

Chapter 3 Affected Environment, Environmental Consequences, and Mitigation Measures—NEPA Evaluation

This chapter comprises the NEPA evaluation of environmental consequences and mitigation measures (see Chapter 5 for the CEQA evaluation of impacts and mitigation measures). It describes the affected environment, environmental consequences, and mitigation needed to avoid or reduce impacts for each of 12 environmental issues:

- 3.1. Land use, planning, and growth;
- 3.2. Community impacts and environmental justice;
- 3.3. Relocation;
- 3.4. Traffic and transportation/pedestrian and bicycle facilities;
- 3.5. Air quality;
- 3.6. Noise;
- 3.7. Hydrology, water quality, and floodplains;
- 3.8. Wildlife and botanical resources, threatened and endangered species, and wetlands and waters of the U.S.;
- 3.9. Historic and archeological resources;
- 3.10. Earth resources and hazardous materials;
- 3.11. Visual; and
- 3.12. Utilities/emergency services.

Each environmental issue section begins by summarizing the specific issues that are addressed in that section. The “Affected Environment” section describes the environment of the area affected by the proposed project and establishes the context in which the proposed action is evaluated. The “Environmental Consequences” section begins by identifying the methods used to assess impacts. This section then assesses the potential adverse environmental effects that could occur with project implementation. The impacts associated with the 4-lane tight diamond interchange are organized by permanent, temporary, and cumulative ones. **Each impact is given a letter/number designation (such as Impact LU1 which designates the first**

impact identified under Land Use, Planning, and Growth) and an impact title.

One or more mitigation measures are identified for each adverse environmental impact that would avoid or reduce the impact. **These measures are also given a letter/number designation that corresponds with the impact nomenclature (such as Mitigation Measure LU1a). A bulleted mitigation measure indicates that the measure also mitigates another impact and is previously described in detail when it is first applied to an impact.**

The impact evaluations for the No-Action Alternative follow the 4-Lane Tight Diamond Interchange evaluations. The alternatives' evaluations are presented as comparative discussions. **When the impacts of an alternative differ from those associated with the 4-lane tight diamond interchange, the impacts are given a letter/number and title and are fully discussed.** Table S.4-3 summarizes the impacts and mitigation measures associated with the proposed action. Table S.4-4 compares the proposed action with the No-Action Alternative.

3.1 Land Use, Planning, and Growth

The information below is summarized from the project community impact assessment (Jones & Stokes 2002c) and relocation impact statement (Jones & Stokes 2002h); these reports are available for review at County offices (see the List of Technical Studies in the Introduction of this joint document for the address and phone number of County offices). This section addresses direct and indirect land use impacts, consistency with plans and policies, growth inducement, and construction-related land use impacts.

3.1.1 Affected Environment

Land Use Characteristics

The project area consists of a mix of vacant, residential, and commercial land uses. Figure 3.1-1 shows existing land uses in the project area. Figure 3.1-2 shows existing land uses in the Missouri Flat area. The area to the north of the Missouri Flat Road interchange is dominated by vacant and commercial lands, including: the Prospector’s Plaza shopping center to the west of Missouri Flat Road and vacant land approved for commercial development (El Dorado Villages Shopping Center), the Jack-in-the-Box fast food restaurant, Chevron gas station, the West Coast Customs Auto Upholstery business, and another small shopping center to the east of Missouri Flat Road. The area to the south of the Missouri Flat Road interchange is dominated by a park-and-ride lot, the Best Western Placerville Inn hotel, and Eppie’s Lounge restaurant to the west of Missouri Flat Road and residential uses and a propane retailer/RV parking area along Perks Court to the east of Missouri Flat Road. No farmland exists in or adjacent to the project area.

Plans and Policies

Land use planning in the study area is governed by the County General Plan and the Missouri Flat Area MC&FP. Regional transportation planning for the area is conducted by the EDCTC, the regional transportation planning agency for the County.

El Dorado County General Plan

The General Plan contains goals, objectives, and policies that guide growth and development within areas under the County’s jurisdiction, including the project area.

Relevant policies contained within the General Plan are described and evaluated in the “Environmental Consequences” section below.

The 1996 General Plan was set aside in September 1999 as the result of a determination by the Sacramento County Superior Court that, in certain respects, the County had not fully complied with CEQA in preparing the EIR and findings for the General Plan. (See *El Dorado County Taxpayers for Quality Growth, et al. v. El Dorado County Board of Supervisors and El Dorado County* (No. 96CS01290.)

After a hearing and argument on the form of the writ to be issued, including the scope of the remedy to be imposed during the period in which the County worked to correct these CEQA violations, the court issued a Writ of Mandate that governs the County’s land use decisions during the interim period between the issuance of the Writ and the completion of a new General Plan. As explained in Chapter 1 in section 1.2, “Project Background”, the first phase of the project (and the 4-Lane Tight Diamond Alternative), as a capital improvement project, is clearly authorized under the Writ, in that it would not be intended to serve future residential growth, but rather is necessary to address capacity deficiencies and safety hazards that already exist, and will only be made worse by commercial development near Placerville that can occur under the terms of the Writ.

The County is in the process of preparing a new General Plan that would replace the General Plan adopted in 1996. The new General Plan will contain a new land use map and the following elements:

- land use,
- circulation,
- housing,
- public services and facilities,
- public health and safety,
- conservation and open space,
- agriculture and forestry,
- parks and recreation,
- economic development, and
- the Tahoe Basin.

The County is expected to adopt a new General Plan in mid-2004.

To date, eleven CEQA alternatives have been identified. Based on preliminary analysis, the General Plan EIR will contain an equal-weight impact analysis of four alternatives: No Project; 1996 General Plan; Environmentally Constrained; and Roadway Constrained 6-Lane “Plus”. Although up to 5 equal weight alternatives have been contemplated, the 4 identified herein have been determined to provide a reasonable range pursuant to the requirements of the CEQA Guidelines. The remaining 7 alternatives will be analyzed at a lesser level of detail. All alternatives are briefly described below (Tschudin pers. comm.).

- **Equal Weight Alternative 1, No Project:** This alternative assumes only development that would be allowed under the Writ of Mandate. Development of all lands covered by an approved Development Agreement and all lands for which there is an approved Tentative Subdivision Map is assumed. All other residential parcels are assumed to develop with at least 1 unit. No additional lot splits or new subdivisions are assumed. Non-residential property is assumed to develop based on market forces, proportional to housing growth. Land use forecasts and traffic analysis have been completed for both a 2025 scenario and full build-out. The LOS policies from the 1996 General Plan (including Measure Y policies) are assumed. Highway 50 is planned for 8-lanes (6 mixed flow and 2 high-occupancy vehicle [HOV]) generally west of Cameron Park. The land use map and policy set for this alternative are the 1996 General Plan land use map and policy set, subject to the limitations of the Writ of Mandate. By 2025, 21,434 new units and 34,414 new jobs are projected. At build-out, 29,520 new units and 87,198 new jobs are projected.
- **Equal Weight Alternative 2, 1996 General Plan:** This alternative assumes development under the 1996 General Plan, as adopted, including Measure Y policies and modified to incorporate any amendments to the Plan made prior to the decision on the General Plan lawsuit in February 1999. Development of all lands for which there are approved Development Agreements and Tentative Subdivision Maps is assumed. Development of all land as designated in the 1996 General Plan is assumed at maximum densities. Non-residential property is assumed to develop based on market forces, proportional to housing growth. Land use forecasts and traffic analysis have been completed for both a 2025 and build-out scenario. The LOS policies from the 1996 General Plan (including Measure Y policies) are used. Highway 50 is planned to be a minimum of 8-lanes per the 1996 Circulation Element, with additional lanes required to mitigate levels of service under the build-out scenario. A land use map and policy set for this alternative are already in place. By 2025, 32,491 new units and 42,202 new jobs are projected. At build-out, 78,692 new units and 89,350 new jobs are projected.
- **Equal Weight Alternative 3, Environmentally Constrained:** This alternative balances a variety of environmental constraints (including geology, habitats, and sensitive plant and wildlife species) and constrains development in more sensitive areas. Development of all lands for which there are Development Agreements and

Tentative Subdivision Maps is assumed. All other lands (both residential and non-residential) have been reevaluated and some have been redesignated based generally on the environmental constraints. Community regions and rural centers have been reduced, both in terms of size and density. Rural centers have also been reduced in terms of total number of units. Land use designations have been redefined. Land use forecasts and traffic analysis for both the 2025 and build-out scenarios are underway. An LOS policy consistent with Measure Y, that generally sets LOS D for rural areas and LOS E for community centers is being used. The size of Highway 50 will be determined in the course of the modeling for this alternative. A land use map and policy set for this alternative are being developed.

- **Equal Weight Alternative 4, Roadway Constrained 6-Lane “Plus”:** This alternative assumes all growth that would be allowed under Measure Y Policy 3.5.1.6.1, using the 1996 General Plan land use distribution as a starting point. A truly roadway constrained 6-lane alternative would only assume as much development as could be accommodated on the defined roadway system, without causing roadway levels of service to be exceeded. We know from prior modeling that approximately 14,000 to 15,000 units can be accommodated. This alternative goes beyond this by keeping Highway 50 at 6-lanes, and allowing all growth that could proceed under Measure Y Policy 3.5.1.6.1—hence the “Plus” in the name.

Development of all lands for which there are approved Development Agreements and Tentative Subdivision Maps is assumed. All other residential lands are allowed to develop under the 1996 General Plan land use designations, up to a maximum of 4 units per parcel. Non-residential property is assumed to develop based on market forces, proportional to housing growth. Land use forecasts and traffic analysis for both the 2025 and build-out scenarios are underway. An LOS policy consistent with Measure Y, that generally sets LOS D for rural areas and LOS E for community centers is being used. As indicated, Highway 50 is set at 6-lanes. A land use map and policy set for this alternative are being developed.

- **CEQA Alternative 5, 2001 Project Description:** This alternative is based in large part on the 1994 General Plan land use alternative considered during the prior General Plan process, modified in accordance with Measure Y, subsequently approved projects in the County, and direction from the Board of Supervisors. Development of all lands for which there are approved Development Agreements and Tentative Subdivision Maps is assumed. Development of all land as designated in the 2001 map is assumed at maximum densities. Non-residential property is assumed to develop based on market forces, proportional to housing growth. Land use forecasts and traffic analysis have been completed for both a 2025 and build-out scenario. An LOS policy consistent with Measure Y, that generally sets LOS D for rural areas and LOS E for community centers is being used. Highway 50 is planned for 8-lanes. A land use map and policy set for this alternative are already in place. By 2025, 32,158 new units and 41,880 new jobs are projected. At build-out, 73,814 new units and 76,836 new jobs are projected.

The results of this alternative closely resemble the 1996 General Plan which will be subject to detailed equal weight analysis in the EIR. As the Board has already confirmed, equal weight analysis of this alternative would be duplicative.

- **CEQA Alternative 6, Roadway Constrained 6-Lane:** This alternative allows the maximum amount of growth that could be accommodated within the planned roadway system assuming Highway 50 at 6-lanes. The capacity under this alternative is approximately 14,000 to 15,000 units. No additional residential units can be accommodated under this alternative. Some non-residential growth is assumed based on existing commitments, the Business Park, and Phase I of Missouri Flat. Preliminary traffic analysis is underway for the 2025 scenario. An LOS policy that generally sets LOS D for rural areas and LOS E for community centers is being used. No land use map or policy set for this alternative has been developed.

This alternative would require a policy set and land use map that precludes further development in the County beyond the 14,000 to 15,000 unit capacity of the planned roadways. The number of units for which there are existing vested commitments (units covered under approved Development Agreements or Tentative Subdivision Maps) is roughly this same number. Assuming that the Development Agreement and Tentative Subdivision Map units proceed, land use designations on all other properties under this alternative would need to be revised to preclude additional development. Individual residential parcels would no longer be allowed 1 unit as a matter of right. This alternative has been identified by County Counsel's office as having significant legal implications in this regard.

- **CEQA Alternative 7, Roadway Constrained 8-Lane:** This alternative allows the maximum amount of growth that could be accommodated within the planned roadway system assuming Highway 50 at 8-lanes. Development of all lands covered by an approved Development Agreement or Tentative Subdivision Map is assumed. All other residential parcels are assumed to develop with at least 1 unit. No additional lot splits or new subdivisions are assumed. Non-residential property is assumed to develop based on market forces, proportional to housing growth (identical to No Project 2025). Preliminary traffic analysis is underway for the 2025 scenario. An LOS policy that generally sets LOS D for rural areas and LOS E for community centers is being used. No land use map or policy set for this alternative has been developed.

Preliminary modeling indicates that the results of this alternative closely resemble the No-Action Alternative, which will be subject to detailed equal weight analysis in the EIR. Equal weight analysis of this alternative would be duplicative.

Policies that do affect the results of this alternative include modification of the Business Park and adjoining land uses, and/or the addition of a new connection to White Rock Road. These concepts could have a mitigating effect under any of the identified alternatives and thus they have been broken out separately below (see Alternatives 9 and 10).

- **CEQA Alternative 8, Modified Development Agreements:** This alternative assumes that land use modifications can be made to the 6 Development Agreements (Serrano, Bass Lake, Marble Valley, Promontory, Carson Creek, and Valley View) to minimize environmental impacts. These modifications would include significant changes in density, design, and/or number of units. This alternative has been identified by County Counsel’s office as having significant legal implications and may not be legally feasible.
- **CEQA Alternative 9, Modified Business Park and Adjoining Land Uses:** This alternative assumes significant modifications of planned land uses for the Business Park, and the adjoining specific plans (Valley View and Carson Creek) to the extent this may be legally possible. The Business Park is not subject to any vesting mechanisms such as a development agreement. The Carson Creek development is vested by an approved Development Agreement. The Valley View development is vested by an approved Development Agreement, but is subject to Measure Y and may be restricted from proceeding given Measure Y constraints on residential development. Both developments were the subject of settlement agreements.

Under this alternative, assuming the County’s ability to make such changes, the Business Park would be subject to significant reductions in land use intensities. Similarly, assuming the County’s ability to make such changes, the Valley View and Carson Creek developments would be subject to significant changes in land use to decrease the overall number of units and geographic area where development is allowed, and to increase the density where roadway capacity could support the units. The alternative would be structured with a policy objective of achieving a balance of jobs and housing between the Business Park and the adjoining development.

No land use map or policy set for this alternative has been developed. No land use forecasts or traffic analysis specific to this alternative have been completed. Rather it was recognized that this alternative may be a mitigation option that could apply to the General Plan under several of the identified alternatives, and should be treated as such in the CEQA analysis. Therefore, this alternative will be subjected to a lesser level of detail in the alternatives analysis and may be identified as mitigation where appropriate in the EIR.

- **CEQA Alternative 10, New White Rock Road Connection:** This alternative assumes a new connection to White Rock Road in the area south of Highway 50 and east of Latrobe Road. There are several connections the road could make including: Suncastr Lane, Investment Boulevard, Sandstone Drive, or Golden Foothill Parkway to White Rock Road; Investment Boulevard to Payen Road; or the extension of Payen Road to connect to Latrobe Road south of the Business Park. All of these potential connections would need to include a connection to Highway 50 in Sacramento County. The intent is to create a new access-restricted east/west outlet for funneling traffic from this area to the freeway.

No land use map or policy set for this alternative has been developed. No land use forecasts for this alternative have been run. This measure is expected to have significant mitigating effects on traffic and related impacts under several of the identified alternatives, and should be treated as such in the CEQA analysis. Therefore, this alternative will be subjected to a lesser level of detail in the alternatives analysis and may be identified as mitigation where appropriate in the EIR.

- **CEQA Alternative 11, Transit Emphasis:** This alternative would establish policies and land use designations that promote the development of light rail and extended transit opportunities in the County. The extension of light rail from the end of the planned Folsom line to El Dorado Hills would be included in the Plan. An improved commuter, feeder, and local bus system, improved Park and Ride facilities, and extensive non-vehicular system would also be planned. No land use map or policy set for this alternative has been developed. No land use forecasts or traffic analysis specific to this alternative have been run. Rather it was recognized that this alternative may be a mitigation option that could apply to the General Plan under several of the identified alternatives, and should be treated as such in the CEQA analysis. Therefore, this alternative will be subjected to a lesser level of detail in the alternatives analysis and will be identified as mitigation where appropriate in the EIR.

Missouri Flat Area Master Circulation & Funding Plan (MC&FP)

In 1998, the County adopted the MC&FP as an implementation measure of the General Plan to fund more than \$40 million for improvements to the U.S. 50/Missouri Flat Road interchange and adjacent arterials and collector roads. The MC&FP area includes all land in the Missouri Flat area designated on the General Plan as *commercial*, as well as land associated with proposed MC&FP-funded roadway improvements (see Figure 3.1-3). (EDAW 1998) The purpose of the MC&FP is to fund road infrastructure projects that will relieve existing traffic congestion and create capacity for additional commercial development, but not generate commercial uses at levels beyond those consistent with County policies (see the “Planning/El Dorado County” section below).

In December 2000, the County implemented the MC&FP by adopting a finding that an adequate threshold level of funding was available (“critical mass”) to finance the circulation plan element of the MC&FP. In March 2002, the County formed a Community Facilities District to provide the financial mechanism for implementing the MC&FP. The major roadway improvements included in the MC&FP financing plan are the Phase 1 improvements to the U.S. 50/Missouri Flat Road interchange, improvements to Missouri Flat Road from Headington Road to the Sacramento Placerville Transportation Corridor (SPTC), and construction of the new Missouri

Flat Road/Pleasant Valley Road (Economic & Planning Systems 2002 and Boyer pers. comm.).

The County General Plan identifies the MC&FP area as a “planned community” (see Figure 3.1-3). The General Plan envisions the project area to contain a large concentration of retail uses. (EDAW 1998) Figure 3.1-3 shows the current County land use designations in the MC&FP area and vicinity, including vacant land. All vacant land in the MC&FP area is designated as *commercial*, with the exception of land proposed for the Pleasant Valley Connector, which is primarily designated *industrial* with small portions in areas designated *multi-family residential* and *commercial*. The Pleasant Valley Connector is a proposal for a connector to allow traffic flow from Pleasant Valley Road (State Route 49) and Missouri Flat Road.

3.1.2 Environmental Consequences

Methods

Data used to characterize the study area were obtained primarily from the County General Plan and the MC&FP Draft EIR (EDAW 1998). Information was also gathered through interviews with the county planning director (Conrad pers. comm.) and the project engineer (Tatman pers. comm.) and through site visits and field surveys.

Permanent Impacts: 4-Lane Tight Diamond Interchange

Impact LU1: Permanent Right-of-Way Acquisitions from 19 Parcels

Impacts on land uses within the project area would result from the widening of Missouri Flat Road and the modifications to the U.S. 50 interchange. The proposed action would require corner or sliver permanent right-of-way acquisitions from residential or commercial parcels. Table 3.1-1 details the anticipated direct land use impacts associated with the proposed action. Table 3.1-2 details the anticipated direct land use impacts associated with each of the Perks Court reconstruction options; the same number of parcels would experience permanent right-of-way acquisitions under both reconstruction options. Figure 3.1-4 shows the location of the affected parcels. Because these acquisitions would not affect the land uses occupying these parcels, and because the project is compatible with existing land uses in the area and is consistent with the County General Plan and the adopted Missouri Flat Area MC&FP, this impact is not considered to be adverse.

Table 3.1-1. Acquisitions and Easements under the 4-Lane Tight Diamond Interchange

Assessor's Parcel Number ^a	Impact Area			Comments ^b
	Meter ²	Foot ²	Acre	
327-140-02	400	4,306	0.10	Permanent acquisition of property; no structure, parking, or signage loss
	1,800	19,376	0.44	Temporary construction easement
327-140-05	0	0	0.00	
327-140-46	0	0	0.00	
327-211-04	50	538	0.01	Temporary construction easement
327-211-03	150	1,615	0.04	Temporary construction easement
327-211-02	200	2,153	0.05	Temporary construction easement
327-211-01	100	1,076	0.02	Temporary construction easement
327-130-22				See Perks Court options, Table 3.1-2
327-130-25				See Perks Court options, Table 3.1-2
327-130-21				See Perks Court options, Table 3.1-2
327-130-20				See Perks Court options, Table 3.1-2
327-130-19				See Perks Court options, Table 3.1-2
327-130-18				See Perks Court options, Table 3.1-2
327-190-32	850	9,150	0.21	Permanent acquisition of property; no structure, parking, or signage loss
327-190-34	1,400	15,070	0.35	Permanent acquisition of property; no structure, parking, or signage loss
327-190-35	700	7,535	0.17	Permanent acquisition of property; no structure, parking, or signage loss
327-190-36	750	8,073	0.19	Permanent acquisition of property; no structure, parking, or signage loss
325-230-23	3,500	37,675	0.86	Temporary construction easement
El Dorado County	8,500	91,496	2.10	Transfer from El Dorado County to State of California, Old bridge to remain with El Dorado County
325-180-14	4,200	45,210	1.04	Permanent acquisition of property; no structure, parking, or signage loss
	6,000	64,586	1.48	Temporary construction easement
325-230-18	1,600	17,223	0.40	Permanent acquisition of property; no structure, parking, or signage loss
327-130-47	1,400	15,070	0.35	Permanent acquisition of property; no structure, parking, or signage loss
327-130-49	3,500	37,675	0.86	Permanent acquisition of property; no structure, parking, or signage loss
327-130-43	1,500	16,146	0.37	Permanent acquisition of property; no structure, parking, or signage loss
327-130-46	4,500	48,439	1.11	Permanent acquisition of property; no structure, parking, or signage loss
327-130-45	1,500	16,146	0.37	Permanent acquisition of property; no structure, parking, or signage loss
327-130-37	2,100	22,605	0.52	Permanent acquisition of property; no structure, parking, or signage loss
327-130-35	350	3,767	0.09	Jack-in-the-Box restaurant at 3945 Missouri Flat Road: building not impacted, but drive-through impacted by sidewalk; entire parcel (0.73 acre) likely to be purchased
327-130-14	200	2,153	0.05	Chevron fuel island impacted at 3943 Missouri Flat Road; entire parcel (0.89 acre) likely to be purchased
327-130-13	400	4,306	0.10	Permanent acquisition of property; no structure, parking, or signage loss
327-130-12	150	1,615	0.04	Permanent acquisition of property; no structure, parking, or signage loss
327-290-58	600	6,459	0.15	Maintain bank drive-through, reset retaining wall
	1,500	16,146	0.37	Loss of 35 parking spaces near K-Mart in Prospector's Plaza

Note: NA = not applicable.

^a See Figure 3.1-4 for location of parcels.

^b Permanent acquisition of property; no structure, parking, or signage loss indicates that only a sliver of the parcel would need to be acquired.

