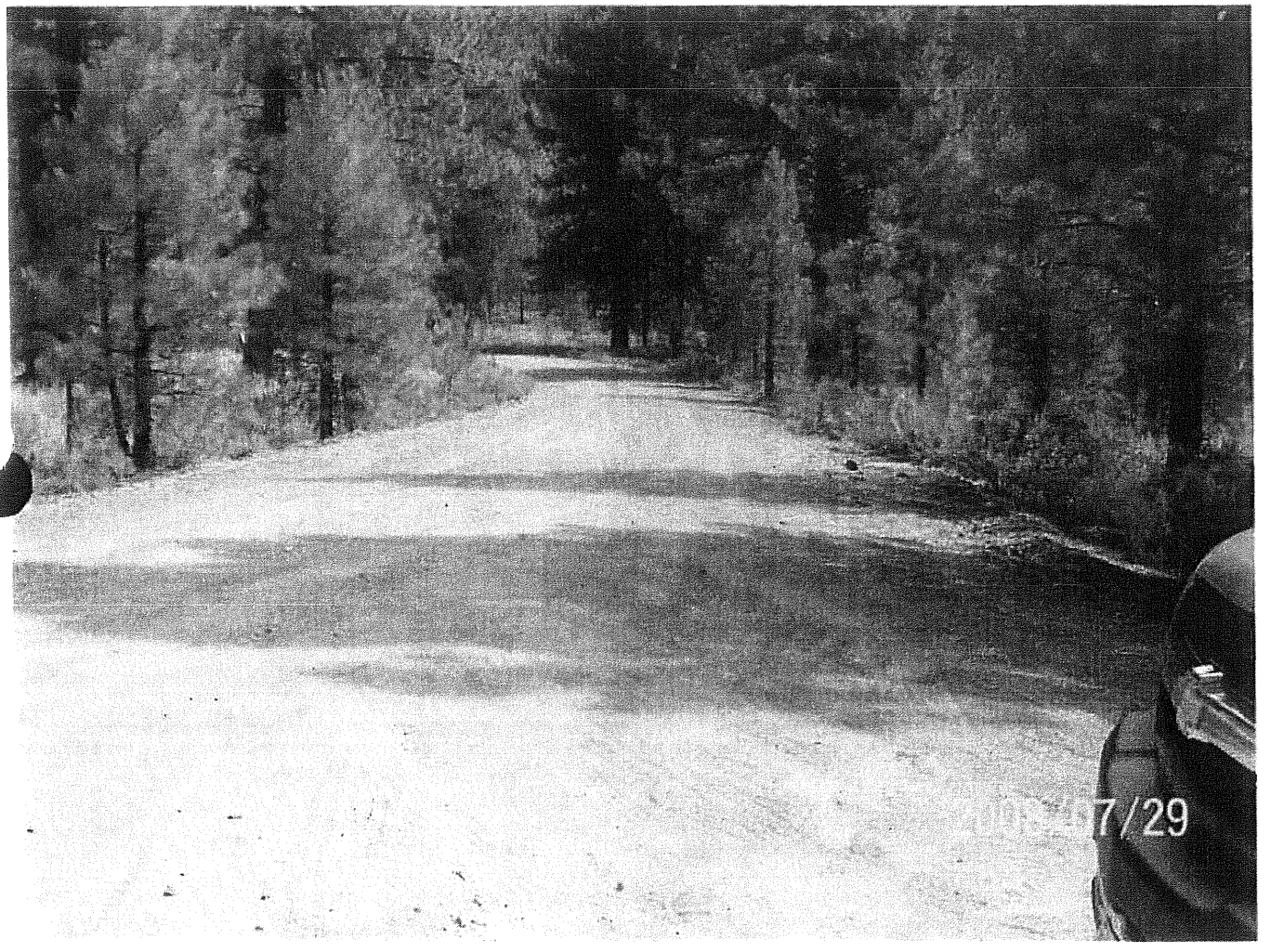
7/29

Prepared by
Tim Dedrick
Tim Dedrick
Forest Transportation Planner/Civil Engineer
Lassen National Forest

Date 9/29/05

Reviewed by
George Kulick

Date

Region 5 Qualified Engineer
Region 5 Office of Engineering

Engineering Report:

Lassen National Forest

Eagle Lake Ranger District

Analysis of

National Forest System Road (NFSR)

32N08

for Motorized Mixed Use Designation

Forest: **Lassen** District: **Eagle Lake**

Road Number: **32N08** Road Name: **Crater Lake Campground Access**

Introduction: This report documents the engineering analysis for a segment of the "Crater Lake Campground Access Road", totaling 0.8 miles in length. NFSR 32N08 is located in the Pine Creek Valley, and connects California State Highway Route 44 with Crater Lake Campground. Lassen National Forest (LNF) currently manages this road as open only to highway-legal vehicles.

