Appendix B CEQA Checklist

Appendix B CEQA Environmental Checklist

The following CEQA Environmental Checklist identifies physical, biological, social and economic factors that might be affected by the proposed project. The CEQA impact levels include potentially significant impact, less than significant impact with mitigation, less than significant impact, and no impact. Please refer to the following for detailed discussions regarding impacts under CEQA:

- Guidance: Title 14, Chapter 3, California Code of Regulations, Sections 15000 et seq.
- Statutes: Division 13, California Public Resource Code, Sections 21000-21178.1

In many cases, background studies performed in connection with the project indicate no impacts. A “no impact” reflects this determination. Any needed discussion is included in the section following the checklist.

The words “significant” and “significance” used throughout the checklist are related to CEQA, not NEPA, impacts (unless otherwise noted). CEQA requires that environmental documents determine significant or potentially significant impacts, NEPA does not. Addressing significant or potentially significant impacts in joint CEQA and NEPA environmental documents can be confusing, especially in those instances where the two laws and implementing regulations have different thresholds of significance. Under NEPA, the degree of impact to a resource is used only to determine which NEPA document is necessary. Once the federal agency has determined the magnitude of a project's impacts and the level of documentation required, it is the magnitude of the impact that is evaluated in the environmental document, not the degree of significance. For the purpose of the impact discussion in this document, determination of significant or potentially significant impacts is made only in the context of CEQA.

	CEQA			
	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
AESTHETICS - Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☑
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic building within a state scenic highway?	☐	☐	☐	☑
c) Substantially degrade the existing visual character or quality of the site and its surroundings? **Visual changes consistent with existing SR 4 corridor and replacement planting provided. (See Section 2.1.7)**	☐	☐	☑	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☑
AGRICULTURE RESOURCES				
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☑
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☑
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☐	☑

	CEQA			
	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
AIR QUALITY -				
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☑
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☐	☑
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☑
d) Expose sensitive receptors to substantial pollutant concentration?	☐	☐	☐	☑
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☑
BIOLOGICAL RESOURCES - Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☑
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☑
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? **Less than 0.5 acres affected. Mitigation banking or on-site/in kind replacement of wetlands will compensate for impacts. (See Section 2.3.1)**	☐	☑	☐	☐

	CEQA			
	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☑
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☑
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☑
COMMUNITY RESOURCES - Would the project:				
a) Cause disruption of orderly planned development?	☐	☐	☐	☑
b) Be inconsistent with a Coastal Zone Management Plan?	☐	☐	☐	☑
c) Affect life-styles, or neighborhood character or stability?	☐	☐	☐	☑
d) Physically divide an established community?	☐	☐	☐	☑
e) Affect minority, low-income, elderly, disabled, transit-dependent, or other specific interest group?	☐	☐	☐	☑
f) Affect employment, industry, or commerce, or require the displacement of businesses or farms? **Relocation assistance provided. (See Section 2.1.4; Appendix D)**	☐	☐	☑	☐
g) Affect property values or the local tax base?	☐	☐	☐	☑
h) Affect any community facilities (including medical, educational, scientific, or religious institutions, ceremonial sites or sacred shrines?	☐	☐	☐	☑
i) Result in alterations to waterborne, rail, or air traffic?	☐	☐	☐	☑
j) Support large commercial or residential development?	☐	☐	☐	☑

	CEQA			
	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
k) Affect wild or scenic rivers or natural landmarks?	☐	☐	☐	☑
l) Result in substantial impacts associated with construction activities (e.g., noise, dust, temporary drainage, traffic detours, and temporary access, etc.)? **Best Management Practices would minimize construction phase impacts. (See Section 2.4)**	☐	☐	☑	☐
CULTURAL RESOURCES - Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☑
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☐	☑
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☑
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☑
GEOLOGY AND SOILS - Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☑
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. **The project will conform to current seismic design standards. (See Section 2.2.3.3)**	☐	☐	☑	☐
ii) Strong seismic ground shaking? **The project will conform to current seismic design standards (See Section 2.2.3.3)**	☐	☐	☑	☐
iii) Seismic-related ground failure, including liquefaction? **The project will conform to current seismic design standards (See Section 2.2.3.3)**	☐	☐	☑	☐

	CEQA			
	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
iv) Landslides?	☐	☐	☐	☑
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☑
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☑
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.	☐	☐	☐	☑
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☑
HAZARDS AND HAZARDOUS MATERIALS - Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☑
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☑
c) Emit hazardous emissions or handle hazardous or acutely hazardous material, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☑
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☑
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☑

	CEQA			
	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☑
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☑
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☑
HYDROLOGY AND WATER QUALITY - Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☐	☑
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☑
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☑
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☐	☑
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☑
f) Otherwise substantially degrade water quality?	☐	☐	☐	☑

	CEQA			
	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☑
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☑
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☑
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☑
LAND USE AND PLANNING - Would the project:				
a) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☑
b) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☑
MINERAL RESOURCES - Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☑
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☑
NOISE - Would the project:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? **Noise Abatement Measures will reduce noise levels (See Section 2.2.6.4)**	☐	☑	☐	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☑

	CEQA			
	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project? **Noise Abatement Measures will reduce noise levels for sensitive receptors (See Section 2.2.6.4)**	☐	☑	☐	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project? **Construction noise will be minimized by equipment noise control and administrative measures. (See Section 2.4.10.3)**	☐	☐	☑	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☑
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☑
POPULATION AND HOUSING - Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☑
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere? **Relocation Assistance provided. (See Section 2.1.4; Appendix D)**	☐	☐	☑	☐
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere? **Relocation Assistance provided. (See Section 2.1.4; Appendix D)**	☐	☐	☑	☐

	CEQA			
	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
PUBLIC SERVICES -				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	☐	☐	☐	☑
Police protection?	☐	☐	☐	☑
Schools?	☐	☐	☐	☑
Parks?	☐	☐	☐	☑
Other public facilities?	☐	☐	☐	☑
RECREATION -				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☑
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☑
TRANSPORTATION/TRAFFIC - Would the project:				
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	☐	☐	☐	☑

	CEQA			
	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways? **Only one intersection would exceed CCTA's level of service standard. Project improvements to traffic operations on a regional level would make this impact less than significant. (See Section 2.1.6.2)**	☐	☐	☑	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☑
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incomplete uses (e.g., farm equipment)?	☐	☐	☐	☑
e) Result in inadequate emergency access?	☐	☐	☐	☑
f) Result in inadequate parking capacity? **Parking mitigation measures proposed in Section 2.1.6.3, would make the impact less than significant**.	☐	☑	☐	☐
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☐	☑
UTILITY AND SERVICE SYSTEMS - Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☑
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☑
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☑
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☑

	CEQA			
	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
e) Result in determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☑
f) Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☑
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☑
MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, or cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☐	☑
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☐	☑
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☑

Appendix C Title VI Policy Statement

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Flex your power!
Be energy efficient!

January 14, 2005

TITLE VI
POLICY STATEMENT

The California Department of Transportation under Title VI of the Civil Rights Act of 1964 and related statutes, ensures that no person in the State of California shall, on the grounds of race, color, national origin, sex, disability, and age, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity it administers.

WILL KEMPTON
Director

Appendix D Summary of Relocation Benefits

APPENDIX D

I. IMPORTANT RELOCATION ASSISTANCE INFORMATION

The following explanation is general in nature and is not intended to be a complete statement of Federal and State relocation laws and regulations. Any questions concerning relocation should be addressed to the Contra Costa Transportation Authority (CCTA).

Any persons to be displaced will be assigned to a relocation advisor, who will work closely with each displacee in order to see that all payments and benefits are fully utilized, and that all regulations are observed, thereby avoiding the possibility of displacees jeopardizing or forfeiting any of their benefits or payments. At the time of the first written offer to purchase, owner-occupants are given a detailed explanation of the CCTA's relocation services. Tenant occupants of properties to be acquired are contacted soon after the first written offer to purchase, and also are given a detailed explanation of the CCTA Relocation Program. To avoid loss of possible benefits, no individual, family, business, farm, or nonprofit organization should commit to purchase or rent a replacement property without first contacting an CCTA relocation advisor.

II. RELOCATION ASSISTANCE ADVISORY SERVICES

In accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, the CCTA will provide relocation advisory assistance to any person, business, farm or nonprofit organization displaced as a result of the acquisition of real property for public use. The CCTA will assist displacees in obtaining comparable replacement housing by providing current and continuing information on the availability and prices of both houses for sale and rental units that are "decent, safe and sanitary." Nonresidential displacees will receive information on comparable properties for lease or purchase. (For business, farm, and nonprofit organization relocation services, see Section IV.)

Residential replacement dwellings will be in equal or better neighborhoods at rents or prices within the financial ability of the individuals and families displaced, and reasonably accessible to their places of employment. Before any displacement occurs, comparable replacement dwellings that are open to all persons regardless of race, color, religion, sex, and national origin, and which are consistent with the requirements of Title VIII of the Civil Rights Act of 1968, will be offered to displacees. This assistance will also include the supply of information concerning Federal and State assisted housing programs, and any other known services being offered by public and private agencies in the area.

Persons who are eligible for relocation payment(s) and who are legally occupying a property required for the project will not be asked to move without first being given at least 90 days written notice, and not unless at least one decent, safe and sanitary replacement residence, available on the market, is offered to them by the CCTA.

III. RESIDENTIAL RELOCATION PAYMENTS PROGRAM

The Relocation Payment Program will help eligible residential occupants by paying certain costs and expenses. These costs are limited to those necessary for or incidental to the purchase or rental of the replacement dwelling and actual reasonable moving expenses to a new location within 50 miles of the displacement property. Any actual moving costs in excess of the 50 miles are the responsibility of the displacee. The Residential Relocation Program can be summarized as follows:

Moving Costs

Any displaced person who lawfully occupied the acquired property, regardless of the length of occupancy in the property acquired, will be eligible for reimbursement of moving costs. Displacees will receive either the actual reasonable costs involved in moving themselves and personal property up to a maximum of 50 miles, or a fixed payment based on a fixed moving cost schedule.

Purchase Supplement

In addition to moving and related expense payments, fully eligible homeowners may be entitled to payments for increased costs of replacement housing.

Homeowners who have owned and occupied their property for 180 days or more prior to the date of the first written offer to purchase the property, may qualify to receive a price differential payment and may qualify to receive reimbursement for certain nonrecurring costs incidental to the purchase of the replacement property. An interest differential payment is also available if the interest rate for the loan on the replacement dwelling is higher than the loan rate on the displacement dwelling, subject to certain limitations on reimbursement based upon the replacement property interest rate. The maximum combination of these three supplemental payments that the owner-occupant can receive is $22,500. If the total entitlement (without the moving payments) is in excess of $22,500, the Last Resort Housing Program will be used. (See the explanation of the Last Resort Housing Program below.)

Rental Supplement

Tenants who have occupied the property to be acquired by the CCTA for 90 days or more and owner-occupants of 90-179 days prior to the date of the first written offer to purchase may qualify to receive a rental differential payment. This payment is made when the CCTA determines that the cost to rent a comparable “decent, safe, and sanitary” replacement dwelling will be more than the present rent of the displacement dwelling. As an alternative, the tenant may qualify for a down payment benefit designed to assist in the purchase of a replacement property and the payment of certain costs incidental to the purchase, subject to certain limitations noted below under the Down Payment section. The maximum amount payable to any tenant of 90 days or more and any owner-occupant of 90-179 days, in addition to moving expenses, is $5,250. If the total entitlement for rental supplement exceeds $5,250, the Last Resort Housing will be used.

