

**STATE ROUTE 89  
TRANSPORTATION CONCEPT REPORT**

**CALTRANS DISTRICT 10  
OFFICE OF SYSTEM PLANNING  
May 2002**

**APPROVAL RECOMMENDED:**

  
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TRANSPORTATION CONCEPT REPORT**

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May 2002**

**APPROVAL RECOMMENDED:**

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**DANA COWELL**  
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Planning, Modal,  
and Local Assistance Program

**DATE**

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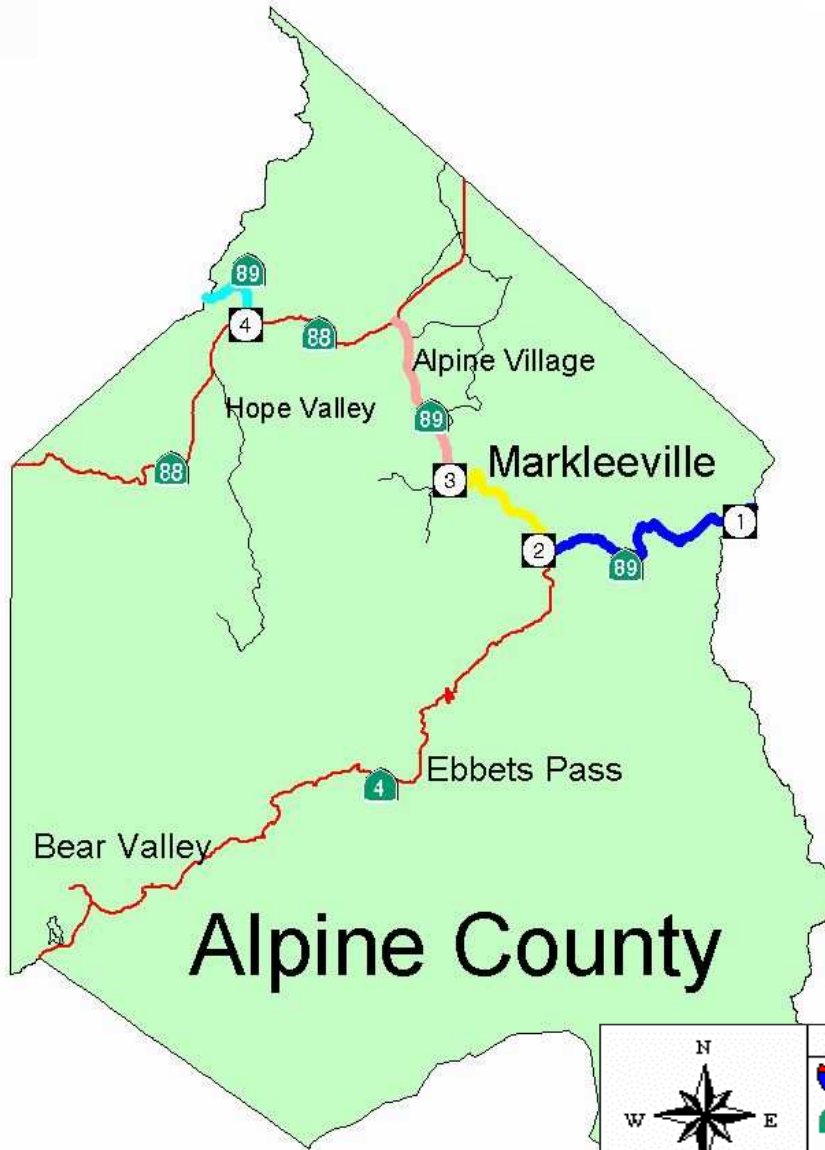
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# ROUTE 89 CORRIDOR STUDY Segmentation Map - Alpine County

Department of Transportation  
District 10  
Office of System Planning



**LEGEND**

- INTERSTATE HIGHWAYS
- CALIFORNIA HIGHWAYS
- CITIES / TOWNS
- COUNTY ROADS

## EXECUTIVE SUMMARY

Segments	Post Miles	Location	2000 LOS	Current Facility	2020 LOS W/O Improvements	2020 Concept Facility
1	0.0-9.957	Alpine Co. Line to Jct with SR-4	A	2-Lane Conventional Highway	B	2-Lane Conventional Highway
2	9.957-14.884	Jct SR-4 to .08 miles north of Markleeville	A	2-Lane Conventional Highway	B	2-Lane Conventional Highway
3	14.884-21.376E	.08 miles north of Markleeville to W. Jct SR-88, Picketts	B	2-Lane Conventional Highway	C	2-Lane Conventional Highway
4	21.3762E-23.97	W. Jct SR-88, Picketts to El Dorado Co. Line	C	2-Lane Expressway	D	2-Lane Expressway with passing lanes

# Transportation Concept Report State Route 89

## STATEMENT OF PLANNING INTENT

System Planning is Caltrans' long-range transportation planning process used to identify and prioritize future transportation improvements in cooperation with planning partners. System planning facilitates the efficient, economical, and intermodal movement of people, goods, and information. It is part of the continuing, cooperative, and comprehensive transportation planning process. System planning strives for interregional and statewide continuity of the State's transportation network.

## PURPOSE OF THE TRANSPORTATION CONCEPT REPORT (TCR)

The Transportation Concept Report (TCR) is a system planning document and tool which includes an analysis of a transportation corridor. It establishes a twenty-year transportation planning concept that is consistent with the District's goals as set forth in the District System Management Plan (DSMP). The TCR establishes the future concept of Level of Service (LOS) for segments along the route and broadly identifies the nature and extent of the improvements needed to attain that LOS. Operating conditions for each corridor are projected for 10 and 20 year horizons. Beyond the 20-year planning period, the TCR identifies the Ultimate Transportation Corridor (UTC) to ensure that adequate right-of-way is preserved for ultimate facility projects. While the 10 and 20 year plans consider funding issues, the UTC does not.

This report is prepared by Caltrans' staff in cooperation with the regional and local agencies that have jurisdiction within this corridor. The objective of the TCR is to have local, regional, and state consensus on route or corridor concepts, improvement priorities, and planning strategies. This document provides concept information only and does not determine policy.

The TCR will be updated as needed, as conditions change, or as new information is obtained.

## **ROUTE DESCRIPTION**

The State Route 89 (SR-89) corridor begins at State Route 395 (SR-395), north of Coleville and extends northerly along the eastern slope of the Sierra Nevada Mountain range, terminating at Interstate 5 near Mt. Shasta. The portion of the corridor in District 10 extends from the Mono-Alpine County Line near Monitor Pass to the El Dorado-Alpine County Line at Luther Pass Summit, a distance of 24 miles. The route is concurrent with State Route 88 from Woodfords to Picketts Junction and serves the communities of Markleeville and Woodfords in Alpine County.

### **Route Designations**

SR-89 is functionally classified as a Minor Arterial. It is a designated Scenic Highway and carries relatively low traffic volumes throughout its entire length with approximately 3% trucks and RVs in the peak hour. Segment one, from the beginning of SR-89 to the junction at State Route 4 (SR-4), is closed during the snow season (generally November through May).

This Federal Aid Primary (FAP) route is on the California Freeway and Expressway (F&E) System, the Scenic Highway System, the Interregional Road System (IRRS) established by Section 164.3 of the Streets and Highways Code, and is a terminal access route. It is a designated forest highway from the junction with SR-4 to the end of the county. It traverses national forest from the beginning of the route to the junction at SR-4, and from Diamond Valley Road to the end of the county. It is not included in the Surface Transportation Assistance Act.

### **Purpose of Route**

SR-89 is an important access route to many recreational facilities in the Tahoe, El Dorado, and Toiyabe National Forests and primarily serves interregional traffic. In District 10, the route is of regional and local significance providing year-round connection from Stockton and Jackson to South Lake Tahoe via State Routes 88 (SR-88) and State Route 50 (SR-50). It also provides a connection to (SR-395) via Monitor Pass approximately six months per year (closed in winter). The route serves the communities of Markleeville and Woodfords and provides access to the many recreational areas of Alpine County including the Toiyabe National Forest and Grover Hot Springs State Park west of Markleeville. During the ski season, the route serves ski enthusiasts traveling from the South Lake Tahoe area to the Kirkwood Ski Resort located off SR-88. It also provides a northward continuation of SR-4 for those traveling over Ebbetts Pass and is an access route to Nevada via SR-88 northeast of Woodfords.

This minor arterial is a designated Scenic Highway from SR-395 in Mono County to the El Dorado County Line in District 3 and is used extensively for bicycle touring.

## **ROUTE CONCEPT SUMMARY / RATIONALE AND CONSIDERATIONS**

The route concept is comprised of two factors:

- 1 - The minimum Level of Service (LOS) tolerable for peak hour conditions.
- 2 - The type of facility necessary to provide the concept LOS.

(Refer to Appendix 2 for the designation of LOS levels.)

### **State Route 89 Concept/Rationale**

Our concept Level of Service for our 20-year planning horizon for SR-89 which falls within the rural portions of Alpine County is "C" for all segments. The concept facility needed to meet our concept LOS is described by segment. The Ultimate Transportation Corridor (UTC) for SR-89 is the existing two-lane conventional highway for Segments 1, 2 and 3, and a two-lane expressway with passing lanes for segment four. Selected passing lanes should be added as needed and practical. Per the State Highway Inventory and As-Built Plans, the right-of-way width varies from 100 feet to 270 feet.

SR-89 between SR-4 and SR-395 is closed approximately six months out of the year and basically serves summer recreation-oriented traffic. The existing roadway is expected to provide a LOS 'C' through 2020, except Segment 4 from W. Junction 88 to the El Dorado-Alpine County Line, which is expected to provide a LOS 'D' through 2020. A concept LOS of 'C' is appropriate considering its functional classification and relatively low traffic volumes. The concept is consistent with Department policy for this type of facility and is generally consistent with the Alpine County Regional Transportation Plan.



## ALPINE COUNTY

### Segment 1

**Our concept facility for Segment 1 (PM 00.0 - 9.957) is a 2-lane conventional highway.**

The LOS for this segment is projected to be adequate for the 20-year planning horizon. The 2001 Alpine County Regional Transportation Plan identifies the need to upgrade for winter travel and recreational use from the Alpine County Line to SR-4. Maintenance, rehabilitation, and safety projects will continue as necessary.

### Segment 2

**Our concept facility for Segment 2 (PM 10.0 - 14.884) is a 2-lane conventional highway.**

The LOS for this segment is projected to be adequate for the 20-year planning horizon. The 2001 Alpine County Regional Transportation Plan identifies the need to widen the Markleeville Creek Bridge. Maintenance, rehabilitation, and safety projects will continue as necessary.

### Segment 3

**Our concept facility for Segment 3 (PM 14.7 - 21.376E) is a 2-lane conventional highway.**

The LOS for this segment is projected to be adequate for the 20-year planning horizon. The route concept is the existing two-lane conventional highway.

### Segment 4

**Our concept facility for Segment 4 (PM 21.376E -23.972) is a 2-lane expressway with passing lanes.**

The LOS for this segment is projected to be inadequate for the 20-year planning horizon. The route concept is a two-lane expressway with passing lanes and is consistent with the 2001 Alpine County Regional Transportation Plan, which identifies the need for a northbound passing lane over Luther Pass Grade.

## State Route 89 Considerations

### Safety/Operational Improvements

Included on the Fact Sheet for each segment is the Traffic Collision rate for that stretch of roadway. This rate indicates the number of incidents per million vehicle miles traveled based on three years of data.

State Highway Operation and Protection (SHOPP) requires Caltrans to prepare a highway operations and protection program to preserve and protect the state highway system. SHOPP improvements are limited to maintenance, safety, and operational improvements that do not add capacity to the system. Funding for these operational improvements compete on a statewide basis.

### Access Management

Access control is the regulation of public access to and from properties adjacent to highways. The primary purpose of access control is to increase the operational efficiency of the facility by controlling where vehicles enter, exit, or cross the highway.

### Trucks

Trucks account for 5 to 6 percent of the average daily traffic through Alpine County. The majority of the truck traffic consists of small commercial and recreational vehicles and varies according to season. SR-89 provides a major connection between SR-88, SR-4, and the Nevada State Line, as well as the Central Valley and the Bay Area.

### Planned and Programmed Projects

#### Planned Projects

County	Route	PM	Description	Designation
Alpine	SR-89	0.00 – 9.96	Upgrade for winter travel and winter recreational use from the Alpine County Line to SR-4. This will help open Monitor Pass to winter travel	2001 RTP
Alpine	SR-89	14.5	Widen Markleeville Creek Bridge	2001 RTP
Alpine	SR-89	22.1 – 23.1	Construct northbound truck climbing lane .7 miles north of Picketts Junction (PM 22.1-23.1)	2001 RTP

#### Programmed Projects

There are currently no programmed projects on SR-89 within Alpine County.

## **RIGHT OF WAY ISSUES AND ENVIRONMENTAL CONDITIONS**

The land uses along SR-89 are currently scattered residential, recreational, and limited commercial. A large portion of SR-89 traverses state and federal protected forest. Where widening of SR-89 is considered, the full range of right of way and environmental specialty studies may be required. These studies will include the assessment of biological, cultural, water quality, and visual impacts along the corridor. Cumulative impacts of all projects along the corridor must be assessed. Any project to expand capacity along SR-89 will require extensive environmental review to comply with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Sufficient time and resources should be allocated to complete the studies and the documents.

## **AIR QUALITY**

### **MOUNTAIN COUNTY AIR BASIN**

The Mountain County Air Basin is unclassified in respect to attainment for carbon monoxide (CO) and for particular matter ten microns (PM-10) or greater. However, based on the recommendations of the EPA and the California Air Resource Board (CARB) it will soon be classified as a non-attainment area for ozone for the 8-hour standard.

State and federal laws require that all State and Regional Transportation Plans conform with the Environmental Protection Agency's (EPA) adopted State Implementation Plan (SIP) for air quality. The Clean Air Act Amendments of 1990 established a requirement that Transportation Plans, Programs, and Projects conform to the SIP's purpose of attainment of the National Ambient Air Quality Standards (NAAQS). Compliance with the conformity rule mandates that non-attainment areas work together toward practical attainment strategies. For example, the cooperation among the local TPA's within each county, Caltrans, and their respective Air Districts.

## **ALTERNATIVE TRANSPORTATION**

### **Transit Consideration**

Alpine County offers limited transit options within the county due to the small population of the county. Several of the nearby ski resorts do offer limited transit services between the resorts and the neighboring communities.

### **Rail**

There are currently no rail operations that serve Alpine County.

## **Airports**

The Alpine County Airport serves approximately 100 aircraft annually. The airport is located on Airport Road in Markleeville.

## **Bicycle Facilities**

The assumption is made that, as County population grows, interest in non-motorized travel including the bicycle will increase among local residents. Bicycle touring is also part of the County's recreation and tourism industry thereby contributing to the local economy. The entire length of SR-89 is open to bikes.

## **Park and Ride Lots**

Currently, there are no park and ride lots along SR-89.

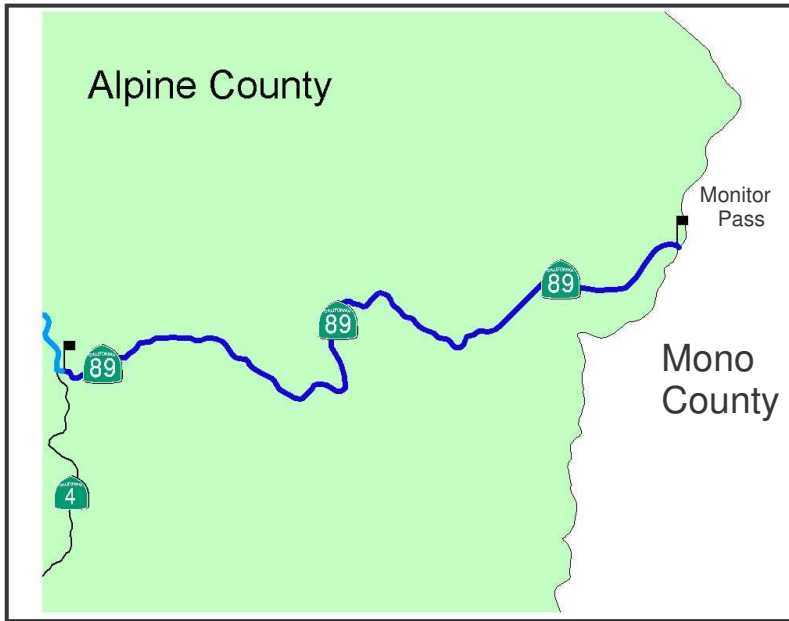
## **INTELLIGENT TRANSPORTATION SYSTEM (ITS)**

Non-recurring congestion and delays are attributed to unplanned incidents such as traffic accidents, stalled vehicles, or special events. This non-recurring congestion may be reduced by improving incident management and reducing the number of incidents through an intelligent transportation system (ITS). ITS is designed to identify non-recurring incidents and remove them from the highway as quickly and efficiently as possible. ITS also provides benefits for safety, traveler information and congestion management through changeable message boards, ramp metering, and automated warning systems.

A Sierra Nevada Strategic Deployment Plan is currently under way to study potential development of ITS uses on a regional basis to address issues, solve problems, and meet needs impacting transportation in the Sierra Nevada Region. The study area includes a 250-mile-long section of the Sierra Nevada mountain range. It covers the five mountain counties served by District 10, Alpine, Amador, Calaveras, Mariposa, and Tuolumne. This plan also includes Mono and Inyo counties, both served by District 9, and a third focus area is known as the trans-sierra region. The study is about two thirds completed.

Currently, there are no ITS projects programmed in Alpine County.

## State Route 89: ALPINE COUNTY - SEGMENT 1 FACT SHEET



**Location: PM 0.0-9.957**  
From Beginning of Route to  
Junction Rte 4

**Length:** 9.957 miles

**Functional Classification:**  
Minor Arterial

**Rural/Urban:** Rural

**Within City Limits:** No

**Terrain:** Mountainous

### Traffic Forecast Data for existing 2-Lane Conventional Highway, Average Highway Speed 45-50 mph

	2000 Existing Facility	2010 w/o Improvement	2020 w/o Improvements
LOS	A	B	B
V/C	.11	.13	.15
ADT	360	430	490
Peak Hour Volume	130	150	178
Peak Hour Dir. Split	60/40	60/40	60/40
% Trucks	5%	5%	5%

**Concept Facility (2020)** 2-lane conventional; LOS C

**Ultimate Transportation Corridor** 2-lane conventional

#### Local Planning Jurisdiction

Alpine County Transportation Commission  
Alpine County Planning Department

#### Programmed Projects (STIP/SHOPP):

There are no programmed capacity increasing projects within this segment.

**Planned Projects :**

County	Route	PM	Description	Designation
Alpine	SR-89	0.0/9.96	Upgrade for winter travel and winter recreational use from the Alpine County Line to SR4. This will help open Monitor Pass to winter travel.	2001 RTP

**System Designations**

- Yes Freeway/Expressway System
- No National Highway System (NHS)
- Yes Interregional Road System (IRRS)
  - No - High Emphasis Route
  - No - Focus Route
- No Surface Transportation Assistance Act (STAA)
- No Terminal Access Route for National Truck Network
- Yes Scenic Highway
- Yes Accessible to Bicycles

**Right of Way/Shoulder Information**

The right of way ranges from 130 to 280 feet. In order to widen this segment, right of way acquisition will be required. The paved shoulder width is 0 feet on each side of the roadway. The majority of the roadway has a 2 foot shoulder. The travel way width for this segment is 11 feet. All other segments of this report are 12 feet. This segment traverses national forest.

**Air Quality/Environmental Status**

Air Quality	Ozone Carbon Monoxide Suspended Particulate Matter	Attainment Attainment Attainment
Flood Plain	No Data Available	
Wetlands	Yes	Low-Moderate Sensitivity
Endangered Species	Yes	Low-Moderate Sensitivity
Archaeological	Yes	High Sensitivity

**Traffic Collision Rate (per million vehicle miles traveled)**

Actual Accident Rate		Statewide Average Rate	
Fatal & Injury	Total (Includes Property Damage only)	Fatal & Injury	Total (Includes Property Damage only)
1.77	2.03	1.39	2.76

**Source: TASAS Database (October 1, 1997 thru September 30, 2000)**

## State Route 89: ALPINE COUNTY - SEGMENT 2 FACT SHEET



**Location: PM 9.957- 14.884**  
From Junction SR-4 to .08 Miles north of Markleeville

**Length:** 4.927 miles

**Functional Classification:**  
Minor Arterial

**Rural/Urban:** Rural

**Within City Limits:** No

**Terrain:** Rolling

**Traffic Forecast Data for existing 2-Lane Conventional Highway, Average Highway Speed 50 mph**

	2000 Existing Facility	2010 w/o Improvement	2020 w/o Improvements
LOS	A	B	B
V/C	.10	.13	.16
ADT	630	750	870
Peak Hour Volume	130	160	190
Peak Hour Dir. Split	60/40	60/40	60/40
60/40	5%	5%	5%

**Concept Facility (2020)** 2-lane conventional; LOS C

**Ultimate Transportation Corridor** 2-lane conventional

**Local Planning Jurisdiction**

Alpine County Transportation Commission

Alpine County Planning Department

**Programmed Projects (STIP/SHOPP):** There are no programmed capacity increasing projects within this segment.

**Planned Projects:**

County	Route	PM	Description	Designation
Alpine	SR-89	14.5	Widen Markleeville Creek Bridge	2001 RTP

**System Designations**

- Yes Freeway/Expressway System
- No National Highway System (NHS)
- Yes Interregional Road System (IRRS)
  - No - High Emphasis Route
  - No - Focus Route
- No Surface Transportation Assistance Act (STAA)
- No Terminal Access Route for National Truck Network
- Yes Scenic Highway
- Yes Accessible to Bicycles

**Right of Way/Shoulder Information**

The right of way ranges from 130 to 440 feet. In order to widen this segment, right of way acquisition will be required. The paved shoulder width ranges from 0 to 14 feet on each side of the roadway. However, the majority of the segment has a 2 foot untreated shoulder. The majority of the roadway has a 0 to 14 foot shoulder.

**Air Quality/Environmental Status**

Air Quality	Ozone Carbon Monoxide Suspended Particulate Matter	Attainment Attainment Attainment
Flood Plain	No Data Available	
Wetlands	Yes	Low-Moderate Sensitivity
Endangered Species	Yes	Low-Moderate Sensitivity
Archaeological	Yes	Medium Sensitivity/Architecture

**Traffic Collision Rate (per million vehicle miles traveled)**

Actual Accident Rate		Statewide Average Rate	
Fatal & Injury	Total (Includes Property Damage only)	Fatal & Injury	Total (Includes Property Damage only)
2.04	3.21	.89	1.85

**Source: TASAS Database (October 1, 1997 thru September 30, 2000)**



## State Route 89: ALPINE COUNTY - SEGMENT 3 FACT SHEET



**Location:**  
**PM 14.884-21.376E**  
 From .08 Miles north of Markleeville to W. Junction 88, Picketts

**Length:** 6.492 miles

**Functional Classification:**  
 Minor Arterial

**Rural/Urban:** Rural

**Within City Limits:** No

**Terrain:** Rolling

### Traffic Forecast Data for existing 2-Lane Conventional Highway, Average Highway Speed 65 mph

	2000 Existing Facility	2010 w/o Improvement	2020 w/o Improvements
LOS	B	C	C
V/C	.15	.19	.22
ADT	1800	2200	2600
Peak Hour Volume	300	370	430
Peak Hour Dir. Split	60/40	60/40	60/40
% Trucks	5%	5%	5%

**Concept Facility (2020)** 2-lane conventional; LOS C

**Ultimate Transportation Corridor** 2-lane conventional

**Local Planning Jurisdiction**

Alpine County Transportation Commission

Alpine County Planning Department

**Programmed Projects (STIP/SHOPP):** There are no programmed capacity increasing projects within this segment.

**Planned Projects :**

There are no planned capacity increasing projects within this segment.

**System Designations**

- Yes Freeway/Expressway System
- No National Highway System (NHS)
- Yes Interregional Road System (IRRS)
  - No - High Emphasis Route
  - No - Focus Route
- No Surface Transportation Assistance Act (STAA)
- Yes Terminal Access Route for National Truck Network
- Yes Scenic Highway
- Yes Accessible to Bicycles

**Right of Way/Shoulder Information**

The right of way ranges from 120 to 680 feet. In order to widen this segment, right of way acquisition will be required. The paved shoulder width ranges from 2 to 4 feet on each side of the roadway. The majority of the roadway has a 4 to 6 foot shoulder. This segment traverses national forest from Diamond Valley Road to W. Junction 88, Picketts.

**Air Quality/Environmental Status**

Air Quality	Ozone Carbon Monoxide Suspended Particulate Matter	Attainment Attainment Attainment
Flood Plain	No Data Available	
Wetlands	Yes	Low-Moderate Sensitivity
Endangered Species	Yes	Low-Moderate Sensitivity
Archaeological	Yes	High Sensitivity

**Traffic Collision Rate (per million vehicle miles traveled)**

Actual Accident Rate		Statewide Average Rate	
Fatal & Injury	Total (Includes Property Damage only)	Fatal & Injury	Total (Includes Property Damage only)
.48	.96	.72	1.49

**Source: TASAS Database (October 1, 1997 thru September 30, 2000)**

## State Route 89: ALPINE COUNTY - SEGMENT 4 FACT SHEET



**Location:**  
**PM 21.376E-23.972**  
 W. Junction 88, Picketts to El Dorado  
 County Line

**Length:** 2.596 miles

**Functional Classification:**  
 Minor Arterial

**Rural/Urban:** Rural

**Within City Limits:** No

**Terrain:** Rolling

### Traffic Forecast Data for existing 2-Lane Expressway, Average Highway Speed 60 mph

	2000 Existing Facility	2010 w/o Improvement	2020 w/o Improvements
LOS	C	C	D
V/C	.43	.52	.61
ADT	3000	4000	4700
Peak Hour Volume	560	790	900
Peak Hour Dir. Split	60/40	60/40	60/40
% Trucks	6%	6%	6%

**Concept Facility (2020)** 2-lane expressway with passing lanes; LOS C

**Ultimate Transportation Corridor** 2-lane expressway with passing lanes

**Local Planning Jurisdiction**

Alpine County Transportation Commission  
 Alpine County Planning Department

**Programmed Projects (STIP/SHOPP):** There are no programmed capacity increasing projects within this segment.

**Planned Projects :**

County	Route	PM	Description	Designation
Alpine	SR-89	22.1-23.1	Construct northbound truck climbing lane .7 miles north of Picketts Junction	2001RTP

**System Designations**

- Yes Freeway/Expressway System
- No National Highway System (NHS)
- Yes Interregional Road System (IRRS)
  - No - High Emphasis Route
  - No - Focus Route
- No Surface Transportation Assistance Act (STAA)
- No Terminal Access Route for National Truck Network
- Yes Scenic Highway
- Yes Accessible to Bicycles

**Right of Way/Shoulder Information**

The right of way ranges from 100 to 220 feet. In order to widen this segment, right of way acquisition will be required. The paved shoulder width ranges from 0 to 2 feet on each side of the roadway. The majority of the roadway has a 0 to 2 foot shoulder. This segment traverses national forest.

**Air Quality/Environmental Status**

Air Quality	Ozone Carbon Monoxide Suspended Particulate Matter	Attainment Attainment Attainment
Flood Plain	No Data Available	
Wetlands	Yes	Low-Moderate Sensitivity
Endangered Species	Yes	Low-Moderate Sensitivity
Archaeological	Yes	High-Sensitivity

**Traffic Collision Rate (per million vehicle miles traveled)**

Actual Accident Rate		Statewide Average Rate	
Fatal & Injury	Total (Includes Property Damage only)	Fatal & Injury	Total (Includes Property Damage only)
.32	1.18	.52	1.18

*Source: TASAS Database (October 1, 1997 thru September 30, 2000)*

## Appendix 1 List of System Planning Acronyms

ACLT	Alpine County Local Transportation Commission
ACTC	Amador County Transportation Commission
ADT	Average Daily Traffic
AHS	Automated Highway System
ATSD	Advanced Transportation System Development
AVI	Automated Vehicle Identification
BN&SF	Burlington Northern and Santa Fe Railroad
CALACOG	Calaveras Council of Governments
CBD	Central Business District
CCAA	California Clean Air Act
CMAQ	Congestion Mitigation and Air Quality (Improvement Program)
CMP	Congestion Management Plan
CTIS	California Transportation Investment Strategy
CTC	California Transportation Commission
D/C	Demand Volume to Capacity Ratio
DSMP	District System Management Plan
EPA	Environmental Protection Agency
ETTM	Electronic Toll Collection and Traffic Management
F&E	Freeway and Expressway System
FAT	Fatalities
FIS	Federal Inspection Facility
FY	Fiscal year
HOV	High Occupancy Vehicle
ICES	Intermodal Corridors of Economic Significance
IRRS	Interregional Route System
ISTEA	Intermodal Surface Transportation Efficiency Act
ITMS	Intermodal Transportation Management System
ITS	Intelligent Transportation System
ITSP	Interregional Transportation Strategic Plan
LOS	Level of Service
LROP	Long Range Operations Plan
LRT	Light Rail Transit
MCAG	Merced County Association of Governments
MCLT	Mariposa County Local Transportation Commission
MIS	Major Investment Study
MOU	Memorandum of Understanding
MSL	Maintenance Service Level
NAFTA	North American Free Trade Agreement
NHS	National Highway System

PHV	Peak Hour Volume
PM	Post Mile
PR	Project Report
PSR	Project Study Report
PTOC	Primary Traffic Operations Center
POE	Port of Entry
RAQS	Regional Air Quality Strategy
RAS	Regional Arterial System
RCR	Route Concept Report (now known as Transportation Concept Reports)
RTP	Regional Transportation Plan
R/W	Right of Way
SHOPP	State Highway Operations and Protection Program
SHRAHNET	Strategic Highway Corridor Network
SJCOG	San Joaquin Council of Governments
SOV	Single Occupancy Vehicle
SR	State Route
STAA	Surface Transportation Assistance Act
StanCOG	Stanislaus Area Association of Governments
STIP	State Transportation Improvement Program
TASAS	Traffic Accident Surveillance and Analysis System
TCCAPC	Tuolumne County / Cities Area Planning Council
TCM	Transportation Control Measure
TCR	Transportation Concept Report
TDM	Transportation Demand Management
TSDP	Transportation System Development Program
TMA	Transportation Management Association/Area
TMC	Transportation Management Center
TSM	Transportation System Management
UTC	Ultimate Transportation Corridor
VMT	Vehicles Miles Traveled

## Appendix 2 Level of Service (LOS) Definitions

The Level of Service (LOS) is a qualitative measure describing operational conditions within a traffic stream and their perception by motorists. A LOS definition generally describes these conditions in terms of speed, travel time, freedom to maneuver, traffic interruption, comfort, and convenience. Six levels of LOS can generally be categorized as follows:

**LOS A** describes free flowing conditions. The operation of vehicles is virtually unaffected by the presence of other vehicles, and operations are constrained only by the geometric features of the highway.

**LOS B** is also indicative of free-flow conditions. Average travel speeds are the same as in LOS A, but drivers have slightly less freedom to maneuver.

**LOS C** represents a range in which the influence of traffic density on operations becomes marked. The ability to maneuver with the traffic stream is now clearly affected by the presence of other vehicles.

**LOS D** demonstrates a range in which the ability to maneuver is severely restricted because of the traffic congestion. Travel speed begins to be reduced as traffic volume increases.

**LOS E** reflects operations at or near capacity and is quite unstable. Because the limits of the level of service are approached, service disruptions cannot be damped or readily dissipated.

**LOS F** represents a breakdown or forced flow. It usually occurs at a point on a planned facility when forecast demand exceeds computed capacity.

## Appendix 3

### Rural, Urban, and Urbanized Definitions

The rural, urban, and urbanized area limits are based upon population density as determined by the U.S. Census Bureau. The criteria are:

**Rural** – Under 5,000 population

**Urban** – 5,000 to 49,999 population.

**Urbanized** – over 50,000 population