3.1 TRANSPORTATION (ROADS)

3.1.1 SCOPE OF ANALYSIS AND ANALYSIS METHODS

This analysis will focus on comparing the potential impacts of implementing the various alternatives on the National Forest System roads on the Forest's Transportation System (motorized trails will be discussed in the Recreation and Trails section, Chapter 3, Section 3.2 of this FEIS), specifically on the costs of maintaining roads for the designated use(s), and the Forest's ability to fund the costs. This analysis was added to the FEIS based on comments received on the DEIS. A National Forest System road is defined as "A forest road other than a road which has been authorized by a legally documented right-of-way held by a State, county, or other local public road authority" (36 CFR §212.1). Roads for public use will need to be maintained at levels that provide for the designated use(s) without undue damage to adjacent resources or risk to safety. Traffic volume, types of vehicles, road design, construction methods and materials, season of use, and environmental factors such as storm events all impact the condition and maintenance needs on the road system. Of these, travel management influences traffic volume, vehicle types, and season of use.

Maintenance Levels (ML) and local forest knowledge were used in estimating relative costs between alternatives; maintenance levels indicate general maintenance guidance for the various classes of roads, along with implied maintenance frequencies; local forest knowledge considered road location and design, level of use, and existing environmental factors. These topics are discussed in detail later in this section.

The analysis area for the Transportation resource consists of the Bitterroot National Forest, not including Designated Wilderness.

3.1.2 REGULATORY FRAMEWORK

Direction pertaining to the Travel Management Planning Project is contained in the 2005 Travel Management Rule (**36 CFR Parts 212, 251, 261, and 295: Travel Management; Designated Routes and Areas for Motor Vehicle Use, Final Rule** {Project File folder 'usfs_direction_and_policies_laws,' Project File document DIRECTION-003.pdf}.

The Forest Service's authority to develop and maintain a road system is contained at 16 U.S.C. 532. This direction regarding the administration, protection, and utilization of National Forests recognizes the need for a transportation system to facilitate legitimate uses and management activities. Although the National Forest Road System is considered a "public" road system, it does not provide for the general commerce, convenience, and transportation needs of the public at large in the same manner that the public highway systems do. The Forest Service encourages public use of the National Forests; therefore, the road system needs to accommodate the access and use by the public, provided that these uses are consistent with existing laws, regulations, and management objectives.

The following Forest Plan goals and objectives are applicable to the Transportation resource:

- Forest Goal 14 states "Roads – Design transportation systems and road management programs that are responsive to public concerns and resource goals" (USDA Forest Service 1987a, II-3).
- Forest-wide Management Objective N states "Roads – Minimize the extent of the road system needed for resource management. Minimize the need for capital investment funds. Minimize adverse effects on water quality and fish habitat during construction and maintenance" (USDA Forest Service 1987a, II-7).

3.1.3 AFFECTED ENVIRONMENT

A. History and Existing Condition

The road system on the Bitterroot National Forest has been developed over the past 120 years. Many of the roads used on a daily basis began as wagon routes in the last quarter of the 19th century. Some of the

earliest forest roads would have been built around 1900. Over the decades, emphasis on resource extraction, mainly timber, in addition to fire suppression and recreation, created a demand for access to National Forest System lands on the Bitterroot National Forest.

As the demands for access increased so did the development of the Forest's Transportation System, the system of roads and trails on the Forest. Road construction increased through the decades, hitting its peak in the 1960s and 1970s before tapering off in the 1980s and essentially ending in the late 1990s. At the high point, approximately 3,300 miles of road were identified on the Bitterroot National Forest. These included roads on private lands within the Forest's boundary, planned roads that were never constructed, substandard roads that were never constructed to the standard of a specified road, and roads constructed for forest management.

Road maintenance practices on the Bitterroot National Forest have changed through the years. In the peak years of timber harvests, the objective was to grade as many miles a year as possible; the belief being that the more times the road was graded, the better. With the high volume of truck traffic, grading road prisms flat and smooth was the preferred method. However, this impeded the road's ability to shed water. As timber harvest on the Forest decreased, so did the miles of road graded each year. The next emphasis in road maintenance was to improve road surface drainage. This involved creating in-sloped, out-sloped, or crowned road prisms. In addition, type 1 drainage dips or rubber-belted cross drains were installed, re-established, or replaced. The next emphasis was to improve hydrologic function by installing culverts in new locations, or replacing insufficient structures with larger structures based on modern design standards. The combination of road surface drainage improvements and additional ditch relief culvert installation improved hydrologic function of road stream interfaces on the Forest.

In the early 1990s the Forest began mitigating for the impacts of roads on water resources. Roads were often ripped or scarified, seeded, and bermed, essentially making them undriveable. When the Forest began implanting these mitigations, adequate tracking mechanisms were not in place. Subsequently, many miles of treatment were not recorded. The Bitterroot National Forest began tracking this information in 2004, and later began going back through historic records, and recording the data. Since the current tracking system has been utilized, approximately 134 miles of National Forest System roads have been decommissioned, re-contoured, and permanently removed from the Forest's Transportation System. Additionally, approximately 195 miles have been hydrologically stabilized and placed into long-term storage. While the stored roads are no longer available for motorized public use, they remain on the Forest's Transportation System, and would be available in the future use for administrative purposes by Forest Service personnel.

Road Use

Road use, or the amount of traffic a road receives, is dependent upon a number of variables: travel management strategy, road location (and, in particular, elevation affect the time of year a road is physically open to public travel), Forest Service administrative activities (timber sales and wildfire suppression), roads near population centers, roads which connect with other roads combining to make through-routes or loop routes, roads with administrative sites (trail heads, rental cabins, or lookouts), destinations (vistas and dispersed campsites), roads within popular big game hunting areas, and residential traffic. Most travel on National Forest System roads occurs during the summer and fall months. The Bitterroot National Forest compiles monthly average daily traffic (MADT) data on various Forest roads. The MADT data is the number of vehicles on a particular road within a month-long period divided by the number of days in that month. Most summer months the MADT varies from 10-30 vehicles per day. Those roads that are open during the fall big- game rifle hunting season will usually see a spike of traffic in late October, and a continued steady high level of use until the Sunday after Thanksgiving. On these roads, MADT has been known to double, triple, even quadruple on select weekend days during the big game rifle hunting season.

Many winter visitors to the Bitterroot National Forest also use National Forest System roads to access areas on the Forest for recreational purposes. This use is somewhat dynamic, changing from year to year based on winter conditions. The Forest does allow some user groups to utilize the road system for winter recreational use; this is discussed in the Recreation and Trails section, Chapter 3, Section 3.2 of this FEIS. The Bitterroot National Forest maintains agreements with user groups that provide the public with groomed snowmobile trails and cross-country ski trails. These opportunities are open to the public.

Unless the Forest Service has administrative activities in progress, e.g. a timber sale, roads are not plowed in the winter, even though they are technically open yearlong to street-legal motorized vehicles. High-elevation roads open yearlong usually receive enough snow to keep the average highway legal vehicle from traveling on them during the winter months. There are some enthusiasts in the Bitterroot Valley who use four-wheel drive vehicles with large tires and low tire pressure to drive on top of the snow when conditions allow, and others that use snowmobiles to ride on these roads when the snow depth prohibits travel by street legal vehicles.

Weather conditions vary year to year on the Bitterroot National Forest. The elevation for suitable snow for winter recreationalists may also vary. The National Forest System roads are the way many recreationists will access areas of the Forest. National Forest System roads are considered public roads; use of snowmobiles on National Forest System roads must be in accordance with Montana State Law. The Forest Service has the authority to supersede state law in with the proper analysis, but is not doing so as part of the Bitterroot National Forest Travel Management Planning Project. Montana Code 23-2-631 outlines Montana State Law in regards to operation of snowmobiles on public roads, streets and highways {Project File folder 'transportation,' Project File document TRANS-005.pdf }.

In the 1970s the cumulative impacts of motorized vehicle traffic, road construction and timber harvest on watersheds became a concern. In 1972 Executive Order (E.O.) 11644, as amended by E.O 11989 (1977), was signed which states; "It is the purpose of this order to establish policies and provide for procedures that will ensure that the use of off-road vehicles on public lands will be controlled and directed so as to protect the resources of those lands, promote the safety of all users of those lands, and to minimize conflicts among the various uses of those lands" {Project File folder 'usfs_direction_and_policies_law,' Project File document DIRECTION-005.pdf}.

