

Engineering Report:

Lassen National Forest

Hat Creek Ranger District

Analysis of

National Forest System Road (NFSR)

32N12

for Motorized Mixed Use Designation

Forest: Lassen

District: Hat Creek

Road Number: 32N12

Road Name: West Prospect Lookout

Introduction: This report documents the engineering analysis for 2 segments of the “West Prospect Lookout Road”, totaling 0.8 miles in length. The study segments are south of Old Station, near the northern boundary of Lassen Volcanic National Park (LVNP). The route connects highway 44/89 to a Forest Service lookout and other electronic facilities on Prospect Peak. Lassen National Forest (LNF) currently manages this road as open only to highway-legal vehicles.

The study 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 three segments of route 32N13 were also recommended for an engineering analysis of motorized mixed use. The results can be found in a separate engineering report.

Study Segment road data from the forest transportation atlas:

Segment 1: Beginning Mile Post: 0.8 Ending Mile Post: 1.1

Segment 2: Beginning Mile Post: 3.3 Ending Mile Post: 3.8

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>
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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 California State Highway Route 44/89 to the West Prospect Lookout. The road is a single-lane road with turnouts. The favorable alignment along with greater than ordinary width (14 – 18 feet) provides for speeds up to 40 MPH.

NFSR 32N12 has traditionally served administration of the LNF, including fuels and vegetation management, commodity extraction, fire suppression, and recreation.

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 is open for winter use—including ATVs, 4WDs, skiers and OSVs (including 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.

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 moderate crash probability and moderate crash severity on segment 1 and a moderate crash probability and high crash severity on segment 2.

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 4 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 32N12 appears to be consistent with State law and Forest Service policy for operational maintenance level 3 roads.
- The roadbed is raised and appears to provide for sufficient drainage and passenger car travel.
- Commercial, recreational, and administrative traffic is expected along this segment.

2. Crash history:

No record of accidents

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 an observation, 6/25/08 @ 1630-1730.
1 passenger car (Jeep), 1 BLM fire engine

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

The road segments were driven at various speeds to simulate conditions encountered by a reasonable and prudent driver in a passenger car.

Segment 1:

30 mph based on observation and engineering judgment. The segment features many operator distractions that require a slow, attentive speed, including: 2 trailheads, campsites, a 1-lane bridge, lava flows.

Segment 2:

35 mph based on observation and engineering judgment.

5. Road surface type: coordinate

Both segments have aggregate surfacing and single lane traveled ways with turnouts. Segment 1 is approximately 14' wide. Segment 2 is approximately 14' – 16' wide.

6. Intersections with other roads and trails:

The sight distances at the managed intersections are rated good. The intersection with NFSR 33N22 on segment one and 32N38 on segment two allows for higher merging speeds since the road lacks the proper entrance treatment. Within the first study segment, there are multiple unauthorized routes accessing 32N12 that exist in association with uncontrolled dispersed camping along Hat Creek.

7. Other roadway factors:

- None

8. Roadside conditions:

- Raised route typical of turnpike construction (1 foot average fill) on segment one
- On segment two the design prism is typical of side hill construction with inboard ditch plus x-drain relief

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

Segment one

Crash probability: High Med Low

Crash severity: High Med Low

Segment two

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 and trees, especially along curves and at intersections, to improve sight distance.
warning: improved sight distance may result in higher speeds
- Removal 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.
- Approximate Implementation Cost: \$ 0
- Expected risk:

Segment one

Crash probability: High Med Low

Crash severity: High Med Low

Segment two

Crash probability: High Med Low

Crash severity: High Med Low

Alternative 2: Designate the road segment 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 on and along the highway to identify and communicate the potential hazards related to motorized mixed use.
- Coordinate with the State and revise existing agreements with Caltrans as applicable.
- Notify the Commissioner of the California Highway Patrol and review their opinion.
- Approximate Implementation Cost: \$ 5500
This does not account for the additional long-term annual maintenance cost increase associated with maintaining these critical safety corridors.
- Expected risk:

Segment one

Crash probability: High Med Low

Crash severity: High Med Low

Segment two

Crash probability: High Med Low

Crash severity: High Med Low

Alternative 3: Designate the road 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, the distinctive route status, and the change from the rest of the collector route, this change would not be consistent with the road management objectives.
- This option is not currently feasible, based on the high standard of existing road
- Approximate Implementation Cost: \$ 100,000
- Expected risk on both segments

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.

