at the programmatic scale rather than a site-specific or individual road scale. As such, this process does not determine whether specific roads will be constructed, maintained, periodically closed, or decommissioned. Through their management direction, Forest Plans provide a basis for future project-level planning and analysis that are required to make those types of site-specific decisions.

Issues and Indicators

Issue Statement

Forest Plan management strategies may affect the road transportation system and the public access that the roads provide.

Background

Management of National Forest System (NFS) roads is an issue of national concern. Public interest in the roads within national forests is increasing, and few natural resource issues in recent years have attracted as much public scrutiny as road management. Concerns linked to the roads on NFS land include public access, resource damage, habitat loss, maintenance capabilities, and economics. Yet some level of road development is needed to produce the goods and services that Americans expect from their national forests. A long-term road strategy to address many of these issues was developed and reflected in the Forest Service Road Management Strategy adopted January 12, 2001. Sometimes referred to as the "Roads Rule",

this policy established the scope and scale of roads analyses needed to inform road management decisions regarding new construction, reconstruction and decommissioning. It also established parameters for construction and reconstruction of roads within Inventoried Roadless Areas.

Comments received both externally and internally reflected two components: the number of miles of designated Forest roads that are developed, and the public access the roads provide. A number of comments focused on the amount of roads that should be maintained as part of the system. Comments were divided between those expressing the need to maintain current access and roads for resource management and recreation needs and those supporting reducing the road system to reduce impacts of roads on other resources and the need to lower road densities. Some comments expressed concern that overall access to the Forest was decreasing. Other comments expressed concern about concentrating public use on fewer and fewer acres, thus causing increased resource damage. Still other comments questioned the merits of reducing the road system in the face of expanding recreation use and access needs. Opposing comments favored a policy of "no new roads", especially in areas that are currently unroaded.

These comments led to an issue concerning the level of the managed road system on the Forest. Reducing the level of access, through management direction or decommissioning roads, would potentially:

- Concentrate use, increasing resource impacts and safety concerns in heavily used areas;
- Reduce public access and opportunity for motorized recreation:
- Reduce economic development opportunities; and
- Reduce resource management capabilities.

Conversely, continued expansion of the road system would potentially:

- Increase potential impacts to soils, water quality, and fish habitat;
- Increase fragmentation of habitat and disturbance for terrestrial wildlife species;
- Reduce opportunities for dispersed recreation away from the influence of roads;
- Increase public access for recreation and resource development; and
- Increase administrative access for management, including project work, surveys, research, monitoring, and fire suppression.

Road access on NFS land consists of two components: Classified roads, which are typically part of the National Forest Road System or roads under other jurisdiction; and unclassified roads, also known as "woods roads", which are typically user-created roads that have never been designed, constructed, or maintained. This analysis will focus on classified roads for the following reasons:

- The majority of roads on NFS land are classified roads.
- The Forest does not construct, decommission, maintain, or inventory unclassified roads.
- Most unclassified roads are in a condition that does not support full-sized vehicle access.
- Unclassified roads typically do not have the sort of design features—cut and fill slopes, culverts, and drainage structures—that could fail over time and cause resource damage.

Having said this, it is important to add that the Forest does not ignore unclassified roads in its transportation management. Unclassified roads are mapped and considered during site-specific

project-level planning. For example, does the unclassified road provide access into an area the Forest wants to manage? Can the road be reconstructed up to standard to provide access and added to the transportation system, or would a different and new road location be more appropriate? Is the road currently providing vehicle access, which is contributing to resource damage, or is it overgrown and returning naturally to productivity? What is the most efficient and effective way to prevent access? All these and more factors are considered when the Forest evaluates the site-specific transportation needs of a given area.

Some respondents also expressed concern about road maintenance funding, specifically that expected road maintenance budgets may not provide for the adequate and timely maintenance of all Forest classified roads to their appropriate standard. The inability to provide an appropriate level of road maintenance may require the Forest to close roads until user safety and resource protection can be assured.

Indicators

The following indicators are used to measure the effects of management strategies on Forest roads on the Forest by alternative.

- **Potential change in Forest classified roads related to timber harvest by alternative.** This indicator is used to assess how Forest road levels may vary by alternative through the next planning period. The primary factors affecting change assessed are 1) roads associated with timber harvest, and 2) Management Prescriptions (MPs) 5.0, 5.1, 6.2, 8.1 Semi-Primitive Non-Motorized, and other special areas where new road construction is restricted.

- **Potential change in public motorized access related to MP allocation by alternative.** This indicator is used to compare the alternatives relative to what amount of the Forest is available for public motorized use. The primary factors for change assessed are MPs 4.1, 5.0, 5.1, 6.2, 6.1, some 8.0 and SPNM areas where public motorized use is restricted.

Scope of the Analysis

The affected area, for direct and indirect effects to roads, is the Forest Classified Road System within the Forest. This transportation network represents the roads that could receive impacts from both management activities and natural events. The affected area for cumulative effects includes these roads plus additional roads that lie within Forest boundaries, but that are under the jurisdiction of other agencies or governments. Cumulative effects to roads that are under other jurisdiction are addressed to lend a broader perspective to the importance of roads on the Forest and to emphasize cooperation among all local transportation resource providers. Effects are analyzed primarily for the short-term planning period (next 10-15 years), but extend as far as 50 years to examine potential trends in road mileage on the Forest.

