

Engineering Report:

Lassen National Forest

Almanor Ranger District

Analysis of

National Forest System Road (NFSR)

29N48

for Motorized Mixed Use Designation

Forest: Lassen

District: Almanor

Road Number: 29N48

Road Name: Turner Mountain Loop

Introduction: This report documents the engineering analysis for two segments (1.1 miles and 2.0 miles, respectively) of NFSR 29N48. The Turner Mountain Loop is located on the west slope of the Lassen National Forest (LNF). The loop road is approximately 2 miles south of Mineral, CA. The loop is 27.2 miles long and encircles Turner Mountain. NFSR 29N48 begins at California State Highway Route 172 (SR 172) and ends roughly 350 feet west of this intersection.

The entire road is currently managed by LNF as open only to highway-legal vehicles.

Each of the two road segments were recommended in the LNF Travel Analysis (2008) for an engineering analysis of motorized mixed use. The purpose of this engineering analysis is to investigate the potentials, and associated risks, for transporting both highway-legal vehicles (motor vehicles, including the operators, that are licensed or certified for general operation on public roads within the State) and non-highway-legal vehicles (motor vehicles, including the operators, that are not licensed or certified for general operation on public roads within the State) from the beginning termini to the end termini.

The LNF Travel Analysis identified these road sections as potential connections for recreational off-highway vehicle (OHV) loop opportunities on the adjacent road network, which is currently managed as open to non-highway-legal vehicle use. In the vicinity, the road to Turner Mountain Lookout (NFSR 28N70) was

also recommended for an engineering analysis of motorized mixed use; this route connects with the segments analyzed in this report. The NFSR 28N70 analysis can be found in a separate report.

Study Segment road data from the forest transportation atlas:

Segment 1: Beginning Mile Post: 0.6 Ending Mile Post: 1.7

Segment 2: Beginning Mile Post: 6.7 Ending Mile Post: 8.7

The following information is applicable to both segments:

Traffic Service Level: A B C D

Objective Maintenance Level: 1 2 3 4 5

Operational Maintenance Level: 1 2 3 4 5

Maintenance by: **Forest Service (FS)**

Non-Forest Service ROW or jurisdiction? Yes No

Any road use agreements, maintenance agreements, or other encumbrances?

Yes No

<p><u>Description of agreements or encumbrances:</u></p> <p>N/A</p>

Subject to Highway Safety Act? Yes No

Non-highway-legal vehicles currently permitted? Yes No

Would motorized mixed use be consistent with State and local laws?

Yes No

The proposed segment would be consistent with California Vehicle Code (CVC), Combined Use Highways Designation (CVC Division 16.5, Chapter 2, Article 1, Section 38026) if limited to less than 3 consecutive miles on maintenance level 3+ roadways. Based on the CVC and Forest Service Region 5 guidelines, the designation of motorized mixed use requires California Highway Patrol notification prior to designation. Based on the response from the CHP commissioner, the Forest may reconsider the decision to designate MMU and/or may adjust mitigation measures needed for implementation.

Description of road management objectives (RMOs), existing use, and proposed use:

The road currently serves as a collector road and provides access from a State highway to various local roads which access an administrative site, a trailhead, various lakes, creeks, and vistas. It has traditionally served commodity extraction, fire suppression (including providing access to a lookout tower), and recreation.

The road provides access to Turner Mountain, which has an interagency administrative radio communication site and a commercial cell phone tower. Traffic associated with maintaining these communication sites is expected throughout the year on this road.

Due to the location in an anadromous fishery watershed (Mill Ck, Sacramento River), significant effort has been put into treating this road for watershed rehabilitation. Past work includes stormproofing, surfacing, and drainage improvements. Funds were provided by FS programs (TRTR, CMLG) and State funds (CalFed).

The road is considered a highway by the forest service and is managed in accordance with the Highway Safety Act. The road is managed for passenger car vehicles and is appropriately posted with horizontal route identification markers. Most of the year it is currently managed as open only to highway-legal vehicles; however, when snow-covered the road serves as a groomed trail for both skiers and snowmobiles.

The study segment is proposed for designation of motorized mixed use to allow both highway-legal and non-highway-legal vehicles to utilize the roadway. Operators of any motor vehicle would be required to be in possession of a valid state driver's license.

General Considerations:

All motor vehicle operators need to be cognizant of the applicable state laws, and how they pertain to each age group, vehicle type, and national forest system road classification (see next bullet).

Through authorities delegated by the Secretary, the Forest Service may restrict or control use to meet road management objectives (36 CFR 212.5). The LNF currently manages this road as a highway, in accordance with the Highway Safety Act. The road is therefore subject to the provisions of the California Vehicle Code (CVC) for highways.