Segment one

- The terrain in this area is moderate and would provide for a parallel trail system.
- This option may also necessitate additional bridges to cross Lost Creek and Hat Creek.
- Approximate implementation cost: \$250,000 with bridges, \$20,000 without.

This does not include the planning, agreements, and long term maintenance costs associated with a new NFS trail.

Crash probability: High Med Low

Crash severity: High Med Low

Segment two

- The terrain in this area is on moderate slopes and would provide for a

- Approximate implementation cost: \$15000
This does not include the planning, agreements, and long term maintenance costs associated with a new NFS trail.

Crash probability: High Med Low

Crash severity: High Med Low

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.



Figure 2: Looking at segment 1, with 32N13 on the right.



Figure 3: Segment 1.



Figure 4: Bridge along segment 1.



Figure 5: Looking back at a bridge, with route 32N71 on the right.



Figure 6: Segment 2, route 32N50 on left.

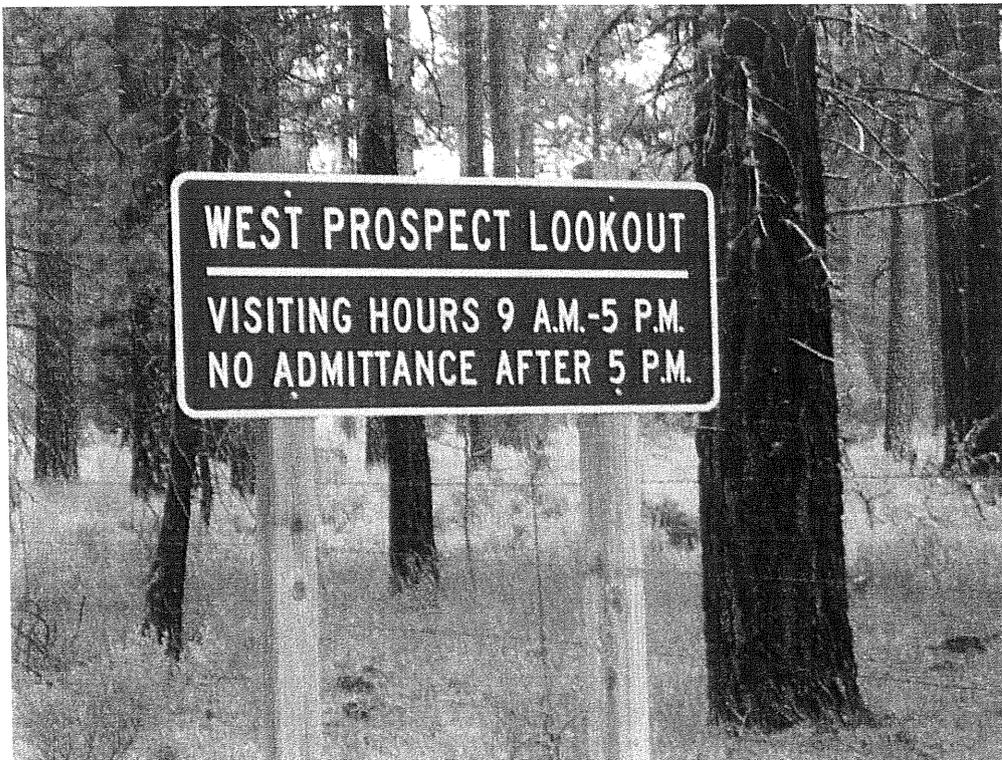


Figure 7: Lookout information sign.



Figure 8: Segment 2, typical section.



Figure 9: Looking back at segment 2, intersection with 32N38 on right.

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