The study segment was 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 this road section as a potential connection 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, segments of NFSRs 32N10 (across SR-44) and 32N22 were also recommended for engineering analyses 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** Ending Mile Post: **0.8**

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

Description of agreements or encumbrances:

The first portion (~100) is managed by Caltrans under a US Department of Transportation easement for California State Highway Route 44.

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.

It is important to note that the addition may result in a crossing of SR-44 that would not allow OHVs to cross the roadway at an angle of approximately 90 degrees, and therefore would not comply with State law. The existing situation would require OHVs to operate within the Caltrans right-of-way for a longitudinal distance of 300' before exiting – if proposing to provide access across the State highway to the "10 Road".

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

The road currently serves as the access road to Crater Lake Campground, and serves as a collector route connecting to a network of NFS roads.

The road was designed as a single-lane road with turnouts.

NFSR 32N08 has traditionally served administration of the LNF, including fuels and vegetation management, commodity extraction, fire suppression, and recreation. The road also provides access to the Bogard Well, the principal NFS water drafting source for the area.

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 is groomed for winter use—including skiers, ATVs, 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.

The road is maintained to a standard allowing efficient passenger car through traffic at speeds up to 40 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 high 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 32N08 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.
- An active Burlington Northern railroad line crosses the study segment.
- Commercial and administrative traffic is expected along this segment.

2. Crash history:

At the time of this analysis, there is no record of a crash on this road.

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 @ 1815-1845

1 passenger car

2 water trucks

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.

40 mph based on observation and engineering judgment.

5. Road surface type: coordinate

Aggregate, well maintained, smooth, 17' width.

6. Intersections with other roads and trails:

The sight distances at the intersections are rated good. The intersection with Burlington Northern rail line is well posted and visible.

The intersection with SR-44 has route identification for NFSR 32N08 in place. Through traffic speed limit is 65 mph in this section along SR-44.

7. Other roadway factors:

- There appear to be underground and above ground utilities accessed from this road.
- A cattleguard is located on the north side of the rail line crossing.

8. Roadside conditions:

- The embankments were gentle.
- The study segment mainly passes through grass and shrub vegetation.
- Occasional boulders and trees were encountered near the shoulders.

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 and trees, especially along curves and at intersections, 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 4 standards.

- Maintain all roadway signing to MUTCD standards.
- Consider designing new trails connecting to the 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 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 (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: $ 3500

  This does not account for the additional increase in long-term annual maintenance costs associated with maintaining these critical safety corridors.
- Expected risk:

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 arterial route, this change would not be consistent with the road management objectives.
- Work with Fruit Growers Supply Company to make necessary adjustments to existing agreements.
- Approximate Implementation Cost: $ 60,000 (~$75k 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 is relatively gentle and would provide for a parallel trail system. However, construction through CA DOT right-of-ways will require coordination and agreement modifications as appropriate.
- Approximate implementation cost: $8,000

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.

Maps & Photos:

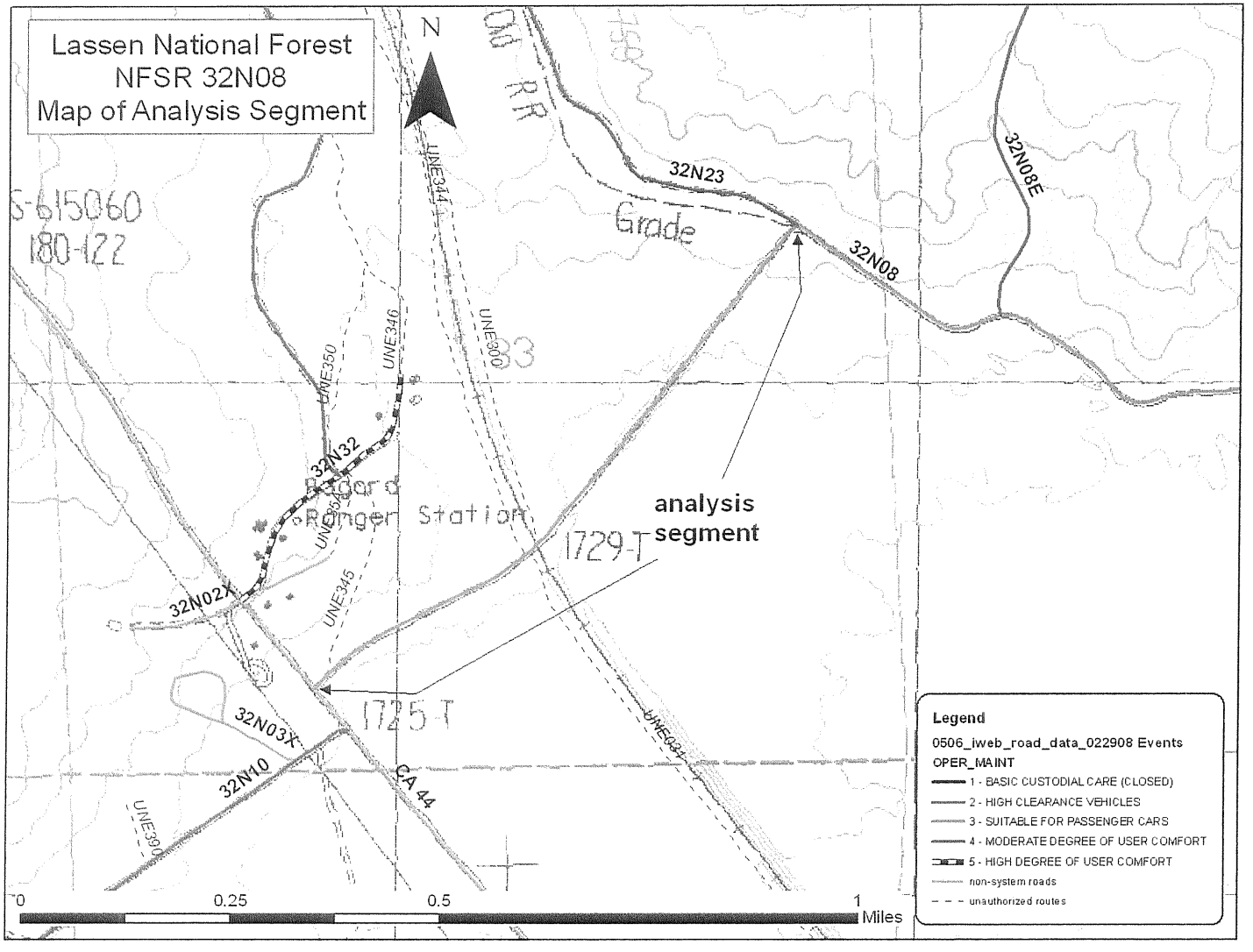

Figure 1: Map of road segments analyzed.