State OHV Regulations: any motor vehicle must have a street-legal license plate to operate on highways. To operate on public lands, off of highways, motor vehicles must have either a street-legal license plate or a red sticker or a green sticker. For more information, see the CA State Parks Off-Highway Motor Vehicle Recreation site, available @ <http://ohv.parks.ca.gov/>

California has:

- requirements for ATV safety
- conditions for operating ATVs
- OHV equipment requirements
- OHV operation requirements

Summary of Findings:

Implementing the universal mitigation measures, especially improving sight distance by removing brush, maintaining proper signing, and providing better communication, will reduce crash probability.

Road hazard mitigation should be prioritized regardless of mixed use, along with implementing a comprehensive communication, management, and enforcement plan. Associated implementation costs will depend on the designated allowed use for the road.

In the last 5 years, the road has been maintained for resource protection and stormproofing. The surfacing is generally reconditioned on an annual basis. The road is maintained to a standard allowing efficient passenger car through traffic at speeds up to 35 mph for reasonable and prudent drivers on straightaways.

Designating the road segment for motorized mixed use, with mitigation, results in a risk assessment of low crash probability and moderate crash severity.

Factors Considered:

1. Operator considerations:

- Based on engineering judgment and experience/observation on other national forest management units, the LNF has an above average standard of road. Culverts are common drainage features on maintenance level 2 roads and standard on maintenance level 3 roads. Often roads on this national forest could be classified one maintenance level higher.
- Allowing non-highway-legal vehicles to use the road segments can involve both non-highway-legal equipment and non-licensed operators, including children.
- In California, children under the age of 18 must take a prescribed safety course, be under direct supervision of an adult possessing appropriate safety certificate, or possess the appropriate safety certificate in order to operate an ATV. In addition, children under the age of 14 cannot operate an ATV without direct supervision by parent, guardian, or authorized adult.
- The current use on NFSR 29N48 appears to be consistent with State law and Forest Service policy for operational maintenance level 3 roads.
- Non-motorized traffic was observed on the road (mountain bike).
- Some intersections with connecting roads are at 45deg angles and do not provide adequate sight distance for merging traffic at higher speeds.
- The roadbed is raised and appears to provide for sufficient drainage and user comfort.

2. Crash history:

At the time of this analysis, there is record of one crash on this road. On January 23, 2005, a snowmobile was involved in a single vehicle accident. The operator experienced severe injuries.

3. Observed Traffic volume and type:

Non-highway-legal vehicles:

< 12 inch tread width < 50 inch tread width >50 inch tread width

Highway-legal vehicles:

< 12 inch tread width < 50 inch tread width >50 inch tread width

Passenger cars Commercial vehicles Recreation vehicles (RV's)

Vehicle distribution from a 3-hour observation, beginning Tuesday 6/10/08 @ 1100 and ending @ 1400

Passenger cars: 2

Mountain Bikers: 1

4. Speed - Anticipated average speed (85th percentile):

The road segments were driven at various speeds to simulate conditions encountered by a Tentatively 30 mph based on observation and engineering judgment. Straightaways allow for higher speeds.

5. Road surface type:

MP 0 to 18.6: aggregate

The entire road length in the vicinity of this analysis is aggregate surfaced.

6. Intersections with other roads and trails:

The study segments connect a variety of NFS roads with lower assigned maintenance levels (ML2). The sight distances at these intersections are rated fair to good. The roads that intersect with the Turner Mountain Loop lack the appropriate entrance treatments needed to provide for the appropriate traffic management strategies (discourage or prohibit passenger cars – *or* – accept or discourage high-clearance vehicles). The current intersections may result in higher traffic merging speeds.

7. Other roadway factors:

- Roadway alignment was adequate for the assigned maintenance level. In general, the road was maintained with a traveled way width of 15'.
- Drainage features include an inside ditch with frequent cross-drain culverts with excavated catch basins.
- The cut slopes were often steep (> 1:1) and contained loose rock. During the analysis field trip, multiple stops were made to remove rocks up to 150lbs from the traveled way that had fallen from the cut slope.
- The fill side of the roadway often features slopes equal to and steeper than 2:1, for distances greater than 30'.
- The portion of NFSR 29N48 in the study is generally a single-lane road with turnouts.
- Summer and fall seasons will experience peak use, winter and spring can bring snowy and icy conditions along with snowmobile traffic.