In addition to the occupancy requirements, in order to receive any relocation benefits, the displaced person must buy or rent and occupy a “decent, safe, and sanitary” replacement dwelling within one year from the date the department takes legal possession of the property, or from the date the displacee vacates the displacement property, whichever is later.

Down Payment

The down payment option has been designed to aid owner occupants of 90-179 days and tenants with no less than 90 days of continuous occupancy prior to the CCTA's first written offer. The down payment and incidental expenses cannot exceed the maximum payment of $5,250. The one year eligibility period in which to purchase and occupy a "decent, safe, and sanitary" replacement dwelling will apply.

Last Resort Housing

Federal regulations (49 CFR 24) contain the policy and procedure for implementing the Last Resort Housing Program on Federal-aid projects. Last resort housing benefits are, except for the amounts of payments and the methods in making them, the same as those benefits for standard residential relocation, as explained above. Last resort housing has been designed primarily to cover situations where a displacee cannot be relocated because of lack of available comparable replacement housing, or when the anticipated replacement housing payments exceed the $5,250 and $22,500 limits of the standard relocation procedure, because either the displacee lacks the financial ability or other valid circumstances. In certain exceptional situations, Last Resort Housing may also be used for tenants of less than 90 days.

Other Relocation Information

After the first written offer to acquire the property has been made, the CCTA will, within a reasonable length of time, personally contact the displacees to gather important information, including the following:

- Preferences in area of relocation;
- Number of people to be displaced and the distribution of adults and children according to age and sex;
- Location of school and employment;
- Specific arrangements needed to accommodate any family members' special needs;
- Financial ability to relocate into comparable replacement dwelling which will adequately house all members of the family.

IV. THE NONRESIDENTIAL RELOCATION ASSISTANCE PROGRAM

The Nonresidential Relocation Assistance Program provides assistance to businesses, farms, and nonprofit organizations in locating suitable replacement property, and reimbursement for certain costs involved in relocation. The Relocation Advisory Assistance Program will provide current lists of properties offered for sale or rent, suitable for a particular business's specific relocation needs. The types of payments available to eligible businesses, farms, and nonprofit organizations are moving and searching expenses, and possibly reestablishment expenses or a fixed in-lieu payment instead of any moving, searching, and reestablishment expenses. The payment types can be summarized as follows:

Moving Expenses

Moving expenses may include the following actual, reasonable costs:

- The moving of inventory, machinery, equipment, and similar business-related property; dismantling, disconnecting, crating, packing, loading, insuring, transporting, unloading, unpacking, and reconnecting of personal property.
- Loss of tangible personal property provides payment for actual, direct loss of personal property that the owner is permitted not to move.
- Expenses related to searching for a new business site, up to $1,000 for reasonable expenses actually incurred.

Appendix E Traffic and Transportation

LIST OF TABLES

Table E-1: SR 4 Existing (2001) Freeway Mainline Service Levels Distance in Kilometers (km) 3
Table E-2: SR 4 Existing (2001) Freeway Mainline Service Levels Distance in Miles 4
Table E-3: Existing (2001) Intersection Levels of Service 5
Table E-4: SR 4 Year 2030 Traffic Volumes 6
Table E-5: SR 4 Accident History - October 1, 1999 through September 30, 2002 7
Table E-6: Existing 2001 and Year 2030 Westbound Mainline Peak-Hour Service Levels (Metric Units) 8
Table E-7: Existing 2001 and Year 2030 Eastbound Mainline Peak-Hour Service Levels (Metric Units) 9
Table E-8: Existing 2001 and Year 2030 Westbound Mainline Peak-Hour Service Levels (English Units) 10
Table E-9: Existing 2001 and Year 2030 Eastbound Mainline Peak-Hour Service Levels (English Units) 11
Table E-10: Year 2030 Eastbound Ramp Junction Peak-Hour Operations (Metric Units) 12
Table E-11: Year 2030 Westbound Ramp Junction Peak-Hour Operations (Metric Units) 13
Table E-12: Year 2030 Eastbound Ramp Junction Peak-Hour Operations (English Units) 14
Table E-13: Year 2030 Westbound Ramp Junction Peak-Hour Operations (English Units) 15
Table E-14: Year 2030 Weaving Section Peak-Hour Operations 16
Table E-15: Signalized Intersection Level of Service Definitions Using V/C Ratio 17
Table E-16: Signalized Intersection Level of Service Definitions Using Control Delay 17
Table E-17: Unsignalized Intersection Level of Service Definitions Using Control Delay 18
Table E-18: Year 2030 Intersection Analysis Results Intersections at Interchanges 19
Table E-19: Year 2030 Intersection Analysis Results – Isolated Intersections 20

Tables in Appendix E follow the discussion in Section 1.2.3, Project Need and Section 2.1.6, Traffic and Transportation/Pedestrian and Bicycle Facilities in a sequential order.

Measures of congestion for the project area: Tables E-1 and E-2 present results of the May 2003 traffic study prepared for this project, which identified measures of congestion for the project area, including vehicles per distance per lane, vehicle speed, and level of service (LOS).

Intersection Levels of Service: The results of the intersection LOS study for the existing conditions (2001) are shown in Table E-3. Appendix E describes the definitions for the two methodologies (CCTA LOS and 2000 HCM procedures) for intersection level of service analysis in Tables E-15, E-16 and E-17. Tables E-18 and E-19 show the Year 2030 intersection analysis results for intersections at interchanges and isolated intersections, respectively.

Year 2030 Traffic Volumes: Table E-4 presents 2030 traffic volumes for SR 4 segments in the study area.

Safety: Table E-5 shows the SR 4 Accident History for three years from October 1, 1999 through September 30, 2002

Mainline Peak Hour Service Levels (LOS): Tables E-1 and E-2 show the level of service of freeway segments in the study area, under existing conditions. Table E-6 and E-7 show existing and 2030 (both No-Build and Build) vehicle speed and levels of service for westbound and eastbound SR 4 in metric units. Tables E-8 and E-9 present the same data in English units.

Ramp Junction Analysis: Tables E-10 and E-11 tabulates the results of the ramp junction analysis in metric units, and Tables E-12 and E-13 in English units.

Weaving Section Analysis: Table E-14 presents the results of weaving section analysis.

Table E-1: SR 4 Existing (2001) Freeway Mainline Service Levels
Distance in Kilometers (km)

SR 4 Segment	A.M.-Peak Hour			P.M.-Peak Hour		
	Vehicles per km per lane	Vehicle speed (kph)	LOS[1]	Vehicles per km per lane	Vehicle speed (kph)	LOS[1]
Eastbound						
Loveridge Off to SB Loveridge On	12-19	100	D	19-25	32	F
SB Loveridge On to NB Loveridge On						
NB Loveridge On to SB Somersville Off	12-19	105	C	37-43	68	F
SB Somersville Off to NB Somersville Off	6-19	105	C	43-50	32	F
NB Somersville Off to Somersville On						
Somersville On to L Street Off	12-19	105	C	26-31	76	F
L Street Off to G Street Off	12-19	105	C	19-25	90	E
G Street Off to A Street Off	6-12	105	B	19-25	97	D
A Street Off to A Street On	6-12	105	B	12-19	105	C
A Street On to Hillcrest Off	6-12	105	B	12-19	105	C
Hillcrest Off to Hillcrest On	<6	105	A	6-12	105	B
Westbound						
Hillcrest Off to Hillcrest On	6-12	105	B	<6	105	A
Hillcrest On to A Street Off	6-12	103	C	6-12	105	B
A Street Off to A Street On	<6	16	F[2]	6-12	93	E
A Street On to G Street On	12-19	16	F[2]	12-19	105	C
G Street On to L Street On	12-19	14	F[2]	12-19	105	C
L Street On to Somersville Off	19-25	19	F[2]	12-19	105	C
Somersville Off to Somersville On	19-25	11	F[2]	6-12	89	E
Somersville On to Loveridge Off	31-37	21	F[2]	12-19	105	C
Loveridge Off to Loveridge On	37-43	19	F	6-12	82	F

Note:
1. Level of service (LOS) is a measurement of congestion, ranging from LOS A to LOS F, with LOS A representing free-flowing conditions, and LOS F stop-and-go conditions.
2. Although the model reported densities (vehicles per lane per kilometer) that would range from LOS A and D (≤ 22 vehicles per lane per kilometer), field observations at these locations show LOS F (> 28 vehicles per lane per kilometer). These six locations are reported in this table as LOS F but with the model reported densities.

Source: Fehr & Peers, May 2003

Table E-2: SR 4 Existing (2001) Freeway Mainline Service Levels
Distance in Miles

SR 4 Segment	A.M.-Peak Hour			P.M.-Peak Hour		
	Vehicles per mile per lane	Vehicle speed (mph)	LOS[1]	Vehicles per mile per lane	Vehicle speed (mph)	LOS[1]
Eastbound						
Loveridge Off to SB Loveridge On	20-30	62	D	30-40	20	F
SB Loveridge On to NB Loveridge On						
NB Loveridge On to SB Somersville Off	20-30	65	C	60-70	42	F
SB Somersville Off to NB Somersville Off	10-30	65	C	70-80	20	F
NB Somersville Off to Somersville On						
Somersville On to L Street Off	20-30	65	C	40-50	47	F
L Street Off to G Street Off	20-30	65	C	30-40	56	E
G Street Off to A Street Off	10-20	65	B	30-40	60	D
A Street Off to A Street On	10-20	65	B	20-30	65	C
A Street On to Hillcrest Off	10-20	65	B	20-30	65	C
Hillcrest Off to Hillcrest On	<10	65	A	10-20	65	B
Westbound						
Hillcrest Off to Hillcrest On	10-20	65	B	<10	65	A
Hillcrest On to A Street Off	10-20	64	C	10-20	65	B
A Street Off to A Street On	<10	10	F[2]	10-20	58	E
A Street On to G Street On	20-30	10	F[2]	20-30	65	C
G Street On to L Street On	20-30	9	F[2]	20-30	65	C
L Street On to Somersville Off	30-40	12	F[2]	20-30	65	C
Somersville Off to Somersville On	30-40	7	F[2]	10-20	55	E
Somersville On to Loveridge Off	50-60	13	F[2]	20-30	65	C
Loveridge Off to Loveridge On	60-70	12	F	10-20	51	F

Note:
1. Level of service (LOS) is a measurement of congestion, ranging from LOS A to LOS F, with LOS A representing free-flowing conditions, and LOS F stop-and-go conditions.
2. Although the model reported densities (vehicles per lane per mile) that would range from LOS A and D (≤ 35 vehicles per lane per mile), field observations at these locations show LOS F (> 45 vehicles per lane per mile). These six locations are reported in this table as LOS F but with the model reported densities.