In 1976, in response to E.O. 11644, the Bitterroot National Forest developed its first forest- wide travel plan. Since then the Forest has adaptively managed its road system in an effort to help mitigate the impacts of management activities on general watershed health. For roads, common methods to mitigate the impacts of motorized travel to affected resources include:

- Seasonal road restrictions
- Yearlong road restrictions to some or all motorized traffic
- Long term storage of roads needed for future forest management
- Decommissioning of unnecessary roads

Access Travel Management

Currently on the Bitterroot National Forest there are 2,576 miles of National Forest System roads, both open and closed to motorized vehicles, in the analysis area, as shown in Table 3.1-1, below:

Table 3.1- 1: Roads in the Analysis Area

MVUM Code	Status	Number of Miles
0	Closed to highway-legal vehicles[1] – yearlong	1,043

MVUM Code	Status	Number of Miles
1	Open to all vehicles – yearlong	10
2	Open to all vehicles – seasonally	67
3	Open to highway-legal vehicles[2] – yearlong	887
4	Open to highway-legal vehicles – seasonally	569
Total Miles		**2,576**

[1] 595 miles of these routes (coincident) are currently open to ATVs and motorcycles seasonally or yearlong
[2] Includes street legal full-size vehicles, ATVs, motorcycles, and UTVs

Motor vehicle use map (MVUM) codes describe the type of vehicle and season of use permitted on National Forest System roads.

As Table 3.1-1 shows, there are 569 miles of roads open seasonally to highway-legal vehicles for public use. The Bitterroot National Forest uses database information tracked in Natural Resource Manager (NRM) to produce the Forest Visitor map. The map shows which routes are open and, if applicable, the season of use. Currently there are eight categories of seasonal restriction to highway-legal vehicles on the Bitterroot National Forest; the categories are shown in Table 3.1-2, below:

Table 3.1- 2: Categories of Seasonal Road Restrictions

Road Restriction	Dates of Restriction	Management Purpose	Number of Miles
R-2	10/15 – 12/01	Protect wildlife and provide wildlife security during hunting season	181
R-3	10/15 – 06/15	Provide wildlife security during hunting season	276
R-5	09/01 – 06/15	Protect wildlife and provide wildlife security during hunting season	6
R-8	12/01 – 05/01	Provide for snowmobile safety	3
R-9	12/01 – 03/31	Provide wildlife security	73
R-10	10/15 - 06/15	Provide for public safety, reduce soil erosion, or protect wildlife	16
R-13	12/01 – 06/15	Erosion – prevent ruts and soil erosion; provide wildlife security	9
R-14	10/15 – 05/15	Provide big game protection	3

The following table, Table 3.1-3, shows the categories of seasonal use corresponding to the MVUM codes 2 and 4.

Table 3.1- 3: MVUM Codes and Season of Use

MVUM Code	Season of Use
2	04/01-11/30
4	04/01 - 11/30 05/02 - 11/30 05/16 - 10/14 06/16 - 08/31 06/16 - 10/14 06/16 - 11/30 12/02 - 10/14

Land Management Project Planning and Minimum Transportation System

Although this analysis is not doing Subpart A of 36 CFR 212, Administration of the Forest Transportation System, the Bitterroot National Forest has been doing minimum road analysis and travel management on a watershed scale, project by project, within the analysis area. The minimum transportation system is the system of roads and trails determined to be needed to meet resource and other management objectives adopted in the relevant land and resource management plan (36 CFR Part 219), to meet applicable statutory and regulatory requirements, to reflect long-term funding expectations, to ensure that the identified system minimizes adverse environmental impacts associated with road and or trail construction, reconstruction, decommissioning, and maintenance.

Past and present projects considered travel management and minimum road analysis across the Forest. For this discussion, the acre totals do not include private land outside the Forest's boundary, or Designated Wilderness. Additionally, there are gaps and overlaps between project boundaries, meaning some acres may have been included in multiple projects. The following EAs and EIS' considered travel management and minimum roads analysis: Lost Lick, Camp Reimel, Reynolds Lick, Meadow Mink Springer, Fern Creek, Huck Trap, Nez Perce, Warm Springs, Slate Hughes, Lyman, Middle East Fork, Trapper Bunkhouse, Lower West Fork, and Three Saddle. These projects totaled approximately 338,000 acres of National Forest System lands, 296,500 acres if the overlaps are removed. The Burned Area Recovery Project did not address travel management but it did consider minimum roads analysis on approximately 285,000 acres of National Forest System lands. Reasonably foreseeable projects which include minimum road analysis or travel management, or both, include the Darby Lumber Lands Watershed Improvement and Travel Management Project, Meadow Vapor, Como Forest Health Project, and the Westside Project. These would cover an additional 44,000 acres of National Forest System lands.

As the Forest identifies its minimum transportation system, a prioritization of management needs versus resource impact is continually being evaluated. In an effort to mitigate impacts of roads, the Forest has improved road surfacing and road drainage, adopted seasonal restrictions, replaced fish barriers with aquatic organism passage structures, performed road storage treatments for National Forest System roads that will be needed for future management activities, and decommissioned unneeded National Forest System roads or unauthorized road prisms. These practices help mitigate the impacts of the road system to affected resources by improving surface hydrology and fish habitat, reducing fine sediment in the long

term, providing secure areas for wildlife, and reducing impacts on roads due to large hydraulic events, such as post fire runoff, or rain-on-snow events.

Road storage treatments include removing culverts; recontouring drainage; water-barring, scarifying, or decompacting road prisms; fully recontouring road entrances; and seeding, mulching, and fertilizing disturbed areas. These treatments help mitigate the impact of remaining roads to the affected resources over the long-term; however, there can be adverse impacts in the short-term. Upon completion of the work, these roads will remain on the Forest's Transportation System as Maintenance Level (ML) 1 roads.

Once the transportation system necessary to manage forest lands is identified, unneeded roads are proposed for decommissioning, in order to restore them to a more natural, stable state. This work includes removing culverts and recontouring drainages, full and partial obliteration of road prism, and seeding, mulching, and fertilizing of disturbed areas. Upon completion of the work, these roads are permanently removed from the Forest's Transportation System.

The Bitterroot National Forest will continue to evaluate the road and trail system on a project-by-project basis. The transportation system will change based on forest management needs and forest prioritization. The Agency must meet the resource and management objectives as outlined in 36 CFR Part 219 and other applicable statutory and regulatory requirements, and consider long term funding expectations to ensure that the identified system minimizes adverse environmental impacts associated with road construction, reconstruction, decommissioning and maintenance.

B. Operation and Maintenance

Operation and maintenance of the National Forest Road System includes identification and classification of routes, management strategies for use of routes, and management objectives relating to overall purpose of the route. Each road on the Forest's Transportation System should have a schedule outlining its current operational status (open, restricted, or closed), its normal operational use class (Forest Service Manual (FSM) 7705.5), as well as other special restrictions on type of traffic or classes of vehicles. For this analysis, **Functional Class** and **Maintenance Level** are discussed in detail.

Functional Class is the way the road services land and resource management needs, and the character of service that it provides. Described below are the three categories the Forest Service uses when identifying the functional class of a road:

- **Arterial Road -** provides service to large land areas and usually connects with other arterial roads or public highways.
- **Collector Road -** serves smaller area than an arterial road, and usually connects arterial roads to local roads or terminal facilities (dead end road accessing a timber stand, or undeveloped trailhead).
- **Local Road -** connects a terminal facility with collector roads, arterial roads, or public highways, and usually serves a single purpose involving intermittent use.

Maintenance Level (ML) defines the service provided by, and maintenance required for, a specific road. Maintenance levels must be consistent with Road Management Objectives (RMOs) and maintenance criteria. RMOs document the intended purpose of an individual road in providing access to implement a land and resource management plan as well as decisions about applicable standards for the road. RMOs should be based on management area direction and access management objectives. They contain design criteria, operation criteria, and maintenance criteria (FSM 7709.59.11) {Project File folder 'transportation,' Project File document TRANS-007.pdf}.

The following information is from FSM 7709.59 60 Road Maintenance, FSM 7709.59 62.30 {Project File document TRANS-007.pdf}.

The following factors are considered when assigning maintenance levels:

1. Road Management Objectives
2. Road investment protection requirements
3. Service life and current operational status
4. User safety
5. Volume, type, class, and composition of traffic
6. Surface type
7. Travel speed
8. User comfort and convenience
9. Functional classification

Roads may be currently maintained at one level and planned to be maintained at a different level at some future date. The operational maintenance level is the maintenance level currently assigned to a road considering today's needs, road condition, budget constraints, and environmental concerns; in other words, it defines the standard to which the road is being maintained.

The objective maintenance level is the maintenance level to be assigned at a future date considering road management objectives, traffic needs, budget constraints, and environmental concerns. The objective maintenance level may be the same, higher, or lower than the operational maintenance level. The transition from operational maintenance level to objective maintenance level may depend on reconstruction or disinvestment, FSM 7709.59 62.31 {Project File document TRANS-007.pdf}.

