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Guidelines for Road Maintenance Levels

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INTRODUCTION

The Forest Service, an agency of the U.S. Department of Agriculture, classifies maintenance of National Forest System roads by five levels: 1, 2, 3, 4, and 5. Maintenance level 1 roads are closed to motor vehicle use. Maintenance level 2 roads are maintained for high-clearance vehicles. Maintenance level 3, 4, and 5 roads are maintained for passage by standard passenger cars during the normal season of use.

This guide defines, summarizes, and illustrates the five road maintenance levels to help Forest Service line officers, road managers, transportation engineers, equipment operators, field personnel, partners, and cooperators understand and achieve consistent application of road management and maintenance standards.

This Forest Service guidance serves as a tool for educating the public and other resource personnel within the Forest Service about how the agency's transportation system is managed and maintained.

MAINTENANCE LEVELS

Maintenance levels define the level of service provided by, and maintenance required for, a specific road. Maintenance levels must be consistent with road management objectives and maintenance criteria (Forest Service Handbook (FSH) 7709.59, sec. 62.3).

Road management objectives (RMOs) document the intended purpose and standards for an individual road. RMOs are developed from the appropriate resource and management area direction, standards, and guidelines; access management objectives; type and extent of resource activities; and any environmental constraints and mitigation measures. RMOs contain design, operation, and maintenance criteria (FSH 7709.59, sec. 11).

Maintenance criteria describe how a road is to be maintained (FSH 7709.59, sec. 61). The 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.

Maintenance activities planned or performed on a road must be consistent with the RMO.

FACTORS

National Forest System roads should be operated and maintained in a manner that provides for user safety, supports resource programs, and implements management area direction; protects the road investment, the environment, and adjacent resources; and meets applicable air and water quality standards.

Consider the following factors when selecting maintenance levels (FSH 7709.59, sec. 62.31):

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.

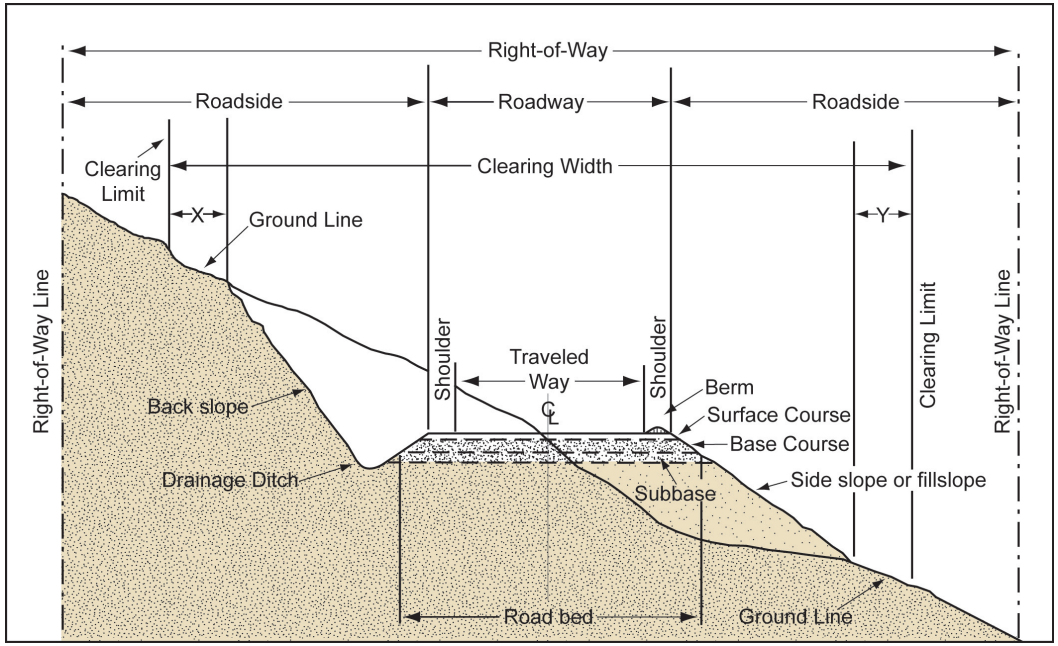
Roads may be maintained currently at one level and planned to be maintained at a different level at some future date. The operational maintenance level is the maintenance level currently assigned to a road considering today's needs, road condition, budget constraints, and environmental concerns; in other words, it defines the level to which the road is being maintained currently. The objective maintenance level is the maintenance level to be assigned at a future date considering future road management objectives, traffic needs, budget constraints, and environmental concerns. The objective maintenance level may be the same as, or higher or lower than, the operational maintenance level. The transition from operational maintenance level to objective maintenance level may depend on reconstruction or disinvestment.