8. Roadside conditions:

- Route identification markers, regulatory signs, and warning signs generally meet the standards in MUTCD.
- Multiple road identification signs were found damaged and lying in the brush near their proper location.
- Roadside brush was beginning to encroach upon the traveled way in multiple sections; this should be removed to provide for improved sight distance.
- Trees often lined the shoulders and sometimes encroached upon the shoulder and edges of the traveled way.

9. Risk without mitigation if designating the roadway "open to all motor vehicles":

Crash probability: High Med Low

Crash severity: High Med Low

Crash probability was assessed based on factors including:

- Operator considerations, traffic volume, rates of speed, alignment, sight distance, traveled way surface and width, drainage, roadside conditions.

Crash severity was assessed based on factors including:

- Roadway geometry (embankments, slopes, horizontal and vertical alignments), speed, traffic types and difference in vehicle sizes, difference in speeds of OHVs and full-size passenger vehicles, potential path and objects encountered if a vehicle left the traveled way.

Alternatives and Mitigation Measures:

Alternatives and mitigation measures are presented to assist with safe road management. They are to be considered, should the agency have the appropriate time, workload, and funding based on competing priorities.

For all situations, the following mitigation measures apply:

- Clear communication and education to the visitors on allowed uses, safe motor vehicle use, and natural resources (informational signing and kiosks, maps, website, etc.).
- Improved route identification signing. Repair and replace devices as needed.
- Clear brush, especially along curves, to improve sight distance.
warning: improved sight distance may result in higher speeds
- Remove of roadside hazards such as boulders, trees, and debris.
- Combine the appropriate enforcement measures with the allowed uses for the road.
- Coordinate with other agencies to improve enforcement consistency.
- Utilize a monitoring program to better determine the appropriate management strategy for the types of use, new technologies, changes in visitor demands, and resource protection measures.

In addition, these mitigation measures would apply to the following alternatives. Although the following alternatives are not comprehensive for the situation, they represent the most likely and/or practical options based on engineering judgment.

Alternative 1: Designate the road segments as “open to highway-legal vehicles only”. Continue to manage the road in accordance with maintenance level 3 standards.

- Maintain all roadway signing to MUTCD standards.
- Consider designing new trails, a new trailhead, and/or a new camping area to provide better opportunities for non-highway legal motor vehicle traffic to access the area and the adjacent maintenance level 2 roads.
- Approximate Implementation Cost: \$ 0
- Expected risk:

Crash probability: High Med Low

Crash severity: High Med Low

Alternative 2: Designate the road segments as “open to all motor vehicles”, including highway legal and non-highway-legal vehicles. Continue to maintain the road in accordance with maintenance level 3 standards.

- Improve education and enforcement communication to explain the complexities of various allowed uses on the road.
- Install appropriate signs of a type approved by the Department of Transportation (i.e., “Share the Road”) on and along the highway to identify and communicate the potential hazards related to motorized mixed use.
- Notify the Commissioner of the California Highway Patrol and review their opinion.
- Approximate Implementation Cost: \$ 4500
- Expected risk:

Crash probability: High Med Low

Crash severity: High Med Low

Alternative 3: Designate the roads as “open to all motor vehicles”, including highway-legal and non-highway-legal vehicles. Downgrade the road segments in accordance with maintenance level 2 standards. This would require removing culverts and ditches, reconstructing the template and narrowing the roadway.

- Based on the quality of the road, the amount of thru traffic, and the change from the rest of the loop, this change would not be consistent with the road management objectives.
- Approximate Implementation Cost: \$ 149,000 (~\$45k per mile)
- Expected risk

Crash probability: High Med Low

Crash severity: High Med Low

Alternative 4: Construct trail segments to allow non-highway-legal vehicles to bypass the road and access adjacent maintenance level 2 roads.

- The terrain in this area does not provide for a feasible parallel trail system.

Final Comments:

Signing on national forest system roads will conform to the standards presented in the FS sign and poster guidelines (available @ http://fsweb.wo.fs.fed.us/eng/roads_trails/signs_05/index.htm).

In addition, roads managed under the Highway Safety Act, including the study segments here, must comply with the standards in the MUTCD (available @ <http://mutcd.fhwa.dot.gov/>).

According to the Sign and Poster Guidelines for the Forest Service (2005):

The following priorities are to be used to minimize the potential conflicts of mixed use:

- Provide separate facilities.
- Separate use periods. Roads may be designated for separate use periods such as season, weekday/weekend, or day/night. Notify the public of the locations, effective dates, times, and duration that the roads may or may not be used. Provide appropriate signs as shown in Chapter 3A.
- Manage concurrent use.

Upon designation and prior to allowing any mixed use, the Forest Supervisor is responsible for appropriately signing and mapping the route such that the dual traffic use is clear to all users.