Maintenance Criteria

Maintenance criteria include:

1. Requirements for the protection of adjacent resources or improvements such as streams, lakes, vegetation, and facilities
2. Smoothness required for desired operating speed and for user comfort and convenience. The level of smoothness should be consistent with the road design.
3. Acceptability of dust
4. Season of use and approximate volumes and types of traffic
5. Current and future road operation and maintenance strategies

This information is to be continually reviewed and updated to ensure that these criteria remain consistent with management area direction, resource program needs, road management objectives, and available resources. Line Officer and interdisciplinary staff participation in this process is essential. Road maintenance criteria are to be documented using road RMOs (FSM 7709.59 61{Project File document TRANS-007.pdf}. The Bitterroot National Forest has signed RMOs on all ML 3, 4, and 5, and some ML 1 and 2, roads, and is currently working towards completing RMOs on all National Forest System roads.

The Forest Service categorizes roads by operational Maintenance Level (ML). Maintenance Levels range from 1 to 5, and are described as follows:

- ML 1 – Roads that are closed and under basic custodial care
- ML 2 – Roads operated for use by high clearance vehicles
- ML 3 – Roads operated and maintained for travel by a prudent driver in a standard passenger car
- ML 4 – Roads that provide a moderate degree of use comfort and convenience at moderate travel speeds
- ML 5 – Roads that provide a high degree of user comfort and convenience

The following table, Table 3.1-4, shows the distribution of roads in the analysis area by maintenance level:

Table 3.1- 4: Miles of Roads by Maintenance Level

Maintenance Level (ML)	Miles of Road	% of Total Miles
1	1,039	40%
2	714	28%
3	792	31%
4	11	>1%
5	20	>1%
Total Miles	**2,576**	**100%**

On the Bitterroot National Forest, the ”highest” classes of roads, ML 4 and 5, provide access to or are part of administrative sites such as District Ranger Stations, the Trapper Creek Job Corps Center, and developed campgrounds. One exception is Road #468 is a seasonally-open road which provides the only access to the Selway-Bitterroot and Frank Church River of No Return Wildernesses from Montana and the Bitterroot Valley. Many of the ML 4 and 5 roads have an improved surface of aggregate, concrete, or pavement. Some are located in areas of little resource risk or concern. The improved surfacing and low speed traffic result in little-to-low impact on the annual maintenance budget. Often these surface improvements, and as-needed-replacement, are accomplished through funding other than the Forest’s road maintenance budget. Again, Road #468 is an exception - it was designed for speeds up to 35 miles per hour, is maintained twice annually, and portions are adjacent to the Nez Perce Fork of the Bitterroot River.

Maintenance Level 2 and 3 roads open yearlong or seasonally to full-size vehicles, provide the most access on the Bitterroot National Forest, over 57 percent of the current National Forest System roads. The majority of these roads are native surface, though some do have improved aggregate surfacing, especially if they are near streams. These roads provide many of the existing recreational driving loop opportunities. They also access identified recreation destinations such as campgrounds, trail heads, vista points, and Forest Service rental cabins. In addition, these roads provide access to recreation opportunities which include berry picking, hunting, fishing, and dispersed camping. These roads also provide the main access for the collection of firewood.

Maintenance Level 2 roads (closed to full size vehicles yearlong), are typically used for intermittent administrative use by Forest Service personnel associated with management treatments or forest protection. These roads are maintained at a low standard, mainly upkeep of drainage structures. Some ML 2 roads which will be needed for future management activities, but pose a current resource risk, have been placed into long term storage. The road storage treatments range from ripping and out-sloping to partial or full re-contouring of portions of the road prism. After treatment, the ML is reduced to 1.

When closed ML 1 or 2 roads are needed for administrative use, such as a timber sale, they receive a higher degree of maintenance, depending on the condition of each individual road. This work may include surface grading, slump removal, brushing, clearing, drainage improvement, culvert installation, and spot surfacing. The Maintenance Level may be increased during administrative use. The costs associated with the higher degree of maintenance are absorbed by the timber sale, and not the annual road maintenance budget. Once the administrative activities are completed, these roads often return to ML 1. When ML 1 roads are no longer needed for future management activities, they are decommissioned and permanently removed from the transportation system. Decommissioning treatments are mainly partial and full re-contouring of the road prism.

Coincident Routes and Maintenance Level 1 Roads

In 1976, in response to E.O. 11644, the Bitterroot National Forest developed its first forest-wide travel plan. Included in this plan were area restrictions intended to eliminate cross country travel seasonally or yearlong, and route restrictions placed on individual roads and trails prohibiting travel seasonally or yearlong. It is important to note that the plan clearly defined trail vehicles as being less than 40 inches in total width, and identified opportunities for trail vehicles to travel on roads closed to full size vehicles. Since then, the official definition of trail vehicle used by the Forest Service has been changed to include vehicles 50 inches or less in total width. Although the Forest has increased the variation and total number of travel restrictions since 1976, some restrictions identified in the first Bitterroot National Forest Travel Plan are still in place today.

The concept of motorized trail vehicles (ATVs and motorcycles) on roads closed to full size vehicles is consistent with what the Forest Service defines as a "coincident route": *a route that is managed as part of another different inventoried route(s) in the Forest's Transportation Atlas*. The 2005 Travel Management Rule requires that these routes, many of which are National Forest System roads, also reside on the database of National Forest System trails in order to be identified on a MVUM. A road may be coincident with another road or trail, and a trail may also be coincident with another trail. Refer to Chapter 3, Recreation and Trails, Section 3.2.3 K, of this FEIS, for further discussion of coincident routes.

On the Bitterroot National Forest, the vast majority of the approximately 595 miles of coincident routes are ML 1 and 2 roads closed yearlong to full size vehicles. The Forest has one exception: the Jew Mountain Road (#5706) is considered a coincident route open to a mixed use of street legal motorized and motorized trail vehicles. This management is considered "concurrent use" and, according to policy, must be managed for mixed traffic. Each traffic type has independent requirements for operators and vehicles that are legal on those routes. In order to allow mixed uses on routes during the same timeframe requires an independent engineering analysis to be completed and approved prior to this kind of designation.

None of the coincident routes proposed in the Travel Management Planning Project FEIS will have concurrent use of full size highway vehicles and trail vehicles.

Historically these coincident routes, (routes that have allowed motorized trail vehicles behind yearlong closures to full size vehicles), have been maintained on an as-needed basis. Many of the most popular coincident routes have remained passable through the efforts of the forest users who enjoy the opportunity they provide. Other, higher profile coincident routes ((Jew Mountain Road (#5706) or Thunder Mountain Road (#5685) receive limited maintenance from road or trail crews, mainly to clear fallen rock or cut out fallen trees in the travel way. Many of these coincident routes have grown in over time, and receive no use due to varying physical conditions found on the landscape. With thousands of acres across the Forest burned as recently as 2000, fallen trees have become much more evident, and will continue as a maintenance issue for at least the next decade.

Maintenance needs on roads are a function of vehicle type, vehicle volume, surfacing material, route alignment, and route gradient. Traffic volumes on roads closed to full-size vehicles would be much less than that seen on the Forest's open roads system during the busiest time of the year. The amount of vehicles traversing these roads during any given year can be considered negligible as it relates to increase maintenance needs on the Bitterroot National Forest.

The Bitterroot National Forest will continue to monitor, adjust travel management, and prioritize maintenance activities on the system of roads open to motorized travel. In the event those routes become closed due to physical conditions, the Forest may temporarily close the route until appropriate repairs can be made, or close the route to motorized traffic, dependent upon year to year budget capacity, or forest priority. The Forest has the authority, under 36 CFR 295.5, to initiate emergency closures of roads, trails, or areas for up to one year to protect water, soil, and fisheries resources which are negatively impacted or adversely affected by motorized vehicle use.

Road System Improvements and Maintenance

Road improvements refer to activities that improve the road from its original design standard; road maintenance refers to the activities associated with maintaining a road at its original design standard, or its original condition. Road improvements help mitigate the impact of roads on water resources. For roads, the most common improvements implemented are placement of crushed aggregate, and installation of road drainage features such as culverts and drain dips. Other types of improvements include slope stabilization, aquatic organism passage (AOP) structures, bridges, gabion retaining walls, and under drain systems.

Road Improvements

The most common road improvement, crushed aggregate surfacing, reduces erosion as well as sedimentation delivery into streams on an annual basis. Road maintenance is not required as often on roads with aggregate surfacing. Bentonite-supplemented aggregate mix designs are often maintained every 3rd or 4th year, depending upon the location, time of year traveled, and the amount of traffic, versus annually or even biannually for similarly-located native surface roads.

The following list identifies the percentage of ML 2 and 3 roads open yearlong with crushed aggregate surfacing within the 300 and 100 foot buffers of forest streams:

- 28 percent of ML 2 roads, and 50 percent of ML 3 roads that reside within 300 feet of routed forest streams
- 25 percent of ML 2 roads, and 61 percent of ML 3 roads that reside within 100 feet of routed forest streams
- 44 percent of ML 2 roads, and 73 percent of ML 3 roads that reside within 300 feet of 303(d)-listed forest streams
- 33 percent of ML 2 roads and 68 percent of ML 3 roads that reside within 100 feet of 303(d)- listed forest streams

The Clean Water Act, Section 303(d) directs states, including Montana, to compile lists of water quality impaired streams.