Source: Fehr & Peers, May 2003

Table E-3: Existing (2001) Intersection Levels of Service

Intersection	A.M.-Peak Hour		P.M.-Peak Hour	
	VC / LOS[1]	Delay / LOS[2]	VC / LOS[1]	Delay / LOS[2]
Loveridge Road / Buchanan Road	0.64/B	18.1/B	0.69/B	13.5/B
Loveridge Road / East Leland Road	0.67/B	34.6/C	0.75/D	50.8/D
Loveridge Road / Eastbound SR 4 On/Off-Ramps	0.57/A	8.5/A	0.43/A	5.5/A
Westbound SR 4 On/Off-Ramps to California Ave.	0.58/A	15.4/B	0.75/C	36.9/D
Loveridge Road / California Avenue (South)	0.56/A	23.3/C	0.55/A	25.1/C
Loveridge Road / California Avenue (North)	18.6/C [3]		21.1/C [3]	
Loveridge Road / Pittsburg-Antioch Highway	0.64/B	46.4/D	1.07/F	>80/F
Somersville Road / Buchanan Road	0.90 / D	>80 / F	0.68 / B	50.7 / D
Somersville Road / Delta Fair Blvd.	0.68 / B	33.7 / C	0.70 / B	51.8 / D
Somersville Road / EB SR 4 On/Off-Ramps	0.51 / A	14.4 / B	0.86 / D	24.3 / C
Somersville Road / WB SR 4 On/Off-Ramps	0.42 / A	13.8 / B	0.61 / B	30.2 / C
Somersville Rd. /Mahogany Wy. / Century Blvd.	0.26 / A	20.1 / C	0.48 / A	29.1 / C
Somersville Rd. / Pittsburg-Antioch Highway	0.44 / A	19.1 / B	0.59 / A	23.4 / C
L Street / Buchanan Road / Fitzuren Road	0.61 / B	41.9 / D	0.63 / B	37.5 / D
Contra Loma Blvd. / Eastbound SR 4 Off-Ramp	18.8 / C [3,4]		39.9 / E [3,4]	
L Street / Westbound SR 4 On-Ramp	4.4 / A [3]		4.7 / A [3]	
L Street / Claudia Court	19.3 / C [3]		16.8 / C [3]	
G Street / EB SR 4 Off-Ramp / Tregallas Rd.	>50 / F [3]		25.3 / D [3]	
G Street / WB SR 4 On-Ramp / Drake Street	>50 / F [3]		31.5 / D [3]	
Lone Tree Way / Tregallas Rd. (South)	0.56 / A	17.6 / B	0.65 / B	27.3 / C
Lone Tree Way / Tregallas Rd. (North)	0.50 / A	6.4 A	0.48 / A	4.4 / A
A Street / Eastbound SR 4 On/Off-Ramps	0.61 / A	12.5 B	0.60 / A	21.0 / C
A Street / Westbound SR 4 On/Off-Ramps	0.78 / C	35.7 / D	0.60 / A	22.0 / C
A Street / Bryan Ave./Texas Street	>50 / F [3]		>50 / F [3]	
A Street / 10th Street	0.57 / A	23.0 / C	0.50 / A	11.7 / B
Hillcrest Rd. / Tregallas Rd./Larkspur Drive	0.54 / A	17.6 / B	0.74 / C	37.3 / C
Hillcrest Rd. / EB SR 4 On/Off-Ramps	0.58 / A	3.3 / A	0.77 / C	47.5 / D
Hillcrest Rd. / WB SR 4 On/Off-Ramps	0.61/ B	29.7 / C	0.53 / A	21.9 / C
Hillcrest Rd. / Sunset Dr.	0.27 / A	16.9 / B	0.35 / A	20.3 / C
Hillcrest Rd. / East 18th Street	0.69 / B	38.1 / D	0.66 / B	30.7 / C

Notes:

1. VC/LOS indicates volume to capacity and LOS based on CCTA LOS analysis. Volume to capacity (VC) is a ratio of vehicle volume to roadway capacity, with numbers greater than 1.0 indicating the roadway capacity is exceeded.
2. Delay/LOS indicates signalized intersection average vehicle delay/LOS based on SYNCHRO 5.0 and 2000 Highway Capacity Manual. Average vehicle delay is measured in seconds per vehicle.
3. These intersections are not signalized. The results reported for these intersections are control delay/LOS, for the worst approach based on SYNCHRO 5.0 and 2000 HCM.
4. The L Street/Eastbound SR 4 off-ramp intersection is analyzed as all-way-stop-controlled; however, the results are reported for the southbound approach with higher stopped volume.

Source: Fehr & Peers Associates, Inc, May 2003.

Table E-4: SR 4 Year 2030 Traffic Volumes		
SR 4 Segment	Traffic Volume	
	A.M. Peak	P.M. Peak
Eastbound		
West limit of project to Loveridge Off	4,580	5,980
Loveridge Off to SB Loveridge On	3,920	3,840
SB Loveridge On to NB Loveridge On	4,130	4,380
NB Loveridge On to SB Somersville Off	4,460	4,950
SB Somersville Off to NB Somersville Off	4,020	4,500
NB Somersville Off to Somersville On	3,790	4,310
Somersville On to L Street Off	4,520	5,440
L Street Off to G Street Off	4,130	5,110
G Street Off to A Street Off	3,920	5,000
A Street Off to A Street On	3,190	4,370
A Street On to Hillcrest Off	3,860	5,030
Hillcrest Off to Hillcrest On	2,780	3,770
Hillcrest On to east limit of project		
Westbound		
East limit of project to Hillcrest Off	4,160	3,770
Hillcrest Off to Hillcrest On	3,580	3,070
Hillcrest On to A Street Off	4,690	4,700
A Street Off to A Street On	4,190	3,830
A Street On to G Street On	4,780	4,660
G Street On to L Street On	4,870	4,740
L Street On to Somersville Off	5,090	5,020
Somersville Off to Somersville On	4,470	4,020
Somersville On to Loveridge Off	5,360	4,670
Loveridge Off to Loveridge On	4,750	3,900
Loveridge On to west limit of project	6,630	4,880
Source: Fehr & Peers Associates, Inc, May 2003		

Table E-5: SR 4 Accident History - October 1, 1999 through September 30, 2002

Route 4/Location	Number of Accidents			Accident Rates (ACCS/MVKM)					
				Actual SR 4 Rate			Statewide Average		
	Tot.	Fat.	Inj.	Fat.	F+I	Tot.	Fat.	F+I	Tot.
SR 4 Mainline									
-KP 37.6 to 47.6 -(PM 23.4 to R029.6) Eastbound (EB)	357	2	131	0.004	0.29	0.78	0.009	0.28	0.76
-KP 37.6 to 47.6 -(PM 23.4 to R029.6) Westbound (WB)	425	2	151	0.004	0.34	0.93	0.009	0.28	0.76
Loveridge Road									
-EB off to Loveridge	9	0	5	0.000	0.40	0.73	0.003	0.38	0.93
-EB on from SB Loveridge	1	0	1	0.000	0.17	0.17	0.002	0.20	0.53
-EB on from NB Loveridge	6	0	2	0.000	0.29	0.88	0.002	0.14	0.37
-WB off to Loveridge	3	0	2	0.000	0.17	0.25	0.003	0.24	0.71
- WB off to California	16	0	3	0.000	0.26	1.40	0.003	0.24	0.71
-WB on from Loveridge	3	0	2	0.000	0.18	0.27	0.001	0.12	0.34
Somersville Road									
-EB off to SB Somersville	5	0	1	0.000	0.14	0.71	0.002	0.14	0.37
-EB off to NB Somerville	8	0	3	0.000	0.32	0.86	0.002	0.26	0.78
-EB on from Somersville	6	0	3	0.000	0.14	0.27	0.001	0.20	0.50
-WB on from Somersville	9	1	2	0.065	0.19	0.58	0.001	0.20	0.50
-WB off to Somersville	9	0	3	0.000	0.15	0.45	0.002	0.31	0.84
Contra Loma Boulevard – L Street									
-EB off to L Street	3	0	1	0.000	0.14	0.42	0.003	0.38	0.93
-WB on from L Street	4	0	3	0.000	0.46	0.62	0.001	0.20	0.50
G Street									
-EB off to H Street	1	0	1	0.000	0.16	0.16	0.003	0.38	0.93
-WB on from H Street	2	0	0	0.000	0.00	0.38	0.001	0.20	0.50
Lone Tree Way – A Street									
-EB off to A Street	14	0	5	0.000	0.24	0.68	0.003	0.38	0.93
-EB on from A Street	3	0	2	0.000	0.35	0.52	0.001	0.20	0.50
-WB on from A Street	3	0	3	0.000	0.14	0.14	0.001	0.20	0.50
-WB off to A Street	2	0	1	0.000	0.16	0.32	0.003	0.38	0.93
Hillcrest Avenue									
-EB off to Hillcrest	4	0	2	0.000	0.07	0.15	0.003	0.38	0.93
-EB on from Hillcrest	1	0	0	0.000	0.00	0.32	0.001	0.20	0.50
-WB on from Hillcrest	5	0	1	0.000	0.04	0.18	0.001	0.20	0.50
-WB off to Hillcrest	0	0	0	0.000	0.00	0.00	0.003	0.38	0.93

Notes: Shading denotes locations that exceed the statewide average for similar facilities.
Source: Caltrans, TASAS, 2003.

Table E-6: Existing 2001 and Year 2030 Westbound Mainline Peak-Hour Service Levels (Metric Units)

SR 4 Mainline Segment	2001 Existing		2030 No Build		2030 Build	
	A.M. Peak [1]	P.M. Peak [1]	A.M. Peak [1]	P.M. Peak [1]	A.M. Peak [1]	P.M. Peak [1]
Beginning - Hillcrest Avenue Off-Ramp			**(43-50) [35] F**	**(43-50) [35] F**	(12-19) [103] D	(12-19) [105] C
Hillcrest Ave. Off-Ramp - Hillcrest Ave. NB On-Ramp	(6-12) [105] B	(<6) [105] A	**(80-90) [24] F**	**(>100) [21] F**	(12-19) [105] C	(6-12) [105] B
Hillcrest Ave. NB On-Ramp - Hillcrest Ave. SB On-Ramp					(12-19) [105] C	(6-12) [105] B
Hillcrest Ave. SB On-Ramp - A Street Off-Ramp	(6-12) [103] C	(6-12) [105] B	**(43-50) [40] F**	**(25-31) [77] F**	(12-19) [100] D	(12-19) [105] C
A Street Off-Ramp - A Street NB On-Ramp	**(<6) [2] [16] F**	(6-12) [93] E	**(43-50) [34] F**	**(31-37) [50] F**	(19-25) [95] E	(12-19) [103] D
A Street NB On-Ramp - A Street SB On-Ramp					(12-19) [95] D	(12-19) [105] C
A Street SB On-Ramp - L Street Off-Ramp					(19-25) [92] E	(12-19) [105] C
A Street On-Ramp - G Street On-Ramp	**(12-19) [2] [16] F**	(12-19) [105] C	**(37-43) [43] F**	**(37-43) [50] F**		
G Street On-Ramp - L Street On-Ramp	**(12-19) [2] [14] F**	(12-19) [105] C	**(37-43) [45] F**	**(43-50) [47] F**		
L Street Off-Ramp - L Street On-Ramp					(19-25) [90] E	(12-19) [101] D
L Street On-Ramp - Somersville Off-Ramp	**(19-25) [2] [19] F**	(12-19) [105] C	**(43-50) [42] F**	**(25-31) [84] F**	(12-19) [93] D	(12-19) [105] C
Somersville Rd. Off-Ramp - Somersville Rd. On-Ramp	**(19-25) [2] [11] F**	(6-12) [89] E	**(37-43) [40] F**	(19-25) [93] E	(19-25) [90] E	(12-19) [105] C
Somersville Rd. On-Ramp – Loveridge Rd. Off-Ramp	**(31-37) [21] F**	(12-19) [105] C	**(31-37) [58] F**	(19-25) [90] E	(12-19) [95] D	(6-12) [105] B
Loveridge Rd. Off-Ramp - Loveridge Rd. On-Ramp	**(37-43) [19] F**	**(6-12) [82] F**	(19-25) [80] E	(12-19) [93] D	(19-25) [97] D	(12-19) [105] C
Loveridge Rd. On-Ramp - Harbor Rd. Off-Ramp			(19-25) [89] E	(12-19) [105] C	(12-19) [98] D	(6-12) [105] B

Note:
1. (12-19) [100] C = (Density range in vehicles per kilometer per lane) [Vehicle speed in kph] Level of service; **bold text** indicates LOS F. Shaded cells denote the absence of the ramp in question.
2. Although FREQ is reporting densities between LOS A and LOS D, field observations show LOS F.