Maps & Photos:

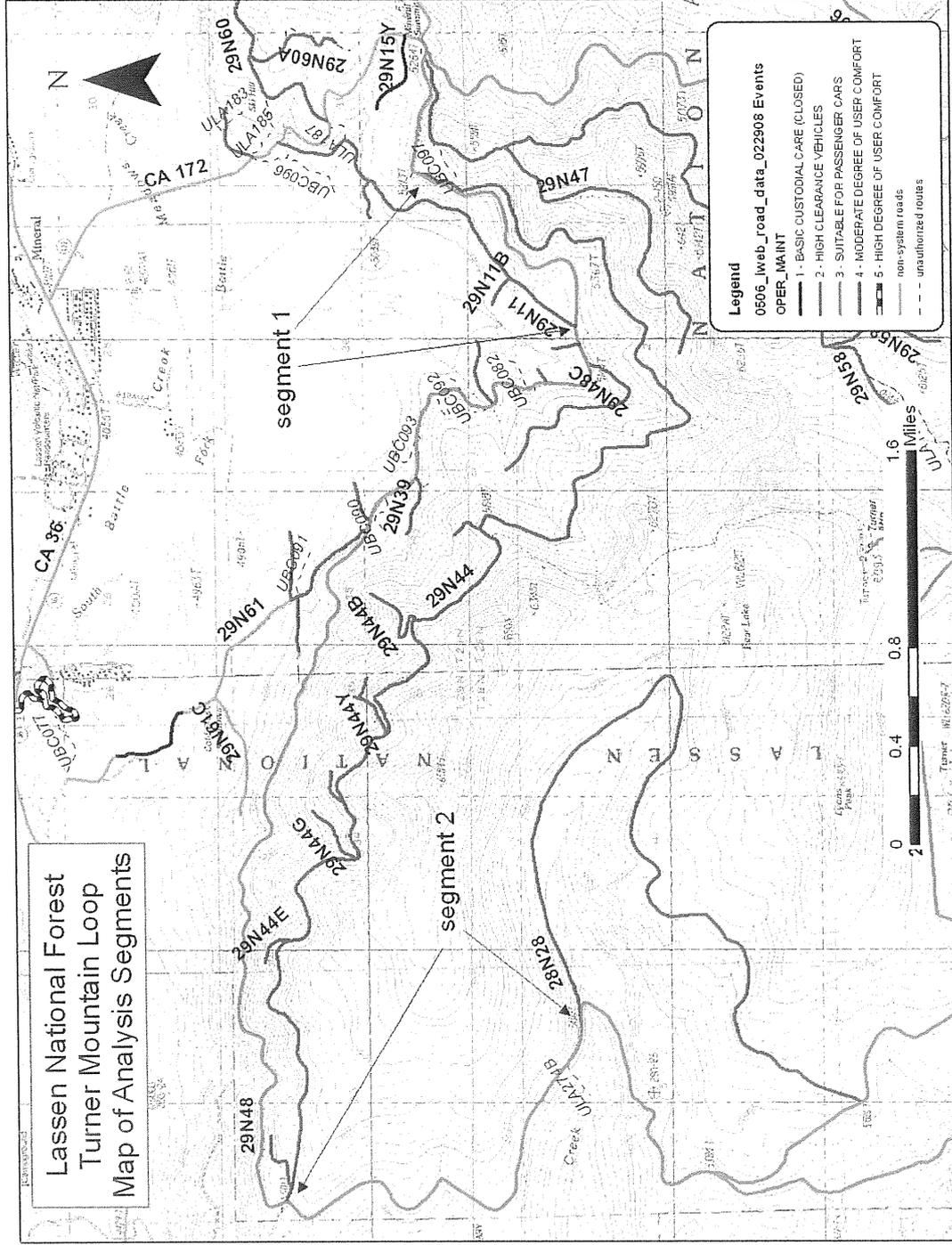


Figure 1: Map of road segments analyzed.