In addition to those miles of road with improved aggregate surfacing, the Bitterroot National Forest has purchased and stockpiled, or has funding and contractual agreements on, 65,000 cubic yards of crushed aggregate material. It is estimated that these reserves will cover an additional 45-60 miles of Bitterroot National Forest System roads, dependent upon road width and aggregate depth.

Following the wildfires of 2000, the elimination of fish-passage barriers at culverts has been a focus of the Forest's Fisheries and Engineering programs. Since then, 80 culverts have been removed, replaced by a bridge, or with a suitable culvert to accommodate AOP on the Forest and adjacent state and private lands. In addition, there are also 81 AOP sites that have gone through the NEPA process; 14 have completed designs. Any sediment-reduction best management practices needed at AOP sites are implemented during construction. Design and construction of the AOP sites where NEPA is complete will be accomplished as funding becomes available. The objective of the AOP program is to help mitigate the impacts of roads on fisheries in the Bitterroot National Forest. An additional benefit of the AOP program is the increase in the culverts' capacity to pass large volumes of water during storm events.

Annual targets for road maintenance and improvement are assigned to the Bitterroot National Forest by the Forest Service's Region 1 office, and vary from year to year. Some years the Forest has no assigned targets in certain categories, yet reports accomplishments; other years there assigned targets, yet no accomplishments. Accomplishments are dependent upon the Forest's program of work in a particular year, and can be achieved through a variety of activities. For example, the miles of roads maintained, whether

high clearance or passenger car, could be achieved through a timber sale, road maintenance contract, state agency, or by the Forest's road crew.

The targets discussed have remained relatively consistent since fiscal year 2007. The discussion of targets will consider fiscal years 2007 to 2013. The targets are as follows:

Table 3.1- 5: Targets for Miles of High Clearance (Full-size Vehicles) Improvement on Roads with Maintenance Levels 1or 2

FY	Target (miles)
2007	0
2008	0
2009	1
2010	4
2011	2
2012	2
2013	3
Total Miles	**12**

Table 3.1- 6: Targets for Miles of Passenger Car Improvement on Roads with Maintenance Levels 3, 4, or 5

FY	Target (miles)
2007	1
2008	5
2009	19
2010	37
2011	6
2012	3
2013	3
Total Miles	**74**

The following table (Table 3.1-7) shows the miles of road in the analysis area which were improved over the past 7 years.

Table 3.1- 7: Miles of Roads Improved by Maintenance Level between 2007-2013

Maintenance Level	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
ML 1-2	0.3	0.6	4.0	6.5	1.0	0.0	3.8
ML 3-4-5	1.4	20.6	37.2	19.5	21.5	9.8	1
Total Miles	**1.7**	**21.2**	**41.2**	**26.0**	**22.5**	**9.8**	**4.8**

Road Maintenance

Road location and basic design are other factors determining when roads are maintained, and to what degree. Roads located away from rivers and streams, or not having excessive grades, will not require as much maintenance as those near waterways or with steep grades. In addition, roads with aggregate surfacing are less likely to deposit excessive amounts of sediment into streams. Unfortunately, many of the roads on the Bitterroot National Forest located near waterways are often main arterials or collectors of the transportation system. These are the main access routes often times creating loop opportunities. Sometimes these are roads into impaired drainages or 303(d)-listed streams.

The majority of the Forest's road maintenance budget goes to those roads located near watercourses, low-elevation roads receiving a lot of yearlong traffic, roads with steeper grades, and roads in impaired watersheds (303(d)-listed streams). Research suggests that roads within approximately 300 feet of streams have the potential to negatively affect hydrology and water quality; refer to the Water Resources analysis, Chapter 3, Section 3.6, of this FEIS for more details. Often these are ML 2 and 3 roads open seasonally or yearlong. The Forest has taken the approach of spending considerable amounts of money on improving road surfaces, as well as road surface drainage and hydrologic function, on many of these roads. Aggregate provides resistance to surface erosions as well as strength during wet times of the year, especially in the spring.

Surface maintenance that establishes good road surface drainage is the primary maintenance need most closely associated with use of open roads. The current emphasis is maintaining good surface drainage, spot blading roads in locations where surface drainage is insufficient, and preserving road surfacing. Road surface maintenance now is based more on erosion control and surface preservation than driver comfort. Other activities, such as culvert cleaning, brushing, and hazard tree removal, are more or less incidental to surface maintenance, and are completed on an as-needed basis.

One advantage of maintaining a forest road crew is the ability to manage road according to needs on the ground, not identified mileposts, contract documents, and specifications. When the Forest's crew maintains roads, they address only the areas that need attention and are not functioning properly. This simple concept enables the Forest to maintain more miles more efficiently than what accomplished with contract work. This concept was developed by the road maintenance supervisor and crew, and is based on years of local personal experience. Contracts do not lend themselves to this kind of flexibility, as the work identified in any contract proceeds from milepost to milepost in accordance with drawings and specifications. Because damage to road surfaces, especially those with a native surface, is more common and more severe during wet periods of the year, roads open yearlong are more likely to incur a higher maintenance frequency than those that are open seasonally during periods of lower precipitation. Experience has shown that many seasonally-open roads have low maintenance costs when compared to roads where yearlong use is allowed. Surface and soil type are factors in considering the impacts of yearlong versus seasonal travel. Variations

in open and close dates that keep the road closed into May and June will not significantly change the outcomes in terms of induced maintenance. Those roads that are seasonally closed for the fall big game hunting season and open the remainder of the year will show wear similarly to those roads open yearlong to motorized travel. Though these roads do not see the increased traffic due to the fall hunting season, they do see traffic during the wet spring-time period where surface damage is much more likely to happen.

The following tables, 3.1-8 and 3.1-9, show the annual targets for miles of maintenance for roads with maintenance levels 1 or 2, and 3, 4, and 5, respectively:

Table 3.1- 8: Targets for Miles of High Clearance (Full-size Vehicles) Maintenance on Roads with Maintenance Levels 1 or 2

FY	Target (miles)
2007	105
2008	83
2009	100
2010	89
2011	61
2012	53
2013	38
Total Miles	**529**

Table 3.1- 9: Targets for Miles of Passenger Car Maintenance on Roads with Maintenance Levels 3, 4, or 5

FY	Target (miles)
2007	507
2008	300
2009	304
2010	344
2011	179
2012	177
2013	187
Total Miles	**1,998**

The following table, Table 3.1-10, shows the miles of road in the analysis area, by maintenance level, which were maintained for the past 7 years.

Table 3.1- 10: Miles of Roads Maintained 2007-2013

Maintenance Level	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013[1]
1	18	12	8	29	6	6	68
2	96	63	62	47	85	50	
3	327	297	317	216	186	226	182
4	7	7	6	7	5	6	
5	19	19	15	10	15	8	
Total Miles	**467**	**398**	**408**	**309**	**297**	**296**	**250**

[1] Maintenance levels were combined for reporting purposes

The numbers in Tables 3.1-7 and 3.1-10 come from the Bitterroot National Forest's Annual Roads Accomplishment Reports for the years 2007 through 2012 {Project File folder 'transportation,' Project File documents TRANS-014 to 019.pdf} and the Workplan Accomplishment Report for 2013 {Project File folder 'transportation,' Project File document TRANS-021.pdf}. It is important to note the Forest accomplishes both road maintenance and improvement using its road crew, as well as with annual contract work. The trend is showing less miles of road maintained annually. Prior to the wildfires of 2000, the Bitterroot National Forest was maintaining approximately 400 to 500 miles annually. Considering the road improvement work, watershed rehabilitation, changes in maintenance emphasis from number of miles maintained per year to improved road surface drainage, more roads with seasonal restrictions, and minimal heavy timber haul, which leads to extended lifespan of road improvements, the trend is not surprising.

Priorities in Road Maintenance and Improvement

As previously mentioned in this section, the Bitterroot National Forest focuses road maintenance and improvement activities to mitigate the impacts of roads on forest resources. The Forest took a hard look at its road system, and identified three categories of roads (high, moderate, and low) based on how often they are maintained: high and moderate-priority roads are the most heavily traveled on the Forest. These roads have destinations associated with them, or create popular loop opportunities for recreational driving. Low priority roads consist of the closed road system, and dead end roads open to motorized use (yearlong or seasonally) without a destination other than a cutting unit.

High-priority roads, 150 miles, often have work done on an annual or biannual basis. These locations are targeted for road improvement activities. Most of these roads, 66 percent, have a functional class of arterial or collector, and access large areas of National Forest System land. The remaining local roads in the high priority category provide access to popular destinations, trailheads, rental cabins, or recreation areas. Some examples are Roads #429 (Lost Horse) and #6223 (Selway River Road). Of the 150 miles, approximately 4 miles are used by Forest Service personnel for administrative purposes, and are closed yearlong to the general public; an example would Road #13500, which accesses the Lone Pine Helibase.