Source: Fehr & Peers Associates, May 2003

Table E-7: Existing 2001 and Year 2030 Eastbound Mainline Peak-Hour Service Levels (Metric Units)

SR 4 Mainline Segment	2001 Existing		2030 No Build		2030 Build	
	A.M. Peak [1]	P.M. Peak [1]	A.M. Peak [1]	P.M. Peak [1]	A.M. Peak [1]	P.M. Peak [1]
Railroad Ave. On-Ramp – Loveridge Rd. Off-Ramp			**(43-50) [31] F**	**(43-50) [32] F**	(6-12) [105] B	(12-19) [98] D
Loveridge Rd. Off-Ramp - SB Loveridge Rd. On-Ramp	(12-19) [100] D	**(19-25) [32] F**	**(37-43) [42] F** (19-25) [84] E	**(43-50) [29] F** **(37-43) [40] F**	(6-12) [105] B	(19-25) [97] D
SB Loveridge Rd. On-Ramp - NB Loveridge Rd. On-Ramp						
NB Loveridge Rd. On-Ramp - SB Somersville Rd. Off-Ramp	(12-19) [105] C	**(37-43) [68] F**	(19-25) [92] E	**(43-50) [39] F**	(6-12) [105] B	(12-19) [97] D
SB Somersville Rd. Off-Ramp – NB Somersville Rd. Off-Ramp	(10-30) [105] C	**(43-50) [32] F**	(19-25) [87] E (19-25) [93] E	**(43-50) [37] F** **(43-50) [34] F**	(6-12) [105] B	(19-25) [92] E
NB Somersville Rd. Off-Ramp - Somersville Rd. On-Ramp						
Somersville On-Ramp - L Street Off-Ramp	(12-19) [105] C	**(25-31) [76] F**	(19-25) [89] E	**(25-31) [80] F**	(6-12) [105] B	**(25-31) [63] F**
L Street Off-Ramp - L Street On-Ramp					(12-19) [105] C	**(25-31) [84] F**
L Street Off-Ramp - G Street Off-Ramp	(12-19) [105] C	(19-25) [90] E	(19-25) [97] D	(19-25) [93] E		
G Street Off-Ramp - A Street Off-Ramp	(6-12) [105] B	(19-25) [97] D	(12-19) [100] D	(19-25) [95] E		
L Street On-Ramp - A Street Off-Ramp					(6-12) [105] B	(19-25) [85] E
A Street Off-Ramp - A Street On-Ramp	(6-12) [105] B	(12-19) [105] C	(12-19) [105] C	(12-19) [100] D	(6-12) [105] B	(12-19) [98] D
A Street On-Ramp - Hillcrest Ave. Off-Ramp	(6-12) [105] B	(12-19) [105] C	(12-19) [100] D	(19-25) [89] E	(6-12) [105] B	(12-19) [100] D
Hillcrest Ave. Off-Ramp - Hillcrest Ave. On-Ramp	(< 6) [105] A	(6-12) [105] B	(12-19) [105] C	(12-19) [103] D	(6-12) [105] B	(12-19) [105] C
Hillcrest Avenue On-Ramp – End			(12-19) [103] D	(12-19) [101] D	(6-12) [105] B	(12-19) [101] D

Note:
(12-19) [100] C = (Density range in vehicles per kilometer per lane) [Vehicle speed in kph] Level of service; **bold text** indicates LOS F. Shaded cells denote the absence of the ramp in question.
Source: Fehr & Peers Associates, May 2003.

Table E-8: Existing 2001 and Year 2030 Westbound Mainline Peak-Hour Service Levels (English Units)

SR 4 Mainline Segment	2001 Existing		2030 No Build		2030 Build	
	A.M. Peak [1]	P.M. Peak [1]	A.M. Peak [1]	P.M. Peak [1]	A.M. Peak [1]	P.M. Peak [1]
Beginning - Hillcrest Avenue Off-Ramp			**(70-80) [22] F**	**(70-80) [22] F**	(20-30) [64] D	(20-30) [65] C
Hillcrest Ave. Off-Ramp - Hillcrest Ave. NB On-Ramp	(10-20) [65] B	(<10) [65] A	**(80-90) [15] F**	**(>100) [13] F**	(20-30) [65] C	(10-20) [65] B
Hillcrest Ave. NB On-Ramp - Hillcrest Ave. SB On-Ramp					(20-30) [65] C	(10-20) [65] B
Hillcrest Ave. SB On-Ramp - A Street Off-Ramp	(10-20) [64] C	(10-20) [65] B	**(70-80) [25] F**	**(40-50) [48] F**	(20-30) [62] D	(20-30) [65] C
A Street Off-Ramp - A Street NB On-Ramp	**(<10) [2] [10] F**	(10-20) [58] E	**(70-80) [21] F**	**(50-60) [31] F**	(30-40) [59] E	(20-30) [64] D
A Street NB On-Ramp - A Street SB On-Ramp					(20-30) [59] D	(20-30) [65] C
A Street SB On-Ramp - L Street Off-Ramp					(30-40) [57] E	(20-30) [65] C
A Street On-Ramp - G Street On-Ramp	**(20-30) [2] [10] F**	(20-30) [65] C	**(60-70) [27] F**	**(60-70) [31] F**		
G Street On-Ramp - L Street On-Ramp	**(20-30) [2] [9] F**	(20-30) [65] C	**(60-70) [28] F**	**(70-80) [29] F**		
L Street Off-Ramp - L Street On-Ramp					(30-40) [56] E	(20-30) [63] D
L Street On-Ramp - Somersville Off-Ramp	**(30-40) [2] [12] F**	(20-30) [65] C	**(70-80) [26] F**	**(40-50) [52] F**	(20-30) [58] D	(20-30) [65] C
Somersville Rd. Off-Ramp - Somersville Rd. On-Ramp	**(30-40) [2] [7] F**	(10-20) [55] E	**(60-70) [25] F**	(30-40) [58] E	(30-40) [56] E	(20-30) [65] C
Somersville Rd. On-Ramp – Loveridge Rd. Off-Ramp	**(50-60) [13] F**	(20-30) [65] C	**(50-60) [36] F**	(30-40) [56] E	(20-30) [59] D	(10-20) [65] B
Loveridge Rd. Off-Ramp - Loveridge Rd. On-Ramp	**(60-70) [12] F**	**(10-20) [51] F**	(30-40) [50] E	(20-30) [58] D	(30-40) [60] D	(20-30) [65] C
Loveridge Rd. On-Ramp - Harbor Rd. Off-Ramp			(30-40) [55] E	(20-30) [65] C	(20-30) [61] D	(10-20) [65] B

Note:
1. (20-30) [62] C = (Density range in vehicles per mile per lane) [Vehicle speed in mph] Level of service; **bold text** indicates LOS F. Shaded cells denote the absence of the ramp in question.
2. Although FREQ is reporting densities between LOS A and LOS D, field observations show LOS F.

Source: Fehr & Peers Associates, May 2003

Table E-9: Existing 2001 and Year 2030 Eastbound Mainline Peak-Hour Service Levels (English Units)

SR 4 Mainline Segment	2001 Existing		2030 No Build		2030 Build	
	A.M. Peak [1]	P.M. Peak [1]	A.M. Peak [1]	P.M. Peak [1]	A.M. Peak [1]	P.M. Peak [1]
Railroad Ave. On-Ramp – Loveridge Rd. Off-Ramp			**(70-80) [19] F**	**(70-80) [20] F**	(10-20) [65] B	(20-30) [61] D
Loveridge Rd. Off-Ramp - SB Loveridge Rd. On-Ramp	(20-30) [62] D	**(30-40) [20] F**	**(60-70) [26] F** (30-40) [52] E	**(70-80) [18] F** **(60-70) [25] F**	(10-20) [65] B	(30-40) [60] D
SB Loveridge Rd. On-Ramp - NB Loveridge Rd. On-Ramp						
NB Loveridge Rd. On-Ramp - SB Somersville Rd. Off-Ramp	(20-30) [65] C	**(60-70) [42] F**	(30-40) [57] E	**(70-80) [24] F**	(10-20) [65] B	(20-30) [60] D
SB Somersville Rd. Off-Ramp – NB Somersville Rd. Off-Ramp	(10-30) [65] C	**(70-80) [20] F**	(30-40) [54] E (30-40) [58] E	**(70-80) [23] F** **(70-80) [21] F**	(10-20) [65] B	(30-40) [57] E
NB Somersville Rd. Off-Ramp - Somersville Rd. On-Ramp						
Somersville On-Ramp - L Street Off-Ramp	(20-30) [65] C	**(40-50) [47] F**	(30-40) [55] E	**(40-50) [50] F**	(10-20) [65] B	**(40-50) [39] F**
L Street Off-Ramp - L Street On-Ramp					(20-30) [65] C	**(40-50) [52] F**
L Street Off-Ramp - G Street Off-Ramp	(20-30) [65] C	(30-40) [56] E	(30-40) [60] D	(30-40) [58] E		
G Street Off-Ramp - A Street Off-Ramp	(10-20) [65] B	(30-40) [60] D	(20-30) [62] D	(30-40) [59] E		
L Street On-Ramp - A Street Off-Ramp					(10-20) [65] B	(30-40) [53] E
A Street Off-Ramp - A Street On-Ramp	(10-20) [65] B	(20-30) [65] C	(20-30) [65] C	(20-30) [62] D	(10-20) [65] B	(20-30) [61] D
A Street On-Ramp - Hillcrest Ave. Off-Ramp	(10-20) [65] B	(20-30) [65] C	(20-30) [62] D	(30-40) [55] E	(10-20) [65] B	(20-30) [62] D
Hillcrest Ave. Off-Ramp - Hillcrest Ave. On-Ramp	(< 10) [65] A	(10-20) [65] B	(20-30) [65] C	(20-30) [64] D	(10-20) [65] B	(20-30) [65] C
Hillcrest Avenue On-Ramp – End			(20-30) [64] D	(20-30) [63] D	(10-20) [65] B	(20-30) [63] D

Note:
1. (20-30) [62] C = (Density range in vehicles per mile per lane) [Vehicle speed in mph] Level of service; **bold text** indicates LOS F. Shaded cells denote the absence of the ramp in question.

Source: Fehr & Peers Associates, May 2003.