CURRENT CONDITIONS

Forest road systems are dynamic. Forest engineering and resource personnel work together in an on-going process of transportation system planning and management. Roads are constructed and reconstructed based on established standards for their intended use and anticipated management needs. A relatively high percentage of new road construction is done in support of timber management, although roads are also constructed for recreation, special uses, mineral development, or private land access. Road reconstruction is done for a number of purposes, which include improving road conditions for driver safety and mitigating resource impacts. Road decommissioning occurs when a road is no longer needed for resource management or special access needs. Road decommissioning terminates motor vehicle use of roads no longer needed and restores ecological processes interrupted or impacted by the unneeded roads. Roads can also be candidates for decommissioning when maintenance requirements and resource impacts outweigh access needs. Decommissioning includes various levels of treatments to stabilize and rehabilitate unneeded roads such as blocking the entrance, revegetating and water barring, removing fills and culverts, re-establishing drainage-ways, and removing unstable road shoulders, or full obliteration by recontouring and restoring natural slopes. A site-specific analysis is required for all road construction, reconstruction, or decommissioning on the Forest.

Road activity levels vary greatly from year to year, depending on the number and type of projects that are approved for implementation. In fiscal year 2004, for example, no new roads were constructed and no roads were decommissioned, due in large part to the project moratorium that was created by the Forest Plan amendment process for threatened and endangered species. Implementation is typically dependent on agency priorities, allocated funding levels, and the level of public controversy with proposed projects.

In 1999, the Forest Service initiated a process to develop a new road management policy for all NFS land managed by the agency. In January 2001, the Forest Service adopted a new road management policy, which directs the agency to maintain a safe, environmentally sound road network that is responsive to public needs and affordable to manage. The new roads policy updates the previous roads policy written in the early 1970s. The purpose of the new policy is to provide guidelines for how the agency will manage existing roads. It includes an analysis process to be used before building new roads and a process for determining when roads are to be decommissioned. The policy relies on Forests conducting a science-based analysis of their long-term access needs and integrating the results of that analysis into the its planning processes. The Forest Service is committed to making the road management policy work. Transportation system management on the Forest will be consistent with the direction provided by the new policy, as seen in the management direction for Roads and Facilities in the 2006 Forest Plan.

Existing Road System

Most of the administrative, commercial, and public travel on the Forest occurs on the National Forest System road network of classified roads. Access to the Forest is provided largely by a combination of classified roads under Forest Service jurisdiction, federal and state highways, and other roads under state jurisdiction. In some locations, access is provided through roads that are

constructed and maintained in partnership or cooperation with other agencies or permittees when access is of mutual benefit to both parties. User-created or "woods" roads also exist.

Through transportation analysis, public access opportunities are analyzed and may be provided along with controls and restrictions necessary to achieve land management objectives. The Forest has determined classified roads are needed on NFS land for public access or resource management needs, and many are open and available for public use. Others have been temporarily closed to reduce or prevent impacts to other resources. Information on open and closed roads on the Forest is made available through the District Ranger offices.

Forest roads provide access in a branching system of arterial, collector, and local roads. Arterials provide access to large land areas, typically by linking to highways or communities. They have the highest standards for construction and maintenance because of the large volume of traffic they carry. Collector roads disperse traffic from arterials to smaller Forest areas such as watersheds. They usually connect arterial roads to local Forest roads. Local roads, used to access specific project areas or sites may be of a lower standard of construction. Table RO-1 displays the total miles of Forest roads under Forest Service jurisdiction on the Forest by functional class.

Table RO-1. Estimated Miles of National Forest System Classified Roads Within Forest Service Jurisdiction*

Arterial	Collector	Local	Total
233	630	889	1,752

*Source is the FY 2004 INFRA Summary Report.

In some areas, "roads" develop not through planning, design, and construction, but through repeated passage of vehicles traveling off of transportation system roads. These unplanned travel ways are commonly called a number of names, including "woods roads", "ghost roads" and "two-tracks". They are not considered to be part of the road system, nor are they included in the roads in Table RO-1. In this analysis, these roads are referred to as unclassified roads.

Road Maintenance

The maintenance of Forest system roads is complicated because it is often achieved through cooperation with other agencies and private citizens. In some cases, maintenance responsibilities are exchanged with other jurisdictions through maintenance agreements when such actions create efficiencies for both parties. Roads maintained by other agencies, local governments, or private organizations under road maintenance agreements are maintained according to the terms of the maintenance agreement, which may not necessarily be to established agency-set standards. Roads with different maintenance levels can have different schedules or standards for maintenance, ranging from unused roads that do not require maintenance until they are used, to heavily used roads that may require maintenance more than once a year. Maintenance levels for Forest classified roads are briefly described below.

Maintenance Level 1 – This level is assigned to intermittent service roads during the time they are closed to vehicular traffic. The closure period must exceed one year. Basic custodial maintenance may be performed to keep damage to resources to an acceptable level and to facilitate future management activities. Planned road deterioration may also occur at this level. Roads may be open and suitable for non-motorized uses.

Maintenance Level 2 – This level is assigned to roads used by high clearance vehicles. Traffic use is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses. Log hauling may occur at this level. Many Level 2 roads are closed on the Forest and do not receive annual maintenance by the Forest Service. Closures are typically due to wildlife disturbance concerns in MP 6.1 areas, backcountry recreation emphasis in MP 6.2 areas, special uses, or mineral operations.

Maintenance Level 3 – This level is assigned to improved roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not priorities. Roads are typically low-speed, single lane with turnouts and spot surfacing. Some roads may be fully surfaced with either native or processed material.