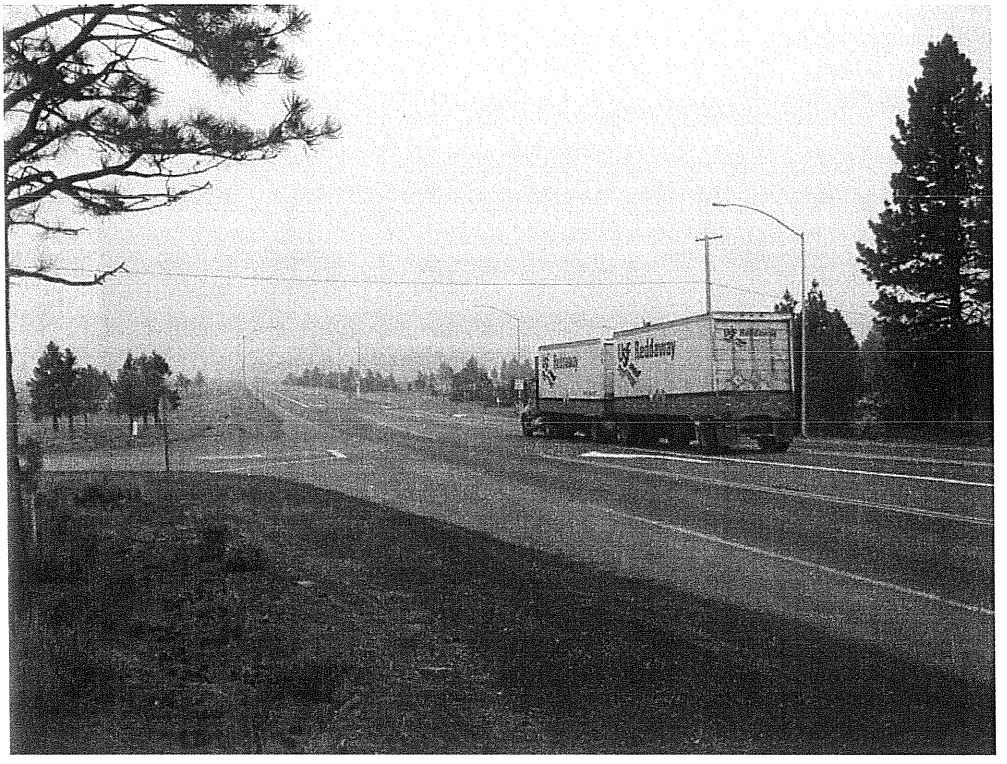

Figure 2: Looking across State Route 44 from NFSR 32N08, showing the potential motorized mixed use connection route crossing the State highway.

Figure 3: Highway approach apron along the beginning of the study segment.

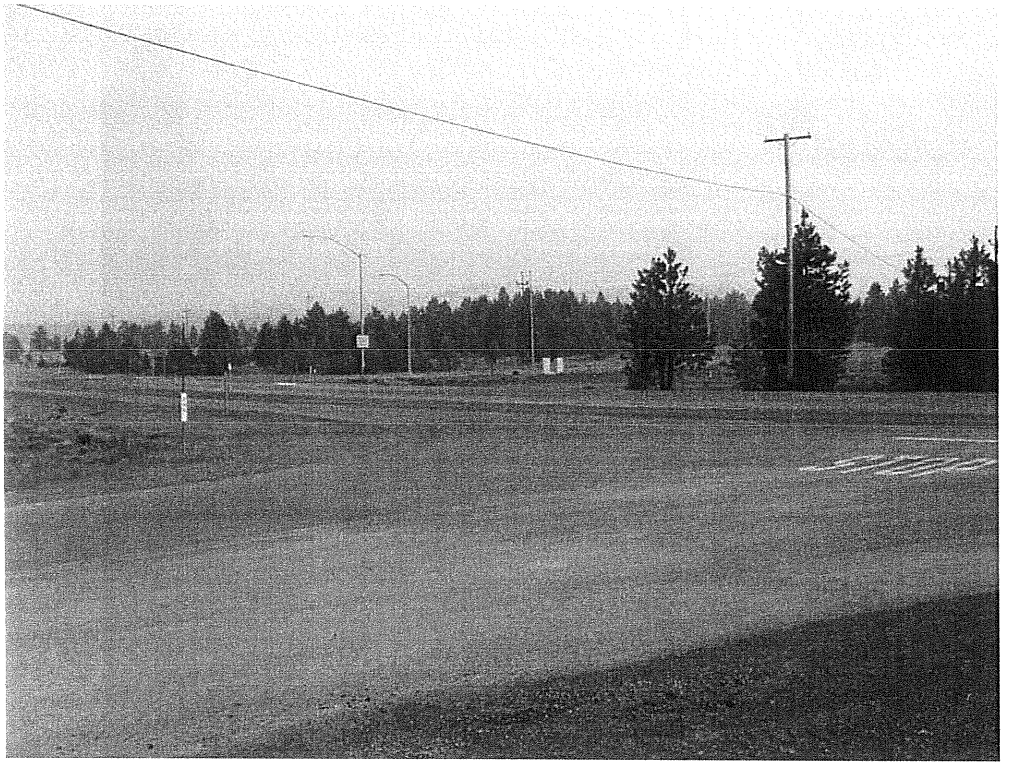

Figure 4: Intersection with SR-44 and the study segment. NFSR 32N10 can be seen in the distance.