**Table 3.1-2. Acquisitions and Easements under Perks Court Options,
4-Lane Tight Diamond Interchange**

Assessor's Parcel Number ^a	Cul-de-sac Option				Realignment Option			
	Impact Area			Comments ^b	Impact Area			Comments ^b
	Meter ²	Foot ²	Acre		Meter ²	Foot ²	Acre	
327-130-22	30	323	0.01	Permanent acquisition of property; no structure, parking, or signage loss	60	646	0.01	Permanent acquisition of property; no structure, parking, or signage loss
	30	323	0.01	Temporary construction easement				Temporary construction easement
327-130-25	100	1,076	0.02	Permanent acquisition of property; no structure, parking, or signage loss	300	3,229	0.07	Permanent acquisition of property; no structure, parking, or signage loss
	150	1,615	0.04	Temporary construction easement	30	323	0.01	Temporary construction easement
327-130-21	200	2,153	0.05	Permanent acquisition of property; no structure, parking, or signage loss; no impact to residence	1,700	18,299	0.42	Residence at 6850 Perks Court to be purchased in whole
327-130-20	21,000	22,6050	5.19	H&S Gas Mart and residence at 6880 Perks Court to be purchased in whole	21,000	226,050	5.19	H&S Gas Mart and residence at 6880 Perks Court to be purchased in whole
327-130-19	3,800	40,904	0.94	Residence at 6910 Perks Court to be purchased in whole	250	2,691	0.06	Retain existing residence driveway at 6910 Perks Court; structures not impacted
327-130-18	13,700	147,470	3.39	Residence at 6940 Perks Court to be purchased in whole	2,200	23,681	0.54	Retain existing residence driveway at 6940 Perks Court; structures not impacted

Note: NA = not applicable.

^a See Figure 3.1-4.

^b Permanent acquisition of property; no structure, parking, or signage loss indicates that only a sliver of the parcel would need to be acquired.

See section 3.3, “Relocation” for a discussion of specific residential and commercial parcels that would experience displacements.

Mitigation Measure

None proposed.

Impact LU2: Compatible with Planned Land Uses

The proposed action is not anticipated to result in conflicts with planned land uses in the project area. One new development, El Dorado Villages shopping center, has begun construction of a Safeway market in the northeast quadrant of the Missouri Flat Road interchange (Figure 3.1-1). The Missouri Flat Road interchange project is being designed to be consistent with the design and layout of the shopping center. As noted above, since the 4-lane tight diamond interchange is consistent with the Missouri Flat Area MC&FP and the Writ of Mandate, this impact is not considered to be adverse.

Mitigation Measure

None proposed.

Impact LU3: No Impact on Community Cohesion

According to Caltrans guidelines for conducting community impact assessments (California Department of Transportation 1997), community cohesion is the degree to which residents have a *sense of belonging* to their neighborhood; a level of commitment of the residents of the community; or a strong attachment to neighbors, groups, or institutions, usually because of continued association over time. Communities are often delineated by physical barriers, such as major roadways or large open space areas.

Cohesive communities are indicated by specific social characteristics, such as long average lengths of residency, home ownership, frequent personal contact, ethnic homogeneity, high levels of community activity, and shared goals. Transportation projects may divide cohesive neighborhoods when such projects act as physical barriers or are perceived as psychological barriers by residents. A transportation project perceived as a physical or psychological barrier may isolate one portion of a homogeneous neighborhood (California Department of Transportation 1997).

The residential area to the southeast of the Missouri Flat Road interchange does not constitute a cohesive community because it lacks the features common to

neighborhoods and does not contain substantial cohesion. The proposed action would not divide any community because improvements are being made to an interchange that already exists. Since the action would have no affect on community cohesion and would not physically divide an established community, this impact is not considered to be adverse.

Mitigation Measure

None proposed.

Impact LU4: Consistent with Local and Regional Plans and Policies

The proposed project is consistent with the following relevant County policies and regional plans, as discussed below.

1996 El Dorado County General Plan – The El Dorado County General Plan was adopted by the Board of Supervisors on January 23, 1996.

The following goals, objectives, and policies from the General Plan (set aside in 1999) apply specifically to the proposed action.

Policy 3.1.2.2. A separation of at least 500 feet shall be provided between the terminus of freeway off ramps and the nearest future intersection.

A Caltrans' design exception was approved for the proposed action in August 2000 to allow for less than 125 meters (500 feet) between the U.S. 50/Missouri Flat Road eastbound ramp intersection and the Missouri Flat Road/Mother Lode Drive intersection. This design exception was needed due to the existing relative locations of these intersections. The other freeway ramp terminal and Missouri Flat Road intersections in the project area are designed to provide for the prescribed 500-foot separation. The proposed action is considered to be consistent with Policy 3.1.2.2.

Objective 3.3.1. Improvement of Interchanges: Improve interchanges along U.S. 50 and the roadway system in the central urban corridor extending from the Sacramento/El Dorado County Line to Camino.

The proposed action would improve the U.S. 50/Missouri Flat Road interchange and is considered to be consistent with this objective.

Policy 3.4.1.1. Circulation facilities should be sited and designed in such a way that avoids damage to the County's scenic and environmental resources to the extent

feasible. Roads should be planned and designed to minimize disruption of soils, topography, vegetative cover, and wildlife habitat.

Sections 3.11, “Visual”, and 3.8, “Wildlife and Botanical Resources, Threatened and Endangered Species, and Wetlands and Waters of the U.S.”, identify a number of mitigation measures to ensure consistency with this policy. If the County implements the recommended mitigation measures identified in these sections, then the proposed action would be consistent with Policy 3.4.1.1.

Policy 3.5.1.1. The County shall adopt a roadway plan consistent with planned land use and shall maintain an operating LOS of “E” or better on all roadways, consistent with Objective 3.5.1. In addition, all road segments projected in the roadway plan at the year 2015 to be operating at LOS A, B, or C shall not be allowed to fall below LOS C and all road segments at LOS D shall not fall below LOS D.

The traffic report for the project (Fehr & Peers Associates 2002) indicates that the following intersections will operate at LOS C or better in 2015 with project construction: Missouri Flat Road/Prospector’s Plaza Drive, U.S. 50 westbound ramps/Missouri Flat Road, U.S. 50 eastbound ramps/Missouri Flat Road, and Missouri Flat Road/Mother Lode Drive.

Policy 3.5.1.3. The County shall identify those roadways with existing or projected capacity problems, prioritize them in terms of mitigation immediacy, and develop programs for planning, financing, and constructing the needed improvements.

The proposed action corrects existing operational deficiencies and provides capacity needed for planned growth, consistent with the adopted MC&FP. The proposed action is considered to be consistent with Policy 3.5.1.3.

Policy 3.9.1.3. The County shall continue to work with employers, residents, and other agencies to encourage increased car pools, van pools, and park-and-ride lots.

The proposed action would result in the loss of up to 20 automobile parking spaces in the existing park-and-ride lot, located in the southwest quadrant of the Missouri Flat Road interchange. If Mitigation Measure T4a is implemented, the proposed action would be consistent with Policy 3.9.1.3.

Policy 10.2.7.3 The County shall commit to the comprehensive development of the needed road circulation plan for this area immediately following adoption of the

General Plan. This plan shall also include the identification and development of a specific funding mechanism that overcomes existing deficiencies and accommodates future traffic demands to the year 2015.

The proposed action is consistent with this policy since it comprises roadway improvements included in the adopted MC&FP, a funding mechanism that is called for by this policy.

Missouri Flat Area Master Circulation & Funding Plan –The MC&FP includes the following Phase 1 improvements: expanding the Missouri Flat Road interchange, adding auxiliary lanes to U.S. 50 in each direction over the Weber Creek bridges, widening Missouri Flat Road from north of Prospector’s Plaza Drive to south of Perks Court, constructing a northbound free right-turn at Mother Lode Drive to eastbound U.S. 50, and realigning Perks Court (EDAW 1998 and Boyer pers. comm.). Appendix I of this joint document contains a table that describes the relationship of each program-level mitigation measure adopted as part of the MC&FP and the project-level mitigation measures that are recommended in this joint document. If the County Board of Supervisors adopts these recommended mitigation measures, then this project will be consistent with the MC&FP.

Regional Transportation Plan – The proposed action is included in the 2025 MTP, approved by FHWA on July 24, 2002, and the 2003/05 MTIP amendment #1, approved by FHWA on December 23, 2002. The MTP identifies the Missouri Flat Road interchange project as “U.S. 50 at Missouri Flat Road Interchange: Reconstruct interchange at U.S. 50 (Phase 1) including construction of auxiliary lanes over Weber Creek bridge and seismic retrofit of bridge” (page 103, July 24, 2002). The MTIP amendment describes the proposed action as “Reconstruct U.S. 50 Missouri Flat Road Interchange: Reconstruct Missouri Flat Interchange at U.S. 50 (Phase 1) including construction of auxiliary lanes over Weber Creek bridge and seismic retrofit of bridge; widen Missouri Flat Road 2 to 4 lanes from Mother Lode Drive to Prospectors Plaza Drive” (page 14, December 23, 2002). The reference to Phase 1 in these documents refer to the 4-lane tight diamond interchange. Therefore, the proposed action is consistent with the MTP and the MTIP. Appendix J of this joint document contains a table that describes the relationship of the program-level MTP mitigation measures and the project-level mitigation measures recommended in this joint document.

Mitigation Measure

None proposed.

Impact LU5: Potential Displacement of 35 Parking Spaces at Prospector's Plaza

The proposed action would result in the displacement of approximately 35 spaces on APN 327-290-058, used by patrons of the Prospector's Plaza shopping center. The County ordinance requires 960 spaces in Prospector's Plaza based on 1 space/250 square feet and 240,000 square feet. Currently, approximately 1,020 spaces exist. Therefore an adequate parking supply would be available.

Mitigation Measure

None proposed.

Growth Inducement Impacts

The MC&FP EIR (EDAW 1998) assumes development of 199 ha (492 ac) of land in the Missouri Flat area designated on the General Plan as *commercial* and approximately 11.0 ha (26.7 ac) of land associated with proposed MC&FP improvements. The MC&FP EIR analyzes the impacts of this development. Project-specific environmental documentation, public notification and involvement, mitigation, and ultimately, approval by the County would be required for this development to occur.

The proposed action would not introduce a new transportation facility to the project area, nor would it increase or provide new access. The intent of the proposed action is to improve the Missouri Flat Road interchange to solve existing operational deficiencies and congestion problems and also to accommodate the traffic demands associated with approved growth through 2015, consistent with the approved MC&FP. The growth that requires the construction of proposed action has already occurred and the 4-lane tight diamond interchange configuration represents the minimum acceptable design necessary to alleviate existing congestion; it is needed today to solve existing traffic problems. The minimum acceptable design also provides some additional capacity beyond what is required for existing traffic levels (although the design of the 4-lane tight diamond interchange would remain unchanged even if it was not intended to accommodate planned growth) to accommodate development through 2015 at acceptable levels of service. Although the proposed action would accommodate this planned growth, it is unlikely that it would induce unplanned growth since it does not provide capacity above and beyond

what is needed to accommodate planned growth to 2015, consistent with the MC&FP and Writ of Mandate. However, the proposed action could hasten planned growth in the immediate vicinity of the interchange. With the exception of the property formerly proposed for Sundance Plaza and the already-approved El Dorado Villages shopping center, the area adjacent to the project area is already developed.

Temporary Impacts: 4-Lane Tight Diamond Interchange

Impact LU6: Construction-Related Impacts

Short-term land use impacts could result from construction activities. The construction of the proposed action, including improvements to Missouri Flat Road and the U.S. 50/Missouri Flat Road interchange would generate temporary air quality impacts (e.g., diesel fumes and dust) and noise from heavy equipment operations. Traffic noise impacts affecting sensitive receptors, such as homes on Perks Court and Helmrich Lane, the hotel, and church could also occur. These impacts are discussed in sections 3.5, “Air Quality”, and 3.6, “Noise”. The potential for daytime and nighttime light and glare impacts is discussed in section 3.11, “Visual”.

Construction could also temporarily disrupt traffic circulation patterns on Missouri Flat Road and U.S. 50, including increased congestion of affected roadways during construction and disrupted access to businesses along Missouri Flat Road and homes along Perks Court. Access to residential properties along Helmrich Lane would also be temporarily affected during construction of the Weber Creek bridges auxiliary lanes; construction in the Weber Creek canyon is estimated to last approximately 9 months (Tatman pers. comm.). Helmrich Lane and the gravel road that extends from Helmrich Lane are proposed for construction vehicle and equipment access to the proposed staging area off of the gravel road (see Figure 1.1-2).

This economic impact is considered adverse because the proposed action has the potential to result in temporary businesses disruptions.

Mitigation Measure LU6a: Implement a Traffic Management Plan

To address this concern, the County will implement a traffic management plan (TMP), consistent with County and Caltrans roadway construction guidelines, that will identify the locations of temporary detours and signage to facilitate local traffic patterns and through-traffic requirements. On U.S. 50 and Missouri Flat Road, 1 lane in each direction will be kept open at all times during construction. Except in emergencies, U.S. 50 ramp closures will occur only during nonpeak hours and likely only at night; any ramp closure will comply with Caltrans ramp closure chart.

Daytime access to businesses along Missouri Flat Road will be retained during construction. To the extent that business access must be disrupted, the disruption will occur only at night. Access to residences along Missouri Flat Road, Perks Court, and Helmrich Lane will be maintained during construction. The County will notify affected businesses and residences at least 1 week in advance of any lane or roadway closures or impacts related to access. The County will also notify personnel of emergency response services, such as fire and police protection, 1–2 weeks in advance of any lane or roadway closures so that alternate routes can be taken. (Tatman pers. comm.)

Cumulative Impacts: 4-Lane Tight Diamond Interchange

See Chapter 4 for a discussion of cumulative impacts.

No-Action Alternative

No construction would occur under this alternative. Therefore, no direct or indirect land use or parking impacts would occur. No air quality- or noise-related construction impacts or disruption of traffic circulation and access would occur related to construction of the proposed interchange improvements. The following impact would occur under this alternative.

Impact LU7: Inconsistent with Adopted Plans

The No-Action Alternative is inconsistent with the MC&FP, MTP, and MTIP since it does not include expanding the Missouri Flat Road interchange, adding auxiliary lanes to U.S. 50 in each direction over the Weber Creek bridges, and widening Missouri Flat Road from north of Prospector’s Plaza Drive to south of Perks Court, as called for in these plans and programs. This impact is considered adverse.

Mitigation Measure LU7a: Construct the 4-Lane Tight Diamond Interchange

The proposed action would meet the project purpose and need and be consistent with adopted plans. If the County decides to adopt the proposed action rather than the No-Action Alternative, this impact would be reduced.

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3.2 Community Impacts and Environmental Justice

The information below is summarized from the project community impact assessment (Jones & Stokes 2002c) and relocation impact statement (Jones & Stokes 2002h); these reports are available for review at County offices (see the List of Technical Studies in the Introduction of this joint document for the address and phone number of County offices). This section addresses population and economic impacts, impacts on businesses, and construction-related economic impacts.

3.2.1 Affected Environment

Study Area

The study area consists of subareas, as delineated by census tracts (CTs), in which the direct impacts and many of the indirect impacts of the proposed action would occur (see Figure 3.2-1). The study area includes an area of unincorporated El Dorado County substantially larger than that directly affected by project construction, right-of-way acquisitions, and displacements. The analysis focuses primarily on the portion of the study area within the project area.

As shown in Figure 3.2-1, the study area includes CTs 315.02 and 309.02 and encompasses the project's displacement area. These CTs refer to the following subareas:

- CT 309.02—area north of U.S. 50 and
- CT 315.02—area south of U.S. 50.

Detailed information concerning the affected environment and effects is provided for these CTs/subareas where appropriate. For context and comparison, information is also provided for El Dorado County as a whole for certain topics. In addition to the data cited in the following sections, information gathered through site visits and field surveys was used to characterize the community and economic settings for the study area.

Community/Neighborhood Characteristics

The project area extends along a corridor that is currently developed surrounding the existing alignment of U.S. 50/Missouri Flat Road. Development consists of commercial and residential uses and vacant land (Figure 3.1-1). Prospector's Plaza shopping center, located west of Missouri Flat Road in the northwest quadrant of the

Missouri Flat Road interchange, and the Best Western Placerville Inn, located in the southwest quadrant, serve regional needs. Other commercial business along Missouri Flat Road near the interchange are smaller businesses, serving more local needs. Older single-family residences occur along Perks Court. No defined neighborhoods or communities exist within the project area.

Population Characteristics

The project area is located in a rapidly urbanizing corridor that runs along U.S. 50 between El Dorado Hills and Placerville. Much of the residential development in this area is rural in nature, especially away from the U.S. 50 corridor where many homes are located on 5- and 10-acre parcels. However, the development trend near the highway has been toward residential subdivisions, with accompanying local- and highway-serving commercial development. In 2000, the population of the study area totaled approximately 10,000, containing 6.4% of the County’s 156,300 residents (U.S. Department of Commerce, Bureau of the Census 2001). As shown by Table 3.2-1, most of the study area residents lived in the Census tract south of U.S. 50, although a large number (44% of the study area residents) also reside in the area north of the highway.

Table 3.2-1. Selected Population and Age Characteristics: 2000 Census

Area	Population	Average Persons per Household	Median Age	Percent Age 18 or Under	Percent Age 65 or Older
El Dorado County	156,299	2.63	39.4	26.1%	12.4%
Placerville	9,610	2.34	38.3	25.6%	17.4%
Census tract 309.02	4,367	2.79	43.2	24.6%	13.0%
Census tract 315.02	5,643	2.39	42.9	24.1%	23.3%

Source: U.S. Census Bureau 2001.

The household and age characteristics of the study area population are similar to those of nearby Placerville and the County as a whole. Within the study area, household size ranged from 2.39 persons per household south of the highway to 2.79 persons north of the highway, compared to 2.34 in Placerville and 2.63 countywide (Table 3.2-1). The median age of study area residents, at approximately 43 years, is slightly higher than elsewhere in the County. This trend is especially noticeable in the area south of the highway, in which 23% of the residents are 65 years old or older, compared to 17% in Placerville and 12% in El Dorado County (Table 3.2-1). On the other hand, the study area contains a smaller percentage of children under the age of 18 compared to Placerville and the entire County.

As Table 3.2-2 shows, the racial distribution of the study area population is largely white and slightly less diverse than elsewhere in the County. With whites accounting for approximately 92% of study area residents, no other racial groups make up a significant portion of the study area population.

Table 3.2-2. Racial Distribution of Area Populations: 2000 Census

Area	White	Black or African American	American Indian or Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Other Race	Two or More Races	Total	Hispanic or Latino of Any Race ^a
El Dorado County	89.7%	0.5%	1.0%	2.1%	0.1%	3.3%	3.0%	199.4%	9.3%
Placerville	88.6%	0.2%	1.3%	0.9%	0.1%	5.8%	3.1%	200.0%	12.6%
Census tract 309.02	92.8%	0.4%	1.6%	0.9%	0.2%	1.3%	2.8%	200.0%	4.7%
Census tract 315.02	90.8%	0.3%	1.8%	0.7%	0.1%	3.0%	3.3%	200.0%	8.0%

Source: U.S. Census Bureau 2001.

^a The percentages in this column are included in one of the other columns.

Housing Stock, Vacancy Rates, and Housing Values

According to the 2000 U.S. Census, approximately 4,000 housing units are located in the study area, representing 5.6% of the countywide housing stock (Table 3.2-3).

During the Census, approximately 155 housing units were vacant within the study area, resulting in a vacancy rate of 3.8%. This rate was substantially lower than the countywide rate of 13.5% and somewhat lower than the Placerville rate of 5.7%. As shown by Table 3.2-3, part of the difference in the vacancy rates is attributable to the large number of vacation homes (i.e., seasonal and recreational housing units) in the County relative to the number of these units located in the study area and in Placerville.

Table 3.2-3. Selected Housing Characteristics: 2000 Census

Area	Total Housing Units	Vacant Housing Units		Vacant Units for Rent	Vacant Units for Sale
		Total	Seasonal, Recreational, or Occasionally Used		
El Dorado County	71,278	12,339	9,614	919	535
Placerville	4,242	241	37	79	40
Census tract 309.02	1,600	45	8	9	9
Census tract 315.02	2,425	109	21	14	19

Source: U.S. Census Bureau 2001.

During the 2000 Census, only 51 vacant housing units were identified as available to be rented or purchased within the study area. A more recent review of homes-for-sale data for the 95667 zip code area, which acquisitions in the larger Placerville area, including the study area, found that 118 homes were for sale (Realtor.com 2001).

These data were for December 2001, a month when the homes-for-sale inventory is generally lower than at other times of the year. Of the homes for sale, 22 (19%) were priced below \$200,000, 45 (38%) were priced between \$200,000 and \$300,000, 27 (23%) were priced between \$300,000 and \$400,000, and 24 (20%) were priced over \$400,000. Similarly, recent data available for rental properties reveal a variety of housing units available for rent in the vicinity of the study area. More than 30 homes, many situated on acreage, were available in a recent review of classified listings in the *Mountain Democrat* (<http://www.mtdemocrat.com>, classifieds listings, April 22, 2002). Available rental homes ranged from 1 to 4 bedrooms, with monthly rents ranging from \$700 to \$1,850. Apartment units were also available in 11 apartment complexes within the 95667 (Placerville) Zip Code area (<http://www.homestore.com>, April 22, 2002). Based on these data, the housing market in the vicinity of the study area appears to be fairly balanced and affordable to a wide range of buyers.

Economic Setting

Tax Revenue

The project area is located in unincorporated El Dorado County. As a result, El Dorado County receives property tax revenue generated by the project area.

According to the State Board of Equalization (2000), the net assessed value of property subject to general property taxes in the County was approximately \$10 billion in fiscal year (FY) 1998. This tax base generates revenues that are distributed among several agencies and districts, including El Dorado County, incorporated cities, school districts, and special districts.

Parts of 29 parcels are located within the limits of the project area. The portions of these properties (including their improvements) within the project right-of-way have a total assessed value of approximately \$2.0 million (Perks Court cul-de-sac option) or \$1.9 million (Perks Court realignment option) (These dollar amounts apply to the areas identified in Tables 5.1-1 and 5.1-2 for the 4-lane tight diamond interchange and the SPDI, and are therefore slightly higher than the assessed values that apply to the 4-lane tight diamond interchange alone). Based on the average property tax rate of 1.06% in El Dorado County, these properties annually (January–December) generate approximately \$21,200 (Perks Court cul-de-sac option) or \$20,100 (Perks Court realignment option) in property tax revenue.