TRAFFIC MANAGEMENT STRATEGIES

The section for traffic management strategies has been removed from this guide. Refer to the companion document "Guidelines for Traffic Management Strategies" (Apodaca et al., in preparation) for more information on traffic management strategies.

ROAD STRUCTURE TERMS

Maintenance activities for the entire road template are discussed in this guide. For this guide, the following diagram illustrates and defines the terms used.



Note: Shapes and dimensions will vary to fit local conditions.
See drawings for typical sections.
X and Y denote clearing outside of the final design cross section.

FOREST SERVICE ROAD MAINTENANCE LEVELS (5 through 1)

Road Maintenance Level 5

Road maintenance level 5 is defined in the FSH 7709.59, sec. 62.32 as:
"Assigned to roads that provide a high degree of user comfort and convenience. These roads are normally double lane, paved facilities. Some may be aggregate surfaced and dust abated. "Manual on Uniform Traffic Control Devices" is applicable. The appropriate traffic management strategy is "encourage." "

Maintenance level 5 roads have the following attributes:

- Provide a high degree of user comfort and convenience for prudent drivers in a standard passenger car during the normal season of use.
- Inspire confidence in the traveler that hazards will be few and identified well in advance. The roadway is visually pleasing.
- Follow the requirements of the "Engineering Manual (EM)-7100-15" and the "Manual on Uniform Traffic Control Devices" (MUTCD) for signs and markings.
- Have high traffic volume and speeds.
- Typically, connect to State and county roads.
- Provide drainage via culverts.
- Are usually an arterial or collector.
- Include some developed recreation roads.
- Have a smooth road surface, often paved or chip-sealed with lane striping.
- May be aggregate surfaced and stabilized using a dust abatement product.
- Have defined shoulders.
- Normally, are double lane.

Maintenance level 5 prescription guidelines:

Traveled way and shoulder. Maintain to provide for the protection of investment and resource values, and for a high degree of user comfort and convenience for all motor vehicles including standard passenger cars. Aggregate surfaced roads should be stabilized using a dust abatement product, such as magnesium chloride. Shoulders usually are constructed as a part of the road template.

Drainage. Drain as necessary to keep drainage facilities functional and prevent unacceptable environmental damage while maintaining a high degree of user comfort and convenience.

Roadway. Control vegetation to provide sight distance. Repair and/or remove slides and slumps to provide passage by prudent drivers in all motor vehicles, including standard passenger cars and to control resource damage.

Roadside. Clean up litter in accordance with road management objectives. Remove danger trees and maintain vegetation as required. Cut fallen trees at the clearing limits. Remove logs and debris.

Structures. Maintain all structures to provide for passage of planned traffic and to preserve structures for future use.

Traffic service. Install and maintain appropriate route markers, warning, regulatory, and guide signs, and other traffic control devices as warranted in a sign plan. Maintain signs at features and points of interest along the road that are shown on forest maps or recognized locally. Maintain centerlines, edge stripes, and other pavement and curb markings as needed.

Figure 1—Maintenance level 5 double-lane road with centerlines and edge markings, a hot-mix asphalt surface, and asphalt- and rock-stabilized shoulders. If centerline markings are placed on a road, the no-passing zone markings also shall be placed as determined by an engineering study.

Figure 2—Maintenance level 5 double-lane road with no-passing zone markings, an asphalt surface, and unpaved shoulders. Grass on shoulders is acceptable and helps with stabilization. Leaving vegetation that does not interfere with sight distance helps stabilize the backslope. As potholes and depressions begin to develop they should be corrected to continue providing a high degree of user comfort and convenience. Curves and other hazards should be marked with warning signs if advised by a documented engineering judgment or engineering study. It is acceptable to mark a double-lane road entirely with no-passing zone markings as shown in the photo.