Moderate-priority roads, 430 miles, have maintenance work done on 2 to 10 year cycle. Many of these roads were in the high priority category prior to road improvement work, mainly consisting of more or larger culvert installations, surface drainage, and road surfacing improvements. Similar to the high priority category, the majority of these roads (77 percent) have a functional class of arterial or collector roads, accessing large areas of National Forest System Land.

Low-priority roads, 1,995 miles, have maintenance work performed on a cycle in excess of 10 years, or on an as-needed basis. Only 15 percent of these roads have a functional class of collector; the remaining 85 percent are local roads accessing terminal facilities. These roads are usually native surfaced, and are not targeted as roads of resource concern.

Monitoring

The Bitterroot National Forest Plan Monitoring and Evaluation Report, required by the Forest Plan, provides a control system for forest management. The results provide Forest Line Officers and employees, Regional and Washington offices, Congress, and the public with information on the progress and results for implementing the Bitterroot Forest Plan. Forest Plan monitoring involves gathering information and observing management activities to document their effects on people and the environment. Some sections pertain directly to the impacts of motor vehicle use on the Bitterroot National Forest. Those include: Invasive Weeds-Item 10; Water and Sediment Yield – Item 17; Cumulative Watershed Effects – Item 19; Riparian Area Condition- Item 22; Road Construction, Mitigation, and Maintenance – Item 24; Off Highway Vehicle Effects on Lands – Item 28; Recreation Site and Trail Use Effects on Land – Item 29; and Law Enforcement Efforts on the Bitterroot National Forest {Project File folder 'forest_plan_and _monitoring,' Project File documents FPMON-003.pdf to 025.pdf, 030.pdf to 036.pdf}.

Funding for Road Maintenance and Improvements

Forest Service funding for road maintenance and improvements is authorized and appropriated by Congress, and fluctuates from year to year. The Forest Service is committed to using whatever funds it has available to accomplish implementation of the 2005 Travel Management Rule in a targeted, efficient manner. Funding for road maintenance, improvements, and special projects mainly come to the Forest through a variety of funding codes known as budget line items (BLIs) that change through the years. There are specific BLIs, CMRD and CMLG, that are intended for road improvements or operations and maintenance. There are also special BLIs, such as NFRR, that Regions and Forests compete for annually at the national or regional levels, as well as some miscellaneous funding through project implementation. Collectively, these types of BLI's fund road improvements, operations and maintenance tasks, or special projects associated with Forest Transportation Systems.

The Forest's funding comes from the Region 1 Office. Factors considered when allocating funds include the board footage to be cut in timber sales, the acres to be treated for fuels reduction, the annual recreation visitor days on the Forest, and the acres of land suitable for road access. Acres of suitable land for road access are identified in the 1987 Bitterroot National Forest Plan. It is important to note that the miles of road are not considered in the allocation of funding.

The investment portion of Capital Improvement and Maintenance – Roads (CMRD) funds road improvement projects, architectural and engineering design of AOP culverts and bridges, culvert and bridge construction, road storage projects, and trailhead improvement projects, as well as salaries and fleet expenses to administer the work; it is essentially investment in any project or design that improves a piece of infrastructure from its original standard. For roads, this could be gravel surfacing; for streams this may be AOP structure installation or bridge construction.

The CMRD operation and maintenance funding covers salaries and fleet costs, road improvement projects, road maintenance projects, annual consumables, road maintenance contracts and contract modifications, or other projects associated with management of the road system. CMRD also assists in funding salaries for NEPA planning efforts, road storage and, if specifically mandated by Congress, road decommissioning projects.

The following table shows funding in CMRD, from 2007 to 2013.

Table 3.1- 11: Bitterroot National Forest CMRD Funding 2006-2013

CMRD Annual Funding	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Investments	$109,000	$310,000	$45,000	$325,000	$8,500	$141,000	$0
Operations and Maintenance	$411,000	$430,000	$321,000	$615,000	$382,500	$319,000	$382,222
Special Projects	$222,000	$227,000	$243,000	$120,000	$133,000	$51,000	$89,801
Total CMRD to the Bitterroot National Forest	**$743,000**	**$967,000**	**$609,000**	**$1,060,000**	**$524,000**	**$511,000**	**$472,023**

Capital Maintenance Legacy Roads and Trails (CMLG) is another BLI intended for use in transportation system management; it is used for road improvements, operations and maintenance, and special projects. Table 3.1-12 shows the funding amounts in CMLG received by the Bitterroot National Forest for fiscal years 2008 through 2011; CMLG has not been funded since 2011.

Table 3.1- 12: Bitterroot National Forest CMLG Funding 2006-2011

CMLG Annual Funding	FY 2008	FY 2009	FY 2010	FY 2011
Investments	$535,000	$243,000	$173,000	$270,000
Operations and Maintenance	$0	$0	$14,000	$251,000
Special Projects	$0	$68,000	$297,000	$0
Total CMLG to the Bitterroot National Forest	**$535,000**	**$311,000**	**$484,000**	**$521,000**

Another BLI associated with the Forest Transportation System is National Forest Resource Restoration (NFRR). Funding under this BLI began in 2012, and is the latest BLI in which forests compete nationally for project dollars. The funds associated with this BLI are intended to improve watershed conditions nationally; however the funds may be used for a variety of projects. Many of those projects involve the road system, or impacts of the road system on water resources. For example, In FY 2012, NFRR funded design of an erosion control project on the Selway River, contract administration of AOP structures being designed and built, road decommissioning projects, and a NEPA planning effort. Table 3.1-13 show the funding amounts in NFRR received by the Bitterroot National Forest in fiscal years 2012 and 2013.

Table 3.1- 13: Bitterroot National Forest NFRR Funding 2012-2013

NFRR Annual Funding	FY 2012	FY 2013
Investments	$27,000	$26,036
Operations and Maintenance	$0	$0
Special Projects	$158,000	$138,892
Total NFRR to the Bitterroot National Forest	**$185,000**	**$164,928**

The funding codes listed in the previous tables are the major sources in which funding is either set aside solely for the management for the road system, or to mitigate the impacts of the road system on natural resources. The following table, Table 3-14, is a compilation of additional funding that may come to the Forest as project dollars that were spent on the road system as investments, operations and maintenance, or special projects over the past 7 years. Some of these funding codes were used to address one-time occurrences; others were used to mitigate impacts of the road system, while others were associated with road management, but were not annual in nature.

Table 3.1- 14: Bitterroot National Forest Miscellaneous Funding 2007-2013

Miscellaneous Funding Source Totals By Year	FY 2007	FY 2008	FY 2009[1]	FY 2010[1]	FY 2011	FY 2012	FY 2013
Investments	$147,000	$516,000	$5,022,000	$2,306,000	$50,000	$150,000	$0
Operations and Maintenance	$0	$87,000	$347,000	$45,000	$35,000	$3,000	$5,000
Special Projects	$0	$0	$11,000	$0	$15,000	$0	$77,228
Total Miscellaneous to the Bitterroot National Forest	**$147,000**	**$603,000**	**$5,380,000**	**$2,351,000**	**$100,000**	**$153,000**	**$82,228**

[1] Unusually high budgets as part of the American Recovery and Reinvestment Act of 2009

Table 3.1-15 shows the total funding from all sources for the road system received by the Forest for the fiscal years 2007-2013.

Table 3.1- 15: Bitterroot National Forest Road System Funding 2007-2013

Funding Source	FY 2007	FY 2008	FY 2009[1]	FY 2010[1]	FY 2011	FY 2012	FY 2013
CMRD	$743,000	$967,000	$609,000	$1,060,000	$524,000	$511,000	$472,023
CMLG	NA	$535,000	$311,00	$484,000	$521,000	$0	$0
NFRR	NA	NA	NA	NA	NA	$185,000	$164,928
Miscellaneous	$147,000	$603,000	$5,380,000	$2,351,000	$100,000	$153,000	$82,228
Total to the Bitterroot National Forest	**$890,000**	**$2,105,000**	**$6,300,000**	**$3,895,000**	**$1,145,000**	**$849,000**	**$719,179**

[1] Unusually high budgets as part of the American Recovery and Reinvestment Act of 2009

Based on the prioritization methodology used by the Bitterroot National Forest, funding for where road maintenance and improvements is spent is continually changing. Those roads impacting resources migrate to the top of the priority list, and receive the treatments needed to mitigate resources impacts. Then they are monitored and maintained over the long-term. Roads located near streams and rivers will generally receive more maintenance, improvements, and monitoring than those traversing drainages at higher elevations. Road maintenance priorities on the Forest are dynamic and evaluated annually.

The following table, Table 3.1-16, displays the annual estimated cost associated with maintaining the road system on the Bitterroot National Forest, according to the prioritization methodology described on pages 16-17.