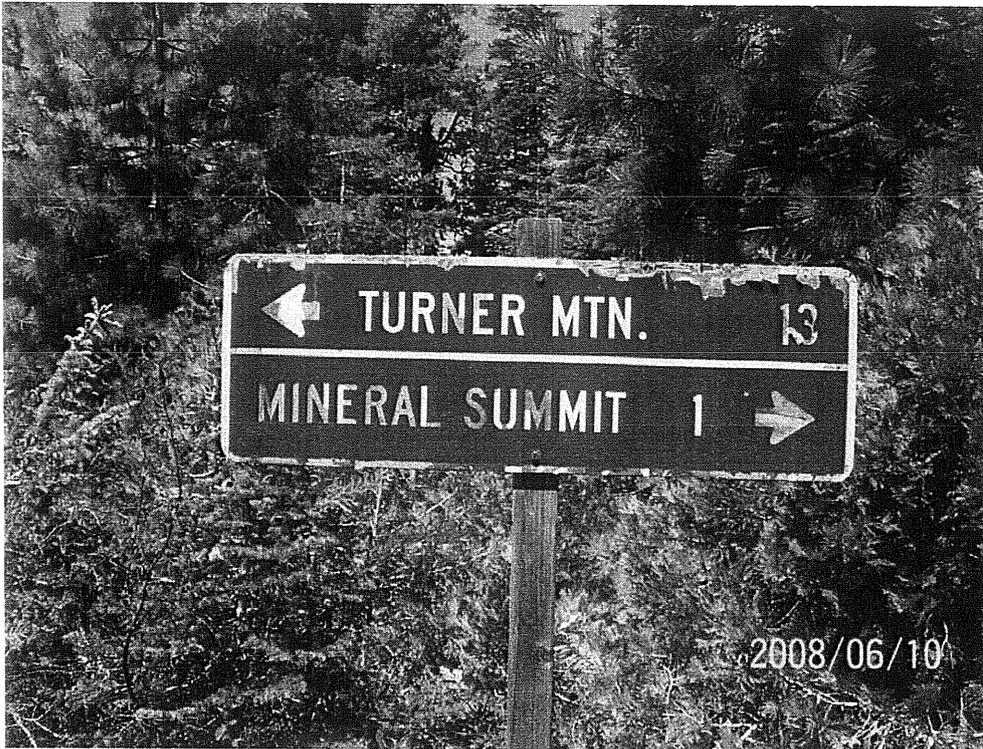


Figure 2: Forest road destination signing.

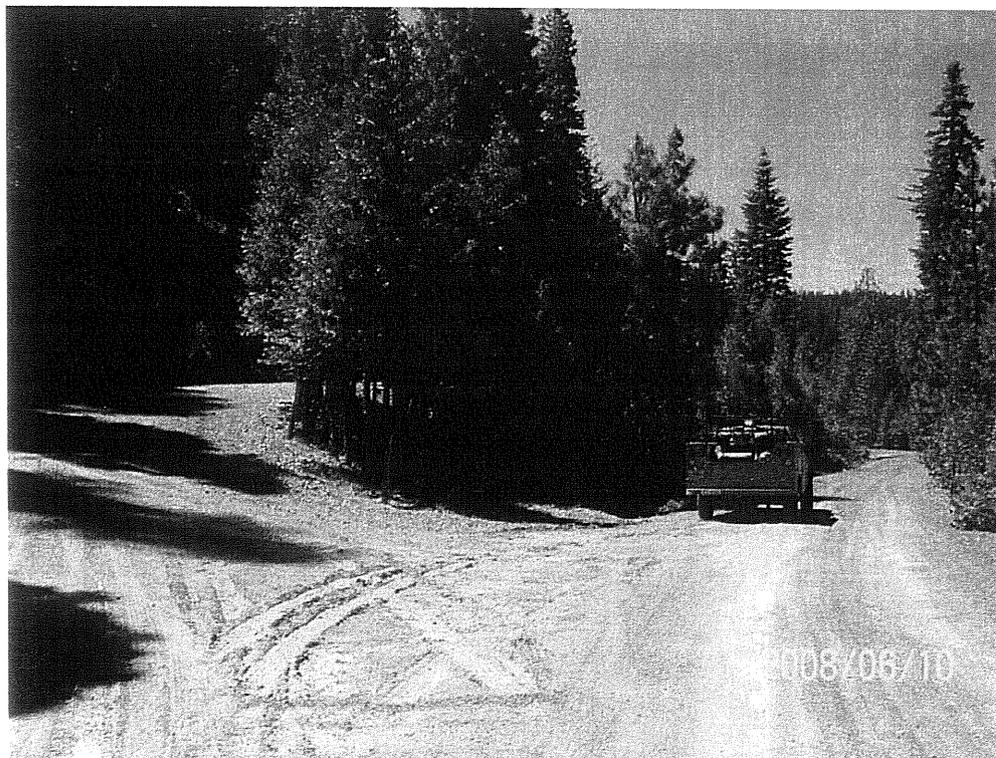


Figure 3: Intersection of NFSRs 29N48 (to the right) and 29N44. This marks the beginning of study segment 1.



Figure 4: Typical alignment and sight distance encountered along straightaways, study segment 1.



Figure 5: Intersection with NFSR 29N44, marking the beginning of the study segment 2.