Figure 3—Maintenance level 5 double-lane road with an asphalt surface and grass on the shoulders. Speed limits may be posted as necessary with a Code of Federal Regulations (CFR) order after completion of an engineering study. Grass on shoulders is acceptable and helps with stabilization. Pavement cracking should be monitored so it can be repaired before it has a negative effect on the high level of user comfort and convenience expected on a maintenance level 5 road. Edge markings are not required on a paved road. Ditches are kept clean to facilitate drainage.

Figure 4—Maintenance level 5 double-lane road with no-passing zone and edge markings, an asphalt surface, and asphalt shoulders. The road is free of litter and the maintenance of the roadside vegetation provides adequate sight distance. Remove danger trees as required. It is acceptable to mark a double-lane road entirely with no-passing zone markings as shown in the photo.

Figure 5—Maintenance level 5 double-lane road with no centerline, no edge marking, a chip-seal surface, and unpaved shoulders. Grass on shoulders is acceptable and helps with stabilization. It is acceptable not to place centerline and/or edge markings on a double-lane nonurban road.

Road Maintenance Level 4

Road maintenance level 4 is defined in the FSH 7709.59, sec. 62.32 as:
"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. However, some roads may be single lane. Some roads may be paved and/or dust abated. "Manual on Uniform Traffic Control Devices" is applicable. The most appropriate traffic management strategy is 'encourage'. However, the 'prohibit' strategy may apply to specific classes of vehicles or users at certain times."

Maintenance level 4 roads have the following attributes:

- Provide a moderate degree of user comfort and convenience at moderate travel speeds for prudent drivers in a standard passenger car during normal season of use.
- Are subject to the requirements of EM-7100-15 and MUTCD for signs and markings.
- Have moderate traffic volume and speeds.
- May connect to State and county roads.
- May include some developed recreation roads.
- Provide drainage via culverts.
- Usually are collectors.
- Typically, are aggregate surfaced and stabilized using a dust abatement product.
- May be paved.
- Typically, are double lane.
- May be single lane with turnouts visible from either direction.

Maintenance level 4 prescription guidelines:

Traveled way and shoulder. Maintain to provide for moderate degree of user comfort and convenience for standard passenger car, and for protection of investment and resource values. Replace surfacing to the depth required for blade maintenance and to prevent wear of the base course. Abate dust when needed for traffic safety and environmental protection. Shoulders usually are part of the designed road-bed, and surfaced with same material as the driving surface.

Drainage. Drain as necessary to keep drainage facilities functional and prevent unacceptable environmental damage while maintaining a moderate degree of user comfort and convenience at moderate travel speeds.

Roadway. Control vegetation to provide sight distance. Repair and/or remove slides and slumps to provide passage by prudent drivers in standard passenger cars and to control resource damage.

Roadside. Clean up litter in accordance with road management objectives. Remove danger trees and maintain vegetation as required. Cut fallen trees at the clearing limits. Remove logs and debris.

Structure. Maintain all structures to provide for passage of planned traffic and to preserve structures for future use.

Traffic service. Install and maintain appropriate route markers, warning, regulatory, and guide signs, and other traffic control devices as warranted in a sign plan. Maintain centerlines, edge stripes, and other pavement and curb markings as needed.

Figure 6—Maintenance level 4 double-lane road with a gravel surface and gravel shoulders. The crown is effective for gravel-surfaced roads to facilitate drainage and maintain a fully functioning surface. This road has been properly bladed to provide a moderate degree of user comfort and convenience. Ditches are kept clean to facilitate drainage. The road is free of litter and the maintenance of the roadside vegetation provides adequate sight distance. Curves and other hazards should be marked with warning signs if advised by a documented engineering judgment or engineering study. Heavy traffic may require dust abatement to maintain standard.