Businesses within and adjacent to the project limits generate sales tax revenue through the sale of taxable products. These businesses include Prospector's Plaza,

the fast food restaurant, gas station, and hotel and other businesses in the project area. Sales tax data are not available for individual businesses within and adjacent to the project limits. According to the California Board of Equalization (2001) (http://www.boe.ca.gov/news/pdf/T2_a00.pdf), taxable sales within El Dorado County totaled approximately \$1.3 billion in 2000, including \$570.1 million within unincorporated areas of the county. Sales within unincorporated areas generate sales tax revenue for the county government based on the 1% local tax rate. Thus, sales taxes received by the county totaled approximately \$5.7 million during 2000. More than 3,900 entities held sales tax permits within unincorporated areas of El Dorado County during 2000. Based on field visit observations, up to eight businesses within or immediately adjacent to the project limits may hold sales tax permits, representing a relatively small number of the total businesses in the county holding permits.

Labor Force and Employment

According to the California Employment Development Department (2000) (<http://www.calmis.ca.gov/file/COsnaps/eldorsnap.pdf>), which prepares employment estimates for El Dorado County, the County's resident civilian labor force averaged 82,500 persons in 2000 and the annual unemployment rate was 3.9%; an average of 3,200 persons were unemployed. Services, retail trade, and government are the dominant industries in El Dorado County. Services account for approximately 34% of all employment and retail trade contributes 22.1 %, with most jobs in the eating and drinking places component. Government jobs contribute approximately 20% of total employment (www.calmis.ca.gov/file/COsnaps/eldorsnap.pdf).

Based on data available from the 2000 Census, the study area's employed labor force totaled about 4,300 persons in 2000, representing 5.8% of the county's employed labor force. The educational, health, and social services sector was the largest employer of study area residents in 2000, accounting for 20% of employment. Other key employment sectors for study area residents included the construction and retail trade sectors, generating 12% and 11% of employment, respectively.

3.2.2 Environmental Consequences

Methods

Data used to characterize the study area and the region were obtained primarily from the County General Plan, the 2000 U.S. Census, the MC&FP, and the *MC&FP Draft EIR* (EDAW 1998). Information was also gathered through interviews with the

county planning director (Montgomery pers. comm.) and the project engineer (Tatman pers. comm.) and through site visits and field surveys.

Permanent Impacts: 4-Lane Tight Diamond Interchange

Impact C1: Minor Population Impacts

Under the Perks Court cul-de-sac option, an estimated 8 persons residing in 3 single-family homes located in the southeast quadrant of the Missouri Flat Road interchange could be displaced. Under the Perks Court realignment option, 5 residents residing in 2 single-family homes could be displaced (see also Impact R1 in section 3.3, “Relocation”). The potential change in population would be considered minor in the context of the current population of the County and the study area. This impact is not considered to be adverse since the proposed action would not displace a large number of people.

Mitigation Measure

None proposed.

Environmental Justice Effects

The proposed action has been developed in accordance with the Civil Rights Act of 1964, as amended; the Uniform Relocation and Assistance and Real Property Acquisition Policies Act of 1970, as amended; and Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. Executive Order 12898 requires each federal agency to take the appropriate and necessary steps to identify and address disproportionately high and adverse human health and environmental effects of its programs, policies, and activities on minority populations and low-income populations. FHWA’s policies and procedures for addressing environmental justice are contained in Order 6640.23 (“FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations”), dated December 2, 1998.

Environmental justice refers to the fair treatment of people of all races, cultures, and incomes with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. The Council on Environmental Quality’s *Draft Guidance for Environmental Justice* (May 24, 1996) indicates that environmental justice concerns may arise from impacts on the natural or physical environment, such as human health or ecological impacts on minority and low-income populations, or from related social or economic impacts (California Department of Transportation 1997).

FHWA defines a “low-income population” as any readily identifiable group of low-income persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who would be similarly affected by a proposed FHWA program, policy, or activity. A “minority population” is defined as any readily identifiable groups of minority persons who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed FHWA program, policy, or activity.

An evaluation of the data from the 2000 U.S. Census (U.S. Department of Commerce, Bureau of the Census 2001) and information gathered through sites visits and field surveys indicates that the study area contains similar median household incomes and ethnicity to the County as a whole. According to Census data, the study contains a higher percentage of white residents and a lower percentage of minority residents than the County as a whole. Median household incomes in the study area ranged from \$37,500 in CT 315.02 to \$60,560 in CT 309.02 in 1999, which bracketed the County’s median household income of \$51,480. Based on this data and information gathered through field observations, no known or readily identifiable minority or low-income groups live in geographic proximity to the project area. Also, few residents and businesses would be displaced or otherwise affected by the proposed action, as described below, thereby having an overall minor effect. Therefore, the proposed action is not considered to potentially cause disproportionately high and adverse human health and environmental effects on minority or low income residents.

Impact C2: Minor Local Tax Revenue Impacts

The removal of the residences and businesses and the acquisition of a right-of-way acquired for the proposed action could reduce property and sales tax revenues for the County and other local agencies. Annual County property tax revenues would be reduced by an estimated \$21,200 (Perks Court cul-de-sac option) or \$20,100 (Perks Court realignment option). Although such reductions would be adverse, they would not substantially affect the ability of local agencies and districts to provide public and educational services.

In addition to property tax revenue, sales tax revenue could also be reduced because of the displacement of the fast food restaurant and gas station. Based on average taxable sales data for establishments in El Dorado County, as reported by the

California Board of Equalization (2001), the displacement of the restaurant and gas stations could cause the loss of approximately \$2.6 million in taxable sales. This reduction could result in the loss of approximately \$26,000 in sales tax revenue to El Dorado County. The revenue loss would represent about 0.5% of the county’s sales tax revenue but would be offset if the businesses relocate to locations elsewhere in the county or if the lost sales are ultimately absorbed by existing or new businesses within the county.

Over the long term, the reductions in property and sales tax revenues potentially caused by the proposed action will likely be offset. The proposed action would facilitate new commercial development within the MC&FP area, thereby generating new sales taxes created by that development. The proposed action could also indirectly generate revenues through project improvements. For example, the addition of sidewalks, curbs and gutters could increase the values of properties in the study area, thereby eventually leading to increased assessed values and higher property tax revenues. Similarly, intersection improvements and the resulting benefits in reduced traffic congestion may facilitate new commercial development within the study area, generating new sales tax revenue. These revenue benefits cannot be quantified, but these long-term revenue effects may offset the near-term effects of the proposed action.

Mitigation Measure

None proposed.

Impact C3: Minor Local and Roadside Business Impacts

As described under Impact R2 in section 3.3, “Relocation”, construction of the proposed action could result in the displacement of three businesses in the study area, including H&S Gas Mart, a Jack-in-the-Box restaurant, and a Chevron Station & Gas Mart. Assuming these businesses do not relocate to sites within the study area, an estimated 27 retail jobs would be permanently lost within the area. While adverse, the loss of these jobs would not represent a substantial reduction in employment opportunities for study area or regional residents, representing 0.6% of 2000 study area employment and less than 0.1% of countywide employment. Ultimately, the employment effects may not be as great as 27 jobs since the sales of displaced businesses may be absorbed by businesses elsewhere in the county, resulting in new jobs being created in those businesses. Additionally, the loss of employment would be somewhat offset by employment opportunities generated by construction of the

proposed action, although these jobs would be temporary and located within the construction section rather than the retail trade sector. This impact is not considered to be adverse since the proposed action would not displace a large number of businesses.

Mitigation Measure

None proposed.

Temporary Impacts: 4-Lane Tight Diamond Interchange

Impact C4: Minor Beneficial Construction-Related Economic Impacts

The construction of the proposed action would generate temporary economic activity in the County and the region, including purchases of goods and services required for construction and employment of workers needed for construction. This increased economic activity would prompt secondary economic activity as construction-related revenue and employee income are respent in sectors throughout the regional economy. The extent of the economic impact of construction-related expenditures on the economy of the County would depend on the proportion of construction expenditures that would occur in the local and regional area and on the residential location of persons employed by construction contractors.

The employment and income impacts generated by construction activities would begin in 2005 and extend through the construction period, which is expected to last for about 18 months. The number of jobs potentially generated by project construction is not known, but many of the non-specialized construction jobs could be filled by persons in the El Dorado County labor force; however, most of the specialists jobs (e.g., crane operators, iron workers) may be filled by outside-of-the-region workers.

Mitigation Measure

None proposed.

Cumulative Impacts: 4-Lane Tight Diamond Interchange

See Chapter 4 for a discussion of cumulative impacts.

No-Action Alternative

No construction would occur under this alternative. Therefore, no community impacts would occur.

3.3 Relocation

The information below is summarized from the project community impact assessment (Jones & Stokes 2002c) and relocation impact statement (Jones & Stokes 2002h); these reports are available for review at County offices (see the List of Technical Studies in the Introduction of this joint document for the address and phone number of County offices). This section addresses residential and commercial displacement impacts.

3.3.1 Affected Environment

The project area consists of a mix of vacant, residential, and commercial land uses. Figure 3.1-1 shows existing land uses in the project area. Figure 3.1-2 shows existing land uses in the Missouri Flat area. See also the Land Use Characteristics section in section 3.1, “Land Use, Planning, and Growth”.

3.3.2 Environmental Consequences

Methods

This evaluation is based on a field visit to parcels with displaced land uses; research based on 2000 Census data and other relevant sources of information, as cited in Jones & Stokes (2002h); and interviews with County staff (Payne pers. comm.) and other knowledgeable sources (Tatman pers. comm.).

Permanent Impacts: 4-Lane Tight Diamond Interchange

Impact R1: Displacement of 3 (Perks Court Cul-de-sac Option) or 2 (Perks Court Realignment Option) Residences

In the area immediately southeast of the Missouri Flat Road interchange, construction of the proposed action with the Perks Court cul-de-sac option would displace a total of 3 residences located in a rural residential neighborhood along Perks Court (Assessor Parcel Numbers [APNs] 327-130-18, 327-130-19, and 327-130-20), resulting in the displacement of an estimated 8 residents. With the Perks Court realignment option, a total of 2 residences along Perks Court (327-130-20 and 327-130-21) would be displaced, resulting in the displacement of an estimated 5 residents. A total of 4 different residences could be affected by the Perks Court reconstruction options (see Table 3.1-2).

None of the potentially displaced residents are known to have special relocation needs. According to 2000 Census data for the Census tract containing the displaced residents (i.e., Census tract 315.02), the age and ethnic characteristics of residents in the displacement area are similar to those of nearby Placerville. All of the displaced residential units are single-family homes located on rural lots ranging in size from 0.17-2.1 hectare (0.42-5.13 acres). Of the 4 homes that could be displaced under the 2 Perks Court reconstruction options, it is believed that 2 of the homes are owner occupied and that 2 of the homes are occupied by a tenant. The residential displacements include the following parcels:

Perks Court cul-de-sac option:

- 6940 Perks Court (APN 327-130-18): full acquisition, 1.4-hectare (3.56-acre) lot, 117-square meters (1,266-square feet (sf)) single-family home and 2 outbuildings, owner occupied;
- 6910 Perks Court (APN 327-130-19): full acquisition, 0.37-hectare (0.92-acre) lot, 181-square meters (1,952-sf) single-family home and detached garage/storage building, owner occupied;
- 6880 Perks Court (APN 327-130-20): full acquisition, 2.1-hectare (5.13-acre) lot, 71-square meters (768-sf) single-family home and shop building used for business (see Impact R2 below), renter occupied.

Perks Court realignment option:

Under the Perks Court realignment option, only a partial acquisition would be required for the properties located at 6910 and 6940 Perks Court (see above); their existing driveways would be retained and no displacement of structures on the properties would occur. Under this option, the displacement effects on the property at 6880 Perks Court would be the same as under the Perks Court cul-de-sac option. In addition to this displacement, the realigned Perks Court option would also result in the following residential displacement:

- 6850 Perks Court (APN 327-130-21): full acquisition, 0.17-hectare (0.42-acre) lot, 116-square meter (1,255-sf) single-family home; believed to be renter occupied.

The County would comply with the requirements of state and federal laws to mitigate relocation impacts. The residents of the displaced homes are likely to seek single-family homes on parcels of 0.17-2.1 hectare (0.42-5.13 acres) within the same region. During the 2000 U.S. Census, 51 vacant housing units were identified as available to

be rented or purchased within CTs 309.02 and 315.02. A more recent review of homes-for-sale data for the 95667 zip code area, which takes in the displacement area and the larger Placerville area, found that 118 single-family homes were for sale (Realtor.com 2001). Of the homes for sale, 80 (68%) were located on parcels of 1 or more acres. The available homes were distributed across a range of prices, as described in the “Housing Stock, Vacancy Rates, and Housing Values” section in section 3.2.1, “Affected Environment” for Community Impacts and Environmental Justice. During this same period, 20 homes were listed for rent in the Placerville area. Similarly, data available for rental properties reveal a variety of housing units available for rent in the vicinity of the residential displacements. In December, 2001, 22 homes were available for rent in the Placerville area (*Mountain Democrat*, classified listings, December 13, 2001). More recently, more than 30 homes, many situated on acreage, were available (*Mountain Democrat*, classified listings, April 22, 2002). Available rental homes ranged from one to four bedrooms, with monthly rents ranging from \$700 to \$1,850. Apartment units were also available in 11 apartment complexes within the 95667 (Placerville) Zip Code area (homestore.com, April 22, 2002). Based on these data, the housing market in the vicinity of the displacement area appears to be fairly balanced and affordable to a wide range of buyers. There appears to be ample single-family residential replacement properties on the market similar to the displacement properties.

This impact is not considered to be adverse since substantial numbers of existing housing or residents would not be displaced, and replacement housing would not need to be constructed elsewhere. However, the County would still need to comply with Mitigation Measure R1a since it meets the legal obligations that arise under another law.

Mitigation Measure R1a: Compensate Displaced Land Uses in Conformance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act

The County will compensate displaced residences and businesses in conformance with Federal and state laws (i.e., the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 Public Law 91-646, as amended April 2, 1987; California Government Code, Chapter 16, Section 7260, et seq. [the Uniform Relocation Act]). These laws require that relocation assistance be provided to any person, business, or nonprofit organization displaced because of the acquisition of real property by a public entity for public uses. Compliance with the federal act is

required where federal funds are to be used in the acquisition or construction of the proposed action. The Federal Uniform Relocation Assistance Act of 1970 (as amended) and the California Relocation Assistance Act (Government Code Section 7260 et seq.) both require that, within a reasonable period of time prior to displacement, comparable replacement housing and commercial properties will be available or provided for each displaced person. Such assurance must be specifically given on every project requiring residential or business displacement. (California Department of Transportation 1997.)

A local certified public agency (El Dorado County) shall carry out the relocation plan to help eligible displaced individuals move with as little inconvenience as possible. All rights and services provided under Public Law 91-646, the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, shall be strictly adhered to. Persons displaced as a result of the project shall receive fair and equitable treatment and shall not suffer disproportionate injuries as a result of programs designed for the benefit of the public as a whole. Relocation resources will be made available to all commercial and residential displacees without discrimination. Appraisals to determine actual market value will be conducted for each property to be relocated once a final alignment has been selected and the Finding of No Significant Impact (FONSI) is signed. See Appendix F for more details.

Impact R2: Displacement of 3 Commercial Businesses

Construction of the proposed action would also likely displace 3 businesses that employ an estimated 27 persons. One of the businesses is located on Perks Court south of U.S. 50 and the other 2 are located along Missouri Flat Road north of U.S. 50. During final design of the proposed action, a final determination will be made concerning whether these properties require acquisition. The commercial displacements, which would be identical for both Perks Court reconstruction options, would include the following parcels (see Table 3.1-2):

- 6880 Perks Court (APN 327-130-20): full acquisition, H&S Gas Mart, an onsite propane distribution and repair business located in a 1,344-square-foot Butler-style shop building on a parcel shared with a single-family home. The business is operated by a tenant.
- 3945 Missouri Flat Road (APN 327-130-35): full acquisition, Jack-in-the-Box restaurant. Proposed sidewalks along Missouri Flat Road result in acquisition of drive-through lane and window. A partial acquisition may result if the location of

the drive-through lane and window can be reoriented to the rear of the structure, which would also require redesign of the restaurant's interior space. This outcome is considered unlikely as the building setback is unlikely to meet County standards with the proposed sidewalks.

- 3943 Missouri Flat Road (APN 327-130-14): full acquisition , Chevron Station & Food Mart. A partial acquisition may result if the gas pumps can be relocated to another area of the site (e.g., alongside the food mart and vehicle service bays), which would leave the business largely intact. This outcome is considered unlikely, however, because moving the pumps would be difficult and costly, shifting the location of the pumps would result in the loss of parking space needed for the food mart and service bays, and internal traffic circulation would likely be impeded.

The County would comply with the requirements of state and federal laws to mitigate relocation impacts. The 3 displaced businesses would require replacement commercial properties suitable for their types of businesses. Informal discussions with the owner and tenant of the H&S Gas Mart propane property indicate that relocation of this business may not be necessary. The property owner has indicated an interest in selling the property, and the tenant-operator of H&S Gas Mart has indicated an interest in retiring and closing the business once the property has been sold (Payne pers. comm.). Should the business require relocation, H&S Gas Mart would require a nearby site with a relatively small (1,400-square-foot) light industrial type structure.

The Jack-in-the-Box and Chevron businesses would require visible locations on streets with high traffic volumes. Relocating these businesses may require constructing commercial retail space that fits the specific needs of the displaced businesses. According to the draft environmental impact report prepared for the MC&FP (EDAW 1998), an estimated 1.5 million square feet of commercial space was expected to be developed in the Missouri Flat area at buildout of areas designated for commercial uses, including 768,000 square feet of commercial space on vacant properties with no pending projects. According to CB Richard Ellis (2001), more than 62,000 square feet of commercial space were also available for lease in the Folsom/El Dorado Hills market area during the latter part of 2001. These data indicate that ample commercial properties are available in the Missouri Flat area and in nearby areas for relocation of the displaced businesses.

Additionally, an opportunity may exist to relocate at least 1 of the potentially displaced businesses to the El Dorado Villages Shopping Center site, an approved

retail development that will be constructed on the vacant parcel immediately south of the displaced Jack-in-the-Box and Chevron businesses. The development includes sites for a gas station and 2 fast food restaurants. A commitment has already been made to lease the gas station site; however, the fast-food sites are still available, providing a potential opportunity for nearby relocation of the Jack-in-the-Box restaurant (Sparre pers. comm.).

This impact is considered to be adverse since existing businesses would be displaced.

- *Mitigation Measure R1a: Compensate Displaced Land Uses in Conformance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act.* See Impact R1 for a description of this measure.

Temporary Impacts: 4-Lane Tight Diamond Interchange

The proposed action would not result in any temporary displacement impacts.

Cumulative Impacts: 4-Lane Tight Diamond Interchange

See Chapter 4 for a discussion of cumulative impacts.

No-Action Alternative

No construction would occur under this alternative. Therefore, no residential or commercial displacements would occur.

3.4 Traffic and Transportation/Pedestrian and Bicycle Facilities

The information below is summarized from the project’s traffic report (Fehr & Peers Associates, Inc. 2002); this report is available for review at County offices (see the List of Technical Studies in the Introduction of this joint document for the address and phone number of County offices). This section addresses U.S. 50 ramp junction and arterial intersection operations under existing conditions and in 2005 and 2015. It also addresses impacts on bicyclists and pedestrians in the project area, as well as short-term construction-related safety concerns.

3.4.1 Affected Environment

Automobiles are the primary travel mode for most trips in the study area. The area is also accessible by bus transit and, to a lesser degree, by walking or bicycling.

Existing Roadway Network

Since most trips in the study area are made by automobile, the roadway system is the primary focus of this analysis.

U.S. Highway 50

This 4-lane freeway provides the primary transportation corridor in El Dorado County (County), serving commute, interregional, and local traffic. U.S. Highway 50 (U.S. 50) traverses the County in an east-west direction, connecting most of its urbanized communities.

Missouri Flat Road

Missouri Flat Road, designated as an arterial roadway in the County General Plan, begins at State Route 49 (Pleasant Valley Road) and extends north to Green Valley Road north of U.S. 50. Missouri Flat Road provides access to U.S. 50 from the El Dorado and Diamond Springs communities and serves a variety of commercial uses near the U.S. 50 interchange and south of Forni Road.

The existing U.S. 50/Missouri Flat Road overcrossing was constructed in 1969 as part of an overall U.S. 50 improvement project in the County. The overcrossing consists of 3 lanes, with the center lane providing alternating left-turn lanes, narrow shoulders, and a sidewalk on only the east side of the bridge.

Recently, Missouri Flat Road was improved south of Mother Lode Drive to the Sacramento Placerville Transportation Corridor, just past Wal-Mart. North of the overcrossing, Missouri Flat Road is a 2-lane road with 1 lane in each direction, except in the vicinity of the Prospector's Plaza Drive intersection where it widens to accommodate turning movements.

Mother Lode Drive

Mother Lode Drive is a 2-lane collector that parallels U.S. 50 between Missouri Flat Road and South Shingle Road in Shingle Springs. Missouri Flat Road intersects with Mother Lode Drive, 70 meters (230 feet) south of the eastbound ramp terminus with Missouri Flat Road. Mother Lode Drive parallels U.S. 50 on the south and provides access to and from commercial, institutional, and residential uses along Mother Lode Drive.

Prospector's Plaza Drive

Prospector's Plaza Drive connects with Missouri Flat Road 120 meters (394 feet) north of the westbound ramp intersection. Prospector's Plaza Drive provides incoming and outgoing access to retail/commercial uses, including Prospector's Plaza shopping center and Jack-in-the-Box to the west and east of Missouri Flat Road, respectively.

Methods

This analysis addresses freeway, arterial, and isolated intersection operations. In addition to the traffic analysis, impacts on transit service and bikeway and pedestrian facilities in the area are evaluated.

Key assumptions used to analyze a.m. and p.m. peak-hour traffic conditions are listed below.

- Freeway and arterial facilities were analyzed using procedures and methodologies contained in the *Highway Capacity Manual* (HCM) (Transportation Research Board 1994).
- Freeway ramp junctions were analyzed using the Highway Capacity Software (HCS), which applies the 1994 HCM procedures.
- Freeway "weaving areas" were analyzed using the Caltrans LOSC Method described in the *Highway Design Manual* (California Department of Transportation 1995) and evaluated using the CORSIM Version 5.0 software program.

- Arterial intersections were analyzed using the CORSIM Version 5.0 software program. The CORSIM calculation of intersection delay is consistent with the procedures described in the 1994 HCM. As part of the arterial intersection analysis, maximum queue lengths were projected for critical turning movements.
- The peak-hour factor (PHF) for all analysis scenarios was 0.90.
- The peak-hour truck percentage for all analysis scenarios was 5% for mainline U.S. 50 and 2% for ramps and local roadways.
- The arterial saturation flow rate for existing conditions was 1,800 passenger cars per hour per lane (pcphpl).
- The intersection lane utilization factors were 1.05 for dual through lanes and 1.03 for exclusive dual left-turn lanes as defined in Table 9-4 of the HCM.