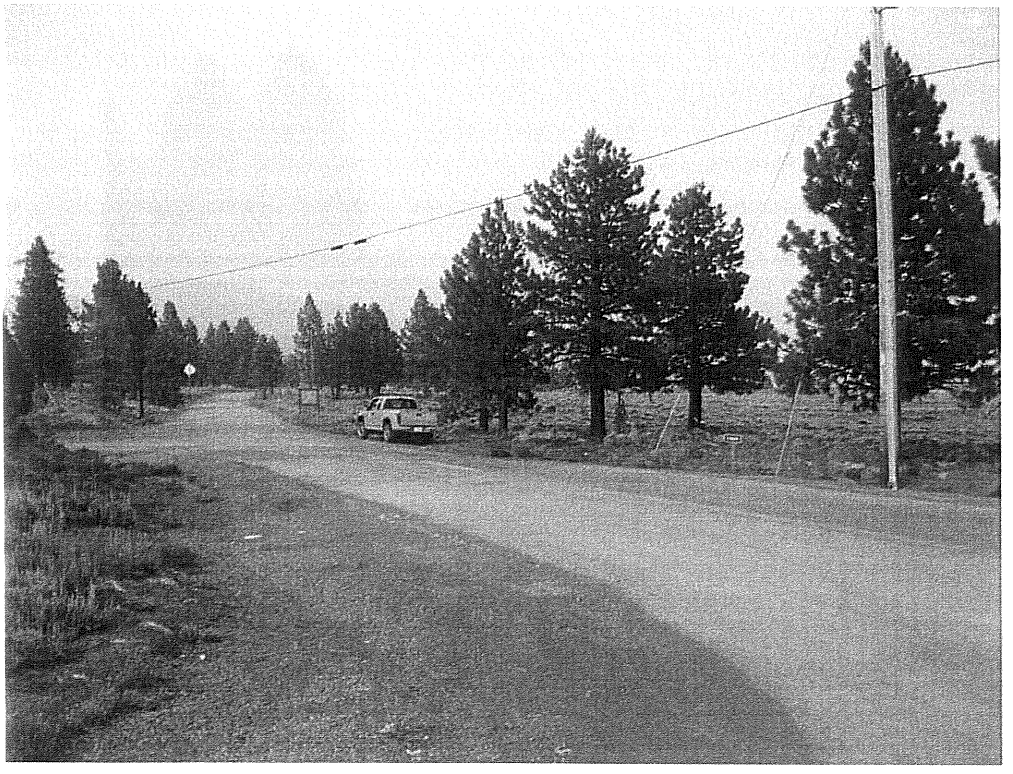

Figure 5: Looking down the study segment from the intersection with SR-44.

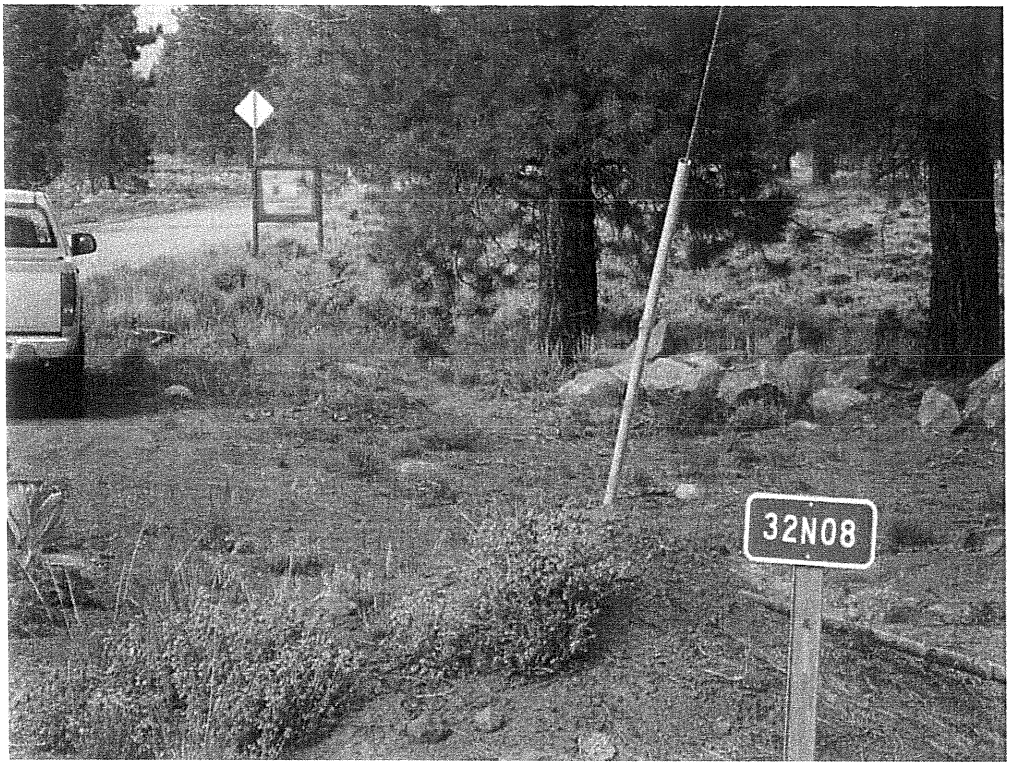

Figure 6: Study segment signing.