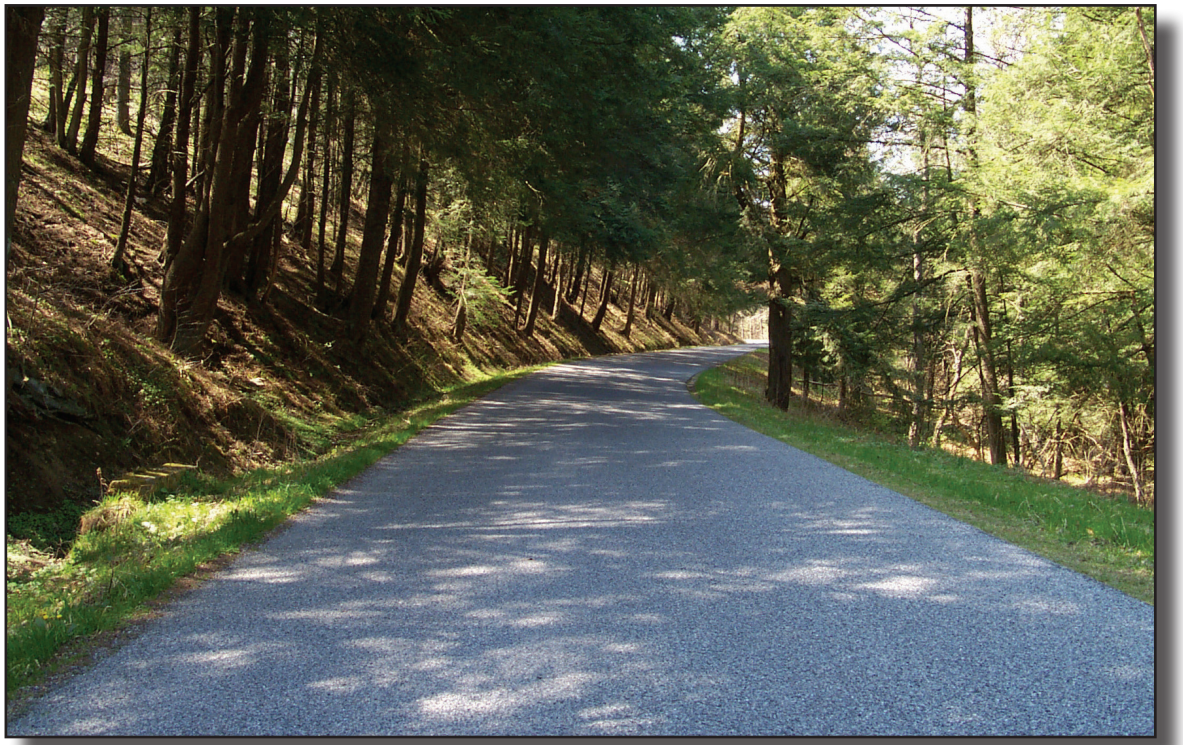


Figure 7—Maintenance level 4 double-lane road with a chip-seal surface and no shoulders. Ditches are kept clean to facilitate drainage. The road is free of litter, and the maintenance of the roadside vegetation provides adequate sight distance. Centerline and edge markings are not required on double-lane paved nonurban roads. Curves and other hazards should be marked with warning signs if advised by a documented engineering judgment or engineering study.

Figure 8—Maintenance level 4 single-lane road with asphalt surface, no shoulders, paved turnouts, and edge markings. It may be desirable to place edge markings when the road has narrow lanes and shoulders as shown in the photo. If it has been determined that edge markings are necessary they should be maintained appropriately. A broken white lane line, with entry and departure breaks, may be used at turnouts to provide continuity of guidance and define the turnout lane. If pavement width is less than required for the travel lane and turnout, mark an uninterrupted uniform lane width without identifying a turnout. The road is free of litter and the maintenance of the roadside vegetation provides adequate sight distance. Curves and other hazards should be marked with warning signs if advised by a documented engineering judgment or engineering study.

Figure 9—Maintenance level 4 single-lane road with a gravel surface and gravel shoulders. Maintain a proper crown, repair potholes, and remove washboarding to facilitate drainage and to maintain a moderate degree of user comfort and convenience at moderate travel speeds. Maintain ditches to facilitate drainage. The road is free of litter and the maintenance of the roadside vegetation provides adequate sight distance. Curves and other hazards should be marked with warning signs if advised by a documented engineering judgment or engineering study.