Maintenance Level 4 – This level is assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most roads are double lane and aggregate surfaced. Some roads may be paved or dust abated.

Maintenance Level 5 – This level is assigned to roads that provide a high degree of user comfort and convenience. Normally roads are double lane and paved. Some may be aggregate surfaces and dust abated.

Road maintenance is not static. The total miles of road maintenance responsibility for 2004 are the same as those displayed in Table RO-1. However, the actual road miles maintained are displayed in Table RO-2. The reason that the "Miles of Road Maintained to Standard" are higher than the "Miles of Road Maintained" is that the maintenance standard for Maintenance Level 1 and some Maintenance Level 2 roads was "no maintenance". The Forest was able to maintain a high percentage of its roads that are open to public use (column 3).

Table RO-2. Miles of Road Maintenance in 2004

Miles of Road Maintained	Percent of Roads Maintained	Percent of Open Roads Maintained	Miles of Road Maintained to Standard	Percent of Roads Maintained to Standard
663	38%	82%	905	52%

Roads meeting identified long-term needs but not short-term needs are often placed in a Level 1 maintenance category. This level usually involves physical closure of the road for a period of one year or longer but not decommissioning, and these roads are not open for vehicle travel until

needed again. As noted above, many Maintenance Level 2 roads on the Forest are also closed to public access and are therefore only maintained periodically, or are maintained by permittees, contractors, lessees, or cooperators.

The Forest's ability to maintain its road system is dependent on a number of factors, including:

- Total miles of open roads,
- Allocated funding for road maintenance,
- Miles maintained through commercial activities, such as timber sale contracts,
- Allocated funding for road improvement projects to support other resources,
- Maintenance levels,
- Resource protection levels,
- Recreation traffic levels,
- Environmental conditions, and
- Material and labor costs.

Road maintenance budgets have fluctuated during the past 10 years. However, traffic volumes on the Forest road system have gradually increased. Because of fewer timber sales, commercial user contributions to road maintenance also have declined. This can affect not only recurrent maintenance, such as seasonal blading, but also deferred maintenance such as long-term surface replacement. Increased use can intensify the maintenance burden on state-maintained road systems, while federal budgetary constraints may concentrate maintenance priorities on roads closer to more popular areas. As a result, roads are often maintained on a priority basis. User safety, resource protection, and user comfort needs are used to prioritize roads for maintenance.

Public Motorized Access

As noted above, public motorized access is affected by Forest Classified Road Maintenance Levels; however, these levels are in turn affected by MP emphasis and direction. In particular, certain MPs have management direction that prohibits or limits public motorized use, primarily due to resource concerns or legal reasons. MPs that prohibit this use are 5.0 (Designated Wilderness), 5.1 (Recommended Wilderness), 6.2 (Backcountry Recreation), selected 8.0 (Special Areas such as National Natural Landmarks, Botanical Areas, and Candidate Research Natural Areas), and SPNM areas in the Spruce Knob-Seneca Rocks National Recreation Area. MPs that limit public motorized use, primarily to create areas of relatively low disturbance to wildlife, are 4.1 (Spruce and Spruce-Hardwood Restoration) and 6.1 (Wildlife Habitat Emphasis). How these areas vary by alternative and what that means in terms of public motorized opportunities will be assessed in the Environmental Consequences section below.

ENVIRONMENTAL CONSEQUENCES

Resource Protection Methods

Laws, Regulations, and Policies

Numerous laws, regulations, and policies govern the management of recreation resources on NFS lands. Some key examples are described below.

- The *National Forest Roads and Trails Act* of 1964 states that construction and maintenance of an adequate system of roads and trails within and near the national forest is essential to meeting the increasing demands for recreation, timber, and other resources. It authorizes and established procedures related to rights-of-way, easements, construction, and agreements.

- The *Surface Transportation Assistance Act* of 1978 establishes criteria for Forest Highways, and defines Forest roads and Forest development roads and trails.

- *36 CFR 219.11 (14-26)* describes resource management requirements that cannot be met without providing a viable transportation system.

- *36 CFR 212* provides the principal regulations for administration of the forest development transportation system.

- *Forest Service Manual 7700* (Transportation System Manual) directs national forests to plan, develop, operate, and maintain forest development transportation facilities as a system that is integrated with other public and private transportation facilities, while carrying out the direction established in the Forest Plan. It provides guidance in the form of objectives, policies, and responsibilities for transportation planning and documenting system roads.

Forest Plan Direction

Forest Plan direction requires an analysis of long-term needs prior to constructing, reconstructing, or decommissioning National Forest System roads during project-level planning. Standards and guidelines are designed to mitigate the impacts on natural resources resulting from existing and new roads and their use. Direction has also been added to the 2006 Forest Plan regarding opportunities, reasons, and techniques for road decommissioning. Road-related direction is concentrated in the Roads and Facilities section in the 2006 Forest Plan, but has also been integrated throughout a number of resources sections.

Forest Plan Implementation

Proper road management depends on current and site-specific information about biophysical conditions and the effects that roads may have on affected resources. Some of these factors are not appropriately addressed at the programmatic level, whereas other factors may be similar to all alternatives. The evaluation of project-level transportation needs is designed to address all

site-related resource factors. Through this process, which would be the same for all alternatives, adjustments in road densities would be made to address resource concerns in a timely, effective, and site-specific manner. Mitigation can also be developed at the project level to protect all resources, and this mitigation would be incorporated into specific timber contract clauses or permits that operators must follow.