Table E-10: Year 2030 Eastbound Ramp Junction Peak-Hour Operations (Metric Units)				
	No-Build Alternative		**Build Alternative**	
SR 4 Ramp Junction	**A.M. Peak [1]**	**P.M. Peak [1]**	**A.M. Peak [1]**	**P.M. Peak [1]**
Loveridge Rd. Off-Ramp	**(43-50) F**	**(43-50) F**	(6-12) B	(12-19) D
SB Loveridge Rd. On-Ramp	**(37-43) F**	**(43-50) F**	(6-12) B	(19-25) D
NB Loveridge Rd. On-Ramp	(19-25) E	**(37-43) F**		
SB Somersville Rd. /Off-Ramp	(19-25) E	**(43-50) F**	(6-12) B	(12-19) D
NB Somersville Rd. Off-Ramp	(19-25) E	**(43-50) F**		
Somersville Rd. On-Ramp	(19-25) E	**(43-50) F**	(6-12) B	(19-25) E
L Street Off-Ramp	(19-25) E	**(25-31) F**	(6-12) B	**(25-31) F**
L Street On-Ramp	N/A[2]	N/A[2]	(12-19) C	**(25-31) F**
G Street Off-Ramp	(19-25) D	(19-25) E	N/A[2]	N/A[2]
A Street Off-Ramp	(12-19) D	(19-25) E	(6-12) B	(19-25) E
A Street On-Ramp	(12-19) C	(12-19) D	(6-12) B	(12-19) D
Hillcrest Avenue Off-Ramp	(12-19) D	(19-25) E	(6-12) B	(12-19) D
Hillcrest Avenue On-Ramp	(12-19) C	(12-19) D	(6-12) B	(12-19) C

Note:
1. (12-19) C = (Density range in vehicles per kilometer per lane) Level of service; **bold text** indicates LOS F.
2. N/A = not applicable; ramp configuration does not exist for this alternative.

Source: Fehr & Peers Associates, May 2003.

Table E-11: Year 2030 Westbound Ramp Junction Peak-Hour Operations (Metric Units)

SR 4 Ramp Junction	No-Build Alternative		Build Alternative	
	A.M. Peak [1]	P.M. Peak [1]	A.M. Peak [1]	P.M. Peak [1]
Hillcrest Avenue Off-Ramp	**(43-50) F**	**(43-50) F**	(12-19) D	(12-19) C
Hillcrest Avenue NB On-Ramp	**(50-56) F**	**(>62) F**	(12-19) C	(6-12) B
Hillcrest Avenue SB On-Ramp			(12-19) C	(6-12) B
A Street Off-Ramp	**(43-50) F**	**(25-31) F**	(12-19) D	(12-19) C
A Street NB On-Ramp	**(43-50) F**	**(31-37) F**	(19-25) E	(12-19) D
A Street SB On-Ramp			(12-19) D	(12-19) C
G Street On-Ramp	**(37-43) F**	**(37-43) F**	N/A[2]	N/A[2]
L Street Off-Ramp	N/A[2]	N/A[2]	(19-25) E	(12-19) C
L Street On-Ramp	**(37-43) F**	**(43-50) F**	(19-25) E	(12-19) D
Somersville Rd. Off-Ramp	**(43-50) F**	**(25-31) F**	(12-19) D	(12-19) C
Somersville Rd. On-Ramp	**(37-43) F**	(19-25) E	(19-25) E	(12-19) C
Loveridge Rd. Off-Ramp	**(31-37) F**	(19-25) E	(12-19) D	(6-12) B
Loveridge Rd. On-Ramp	(19-25) E	(12-19) D	(19-25) D	(12-19) C

Note:
1. (12-19) C = (Density range in vehicles per kilometer per lane) Level of service; **bold text** indicates LOS F.
2. N/A = not applicable; ramp configuration does not exist for this alternative.

Source: Fehr & Peers Associates, May 2003.

Table E-12: Year 2030 Eastbound Ramp Junction Peak-Hour Operations (English Units)

SR 4 Ramp Junction	No-Build Alternative		Build Alternative	
	A.M. Peak [1]	P.M. Peak [1]	A.M. Peak [1]	P.M. Peak [1]
Loveridge Rd. Off-Ramp	**(70-80) F**	**(70-80) F**	(10-20) B	(20-30) D
SB Loveridge Rd. On-Ramp	**(60-70) F**	**(70-80) F**	(10-20) B	(30-40) D
NB Loveridge Rd. On-Ramp	(30-40) E	**(60-70) F**		
SB Somersville Rd. /Off-Ramp	(30-40) E	**(70-80) F**	(10-20) B	(20-30) D
NB Somersville Rd. Off-Ramp	(30-40) E	**(70-80) F**		
Somersville Rd. On-Ramp	(30-40) E	**(70-80) F**	(10-20) B	(30-40) E
L Street Off-Ramp	(30-40) E	**(40-50) F**	(10-20) B	**(40-50) F**
L Street On-Ramp	N/A[2]	N/A[2]	(20-30) C	**(40-50) F**
G Street Off-Ramp	(30-40) D	(30-40) E	N/A[2]	N/A[2]
A Street Off-Ramp	(20-30) D	(30-40) E	(10-20) B	(30-40) E
A Street On-Ramp	(20-30) C	(20-30) D	(10-20) B	(20-30) D
Hillcrest Avenue Off-Ramp	(20-30) D	(30-40) E	(10-20) B	(20-30) D
Hillcrest Avenue On-Ramp	(20-30) C	(20-30) D	(10-20) B	(20-30) C

Note:
1. (20-30) C = (Density range in vehicles per mile per lane) Level of service; **bold text** indicates LOS F.
2. N/A = not applicable; ramp configuration does not exist for this alternative.

Source: Fehr & Peers Associates, May 2003.

Table E-13: Year 2030 Westbound Ramp Junction Peak-Hour Operations (English Units)

SR 4 Ramp Junction	No-Build Alternative		Build Alternative	
	A.M. Peak [1]	P.M. Peak [1]	A.M. Peak [1]	P.M. Peak [1]
Hillcrest Avenue Off-Ramp	**(70-80) F**	**(70-80) F**	(20-30) D	(20-30) C
Hillcrest Avenue NB On-Ramp	**(80-90) F**	**(>100) F**	(20-30) C	(10-20) B
Hillcrest Avenue SB On-Ramp			(20-30) C	(10-20) B
A Street Off-Ramp	**(70-80) F**	**(40-50) F**	(20-30) D	(20-30) C
A Street NB On-Ramp	**(70-80) F**	**(50-60) F**	(30-40) E	(20-30) D
A Street SB On-Ramp			(20-30) D	(20-30) C
G Street On-Ramp	**(60-70) F**	**(60-70) F**	N/A[2]	N/A[2]
L Street Off-Ramp	N/A[2]	N/A[2]	(30-40) E	(20-30) C
L Street On-Ramp	**(60-70) F**	**(70-80) F**	(30-40) E	(20-30) D
Somersville Rd. Off-Ramp	**(70-80) F**	**(40-50) F**	(20-30) D	(20-30) C
Somersville Rd. On-Ramp	**(60-70) F**	(30-40) E	(30-40) E	(20-30) C
Loveridge Rd. Off-Ramp	**(50-60) F**	(30-40) E	(20-30) D	(10-20) B
Loveridge Rd. On-Ramp	(30-40) E	(20-30) D	(30-40) D	(20-30) C

Note:
1. (20-30) C = (Density range in vehicles per mile per lane) Level of service; **bold text** indicates LOS F.
2. N/A = not applicable; ramp configuration does not exist for this alternative.

Source: Fehr & Peers Associates, May 2003.

Table E-14: Year 2030 Weaving Section Peak-Hour Operations

Direction	SR 4 Weaving Segment [1]	No Build [2]		Build [3]	
		A.M.	P.M.	A.M.	P.M.
East-bound	Somersville Rd. On-Ramp - L Street Off-Ramp	E	F	C	F
	L Street On-Ramp - A Street Off-Ramp	D	E	C	F
	A Street On-Ramp – Hillcrest Avenue Off-Ramp	D	E	C	D
West-bound	Hillcrest Avenue NB On-Ramp - Hillcrest Avenue SB On-Ramp	F	F	E	D
	Hillcrest Avenue SB On-Ramp - A Street Off-Ramp	F	F		
	A Street NB On-Ramp - A Street SB On-Ramp	F	F	F	E
	A Street SB On-Ramp - L Street Off-Ramp	F	F		
	L Street On-Ramp - Somersville Rd. Off-Ramp	F	F	F	D

Notes:
1. The freeway segments between Loveridge Road and Somersville Road are not considered weaving sections because their distance exceeds the maximum considered as a weaving section in the *Highway Design Manual* (California Department of Transportation, 2003).
2. No weaving sections exist for the No Project condition. Service levels from FREQ model output are shown for comparison purposes.
3. Service levels were computed according to the LOS D methodology identified in the *Highway Design Manual* (California Department of Transportation, 2003). These results are not directly comparable to the FREQ results as the weaving analysis methodology assumes a mainline capacity of 1,900 vehicles per lane per hour, whereas the FREQ analysis assumes a capacity of 2,200 vehicles per lane per hour.

Source: Fehr & Peers Associates, May 2003.

Table E-15 describes the relationship between the volume-to-capacity ratio and LOS for signalized intersections per the CCTA LOS procedures. Table E-16 summarizes the relationship between delay and LOS for signalized intersections, per the *2000 Highway Capacity Manual*. Unsignalized intersections were also evaluated using this software. Table E-17 presents the LOS thresholds for unsignalized intersections, based on control delay per vehicle.

Table E-15: Signalized Intersection Level of Service Definitions Using V/C Ratio

Level of Service	Description of Traffic Conditions	V/C Ratio
A	Operations with very slight delay, with no approach phase fully utilized.	0.00 – 0.60
B	Operations with slight delay, and an occasional approach phase is fully utilized.	0.61 – 0.70
C	Operations with average delay. Individual cycle failures begin to appear.	0.71 – 0.80
D	Operations with tolerable delay. Many vehicles stop and individual cycle failures are noticeable.	0.81 – 0.90
E	Operations with high delay, up to several signal cycles. Long queues form upstream of intersection.	0.91 – 1.00
F	Operation with excessive and unacceptable delays. Volumes vary widely depending on downstream queue conditions.	> 1.00

Source: *Technical Procedures* (Contra Costa Transportation Authority, September, 1997)

Table E-16: Signalized Intersection Level of Service Definitions Using Control Delay

Level of Service	Description	Control Delay per Vehicle (sec/veh)
A	Operations with very low delay occurring with favorable progression and/or short cycle length.	$\leq$ 10
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10 – 20
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20 – 35
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35 – 55
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	> 55 – 80
F	Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	> 80

Source: *Highway Capacity Manual* (Transportation Research Board, 2000)

Table E-17: Unsignalized Intersection Level of Service Definitions Using Control Delay

Level of Service	Average Control Delay (sec/veh)	Description
A	0 – 10	Little or no delay.
B	> 10 – 15	Minor delays.
C	> 15 – 25	Average delays.
D	> 25 – 35	Moderate delays.
E	> 35 – 50	Lengthy delays.
F	> 50	Excessive delays/gridlock.