Figure 10—Maintenance level 4 single-lane road with a chip-seal surface and ditches. Potholes and depressions should be monitored and repaired before they adversely affect the user's comfort and/or convenience expected on a maintenance level 4 road. The ditches in this photo are beginning to become overgrown with vegetation, and they should be maintained properly to facilitate drainage. The road is free of litter, and the maintenance of the roadside vegetation provides adequate sight distance. Curves and other hazards should be marked with warning signs if advised by a documented engineering judgment or engineering study.

Figure 11—Maintenance level 4 single-lane road with a gravel surface and gravel shoulders with ditches. The ditches have been cleaned out to facilitate proper drainage. Maintain proper crown, repair potholes, and remove washboarding to facilitate drainage and to maintain a moderate degree of user comfort and convenience at moderate travel speeds. Replace surfacing to the depth required for blade maintenance and to prevent wear of the base course. The roadside vegetation is becoming overgrown and should be maintained to provide adequate sight distance.

Road Maintenance Level 3

Road maintenance level 3 is defined in the FSH 7709.59, sec. 62.32 as:
"Assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities. The "Manual on Uniform Traffic Control Devices" (MUTCD) is applicable. Warning signs and traffic control devices are provided to alert motorists of situations that may violate expectations.

"Roads in this maintenance level are typically low speed with single lanes and turnouts. Appropriate traffic management strategies are either 'encourage' or 'accept.' Discourage or prohibit strategies may be employed for certain classes of vehicles or users.

Maintenance level 3 roads have the following attributes:

- Are passable to prudent drivers in passenger cars during the normal season of use.
- Usually do not consider user comfort and convenience priorities.
- Are subject to the requirements of EM-7100-15 and MUTCD for signs.
- Are typically, single lane with turnouts visible from either direction.
- Typically, must be driven at low speeds.
- May be local or collectors.
- Have low- to moderate-traffic volume.
- Typically, connect to arterial and collector roads or other maintenance level 3 roads.
- May include some dispersed recreation roads.
- Provide drainage via a combination of dips and culverts.
- Typically, may have potholes or washboarding.

Maintenance level 3 prescription guidelines:

Traveled way and shoulder. Maintain to provide travel by prudent drivers in standard passenger cars during the normal season of use. Some surface roughness is acceptable. User comfort and convenience is a low priority. Maintain a traveled way crown or cross slope to provide adequate drainage. Replace the base course and surfacing as needed to protect the resources.

Drainage. Drain as necessary to keep drainage facilities functional and prevent unacceptable environmental damage while maintaining passage for prudent drivers in standard passenger cars.

Roadway. Control the vegetation to provide sight distance. Repair and/or remove slides and slumps to provide passage by prudent drivers in standard passenger cars and to control resource damage.

Roadside. Clean up litter in accordance with road management objectives. Remove danger trees and maintain vegetation as required. Remove logs and debris when interfering with drainage or operation of maintenance equipment.

Structure. Maintain all structures to provide for passage of planned traffic and to preserve structures for future use.

Traffic service. Install and maintain appropriate route markers, warning, regulatory, and guide signs and other traffic control devices as warranted in a sign plan.

Figure 12—Maintenance level 3 single-lane road with a gravel surface and gravel shoulders. Road surface should be maintained to provide adequate drainage and to provide for travel by prudent drivers in standard passenger cars and not to increase the user comfort and convenience above that expected for a maintenance level 3 road. User comfort and convenience are not considered priorities. The base course and surfacing should be replaced as needed to protect the resource.

Figure 13—Maintenance level 3 single-lane road with a gravel surface and gravel shoulders. Maintain the crown and keep the drainage functional by properly maintaining the ditches. In the road shown above, removing the berms from the road edge and removing vegetation and other material that would impede the flow of water off the road and through the ditch would improve the drainage. The road is free of litter and the maintenance of the roadside vegetation provides adequate sight distance. Curves and other hazards should be marked with warning signs if advised by a documented engineering judgment or engineering study.

Figure 14—Maintenance level 3 single-lane road with a gravel surface and gravel shoulders. Surface roughness is acceptable if travel by prudent drivers in standard passenger cars is provided. Vegetation up to the road edge is acceptable if it does not interfere with adequate sight distance needed for a maintenance level 3 road. Brushing may be necessary on this road to provide adequate sight distance. The base course and surfacing should be replaced as needed to protect the resource.

Figure 15—Maintenance level 3 single-lane road with a gravel surface, no shoulders, and a cross-drain dip. Drainage facilities, such as drain dips, should be maintained so they are functional to prevent unacceptable environmental and resource damage and to provide travel by prudent drivers in standard passenger cars. Surface roughness is acceptable if travel by prudent drivers in standard passenger cars is provided. Curves and other hazards should be marked with warning signs if advised by a documented engineering judgment or engineering study.

Figure 16—Maintenance level 3 double-lane road with a native surface and shoulders. Maintain road surface to provide adequate drainage. The road is free of litter. Maintenance of roadside vegetation provides adequate sight distance. Surface roughness and rutting is acceptable if maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities.

Figure 17—Maintenance level 3 single-lane road with a gravel surface and no shoulders. Maintain road surface to provide adequate drainage. Surface roughness is acceptable if maintained for travel by a prudent driver in a standard passenger car. Remove berms and vegetation from the middle of the road that would impede travel by a prudent driver in a standard passenger car. Maintain drainage facilities, such as culverts and drainage pipes, so they are functional and prevent unacceptable environmental and resource damage.

Road Maintenance Level 2

Road maintenance level 2 is defined in the FSH 7709.59, sec. 62.32 as:
"Assigned to roads open for use by high-clearance vehicles. Passenger car traffic, user comfort, and user convenience are not considerations. Warning signs and traffic control devices are not provided with the exception that some signing, such as W-18-1 "No Traffic Signs" may be posted at intersections. Motorists should have no expectations of being alerted to potential hazards while driving these roads. Traffic normally is minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses. Log haul may occur at this level."

Appropriate traffic management strategies are encourage, accept, discourage, and prohibit.

Maintenance level 2 roads have the following attributes:

- Are maintained for use by high-clearance vehicles and not suitable for passenger cars.
- Do not consider passenger car traffic, user comfort, and user convenience.
- Have low traffic volume and low speed.
- Typically, are local roads that connect to collectors and other local roads.
- Have dips or cross drains as the preferred drainage treatments.
- Avoid the use of culverts, arches, and bridges when possible.
- Typically, have very few, if any, signs or other traffic control devices.
- Are subject to the requirements of EM-7100-15 and MUTCD for all signs.
- Do not consider surface smoothness.
- Do not always provide motorists with alerts to potential hazards.
- May not be passable during periods of inclement weather.

Maintenance level 2 prescription guidelines:

Traveled way. Log out and brush only as necessary to provide passage for high-clearance vehicles. Maintain road prism for drainage and to provide for passage of high-clearance vehicles. Traveled way should only be bladed to maintain drainage functionality and not to provide a smooth surface for passenger cars.

Shoulder. Shoulder is usually not defined and maintenance is not required unless necessary to maintain structural integrity of the roadway, drainage functionality, or access by high-clearance vehicles.

Drainage. Drain as necessary to keep drainage facilities functional and prevent unacceptable environmental damage while maintaining passage for high-clearance vehicles.

Roadway. Remove or rampover slides and repair slumps as needed to provide access for high-clearance vehicles and to control resource damage.

Roadside. Generally no work is required unless necessary to provide clearance for existing traffic. Fallen trees may be left in place if not an obstacle to safe passage of intended traffic.

Structure. Maintain all structures to provide for the passage of high-clearance vehicles and to protect natural resources.

Traffic service. Install and maintain route markers. Maintain warning, regulatory, and guide signs, and other traffic control devices as warranted in the sign plan to provide for existing traffic and the appropriate traffic management strategy. Generally, few, if any, signs or other traffic control devices are required.

Figure 18—Maintenance level 2 single-lane road with pit-run surface. This road is currently passable by high-clearance vehicles at low speeds and there is no evidence of significant erosion. No immediate maintenance is needed and future surface and shoulder maintenance activities should be limited to maintaining passage by high-clearance vehicles and to keep drainage features functional.