Figure 7: Study segment straightaway.

Figure 8: Railroad crossing along the study segment.

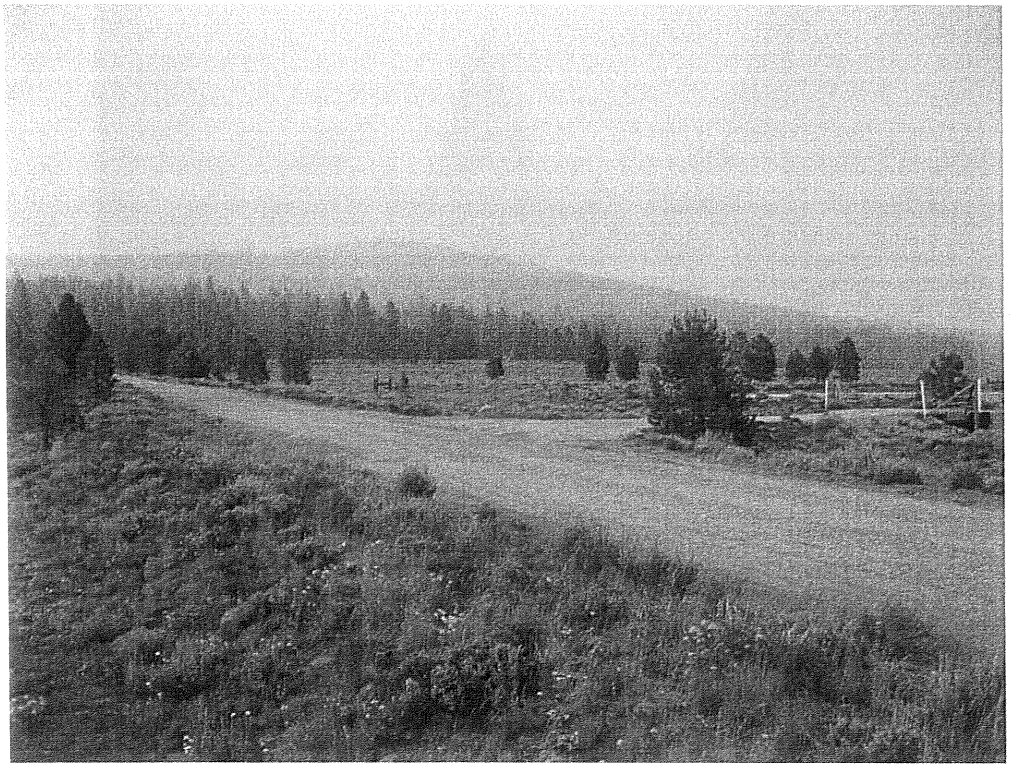

Figure 9: Study segment straightaway; intersection with water source access on the right.