Table 3.1- 16: Bitterroot National Forest Estimated Maintenance Cost by Priority Level

Road Maintenance Priority	Miles By Category	Maintenance Cycle (years)	Miles Maintained Annually	Estimated Cost/Mile	Estimated Total Cost
High-Priority Roads	150	1-2	150	$1,500	$225,000
Moderate-Priority Roads	430	2-10	150	$750	$112,500
Low-Priority Roads[1]	1,995	10+	50	$200	$10,000
Estimated Annual Maintenance Cost					**$347,500**

[1] Maintenance cycle estimated at a 10 year interval, but roads are also maintained on an as-needed basis

The Bitterroot National Forest has identified, and is maintaining a base transportation system at current funding levels. As the technology for forest management evolves over the coming decades, so will the need for access across the National Forests. The resulting National Forest System roads will change with this evolution. As the Forest considers the sustainability of its transportation system, Forest managers must balance forest management needs and objectives, resource impacts, mitigations of those impacts, social benefits, and the costs of the associated transportations system. The Forest Service has been using adaptive management in regards to motorized access since 1976. Individual projects evaluate the impacts of the

road system on affected resources, and design features are identified, implemented, and evaluated for effectiveness. Monitoring the impacts of roads is ongoing, and future adjustments in travel management and the minimum transportation system will be made on a project-by-project basis. If funding levels remain consistent with what the Bitterroot National Forest has received over the past 7 years, the Forest has the ability to maintain the current road system. With 65,000 cubic yards of crushed aggregate stockpiled at a variety of locations, and the ability to haul and place the material with a road crew, the Forest will maintain improved aggregate surfaced roads and continue to show miles of road improved every year.

A commenter on the Travel Management Planning Project DEIS asked the ID Team to consider a road maintenance model developed by Dr. Wing at the Forest Engineering Department, Oregon State University. The ID Team's transportation engineer and the Forest's road maintenance supervisor reviewed the model, and determined that estimating funding needs by miles per maintenance level is not consistent with the approach used by Region 1 of the Forest Service; every mile of road is not maintained on an annual basis, and every mile of a certain maintenance level will not receive the same level of effort or attention. For additional information regarding the Wing model, please refer to {Project File folder 'transportation,' Project File document TRANS-003.pdf}.

3.1.4 ENVIRONMENTAL CONSEQUENCES

Summer

A. Effects Common to All Action Alternatives

The Travel Management Planning Project will not impact ML 4 or 5 roads as there are no changes proposed to any roads in these categories. Maintenance Level 1 roads (coincident routes) will be addressed in the Recreation and Trails section, Chapter 3, Section 3.2.3 K of this FEIS. Public traffic on the National Forest System roads affected by this project will be those roads categorized as ML 2 and 3 that are open yearlong or seasonally.

There are no changes proposed to the miles of roads in MVUM categories 1 (Roads open yearlong to motorized, mixed use) and 2 (Roads open seasonally to motorized, mixed use), so there will be no further analysis.

B. Direct and Indirect Effects

The following table, Table 3.1-17, shows the miles of roads open, yearlong and seasonally, to motorized vehicles under each alternative. Table 3.1-3 contains information on the seasons of use for MVUMs 2 and 4.

Table 3.1- 17: Miles of Open Roads

MVUM Code	Status	Alt. 1 miles	Alt. 2 miles	Alt. 3 miles	Alt. 4 miles
1	Road open yearlong to all motorized vehicles, mixed use - yearlong	10	10	10	10
2	Road open seasonally to all motorized vehicles, mixed use - seasonally	67	67	67	67
3	Road open to street legal motorized vehicles - yearlong	846	887	873	575

MVUM Code	Status	Alt. 1 miles	Alt. 2 miles	Alt. 3 miles	Alt. 4 miles
1	Road open yearlong to all motorized vehicles, mixed use - yearlong	10	10	10	10
4	Road open to street legal motorized vehicles - seasonally	560	569	577	429
Total Miles		**1,483**	**1,533**	**1,527**	**1,081**

Comparison of Alternatives

The indicator for comparing alternatives is the estimated cost to maintain the miles of roads by maintenance priority level.

The following table, 3.1-18, compares indicator miles per action alternative by forest road maintenance priority. The table breaks down indicator road mileages per alternative into road maintenance priorities high, moderate, or low. MVUM codes 1 and 2 do not change in any alternative.

Table 3.1- 18: MVUM Codes, Description, Maintenance Priority of Indicator Miles

MVUM Code	Maintenance Priority	Alt. 1 Miles	Alt. 2 Miles	Alt. 3 Miles	Alt. 4 Miles
1 – Open yearlong to all motorized	Low	10	10	10	10
Totals Miles MVUM - 1		**10**	**10**	**10**	**10**
2 – Open seasonally to all motorized	High	22	22	22	22
	Moderate	33	33	33	33
	Low	12	12	12	12
Totals Miles MVUM - 2		**67**	**67**	**67**	**67**
3 – Open yearlong to street legal motorized	High	94	96	96	72
	Moderate	337	339	340	218
	Low	415	452	437	285
Totals Miles MVUM - 3		**846**	**887**	**873**	**575**
4 – Open seasonally to street legal motorized	High	30	28	28	28
	Moderate	59	58	57	45
	Low	471	483	492	356
Totals Miles MVUM - 4		**560**	**569**	**577**	**429**

The following table, 3.1-19, illustrates the estimated relative cost to maintain each alternative considering maintenance priority, and estimated miles maintained annually.

Table 3.1- 19: Comparison of Alternatives by Maintenance Priority Miles

Maintenance Priority	Estimated Cost/Mile	Projected Miles to be Maintained Annually	Alt. 1 Miles/Cost	Alt. 2 Miles/Cost	Alt. 3 Miles/Cost	Alt. 4 Miles/Cost
High	$1,500	150	150/$225,000	150/$225,000	150/$225,000	125/$187,500
Moderate	$750	150	150/$112,500	150/$112,500	150/$112,500	150/$112,500
Low	$200	50	50/$10,000	50/$10,000	50/$10,000	50/$10,000
Total per Alternative			**$347,500**	**$347,500**	**$347,500**	**$310,000**

The estimated unit cost (Estimated Cost/Mile) of maintaining high, moderate, or low priority roads is directly multiplied by the estimated miles maintained annually of road per maintenance priority in each action alternative. **Alternatives 1, 2, and 3** are very similar in regards to relative cost to maintain the proposed road system; **Alternative 4** shows the greatest contrast, reducing the open miles of high priority roads by 16.6 percent. The closure of high maintenance priority road would benefit affected resources and reduce maintenance need on those particular miles, but not likely result in cost savings to the Forest as the potential impacts of concentration of use to open facilities is not known at this time and some investment would be needed to maintain access to existing recreational facilities on the forest. Again, road maintenance funding is not related to miles of system road or miles of road available to the public.

As noted in Table 3.1-10, the number of miles of road maintained annually by the Forest has decreased since 2009. Investments in road surface drainage and other improvements, more seasonal restrictions, and reductions in heavy timber haul, contribute to extending the lifespan of road improvements.

Alternative 1

The estimated cost to maintain the miles of roads by priority level, $347,500, would be sufficiently covered by the level of Forest funding available for the National Forest System roads, from 2007 through 2013, with a minimum of $719,179/year as shown in Table 3.1-15.

Table 3.1-20 shows the changes proposed with **Alternative 1** to MVUM 3 (Roads open yearlong to full size vehicles) compared to **Alternative 2**.

Table 3.1- 20: Alternative 1- Changes in Miles of Roads Open to Full Size Vehicles-Yearlong

Changes to MVUM 3 Roads – Open Yearlong to full size vehicles	Miles
Miles Open Yearlong (Alt. 2)	895.6
Miles to be closed yearlong	-24.8[1]
Miles to be open seasonally	-16.9
Miles previously closed yearlong	+0.5
Miles previously closed seasonally	+1.2
Miles Open Yearlong (Alt. 1)	855.6

[1] 4.0 miles to be closed yearlong will remain open to ATVs seasonally

When comparing Alternative 1 to Alternative 2, there is a decline of approximately 41 miles (-4.40 percent) Table 3.1-21 shows the changes proposed with Alternative 1 to MVUM 4 (Roads open seasonally to full size vehicles) compared to Alternative 2.

Table 3.1- 21: Alternative 1- Changes in Miles of Roads Open to Full Size Vehicles - Seasonally

Changes to MVUM 4 Roads – Open Seasonally to full size vehicles	Miles
Miles Open Seasonally (Alt. 2)	636.9

Changes to MVUM 4 Roads – Open Seasonally to full size vehicles	Miles
Miles to be closed seasonally	0.0
Miles to be closed yearlong	-25.2[1]
Miles to be open yearlong	-1.2
Miles previously open yearlong	+16.9
Miles Open Seasonally (Alt. 1)	627.4

[1]15.9 miles to be closed yearlong will remain open to ATVs seasonally

When comparing **Alternative 1** to **Alternative 2,** there is a decrease of approximately 10 miles (-1.49 percent).