Level of Service Criteria

The peak-hour analysis results include a descriptive term known as *level of service* (LOS). The LOS is a qualitative measure of traffic operating conditions, which varies from LOS A (the best) to LOS F (the worst). Tables 3.4-1, 3.4-2, and 3.4-3 present the LOS criteria for ramp junctions, weaving areas, and signalized intersections, respectively.

Table 3.4-1. Ramp Junction Level of Service Criteria

LOS	Maximum Density (pc/mi/ln)	Description
A	10	Unrestricted operation. Merging and diverging vehicles have little effect on other freeway flows.
B	20	Merging and diverging maneuvers become noticeable to through drivers and minimal levels of turbulence exist.
C	28	Average speed within the ramp influence area begins to decline as the level of merging or diverging turbulence becomes noticeable.
D	35	Turbulence levels become intrusive and virtually all vehicles slow to accommodate merging or diverging maneuvers.
E	>35 and minimum speed of 42 mph	Conditions are approaching and reaching capacity operation. Speeds are reduced to the low 40s (miles per hour [mph]), and the turbulence of merging and diverging maneuvers becomes intrusive to all drivers in the influence area.
F	*	Conditions are saturated. At this level, approach demand flow exceeds the discharge capacity of the downstream freeway (and ramp, in the case of diverge areas).

Source: Transportation Research Board 1994.

Note: pc/mi/ln = passenger cars/mile/lane.

* Demand flow exceeds capacity.

Table 3.4-2. Weaving Area Level of Service Criteria

LOS	Minimum Average Weaving Speed (mph)	Minimum Average Non-Weaving Speed (mph)
A	55	60
B	50	54
C	45	48
D	40	42
E	35	35
F	< 35	< 35

Source: Transportation Research Board 1994.

Table 3.4-3. Signalized Intersection LOS Criteria

LOS	Average Stopped Delay (seconds/vehicle)	Description
A	< 5.0	Very low delay. Most vehicles do not stop.
B	5.1–15.0	Generally good progression of vehicles. Slight delays.
C	15.1–25.0	Fair progression. Increased number of stopped vehicles.
D	25.1–40.0	Noticeable congestion. Large portion of vehicles stopped.
E	40.1–60.0	Poor progression. High delays and frequent cycle failure.
F	> 60.0	Oversaturation. Forced flow. Extensive queuing.

Source: Transportation Research Board 1994.

Minimum Acceptable Levels of service

The analysis evaluation criteria are used to determine acceptable traffic operating conditions. Caltrans has identified LOS D as desirable for U.S. 50 through the study area.

Under Policy 3.5.1.1 of the 1996 El Dorado County General Plan, the County is required to maintain LOS E on all roadways. In addition, the County shall not allow the LOS to drop below the projected LOS under 2015 conditions with the roadway plan (i.e., *El Dorado County 20-Year Capital Improvement Program [CIP]*, El Dorado County Department of Transportation, July 25, 1996) assumed in place. For this study, the following LOS thresholds were used for the study intersections based on Policy 3.5.1.1 1; these LOS are the same or better than the projected 2015 LOS for these roadways (Note that Policy 3.5.1.1, addressing roadways, is applied to intersections since intersections are the nodes that connect roadway segments and are the critical elements that control traffic operations through the roadway system. Therefore, intersection operations govern LOS for the roadway system.):

Intersection	Minimum Acceptable LOS
• Missouri Flat Road/Prospector’s Plaza Drive	C
• Missouri Flat Road/Bank Driveway	C
• Missouri Flat Road/U.S. 50 westbound ramps	D
• Missouri Flat Road/U.S. 50 eastbound ramps	E
• Missouri Flat Road/Mother Lode Drive	E

NOTE: The MC&FP EIR (EDAW 1998) identifies the LOS threshold for the Missouri Flat Road/U.S. 50 eastbound ramps as D rather than E. This difference is due to a refined interpretation of the limits of the CIP roadway segments. LOS D was identified in the MC&FP EIR since LOS D is Caltrans’ threshold. However, further discussions with Caltrans and the County have indicated that the County’s threshold of E should be used consistent with the 1996 General Plan.

Study Conditions

This section includes an analysis of the following study conditions:

- existing conditions,
- 2005 No-Action Alternative,
- 2005 with 4-lane tight diamond interchange (proposed action), and
- Cumulative 2015 with 4-lane tight diamond interchange (proposed action).

The following scenarios were also analyzed and are included in Chapter 5:

- Cumulative 2025 with No-Project Alternative,
- Cumulative 2025 with Single Point Diamond Interchange,
- Cumulative 2025 with 6-Lane Tight Diamond Alternative, and
- Cumulative 2025 with Phase 1 4-Lane Tight Diamond Alternative.

Existing Conditions

To provide reviewers with a context for how a.m. and p.m. peak-hour traffic operations are projected to change over time, an analysis of existing traffic operations in the study area was conducted. In addition, existing traffic safety was also evaluated.

The operations analysis included the following freeway and arterial facilities.

Freeway Ramp Junctions

- U.S. 50 westbound off-ramp,

- U.S. 50 westbound on-ramp,
- U.S. 50 eastbound off-ramp, and
- U.S. 50 eastbound on-ramp.

The ramp junctions govern the operation of the freeway mainline in the vicinity of the U.S. 50/Missouri Flat Road interchange. Therefore, the ramp junction LOS also describes the freeway mainline operation. For some alternatives, the ramp junction is part of a weaving area. In these cases, performance measures related to the weaving area are reported, which also govern the operation of the freeway mainline.

Arterial Intersections

- Missouri Flat Road/Prospector’s Plaza Drive,
- Missouri Flat Road/Bank Driveway,
- Missouri Flat Road/U.S. 50 westbound ramps,
- Missouri Flat Road/U.S. 50 eastbound ramps, and
- Missouri Flat Road/Mother Lode Drive.

Figure 3.4-1 displays the existing geometrics, traffic control, and peak-hour traffic volumes for the selected analysis locations. As depicted in the figure, the U.S. 50/Missouri Flat Road interchange has tight diamond ramps in the eastbound direction with a loop off-ramp and diagonal on-ramp in the westbound direction. U.S. 50 has 2 mixed-flow lanes in each direction through the interchange area.

Freeway Operations

Traffic operations results for the ramp junctions are contained in Table 3.4-4. As stated above, the operations of the ramp junctions govern the operation of the freeway mainline through the study area. Therefore, the mainline LOS is the same as that reported for the ramp junctions.

Table 3.4-4. Ramp Junction LOS Summary—Existing Conditions

Ramp Junction	A.M. Peak-Hour LOS/Density	P.M. Peak-Hour LOS/Density
U.S. 50 eastbound off-ramp	C/21	C/26
U.S. 50 eastbound on-ramp	C/20	C/24
U.S. 50 westbound off-ramp	C/25	C/26
U.S. 50 westbound on-ramp	B/19	B/18

Table 3.4-4 shows that the ramp junctions operate at LOS C or better under existing conditions during both peak hours.

Arterial Intersection Operations

Traffic operations results for the arterial intersections are displayed in Table 3.4-5.

Table 3.4-5. Intersection LOS Summary—Existing Conditions

Ramp Junction	A.M. Peak-Hour LOS/Delay ^a	P.M. Peak-Hour LOS/Delay ^a
Missouri Flat Road/Prospector’s Plaza Drive	B/10	<u>F/>60</u>
Missouri Flat Road/Bank Driveway (unsignalized)	A/2	<u>F/>45</u>
Missouri Flat Road/U.S. 50 westbound ramps	D/36	F/>60
Missouri Flat Road/U.S. 50 eastbound ramps	B/9	F/>60
Missouri Flat Road/Mother Lode Drive	B/8	<u>F/>60</u>

^a Average stopped delay for signalized intersections and average total delay for two-way stop controlled intersections. All delay is reported in seconds per vehicle. LOS shown in bold underline font represents observed conditions. The theoretical intersection LOS based solely on traffic counts is better. However, the theoretical calculations only consider the volume passing through the intersection, and observation of the intersection revealed long queues and high delays.

Table 3.4-5 shows that a.m. peak-hour intersection operations are satisfactory with all intersections at LOS D or better. During the p.m. peak hour, the Missouri Flat Road/Mother Lode Drive intersection operates at LOS F, which affects upstream intersection operations. As a result, extensive queuing occurs at most intersections for more than 1 hour during the evening. Field observations confirm that significant delays and queuing occur at several locations along the Missouri Flat Road corridor during the p.m. peak hours, and that the overall corridor can be described as operating at LOS F. These observations are summarized in the following bullets.

- Northbound Missouri Flat Road has vehicle queues from the eastbound on-ramp back through the Mother Lode Drive intersection.
- Southbound Missouri Flat Road has vehicle queues from Mother Lode Drive, through the eastbound U.S. 50 ramp intersection, and onto the U.S. 50 overcrossing. On occasion, this queuing will block the left-turn lane for the eastbound U.S. 50 on-ramp.
- Eastbound U.S. 50 off-ramp has traffic queues resulting from congestion at the Missouri Flat Road intersection. Vehicles desiring to make a right turn from this off-ramp onto southbound Missouri Flat Road are typically unwilling to make the right turn during the red phase. The layout and striping of this intersection make it difficult for these turning vehicles to complete this turn while Missouri Flat Road southbound traffic is passing through the intersection. The phase length for the eastbound off-ramp was observed to be approximately 10 seconds. This phase length allowed the standing queue for the left-turn movement to discharge but was not long enough to discharge the standing queue for the right-turn movement.
- Westbound U.S. 50 off-ramp traffic queues back along the ramp because of congestion at the Missouri Flat Road intersection. During the field visit, this traffic was typically able to pass through the intersection within 1 cycle.

- Southbound Missouri Flat Road traffic queues between the westbound U.S. 50 ramp intersection and the Prospector’s Plaza Drive intersection. This queue was observed to frequently extend through the Prospector’s Plaza Drive intersection.

Traffic Safety

Table 3.4-6 shows a summary of traffic accident data at the U.S. 50/Missouri Flat Road interchange from the Traffic Accident Surveillance and Analysis System (TASAS) database maintained by Caltrans (2002). The data are shown for the 3-year period between July 1997 and June 2000.

Table 3.4-6. U.S. 50/Missouri Flat Road Interchange Accident History July 1997 Through June 2000

Location	Total Accidents in 3-Year Period	Total Fatalities in 3-Year Period	Actual Accident Rate ^a	Average Accident Rate Statewide for Similar Facilities
U.S. 50 both directions	48	0	0.62 per MV	0.60 per MV
Eastbound off-ramp	8	0	1.43 per MV	1.35 per MV
Eastbound on-ramp	8	0	0.71 per MV	0.55 per MV
Westbound off-ramp	17	0	1.58 per MV	1.75 per MV
Westbound on-ramp	4	0	0.82 per MV	0.80 per MV

Source: Caltrans District 3 TASAS Table B Data.

^a MV = million vehicles.

These data indicate that the accident rate on U.S. 50 in the vicinity of the Missouri Flat Road interchange was greater than the average rate for similar mainline facilities. The actual accident rate was also greater than average for the eastbound ramps and westbound on-ramp. Although none of the accidents resulted in a fatality, injuries occurred in approximately 45% of the mainline accidents and about 35% of the ramp accidents. Contributing factors in the mainline accidents were darkness (29%) and wet conditions (17%). These same factors were also present in at least 1 accident for each of the ramps.

Transit System

The County’s public transit system consists of fixed-route bus service, dial-a-ride bus service in Placerville and outlying communities, and daily commuter bus service to Sacramento. These services are provided by the El Dorado County Transit Authority (EDCTA). Prospector’s Plaza is a major transit center and transfer point. All 7 EDCTA bus lines have scheduled stops. In the project area, bus lines run along Missouri Flat Road and Mother Lode Drive. Caltrans operates a 73-space park-and-

ride lot in the southwest quadrant of the U.S. 50/Missouri Flat Road interchange which accommodates automobiles only.

Bicycle/Pedestrian System

The 1979 County Bikeway Master Plan shows a bicycle lane (Class II facility) on Missouri Flat Road from Pleasant Valley Road to Green Valley Road (EDAW 1998). The El Dorado County Bicycle Transportation Plan (El Dorado County Parks and Recreation Division 2001) (approved by the EDCTC, on June 5, 1997, and amended by the County Parks and Recreation Department and the County Parks and Trail Advisory Committee on March 11, 2001) calls for a Class II bicycle lane along Missouri Flat Road from Forni Road north to Mother Lode Drive and from U.S. 50 north to Green Valley Road. A recently completed widening project has provided a Class II bicycle lane from north of China Garden Road to Mother Lode Drive.

Missouri Flat Road within the project area provides a discontinuous system of sidewalks. No sidewalks currently exist on the Missouri Flat Road overcrossing. No pedestrians were observed in the interchange area during numerous site visits by the project traffic engineer.

3.4.2 Environmental Consequences

This section presents the methodology used and the analysis results for those future-year conditions identified under the “Study Conditions” section above.

Methods

Baseline

The baselines used to evaluate project impacts were existing conditions and 2005 No-Action conditions. The 2005 No-Action conditions include major commercial projects in the project vicinity which have already been approved, some of which are under construction.

Traffic Volume Forecasts

The traffic volume forecasts were generated using a modified version of the regional SACMET travel demand model that is maintained by the Sacramento Area Council of Governments (SACOG). The modified SACMET model used 2025 market-based land use development levels projected by SACOG. These projections for El Dorado County were generally allocated to traffic analysis zones based on the 1996 County General Plan. The SACMET model assumes a County population of approximately

213,000 in 2025. The 1996 General Plan was based on 2015 projections and is generally considered to be a “high-growth” general plan. The General Plan update is based on a 2025 population growth projection of approximately 200,000. Therefore, the land use inputs to the SACMET model represent a reasonable worst-case assumption, and analysis based on this assumption avoids understating the significance of future cumulative traffic impacts.

A summary of other key modifications is provided below.

- **Split Traffic Analysis Zones (TAZs).** SACMET TAZs in the vicinity of the study area were split to increase the level of land use detail in the study area.
- **Increase Future-Year Households and Employment.** Potential development in the vicinity of the interchange was added to the future-year socioeconomic forecasts of households and employment.
- **Modify Roadway Networks.** The SACMET roadway networks were modified to improve the level of detail in the study area and to maintain consistency with the existing and planned roadway systems.

After making these modifications, a.m. and p.m. peak-hour traffic volume forecasts were generated for design year (2025) conditions. 2005 (construction year) and 2015 traffic volume forecasts were developed through linear interpolation.

Planned Improvements

For all of the 2015 study conditions, the analysis assumed that the U.S. 50/Forni Road/Placerville Drive interchange would be improved by 2015 according to the Alternative 1 design contained in the *Western Placerville Interchanges Project Study Report* (Dokken Engineering 2001) since it is likely that these improvements will be in place by 2015 (For the 2025 CEQA analysis contained in Chapter 5, this same assumption was made.). The final improved interchange configuration has not been determined. The draft environmental document for this is expected to be completed in the summer of 2004.

2005 Conditions

For 2005 conditions, the 4-lane tight diamond was compared to existing and 2005 No-Action conditions (2005 No-Action conditions include major commercial projects in the project vicinity which have already been approved, some of which are under construction). Figures 3.4-2 and 3.4-3 display the geometrics, traffic control, and peak-hour traffic volumes for these 2 scenarios. The analysis results are discussed below.

Freeway Operations

Traffic operations results for the U.S. 50 ramp junctions and weaving areas created by the 4-lane tight diamond under 2005 conditions are contained in Tables 3.4-7 and 3.4-8. Table 3.4-7 also contains the results for the No-Action conditions in 2005.

Table 3.4-7. Ramp Junction and Weaving Section LOS/Operations Summary—2005 Conditions

Ramp Junction	No-Action Condition		4-Lane Tight Diamond	
	A.M. Peak-Hour LOS/Density ^a	P.M. Peak-Hour LOS/Density ^a	A.M. Peak-Hour LOS/Density ^a	P.M. Peak-Hour LOS/Density ^a
U.S. 50 eastbound off-ramp	C/24	C/28	C/24	C/28
U.S. 50 eastbound on-ramp	C/23	C/26	(b)	(b)
U.S. 50 westbound off-ramp	C/26	D/31	(b)	(b)
U.S. 50 westbound on-ramp	C/20	C/21	C/20	C/21
Weaving area (CORSIM results)	A.M. peak-hour avg. speed ^c	P.M. peak-hour avg. speed ^c	A.M. peak-hour avg. speed ^c	P.M. peak-hour avg. speed ^c
U.S. 50 eastbound—Missouri Flat Road on-ramp to Forni Road off-ramp	58	12 ^d	39 ^d	14 ^d
U.S. 50 westbound—Placerville Drive on-ramp to Missouri Flat Road off-ramp	59	20	62	62

^a Density is reported in passenger cars per mile per lane.

^b The 4-Lane Tight Diamond interchange includes continuous auxiliary lanes on U.S. 50 between the Missouri Flat Road and Forni Road/Placerville Drive interchanges, which create weaving sections that govern the operation of the freeway in this area.

^c Avg. speed = average speed for U.S. 50 freeway segment between Missouri Flat Road and Forni Road.

^d Low speeds in the eastbound direction are caused by congestion downstream of the U.S. 50 off-ramp at Forni Road.

Note: The p.m. peak hour LOS for the eastbound off-ramp junction under the no-action condition would be worse than reported. The reported LOS ignores the potential effects of queuing from the ramp terminal intersection, which are projected to extend back to the mainline causing poor (i.e., LOS E or F) conditions for this ramp junction.

The results in Table 3.4-7 show that the tight diamond ramp junctions would operate at LOS D or better and average speeds through the weaving areas would be less than 20 mph in the eastbound direction during the p.m. peak hour and more than 60 mph in the westbound direction during both peak hours. Average speeds above 42 mph for nonweaving vehicles and above 40 mph for weaving vehicles are associated with LOS D conditions based on the 1994 HCM. Average speeds less than 35 mph are associated with LOS F conditions. Because the CORSIM speeds do not differentiate between weaving and nonweaving vehicles, an exact comparison to the 1994 HCM criteria to determine LOS is not possible. Nevertheless, based on a review of the simulation animation and an average speed for all vehicles above 42 mph for the westbound weaving section, this weaving section was considered to operate acceptably.

Based on similar information for the eastbound weaving section, unacceptable operations are projected to occur. The low speeds for this section are a result of queuing from the U.S. 50/Forni Road/Placerville Drive interchange that originates at the ramp terminal intersections. The eastbound queues are projected to extend onto the U.S. 50 mainline as far back as the U.S. 50/Missouri Flat Road interchange under 2005 No-Action or 4-lane tight diamond conditions. The 4-lane tight diamond improvements to the Missouri Flat Road interchange would allow more peak-hour traffic to enter eastbound U.S. 50 from Missouri Flat Road, which would exacerbate the queuing problem. However, the 4-lane tight diamond interchange would also provide a continuous auxiliary lane in the eastbound direction, which would reduce the delay to through vehicles.

As noted above, the average speed through the weaving area is not associated with a specific LOS because the CORSIM output does not provide speed performance measures that are consistent with the 1994 HCM methodology. Further, Caltrans does not consider the HCM analysis of weaving areas to always provide accurate results (Section 504.7, *Highway Design Manual* [California Department of Transportation 1995]). Instead, Caltrans relies on methodologies other than the HCM to analyze weaving operations. For this study, the LOS C Method documented in the manual was used to complement the CORSIM evaluation. This methodology determines the minimum length between successive on- and off-ramps required to provide LOS C operations based on the total weaving volume and without regard for arrival rates of freeway or ramp traffic. The LOS C Method results are shown in Table 3.4-8.

**Table 3.4-8. Caltrans Weaving Operations Evaluation
 4-Lane Tight Diamond Interchange—2005 Conditions**

Weaving Section	Weaving Length (meters)	Minimum Weaving Section Length to Maintain LOS C ^a (meters)	
		A.M. Peak Hour	P.M. Peak Hour
U.S. 50 eastbound—Missouri Flat Road on-ramp to Forni Road off-ramp	954	306	356
U.S. 50 westbound—Placerville Drive on-ramp to Missouri Flat Road off-ramp	610	293	396

^a Caltrans Highway Design Manual, Section 504.7.

Although the 4-lane tight diamond interchange would provide weaving section lengths for eastbound and westbound U.S. 50 that are sufficient to maintain LOS C operations, this evaluation ignores the queuing problem projected to occur on

eastbound U.S. 50 because of the operation of the U.S. 50/Forni Road/Placerville Drive interchange.

Arterial Intersection Operations

Traffic operations results for the arterial intersections are displayed in Table 3.4-9.

Table 3.4-9. Intersection LOS/Operations Summary—2005 Conditions

Intersection	No-Action Condition		4-Lane Tight Diamond	
	A.M. Peak-Hour LOS/Delay ^a	P.M. Peak-Hour LOS/Delay ^a	A.M. Peak-Hour LOS/Delay ^a	P.M. Peak-Hour LOS/Delay ^a
Missouri Flat Road/Prospector's Plaza Drive	B/11	<u>F>60</u>	B/13	B/14
Missouri Flat Road/Bank Driveway (unsignalized)	A/4	<u>F>45</u>	(b)	(b)
Missouri Flat Road/U.S. 50 westbound ramps	D/26	<u>F>60</u>	B/14	C/18
Missouri Flat Road/U.S. 50 eastbound ramps	C/15	<u>F>60</u>	B/6	C/18
Missouri Flat Road/Mother Lode Drive	B/11	<u>F>60</u>	B/6	B/9 ^c
Arterial operations performance	A.M. peak hour	P.M. peak hour	A.M. peak hour	P.M. peak hour
Vehicle demand served	97%	83%	100%	101%
Vehicle hours of delay	38	197	22	52

Note: 2005 conditions assume that the U.S. 50/Forni Road/Placerville Drive interchange improvements are not in place. See the "Planned Improvements" section.

^a Average stopped delay for signalized intersections and average total delay for 2-way stop controlled intersections. All delay is reported in seconds per vehicle.

^b Under the 4-lane tight diamond, the bank driveway is closed.

^c The reported LOS B assumes optimized signal timing. The LOS at this intersection may be worse, using slightly different signal timing, which may be necessary because of the short distance to the eastbound off-ramp intersection.

LOS shown in bold underlined font indicates the intersection LOS is assumed to be F because less than 95% of peak-hour vehicle demand is served. As a result, peak-hour conditions would spread to multiple hours.

Because the No-Action interchange configuration would only accommodate 83% of the projected 2005 p.m. peak-hour demand, LOS F is assumed to occur at all study locations for at least 1 hour. The 4-lane tight diamond interchange would improve a.m. and p.m. peak-hour traffic operations compared to No-Action conditions. All of the intersections would operate at LOS C or better for 2005 conditions with the 4-lane tight diamond interchange.

2015 Conditions

For 2015 conditions, the 4-lane tight diamond interchange was evaluated to determine if it would operate adequately for a minimum of 10 years after construction. This time period is typically used by Caltrans to justify the phasing of state highway improvements. Figure 3.4-4 displays the geometrics, traffic control, and peak-hour traffic volumes for this scenario. Note that this scenario assumes that the U.S. 50/Forni Road/Placerville Drive interchange will be improved by 2015 since it is

likely that these improvements will be in place by 2015. The project report and environmental document for this project are expected to be completed in 2003.

The analysis results are discussed below.

Freeway Operations

Traffic operations results for the U.S. 50 ramp junctions and weaving areas created by the 4-lane tight diamond under 2015 conditions are contained in Tables 3.4-10 and 3.4-11.

**Table 3.4-10. Ramp Junction and Weaving Area LOS/Operations Summary
 4-Lane Tight Diamond Interchange—2015 Conditions**

Ramp Junction	A.M. Peak-Hour LOS/Density ^a	P.M. Peak-Hour LOS/Density ^a
U.S. 50 eastbound off-ramp	D/31	D/31
U.S. 50 westbound on-ramp	C/22	C/27
Weaving area (CORSIM results)	A.M. peak-hour avg. speed ^b	P.M. peak-hour avg. speed ^b
U.S. 50 eastbound—Missouri Flat Road on-ramp to Forni Road off-ramp	60	59
U.S. 50 westbound—Placerville Drive on-ramp to Missouri Flat Road off-ramp	61	59

Note: 2015 conditions assume the U.S. 50/Forni Road/Placerville Drive interchange improvements are in place. See the “Planned Improvements” section.

^a Density is reported in passenger cars per mile per lane.

^b Avg. speed = average speed for U.S. 50 eastbound freeway segment between Missouri Flat Road and Forni Road.

The ramp junctions would continue to operate acceptably at LOS D or better under 2015 conditions with the 4-lane tight diamond, and the weaving area speeds would be approximately 60 mph in both directions during the a.m. and p.m. peak hours. The average speeds represent almost free-flow conditions and are substantially higher than the 42 mph LOS D threshold for nonweaving vehicles used by the 1994 HCM. Further, the CORSIM simulation shows no operational problems in the weaving sections. Therefore, both weaving sections were considered to operate acceptably.

Table 3.4-11 contains the weaving operations evaluation for 2015 conditions using the Caltrans LOS C Method. The results show an insufficient weaving section length in the westbound direction on U.S. 50. Since the LOS C methodology does not consider the rate of traffic flow into the weaving section, CORSIM was used to analyze the weaving section. This analysis showed that the weaving section would operate acceptably with a.m. and p.m. peak-hour average speeds for all freeway vehicles of approximately 60 mph between the 2 ramps.

**Table 3.4-11. Caltrans Weaving Operations Evaluation
 4-Lane Tight Diamond Interchange—2015 Conditions**

Weaving Section	Weaving Length (meters)	Minimum Weaving Section Length to Maintain LOS C ^a (meters)	
		A.M. Peak Hour	P.M. Peak Hour
U.S. 50 eastbound—Missouri Flat Road on-ramp to Forni Road off-ramp	884	377	408
U.S. 50 westbound—Placerville Drive on-ramp to Missouri Flat Road off-ramp	314	<u>347</u>	<u>465</u>

^a Caltrans Highway Design Manual, Section 504.7.

Bold and underlined minimum weaving section lengths are not achievable.

Arterial Intersection Operations

Traffic operations results for the arterial intersections are displayed in Table 3.4-12.

**Table 3.4-12. Intersection LOS/Operations Summary
 4-Lane Tight Diamond Interchange—2015 Conditions**

Intersection	A.M. Peak-Hour LOS/Delay ^a	P.M. Peak-Hour LOS/Delay ^a
Missouri Flat Road/Prospector's Plaza Drive	B/13	C/18
Missouri Flat Road/U.S. 50 westbound ramps	C/15	C/17
Missouri Flat Road/U.S. 50 eastbound ramps	B/6	C/15
Missouri Flat Road/Mother Lode Drive	B/7	B/8 ^b
Arterial operations performance	A.M. peak hour	P.M. peak hour
Vehicle demand served	98%	99%
Vehicle hours of delay	27	60

^a Average stopped delay in seconds per vehicle.

^b The reported LOS B assumes optimized signal timing. The LOS at this intersection may be worse, using slightly different signal timing, which may be necessary because of the short distance to the eastbound off-ramp intersection.

The 4-lane tight diamond interchange would provide LOS C or better operations at the study intersections through 2015. Vehicle hours of delay would also remain lower than 2005 No-Action conditions.

Permanent Impacts: 4-Lane Tight Diamond Interchange

Impact T1: 2005—Acceptable LOS at All Ramp Junctions

All ramp junctions would operate at LOS C in 2005 with construction of the 4-lane tight diamond interchange (Table 3.4-7). The proposed action would not degrade existing or 2005 No-Action LOS from an acceptable to an unacceptable level (the minimum acceptable LOS is considered C at the Missouri Flat Road/Prospector's Plaza Drive and Missouri Flat Road/Bank Driveway intersections, D at the Missouri Flat Road/U.S. 50 westbound ramps intersection, and E at the Missouri Flat Road/U.S. 50 eastbound ramps and the Missouri Flat Road/Mother Lode Drive intersections; see the "Minimum Acceptable Levels of Service" section). Therefore, this impact is not considered to be adverse.

Mitigation Measure

None proposed.

Impact T2: 2005—Unacceptable Weaving Conditions at the U.S. 50/Missouri Flat Road Eastbound On-Ramp until the U.S. 50/Forni Road/Placerville Drive Interchange is Improved

Unacceptable weaving conditions are expected to occur at the U.S. 50 eastbound on-ramp because of existing queuing from the U.S. 50/Forni Road/Placerville Drive interchange that originates at the ramp terminal intersections based upon the current weaving threshold criteria of LOS D (Caltrans has allowed LOS E at other locations in the state). Weaving conditions at the U.S. 50 westbound on-ramp are expected to be acceptable in 2005.

The eastbound queues are projected to extend onto the U.S. 50 mainline as far back as the U.S. 50/Missouri Flat Road interchange under both No-Action and 4-lane tight diamond conditions. The proposed 4-lane tight diamond improvements to the Missouri Flat Road interchange would allow more peak-hour traffic to enter eastbound U.S. 50 from Missouri Flat Road, which would exacerbate the existing queuing problem. (It should also be noted that the 4-lane tight diamond improvements provide a continuous auxiliary lane in the eastbound direction, which would reduce the delay to through vehicles and reduce the safety concerns associated with the queued vehicles encroaching on the through lanes.) This impact is considered to be adverse in the short-term (until the U.S. 50/Forni Road/Placerville Drive interchange is improved) (even considering the reduction in delay) because the proposed action would change the existing LOS of this weaving section from an acceptable one (LOS C) to an unacceptable one (as noted in the “2005 Conditions” section, the average speed through this weaving area is not associated with a specific LOS because the CORSIM output does not provide speed performance measures that are consistent with the 1994 HCM methodology. However, acceptable operations are not expected to occur based on evaluation of average speeds.).

Mitigation Measure T2

Reducing this adverse impact would require construction of planned improvements at the U.S. 50/Forni Road/Placerville Drive interchange prior to completing the improvements to the U.S. 50/Missouri Flat Road interchange. The County cannot control the timing of improvements at the U.S. 50/Forni Road/Placerville Drive interchange. Until the U.S. 50/Forni Road/Placerville Drive interchange is improved,

implementation of Mitigation Measure T2a (described below) would reduce this impact.

Mitigation Measure T2a: Provide Temporary Ramp Metering for the U.S. 50 Eastbound On-Ramp from Missouri Flat Road

The CORSIM micro-simulation model that was developed for this proposed action was used to analyze ramp metering at the U.S. 50 eastbound on-ramp for the 4-lane tight diamond. This analysis (David Stanek pers. comm.) assumed that the ramp meter has two metered lanes and the ramp geometry provides a storage length of approximately 313.9 meters (1,030 feet) (from the eastbound ramp intersection to the ramp meter stop bar). It was also assumed that two vehicles per lane would enter the freeway during each ramp meter cycle. This analysis included a.m. and p.m. peak hour analysis involving multiple iterations testing varying the ramp metering rates. The goal of this analysis was to provide a balance between freeway mainline and arterial intersection operations. Two ramp metering rates were evaluated:

- Option 1 (minimum headway) with headways of 20 and 16.4 seconds per cycle for the a.m. and p.m. peak hours, respectively, such that queues on the ramp would not extend onto Missouri Flat Road and more traffic would be allowed onto U.S. 50 (360 vehicles per hour [vph] per lane in the a.m. peak hour and 438 vph per lane in the p.m. peak hour);
- Option 2 (maximum headway) with maximum rate of 240 vph per lane (or 30 seconds per cycle) in the a.m. and p.m. peak hours to reduce demand on U.S. 50 approaching the Forni Road interchange.

Table 3.4-13 shows that adding a ramp meter at the eastbound on-ramp improves the average speed to near free-flow conditions during the a.m. peak hour and significantly improves speeds during the p.m. peak hour. Option 2 provides higher freeway speeds, primarily during the p.m. peak hour.

Table 3.4-13. U.S. 50 Eastbound Average Speed^a—2005 Conditions

Scenario	Am Peak Hour	Pm Peak Hour ^b
No project	58	12
4-lane tight diamond with no ramp metering	39 ^b	14
4-lane tight diamond with minimum headway (Option 1)	55	33
4-lane tight diamond with maximum headway (Option 2)	56	55

^a Average Speed for U.S. 50 freeway segment between Missouri Flat Road and Forni Road.

^b Low speeds are caused by congestion at the Forni Road interchange that backs up onto the U.S.50 mainline.

According to the 1994 Highway Capacity Manual (HCM), average speeds above 42 miles per hour (mph) for non-weaving vehicles and 40 mph for weaving vehicles are associated with LOS D conditions. Average speeds less than 35 mph are associated with LOS F conditions. Because CORSIM does not differentiate between non-weaving and weaving vehicles, a direct comparison to the 1994 HCM criteria is not possible. Nevertheless, the improvement in average speed during the a.m. peak hour is considered to generate LOS D or better conditions for both options.

Table 3.4-14 describes intersection operations results for Missouri Flat Road. This table shows results for three options:

- 4-lane tight diamond with no ramp metering;
- 4-lane tight diamond with minimum headway; and
- 4-lane tight diamond with maximum headway.

Table 3.4-14. Intersection Operations Summary—2005 Conditions

Intersection	4-Lane Tight Diamond No Ramp Metering		4-Lane Tight Diamond Option 1 Minimum Headway		4-Lane Tight Diamond Option 2 Maximum Headway	
	A.M. Peak Hour LOS/Delay ^a	P.M. Peak Hour LOS/Delay ^a	A.M. Peak Hour LOS/Delay ^a	P.M. Peak Hour LOS/Delay ^a	A.M. Peak Hour LOS/Delay ^a	P.M. Peak Hour LOS/Delay ^a
Missouri Flat Road/ Prospector's Plaza Drive	B/13	B/14	B/13	B/14	B/13	<u>F/>60</u>
Missouri Flat Road/ U.S. 50 westbound ramps	B/14	C/18	C/15	C/19	C/16	<u>F/>60</u>
Missouri Flat Road/ U.S. 50 eastbound ramps	B/6	C/18	B/6	C/17	B/9	<u>F/>60</u>
Missouri Flat Road/ Mother Lode Drive	B/6	B/9 ^b	B/6	B/9	B/7	<u>F/>60</u>

^a Average stopped delay reported in seconds per vehicle.

^b The reported LOS B assumes optimized signal timings, so the LOS may be worse using slightly different signal timings given the short distance to the eastbound off-ramp intersection.

The results in Table 3.4-14 show that both ramp metering options provide acceptable levels of service (LOS D or better) during the a.m. peak hour. Option 1 also has acceptable LOS during the p.m. peak hour since queues from the ramp meter do not interfere with traffic operations on Missouri Flat Road. However, Option 2 creates unacceptable levels of service (LOS F) at all study intersections during the p.m. peak hour. In the a.m. peak hour, the queue from the Forni Road off-ramp extends about half-way back to the Missouri Flat Road on-ramp in the auxiliary lane. Both ramp meter options reduce this queue by about half. The queue at the ramp meter does not

affect Missouri Flat Road under Option 1, but Option 2 has congestion on northbound Missouri Flat Road approaching the interchange.

For the p.m. peak hour, 4-lane tight diamond has congestion on eastbound U.S. 50 at the Forni Road off-ramp that extends back to the Missouri Flat Road overcrossing. Ramp metering under Option 1 shrinks the congested area so that the back of queue is east of the Missouri Flat Road on-ramp. Option 2 reduces the queuing to only the auxiliary lane so that through traffic is relatively unimpeded. The ramp meter queue under Option 1 has little or no effect on Missouri Flat Road; however, the lower ramp metering rate under Option 2 causes a long ramp queue which extends onto Missouri Flat Road in both directions causing significant congestion at the adjacent intersections.

Installing a ramp meter at the eastbound on-ramp from Missouri Flat Road can mitigate the congestion on eastbound U.S. 50 for 4-lane tight diamond. If the metering rate is set such that the queues on the ramp do not back onto Missouri Flat Road (Option 1), the freeway speeds can be improved to near free-flow during the a.m. peak hour and increased over no project conditions in the p.m. peak hour. Freeway operations in the p.m. peak hour can be further improved by reducing the metering rate to the minimum practicable rate (Option 2). However, this causes new negative impacts to intersection operations on Missouri Flat Road resulting in LOS F. Therefore, it is recommended that Option 1 be implemented.

Impact T3: 2005—Acceptable LOS at All Arterial Intersections

As shown in Table 3.4-9, all study intersections would operate at LOS C or better during both the a.m. and p.m. peak hours. Construction of the 4-lane tight diamond improvements would improve a.m. and p.m. peak-hour traffic operations compared to existing and No-Action 2005 conditions, under both of which LOS F is expected at all study intersections during the p.m. peak hour. The proposed action would not degrade existing or 2005 No-Action LOS from an acceptable to an unacceptable level (the minimum acceptable LOS is considered C at the Missouri Flat Road/Prospector's Plaza Drive and Missouri Flat Road/Bank Driveway intersections, D at the Missouri Flat Road/U.S. 50 westbound ramps intersection, and E at the Missouri Flat Road/U.S. 50 eastbound ramps and the Missouri Flat Road/Mother Lode Drive intersections; see the "Minimum Acceptable Levels of Service" section). Therefore, this impact is not considered to be adverse.

Mitigation Measure

None proposed.

Impact T4: 2005—Elimination of 20 Park-and-Ride Lot Spaces

Implementation of the 4-lane tight diamond configuration would result in the loss of up to 20 automobile parking spaces in the existing 73-space park-and-ride lot in the southwest quadrant of the Missouri Flat Road interchange. This lot does not accommodate buses. This impact is considered adverse since loss of these parking spaces could result in an inadequate supply of parking at this facility.

Mitigation Measure T4a: Establish Another Park-and-Ride Lot

The County will replace up to 20 automobile park-and-ride spaces by working with El Dorado County Transit Authority on its proposal to develop another park-and-ride lot that will serve the project area. One possible location for the new lot is the northwest quadrant of the Missouri Flat Road interchange where the existing westbound on-ramp and off-ramps are located. Since the northwest quadrant was included within the project area for the proposed action, the potential for sensitive environmental resources to occur in this quadrant has been evaluated and is addressed in this joint document. No sensitive environmental resources exist in this area (A non-jurisdictional seasonal wetland [0.0055 hectare or 0.01 acre in size] is located in this area. This wetland is a small, artificial feature that was created by highway construction activities, and it has been disturbed by human activities. See Impact BR2.).

Impact T5: Provision of Class II Bicycle Lanes and a Continuous Sidewalk on Both Sides of Missouri Flat Road

The proposed action includes providing bicycle lanes (Class II facilities) along Missouri Flat Road within the project boundaries. In addition, sidewalks will be provided on Missouri Flat Road including on both sides of the overcrossing. The proposed action would not disrupt an existing bicycle or pedestrian facility, nor would it interfere with the implementation of a planned facility. As such, the proposed action is consistent with the El Dorado County Bicycle Transportation Plan, which calls for a Class II facility on Missouri Flat Road from U.S. 50 to Green Valley Road and from Forni Road to Mother Lode Drive, and the El Dorado County Bikeway Master Plan which calls for a Class II facility on Missouri Flat Road from Pleasant Valley to Green Valley Road. Therefore, no adverse impact would occur.

Mitigation Measure

None proposed.

Temporary Impacts: 4-Lane Tight Diamond Interchange

Impact T6: Construction-Related Safety Concerns

During construction of the 4-lane tight diamond improvements, motorists, bicyclists, and pedestrians may experience delays and be required to take alternative routes to their destinations. This impact is considered adverse since the proposed action has the potential to result in temporary construction-related safety concerns.

- *Mitigation Measure LU6a: Implement a Traffic Management Plan.* See Impact LU6a for a description of this mitigation measure.

Cumulative Impacts: 4-Lane Tight Diamond Interchange

Impact T7: 2015—Acceptable LOS and Weaving Conditions at All Ramp Junctions

As shown in Table 3.4-10, all ramp junctions would operate at LOS D or better during both the a.m. and p.m. peak hours. Weaving sections are also expected to operate acceptably in both directions. The proposed action would not degrade existing or 2005 No-Action LOS from an acceptable (A, B, C, or D) to an unacceptable level (E or F). Therefore, this impact is not considered to be adverse.

Mitigation Measure

None proposed.

Impact T8: 2015—Acceptable LOS at All Arterial Intersections

The proposed 4-lane tight diamond improvements would provide LOS C or better operations at study intersections in 2015 (Table 3.4-12). Implementation of these improvements would improve LOS over both existing and 2005 No-Action p.m. peak-hour levels (LOS F). The proposed action would not degrade existing or 2005 No-Action LOS from an acceptable to an unacceptable level (the minimum acceptable LOS is considered C at the Missouri Flat Road/Prospector's Plaza Drive and Missouri Flat Road/Bank Driveway intersections, D at the Missouri Flat Road/U.S. 50 westbound ramps intersection, and E at the Missouri Flat Road/U.S. 50 eastbound ramps and the Missouri Flat Road/Mother Lode Drive intersections; see the "Minimum Acceptable Levels of Service" section). Therefore, this impact is not considered to be adverse.

Mitigation Measure

None proposed.

Please note Impacts T9 and T10 appear in Chapter 5 since they are exclusively CEQA impacts.

No-Action Alternative

The No-Action Alternative would not result in any construction-related impacts since no improvements would occur. Permanent and cumulative impacts associated with the No-Action Alternative in 2005 are described below.

It should be noted that 2015 No-Action conditions were not evaluated since the 2015 analysis was intended to test the phasing of the CEQA project. However, 2015 No-Action conditions can be estimated based on the results of the existing and 2005 conditions analyses. Under existing conditions, LOS F occurs at the following intersections during the p.m. peak hour.

- Missouri Flat Road/Prospector's Plaza Drive
- Missouri Flat Road/U.S. 50 Westbound Ramps
- Missouri Flat Road/U.S. 50 Eastbound Ramps
- Missouri Flat Road/Mother Lode Drive

The queuing that occurs at the ramp terminal intersections can be severe at times such that queues occasionally extend back to the mainline.

By 2005, the LOS F conditions at these intersections are expected to worsen and spread to additional hours, which could create safety problems due to queuing extending back to the U.S. 50 mainline on a more regular basis. An indication of this problem is the projected 20 mile per hour freeway mainline speed on westbound U.S. 50 prior to the Missouri Flat Road off-ramp during the p.m. peak hour under 2005 conditions. Also, congestion at the U.S. 50/Forni Road interchange is expected to worsen such that freeway mainline speeds on eastbound U.S. 50 are projected to decrease to approximately 12 miles per hour during the p.m. peak hour under 2005 conditions. Based on these results, the U.S. 50 mainline between the Missouri Flat Road and Forni Road interchanges is projected to operate at LOS F during the p.m. peak hour in both directions by 2005. These conditions will be exacerbated under 2015 No-Action conditions by growth occurring from planned development in El Dorado County and in the vicinity of the interchanges.

Impact T11: 2005—Acceptable LOS at Ramp Junctions

All ramp junctions would operate acceptably at LOS D or better in 2005 (Table 3.4-7). Therefore, this impact is not considered to be adverse.

Mitigation Measure

None proposed.

Impact T12: 2005—Unacceptable Weaving Conditions at the U.S. 50/Missouri Flat Road Eastbound and the U.S. 50/Forni Road/Placerville Drive Westbound On-Ramp until the U.S. 50/Forni Road/Placerville Drive Interchange is Improved

Unacceptable weaving conditions are expected to occur at both the U.S. 50/Missouri Flat Road eastbound and U.S. 50/Forni Road/Placerville Drive westbound on-ramps. This condition would occur because of queuing from the U.S./Forni Road/Placerville Drive interchange. These queues are projected to extend onto the U.S. 50 mainline as far back as the U.S. 50/Missouri Flat Road interchange. This impact is considered to be adverse since unacceptable weaving conditions (worse than LOS D) are anticipated.

Mitigation Measure T12

Reducing the unacceptable weaving conditions at the eastbound on-ramp would require construction of planned improvements at the U.S. 50/Forni Road/Placerville Drive interchange prior to completing the improvements to the U.S. 50/Missouri Flat Road interchange. The County cannot control the timing of improvements at the U.S. 50/Forni Road/Placerville Drive interchange. Until the U.S. 50/Forni Road/Placerville Drive interchange is improved, implementation of Mitigation Measure T2a would reduce this impact.

- **Mitigation Measure T2a: Provide Temporary Ramp Metering for the U.S. 50 Eastbound On-Ramp from Missouri Flat Road.** See Impact T2 for a description of this mitigation measure.

For the westbound weaving segment, the following mitigation measure would reduce the adverse impact to acceptable levels:

Mitigation Measure T12a: Construct the 4-Lane Tight Diamond Interchange

This interchange configuration would provide acceptable peak-hour traffic operations at the weaving section of the westbound on-ramp.

Impact T13: 2005—Unacceptable LOS at All Arterial Intersections during the P.M. Peak Hour

Table 3.4-9 shows that under the No-Action Alternative, all intersections would operate at LOS F during the p.m. peak hour because less than 95% of peak-hour vehicle demand is served. Therefore, peak-hour conditions would spread to multiple hours. This impact is considered to be adverse since all intersections would not operate at the minimally acceptable level (the minimum acceptable LOS is considered C at the Missouri Flat Road/Prospector’s Plaza Drive and Missouri Flat Road/Bank Driveway intersections, D at the Missouri Flat Road/U.S. 50 westbound ramps intersection, and E at the Missouri Flat Road/U.S. 50 eastbound ramps and the Missouri Flat Road/Mother Lode Drive intersections).

Mitigation Measure T13a: Construct the 4-Lane Tight Diamond Interchange

This interchange configuration would provide acceptable peak-hour traffic operations. If the County decides to adopt the proposed action rather than the No-Action Alternative, this impact would be reduced to acceptable levels.

Impact T14: No Provision of Bicycle Lane or Continuous Sidewalks along Missouri Flat Road as Part of Project

Under this alternative, a Class II bicycle lane would not be constructed along Missouri Flat Road as part of the proposed action. Also, sidewalks would not be constructed. This impact is considered adverse since the No-Action Alternative is not consistent with El Dorado County’s Bicycle Master Plan or the Bicycle Transportation Plan.

- **Mitigation Measure T13a: Construct the 4-Lane Tight Diamond Interchange.** See Impact T13 for a description of this mitigation measure.

3.5 Air Quality

The information below is summarized from the project air quality report (Jones & Stokes 2002b); this report is available for review at County offices (see the List of Technical Studies in the Introduction of this joint document for the address and phone number of County offices). This section addresses operational and construction-related emissions, as well as transportation conformity.

3.5.1 Affected Environment

Physical Setting

Ambient air quality is affected by climatological conditions, topography, and the types and amounts of pollutants emitted. The following discussion describes relevant characteristics of the air basin and offers an overview of conditions affecting pollutant ambient air concentrations in the basin.

Climate and Topography

The project area is located in the Mountain Counties Air Basin (MCAB). The basin lies along the northern Sierra Nevada, close to or contiguous with the Nevada border, and covers an area of roughly 17,600 square kilometers (11,000 square miles). The western slope of El Dorado County, from Lake Tahoe on the east to the Sacramento County boundary on the west, lies within the MCAB. Elevations range from over 3,046 meters (10,000 feet) at the Sierra crest down to several hundred feet above sea level at the Sacramento County boundary. Throughout the basin, the topography is highly variable and includes rugged mountain peaks and valleys with extreme slopes and differences in altitude in the Sierra Nevada, as well as rolling foothills to the west.

The general climate of the MCAB varies considerably with elevation and proximity to the Sierra Nevada. This variable terrain makes it possible for various climates to exist in relatively close proximity. The pattern of mountains and hills causes a wide variation in rainfall, temperature, and localized winds throughout the basin. Winter temperatures in the mountains can be below freezing for weeks at a time, and substantial depths of snow can accumulate; however, in the western foothills, winter temperatures usually dip below freezing only at night and precipitation is mixed as rain or light snow. In the summer, temperatures in the mountains are mild, with

daytime peaks in the 70s to low 80s F, while the western end of the MCAB can routinely exceed 100 degrees F.

Regulatory Setting

The proposed action is located in the El Dorado County Air Pollution Control District (EDCAPCD). The EDCAPCD has jurisdiction over air quality issues throughout the County, administering air quality regulations developed at the federal, state, and local levels. Federal, state, and local air quality regulations applicable to the proposed action are described below.

Federal Requirements

The primary legislation that governs federal air quality regulations is the Clean Air Act Amendments of 1990 (CAAA). The CAAA delegates primary responsibility for clean air to the U.S. Environmental Protection Agency (EPA). EPA develops rules and regulations to preserve and improve air quality and delegates specific responsibilities to state and local agencies.

EPA has established national ambient air quality standards (NAAQS) for criteria pollutants (Table 3.5-1). Criteria pollutants include carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), ozone (O₃), particulate matter less than or equal to 10 microns in diameter (PM₁₀), particulate matter less than or equal to 2.5 microns in diameter (PM_{2.5}), and lead (Pb). O₃, PM₁₀, and PM_{2.5} generally are considered to be regional pollutants because they or their precursors affect air quality on a regional scale. Pollutants such as CO, NO₂, SO₂, and Pb are considered to be local pollutants because they tend to accumulate in the air locally. PM₁₀ and PM_{2.5} also are considered to be localized pollutants.

Areas are classified as either *attainment* or *nonattainment* with respect to state and federal ambient air quality standards. These classifications are made by comparing actual monitored air pollutant concentrations to state and federal standards. Table 3.5-1 summarizes the attainment status of El Dorado County for each pollutant. Table 3.5-2 summarizes the local air quality monitoring data taken from the monitors in Placerville.

Table 3.5-1. Ambient Air Quality Standards Applicable in California and the Attainment Status of El Dorado County

Pollutant	Symbol	Average Time	Standard (parts per million)		Standard (micrograms per cubic meter)		Violation Criteria		Attainment Status of El Dorado County	
			California	National	California	National	California	National	California	National
Ozone	O ₃	1 hour	0.09	0.12	180	235	If exceeded	If exceeded on more than 3 days in 3 years	Nonattainment	Severe nonattainment
		8 hours	NA	0.08	NA	157	NA	If fourth highest 8-hour concentration in a year, averaged over 3 years, is exceeded	No state standard	No designation
Carbon monoxide (Lake Tahoe only)	CO	8 hours	9.0	9	10,000	10,000	If exceeded	If exceeded on more than 1 day per year	Unclassified	Unclassified/attainment
		1 hour	20	35	23,000	40,000	If exceeded	If exceeded on more than 1 day per year	Unclassified	Unclassified/attainment
		8 hours	6	NA	7,000	NA	If equaled or exceeded	NA	NA	NA
Nitrogen dioxide	NO ₂	Annual average	NA	0.053	NA	100	NA	If exceeded	No state standard	Attainment
		1 hour	0.25	NA	470	NA	If exceeded	If exceeded	Attainment	No federal standard
Sulfur dioxide	SO ₂	Annual average	NA	0.03	NA	80	NA	If exceeded	No state standard	Attainment
		24 hours	0.04	0.14	105	365	If exceeded	If exceeded on more than 1 day per year	Attainment	Attainment
		1 hour	0.25	NA	655	NA	NA	NA	Attainment	No federal standard
Hydrogen sulfide	H ₂ S	1 hour	0.03	NA	42	NA	If equaled or exceeded	NA	Attainment	No federal standard
Vinyl chloride	C ₂ H ₃ Cl	24 hours	0.010	NA	26	NA	If equaled or exceeded	NA	No designation	No federal standard
Inhalable particulate matter	PM10	Annual geometric mean	NA	NA	20	NA	If exceeded	NA	Nonattainment	No federal standard
		Annual arithmetic mean	NA	NA	NA	50	NA	If exceeded	No state standard	Unclassified/attainment
		24 hours	NA	NA	50	150	If exceeded	If average 1% over 3 years is exceeded	Nonattainment	Unclassified/attainment
	PM2.5	Annual geometric mean	NA	NA	12	NA	If exceeded	NA	No designation	No federal standard
		Annual arithmetic mean	NA	NA	NA	15	NA	If exceeded	No state standard	No designation
		24 hours	NA	NA	NA	65	NA	If average 2% over 3 years is exceeded	No state standard	No designation
Sulfate particles	SO ₄	24 hours	NA	NA	25	NA	If equaled or exceeded	NA	Attainment	No federal standard
Lead particles	Pb	Calendar quarter	NA	NA	NA	1.5	NA	If exceeded no more than 1 day per year	No state standard	No designation
		30 days	NA	NA	1.5	NA	If equaled or exceeded	NA	Attainment	No federal standard

Source: ARB, "Area Designations for State and National Ambient Air Quality Standards."

Notes: All standards are based on measurements at 25°C and 1 atmosphere pressure.

National standards shown are the primary (health effects) standards.

NA = not applicable.

Table 3.5-2. Ambient Air Quality Monitoring Data from Placerville Monitoring Station

Pollutant Standards	1998	1999	2000
Ozone (O₃)			
Maximum 1-hour concentration (ppm)	0.139	0.129	0.119
Number of Days Standard Exceeded			
NAAQS (1-hour) > 0.12 ppm	2	2	0
CAAQS (1-hour) > 0.09 ppm	22	21	19
Carbon Monoxide (CO)			
Maximum 8-hour concentration (ppm)	0.90	0.88	0.96
Maximum 1-hour concentration (ppm)	1.7	1.4	2.7
Number of Days Standard Exceeded			
NAAQS (8-hour) ≥ 9.0 ppm	0	0	0
NAAQS (1-hour) ≥ 35 ppm	0	0	0
CAAQS (8-hour) ≥ 9.0 ppm	0	0	0
CAAQS (1-hour) ≥ 20 ppm	0	0	0
Particulate Matter (PM₁₀)			
Maximum 24-hour concentration (µg/m ³)	41.0	49.0	38.0
2 nd highest 24-hour concentration (µg/m ³)	38.0	41.0	33.0
Average arithmetic mean concentration (µg/m ³)	14.9	18.4	16.5
Average geometric mean concentration (µg/m ³)	13.0	15.8	14.6
Number of Days Standard Exceeded			
NAAQS (24-hour) > 50 µg/m ³ *	0	0	0
CAAQS (24-hour) > 150 µg/m ³ *	0	0	0

Source: California Air Resources Board 2002.
 *Recorded every 6 days.

If an area does not meet the federal NAAQS shown in Table 3.5-1, federal clean air planning requirements specify that the state in which the area is located must develop and adopt state implementation plans (SIPs), which describe how air quality standards will be attained. In California, EPA has delegated the authority to prepare SIPs to the California Air Resources Board (ARB), which has delegated that authority to individual air districts.

Ozone (O₃)

O₃ is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. It is a severe eye, nose, and throat irritant. O₃ also attacks synthetic rubber, textiles, plants, and other materials and can cause extensive cell damage and leaf discoloration in plants.

O₃ is not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. O₃ precursors, which include reactive organic gases (ROG) and nitrogen oxides (NO_x), react in the atmosphere in the presence of sunlight to form O₃. Because photochemical reaction rates increase when the intensity of ultraviolet light and air temperature increase, O₃ is primarily a summer air pollution problem. The O₃

precursors ROG and NO_x are emitted by stationary combustion engines and mobile sources, such as construction equipment.

State and federal standards for O₃ have been set for a 1-hour averaging time; a federal 8-hour standard has also been set. The state requires that a 1-hour O₃ standard of 0.09 part per million (ppm) not be exceeded. The federal 1-hour ozone standard is 0.12 ppm, not to be exceeded more than 3 times in any 3-year period. The federal 8-hour ozone standard is 0.08 ppm (if the fourth highest 8-hour concentration in a year, averaged over 3 years, is exceeded). As shown in Table 3.5-2, the monitoring station closest to the project area has consistently exceeded the state's 1-hour O₃ standard during the 3 most recent years for which data are available.

The proposed action is located in a federal severe nonattainment area for O₃. This area is required under federal law to meet the federal ozone standard by 2005 or face significant consequences that range from the imposition of financial penalties and permit bans to the adoption of even more stringent federal air emission control requirements.

In response to the complex factors that contribute to the regional O₃ problem, the 3 air quality management districts (AQMDs) (Feather River, Sacramento Metropolitan, and Yolo-Solano AQMDs) and 2 air pollution control districts (APCDs) (El Dorado County and Placer County APCDs) that regulate air quality in the Sacramento Area region jointly developed and approved a plan for achieving attainment. The EDCAPCD is 1 of 2 APCDs involved in the development of the plan. This plan, the Sacramento Area Regional Ozone Attainment Plan—commonly referred to as the 1994 State Implementation Plan (SIP) for Sacramento—identifies a comprehensive regional strategy to reduce emissions to the level required for attainment of the federal standards.

Carbon Monoxide (CO)

CO essentially has no effect on plants and materials but can have significant effects on human health. It is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Effects on humans range from slight headaches to nausea to death.

Motor vehicles are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter when periods of light winds combine with the formation of ground-level temperature inversions (typically from evening through

early morning hours). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also emit increased CO at low air temperatures.

State and federal CO standards have been set for both 1-hour and 8-hour averaging times. The state 1-hour standard is 20 ppm by volume, and the federal 1-hour standard is 35 ppm. Both state and federal standards are 9 ppm for the 8-hour averaging period. The CO monitoring data for Placerville, collected for the 3 most recent years for which data are available, show no violations of the state or federal CO standard. The project area is designated as unclassified/attainment for the federal CO standard.

Inhalable Particulate Matter (PM10)

PM10 and PM 2.5 can damage human health and retard plant growth. Health concerns associated with suspended particulate matter focus on those particles small enough to reach the lungs when inhaled. Particulates also reduce visibility and corrode materials.

PM10 and PM 2.5 are generated by a wide variety of sources, including agricultural activities, industrial emissions, dust suspended by vehicle traffic and construction equipment, and secondary aerosols formed by reactions in the atmosphere.

The state PM10 standards are 50 micrograms per cubic meter (μm^3) as a 24-hour average and 30 μm^3 as an annual geometric mean. The federal PM10 standards are 150 μm^3 as a 24-hour average and 50 μm^3 as an annual arithmetic mean. The federal PM2.5 standard are 65 μm^3 as a 24-hour average and 15 μm^3 as an annual arithmetic mean. The monitoring data presented in Table 3.5-2 show no violations of the state or federal PM10 standard for the 3 most recent years for which data are available. The project area is designated as unclassified for the federal PM10 standard.

Transportation Conformity

The concept of transportation conformity was introduced in the 1977 federal CAA. Transportation conformity requires that no federal dollars be used to fund a transportation project unless it can be clearly demonstrated that the proposed action would not cause or contribute to violations of the NAAQS. Conformity requirements were made substantially more rigorous in the CAA of 1990, and the transportation conformity regulation that details implementation of the new requirements was issued in November 1993 (Section 176 of the CAA (42 U.S.C. Sect. 7506) and 40 CFR Part

93, subpart B). Typically, conformity for transportation projects is assessed by evaluating whether the proposed action is included in a conforming regional transportation plan (RTP) and transportation improvement program (TIP).

State Requirements

The California ARB, which is part of the California EPA regulatory agency, develops air quality regulations at the state level. The state regulations mirror federal regulations by establishing industry-specific pollution controls for criteria, toxic, and nuisance pollutants. California also requires areas to develop plans and strategies for attaining state ambient air quality standards as set forth in the California CAA of 1988 (Table 3.5-1). ARB also is responsible for developing motor vehicle emission standards for California vehicles.

Local and Regional Implementation of Federal Requirements

At the local and regional levels, four agencies are responsible for ensuring that transportation projects meet state and federal air requirements. Those agencies include Caltrans, the local sponsoring agency (typically the local transportation agency), SACOG, and the local air district.

The first step in the process is the responsibility of the local transportation agency. Once the need for a proposed action has been identified, the local transportation agency must work with SACOG to ensure that the proposed action is included in the MTP, the long-range transportation plan for the SACOG area. If a proposed action is fully funded and will be initiated within the next three years, it must also be included in SACOG's MTIP.

SACOG assembles all transportation projects into its MTP and MTIP, then incorporates those projects into its regional traffic model. Output from the traffic model is fed into the regional air quality model. The air quality model is then used to determine whether the MTP and MTIP would produce ozone precursor and PM10 emissions within the allowable transportation emissions budget for the SACOG region in future years. If emissions are within the allowable budget, then the MTP and MTIP are considered to be in conformity with the SIP for regional emissions.

For transportation projects in nonattainment or maintenance areas for the CO or PM10 NAAQS, additional analyses are needed to determine whether a proposed action would cause localized CO or PM10 hotspots. Those additional hotspot analyses are typically the responsibility of the local sponsoring agency. The hotspot

analyses have to meet criteria developed by Caltrans (and subsequently agreed to by FHWA and the U.S. EPA). Caltrans (and oftentimes the local air district) then review the hotspot analyses to verify their accuracy and completeness. If the hotspot analyses show no violation of the NAAQS, then the proposed action meets the local hotspots conformity requirement. The local air district may also evaluate other unique air quality concerns associated with construction or operation of a transportation project.

3.5.2 Environmental Consequences

Methodology

The proposed action would generate construction-related emissions and operational emissions. The methodology used to evaluate construction and operational effects is described below.

Construction Impact Assessment Methodology

Construction is a source of dust and exhaust emissions, which can have substantial temporary impacts on local air quality (i.e., exceed state air quality standards for PM10). Such emissions would result from earthmoving and use of heavy equipment, as well as land clearing, ground excavation, cut and fill operations, and the construction of roadways. Dust emissions can vary substantially from day to day, depending on the level of activity, the specific operations, and the prevailing weather. A major portion of dust emissions for the proposed action would likely be caused by construction traffic on temporary construction roads.

Construction emissions are estimated by using the road construction model (distributed publicly by the Sacramento Metropolitan AQMD). The road construction model is a public domain spreadsheet model formatted as a series of individual worksheets. The model enables users to estimate emissions using a minimum amount of project-specific information. The model estimates emissions for load hauling (onroad heavy-duty vehicle trips), worker commute trips, construction site fugitive PM10 dust, and offroad construction vehicles. Although exhaust emissions are estimated for each activity, fugitive dust estimates are currently limited to grubbing/land clearing, and grading/excavation.

The emission thresholds that are used in this analysis are contained in the EDCAPCD's Guide to Air Quality Assessment (EDCAPCD 2002). The

EDCAPCD's threshold of significance for project construction and operation is 82 pounds per day (ppd) of ROG or NO_x.

Operational Impact Assessment Methodology

The primary operational emissions associated with the proposed action are CO, PM₁₀, and O₃ precursors emitted as vehicle exhaust. The effects of CO emissions were evaluated through CO dispersion modeling, as described below. The effects of O₃ precursors were evaluated through the conformity process, as described below.

Carbon Monoxide Dispersion Modeling

Predicting the ambient air quality impacts of pollutant emissions requires an assessment of the transport, dispersion, chemical transformation, and removal processes that affect pollutant emissions after their release from a source. Gaussian dispersion models are frequently used for such analyses. The term *Gaussian dispersion* refers to a general type of mathematical equation used to describe the horizontal and vertical distribution of pollutants downwind from an emission source.

The ambient air quality effects of traffic emissions were evaluated using the CALINE4 dispersion model (Benson 1989). CALINE4 is a Gaussian dispersion model specifically designed to evaluate air quality impacts of roadway projects. Each roadway link analyzed in the model is treated as a sequence of short segments. Each segment of a roadway link is treated as a separate emission source producing a plume of pollutants that disperses downwind. Pollutant concentrations at any specific location are calculated using the total contribution from overlapping pollution plumes originating from the sequence of roadway segments.

Traffic volumes and operating conditions used in the modeling were obtained from the traffic analysis prepared for this project (Fehr & Peers Associates 2002). CO modeling was conducted for the proposed interchange using p.m. peak-hour traffic volumes.

CO modeling was performed for the cumulative 2015 condition with the 4-lane tight diamond. The following scenarios were also modeled and are included in Chapter 5:

- Cumulative 2025 with SPDI,
- Cumulative 2025 with No-Action Alternative,
- Cumulative 2025 with 6-Lane Tight Diamond Alternative, and
- Cumulative 2025 with 4-Lane Tight Diamond Alternative.

Modeling of the 2025 under with- and without-project conditions isolates the effect that each scenario would have on CO concentrations. The construction year for the 4-lane tight diamond (2005) was not modeled because all the intersections and links are expected to have LOS C or better (and, therefore, there would not be enough vehicle idling to cause any air quality impacts) based on the project traffic report.

CO concentrations were estimated at 13 receptor locations located along the interchange. Receptors were chosen based on the CO protocol developed for Caltrans by the Institute of Transportation Studies at the University of California, Davis (Garza et al. 1997). Figure 3.5-1 shows the modeling network and receptors used for the analysis. Receptor heights were set at 1.8 meters (5.9 feet).

See the project Air Quality Technical Report (Jones & Stokes 2002b) for more details on the CO dispersion modeling procedures.

Transportation Conformity

The proposed action is located in an area designated nonattainment for the federal O₃ precursor standards. Because O₃ precursors are regional pollutants, the proposed action must be evaluated under the transportation conformity requirements described earlier. An affirmative regional conformity determination must be made before the proposed action can proceed. Such a determination is not required if the proposed action is described in the approved RTP and the TIP and has not been altered in design concept or scope. As noted under Impact AQ5, the proposed action is included in an approved and conforming MTP and MTIP, and the design concept and scope of the proposed action have not been changed since the action was evaluated as part of the MTP.

The project area is located in an area designated as unclassified/attainment for the federal CO and unclassified for the federal PM₁₀ standards. The transportation conformity regulations require a separate hotspot analysis for projects in CO and PM₁₀ nonattainment and maintenance areas since these are localized pollutants. Although hot spot analyses are not required for the proposed action, a localized CO analysis was conducted to comply with NEPA (see Impact AQ1 below).

Permanent Impacts: 4-Lane Tight Diamond Interchange

Impact AQ1: 2005—No Exceedances of CO Standards

The construction year for the 4-lane tight diamond was not modeled because all the intersections and links are expected to have LOS C or better based on the project

traffic report. Therefore, no violations of either the 1-hour or the 8-hour CO state standard are expected to occur in 2005, and this impact is not considered to be adverse.

Mitigation Measure

None proposed.

Temporary Impacts: 4-Lane Tight Diamond Interchange

Impact AQ2: Temporary Increase in Construction-Related ROG and NO_x Emissions during Grading and Construction Activities

Implementation of the proposed action would result in the construction of new ramps and embankments, as well as bridge construction. EDCAPCD recommends that the Sacramento Metropolitan APCD-approved Road Construction Model, Version 3.1, be used to assess construction emissions (EDCAPCD 2002). This model assumes that road construction typically entails 4 sequential activities: 1) grubbing/land clearing, 2) grading/excavation, 3) drainage/utilities/subgrade, and 4) paving. The road construction model was used to estimate construction-related ROG and NO_x emissions and the results are shown in Table 3.5-3.

Table 3.5-3. Construction Emission Estimates (lbs/day)

Construction phase	ROG	NO _x
Grubbing/land clearing	16	117
Grading/excavation	23	162
Drainage/utilities/sub-grade	24	172
Paving	15	104
Maximum	24	172
EDCAPCD threshold	82	82
Exceed threshold?	No	Yes

Source: Road Construction Model Version 3.1.

The NO_x emissions estimate is over the threshold of 82 lbs/day set by the EDCAPCD. Therefore, this impact is considered to be adverse.

Mitigation Measure AQ2a: Mitigate Construction Equipment Exhaust Emissions Consistent with EDCAPCD Requirements

To reduce construction-related emissions below the EDCAPCD threshold, the County will mitigate construction equipment exhaust emissions by keeping construction-related fuel use below the fuel use screening levels established by the EDCAPCD or by implementing measures required by the EDCAPCD. Based on conservative assumptions regarding emissions and fuel use rates for diesel-powered equipment used for construction, Table 3.5-4 sets forth the average daily fuel use per quarter for

all construction equipment at a single site that would ensure that emissions remain below the combined 82 lbs/day significance thresholds for ROG and NO_x on a quarterly basis. The quarterly averaging approach is based on the quarterly calculation of emission offsets used for stationary facilities in the District’s New Source Rule 523. If average daily fuel use is kept below the levels shown in Table 3.5-4 on a quarterly basis, implementation of additional measures is not required to reduce ROG and NO_x emissions from construction equipment.

Table 3.5-4. Construction Equipment Fuel Use Screening Levels

Equipment Age Distribution	Average Daily Fuel Use per Quarter (Gallons per Day)
All equipment 1995 model year or earlier	337
All equipment 1996 model year or later	402

Source: EDCAPCD 2002.

Note: The project applicant should use linear documentation between 337 and 402 gallons per day in proportion to the distribution of equipment into the 2 age categories. Thus, a 50/50 age distribution yields an allowable fuel use of (337+402)/2 or 370 gallons per day.

If project construction fuel use exceeds these screening levels, the County will implement the following measures as required by the ECDAQMD:

- Contractor must ensure that the maximum amount of ground disturbed on any single day of construction is 12 acres or less.
- Contractor must use aqueous emulsified fuel (such as PuriNox) that has been verified by the California ARB or otherwise documented through emissions testing to have the greatest NO_x and PM10 reduction benefit available, provided each pollutant is reduced by at least 15%.

Impact AQ3: Temporary Increase in Construction-Related PM10 Emissions during Grading and Construction Activities

EDCAPCD air quality assessment guidelines (EDCAPCD 2002) considers mass emissions of fugitive dust PM10 to be minor if the proposed action includes mitigation measures that will prevent visible dust beyond the project boundaries, in compliance with Rule 403 of the South Coast AQMD, as required by the EDCAPCD. Therefore, PM10 impacts are not considered adverse with implementation of Mitigation Measure AQ3a.

Mitigation Measure AQ3a: Comply with Rule 403 of the South Coast AQMD, as required by the EDCAPCD.

The County will comply with all applicable aspects of Rule 403 as shown in Tables 3.5-5 and 3.5-6.

Cumulative Impacts: 4-Lane Tight Diamond Interchange

Impact AQ4: 2015—No Exceedances of CO Standards

Carbon monoxide concentrations were estimated for 13 sensitive receptor locations, including residences and other locations where individuals could be exposed. Sensitive receptors were identified during a project site visit.

Table 3.5-7 summarizes the CO modeling results. No violations of either the 1-hour or the 8-hour CO state standard would occur with the 4-Lane Tight Diamond Interchange. On the basis of assumptions about improvements in vehicle emission technology and the turnover in the vehicle fleet, estimated future CO concentrations for each project condition and averaging time would be well below the thresholds established for the state and federal ambient CO standards. Based on this analysis, the project would not create a new CO violation.

Mitigation Measure

None proposed.

Impact AQ5: Transportation Conformity Achieved

The proposed action is included in the 2025 MTP, approved by FHWA on July 24, 2002, and the 2003/05 MTIP amendment #1, approved by FHWA on December 23, 2002. The MTP identifies the Missouri Flat Road interchange project as “U.S. 50 at Missouri Flat Road Interchange: Reconstruct interchange at U.S. 50 (Phase 1) including construction of auxiliary lanes over Weber Creek bridge and seismic retrofit of bridge” (page 103, July 24, 2002). The MTIP amendment describes the proposed action as “Reconstruct U.S. 50 Missouri Flat Road Interchange: Reconstruct Missouri Flat Interchange at U.S. 50 (Phase 1) including construction of auxiliary lanes over Weber Creek bridge and seismic retrofit of bridge; widen Missouri Flat Road 2 to 4 lanes from Mother Lode Drive to Prospectors Plaza Drive” (page 14, December 23, 2002). The reference to Phase 1 in these documents refer to the 4-lane tight diamond interchange. Therefore, the design concept and scope of the action have not changed from what was analyzed for air quality conformity, and the action is a conforming transportation project. The proposed action would not interfere with the timely implementation of transportation control measures from the applicable SIP.

Mitigation Measure

None proposed.

Table-3.5-5. Best Available Fugitive Dust Control Measures

Fugitive Dust Source Category	Control Actions
Earth moving (except construction cutting and filling areas, and mining operations)	<p>1a. Maintain soil moisture content at a minimum of 12%, as determined by ASTM method D-2216 or other equivalent method approved by the District; two soil moisture evaluations must be conducted during the first 3 hours of active operations during a calendar day, and 2 such evaluations each subsequent 4-hour period of active operations; OR</p> <p>1a-1. For any earth moving that is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.</p>
Earth moving, construction fill areas	<p>1b. Maintain soil moisture content at a minimum of 12%, as determined by ASTM method D-2216 or other equivalent method approved by the District; for areas that have an optimum moisture content for compaction of less than 12%, as determined by ASTM method 1557 or other equivalent method approved by the District, complete the compaction process as expeditiously as possible after achieving at least 70% of the optimum soil moisture content; two soil moisture evaluations must be conducted during the first 3 hours of active operations during a calendar day, and 2 such evaluations during each subsequent 4-hour period of active operations.</p>
Earth-moving, construction cut areas and mining operations	<p>1c. Conduct watering as necessary to prevent visible emissions from extending more than 100 feet beyond the active cut or mining areas, unless the area is inaccessible to watering vehicles because of slope conditions or other safety factors.</p>
Disturbed surface areas (except completed grading areas)	<p>2a/b. Apply dust suppression in a sufficient quantity and frequency to maintain a stabilized surface; any areas that cannot be stabilized, as evidenced by wind driven dust, must have an application of water at least twice per day to at least 80% of the unstabilized area.</p> <p>2c. Apply chemical stabilizers within 5 working days of grading completion; OR</p> <p>2d. take action 3a or 3c specified for inactive disturbed surface areas.</p>
Inactive disturbed surface areas	<p>3a. Apply water to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind driven fugitive dust, excluding any areas which are inaccessible due to excessive slope or other safety conditions; OR</p> <p>3b. apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; OR</p> <p>3c. establish a vegetative ground cover within 21 days after active operations have ceased; ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; OR</p> <p>3d. utilize any combination of control actions 3a, 3b, and 3c such that, in total, they apply to all inactive disturbed surface areas.</p>
Unpaved roads	<p>4a. Water all roads used for any vehicular traffic at least once per every 2 hours of active operations; OR</p> <p>4b. water all roads used for any vehicular traffic once daily and restrict vehicle speed to 15 mph; OR</p> <p>4c. apply chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface.</p>
Open storage piles	<p>5a. Apply chemical stabilizers; OR</p> <p>5b. apply water to at least 80 percent of the surface areas of all open storage piles on a daily basis when there is evidence of wind driven fugitive dust; OR</p> <p>5c. install a three-sided enclosure with walls with no more than 50 percent porosity that extend, at a minimum, to the top of the pile.</p>
Track-out control	<p>6a. Pave or apply chemical stabilization at sufficient concentration and frequency to maintain a stabilized surface starting from the point of intersection with the public paved surface, and extending for a centerline distance of at least 100 feet and width of at least 20 feet; OR</p> <p>6b. pave from the point of intersection with the public paved road surface, and extending for a centerline distance of at least 25 feet and a width of at least 20 feet, and install a track-out control device immediately adjacent to the paved surface such that exiting vehicles do not travel on any unpaved road surface after passing through the track-out control device.</p>

Source: South Coast AQMD Rule 403, Tables 2 and 3.

**Table 3.5-6. Best Available Fugitive Dust Control Measures
for High Wind Conditions^a**

Fugitive Dust Source Category	Control Measures
Earth moving	1A. Cease all active operations, OR 2A. apply water to soil not more than 15 minutes prior to moving such soil.
Disturbed surface areas	0B. On the last day of active operations prior to a weekend, holiday, or any other period when active operations will not occur for not more than 4 consecutive days: apply water with a mixture of chemical stabilizer diluted to not less than 1/20 of the concentration required to maintain a stabilized surface for a period of 6 months; OR 1B. apply chemical stabilizers prior to a wind event; OR 2B. apply water to all unstabilized disturbed areas 3 times per day; if there is any evidence of wind driven fugitive dust, watering frequency will be increased to a minimum of 4 times per day; OR 3B. establish a vegetative ground cover within 30 days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; OR 4B. utilize any combination of control actions (1B), (2B), and (3B) such that, in total, these actions apply to all disturbed surface areas.
Unpaved roads	1C. Apply chemical stabilizers prior to a wind event; OR 2C. apply water twice per hour during active operation; OR 3C. stop all vehicular traffic.
Open storage piles	1D. Apply water twice per hour; OR 2D. install temporary coverings.
Paved road track-out	1E. Cover all haul vehicles; OR 2E. comply with the vehicle freeboard requirements of Section 23114 of the California Vehicle Code for operation on both public and private roads.
All categories	1F. Use any other control measures approved by the District.

Source: South Coast AQMD Rule 403, Table 1.

^a "High wind conditions" are occurrences of gusts exceeding 25 mph.

Table 3.5-7. Carbon Monoxide Modeling Concentrations (PPM) Results for the Proposed Action and No-Action Alternative

Receptor ^a	4-Lane Tight Diamond Interchange (2015)		No-Action Alternative (2025)	
	1-hour	8-hour	1-hour	8-hour
1	1.8	0.4	2.7	1.0
2	1.7	0.3	1.9	0.4
3	1.6	0.2	1.9	0.4
4	1.7	0.3	2.0	0.5
5	1.6	0.2	1.9	0.4
6	1.6	0.2	1.7	0.3
7	1.6	0.2	2.0	0.5
8	1.6	0.2	1.9	0.4
9	1.8	0.4	2.2	0.6
10	1.8	0.4	2.4	0.8
11	1.8	0.4	2.6	0.9
12	1.9	0.4	2.9	1.1
13	2.1	0.6	3.4	1.5

Description of receptors:

- 1: Best Western Placerville Inn located at 6850 Green Leaf Drive.
- 2: Residence at 4221 Montana Court representing residences in the vicinity of Montana Court.
- 3: Residence at 6614 Runnymede Drive representing residences in the vicinity of Runnymede Drive and Brent Court.
- 4: Residence at 6910 Perks Court^b
- 5: Residence at 6940 Perks Court^b
- 6: Wamego Road near Forni Road representing residences at 3602, 3607, 3625, 3636, and 3643 Wamego Road.
- 7: Residence at 3081 Forni Road.
- 8: Area representing residences at 7080, 7125, 7081, and 7141 Helmrich Lane.
- 9: 7th-Day Adventist Church on Mother Lode Drive.
- 10: Residence at 6848 Perks Court representing residences at 6850,^c 6846, 6844, and 6842 Perks Court.
- 11: Two residences at 4121 Missouri Flat Road.
- 12: Residence at 4127 Missouri Flat Road.
- 13: Residence at 4133 Missouri Flat Road.

^a See Figure 3.5-1 for location of receptors.

^b Parcel would be fully acquired under the Perks Court cul-de-sac option.

^c Parcel would be fully acquired under the Perks Court realignment option.

No-Action Alternative

No construction would occur under this alternative. Therefore, no construction-related impacts would occur and no mitigation would be required.

Carbon monoxide concentrations were estimated for 13 sensitive receptor locations in 2025, including residences and other locations where individuals could be exposed. Table 3.5-7 summarizes the CO modeling results. No violations of either the 1-hour or the 8-hour CO state standard would occur under the No-Action Alternative. 2015 No-Action conditions were not evaluated since the 2015 analysis was intended to evaluate the phasing of the CEQA project. Under 2015 No-Action conditions, CO violations could occur due to the expected occurrences of LOS E or F at ramp junctions and arterial intersections caused by background growth. (CO violations could occur in 2015, but not 2025 even with increased traffic volumes in 2025 since the emission factors would be higher in 2015 due to less clean automobiles.)

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3.6 Noise

The information below is summarized from the project noise study report (Jones & Stokes 2002g); this report is available for review at County offices (see the List of Technical Studies in the Introduction of this joint document for the address and phone number of County offices). The noise study report can also be consulted for more information on environmental acoustics and definitions of commonly used noise terminology.

This section describes FHWA's noise analysis procedures that are used to determine the need for noise abatement under NEPA and evaluates operational and construction-related noise impacts under NEPA. It also describes CEQA requirements for noise impact analysis; CEQA noise impacts are addressed in Chapter 5.

3.6.1 Affected Environment

Regulatory Setting

Federal Highway Administration Regulations

FHWA regulations in 23 CFR 772 provides procedures for conducting noise studies for highway projects and implementing noise abatement measures to help to protect the public health and welfare, supply noise abatement criteria (NAC), and establish requirements for information to be given to local officials for use in planning and designing highways. Under these procedures, a type 1 project is defined as a proposed federal or federal-aid highway project for construction of a highway on a new location or the physical alteration of an existing highway that significantly changes the horizontal or vertical alignment or increases the number of through traffic lanes. FHWA has clarified its interpretation of type 1 projects by stating that a type 1 project is any project that has the potential to increase noise levels at adjacent receivers. This includes projects to add interchange, ramp, auxiliary, or truck-climbing lanes to an existing highway. A project to widen an existing ramp by a full lane width is also considered to be a type 1 project. The project alternatives evaluated in this joint document are considered to be type 1 projects because they involve federal funding, adding lanes to the existing mainline highway, and modifying an existing interchange.

Under 23CFR772, noise abatement must be considered for a type 1 project if the project is predicted to result in a traffic noise impact. Such an impact is considered to occur when the project results in a substantial noise increase or when the predicted noise levels approach or exceed the NAC specified in the regulation. 23 CFR 772 does not specifically define what constitutes a substantial increase or the term approach; instead, it leaves interpretation of these terms to the states.

Noise abatement measures that are reasonable and feasible and likely to be incorporated into the project, as well as noise impacts for which no apparent solution is available, must be identified before adoption of the final environmental document for a project. Table 3.6-1 summarizes FHWA’s NAC for each activity category expressed in terms of hourly A-weighted sound levels (dBA).

Table 3.6-1. Activity Categories and Noise Abatement Criteria

Activity Category	NAC, Hourly A-Weighted Noise Level (dBA-Leq[h])	Description of Activities
A	57 exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B	67 exterior	Picnic areas, recreation areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals
C	72 exterior	Developed lands, properties, or activities not included in categories A or B above
D	—	Undeveloped lands
E	52 interior	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums

Note: Leq = equivalent sound levels.

Primary consideration is given to exterior areas. In situations in which no exterior activities are affected by traffic noise, the interior criterion (activity category E) is used as the basis for noise abatement consideration.

Caltrans’ noise analysis policy, as described in the Construction Noise and Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects (Protocol) (Caltrans 1998), specifies the policies, procedures, and practices to be used by agencies that sponsor new construction or reconstruction projects. NAC specified in the Protocol are the same as those specified in 23 CFR 772. As directed by FHWA, the Protocol specifically defines the terms “substantial noise increase” and “approach or exceed”. The Protocol states that a substantial noise increase occurs when the predicted noise levels with project implementation exceed existing noise levels by 12

dBA-Leq(h). The Protocol also states that a sound level is considered to approach an NAC level when the sound level is within 1 dB of the NAC identified in 23 CFR 772 (e.g., 66 dBA is considered to approach the NAC of 67 dBA, but 65 dBA is not). These Caltrans' definitions have been explicitly reviewed and approved by FHWA.

National Environmental Policy Act

Guidance from FHWA in the document entitled “Highway Traffic Noise Analysis and Abatement Policy and Guidance” (FHWA 1995) states that if a traffic noise impact is identified under 23CFR772, the significance of the impact under NEPA must be identified. FHWA does not define specific thresholds for the significance of noise impacts and states that the determination of significance is based on the consideration of the context and intensity of the impact as defined in the Council on Environmental Quality Regulation 40CFR1508.27 (FHWA 1995). The FHWA guidance document states that the evaluation of “context” relates to the number people effected while the “intensity” relates to the absolute noise levels associated with the impact.

California Environmental Quality Act

The County's noise element establishes land use compatibility criteria relating to noise. Policy 6.5.1.9 states the following:

Policy 6.5.1.9. Noise created by new transportation sources, excluding airport expansion but including roadway improvement projects, shall be mitigated so as not to exceed the levels specified in Table 6-1 at existing noise-sensitive land uses.

Table 6-1 identifies a level of 60 decibels (dB), day-night average sound level (Ldn) as the maximum exposure allowed at outdoor activity areas for residences, lodging, and churches. A level of 45 Ldn is identified as the maximum interior exposure at residences and lodging and 40 dB-Leq (highest 1 hour) is identified as the maximum interior exposure for churches. The noise element further states that where it is not possible to reduce noise in outdoor activity areas to 60 dB Ldn/CNEL or less using a practical application of the best available noise reduction measures, an exterior noise level of up to 65 dB Ldn/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with the noise levels described above.

See section 5.6.1, “Noise”, for County policy on construction-related noise. See section 5.6.2, “Noise”, for a discussion of noise impacts under CEQA.

Potential Receiver Locations

Jones & Stokes technical staff conducted a field investigation of the project area to identify uses in the project area that could be subject to traffic noise impacts from the project alternatives. Single-family residences, 2 churches, and a motel were identified as activity category B land uses, as defined in Table 3.6-1. Numerous commercial uses located in the project area are considered to be activity category C land uses. Residences, churches, motels, and schools are uses for which the activity category E interior NAC would apply where there is no frequent exterior human use.

As stated in the Protocol, noise abatement is only considered where frequent human use occurs and where a lowered noise level would be of benefit. As a matter of practice, frequent human use is considered to occur at exterior locations where people are exposed to highway noise for at least 1 hour on a regular basis. As an extension of this concept, impacts are only assessed in detail at locations where frequent human use occurs and where a lowered noise level would be of benefit. Accordingly, impacts are typically assessed at locations with defined outdoor activity areas, such as residential backyards, patios, and parks with defined activity areas (e.g., playgrounds and picnic tables).

No activity category C land uses in the project area are considered to have outdoor activity areas with frequent human use that would benefit from a lowered noise level, and in no case does the activity category E interior criterion apply to category C land uses. Accordingly, detailed evaluation of traffic noise impacts and abatement is not considered warranted for activity category C land uses in the project area.

Land Uses in the Project Area

Northwest Interchange Quadrant

No activity category B land uses occur in this area. Activity category C uses include a commercial shopping center, Prospector's Plaza. At these commercial land use sites, there are no exterior areas of frequent human use.

Northeast Interchange Quadrant

Activity category B land uses include several isolated single-family residences near the intersection of Headington Road and Bells Road (300–400 feet from the highway). Activity category C land uses include fast food restaurants and other commercial uses, including the approved El Dorado Villages Shopping Center. At these commercial land use locations, there are no exterior areas of frequent human use.

Southwest Interchange Quadrant

Activity category B land uses include a subdivision of single-family residences located immediately south of the highway in the vicinity of Runnymede Avenue, the Best Western Placerville Inn located off of Green Leaf Drive, a residence uphill from Missouri Flat Road just south of the Placerville Inn, the 7th-Day Adventist Church on Mother Lode Drive, and the Placerville Church of Christ on Missouri Flat Road. The Placerville Inn and the churches do not have any exterior areas of frequent human use. Although the pool area at the Best Western Placerville Inn is an exterior area of human use, its location is such that it is shielded from traffic noise on Missouri Flat Road by existing structures. Therefore, the pool area is not treated as a sensitive exterior area of frequent human use.

Southeast Interchange Quadrant

Activity category B land uses east of Missouri Flat Road consist of single-family residences located along Perks Court and along Missouri Flat road just south of the Perks Court access to Missouri Flat Road. Activity category C uses include a commercial use on Perks Court (H&S Gas Mart). At this commercial land use site, there are no exterior areas of frequent human use.

Receivers Selected for Impact and Abatement Assessment

Detailed traffic noise modeling and impact assessment was conducted only at activity category B land uses where frequent human use occurs and where a lowered noise level would be of benefit. The screening procedure defined in the Protocol was used to eliminate sites where existing noise levels are low (i.e., less than 60 dB-Leq) and the project would clearly result in little or no change in noise levels.

Detailed noise impact assessment has been conducted at the following receiver points in the project area (Figure 3.6-1).

- **Receiver 1:** Best Western Placerville Inn located at 6850 Green Leaf Drive;
- **Receiver 2:** the residence at 4221 Montana Court representing residences in the vicinity of Montana Court;
- **Receiver 3:** the residence at 6614 Runnymede Drive representing residences in the vicinity of Runnymede Drive and Brent Court;
- **Receiver 4:** the residence at 6910 Perks Court;
- **Receiver 5:** the residence at 6940 Perks Court;

- **Receiver 6:** Wamego Road near Forni Road representing residences at 3602, 3607, 3625, 3636, and 3643 Wamego Road;
- **Receiver 7:** the residence at 3081 Forni Road;
- **Receiver 8:** an area representing residences at 7080, 7125, 7081, and 7141 Helmrich Lane;
- **Receiver 9:** 7th-Day Adventist Church on Mother Lode Drive;
- **Receiver 10:** the residence at 6848 Perks Court representing residences at 6850, 6846, 6844, and 6842 Perks Court;
- **Receiver 11:** 2 residences at 4121 Missouri Flat Road;
- **Receiver 12:** the residence at 4127 Missouri Flat Road;
- **Receiver 13:** the residence at 4133 Missouri Flat Road;
- **Receiver 14:** Placerville Church of Christ at 4120 Missouri Flat Road; and
- **Receiver 15:** the residence located uphill from Missouri Flat Road, directly southeast of Placerville Inn (no address identified).

Noise Monitoring

Short-Term Monitoring

Short-term monitoring was conducted on Monday, August 27, 2001, and Friday, August 31, 2001, using Larson-Davis Model 812 Precision Type 1 sound level meters (serial numbers 0430 and 0432) placed 1.5 meters (5 feet) above the ground on a tripod. Measurements were typically taken for approximately 10 minutes at each position. At some locations, measurements were repeated to verify the measurement.

The short-term monitoring focused on activity category B land uses. The short-term measurement positions are the lettered positions identified in Figure 3.6-1. Table 3.6-2 identifies the time of day for short-term monitoring and summarizes the sound level and traffic data collected during this session.

Long-Term Monitoring

Jones & Stokes staff conducted long-term monitoring using a Larson-Davis Model 700 Type 2 sound level meter (serial number 1132) placed near the 7th-Day Adventist Church (Figure 3.6-1). The purpose of these measurements was to quantify variations in sound level throughout the day, rather than rely solely on absolute sound levels at a specific receiver of concern. The long-term sound level data were collected over a 5-day period beginning on Tuesday August 28, 2001. Table 3.6-3 summarizes the results of the long-term monitoring, including the time of day in which long-term monitoring was conducted.

Table 3.6-2. Summary of Field-Measured Data

Receiver ^d	Measurement	Date	Start Time	Duration (minutes)	Measured Sound Level (dB-Leq)	Traffic Volumes (Scaled to 1 Hour)							
						Eastbound U.S. 50 Lanes				Westbound U.S. 50 Lanes			
						Autos	Med. Truck	Heavy Truck	Speed (mph)	Autos	Med. Truck	Heavy Truck	Speed (mph)
A	1 ^a	8/27/01	12:15 p.m.	10:00	61.8	NA	NA	NA	NA	NA	NA	NA	NA
	2 ^b	8/27/01	12:37 p.m.	10:00	45.1	NA	NA	NA	NA	NA	NA	NA	NA
B	1	8/27/01	1:30 p.m.	9:44	58.8	990	48	36	65	1086	108	30	65
	2	8/27/01	1:45 p.m.	9:44	58.9	1183	43	25	65	1041	55	25	65
C	1	8/27/01	1:30 p.m.	10:00	54.6	990	48	36	65	1086	108	30	65
	2	8/27/01	1:45 p.m.	10:00	53.1	1183	43	25	65	1041	55	25	65
D	1	8/27/01	3:37 p.m.	10:00	58.8	1212	54	0	65	1920	66	24	65
	2	8/27/01	3:53 p.m.	10:00	58.3	1326	48	0	65	1674	84	108	65
E	1	8/27/01	3:37 p.m.	10:00	52.0	1212	54	0	65	1920	66	24	65
	2	8/27/01	3:53 p.m.	6:55	51.4	1413	43	0	65	832	52	104	65
F	1	8/27/01	4:35 p.m.	8:00	57.1	1710	38	15	65	2423	53	30	65
	2	8/27/01	4:35 p.m.	8:00	57.3	1710	38	15	65	2423	53	30	65
G	1	8/31/01	9:27 a.m.	10:00	61.4	NA	NA	NA	NA	NA	NA	NA	NA
H	1	8/27/01	9:55 a.m.	10:00	52.5	NA	NA	NA	NA	NA	NA	NA	NA
I	1 ^c	8/27/01	10:32 a.m.	10:00	40.1	NA	NA	NA	NA	NA	NA	NA	NA
	2	8/27/01	10:42 a.m.	10:00	60.5	NA	NA	NA	NA	NA	NA	NA	NA
Receiver	Measurement	Date	Start Time	Duration (minutes)	Measured Sound Level (dB-Leq)	Traffic Volumes (Scaled to 1 Hour)							
						Southbound Lanes On Missouri Flat Road				Northbound Lanes On Missouri Flat Road			
						Autos	Med. Truck	Heavy Truck	Speed (mph)	Autos	Med. Truck	Heavy Truck	Speed (mph)
J	1	8/31/01	11:05 a.m.	10:00	63.3	852	42	18	35	1098	18	6	35
	2	8/31/01	11:21 a.m.	10:00	62.9	870	12	12	35	1098	18	6	35

Note: NA = traffic counts were not conducted for these noise monitoring locations.

^a Noise measurement taken with window open.

^b Noise measurement taken with window closed.

^c Noise measurement inside church with doors and windows closed.

^d See Figure 3.6-1 for location of monitored receiver positions.

The 24-hour pattern of traffic noise levels is typical of a roadway with a strong morning peak and consistent noise levels throughout the day. As expected, traffic noise levels drop off during the evening and nighttime hours. Table 3.6-3 summarizes the average hourly Leq sound levels measured in each hour of the day over 3 mid-week days (Tuesday, Wednesday, and Thursday) during the long-term monitoring period along with calculated Ldn values for each day and the average. The differences between the sound levels measured during each hour and the maximum noise hour sound levels are also shown. These values are used to estimate worst noise hour noise level Leq (Leq is the metric upon which FHWA's noise abatement are based) from measurements not taken during the worst noise hour and to estimate Ldn values (Ldn is a 24-hour average noise level with a penalty added for noise that occurs between 10:00 p.m. and 7:00 a.m.; this metric is used by the County) from calculated worst hour noise levels. The average Ldn value is 3 dB greater than the worst hour noise level Leq.

Table 3.6-3. Summary of Long-Term Noise Monitoring Conducted near the 7th-Day Adventist Church

Time	1-Hour dB-Leq				Maximum Noise Hour dB-Leq Minus Hourly dB-Leq
	Tuesday (August 28, 2001)	Wednesday (August 29, 2001)	Thursday (August 30, 2001)	Average	
12 a.m.	54.5	54	54	54	7
1 a.m.	53	56	53.5	54	7
2 a.m.	52.5	54	53	53	8
3 a.m.	54	53	52.5	53	8
4 a.m.	55	54.5	55	55	6
5 a.m.	59	58	58	58	3
6 a.m.	61	61.5	60.5	61	0
7 a.m.	64	61.5	61	61 ^a	0
8 a.m.	61.5	61.5	61	61	0
9 a.m.	61	61.5	61	61	0
10 a.m.	61	61	61	61	0
11 a.m.	60.5	60.5	61	61	1
12 p.m.	60	60.5	60.5	60	1
1 p.m.	59.5	59	61	60	1
2 p.m.	60	60	60.5	60	1
3 p.m.	60.5	61	61	61	0
4 p.m.	60.5	61	61.5	61	0
5 p.m.	60.5	60.5	61.5	61	0
6 p.m.	61.5	60	61	61	0
7 p.m.	59	58.5	59.5	59	2
8 p.m.	59	58.5	58	59	3
9 p.m.	58	58	57.5	58	3
10 p.m.	56.5	57.5	57	57	4
11 p.m.	55	55	55.5	55	6
Ldn	63.8	63.9	63.6	64	NA

^a Excludes Tuesday value because high value is attributed to non-typical event.

Traffic Noise Modeling of Existing Noise Levels

Sound32, the Caltrans version of the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108), was used in this analysis. Digitized roadway, receiver, and barrier locations were entered into the model, then traffic volumes that were counted during the short-term measurement period were scaled up to 1 hour and entered into the model. Table 3.6-4 summarizes the measured and modeled noise levels.

Table 3.6-4. Measured and Modeled Noise Levels

Receiver	Measurement	Modeling Receiver Number	Measured Sound Level (dB-Leq[h])	Modeled Sound Level (dB-Leq[h])	Measured Minus Modeled Sound Levels	K Factor Used in Model
B	1	2	58.8	62.0	3.2	-3
	2	2	58.9	61.5	2.6	
C	1	3	54.6	57.0	2.4	-3
	2	3	53.1	56.5	3.4	
D	1	4	58.0	59.8	1.8	-2
	2	4	58.3	59.8	1.5	
E	1	5	52.0	57.4	5.4	-5
	2	5	51.4	57.3	5.9	
F	1	6	57.1	60.7	3.6	-3
	2	6	57.3	60.7	3.4	
J	1	10	63.3	62.5	-0.8	0
	2	10	62.9	62.4	-0.5	

Note: See Figure 3.6-1 for location of monitored and modeled receiver positions.

Modeled and predicted results are considered to be in reasonable agreement when they are within 2–3 dB of each other. With the exception of receiver E, modeled results are within about 3 dB of measurements for areas exposed primarily to noise from U.S. 50. For receiver J, which is dominated by noise from traffic on Missouri Flat Road, the modeled and measured results are in reasonable agreement. Receiver E is located far below the highway and is subject to shielding from terrain and vegetation that may not directly be accounted for in the model. For the purposes of this impact assessment, adjustment (or “K”) factors have been included in the model as indicated in Table 3.6-4 for receivers close to these measurement positions.

Existing Noise Environment

The existing noise environment in the project area is dominated by noise from traffic traveling on U.S. 50 and Missouri Flat Road. Table 3.6-5 summarizes the noise modeling results for existing conditions. Results for the Placerville Inn, 7th-Day Adventist Church, and the Placerville Church of Christ are based on interior noise levels because there are no outside areas of frequent human use exposed to traffic noise. Interior measurements were taken inside the Placerville Inn and the 7th-Day Adventist Church but not inside the Placerville Church of Christ. Visual inspection of the Placerville Church of Christ indicates that all exterior walls are solid with no windows. Based on the type of construction, an exterior-to-interior noise reduction of 20 dBA was assumed.

Existing worst-hour traffic noise levels approach or exceed 67 dB-Leq(h) at residences along Missouri Flat Road (receivers 11–13, 15) and on Perks Court (receiver 10).

3.6.2 Environmental Consequences

Methodology

Peak hour traffic volumes used to model traffic noise under existing and design-year conditions were provided by the project traffic engineering firm, Fehr & Peers Associates, for each alternative. Table 3.6-5 summarizes the traffic noise modeling results for existing and design-year conditions for each alternative considered in the detailed assessment areas.

In accordance with the requirements of the Protocol, traffic noise impacts were identified by determining if design-year noise levels would approach or exceed the NAC or would be 12 dB or more greater than existing conditions. Where traffic noise impacts are identified, noise abatement must be considered for reasonableness and feasibility, as required by 23 CFR 772 and the Protocol. According to the Protocol, noise at affected receivers must be reduced by a minimum of 5 dB for the proposed abatement to be considered feasible from an acoustical perspective. Other factors that can also restrict feasibility include topography; access requirements for driveways, ramps, etc.; presence of local cross streets; other noise sources in the area; and safety considerations.

The overall reasonableness of noise abatement is determined by considering factors such as cost; absolute noise levels; change in noise levels; noise abatement benefits; date of development along the highway; environmental impacts of abatement construction; opinions of affected residents; input from the public and local agencies; and social, legal, and technological factors.

Table 3.6-5 summarizes the results of the traffic noise modeling for cumulative 2015 conditions with the 4-lane tight diamond interchange (proposed action) using the methodology called for in the Protocol.

The following scenarios were also modeled based on County standards and are included in Chapter 5:

- Cumulative 2025 with SPDI ;

Table 3.6-5. Summary of Traffic Noise Modeling Results in Terms of FHWA/Caltrans Standards

Receiver ^a	Location	Type of Use	Activity Category NAC (dB-L[h])	Existing Worst Hour Noise Level (dB-Leq[h])	Predicted Worst Noise Hour Noise Level (dB-Leq[h])		Noise Increase Relative to Existing Worst Hour Noise Level (dB)		Impact Type ^b	
					4-Lane Tight Diamond (2015)	No-Action Alternative (2025)	4-Lane Tight Diamond (2015)	No-Action Alternative (2025)	4-Lane Tight Diamond (2015)	No-Action Alternative (2025)
1 (A)	Room 204 of the Best Western Placerville Inn ^c	Motel	B (67 dB)	45	46	47	1	2	None	None
2 (B)	Montana Court	Residence	B (67 dB)	61	62	63	1	2	None	None
3 (C)	Runnymede Drive and Brent Court	Residence	B (67 dB)	56	58	59	2	3	None	None
4 (D)	Perks Court ^d	Residence	B (67 dB)	60	62	63	2	3	None	None
5 (E)	Perks Court ^d	Residence	B (67 dB)	56	58	58	2	2	None	None
6 (F)	Wamego Road	Residence	B (67 dB)	60	61	61	1	1	None	None
7 (G)	Forni Road	Residence	B (67 dB)	61	62	63	1	2	None	None
8 (H)	Helmrich Lane	Residence	B (67 dB)	53	54	54	1	1	None	None
9 (I)	7th-Day Adventist Church ^c	Church	B (67 dB)	40	42	42	2	2	None	None
10 (J)	Perks Court ^e	Residence	B (67 dB)	64	67	66	3	2	A/E	A/E
11	Missouri Flat Road	Residence	B (67 dB)	66	68	67	2	1	A/E	A/E
12	Missouri Flat Road	Residence	B (67 dB)	67	69	69	2	2	A/E	A/E
13	Missouri Flat Road	Residence	B (67 dB)	68	70	69	2	1	A/E	A/E
14	Placerville Church of Christ ^f	Church	B (67 dB)	48	50	49	2	1	None	None
15	Missouri Flat Road	Residence	B (67 dB)	66	68	68	2	2	A/E	A/E

Note: Receiver with letter indicates noise monitoring position.

^a See Figure 3.6-1 for location of receivers and noise monitoring positions.

^b None = no impacts identified.

A/E = noise abatement criterion threshold approached or exceeded.

^c Interior noise level is based on measurements inside motel or church.

^d Parcels at 6910 and 6940 Perks Court would be fully acquired under the Perks Court cul-de-sac option.

^e Parcel at 6850 Perks Court would be fully acquired under the Perks Court realignment option.

^f Interior noise level is based on a 20 dB exterior to interior noise reduction.

- Cumulative 2025 with No-Action Alternative;
- Cumulative 2025 with 6-Lane Tight Diamond Alternative; and
- Cumulative 2025 with 4-Lane Tight Diamond Alternative.

Projected traffic volumes under the 4-lane tight diamond configuration are projected to be less than under the following CEQA alternatives: SPDI, the 6-Lane Tight Diamond Alternative, or the 4-Lane Tight Diamond Alternative (2025) because 4-lane tight diamond assumes that adequate capacity would be provided to 2015, while the other interchange configurations assume 2025 capacities. Projected traffic volumes for the SPDI, the 6-Lane Tight Diamond Alternative, and the 4-Lane Tight Diamond Alternative under 2025 conditions are anticipated to be similar. Consequently, at all modeled receivers, there is little or no difference between traffic noise levels predicted under each of these alternatives.

Permanent Impacts: 4-Lane Tight Diamond

See the Cumulative Impacts section below.

Temporary Impacts: 4-Lane Tight Diamond

Impact N1: Exposure of Noise-Sensitive Land Uses to Construction Noise

During construction of the project, noise from construction activities (primarily operation of heavy equipment) may intermittently dominate the noise environment in the immediate area of construction. Construction noise is regulated by Caltrans' standard specifications (section 7-1.01I, "Sound Control Requirements"), which state that noise levels generated during construction shall comply with applicable local, state, and federal regulations and that all equipment shall be fitted with adequate mufflers according to the manufacturers' specifications.

El Dorado County has not adopted specific noise level limits for construction noise. However, the El Dorado County Board of Supervisors recently approved a document entitled "Technical Memorandum for Night-Time Construction Work for the Green Valley Road Widening Project" (Hust pers. comm.). This document recognizes construction noise limits specified in the Model Community Noise Control Ordinance promulgated by the California Department of Health Services, Office of Noise Control (ONC) (Hust pers. comm.). Table 3.6-6 summarizes the ONC construction noise limits.

Table 3.6-6. Office of Noise Control Construction Noise Limits

Time of Day	Single Family Residential		Multi-Family Residential		Semi-Residential/Commercial	
	Duration < 10 days	Duration ≥ 10 days	Duration < 10 days	Duration ≥ 10 days	Duration < 10 days	Duration ≥ 10 days
Daily, except Sundays and legal holidays, 7 a.m. to 7 p.m.	75 dBA	60 dBA	80 dBA	65 dBA	85 dBA	70 dBA
Daily, 7 p.m. to 7 a.m. and all day Sunday and legal holidays	60 dBA	50 dBA	65 dBA	55 dBA	70 dBA	60 dBA

Source: California Department of Health Services, Office of Noise Control 1977.

Table 3.6-7 summarizes noise levels produced by construction equipment that is commonly used on roadway-construction projects. Construction equipment is expected to generate noise levels ranging from 70–90 dB at a distance of 15 meters (50 feet), and noise produced by construction equipment would be reduced over distance at a rate of about 6 dB per doubling of distance.

Table 3.6-7. Construction Equipment Noise

Equipment	Maximum Noise Level (dBA at 15 meters [50 feet])
Scrapers	89
Bulldozers	85
Heavy trucks	88
Backhoe	80
Pneumatic tools	85
Concrete pump	82

Source: Federal Transit Administration 1995.

In general, adverse noise impacts from construction are not anticipated because construction would be conducted in accordance with Caltrans’ standard specifications and would be short-term, intermittent, and dominated by local traffic noise. However, there may be instances where construction operations in close proximity to residences could result in noise that exceeds the limits specified in Table 3.6-6, and, therefore, this impact is considered adverse.

Mitigation Measure N1a: Employ Noise-Reduction Construction Measures

- For construction of the interchange, the County will prohibit the construction contractor from undertaking construction activities within 1,000 feet of residences on Sunday, legal holidays, or between the hours of 7 p.m. and 7 a.m. on other days, unless other factors (such as disruptions of peak hour traffic, disruptions to businesses, and traffic safety considerations) render this time frame infeasible.
- The County will require the construction contractor to use equipment with sound control devices no less effective than those provided on the original equipment.

- The County will require that no equipment have an unmuffled exhaust.
- As directed by the County, the contractor shall implement appropriate additional noise mitigation measures, including but not limited to changing the location of stationery construction equipment, shutting off idling equipment, rescheduling construction activity, notifying adjacent residents in advance of construction work, and installing acoustic barriers around stationary construction noise sources such that noise from construction does not exceed the limits specified in Table 3.6-6. If the existing background noise levels exceed the values in the Table 3.6-6, then the limit for construction noise will be 5 db greater than the levels specified in Table 3.6-6.
- Where Caltrans requires construction during nighttime hours within 1,000 feet of an occupied residence, and the additional measures described above will not reduce construction to less than the limits specified in Table 3.6-6 (or to 5 dB or less above the existing background noise levels), the County will consider temporarily relocating the affected resident, upon request, by providing hotel vouchers for nights when construction must occur.

Impact N2: Exposure of Noise-Sensitive Land Uses to Noise from Blasting

The installation of new piers at the Weber Creek bridges may require rock blasting. Noise resulting from blasting during construction has the potential to result in adverse noise impacts at residences on Helmrich Lane and Wamego Road. The County does not have noise-level criteria for evaluating noise impacts associated with blasting activities. However, the following text provides an explanation of criteria that can be employed to determine potential noise impacts associated with project-related blasting noise levels.

Noise levels from blasting activities are described as impulsive sound levels, which are of very low frequency and short duration (generally less than 1 second). These noise levels are reported as linear, peak noise levels, which represent the absolute maximum overpressure produced by a blast. According to researchers investigating human response to blasting, the threshold of persons becoming highly annoyed occurs when peak overpressures exceed about 122 dB. About 10% of the people in the surrounding area would be expected to become highly annoyed if peak overpressures exceed 125 dB. There is very poor correlation between air blasts below 112 dB and the percentage of people highly annoyed. Therefore, it can be concluded that peak overpressures below 112 dB would generally not cause people to become annoyed. In fact, people would probably not be startled by such levels and may not even notice them.

Because noise levels from blasting are generally very low frequency (approximately 2–25 Hz), the human ear does not detect the total energy associated with the overall linear sound energy. The A-weighted sound level de-emphasizes the very low frequency and very high frequency components of sound in a manner similar to the response of the human ear. Research on blasting indicates the typical fundamental frequency (the frequency at which the majority of sound energy for a blast is in the 20–25 Hz range. Applying a typical correction from linear sound levels to A-weighted sound levels at the 25 Hz range and taking into consideration typical noise-level data for blasting, a 40 dB correction can be applied to measured peak overpressures to estimate typical A-weighted maximum noise levels.

The Model Community Noise Control Ordinance developed by the State of California establishes recommended exterior maximum noise level criteria for noise sources such as those associated with blasting activities. The ordinance recommends that a maximum noise level (L_{max}) of 70 dBA be used, which would result in a peak overpressure of approximately 110 dB. This result corresponds to the research discussed above that indicates there is a very poor correlation between air blasts below 112 dB and the percentage of people highly annoyed.

The noise level resulting from blasting activities can be attributed to many variables, which include the size and number of explosive charges, the shot timing between charges, and the inground depth and amount of overburden covering the charges.

The specific type and location of the blasting that may be required for this project has not been determined. However, based on the proximity of residences to the Weber Creek bridges construction area, there is potential for blasting to exceed 112 dB peak overpressure, thereby disturbing residences and resulting in adverse noise impacts.

Mitigation Measure N2a: Employ Measures to Limit Blast Noise

The County shall incorporate the following measures into the construction contract to avoid exceeding 112 dB peak overpressure from blasting:

- The County shall notify all landowners within 900 meters (3,000 feet) of blasting sites of the specific date and time that blasting will occur. This notice shall be provided at least 1 week in advance of the proposed blasting and will specify the day and general timeframe (a.m. or p.m.) that blasting is anticipated.
- The County shall retain a qualified blasting consultant to develop and implement measures to limit peak overpressures from blasting to 112 dB at the nearest inhabited building facade. These measures may include but are not limited to

using reduced charge sizes, changing the number of charges and charge timing, and modifying the depth of charges.

Cumulative Impacts: 4-Lane Tight Diamond Alternative

Impact N3: 2015—1–3 dB Increase in Existing Traffic Noise Levels

Predicted increases in traffic noise under year 2015 conditions relative to existing conditions are in the range of 1–3 dB. These increases are attributed to predicted increases in traffic volumes and shifting of traffic closer to adjacent receivers resulting from ramp modifications and widening of U.S. 50 and Missouri Flat Road. Increases in traffic noise are not considered substantial as defined in the Protocol because they are less than 12 dB above existing noise levels. Modeling results in Table 3.6-5 indicate that predicted traffic noise levels approach or exceed the NAC of 67 dBA-Leq(h) for activity category B lanes uses, which include:

- residences located on Missouri Flat Road (receivers 11–13, 15); and
- residences located on Perks Court near Missouri Flat Road (receiver 10).

Because traffic noise impacts are predicted to occur at these activity category B land uses, noise abatement must be considered in accordance with the requirements of 23CFR772.

The predicted increase in noise between existing and 2015 design year conditions is 3 dB or less. The predicted increase in noise directly attributable to the project, i.e. the increase in noise relative to 2015 No-Action conditions is less than 3 dB. Because the increase in noise attributable to the proposed action is less than 3 dB, the increase would not be perceptible. The predicted traffic noise impacts are therefore not expected to result in a significant effect on the quality of the human environment under NEPA.

Abatement Measure Per the Protocol

As stated in the Protocol, noise abatement is considered only where noise impacts are predicted, where frequent human use occurs, and where a lowered noise level would be of benefit. Potential noise abatement measures identified in the Protocol include

- avoiding the impact by using design alternatives, such as altering the horizontal and vertical alignment of the project;
- constructing noise barriers;
- acquiring property to serve as a buffer zone;

- using traffic management measures to regulate types of vehicles and speeds; and
- acoustically insulating public use or nonprofit institutional structures.

Based on the configuration and location of the proposed action, noise barrier abatement is the only form of noise abatement considered to be potentially reasonable for the residences located on Perks Court and Missouri Flat Road.

Residences located on Missouri Flat Road (receivers 11, 12, 13, 15) have direct driveway access to Missouri Flat Road. Residences on Perks Court (receiver 10) are located adjacent to the Perks Court access point to Missouri Flat Road. Because the driveways and the Perks Court access point would preclude the construction of a continuous sound wall between Missouri Flat Road and these residences, a sound wall at this location would not be acoustically feasible (i.e., would not provide at least 5 dB of noise reduction).

Mitigation Measure

None proposed.

No-Action Alternative

Projected traffic noise under 2025 No-Action conditions was modeled; traffic noise increases relative to existing conditions are predicted to be in the range of 1–3 dB in 2025. Traffic noise under 2015 No-Action conditions was not modeled since the 2015 analysis was intended to evaluate the phasing of the CEQA project. Under 2015 No-Action conditions, the increases are expected to be 1dB or less. The projected increases in noise identified under 2025 and 2015 project conditions are due to background growth in traffic, and not the project itself. 23CFR772 does not require consideration of the No-Action Alternative; so no assessment of impacts or abatement is required under this alternative. No project-related impacts would occur under the No-Action Alternative.