Source: *Highway Capacity Manual* (Transportation Research Board, 2000)

Table E-18: Year 2030 Intersection Analysis Results Intersections at Interchanges

Intersection	A.M. (P.M.) Peak Hour [1]	
	No-Build Alternative	**Build Alternative**
Loveridge Road Interchange		
3. Loveridge Road / State Route 4 EB Ramps	44.3 / D (**>80 / F**)	27.1 / C (24.8 / C)
4. California Avenue / State Route 4 WB Ramps	39.7 / D (43.2 / D)	19.4 / B (21.6 / C)
5. Loveridge Rd. / California Ave. (West) – North Park Blvd.	**>80 / F (>80 / F)**	30.0 / C (29.9 / C)
6. Loveridge Road / California Avenue (East)	6.3 / A (3.5 / A)	3.3 / A (3.2 / A)
Somersville Road Interchange		
9. Somersville Road / Delta Fair Blvd.	**>80 / F (>80 / F)**	54.7 / D **(45.5 / D)**
10. Somersville Road / State Route 4 EB Ramps	11.8 / B (14.4 / B)	12.4 / B (16.2 / B)
11. Somersville Road / State Route 4 WB Ramps	42.2 / D (23.4 / C)	14.9 / B (21.7 / C)
12. Somersville Road / Century Blvd / Mahogany Way	**74.9 / E (59.7 / E)**	32.5 / D (39.8 / D)
L Street/Contra Loma Boulevard Interchange		
14. L St/Contra Loma Blvd/ Buchanan Rd/Fitzuren Rd	**>80 / F (>80 / F)**	**56.1 / E** (38.6 / D)
15. L St/Contra Loma Blvd./ SR 4 EB Ramps	**>50 / F [2] (>50 / F[2])**	13.3 / B (17.5 / B)
16. L St /Contra Loma Blvd/ SR 4 WB Ramps	4.1 / A [3] (7.1 / A [3])	23.9 / C (24.9 / C)
A Street/Lone Tree Way Interchanges		
20. A Street / Lone Tree Way /Tregallas Rd. (south)	53.4 / D (35.6 / D)	15.5 / B (21.6 / C)
21. A Street / Lone Tree Way /Tregallas Rd. (north)	29.9 / C (15.3 / B)	16.4 / B (16.3 / B)
22. A Street / Lone Tree Way /SR 4 EB Ramps	64.1 / E (41.6 / D)	21.2 / C (54.7 / D)
23. A Street / Lone Tree Way /SR 4 WB Ramps	29.9 / C (42.6 / D)	8.7 / A (15.1 / B)
Hillcrest Avenue Interchange		
26. Hillcrest Avenue / Tregallas Road[4]	**59.6 / E (58.6 / E)**	40.6 / D (**58.5 / E**)
27. Hillcrest Avenue / SR 4 EB Ramps[4]	**64.0 / E** (28.3/ C)[5]	**>80 / F (>80 / F)**
28. Hillcrest Avenue / SR 4 WB Ramps	31.0 / C (48.2 / D)	Not applicable
28a. Sunset Drive / SR 4 WB Ramps	Not applicable	20.3 / C (38.1 / D)
29. Hillcrest Avenue / Sunset Drive	43.3 / D (**59.2 / E**)	27.8 / C (29.4 / C) [3]

Note:
1. 2.2 / A = Average total delay in seconds per vehicle / intersection level of service. **Bold text** indicates unacceptable LOS at intersections of suburban arterial routes of regional significance (> 45 seconds of delay for signalized intersection, > 30 seconds for unsignalized intersection) under Traffic Service Objective. On lesser routes, **bold text** indicates LOS F.
2. Southbound/eastbound
3. Northbound.
4. These intersections are assumed to operate via a single traffic signal controller.
5. The delay results indicate acceptable operations; with no improvement to the freeway, the ramps at Hillcrest Avenue will be underutilized due to traffic diversion onto parallel surface streets.

Source: Fehr & Peers Associates, May, 2003

Table E-19: Year 2030 Intersection Analysis Results – Isolated Intersections

Intersection		No-Build Alternative		Build Alternative	
		CCTA LOS A.M. (P.M.) [1]	**HCM A.M. (P.M.) [2]**	**CCTA LOS A.M. (P.M.) [1]**	**HCM A.M. (P.M.) [2]**
1	Loveridge Rd/Buchanan Rd	0.78/C (**0.94/E**)	34.3/C (**63.0/E**)	0.66/B (0.51/A)	22.8/C (13.4/B)
2	Loveridge Rd/ East Leland Rd	**>1.00/F** (0.91/E)	**>80/F** (71.8/E)	0.90/D (0.68/B)	63.1/E (45.4/D)
7	Loveridge Rd/ Pittsburg-Antioch Hwy	**0.99/E (>1.00/F)**	**>80/F (>80/F)**	**0.87/D (0.90/D)**	**>80/F (>80/F)**
8	Somersville Rd/ Buchanan Rd	**0.93/E (0.88/D)**	**>80/F (61.1/E)**	0.53/A (0.64/B)	31.0/C (31.2/C)
13	Somersville Rd/Pittsburg-Antioch Hwy	**>1.00/F (>1.00/F)**	**>80/F (>80/F)**	**>1.00/F** (0.68/B)	**>80/F** (31.3/C)
17	L St/Claudia Ct	Not applicable	27.9/D[4] 22.0/C[4]	Not applicable	25.2/D[4] 22.0/C[4]
24	A St/Bryan Ave/Texas St	Not applicable	>50/F[5] (>50/F[5])	Not applicable	**>50/F[5] (>50/F[5])**
25	A St/10th St	**>1.00/F (>1.00/F)**	**>80/F (>80/F)**	**>1.00/F** (0.74/C)	**>80/F** (61.5/E)
30	Hillcrest Rd/East 18th St	**0.90/D (0.88/D)**	**58.2/E (55.6/E)**	0.73/C (0.78/C)	**33.3/E** (43.6/D)

Notes:
1. Signalized intersection V/C/LOS based on CCTA LOS analysis. **Bold text** indicates unacceptable LOS at intersections of suburban arterial routes of regional significance (> 45 seconds of delay for signalized intersection, > 30 seconds for unsignalized intersection) under Traffic Service Objective. On lesser routes, **bold text** indicates LOS F.
2. Signalized intersection average vehicle delay/LOS based on SYNCHRO 5.0 and *2000 HCM*. **Bold text** follows usage in note 1.
3. For all-way stop-controlled intersections, the control delay/LOS for the intersection is reported; for side-street stop controlled intersections, the control delay/LOS for the worst approach is reported based on SYNCHRO 5.0 and *2000 HCM*.
4. Worst-case reported for westbound approach.
5. Worst-case reported for westbound and eastbound approaches.

Source: Fehr & Peers Associates, May 2003.

Appendix F U.S. Fish and Wildlife Service Biological Opinion

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

In Reply Refer To:
1-1-05-F-0158

Mr. Gene Fong
Federal Highway Administration
Department of Transportation
650 Capital Mall, Suite 4-100
Sacramento, California 95814

JUN 13 2005

Subject: Biological Opinion on the Proposed State Route 4 (east) from Loveridge Road to State Route 160 Widening Project in Contra Costa County, California

Dear Mr. Fong:

This is in response to your June 7, 2005, request for formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed State Route 4 (east) widening from Loveridge Road to State Route 160 in Contra Costa County, California. Your request was received in this office on June 9, 2005. This document represents the Service's biological opinion on the effects of the action on the threatened California red-legged frog (*Rana aurora draytonii*). This document is issued pursuant to section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act).

The proposed State Route 4 project is not likely to adversely affect the endangered salt marsh harvest mouse (*Reithrodontomys raviventris*) and the threatened giant garter snake (*Thamnophis gigas*) due to an apparent lack of suitable habitat for these two listed animals in the action area.

This biological opinion is based on: (1) a letter from the Federal Highway Administration to the Service dated June 9, 2005; (2) *Natural Environmental Study/Biological Assessment State Route 4 (east) Widening Project Loveridge Road to State Route 160 04-CC-4 KP7.8/R47.6 (PM2.5/R29.6) EA 04275-228500* (Biological Assessment) dated March 2004 that was prepared by Parsons; (3) a visit to the project site on April 1, 2005, by Chris Nagano of the Service, John Cleckler detailee from the California Department of Transportation (Caltrans) to Service, and representatives from Caltrans, the County of Contra Costa, and Parsons; (4) An April 22, 2005, letter from the Service to the Federal Highway Administration; (5) Several telephone calls between the Service and Parsons regarding the location where a frog and suitable California red-legged frog habitat were observed at West Antioch Creek on the April 1, 2005, field meeting; (6) an electronic mail message from Kate Lewis of Parsons to David Yam of Caltrans dated May 1,

2005, that contained the amount of permanent and temporary effects to the upland habitat of the California red-legged frog at West Antioch Creek; (7) a meeting between David Yam and Chris Nagano regarding the effects to the California red-legged frog and appropriate compensation for the proposed project; (8) Addendum to the Natural Environment Study/Biological Assessment prepared by Parsons and electronically mailed on June 3, 2005; and (9) other information available to the Service.

CONSULTATION HISTORY

May 3, 2004:	The Service received the *Natural Environmental Study/Biological Assessment State Route 4 (east) Widening Project Loveridge Road to State Route 160 04-CC-4 KP7.8/R47.6 (PM2.5/R29.6) EA 04275-228500.*
April 1, 2005:	Chris Nagano and John Cleckler, and representatives from Caltrans, the County of Contra Costa, and Parsons met at the proposed project site. Mr. Nagano observed a medium-sized frog in West Antioch Creek on the north side of State Route 4, and the Caltrans representative observed a frog in West Antioch Creek on the south side of State Route 4; suitable aquatic and upland habitat for the California red-legged frog was observed along West Antioch Creek on the north and south sides of State Route 4.
April 22, 2005:	The Service sent a letter to the Federal Highway Administration requesting additional information on the proposed project.
April 28, 2005 to May 23, 2005	Several telephone conversations between the Service and Parsons regarding the location where the frogs and the California red-legged frog habitat was observed at West Antioch Creek on the April 1, 2005, field meeting.
May 1, 2005:	Kate Lewis of Parsons sent an e-mail to David Yam of Caltrans dated May 1, 2005, that contained the amount of permanent and temporary effects to the upland habitat of the California red-legged frog at West Antioch Creek.
June 1, 2005:	Chris Nagano of the Service met with David Yam of Caltrans regarding the effects to the California red-legged frog and appropriate compensation for the proposed project.

BIOLOGICAL OPINION

Description of Proposed Action

It is our understanding, the proposed project is located on State Route 4 from approximately 0.81 mile west of the Loveridge Road interchange to 0.77 mile east of the Hillcrest Avenue interchange in the City of Antioch in Contra Costa County, California. The proposed action consists of the doubling of available lanes from four to eight, reconstruction of five interchanges;

widening the median for the entire project segment; widening of pedestrian undercrossings; extending box culverts at Kirker Creek, West Antioch Creek, and the Los Medanos; widening of a utility undercrossing at Century Boulevard; and the relocation of a pump station at Loveridge Road.

Construction of the proposed project is expected to begin in 2007 and extend to 2013. The construction primarily will take place during the daylight hours, but some nighttime work will occur to avoid interference with highway traffic.

Avoidance and Conservation Measures

According to the Biological Assessment, the June 1, 2005, meeting between the Service and David Yam of Caltrans, the Addendum to the Biological Assessment and other information available to the Service, Caltrans proposes to avoid, minimize, and compensate for effects to the California red-legged frog through the following measures (several of these measures are being implemented for effects to wetlands and other wildlife, but will serve as conservation measures for the listed amphibian):

1. Construction activities in streambeds will be restricted to the dry season.

2. Creek flow will not be impeded.

3. A high visibility construction fence outlining environmentally sensitive areas (ESA) will be installed as a first order of work and will remain until job completion. No work, storage, or other activities shall occur within an ESA.