Of all the changes, a total of 66.9 miles of road had reductions in impacts while 1.7 miles had increased impacts due to motorized travel to resources. These impacts are indicated by change in yearlong closure, seasonal closure (especially during the spring), reduction in vehicle weight and volume. Extending seasonal closures also will reduce impacts of motorized travel to resources. In addition, the more restrictive travel management on the road system may also reduce the maintenance needs on those miles of road affected. The trend outlined above also is more restrictive to motorized users than the existing condition.

Alternative 2 - No Action

The estimated cost to maintain the miles of roads by priority level, $347,500, would be sufficiently covered by the level of Forest funding available for the National Forest System roads, from 2007 through 2013, with a minimum of $719,179/year, as shown in Table 3.1-15.

There would be no change in the miles of roads open to motorized use in MVUMs 3 and 4.

Alternative 3

The estimated cost to maintain the miles of roads by priority level, $347,500, would be sufficiently covered by the level of Forest funding available for the National Forest System roads, from 2007 through 2013, with a minimum of $719,179/year, as shown in Table 3.1-15.

Table 3.1-22 shows the changes proposed with **Alternative 3** to MVUM 3 (Roads open yearlong to full size vehicles) compared to **Alternative 2**:

Table 3.1- 22: Alternative 3- Changes in Miles of Roads Open to Full Size Vehicles - Yearlong

Changes to MVUM 3 Roads – Open Yearlong to full size vehicles	Miles
Miles Open Yearlong (Alt. 2)	895.6
Miles to be closed yearlong	-8.6[1]

Changes to MVUM 3 Roads – Open Yearlong to full size vehicles	Miles
Miles to be open seasonally	-6.5
Miles previously closed yearlong	+0.5
Miles previously closed seasonally	+1.2
Miles Open Yearlong (Alt. 3)	882.2

[1]1.6 miles to be closed yearlong will remain open to ATVs yearlong or seasonally

When comparing **Alternative 3** to **Alternative 2**, there is a decline in total miles of approximately 14 miles (-1.49 percent) .

Table 3.1-23 shows the changes proposed with **Alternative 3** to MVUM 4 (Roads open seasonally to full size vehicles) compared to **Alternative 2**.

Table 3.1- 23: Alternative 3- Changes in Miles of Roads Open to Full Size Vehicles - Seasonally

Changes to MVUM 4 Roads – Open Seasonally to full size vehicles	Miles
Miles Open Seasonally (Alt. 2)	636.9
Miles to be open seasonally	0.0
Miles to be closed yearlong	-4.5[1]
Miles to be open yearlong	-1.2
Miles previously open yearlong	+6.5
Miles previously closed yearlong	+6.4
Miles Open Seasonally (Alt. 3)	644.1

[1]1.7 miles to be closed yearlong will remain open to ATVs seasonally

When comparing **Alternative 3** to **Alternative 2**, there is an increase in total miles of approximately 7.2 miles (+1.13 percent).

Of all the changes a total of 19.6 miles of road had reduction in impacts while 8.1 miles had increased impacts due to motorized travel to resources, indicated by yearlong closure, seasonal closure (especially during the spring), reduction in vehicle weight and volume. Extending seasonal closures also will reduce impacts of motorized travel to resources. In addition, the more restrictive travel management on the road system may also reduce the maintenance needs on those miles of road affected. The trend outlined above also is more restrictive to motorized users than the existing condition.

Alternative 4

The estimated cost to maintain the miles of roads by priority level, $310,000 would be sufficiently covered by the level of Forest funding available for the National Forest System roads, from 2007 through 2013, with a minimum of $719,179/year, as shown in Table 3.1-15.

Table 3.1-24 accounts for the changes proposed for **Alternative 4** to MVUM 3 (Roads open yearlong to full size vehicles) compared to **Alternative 2**.

Table 3.1- 24: Alternative 4- Changes in Miles of Roads Open to Full Size Vehicles - Yearlong

Changes to MVUM 3 Roads – Open Yearlong to full size vehicles	Miles
Miles Open Yearlong (Alt. 2)	895.6
Miles to be closed yearlong	-303.3
Miles to be open seasonally	-9.4
Miles previously closed yearlong	+0.5
Miles previously closed seasonally	+1.2
Miles Open Yearlong (Alt. 4)	584.6

When comparing **Alternative 4** to **Alternative 2**, there is a decline in total miles of 311 miles (-34.73 percent).

Table 3.1-25 shows the changes proposed with **Alternative 4** to MVUM 4 (Roads open seasonally to full size vehicles) compared to **Alternative 2**.

Table 3.1- 25: Alternative 4- Changes in Miles of Roads Open to Full Size Vehicles - Seasonally

Changes to MVUM 4 Roads – Open Seasonally to full size vehicles	Miles
Miles Open Seasonally (Alt. 2)	636.9
Miles to be closed seasonally	
Miles to be closed yearlong	-148.9
Miles to be open yearlong	-1.2
Miles previously open yearlong	+9.4
Miles Open Seasonally (Alt. 4)	496.2

When comparing **Alternative 4** to **Alternative 2**, there is a decrease in total miles of 141 miles (-22.09 percent).

Of all the changes a total of 461.6 miles of road had reduction in impacts while 1.7 miles had increased impacts due to motorized travel to resources, indicated by yearlong closure, seasonal closure (especially

during the spring), reduction in vehicle weight and volume. Extending seasonal closures also will reduce impacts of motorized travel to resources. In addition, the more restrictive travel management on the road system may also reduce the maintenance needs on those miles of road affected. The trend outlined above also is more restrictive to motorized users than the existing condition.

Over-Snow

Over-snow vehicle use would have no effect on the Transportation resource, as vehicles would be operated on snow-covered roads, which would not result in any adverse effects to the road surfaces, resulting in a need for maintenance. Motorized over-snow use will not be discussed further as a transportation effect. There would be no difference between alternatives for this activity.

Summary

Alternatives 1, 2, and 3 are very similar with respect to the road maintenance burden based on their maintenance priority (High, Medium, and Low). It is expected that over the long term, road conditions would remain constant with **Alternatives 1, 2, and 3**. The estimated cost/mile for maintenance priority miles, ranging from $310,000 to $347,500, would be sufficiently covered by the historical level of funding, ranging from $719,179 to $6,300,000, available for National Forest System roads on the Bitterroot National Forest for the years 2007-2013. **Alternative 4** would be the least costly; **Alternatives 1, 2, and 3** would have the same costs.

Alternative 4 shows the greatest contrast by proposing to close the most miles of maintenance priority roads. This may potentially concentrate public use on the remaining roads on the Forest. The impact of this concentration is difficult to predict, but it may require additional maintenance efforts, and, potentially, surface improvements. Considering the potential concentration of traffic, and subsequent increased maintenance needs on some National Forest System roads, the annual road maintenance allocation would be invested into the road system existing on the Forest. It is expected that over the long term, road conditions would improve with **Alternative 4**.

Any savings in maintenance expenditures resulting from closing or seasonally restricting roads with the Bitterroot National Forest Travel Management Planning Project would be reallocated and spent on other National Forest System roads on the Forest.

The analysis does not show a large decrease in the number of miles per maintenance level by any alternative, reinforcing confidence that there would not be a significant financial effect to maintenance expenditures associated with closing or seasonally restricting roads. However, each action alternative considered is more conservative than the existing condition (**Alternative 2**). When considering roads open during the springtime wet season, **Alternative 4** would be the most economical alternative with a 10.3 percent reduction in ML 2 roads and a 1.2 percent reduction in ML 3 roads.

It is not expected that visitors will forego use of the Bitterroot National Forest as a result of decisions made regarding the Travel Management Planning Project. Generally, it would be expected that the total volume of public use would not significantly change but would be distributed over available routes, which would vary by alternative. The implication that alternatives with fewer routes will probably have more traffic on these routes is valid but not predictable. As a result, the analysis dismisses traffic volume as a measure that provides meaningful differences between the alternatives.

C. Cumulative Effects

Geographic Boundaries

The defined cumulative effects analysis area for the Transportation resource is the same as the project area; the portion of the Bitterroot National Forest outside of Designated Wilderness. This analysis area is appropriate to analyze any incremental effects from the actions of this project, in combination with past,

present, and reasonably foreseeable activities, because effects of implementing travel planning decisions on the Bitterroot National Forest would be no effect to the Transportation resource outside of this analysis area.

Activities Within the Cumulative Effects Analysis Area

Past actions have contributed to the existing condition for the Transportation resource, which is described in Section 3.1.3 (Affected Environment).

Appendix A to the FEIS describes past, present, and reasonably foreseeable forest and other activities which, when combined with the activities proposed in the Travel Management Planning Project, could result in cumulative effects to the Transportation resource.