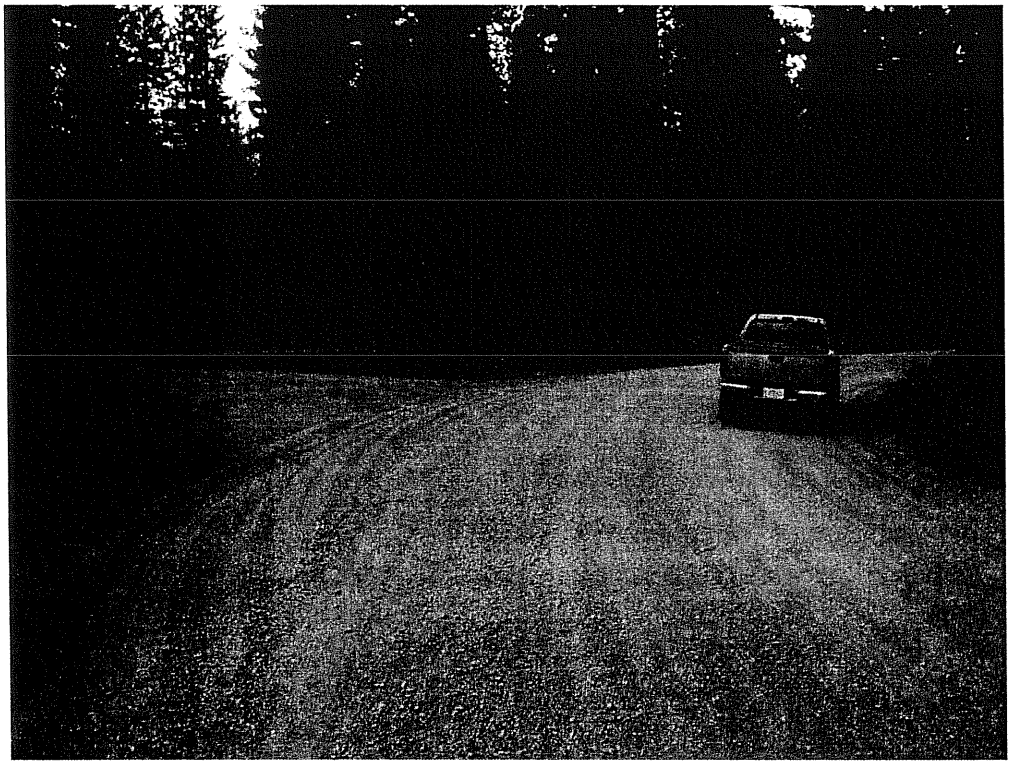

Figure 10: Intersection at the north end of the study segment.

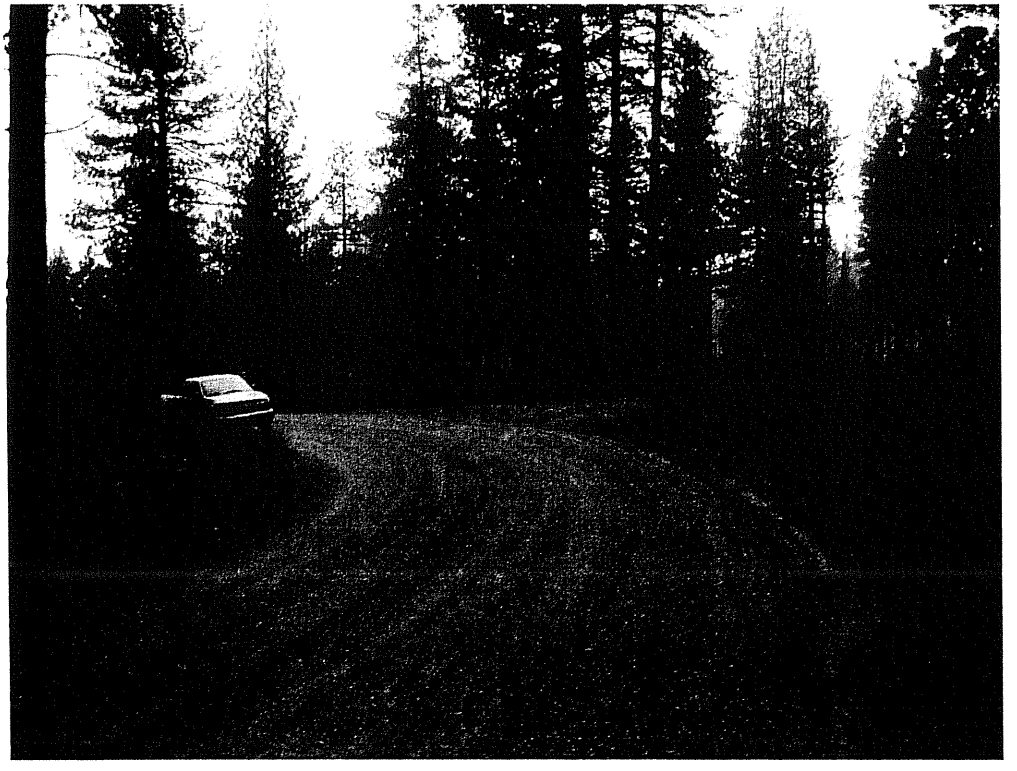

Figure 11: End of the study segment; intersection with NFSR 32N23 on right.

Prepared by:
Chris Bielecki, Supervisory Civil Engineer