Figure 19—Maintenance level 2 single-lane road with native surface. This road is passable by high-clearance vehicles at low speeds even though some rutting of the traveled way is evident. Rutting on the road surface should be corrected at the next scheduled maintenance if it begins to cause unacceptable environmental damage.

Figure 20—Maintenance level 2 single-lane road with pit-run surface. The surface on this road is maintained adequately for high-clearance vehicles at low speed, and there is no evidence of erosion. However, the vegetation on the shoulder is beginning to encroach onto the traveled way and should be maintained to allow for access by high-clearance vehicles and maintenance equipment. The grass growing on the road surface is acceptable since it is not affecting passage.

Figure 21—Maintenance level 2 single-lane road with native surface. While the surface on this road is extremely rough, it is still passable by high-clearance vehicles at low speeds. Generally, no additional surface maintenance is required unless unacceptable environmental damage due to erosion or widening occurs.

Figure 22—Maintenance level 2 single-lane road with native surface. This road surface is passable by high-clearance vehicles at low speeds and does not require surface maintenance unless significant erosion is occurring. Rutting on the road surface should be corrected at the next scheduled maintenance if it begins to cause unacceptable environmental damage. There is significant vegetation encroachment that could make the road impassable. The encroaching vegetation should be logged out and brushed to provide passage by high-clearance vehicles.

Figure 23—Maintenance level 2 single-lane road with native surfacing that has motor vehicle use restricted by a gate. The surface and shoulders of this maintenance level 2 road are adequate for access by high-clearance vehicles at low speeds, and there is no evidence of significant environmental damage. A gate is an appropriate closure devise for maintenance level 2 roads that temporarily restrict all motor vehicle use or that are managed as administrative use only roads. If motorized or nonmotorized use, such as bicycles, occurs behind a gate, the back side may require signing also.

Road Maintenance Level 1

Road management level 1 is defined in the FSH 7709.59, sec. 62.32 as:
"These are roads that have been placed in storage between intermittent uses. The period of storage must exceed 1 year. Basic custodial maintenance is performed to prevent damage to adjacent resources and to perpetuate the road for future resource management needs. Emphasis is normally given to maintaining drainage facilities and runoff patterns. Planned road deterioration may occur at this level."

"Roads receiving level 1 maintenance may be of any type, class, or construction standard, and may be managed at any other maintenance level during the time they are open for traffic."

The only traffic management strategy that is appropriate for maintenance level 1 roads is prohibit.

Maintenance level 1 roads have the following attributes:

- They are in a period of storage between intermittent uses for periods exceeding 1 year.
- They are not designated for motor vehicles as a road and not shown as a road on the motor vehicle use map.
- They may be managed and designated as a motorized trail and shown on motor vehicle use maps as a motorized trail.
- They may be available and suitable for nonmotorized uses.
- As a road, motor vehicular traffic is prohibited, including administrative motor vehicle traffic.
- The road entrance is physically blocked or disguised.
- Emphasis is given to maintaining drainage facilities and runoff patterns.
- Culverts may be removed.
- Basic custodial maintenance is performed to prevent damage to adjacent resources and to perpetuate the road for future resource management needs.
- Planned road deterioration may occur.
- Route markers should be installed but need not be visible from an open road at the entrance.
- No road maintenance other than a condition survey may be required if no potential exists for resource damage.

Maintenance level 1 prescription guidelines:

Traveled way and shoulder. Generally, no work is required.

Drainage. Drain as necessary to keep drainage facilities functional and prevent unacceptable environmental damage. Culverts and fills may be removed.

Roadway. Perform only that work needed to facilitate restoration of the roadway for future use and to alleviate erosion or sedimentation on or from the roadway or roadsides. Defer the removal of brush and trees from the roadway until the road is opened for traffic at a future date. Repair slides and slumps only if potential for loss of road investment or environmental damage is determined to be at an unacceptable risk. Motor vehicle traffic is not a consideration.

Roadside. Generally, no work is required.

Structure. Repair only those items that cannot be deferred, and that are necessary to protect investment and preserve structural integrity.