Summer

Some forest activities have a negligible effect on the Transportation resource for the following reasons:

- Mechanisms exist for collecting funds to cover the costs of road maintenance associated with these activities. Costs of maintaining roads used during timber harvest projects are incorporated into the timber sale contact. Costs incurred for road maintenance associated with wildfire suppression activities can be charged to fire project codes. Cost-share agreements between the State of Montana and the Forest Service cover road maintenance.

Examples of forest activities which, when carried out consistent with existing regulations, result in negligible cumulative effects to the Transportation resource include:

- Timber harvest that occurred more than 40-50 years ago
- Wildfire suppression
- Personal use Christmas Tree harvesting
- Activities on State land

Other activities have little effect on the Transportation resource for the following reasons:

- The activity involves minimal impact to roads resulting in the need for little maintenance, due to the time of year when the activity occurs, or the fact that there are limited numbers of people using roads for these purposes
- The time elapsed and natural recovery that has occurred since the project completion has diminished effects

Examples of forest activities, which, when carried out consistent with existing regulations, produce little cumulative effects to the Transportation resource:

- Timber harvest, prescribed burning, and associated activities
- Special Uses\Permits
- Public use
- Invasive Plants Management
- Cattle Grazing
- Activities on private lands

There are other forest activities which could result in cumulative effects to the Transportation resource:

Road and Trail Management

Routine road maintenance projects, such as blading, gate repair/replacement, cleaning ditches and culverts, brushing, and debris removal, would result in beneficial effects to roads.

Personal Use Firewood Cutting

Personal use firewood cutting could affect the Transportation resource if slash left in drain ditches plugs culverts and causes water to run across the road. This could result in culverts washing out and road prism damage, making roads impassable, and contributing to maintenance costs.

Wildfires

Wildfires are expected to play an increased role across the Bitterroot National Forest due to trends of increased warming and drying. Depending upon their location and duration, wildfires could result in temporary-to-long term restrictions and closures on Forest roads due to resource damage and safety concerns.

Natural Disturbance Events

Blowdowns, floods, and mass movement events could result in temporary-to-long-term closure of public use of Forest roads due to safety concerns. Blowdowns commonly cause trees to fall across roads, blocking access. Flooding can cause culverts and road beds to wash out. Mass movements in the form of debris torrents and debris avalanches can block roads. All of these natural events are expected to continue within their current range of variability.

Over-Snow

Most motorized over-snow use would generally occur off-road, while any roads used by motorized vehicles for winter use or for accessing areas where over-snow vehicle use would occur, would most likely be snow-covered, so there would be little likelihood for wear and tear on the road surface, and no need for maintenance. Therefore, there would not be any cumulative effects to the Transportation resource from the past, present, and reasonably foreseeable activities previously described.

Cumulative Effects from the Implementation of the Alternatives

Alternative 1

Most of the above listed present and reasonably foreseeable activities would have negligible-to-little cumulative effects on the Transportation resource, in combination with the activities proposed in the Travel Management Planning Project, for both summer and over-snow vehicle use. Road and trail management would result in beneficial effects, while personal use firewood cutting could result in adverse effects.

Alternative 2

Most of the above listed present and reasonably foreseeable activities would have negligible-to-little cumulative effects on the Transportation resource, in combination with the activities proposed in the Travel Management Planning Project, for both summer and over-snow vehicle use. Road and trail management would result in beneficial effects, while personal use firewood cutting could result in adverse effects.

Alternative 3

Most of the above listed present and reasonably foreseeable activities would have negligible-to-little cumulative effects on the Transportation resource, in combination with the activities proposed in the Travel Management Planning Project, for both summer and over-snow vehicle use. Road and trail management would result in beneficial effects, while personal use firewood cutting could result in adverse effects.

Alternative 4

Most of the above listed present and reasonably foreseeable activities would have negligible-to-little cumulative effects on the Transportation resource, in combination with the activities proposed in the Travel Management Planning Project, for both summer and over-snow vehicle use. Road and trail management would result in beneficial effects, while personal use firewood cutting could result in adverse effects.

Cumulative Effects Finding

Most of the above listed present and reasonably foreseeable activities would have negligible-to-little cumulative effects on the Transportation resource, in combination with **Alternatives 1, 2, 3, and 4** of the Travel Management Planning Project, for both summer and over-snow vehicle use. Road and trail management would result in beneficial effects, while personal use firewood cutting could result in adverse effects.

3.1.5 CONSISTENCY WITH FOREST PLAN, LAWS, AND REGULATIONS

The Travel Management Planning Project is essentially a planning effort, and does not create new ground disturbance. As such, consistency with existing regulation is a matter of incorporating various concerns into the planning effort. This has been done in all phases of the project, and all alternatives would be consistent with the Forest Plan and other applicable laws and regulations.

A. Bitterroot National Forest Plan

Consistency with the Bitterroot National Forest Plan forest-wide resource and management area standards applicable to the Transportation resource would be accomplished as follows:

Most of the forest-wide and management area standards applicable to roads, with the exception of those listed below, pertain to road density and new road construction, neither of which are within the scope of the Travel Management Planning Project. The intent of the project is to designate roads, trails, and areas for use by motorized vehicles.

Forest-wide Management Standard:

Roads will be closed to public use if adequate road maintenance funds are not available (USDA Forest Service 1987a, II-27).

How addressed:

The Bitterroot National Forest has identified and is maintaining a base transportation system at current funding levels. If funding levels remain constant with what the Forest has received over the past 7 years (2006-2012), the ability to maintain the current road system will be maintained.

Tables 3.1-15 and 3.1-19 indicate that the Forest has received funding in excess of what is required to maintain roads on an annual basis

Management Area Standards:

Management Area 5

Maintain road surface for public safety and to protect the environment (USDA Forest Service 1987a, III-39).

How addressed:

The majority of the Forest's road improvement and maintenance budget goes to those roads located near watercourses, low-elevation roads receiving a lot of yearlong traffic, roads with steeper grades, and roads in impaired watersheds (303(d)-listed steams). This includes the application of crushed aggregate. Research

suggests that roads within approximately 300 feet of streams have the potential to negatively affect hydrology and water quality. The Forest has taken the approach of improving road surface, as well as road surface drainage and hydrologic function. This action results in a safer facility for the general public, as many of the streamside roads are arterial and collector roads.

Management Area 9

Closures or restrictions may be used to resolve user conflicts, promote user safety, or protect resources (USDA Forest Service 1987a, III-67).

How addressed:

The Bitterroot National Forest currently has the authority, under 36 CFR 295.5, to initiate emergency closures of roads for up to one year to protect water, soil, and fisheries resources which are negatively impacted or adversely affected by motorized vehicle use. Additionally, the Forest uses "emergency orders" to close roads for a limited duration to address immediate resource issues.

Management Area 10

Road maintenance to level 4 for access to developed sites and interior site roads (USDA Forest Service 1987a, III-71).

How addressed:

Maintenance Level 4 and 5 roads provide access to or are part of administrative sites and developed campgrounds. Many of these roads have an improved surface of aggregate, concrete, or pavement. The improved surface and low speed traffic result in little-to-no impact on the maintenance budget.

All alternatives would be in compliance with applicable forest-wide and management areas Forest Plan standards.

There are no other laws and regulations applicable to the Transportation resource.

3.1.6 CHANGES BETWEEN DRAFT EIS AND FINAL EIS

- Minor grammatical edits were made to correct typographical errors and to improve readability.
- Section 3.1.1 (Scope of Analysis and Analysis Methods). The first paragraph was changed from "The analysis area for the Transportation resource consists of the 758,177 acres of the Bitterroot National Forest, not including Designated and Recommended Wilderness" to "The analysis area for the Transportation resource consists of the Bitterroot National Forest, not including Designated Wilderness."; it was moved to the third paragraph. This was done as motorized/mechanical transport use in recommended wilderness was analyzed in Alternative 3.
- Section 3.1.3 (Affected Environment) was rewritten to improve clarity and organization. Pg. 3.1-2, first paragraph. The number of miles road decommissioned and removed from the Forest's Transportation System was changed from 600 to approximately 134 miles. Additionally, about 195 miles of roads have been hydrologically stabilized and placed into long term storage. Table 3.1-2 was modified to show the number of miles of roads under each road restriction category. This was done in response to a comment on the DEIS. Table 3.1-3 was replaced with a new table, and Table 3.1-4 was modified. The discussion on coincident routes and Level 1 road maintenance was added.
- Tables 3.1-5 to 3.1-10 were added. The section titled Funding for Road Maintenance and Improvements, including Tables 3.1-11 to 3.1-16, was added in response to public comments on the DEIS. Table 3.1-7 was renamed Table 3.1-17.
- Section 3.1.4 (Environmental Consequences) was rewritten to improve clarity and organization. Tables 3.1-18 and 3.1-19 were added. Discussion of effects associated with over-snow vehicle use was added.
- Section 3.1.4 C (Cumulative Effects). Effects associated with over-snow vehicle use were added.

Section 3.1.5 (Consistency with Forest Plan, Laws, and Regulations). Rewritten to provide clarity and organization.