Figure 6: Looking south at NFSR 29N48, from the intersection with NFSR 29N44.



Figure 7: Typical straightaway along study segment 2.



Figure 8: Intersection with NFSR 28N28 (left) and NFSR 29N48 (right). This marks the end of study segment 2.

Chris Bielecki

Prepared by:
Chris Bielecki, Supervisory Civil Engineer

Engineering Report:

Lassen National Forest

Almanor Ranger District

Analysis of

National Forest System Road (NFSR)

30N07

for Motorized Mixed Use Designation

Forest: Lassen

District: Almanor

Road Number: 30N07

Road Name: Clover – Swain Mtn Road

Introduction: The 30N07 Road segment studied is located on the west side of Lassen National Forest (LNF) in the Swain Mountain quadrangle.

NFSR 30N07 ML3 begins at the intersection with State Highway 44 in Section 13 of the Pegleg Mountain quadrangle, trends west and south through the Westwood Junction and an intersection with 30N10, traverses the northwest flank of Pegleg Mountain and an intersection with 30N23 at Lasco, then trends west and enters the Swain Mountain quadrangle where it intersects with 30N49 at the Swain Snowmobile Park where the road enters the Swain Mountain experimental Forest. 30N07 then traverses the experimental forest where it exits and intersects at its terminus with 32N10. The road length is approximately 17 miles in length.

The segment studied starts at approximate road mile 10.50 in Section 22 of Swain Mountain quadrangle at the intersection with 30N49 and intersects with 30N33 / 30N26A in the Swain Mountain Experimental Forest for a distance of approximately 1.00 miles to approximate road mile 11.50.

This entire road is currently managed by LNF as open only to highway-legal vehicles. The road segments analyzed were recommended in the LNF Travel Analysis (2008) for an engineering analysis of motorized mixed use. The purpose of this engineering analysis is to investigate the potentials, and associated risks, for operating/transporting both highway-legal vehicles (motor

vehicles, including the operators, that are licensed or certified for general operation on public roads within the State) and non-highway-legal vehicles (motor vehicles, including the operators, that are not licensed or certified for general operation on public roads within the State) on 30N07 / ML3. The LNF Travel Analysis (June 2008) identified this road section as a connector for recreational off-highway vehicle (OHV) loop opportunities on the adjacent maintenance level two road network, of which a portion is currently managed as open to non-highway-legal vehicle use.

Study Segment road data from the forest transportation atlas:

Segment 1: Beginning Mile Post: 10.50 Ending Mile Post: 11.50

30N49 to 30N33 / 30N26A

Traffic Service Level: A B C D

Objective Maintenance Level: 1 2 3 4 5

Operational Maintenance Level: 1 2 3 4 5

Maintenance by: Forest Service (FS)

Non-Forest Service ROW or jurisdiction? Yes No

Any road use agreements, maintenance agreements, or other encumbrances?

Yes No

Description of agreements or encumbrances:

No agreements are documented.

Subject to Highway Safety Act? Yes No

Non-highway-legal vehicles currently permitted? Yes No

Would motorized mixed use be consistent with State and local laws? Yes
 No

Description of State California Vehicle Code and Forest Service Directives:

According to California Vehicle Code section 38026, *Designating Highways: Combined Use*, off-highway operators on a Combined Use highway must be in possession of a valid driver's license.

Based on the Forest Service Directives and Travel Management purpose and need, to allow all motor vehicles on this segment with a designation of motorized mixed use for a segment or segments with a cumulative distance of 3 miles or less could be consistent with state and federal laws and directives with appropriate mitigation for safety concerns.

Description of road management objectives (RMOs), existing use, and proposed use:

Road 30N07 / ML3 currently encourages use as an objective ML3 and operational ML3 collector road and functions as a forest highway connecting the State Highway 44 to the Almanor Ranger District, defensible fuel profile zones, experimental forest and recreation destinations.

This forest highway connects to all weather asphalt surfaced State highway and provides ingress and egress to a myriad of defensible fuel profile zones – DFPZ's, forest plan units for timber harvesting, and wildlife management areas.

30N07 is utilized by forest personnel for ingress and egress to Defensible Fuel Profile Zones – DFPZ's and their associated vegetation management and fire suppression functions, for wildlife management, and for recreation access to several forest destinations.

Most of the year it is currently managed as open only to highway legal traffic. The road is considered a highway by the forest service and is managed in accordance with the Highway Safety Act.

The proposed use for this segment of 30N07 / ML3 identified in this analysis is to authorize motorized mixed vehicle class use. The proposal is to utilize the ML3 road segment to connect adjacent ML2 roads into a loop for off highway motorized vehicle use.