Finally, the 2006 Forest Plan has the following direction that would be applied to watershed or project-level planning and implementation:

Guideline	RF07	In support of road management decisions, use an interdisciplinary science-based roads analysis process such as Roads Analysis: Informing Decisions About Managing the National Forest Transportation System (USDA Forest Service 1999).
Guideline	RF08	Evaluate existing routes during transportation planning to determine whether they should be retained, reconstructed, replaced, or decommissioned. Evaluate transportation needs based on existing uses and condition, environmental and economic impacts, and compatibility with management prescriptions. Coordinate evaluation with information in the Roads Analysis Report for the Monongahela National Forest (January 2003) or updated versions.
Guideline	RF09	During watershed or project-level analysis, opportunities for road decommissioning should be identified and prioritized based on: a) Hazard assessments in the Roads Analysis Report for the Monongahela National Forest (January 2003) or updated versions b) Identified needs in drainages with 303(d) impaired water bodies c) Prescription units that exceed road density standards for the management prescription d) Other site-specific concerns identified in the watershed or project analyses.

The *Roads Analysis Report* referred to above is a comprehensive assessment of the Maintenance Level 3, 4, and 5 roads on the Forest, including their current condition, known hazards or concerns, and recommendations for potential improvements or decommissioning.

Effects Common to All Alternatives

General Effects

Road construction and reconstruction are usually associated with development related to timber harvest, utility lines, mineral and energy exploration and production, recreation facilities, and public safety. Most of the Forest's road needs for the current level of use are in place. New road construction has been lower than was predicted for the previous planning period. Commercial use of the transportation system declined in the late 1990s and early part of this decade, and this trend may or may not continue. On the other hand, recreational traffic will likely continue to increase. This shift in traffic composition and user types is a driving force for development of new travel management philosophies and strategies.

Nationally, the trend over the past 10-15 years has been to redirect maintenance funding to decommission unneeded roads and improve the maintenance conditions of those remaining. A smaller, more efficient transportation system is the expected outcome.

Road Improvements – Road improvement projects—such as paving, graveling, or other major reconstruction—are relatively common on the Forest, and are expected to continue under any alternative. Accomplishment of these road improvements is very dependent on capital improvement funding within the agency. Priorities can also shift dramatically, for varied reasons, which may cause some projects to rise in priority or drop completely off the capital improvement list.

Recreation – Increasingly, national forests and other public land are likely to be the destinations of choice for people looking for high-quality outdoor recreation experiences in natural settings. As populations grow and visitation expands, the use of Forest roads increases. The arterials and major collectors that connect the Forest to these areas will experience the most increased day-use traffic, particularly on weekends and holidays. This traffic will add to the maintenance work necessary to keep the roads in a safe and structurally sound condition. Continued growth in recreation use without increases in the road system will likely lead to lower visitor satisfaction and more conflicts between users. New road construction for recreation purposes is expected to be very low to none, and would not vary by alternative.

Restoration Activities – Restoration activities include a broad array of management activities including timber harvest, road construction, reconstruction and decommissioning, prescribed fire, facility relocation and modification, fish habitat improvement, stream bank stabilization, slope stabilization, and mining reclamation. The effects that some of these activities may have on the transportation system are described in greater detail, below.

Timber Harvest – Historically, most Forest roads were constructed for timber management purposes. Today, timber management is still a significant contributor to the need for new road construction, although this need has declined due to a combination of reduced harvest and improved helicopter logging technology. The Forest's ability to decommission roads is also linked, to some extent, to timber sales in that funds gained through timber sales are frequently also used to decommission roads within the sale area. Road decommissioning is also funded by watershed restoration, minerals, and other sources. Timber management has also contributed to road maintenance activities on the Forest. Timber sale purchasers are usually required to perform recurrent road maintenance during timber hauling operations or post cash deposits in lieu of performance in the case of some small sales. Deferred maintenance deposits are also collected from timber sale purchasers in some cases.

Mineral and Energy Exploration, Development, and Reclamation – Road development is often associated with mineral and energy exploration and development activities. Given recent levels of these activities, relatively little development is anticipated for all of the alternatives. A site-specific analysis would be needed prior to final approval of any road development for these purposes. Reclamation activities may include re-opening closed roads or re-construction of

existing ones for temporary or short-term access needs. In that the level of mineral exploration and development is largely driven by market forces and regulated by existing mining laws, there would be little difference between the alternatives in effects on the road system.

Utility Developments – These include pipelines and overhead power lines that can potentially require road construction or reconstruction for the installation and/maintenance of developed facilities. In some cases, helicopters can be used effectively to reduce new road construction needs. Little road construction and reconstruction associated with utility development is anticipated for all alternatives, and any that occurs would not likely differ by alternative.

Telecommunications Sites – Sites include communications developments that can potentially require road construction or reconstruction for the installation and/maintenance of developed facilities. In some cases, helicopters can be used effectively to reduce new road construction needs. Little or no road construction and reconstruction associated with telecommunication site development is anticipated for all alternatives. A site-specific analysis would be needed prior to final approval of any telecommunications site development.

Fish and Wildlife Habitat Protection and Watershed Improvement – These management activities can include both road management and road improvement activities done for watershed restoration. In some cases, road management measures reduce access where wildlife habitat or watershed improvement is emphasized. Some roads are closed or decommissioned upon conclusion of the primary purpose activities, while others are managed with seasonal closures in an effort to protect wildlife or their habitat. Usually, these considerations are made during project planning as part of determining transportation system needs for project implementation.