Traffic service. Physically block roadway with a barrier other than a gate. Ensure that physical closure devices and/or appropriate signing are in place and are functional at the road entrance. Install and maintain route markers so that National Forest System roads are clearly identified for administrative purposes. Defer the maintenance of all other signs within the closure until the road is opened. Consider removing signs if road is planned for a storage period of more than 5 years. Correct deferred maintenance items prior to opening the road to traffic.

Figure 24—Maintenance level 1 road that has been blocked to motor vehicles by an earth mound. Design closure features to avoid creating hidden hazards to users, such as snowmobilers and bicyclists. An example of a hidden hazard is deep trenching behind the earth mound.

Figure 25—Maintenance level 1 road that has been blocked to motor vehicle traffic by an earth mound. Constructing a berm in a relatively flat terrain (i.e., minimal cut and fill) is a challenge. Periodic maintenance of the closure may be needed to ensure that it is an effective closure. Design the closure features to avoid creating hidden hazards to users, such as snowmobilers and bicyclists. An example of a hidden hazard is deep trenching behind the earth mound.

Figure 26—Maintenance level 1 road that has been blocked to motor vehicles by boulders. Partially bury boulders and arrange them in a nonlinear pattern for a more natural look. Boulders may not be an effective natural barrier if adjacent vegetation is grass and light brush. Vertical route markers may be used but are not prominently displayed.

Figure 27—Maintenance level 1 road that has been blocked to highway vehicle traffic by posts and includes a sign prohibiting motorized vehicles. Use type 2 object markers if the posts present a hazard. Wooden posts are easily cut or damaged and removed and may not be an effective closure. Use posts in areas that are patrolled on a regular basis, or near high-use areas. Road restricted signs, with or without reasons, may be used. Route numbers should be displayed on a separate vertical marker from the restriction sign.

Figure 28—Maintenance level 1 road that has been blocked to motor vehicles by natural vegetative overgrowth. Camouflage is a good alternative when there is limited availability of large rocks or down trees to use as a barrier. Vegetation treatment, such as planting, may be an effective solution in regions with suitable growing conditions.

Figure 29—Maintenance level 1 road with motor vehicles eliminated by a vegetated earth mound, which both disguises and physically blocks the road.

Figure 30 - Maintenance level 1 road with motor vehicle use restricted by a barricade. The road is closed to all motor vehicle use, including administrative use, for a period of more than 1 year. Gates are not appropriate on level 1 roads. Appropriate travel management signs may be placed on the barricade to display restrictions and/or reasons for closures. If motorized or nonmotorized use, such as bicycles, occurs behind a barrier, the back side also will require signing.

USEFUL REFERENCES

Apodaca et al. (In publication). Guidelines for traffic management stratagies. 1277 1806–SDTDC. San Dimas, CA: U.S. Department of Agriculture, Forest Service, San Dimas Technology and Development Center.

Forest Service Handbook, Web site <http://fsweb.wo.fs.fed.us/directives/html/fsh7000.shtml>.

Forest Service Manual, Web site <http://fsweb.wo.fs.fed.us/directives/html/fsm7000.shtml>.

Manual on Uniform Traffic Control Devices, Web site <http://mutcd.fhwa.dot.gov/>.

Motorized Vehicle Access Controls, Web site <http://fsweb.sdtdc.wo.fs.fed.us/programs/eng/Motorized_Vehicle_Control/index.shtml>.

Sign and Poster Guidelines for the Forest Service 2005 edition, Web site <http://fsweb.wo.fs.fed.us/eng/roads_trails/signs_05/>.

Highway Safety Act, Title 23 CFR
Web site <http://www.nhtsa.dot.gov/nhtsa/whatsup/tea21/GrantMan/HTML/07_Sect402Leg23USC_Chap4.html>.

ADDITIONAL INFORMATION

For additional information on Forest Service road maintenance levels, contact Vincent Barandino at SDTDC by phone: 909–599–1267, ext. 218, or email <vbarandino@fs.fed.us>.

SDTDC national publications are available on the Internet at <http://www.fs.fed.us/eng/pubs/>.

Forest Service and U.S. Department of the Interior Bureau of Land Management employees also can view videos, CD's and SDTDC's individual project pages on their internal computer network at <http://fsweb.sdtdc.wo.fs.fed.us/>.