General Considerations:

All motor vehicle operators need to be cognizant of the applicable state laws, and how they pertain to each age group, vehicle type, and national forest system road classification (see next bullet).

Through authorities delegated by the Secretary, the Forest Service may restrict or control use to meet road management objectives (36 CFR 212.5). The LNF currently manages this road as a highway, in accordance with the Highway Safety Act. The road is therefore subject to the provisions of the California Vehicle Code (CVC) for highways.

State OHV Regulations: any motor vehicle must have a street-legal license plate to operate on highways. To operate on public lands, off of highways, motor vehicles must have either a street-legal license plate or a red sticker or a green sticker. For more information, see the CA State Parks Off-Highway Motor Vehicle Recreation site, available @ <http://ohv.parks.ca.gov/>

California has:

- requirements for ATV safety
- conditions for operating ATVs
- OHV equipment requirements
- OHV operation requirements

Summary of Findings:

Implementing mitigation measures, especially improved road / safety signing and comprehensive public education / outreach, will reduce crash probability although road alignment and associated higher closing speeds will continue to affect crash severity.

Road mitigation should include implementing a comprehensive communication, management, and enforcement plan. Associated implementation costs will depend on the designated allowed use for the road.

NFSR road 30N07 is an observed 1+ lane operational maintenance level 3 standard throughout its extent.

The road is maintained to a standard allowing efficient passenger car through traffic at speeds up to 45 mph for reasonable and prudent drivers on straightaways. Based on speeds and their associated risk for crash severity, designating the road segments as open only to highway-legal vehicles will provide the lowest crash probability and severity. Crash severity is determined by the dynamics of a vehicles speed or combined speeds, mass, and configurations.

Factors Considered:

1. Operator considerations:

- Based on engineering judgment and experience/observation on other national forest management units, the LNF has an above average standard of road. The Lassen is not "typical" in its road system's adherence to maintenance levels. This road is an objective ML3 and an operational ML3. It provides forest commodity haul and fire suppression access which necessitates a high level ingress/egress access road for the DOT Class 8 (26,001 – 33,000 GVWR) trucks that use it.
- The objective level of this road is classified as a 3, and the operational level is a ML3. This provides for all-weather (during fire season May to October) fire staffing access and fire vehicle emergency access. The objective of the road is to provide access for commodity haul, wildlife management, emergency fire detection and suppression response.
- Allowing non-highway-legal vehicles to use the road segment can involve both non-highway-legal equipment and non-licensed operators, including children.
- In California, children under the age of 18 must take a prescribed safety course, be under direct supervision of an adult possessing appropriate safety certificate, or possess the appropriate safety certificate in order to operate an ATV. In addition, children under the age of 14 cannot operate an ATV without direct supervision by parent, guardian, or authorized adult.
- The Lassen National Forest currently manages this road as a highway, in accordance with the Highway Safety Act. The road is subject to the provisions of the California Vehicle Code (CVC) for highways.
- The current use on NFSR 30N07 appears to be consistent with state law and forest policy for operational maintenance level 3 roads.

2. Crash history:

There is one reported motor vehicle crash on this road. The crash occurred on January 7, 2006 on a Saturday at 1240 hours. The vehicle was a snowmobile traveling at 45 mph which lost control and impacted a tree. The snowmobile then caught fire and burned entirely. The driver was transported to Banner Lassen Hospital and suffered a fractured left shoulder and bruises to hip and calf. The California Highway Patrol investigated this crash and determined that excess speed caused the motor vehicle to lose control and leave the roadway where it impacted a tree and burned-up.

3. Traffic volume and type:

Non-highway-legal vehicles:

< 12 inch tread width < 50 inch tread width >50 inch tread width

Highway-legal vehicles:

< 12 inch tread width < 50 inch tread width >50 inch tread width

Passenger cars Commercial vehicles Recreation vehicles (RV's)

4 civilian motor vehicles were observed along the 30N07 road during the field observation.

4. Speed - Anticipated average speed (85th percentile):

The speed greatly varies, depending on the roadway conditions. The 85th percentile would be estimated at: 45 mph.

5. Road surface type:

The road has a combination of native crushed rock aggregate and volcanic cinder surfacing. The majority of the traveled way is constructed upon a raised roadbed and the road has drainage ditches, singular culverts, and ditch-relief culverts. The road is approximately 16'-20' wide. The road traveled way is very dry and contains many fine aggregate components and produces prodigious quantities of dust when driven over. Road shoulders are soft and unconsolidated.

6. Intersections with other roads and trails:

Road segment 1 intersects with the following forest roads.