Road improvements done for fisheries and watershed restoration can include a variety of road-related activities such as culvert replacements and road re-alignments. Generally, these road improvements are designed to reduce impacts, such as sediment delivery from existing roads to streams and fish habitat.

Direct and Indirect Effects by Alternative

Potential Change in Forest Classified Roads Related to Timber Harvest by Alternative

As noted above, new road construction over the planning period is most likely to be associated with timber harvest. Estimated acres of timber harvest by alternative are shown in Table RO-3.

Table RO-3. Acres of Projected Maximum Timber Harvest by Alternative in the First Planning Decade

Estimated Maximum Harvest Acres for the Next Decade by Alternative				
Alternative 1	Alternative 2	Alternative 2M	Alternative 3	Alternative 4
54,821	45,297	45,338	40,764	51,573

Based on this relative comparison, the most road construction and reconstruction for timber-related purposes would likely occur in Alternative 1, followed in order by Alternatives 4, 2M, 2 and 3. Under every alternative, various levels of road construction, reconstruction, or decommissioning would likely occur, but those levels are unknown and cannot be accurately predicted at this scale. New roads would be built as needed, while others are decommissioned. Levels of new road construction and decommissioning vary greatly on a yearly basis due to a number of factors, including fluctuations in funding and project-level implementation schedules. Usually, classified roads that are decommissioned are local roads rather than arterial or collector roads. This is due to a number of factors, including that arterial and collectors are relatively fewer in number, receive significantly higher traffic levels, and provide access to developed facilities or serve as vital transportation links between state roads or communities.

Potential Change in Forest Classified Roads Related to Harvest Distance from Roads

Comments received on the Draft EIS suggested that we provide more information on the potential for new road construction by looking at the relationship between acres harvested by alternative and how far those acres would be from existing roads. The premise behind this request is simple—the farther the harvested stands are from existing roads, the more road will be needed to access them. However, the analysis proved to be more complex that the request, given the tools and information available.

The Spectrum model formulations provided acres harvested by alternative and a rough breakdown of how far those acres were from existing Forest Service Maintenance Level 3, 4, 5 or other public roads. The breakdowns were by increments of 3/8 (0.375) mile, as most logs can be skidded over this distance without requiring a new road. Therefore, it was assumed that timber harvested from a stand having a median distance less than 3/8 mile from an existing Maintenance Level 3, 4, 5, or other public road would not require road construction or reconstruction. Incremental road mile assumptions were assigned to distances of 3/8 to 6/8 mile, 6/8 to 9/8 mile, and greater than 9/8 mile from Level 3, 4, 5, or other public roads.

Level 3, 4, 5, or other public roads were used because it was assumed that logs could be hauled on these well-maintained roads without the need for major reconstruction. It was also assumed that if Level 1 and 2 roads were used to haul timber, they would require substantial reconstruction such as brush and tree removal, culvert replacement, and new drainage structures. However, it was impossible to differentiate how many Level 3, 4, and 5 roads would be needed versus Level 1 and 2 roads. Therefore, new construction for Level 3, 4, and 5 roads, and reconstruction for Level 1 and 2 roads, were lumped together for this analysis.

It was also impossible to tell whether harvested stands would require an entirely new road for access, or whether access would include part of a new road that had been constructed to access other stands. Therefore, we did two analyses: the first assumed all harvest would be accessed by a combination of new and existing Level 3, 4, 5, or other public roads and reconstructed Level 1 and 2 roads, and the second assumed all harvest would be accessed by only newly constructed Level 3, 4, and 5 roads and reconstructed Level 1 and 2 roads. These two sets of roads are used as a projected range of road miles that could occur by alternative. These ranges are provided in the last row of Tables RO-4 and RO-5, below. Table RO-4 shows maximum acres harvested and

associated roads needed for the first decade of the planning horizon, while Table RO-5 shows the same information for the fifth decade (40-50 years from now) of the planning horizon.

Table RO-4. Miles of Road by Alternative for Decade 1 Based on Maximum Harvest Levels and Harvest Distance From Roads

Indicator	Distance to Road (Miles)	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
Maximum Acres Harvested	0 to 3/8	44,911	42,133	42,349	39,154	45,460
	3/8 to 6/8	7,328	3,060	2,989	1,057	5,316
	6/8 to 9/8	1,482	80	0	553	500
	> 9/8	1,100	24	0	0	288
	Totals	54,821	45,297	45,338	40,764	51,573
Harvest Using New and Existing Maintenance Level 3, 4, and 5 Roads, and Reconstructing Existing Maintenance Level 1 and 2 Roads	0 to 3/8	0.0	0.0	0.0	0.0	0.0
	3/8 to 6/8	15.4	6.4	6.4	2.3	11.3
	6/8 to 9/8	3.4	0.4	0.0	1.5	1.1
	> 9/8	2.6	0.4	0.0	0.0	0.8
	Totals	21.4	7.1	6.4	3.8	13.1
Harvest Using New Maintenance Level 3, 4, and 5 Roads, and Reconstructing Existing Maintenance Level 1 and 2 Roads	0 to 3/8	0.0	0.0	0.0	0.0	0.0
	3/8 to 6/8	15.4	6.4	6.4	2.3	11.3
	6/8 to 9/8	6.8	0.8	0.0	3.0	2.3
	> 9/8	7.9	1.1	0.0	0.0	2.3
	Totals	30.0	8.3	6.4	5.3	15.8
Estimated Range of Road Miles for the Decade		21 - 30	7 – 8	6 – 6	4 – 5	13 - 16

As shown in Table RO-4, Alternative 1, which is harvesting the most timber over the decade, would also need the most roads to harvest that timber. Alternative 1 is followed in order by Alternatives 4, 2, 2M, and 3. The reason that Alternative 1 requires so many more road miles than the other alternatives is directly related to the larger amount of harvest that is occurring beyond 3/8 mile from existing roads. Similarly, Alternative 2M would require slightly less road mileage than Alternative 2, which harvests less timber, because more stands in Alternative 2 are farther away from existing roads. That all alternatives have such a low overall need for new is closely related to the high amount of harvest close to existing roads that has been selected by the scheduling model. The tendency of the model to optimize timber production and value may be resulting in an under-estimation of road miles needed in the first decade for all alternatives.

By the fifth decade, represented in Table RO-5, road mile patterns have shifted somewhat. Alternatives 1, 2, and 2M have very similar amounts of predicted road mileage, Alternative 4 has slightly less mileage, and Alternative 3 substantially less. For all alternatives, potential road miles range from 48 to 127 for the entire decade, which averages out to 4.8 to 12.7 miles per year. More road miles are needed in all alternatives because more harvest is projected in stands farther from existing roads. The ranges of road miles for the alternatives are greater as well, indicating that there are more road options available. The overall miles reported in the fifth decade are much greater than in the first decade primarily because the optimization model is choosing to harvest a very high percentage of easily accessible stands in the first decade. This

choice has the indirect effect of leaving less accessible stands to be harvested in later decades, which requires more road construction/reconstruction.

Table RO-5. Miles of Road by Alternative for Decade 5 Based on Maximum Harvest Levels and Harvest Distance From Roads

Indicator	Distance to Road (Miles)	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
Maximum Acres Harvested	0 to 3/8	27,037	19,149	21,404	16,386	18,297
	3/8 to 6/8	12,364	12,586	10,401	11,468	10,777
	6/8 to 9/8	7,909	13,113	12,682	5,504	4,460
	> 9/8	10,312	7,244	7,034	5,619	10,047
	Totals	57,622	52,092	51,521	38,977	43,581
Harvest Using New and Existing Maintenance Level 3, 4, and 5 Roads, and Reconstructing Existing Maintenance Level 1 and 2 Roads	0 to 3/8	0.0	0.0	0.0	0.0	0.0
	3/8 to 6/8	25.9	26.3	21.8	24.0	22.5
	6/8 to 9/8	16.5	28.5	31.5	11.6	9.4
	> 9/8	27.0	15.4	15.0	12.4	32.6
	Totals	69.4	70.1	68.3	48.0	64.5
Harvest Using New Maintenance Level 3, 4, and 5 Roads, and Reconstructing Existing Maintenance Level 1 and 2 Roads	0 to 3/8	0.0	0.0	0.0	0.0	0.0
	3/8 to 6/8	25.9	26.3	21.8	24.0	22.5
	6/8 to 9/8	33.0	54.8	53.3	23.3	18.8
	> 9/8	65.3	46.1	45.0	36.0	63.0
	Totals	124.1	127.1	120.0	83.3	104.3
Estimated Range of Road Miles for the Decade		69–124	70–127	68–120	48–83	6 -104

If the overall road miles are somewhat under-estimated for the first decade due to model choices and tendencies, the overall road miles in the fifth decade (or any later decade, for that matter) are likely over-estimates for the following reasons:

- Miles are based on maximum projected timber harvest (ASQ), rather than actual harvest. Records (see *Timber Resources* section) show that the Forest has not harvested the ASQ in the past 20 years.

- Helicopter yarding was not factored into the analysis, even though the Spectrum model formulations estimated that 40 percent of the projected harvest would be by helicopter yarding, which requires significantly fewer roads.

- There are a number of areas on the Forest that could be harvested if the Forest were to acquire easements or rights-of-way to existing roads. These roads may or may not need to be reconstructed to haul timber, but they would not have to be constructed.

- For this exercise, a reconstructed road was given the same value or weight as a newly constructed road, whereas in reality reconstruction may often be a more cost-efficient option, depending on site-specific circumstances. This option is worth noting because reconstructed

roads do not create a major new imprint on the landscape, with the associated effects of large tree removal, new cut and fill slope excavation, habitat fragmentation, etc.

Although the road miles presented are not intended to be accurate projections, the patterns and the reasons behind those patterns are important information for land managers to recognize.

Potential Change in Public Motorized Access Related to MP Allocation

Another way to look at opportunities for road construction, reconstruction, and public motorized access is by comparing the amount of land allocated by alternative to MPs that restrict these activities. These MPs are Designated Wilderness (5.0), Recommended Wilderness (5.1), Backcountry Recreation (6.2), and selected Special Areas, such as NRA backcountry recreation areas (8.1 SPNM), Ecological Areas (8.4), and Candidate Research Natural Areas (8.5). The acres of these MPs by alternative are shown in Table RO-6.

Table RO-6. Acres of MPs that would Prohibit Public Motorized Access by Alternative

Area	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
MP 5.0 Acres	78,700	78,700	78,700	78,700	78,700
MP 5.1 Acres	0	27,700	27,700	99,400	0
MP 6.2 Acres	124,500	97,500	106,800	225,900	51,000
MP 8.1 SPNM Acres	0	24,900	24,900	13,000	24,900
MPs 8.4, 8.5	2,030	2,020	3,960	2,020	2,020
Total Acres	**205,230**	**230,820**	**242,060**	**419,020**	**156,620**

Based on the areas shown in Table RO-5, the alternative that would have the most direct effect on prohibiting public motorized access is Alternative 3, followed in descending order by Alternatives 2M, 2, 1, and 4. Compared to the current condition, represented by Alternative 1, Alternatives 2 and 2M would increase the amount of land that is off-limits to public motorized access by 25,590 acres and 36,830 acres, respectively. These acres represent about 3 and 4 percent of the Forest, respectively. Alternative 3 would more than double the current acres, and the increase would represent over 23 percent of the Forest land base. Conversely, Alternative 4 would reduce the amount of land off-limits to public motorized access by 48,600 acres, or about 5 percent of the Forest. Alternative 4 would accommodate those who favor more public motorized access on the Forest, whereas those who favor less public motorized access would be best accommodated by Alternative 3, and to a much lesser extent by Alternatives 2M and 2.

Road Maintenance Capabilities

As noted previously, road maintenance capabilities are affected by a number of variables. Because budget allocations vary from year to year and Forest to Forest, it is difficult to predict future budget allocations. Also, there is no direct linkage between stated Forest Plan budget needs and what Congress eventually allocates, so there is no assurance that future budget levels will even approach those stated in Forest planning. Recent maintenance performance levels can

be used in combination with anticipated road system levels to estimate the relative percent of the road system that could be maintained under each alternative. This does not account for road maintenance contributions from commercial users or road maintenance cooperators. However, commercial road maintenance contributions are currently relatively small. Based on each alternative's relative levels of mechanical vegetation treatments, Alternative 4 would probably provide greater road maintenance contributions from commercial users. Alternatives 1, 2, and 2M would provide similar levels, while Alternative 3 would provide the lowest levels. Road maintenance cooperator contributions would probably vary little by alternative and would also be relatively small.

In general, maintenance responsibilities are proportional to the size of the classified road system. This analysis assumes a static road maintenance funding level. Because Alternative 4 may result in the largest road system on the Forest, it may also result in the lowest percentage of roads maintained to standard. Conversely, Alternative 3 may result in the smallest road system. This alternative may result in the highest percentages of roads maintained to standard.

The above results may be improved, to some extent, by commercial user contributions, which are not estimated in this analysis. Commercial user contributions would contribute to meeting road maintenance standards and would be likely to be proportional to the levels of timber harvest under each alternative. In this regard, road maintenance capabilities under Alternative 4 would probably benefit to the greatest extent. However, such performance improvements are not expected to be substantial.

Cumulative Effects

Potential Change in Forest Classified Roads Related to Timber Harvest by Alternative

The actual miles of road constructed or reconstructed related to timber harvest are impossible to predict at this scale because project design, location, transportation needs, and resource concerns are unknown. However, road decommissioning or improvement opportunities may also increase in relation to the harvest-related activities for the following reasons:

- Roads constructed for timber harvest are often Maintenance Level 1 or 2 roads, which usually provide the best opportunity for decommissioning over the short and long term.

- Any proposed timber sale would be accompanied by an area-specific transportation system analysis, which would identify the minimum system needed over the long term. This analysis would also identify any existing roads in the project or watershed area that could be improved or decommissioned.

- Timber receipts could be used to fund road decommissioning or improvement projects.

- The 2006 Forest Plan has a road decommissioning objective to achieve.

Thus, the overall Forest Classified Roads related to timber harvest—including road construction, reconstruction, and decommissioning—would be cumulatively affected by project-level decisions based primarily on the following criteria:

- The amount of timber to be harvested and the current access to that timber,
- Road-related resource concerns that can be mitigated through other harvest methods,
- The long-term transportation needs in the area,
- The opportunities for decommissioning roads to provide the minimal road system needed and to meet or exceed the 2006 Forest Plan decommissioning objective.

Relative Potential Change in Public Motorized Access Related to MP Allocation

The Direct and Indirect Effects analysis looked separately at MPs on the Forest that would either prohibit or limit public motorized access through management direction. This cumulative effects assessment combines that analysis with MPs that would potentially limit public motorized access to federal lands, to give the reader a feel for how public motorized access would be affected overall by each alternative.

It is assumed, due to past history and current management direction, that harvest activities that take place in MPs 6.1 (Wildlife Habitat Emphasis) and 4.1 (Spruce and Spruce-Hardwood Restoration) would have fewer roads open to public motorized access than activities occurring in MP 3.0. In Alternative 1, Opportunity Areas (OA) 832, 837, and 838 represent threatened and endangered species habitat that would also have some access limitations, not only to protect federally listed species, but also because most of the land in these MPs came from what was originally MP 6.1 in the 1986 Forest Plan. Thus, these MPs have access restrictions in place from when they were 6.1. The restrictions would be primarily seasonal, short-term, or long-term road closures to protect wildlife from disturbance. Public motorized access on these roads would be determined through site-specific decisions coordinated with the WVDNR and/or USFWS.

Table RO-7. Acres of MPs 4.1 and 6.1 by Alternative Limiting Public Access

Area	Alternative 1	Alternative 2	Alternative 2M	Alternative 3	Alternative 4
OA 837/838 Acres	2,540	0	0	0	0
OA 832 Acres	115,530	0	0	0	0
MP 4.1 Acres	0	155,700	154,500	90,100	199,800
MP 6.1 Acres*	284,400	286,600	277,600	177,900	310,300
Total Acres	**402,470**	**442,300**	**432,100**	**268,000**	**510,100**

*Acres are given following the Forest Plan T&E Amendment, which converted many 6.1 areas to 6.3 and OA 832 areas, but did not affect how the roads are being managed.