4. The equipment staging area will be on State Route 4 or on the property outside of the U.S. Army Corps of Engineer's jurisdiction.

5. A coffer dam and corrugated steel pipe, sized at about 48 inches in diameter for dry-season flows, will be installed with clean gravel and filter fiber. The coffer dam, filter fiber, and corrugated steel pipe will be removed from the creek bed after completion of the project.

6. Landscape trees growing on top of the culvert will be cut down, rather than bulldozed or pulled out

7. Excavated materials will be disposed of at an approved disposal site.

8. The Contractor shall furnish a permitted Biological Monitor. The permitted Biological Monitor shall be permitted by the Service to handle listed species, specifically the California red-legged frog. The permitted Biological Monitor shall also hold a California Department of Fish and Game Scientific Collection Permit for handling general wildlife species, common to coastal scrub and riparian habitats of the San Francisco Bay Area, that might be expected in the project vicinity and any additional written permits or

Memorandum of Understanding (MOUs) from the California Department of Fish and Game for the 'Species of Special Concern'.

9. A general Biological Monitor may be used instead of the permitted Biological Monitor for onsite monitoring in certain instances as specified below. The general Biological Monitor shall possess a 4-year college degree in Biology or Environmental Sciences, a minimum of one year's experience in biological wildlife surveys or wildlife monitoring, and shall hold a California Department of Fish and Game Scientific Collection Permit for handling general wildlife species, common to coastal scrub and riparian habitats of the San Francisco Bay Area, that might be expected in the project vicinity. In addition, the general Biological Monitor shall also be able to identify the California red-legged frog.

10. The permitted Biological Monitor shall be on site during the installation of perimeter barriers (Type Frog) and temporary fence (Type ESA), and during any clearing and grubbing activities to ensure work areas are clear of listed species. During these activities, the permitted Biological Monitor shall conduct monitoring in the area where work is scheduled prior to the initiation of each construction work shift and visually survey the entire area, where fences are to be installed or removed, and where clearing and grubbing activities are to take place. The monitoring shall consist at a minimum of the following activities: (1) visual surveys of the entire area focusing on the immediate area where work is proposed for that shift; (2) inspecting under rocks, wood, or other debris; (3) inspecting under and in construction equipment and stored materials; (4) probing and shaking of vegetation to flush wildlife. Tools such as, but not limited to, a spotlight and a wooden stick for probing vegetation and litter may be used during the monitoring process. During the fencing and clearing and grubbing work shifts, the permitted Biological Monitor shall continue to monitor the area for the California red-legged frog. If any barrier or fence is found not to be in good condition, the permitted Biological Monitor shall immediately inform the Resident Engineer and Contractor, and corrective action shall be taken immediately by the Contractor. The permitted Biological Monitor shall make a final visual survey of all fences and barriers at the beginning of each work day during these phases of construction to ensure the integrity of the fence and barrier lines such that wildlife will not be able to enter the construction area between work shifts.

11. The general Biological Monitor shall conduct monitoring prior to the initiation of each construction work shift in active construction work areas at West Antioch Creek, routinely at the beginning of the work shift. This Biological Monitor shall perform the following tasks: (1) monitoring of ESAs, fencing, perimeter barriers, and silt fences throughout the entire project site, and (2) monitoring of active construction zones to ensure work areas are clear of listed species, species of special concern, and other general wildlife that might enter the construction zone. If any fence or barrier is found not to be in good condition, the Biological Monitor shall immediately inform the Resident Engineer and Contractor, and the Contractor shall take immediate corrective action.

12. A Biological Monitor must be on-call and capable of responding to the work site within

one (1) hour.

13. Biological Monitors shall maintain monitoring records that include: (1) the beginning and ending time of each day's monitoring effort; (2) a statement clearly stating whether specified species, or any other general wildlife species, were encountered, including the time and location when such species were found; (3) the time the specimen was identified and by whom and its condition; (5) condition of the barriers and fences; and (6) a description of any actions taken. The Biological Monitors shall maintain complete records in their possession while conducting monitoring activities and shall immediately surrender records to the Resident Engineer upon request. All monitoring records shall be provided to the Resident Engineer upon completion of the monitoring work.

14. When any frog is encountered by a Biological Monitor or Contractor's personnel, construction activities in the immediate area (within a 15-meter radius) of where the frog is found shall be immediately halted. If encountered by the Contractor's personnel, the Resident Engineer and onsite Biological Monitor shall be immediately notified. If encountered by the Biological Monitor, the Resident Engineer and Contractor shall be immediately notified. If the permitted Biological Monitor is not present when a frog is encountered, the general Biological Monitor shall immediately notify the permitted Biological Monitor.

15. If the general Biological Monitor is not authorized by the Service to handle the California red-legged frog, any individual frog encountered on the project site shall be protected, at the location where encountered, underneath an inverted 5-gallon white plastic bucket until the permitted Biological Monitor arrives at the site to identify the specimen to species. The bucket shall have a minimum of six (6) 15 mm holes drilled in the bottom for ventilation. The bucket shall be shaded and damp material inserted if necessary to ensure that the frog does not become overheated and dehydrated or desiccated. Under no circumstances shall the frog be left under the bucket for more than three (3) hours. The permitted Biological Monitor shall come immediately to the project site in order to confirm whether or not the specimen is a California red-legged frog. The permitted Biological Monitor, in accordance with Service guidelines, shall move any live California red-legged frog encountered within the construction zone a minimum of 100 meters from the construction zone. The relocation site shall be determined prior to commencement of conservation activities. Injured or dead California red-legged frogs shall be handled only by the permitted Biological Monitor as prescribed in the Service permit.

16. In addition, any injured or dead California red-legged frogs found or any unanticipated damage to the species habitat occurring due to construction activities, shall be reported immediately to the on-site Biological Monitor and the Resident Engineer. The Biological Monitor shall: (1) notify the Service within 24 hrs, and (2) prepare a written report (separate from monitoring report as described elsewhere in these special provisions) by the end of the work shift and submit the report to the Resident Engineer. The written report shall include the following information, as a minimum: the date, time, precise location of the specimen/incident, and any other pertinent information.

17. The permitted Biological Monitor shall conduct a pre-construction employee education program for Contractor and State personnel prior to the start of construction. All Contractor personnel working on the project shall attend the program. An education program shall also be provided for all new personnel and substitutes brought onto the job after the pre-construction employee education program who have not previously had the training. The employee education program shall include: (1) descriptions of the California red-legged frog, (2) photographs of all the frog species that might be found in the area, and (3) information regarding the duties of the permitted Biological Monitor and, if applicable, the general Biological Monitor. Contact information for each Biological Monitor shall be provided to all Contractor employees and shall direct the employees to immediately notify the on-site Biological Monitor should a Contractor employee encounter a California red-legged frog or species of similar appearance during the progress of the work.

18. California red-legged frog photo identification cards and information sheets shall be passed out to all workers. An 8.5-inch x 11-inch information fact sheet for the California red-legged frog and a laminated pocket-size California red-legged frog ID card shall be passed out to workers during the pre-construction education program. The information fact sheet shall contain descriptive species identification and habitat information including color photographs of the California red-legged frog, the common bullfrog, and the common tree frog. The frog ID card shall contain a color photo of the California red-legged frog on one side and California red legged frog identification information on the other side.

19. Activities shall cease until appropriate corrective measures have been completed.

20. All sightings of any incidental take shall be reported the Service immediately by telephone.

21. The Biological Assessment stated that the approximately 0.47 acres of wetlands that will be affected temporarily or permanently by the proposed project will be mitigated for at a 1:1 or 2:1 ratio. The preferred method of mitigation is through the purchase of credits from an established conservation bank.

22. According to the June 1, 2005, meeting, there will be permanent effects to 1.42 acres of upland habitat and 1.04 acres of temporary effects. The permanent effects will be compensated for at a 2:1 ratio (2.84 acres) and areas subject to temporary effects will be restored.

STATUS OF SPECIES/ENVIRONMENTAL BASELINE

The California red-legged frog was listed as a threatened species on May 23, 1996, (U.S. Fish and Wildlife Service 1996). Please refer to the final rule and the *Recovery Plan for the California Red-Legged Frog (Rana aurora draytonii)*(U.S. Fish and Wildlife Service 2002) for additional information on this species.

This species is the largest native frog in the western United States (Wright and Wright 1949), ranging from 1.5 to 5.1 inches in length (Stebbins 1985). The abdomen and hind legs of adults are largely red; the back is characterized by small black flecks and larger irregular dark blotches with indistinct outlines on a brown, gray, olive, or reddish background color. Dorsal spots usually have light centers (Stebbins 1985), and dorsolateral folds are prominent on the back. Larvae (tadpoles) range from 0.6 to 3.1 inches in length, and the background color of the body is dark brown and yellow with darker spots (Storer 1925).

California red-legged frogs have paired vocal sacs and vocalize in air (Hayes and Krempels 1986). Female frogs deposit egg masses on emergent vegetation so that the egg mass floats on the surface of the water (Hayes and Miyamoto 1984). California red-legged frogs breed from November through March with earlier breeding records occurring in southern localities (Storer 1925). Individuals occurring in coastal drainages are active year-round (Jennings et al. 1992), whereas those found in interior sites are normally less active during the cold season.

The historic range of the red-legged frog extended coastally from the vicinity of Elk Creek in Mendocino County, California, and inland from the vicinity of Redding, Shasta County, California, southward to northwestern Baja California, Mexico (Fellers 2005; Jennings and Hayes 1985; Hayes and Krempels 1986). The California Red-legged frog was historically documented with 46 counties but the taxa now remains in 238 streams or drainages within 23 counties, representing a loss of 70 percent of its former range (U.S. Fish and Wildlife Service 2002). Red-legged frogs are still locally abundant within portions of the San Francisco Bay area and the central coast. Within the remaining distribution of the species, only isolated populations have been documented in the Sierra Nevada, northern Coast, and northern Transverse Ranges. The species is believed to be extirpated from the southern Transverse and Peninsular ranges, but is still present in Baja California, Mexico (California Department of Fish and Game 2002).

Adult California red-legged frogs prefer dense, shrubby or emergent riparian vegetation closely associated with deep (>2.3 feet), still, or slow-moving water (Hayes and Jennings 1988). However, frogs also have been found in ephemeral creeks and drainages and in ponds that may or may not have riparian vegetation. The largest densities of California red-legged frogs currently are associated with deep pools with dense stands of overhanging willows (*Salix* spp.) and an intermixed fringe of cattails (*Typha latifolia*) (Jennings 1988). California red-legged frogs disperse upstream and downstream of their breeding habitat to forage and seek sheltering habitat.

During other parts of the year habitat includes nearly any area within 1-2 miles of a breeding site that stays moist and cool through the summer (Fellers 2005). According to Feller (2005), this includes coyote bush (*Baccharis pilularis*) California blackberry thickets (*Rubus ursinus*), and root masses associated with willow (*Salix* species) and California bay trees (*Umbellularis californica*). Sometimes the non-breeding habitat used by California red-legged frogs is extremely limited in size, for example, a 6-foot wide Coyote bush thicket growing along a tiny intermittent creek surrounded by heavily grazed grassland (Feller 2005). Sheltering habitat for California red-legged frogs is potentially all aquatic, riparian, and upland areas within the range of the species and includes any landscape features that provide cover, such as existing animal burrows, boulders or rocks, organic debris such as downed trees or logs, and industrial debris.