- 30N49
- 30N07D
- 30N31
- 30N77
- 30N26A
- 30N33

The maintenance level 2 roads have historically provided forest management access, fire suppression access, commodity haul, forest grazing access, and hunting and firewood gathering access. The proposed MMU intersections of 30N07 /ML3 may result in higher traffic merging speeds.

7. Other roadway factors:

- Roadway alignment was adequate for the assigned maintenance level. Alignment provides for vehicle closing speeds of approximately 90 mph.
- The road was maintained with a traveled way width of 16'-20".
- Raised roadbed creates soft unconsolidated shoulders. Emergency vehicle run-out among numerous lava rocks, Juniper trees, Pine trees, and brush may lead to loss of control for vehicle operators and/or collisions with immobile objects.
- The road provides administrative access for commodity haul, fire prevention patrol access, fire suppression access, wildlife management. Summer and fall seasons will experience peak use, winter and spring can bring snowy and icy conditions.

8. Roadside conditions:

- The segment runs through high elevation, 5,000 ft., open Pine forest, meadow, open Juniper, brush, native grass and lava rock forest land.
- Cross slope is 0-2%.
- Grade is 0-2%.
- Pine and other conifer trees are ≤ 18 " and numerous.
- Emergency run-out is limited.

9. Risk without mitigation:

Crash probability: High Med Low

Crash severity: High Med Low

Crash probability was assessed based on:

- Traffic volume, dust, rates of speed, alignment, sight distance, traveled way surface and width.

Crash severity was assessed based on:

- Roadway geometry (including embankments), difference in vehicle sizes, difference in speeds of OHVs and full-size passenger vehicles.

Alternatives and Mitigation Measures:

Alternatives and mitigation measures are presented to assist with safe road management. They are to be considered, should the agency have the appropriate time, workload, and funding based on competing priorities.

For all situations, the following mitigation measures apply:

- Clear communication and education to the visitors on allowed uses, safe motor vehicle use, and natural resources (informational signing and kiosks, maps, website, etc.).
- Improved route identification and safety signing. Repair and replace devices as needed.
- Clear brush, especially along curves, to improve sight distance.
- Combine the appropriate enforcement measures with the allowed uses for the road.
- Coordinate with other agencies to improve enforcement consistency.
- Utilize a monitoring program to better determine the appropriate management strategy for the types of use, new technologies, changes in visitor demands, and resource protection measures.

In addition, these mitigation measures would apply to the following alternatives. Although the following alternatives are not comprehensive for the situation, they represent the most likely and/or practical options based on engineering judgment.

Alternative 1: Designate the road segments as “open to highway-legal vehicles only”. Manage the road in accordance with maintenance level 3 standards.

- Maintain all roadway signing to MUTCD standards.
- Consider designing new road-parallel trails, a new trailhead, and/or a new camping area to provide better opportunities for non-highway-legal motor vehicle traffic to access the area and the adjacent maintenance level 2 roads.
- Approximate Implementation Cost: \$ 0
- Expected risk:

Crash probability: High Med Low

Crash severity: High Med Low

Alternative 2: Designate the road segments as “open to all motor vehicles”, including highway-legal and non-highway-legal vehicles.

- Recognize that this situation would involve different allowed uses and would complicate communication and enforcement.
- Improve education and enforcement communication to explain the complexities of various allowed uses on the road.
- Install appropriate signs of a type approved by the Department of Transportation on and along the highway to identify and communicate the potential hazards related to motorized mixed use.
- Notify the Commissioner of the California Highway Patrol and review their opinion.
- Approximate Implementation Cost: \$ 3500 per segment
- Expected risk:

Crash probability: High Med Low

Crash severity: High Med Low

Final Comments:

Signing on national forest system roads should conform to the standards presented in the FS sign and poster guidelines (available @ http://fsweb.wo.fs.fed.us/eng/roads_trails/signs_05/index.htm).

In addition, roads managed under the highway safety act, including the study segments here, must comply with the standards in the MUTCD (available @ <http://mutcd.fhwa.dot.gov/>).

According to the Sign and Poster Guidelines for the Forest Service (2005):

The following priorities are to be used to minimize the potential conflicts of mixed use:

- Provide separate facilities.
- Separate use periods. Roads may be designated for separate use periods such as season, weekday/weekend, or day/night. Notify the public of the locations, effective dates, times, and duration that the roads may or may not be used. Provide appropriate signs as shown in Chapter 3A.
- Manage concurrent use.

Upon designation and prior to allowing any mixed use, the Forest

Supervisor is responsible for appropriately signing and mapping the route such that the dual traffic use is clear to all users.

Maps & Photos:



