

## 3.12 Transportation/Traffic

This section evaluates potential transportation impacts associated with construction and operation of the proposed project. The analysis comprises a review of existing conditions; a summary of federal, state, and local policies and regulations related to transportation and traffic; and an analysis of direct, indirect, and cumulative environmental impacts of the project. The results of all calculations are presented herein. Where feasible, mitigation measures are recommended to reduce the level of expected impacts.

### 3.12.1 Existing Conditions

#### Environmental Setting

##### Study Area

The project area is located in rural Shasta County north of State Route 299 approximately 7 miles west of the town of Burney and 34 miles northeast of Redding (Figure 2-1). The project area is accessed from State Route 299 at approximately milepost (MP) 68.1 by an existing private road, Bunchgrass Lookout Road. Bunchgrass Lookout Road extends north from State Route 299 for approximately 1.25 miles to the project area (Figure 2-2). The study area for this transportation analysis comprises State Route 299 between I-5 on the west and State Route 89 on the east and Bunchgrass Lookout Road between State Route 299 and the project area. Most of the public roads in the region are paved county roads, with a few state routes traversing the area.

##### Existing Roadway Network

###### Regional Access Roadways

Regional access to the project vicinity is provided by State Route 299. State Route 299 connects to I-5 and city of Redding on the west and connects to State Route 89 and the town of Burney on the east. Within the project vicinity, State Route 299 varies between two and four lanes with paved shoulders and rolling terrain. State Route 299 at Bunchgrass Lookout Road (project access) is near Hatchet Mountain Summit, from which point State Route 299 descends to both east and west. The posted speed limit of State Route 299 is 55 mph in the project vicinity.

###### Project Access Roadways

Site access to the project is provided by Bunchgrass Lookout Road from State Route 299. Bunchgrass Lookout Road is a private gravel road 8–16 feet wide. It extends north from State Route 299 for approximately 1.25 miles to the project area boundary and continues through the length of the project area. At the intersection of State Route 299 and Bunchgrass Lookout Road, there are left turn lanes on State Route 299 and stop signs on the northbound and southbound approaches.

##### Traffic Volumes

The average annual daily traffic (AADT) volumes, peak hour volumes, and truck percentages on State Route 299 in the study area are provided in Table 3.12-1. Bunchgrass Lookout Road is a privately owned road with minimum usage. Field observations indicate that traffic volumes are

light and the level of service at the intersection of State Route 299 and Bunchgrass Lookout Road appears to be adequate.

**Table 3.12-1. State Route 299 Traffic Volumes**

Location	Milepost	2006 AADT	2006 Average Peak Hour Volumes	Average Daily Truck %
State Route 299 east of I-5 at Deschutes Road	31.5	4,750	610	4.7%
State Route 299 west of Bunchgrass Lookout Road at Big Bend Road	60.1	2,900	320	11.3%
State Route 299 east of Bunchgrass Lookout Road at Tamarack Road	73.1	2,950	420	14.7%
State Route 299 west of State Route 89	80.1	4,550	560	17.8%

Source: California Department of Transportation 2007.

## Traffic Levels of Service

Level of Service (LOS) is a scale used to determine the operating quality of a roadway segment or intersection based on volume-to-capacity ratio (V/C) or average delay experienced by vehicles on the facility. The levels range from A to F, with LOS A representing free traffic flow and LOS F representing severe traffic congestion. Agencies adopt LOS standards that define the level of operations that are acceptable within their jurisdiction. LOS analysis procedures and agency standards are described in detail in *Methodology*.

Existing LOS conditions, V/C, and percent time-spent-following (PTSF) along State Route 299 are summarized in Table 3.12-2. PTSF is the average percentage of travel that vehicles must travel in platoons behind slower vehicles due to the inability to pass. The table shows that State Route 299 currently operates at LOS B within the study area. At the intersection of State Route 299 and Bunchgrass Lookout Road, the peak hour LOS is expected to be LOS A (assuming two vehicles per hour exiting Bunchgrass Lookout Road during peak hour).

**Table 3.12-2. State Route 299 Level of Service—Existing (2006) Conditions**

Location	LOS	V/C	PTSF
State Route 299 east of I-5 at Deschutes Road	A	0.22	50%
State Route 299 west of Bunchgrass Lookout Road at Big Bend Road	B	0.19	48%
State Route 299 east of Bunchgrass Lookout Road at Tamarack Road	B	0.18	54%
State Route 299 west of State Route 89	B	0.21	54%

## Roadway Hazards

Accidents are generally expressed in terms of accident rate, where accident occurrence is indexed to the amount of traffic using a given roadway. For roadway segments, accident rates are computed as the number of accidents per million vehicle miles (mvm) of travel. There were 37 accidents on State Route 299 reported in the past 5 years within 5 miles of Bunchgrass Lookout Road. (Gonzalez 2007.) The average accident rate is 1.5 accidents per mvm. This accident rate is higher than the statewide average for similar facilities of 1.2 accidents per mvm.

Sight distance could be of concern along State Route 299 at Bunchgrass Lookout Road near Hatchet Mountain Summit due to the winding roadway. Field investigations indicated that this area is adequately signed to advise motorists to reduce their speed as they approach; accordingly, this location is not considered to pose safety issues.

## Nonmotorized Transportation

No pedestrian facilities are provided on State Route 299 and Bunchgrass Lookout Road. No classified bikeways or trails have been identified in the study area.

## Transit Service

Shasta County is primarily a rural county with very limited public transportation. Redding Area Bus Authority (RABA) provides both fixed route and demand response transit services in the Redding urban area. Burney Express provides transit service to the Burney intermountain area. No transit service is provided on roadways adjacent to the project site.

## Rail Service

Shasta County is served by two railroad lines: the Union Pacific single track main line parallels I-5; and the McCloud Railway Company, a single track short line, runs from Mount Shasta to Burney. Union Pacific carries both passengers and freight, while McCloud Railway Company hauls primarily freight, with the exception of the Shasta Sunset Dinner Train, which is a short-distance passenger excursion train service out of McCloud in Siskiyou County. No passenger or freight railroad service is provided in the project vicinity.

## Air Traffic

There are four publicly operated airports in Shasta County. Redding Municipal and Benton Field Airports are owned by the City of Redding. Shasta County owns the Fall River Mills Airport and leases the Shingletown Airport. Redding Municipal Airport provides scheduled air carrier service, while charter service is available at Benton Field and Redding Municipal Airports.

No aviation facilities are located within the project vicinity. The nearest aviation facilities are the Fall River Mills Airport, approximately 20 miles northeast of the site, and the Redding Municipal Airport, approximately 40 miles to the southwest.

## Regulatory Setting

### State

The California Department of Transportation (Caltrans) has jurisdiction over state highways. It requires that a traffic analysis be conducted if the proposed project generates any of the following conditions (California Department of Transportation 2002).

- More than 100 peak-hour trips to state highways.
- 50–100 peak-hour trips to state highways and LOS C or D conditions.
- 1–49 peak-hour trips to state highways and LOS E or F conditions.

The California Vehicle Code (CVC) sets maximum load limits for trucks and safety requirements for oversized vehicles that operate on highways. According to CVC Section 35500, the

maximum overall weight limit for a truck is 80,000 pounds and the maximum allowable weights are 20,000 pounds on single axles and 34,000 pounds on tandem axles equipped with the proper tire weight capacity ratings. CVC Section 35250 specifies that the maximum height limit for a truck is 14 feet, and Section 35100 limits the maximum width of a truck to 8.5 feet. A permit issued by Caltrans is required to authorize the operation of oversize or overweight trucks.

## Shasta County

Transportation policies that could potentially apply to the proposed project, as defined in the Circulation Element of the adopted General Plan (Shasta County 1995), are listed below.

**C-6g** All new land divisions shall be provided with a legally accessible road.

**C-6j** New development shall provide circulation improvements for emergency access by police, fire, and medical vehicles; and shall provide for escape by residents/occupants in accordance with the Fire Safety Standards.

**C-6k** Shasta County shall adopt the following LOS standards for considering any new roads:

- rural arterial and collectors—LOS C
- urban/suburban arterial and collectors—LOS C

**C-6l** New development which may result in exceeding LOS E on existing facilities shall demonstrate that all feasible methods of reducing travel demand have been attempted to reach LOS C. New development shall not be approved unless traffic impacts are adequately mitigated.

**C-8b** Working in conjunction with Caltrans, the County shall designate and provide signed truck routes, ensure that adequate pavement depth, lane widths, loading areas, bridge capacities, vertical height of overpasses and utility lines, and turn radii are maintained on the designated truck routes, and prohibit commercial truck traffic from non-truck routes except for deliveries.

**C-8c** Adequate truck access to off-street loading areas in commercial and industrial areas shall be provided in all new development applications.

The Shasta County Development Standards Manual has also set specific guidelines for the construction of public road improvements and private roads, including design standards addressing slopes, widths, connection to County roads, and others (Shasta County 1997).

## Aviation

According to Federal Aviation Regulation (FAR) 49 CFR Part 77.13, the Administrator of the FAA must be notified by any person/organization who intends to sponsor any of the following construction or alterations.

- Any construction or alteration exceeding 200 feet above ground level.
- Any construction or alteration:
  - Within 20,000 feet of a public use or military airport which exceeds a 100:1 surface from any point on the runway;

- ❑ Within 10,000 feet of a public use or military airport which exceeds a 50:1 surface from any point on the runway; or
- ❑ Within 5,000 feet of a public use heliport which exceeds a 25:1 surface.
- Any highway, railroad, or other traverse way whose prescribed adjusted height would exceed the above noted standards.
- When requested by the FAA: Any construction or alteration located on a public use airport or heliport regardless of height or location.

The U.S. Department of Transportation and Caltrans also require that the proponent submit FAA Form 7460-1, *Notice of Proposed Construction or Alteration*, and Form 7460-2, *Notice of Actual Construction or Alteration*. According to 49 CFR Part 77.17, individuals/organizations proposing construction or alterations must submit Form 7460-1 at least 30 days prior to construction. FAA Form 7460-2 must be submitted at least 10 days prior to start of construction and within 5 days after the construction reaches its greatest height as required under 49 CFR Part 77.13.

Notification allows the FAA to identify potential aeronautical hazards in advance, thus preventing or minimizing any adverse impacts on the safe and efficient use of navigable airspace. Any structure that would constitute a hazard to air navigation, as defined in FAR Part 77, requires issuance of a permit from the Caltrans Aeronautics Program. The permit is not required if the FAA aeronautical study determines that the structure has no impact on air navigation.

## 3.12.2 Impact Analysis

### Methodology

#### Level of Service Definitions and Procedures

##### Highway Level of Service

LOS on transportation facilities is analyzed and measured according to procedures provided in the *Highway Capacity Manual* (Transportation Research Board 2000). Highway LOS analysis was performed for State Route 299, which is mostly two lanes. Using the *Highway Capacity Manual* procedures, the LOS for two-lane highway segments is calculated using average two-way volumes for the peak hour. The LOS criteria are based on the free flow speed, V/C, and PTSF.

##### Intersection Level of Service

Intersection LOS analysis was performed at the intersection of State Route 299 and Bunchgrass Lookout Road, which is a stop-controlled intersection. LOS is measured by delay experienced by vehicles on the stop-controlled approaches for two-way stop-controlled intersections. Table 3.12-3 summarizes the relationship between average delay per vehicle and LOS for stop-controlled intersections, based on *Highway Capacity Manual* procedures.

**Table 3.12-3. Level of Service Criteria for Stop-Controlled Intersections**

LOS	Average Control Delay (seconds/vehicle)
A	≤10
B	>10 and ≤15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	>50

Source: Transportation Research Board 2000.

### Level of Service Standards

LOS standards are used to evaluate the transportation impacts of long-term growth. In order to monitor roadway operations, cities and counties adopt standards by which the minimum acceptable roadway operating conditions are determined and deficiencies may be identified.

Caltrans endeavors to maintain a target LOS D at the transition between LOS C and LOS D on state highways; however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS (California Department of Transportation 2002).

The LOS standard for County roads is LOS C as set forth in Policy C-61 of the Shasta County General Plan (Shasta County 1995).

### Construction Trip Generation and Distribution

Construction of the proposed project is expected to commence in 2008, last 6–12 months, and be completed in 2009. Traffic generated during the construction phase would comprise commuting construction workers and delivery of materials and project equipment. Construction activities would include widening Bunchgrass Lookout Road to 20 feet for approximately 1.25 miles.

There would be an average of 200 workers on site per workday during the peak months of construction. During the peak construction period, construction workers would generate an estimated 266 daily trips (assuming one-third of the workforce would carpool to the site), 93 of which would occur during the AM and PM peak hours (assuming 70% of workforce commutes during peak traffic hours).

It is anticipated that approximately 25–50% of the construction workforce would most likely be residents of the broader intermountain area. The balance of the workforce would be non-local and is expected to reside at hotel and RV parks in Burney, Redding, and the surrounding areas.

It is anticipated that approximately 60% of the construction workers from Redding and the surrounding areas would most likely travel on I-5 or local roads and continue east on State Route 299 to access the project site. The 40% of workers from Burney and the surrounding areas would travel on State Route 89 or local roads and continue west on State Route 299 to access the project site. Table 3.12-4 summarizes the daily, AM, and PM peak hour construction traffic for the peak construction period.

**Table 3.12-4. Construction-Generated Traffic**

Roadway Segment	Daily Construction Truck Traffic (vehicles/day)	AM Peak Hour Construction Truck Traffic (vehicles/hour)	PM Peak Hour Construction Truck Traffic (vehicles/hour)
State Route 299 between I-5 and Bunchgrass Lookout Road	160 worker trips 1 light truck 10 heavy trucks (8 oversized trucks) (Both directions)	56 worker trips (eastbound) 2 heavy trucks (2 oversized trucks)	56 worker trips (westbound) 2 heavy trucks (2 oversized trucks)
State Route 299 between Bunchgrass Lookout Road and State Route 89	106 worker trips 116 heavy trucks (Both directions)	38 worker trips (westbound) 30 heavy trucks	38 worker trips (eastbound) 30 heavy trucks

Source: Estimates provided by HRW.

Construction-related truck traffic would consist of deliveries of project equipment and construction materials. The project equipment includes wind turbines, towers, transformers, and other large equipment. This material would be transported to the site using semi trucks and lowboy trailers designed for heavy loads (i.e., multiple axles). These vehicles would travel along I-5 and continue east on State Route 299 to access the project site. The other construction equipment and material (including water, cement, sand, and aggregate) would come from the east along State Route 299.

Truck deliveries are anticipated to occur 5–6 days per week between 7 a.m. and 5 p.m. It is assumed that construction truck traffic will occur over a 4-month period with 24 workdays per month for a total of 96 workdays.

There would be a total of 28 light truck and 6,041 heavy truck deliveries during the construction period. A total of 28 light trucks and 481 heavy trucks are expected to access the project site from the west on State Route 299. Of these heavy trucks, 352 trucks will carry oversized loads. The remaining 5,560 heavy truck deliveries would travel on State Route 89 and continue west on State Route 299 to access the project site.

Assuming 96 workdays, an average day would entail less than 1 light truck (or 1 truck trip) and 5 heavy trucks (or 10 truck trips) to/from the west along State Route 299. About 58 heavy trucks (or 116 truck trips) would travel to/from the east along State Route 299. Assuming 25% of the daily truck trips would occur during the peak hours, Table 3.12-4 summarizes the daily, AM, and PM peak hour construction traffic for the construction period.

Table 3.12-4 summarizes the total construction-related traffic—both worker and truck trips. State Route 299 between I-5 and Bunchgrass Lookout Road would experience an additional 58 peak-hour trips (56 worker trips and 2 heavy truck trips) during the peak of construction. State Route 299 between Bunchgrass Lookout Road and State Route 89 would experience an additional 68 peak-hour trips (38 worker trips and 30 heavy truck trips) during the peak of construction.

## Operation Trip Generation and Distribution

The project would operate continuously (24 hours per day, 7 days per week) using an automated monitoring system. For this analysis it was assumed that 10 full-time workers would staff the project during core operating hours (8 a.m. to 5 p.m.). The operations crew would normally work 8-hour days Monday through Friday, with additional hours on weekend shifts as required. This equates to a maximum of 20 trips a day or 10 trips during the peak hour. It is anticipated that nearly all the operation workers would reside within daily-commute distances of the project site. These operation workers would access the site in the same manner as described for construction workers. It is anticipated that project operations crews would drive light trucks and vans on site to perform maintenance and supervision activities. Table 3.12-5 summarizes the daily, AM, and PM peak hour employee traffic for project operation.

**Table 3.12-5. Operation Worker Traffic**

Roadway Segment	Daily Operation Worker Traffic (vehicles/day)	AM Peak Hour Operation Worker Traffic (vehicles/hour)	PM Peak Hour Operation Worker Traffic (vehicles/hour)
State Route 299 between I-5 and Bunchgrass Lookout Road	12 (both directions)	6 (eastbound)	6 (westbound)
State Route 299 between Bunchgrass Lookout Road and State Route 89	8 (both directions)	4 (westbound)	4 (eastbound)

Source: Estimates provided by HRW.

## Thresholds of Significance

Criteria for determining the significance of impacts related to transportation are based upon criteria contained in Appendix G of the State CEQA Guidelines. The proposed project would have a significant impact on the environment if it would result in any of the conditions listed below.

- Cause an increase in traffic that is substantial in relation to the existing traffic volumes and capacity of the roadway system (e.g., result in a substantial increase in either the number of vehicle trips, the V/C ratio on roads, or congestion at intersections).
- Exceed, either individually or cumulatively, an LOS standard established by local jurisdictions for designated roadways or highways.
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
- Substantially increase hazards to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Result in inadequate emergency access.
- Result in inadequate parking capacity.
- Conflict with adopted policies supporting alternative transportation.



The following traffic characteristics were examined to determine the level of significance of impacts that may be generated by the proposed project.

- **Traffic Volume and LOS.** Traffic increases are considered significant if they result in violation of the intersection LOS standards of Caltrans and Shasta County.
- **Safety.** Safety impacts are considered significant if design elements of the project, or project construction, would result in conditions that would increase the risk of accidents, either for vehicular or non-motorized traffic. Elements that could result in safety impacts include poor sight distance, sharp curves, or substantial differences in speed between construction-related and general-purpose traffic.
- **Emergency Access and Circulation.** Adequate emergency access routes must be maintained at all times during construction and after the project is completed. A significant impact would occur if the project failed to maintain emergency access and circulation at all times or caused an increase in response times.
- **Parking.** A significant impact would occur if the project results in violation of the County's adopted parking policies.
- **Air Travel.** A significant impact would occur if the project results in a hazard to air navigation or would create an unsafe condition for air navigation.

## Impacts and Mitigation Measures

### Construction Impacts

#### **Impact TRA-1: Increase in area traffic volumes and degradation of LOS due to construction-generated traffic (less than significant)**

Temporary increases in traffic due to project construction have the potential to worsen LOS on study area roadways. Table 3.12-6 shows the traffic volumes and LOS on State Route 299 with the construction-generated traffic. As shown in the table, LOS on State Route 299 east of Bunchgrass Lookout Road would operate at LOS C with the construction traffic. At the intersection of State Route 299 and Bunchgrass Lookout Road, the peak hour LOS would be expected to be LOS B during the peak construction period.

**Table 3.12-6.** State Route 299 Traffic Volumes and LOS with Construction Traffic

Location	ADT	Peak Hour Volumes	LOS
State Route 299 east of I-5 at Deschutes Road	4,921	668	B
State Route 299 west of Bunchgrass Lookout Road at Big Bend Road	3,071	378	B
State Route 299 east of Bunchgrass Lookout Road at Tamarack Road	3,172	488	C
State Route 299 west of State Route 89	4,772	628	C

Both State Route 299 and the intersection of State Route 299 and Bunchgrass Lookout Road would operate within LOS standards. The impact of construction generated-traffic on area traffic volumes and LOS is considered less than significant. No mitigation is required.

**Impact TRA-2: Increase in safety hazards due to construction-generated traffic (less than significant with mitigation)**

Trucks entering and exiting State Route 299 to and from Bunchgrass Lookout Road and construction trucks widening Bunchgrass Lookout Road could increase safety hazards. This impact is considered potentially significant. Implementation of Mitigation Measure TRA-1 would reduce this impact to a less-than-significant level.

**Mitigation Measure TRA-1: Develop and implement a construction Traffic Control Plan**

The proposed project's construction-related traffic impacts can be mitigated through development and implementation of a Traffic Control Plan as part of the overall Construction Management Plan, in accordance with County and Caltrans policies. The Traffic Control Plan will be implemented throughout the course of project construction. This plan would include but not be limited to the elements listed below.

- A plan for communicating construction plans with Caltrans, emergency service providers, residences located in the project vicinity, and anyone else who may be affected by project construction.
- An access and circulation plan for use by emergency vehicles when lane closures and/or detours are in effect. If lane closures occur, provide advance notice to local fire departments and sheriff's department to ensure that alternative evacuation and emergency routes are designed to maintain response times.
- Maintain access to existing development in the area at all times.
- Provide for adequate parking for construction trucks and equipment within the project area and designated staging areas along Bunchgrass Lookout Road throughout the construction period.
- Provide adequate parking for construction workers within the project area and designated staging areas.
- Provide temporary truck crossing signs on State Route 299 during construction if allowed by Caltrans.
- Provide flaggers/traffic control personnel as necessary (e.g., when oversize loads must turn from State Route 299 onto Bunchgrass Lookout Road).

**Impact TRA-3: Interference with emergency access and circulation due to construction-generated traffic (less than significant with mitigation)**

Emergency access to the project area could be affected by project construction—specifically, road closures, detours, and construction-related traffic could delay or obstruct the movement of emergency vehicles. This impact is considered potentially significant, but implementation of Mitigation Measure TRA-1 would reduce this impact to a less-than-significant level.

**Impact TRA-4: Inadequate parking supply to meet parking demand for construction equipment and construction workers (less than significant)**

The parking needs of construction workers and parking for heavy construction equipment would increase the demand for parking. However, because these parking needs would be

accommodated in the project area, this impact is considered less than significant. No mitigation is required.

## Operation Impacts

### **Impact TRA-5: Increase in area traffic volumes and degradation of LOS due to traffic generated by the proposed project (less than significant)**

Table 3.12-7 shows the traffic volumes and LOS on State Route 299 with the operation-generated traffic. The project operation would only expect to generate approximately 10 trips in the peak hours. As shown in the Table, the LOS on State Route 299 would operate at LOS B after the traffic generated by the proposed Project was added to the existing traffic. The intersection of State Route 299 and Bunchgrass Lookout Road would operate at LOS A.

**Table 3.12-7. State Route 299 Traffic Volumes and LOS with Operation-Related Traffic**

Location	ADT	Peak Hour Volumes	LOS
East of I-5 at Deschutes Road	4,762	616	B
West of Bunchgrass Lookout Road at Big Bend Road	2,912	326	B
East of Bunchgrass Lookout Road at Tamarack Road	2,958	424	B
West of State Route 89	4,558	564	B

Both State Route 299 and the intersection of State Route 299 and Bunchgrass Lookout Road would operate within LOS standards. The impact of operation-generated traffic on area traffic volumes and LOS is considered less than significant. No mitigation is required.

### **Impact TRA-6: Impact on aviation patterns due to the height of turbines (less than significant with mitigation)**

The proposed project is approximately 20 miles from the closest airport. However, because the turbines and meteorological tower would be up to 420 feet tall, the project would have potential impacts on air navigation.

According to FAR 49 CFR Part 77, the project would require a Determination of No Hazard to Air Navigation for each wind turbine structure from the FAA, because the turbines and meteorological tower will be more than 200 feet above ground level. The project proponent has completed an FAA Form 7460-1 for a preliminary design and received conditional approval. Current concepts have altered the design and will require resubmitting an FAA Form 7460-1. However, based on FAA's evaluation of the previous design, implementation of Mitigation Measure TRA-6 is expected to reduce the project's impacts on air navigation to a less-than-significant level.

### **Mitigation Measure TRA-6: Consult with FAA to meet the FAA requirements**

The project proponent is required to file a FAA Form 7460-1, *Notice of Proposed Construction or Alteration*, for each wind turbine structure. FAA will issue a Determination of No Hazard to Air Navigation for each of the project turbines and meteorological towers if the project meets FAA requirements.

If FAA determines that the project would potentially be an obstruction unless reduced to a specified height, the project proponent will work with FAA to resolve any adverse effects on aeronautical operations.