Based on the areas shown in Table RO-7, the alternative with MP direction that would have the most effect on limiting public motorized access is Alternative 4, followed in descending order by Alternatives 2, 2M, 1, and 3. Compared to Alternative 1, the current condition, Alternatives 2M and 2 would moderately increase the amount of land that has limited public motorized access on the Forest by 28,730 acres and 39,830 acres, respectively.

Table RO-8 displays acres of all the areas that would likely affect public motorized access by alternative.

Table RO-8. Acres of Areas Prohibiting or Limiting Public Motorized Access by Alternative

Area	Alt. 1	Alt. 2	Alt. 2M	Alt. 3	Alt. 4
MP 5.0 Acres	78,700	78,700	78,700	78,700	78,700
MP 5.1 Acres	0	27,700	27,700	99,400	0
MP 6.2 Acres	124,500	96,200	106,800	225,900	51,000
MP 8.4 and 8.5 Acres	2,030	2,020	3,960	2,020	2,020
SPNM Acres in NRA	0	24,900	24,900	13,000	24,900
Prohibiting Acre Subtotal	**205,230**	**230,820**	**242,060**	**419,020**	**156,650**
OA 837/838 Acres	2,540	0	0	0	0
OA 832 Acres	115,530	0	0	0	0
MP 4.1 Acres	0	155,700	154,500	90,100	199,800
MP 6.1 Acres*	284,400	286,600	277,600	177,900	310,300
Limiting Acre Subtotal	**402,470**	**442,300**	**432,100**	**268,000**	**510,100**
Total Acres	**607,700**	**673,120**	**674,160**	**687,020**	**666,730**

*Acres are given following the Forest Plan T&E Amendment, which converted many 6.1 areas to 6.3 and OA 832 areas, but did not affect how the roads are being managed. See explanation below

Cumulatively, Alternative 3 would have the most overall effect on prohibiting or limiting public motorized access, and it would have by far the most effect on prohibiting access and use. Alternatives 2, 2M, and 4 would have very similar overall effects. Alternative 1 would have the least overall limiting and prohibiting acres, but would have more prohibiting acres than Alternative 4. The difference between the alternatives with the most (3) and least (1) overall prohibiting and limiting acres is around 79,000 acres, or less than 9 percent of the Forest land base. The difference between the alternatives with the most (3) and least (4) prohibiting acres, though, is over 262,000 acres, or about 28 percent of the Forest land base.

Other Factors Influencing Road System Levels and Public Motorized Access

As populations grow and visitation expands on the Forest, the use of Forest roads will increase. The Forest arterials and major collectors that connect the Forest to popular recreation areas will experience the most increased day-use traffic, particularly on weekends and holidays. This traffic adds to the maintenance work necessary to keep the roads in a safe and structurally sound condition.

As travel to and through the Forest increases, there will be an increase in impacts to surrounding public roads. Corridor H, currently under development, is expected to generate such effects. Congestion during peak summer travel months will likely increase on State Highways 28, 39, 55, and 92, as well as U.S. Routes 33, 219, 220, and 250.

Timber sale appeals and litigation have reduced commercial forest products traffic to well below what was expected under the original Forest Plan. The level of commercial forest products traffic would vary by alternative compared to current levels.

There are no new roads planned for recreation at this time.

The Forest Service is required by law to provide reasonable access to private inholdings. As ownership of these lands has changed in recent years, more interest in developing them for second homes or developed recreation areas has been seen. Pressure on the Forest to provide more than the historical, primitive, or low-standard road access may also increase. It usually is in the interest of the Forest Service to request that a public transportation authority, such as the state government, accept responsibility for management and maintenance of roads that provide access to multiple private inholdings.

The Forest Service is also required to allow reasonable access to privately owned mineral rights for exploration, development, and extraction purposes. Currently, an estimated 38 percent of the Forest has privately owned mineral rights for gas and oil, and about 24 percent of federally owned oil and gas is currently leased. The reasonably foreseeable gas development (RFD) scenario, prepared in May 1990 and updated and validated for plan revision, predicted that there may be 19 miles of road needed for potential natural gas development per decade within the Forest proclamation boundary. However, the Forest has had only 3 miles of road constructed for mineral development since 1991 (see Table MI-1 in the *Mineral Resources* section). Operators have chosen options for development that reduce the total amount of surface disturbance dedicated to gas wells and associated roads and pipelines.

There are also roads associated with certain special use authorizations. Such roads are typically not open to public motorized use.

Because mineral development and special use requests are initiated externally, it is impossible to accurately predict what specific activities would occur, where or when they would occur, or to what intensity level—and therefore what new roads may need to be constructed. However, the government can purchase mineral rights, and leases can expire and not be extended or renewed. These situations can lead to road decommissioning opportunities.

The Forest currently has an estimated 98,000 acres of NFS land (11 percent of the Forest) for which it does not have legal road access, and therefore cannot provide access for the public.

There is currently a 47-acre (about 15 miles) limitation on annual new road construction on the Forest as a result of USFWS terms and conditions for the recent Threatened and Endangered Species Amendment to the Forest Plan.

Forest Road – Maintenance Level 4

Forest Road – Maintenance Level 3