Agricultural features such as drains, watering troughs, spring boxes, abandoned sheds, or hay ricks may also be used. Incised stream channels with portions narrower and depths greater than than 18 inches also may provide important summer sheltering habitat. Accessibility to sheltering habitat is essential for the survival of California red-legged frogs within a watershed, and can be a factor limiting frog population numbers and survival.

California red-legged frogs do not have a distinct breeding migration (Fellers 2005). Adult frogs are often associated with permanent bodies of water. Some frogs remain at breeding sites all year while others disperse. Dispersal distances are typically less than 0.5 mile, with a few individuals moving up to 1-2 miles (Fellers 2005). Movements are typically along riparian corridors, but some individuals, especially on rainy nights, move directly from one site to another through normally inhospitable habitats, such as heavily grazed pastures or oak-grassland savannas (Fellers 2005). Dispersing frogs in northern Santa Cruz County traveled distances from 0.25 mile to more than 2 miles without apparent regard to topography, vegetation type, or riparian corridors (Bulger, unpublished data).

Egg masses contain about 2,000 to 5,000 moderate sized (0.08 to 0.11 inches in diameter), dark reddish brown eggs and are typically attached to vertical emergent vegetation, such as bulrushes (*Scirpus* spp.) or cattails (Jennings *et al.* 1992). California red-legged frogs are often prolific breeders, laying their eggs during or shortly after large rainfall events in late winter and early spring (Hayes and Miyamoto 1984). Eggs hatch in 6 to 14 days (Jennings 1988). In coastal lagoons, the most significant mortality factor in the pre-hatching stage is water salinity (Jennings *et al.* 1992); eggs exposed to salinity levels greater than 4.5 parts per thousand results in 100 percent mortality (Jennings and Hayes 1990). Increased siltation during the breeding season can cause asphyxiation of eggs and small larvae. Larvae undergo metamorphosis 3.5 to 7 months after hatching (Storer 1925; Wright and Wright 1949; Jennings and Hayes 1990). Of the various life stages, larvae probably experience the highest mortality rates, with less than 1 percent of eggs laid reaching metamorphosis (Jennings *et al.* 1992). Sexual maturity normally is reached at 3 to 4 years of age (Storer 1925; Jennings and Hayes 1985). California red-legged frogs may live 8 to 10 years (Jennings *et al.* 1992). Populations of California red-legged frogs fluctuate from year to year. When conditions are favorable California red-legged frogs can experience extremely high rates of reproduction and thus produce large numbers of dispersing young and a concomitant increase in the number of occupied sites. In contrast, California red-legged frogs may temporarily disappear from an area when conditions are stressful (e.g., drought).

The diet of California red-legged frogs is highly variable. Hayes and Tennant (1985) found invertebrates to be the most common food items. Vertebrates, such as Pacific tree frogs (*Hyla regilla*) and California mice (*Peromyscus californicus*), represented over half the prey mass eaten by larger frogs (Hayes and Tennant 1985). Hayes and Tennant (1985) found juvenile frogs to be active diurnally and nocturnally, whereas adult frogs were largely nocturnal. Feeding activity probably occurs along the shoreline and on the surface of the water (Hayes and Tennant 1985). The diet of California red-legged frogs apparently has not been studied, but their diet probably is similar to other ranid frogs that feed on algae, diatoms, and detritus by grazing on the surface of rocks and vegetation (Fellers 2005; Kupferberg 1996a, 1996b).

Several researchers in central California have noted the decline and eventual local disappearance of California and northern red-legged frogs in systems supporting bullfrogs (*Rana catesbeiana*) (Jennings and Hayes 1990; Twedt 1993), red swamp crayfish (*Procambarus clarkii*), signal crayfish (*Pacifastacus leniusculus*), and several species of warm water fish including sunfish (*Lepomis* spp.), goldfish (*Carassius auratus*), common carp (*Cyprinus carpio*), and mosquitofish (*Gambusia affinis*) (L. Hunt, in litt. 1993; S. Barry, in litt. 1992; S. Sweet, in litt. 1993). Habitat loss, non-native species introduction, and urban encroachment are the primary factors that have adversely affected the California red-legged frog throughout its range.

Several researchers in central California have noted the decline and eventual disappearance of California red-legged frog populations once bullfrogs became established at the same site (L. Hunt, in litt. 1993; S. Barry, in litt. 1992; S. Sweet, in litt. 1993). This has been attributed to both predation and competition. Twedt (1993) documented bullfrog predation of juvenile northern red-legged frogs (*Rana aurora aurora*), and suggested that bullfrogs could prey on subadult northern red-legged frogs as well. In addition to predation, bullfrogs may have a competitive advantage over California red-legged frogs; bullfrogs are larger, possess more generalized food habits (Bury and Whelan 1984), have an extended breeding season (Storer 1933) during which an individual female can produce as many as 20,000 eggs (Emlen 1977), and larvae are unpalatable to predatory fish (Kruse and Francis 1977). In addition to competition, bullfrogs also interfere with California red-legged frog reproduction. Both California and northern red-legged frogs have been observed in amplexus with (mounted on) both male and female bullfrogs (Jennings and Hayes 1990; Twedt 1993; M. Jennings, in litt.1993; R. Stebbins in litt. 1993). Thus bullfrogs are able to prey upon and out-compete California red-legged frogs, especially in sub-optimal habitat. The urbanization of land within and adjacent to California red-legged frog habitat has also impacted California red-legged frogs. These declines are attributed to channelization of riparian areas, enclosure of the channels by urban development that blocks California red-legged frog dispersal, and the introduction of predatory fishes and bullfrogs. This report further identifies the conversion and isolation of perennial pool habitats resulting from urbanization as an ongoing impact to California red-legged frogs.

Mao *et al.* (1999 cited in Fellers 2005) reported northern red-legged frog (*Rana aurora aurora*) infected with an iridovirus, which also was presented in sympatric three-spined sticklebacks (*Gastrucleatus aculeatus*) in northwestern California. Ingles (1932a, 1932b, and 1933 cited in Fellers 2005) reported four species of trematodes from California red-legged frogs, but he later synonomized two of them.

The recovery plan for the California red-legged frog identifies eight recovery units. Each recovery unit reflects areas with similar conservation needs. The strategy for recovery of California red-legged frogs includes promoting and protecting populations that are geographically distributed in a manner that allows for the continued existence of viable metapopulations. The California red-legged frog has been extirpated or nearly extirpated from over 70 percent of their former range. Historically, this species was found throughout the Central Valley and Sierra Nevada foothills. As of 1996, California red-legged frogs have been documented in approximately 240 streams or drainages from 23 counties, primarily in central coastal California. Monterey, San Luis Obispo, and Santa Barbara counties support the largest

extent of currently occupied habitat. The most secure aggregations of California red-legged frogs are found in aquatic sites that support substantial riparian and aquatic vegetation and lack non-native predators.

This project is located within the East San Francisco Bay Recovery Unit, which extends from the northernmost portion of Contra Costa County, includes a portion of San Joaquin County south to Santa Clara County, includes the eastern portion of San Mateo County, and all of San Francisco County (U. S. Fish and Wildlife Service 2002). Contra Costa and Alameda counties contain the majority of known California red-legged frog localities within the eastern San Francisco Bay area. Within this recovery unit, the listed amphibian seem to have been nearly eliminated from the western lowland areas near urbanization, they still occur in isolated populations in the East Bay Foothills (between Interstate 580 and Interstate 680), and are abundant in several areas in the eastern portions of Alameda and Contra Costa counties. This recovery unit is essential to the survival and recovery of California red-legged frogs, as it contains the largest number of occupied drainages in the northern portion of its range. There is a breeding population at Black Diamond Mines Regional Park (U.S. Fish and Wildlife Service 2002).

There are several recent sightings of the California red-legged frog in the vicinity of the action area and throughout the region south of Antioch and Pittsburg (California Department of Fish and Game 2004). Adult California red-legged frogs are highly mobile and may move considerable distances from their breeding ponds. Areas containing aquatic and upland habitat exist within and adjacent to the action area; and a medium sized frog of an unidentified species was observed at West Antioch Creek (Nagano pers. obs. April 2005). The action area contains components that can be used by the California red-legged frog for feeding, resting, mating, movement corridors, and other essential behaviors. Therefore, the Service believes that the California red-legged frog is reasonably certain to occur within the action area because of the biology and ecology of the animal, the presence of suitable habitat in and adjacent to the action area, as well as the nearby recent observations of this listed species.

Effects of the Proposed Action

The proposed State Route 4 Project likely will result in a number of adverse effects to California red-legged frog. There is a likelihood the animals may be affected by being crushed, entombed, hit and injured or killed by vehicle strikes, poisoned by chemical agents, trapped in erosion control netting, or harassed by noise and vibration. Individuals exposed during excavations likely will be crushed and killed or injured by construction-related activities. California red-legged frogs could fall into the trenches, pits, or other excavations, and then they could be directly killed or be unable to escape and be killed due to desiccation, entombment, or starvation. The amphibians could be subject to increased levels of harassment resulting from lights used during night time construction. Edible trash left during or after repair activities could attract predators, such as raccoons (*Procyon lotor*) and crows (*Corvus corax*) to the sites, who could subsequently prey on the listed amphibian. California red-legged frogs may become trapped if plastic mono-filament netting is used for erosion control or other purposes where they would be subject to death by predation, starvation, or desiccation (Stuart *et al.* 2001). The increased width of the

road and higher levels of vehicle traffic will result in higher numbers of California red-legged frog killed during their movements between their upland habitat and breeding ponds.

Temporary effects are project activities that temporarily remove one or more essential components of the habitat of a listed species, but can be restored to pre-project conditions of equal or greater habitat value. In order for the effects to be considered temporary, the affected habitat of the listed species must be totally restored within two seasons. Ground disturbance resulting from the proposed State Route 4 Project includes substantial grading, excavating, and fill. The Caltrans is considering the adverse effects of a significant amount of cut and fill of earth, a maximum of 1.04 acres, to be of a temporary nature. These activities have potential to cause injury and mortality to individual California red-legged frogs occupying the action area. As part of the project description, the Caltrans has stated upon completion of the project, they will restore temporary disturbed areas to promote restoration to pre-project conditions. The temporary effects will result in the permanent loss of the habitat utilized by the California red-legged frog unless the restoration implemented by Caltrans is adequately planned, utilizes native California plant species collected in the immediate area of the proposed project, and meets specific success criteria.

The amount of wetlands and other Waters of the United States at West Antioch Creek that will be permanently affected is 0.1518 acre and 0.0208 acre will be temporarily affected by the proposed State Route 4 project; there will be permanent effects to 1.42 acres of upland habitat and 1.04 acres of temporary effects. The permanent effects to the upland habitat will be compensated for at a 2:1 ratio (2.84 acres) and the areas subject to temporary effects will be restored.

Construction equipment that has been used in different areas and with different species of amphibians including the California red-legged frog may transmit diseases by introducing contaminated soil and other material on the equipment. The chance of a disease being introduced into a new area is greater today than in the past due to the increasing occurrences of disease throughout amphibian populations in California and the United States. It is possible that chytrid fungus may exacerbate the effects of other diseases on amphibians or increase the sensitivity of the amphibian to environmental changes (*e.g.*, water pH) that reduce normal immune response capabilities (Bosch *et al.* 2000).

Construction related activities are likely to cause disruption of surface movement, disruption or complete loss of reproduction, harassment from increased human activity, and permanent and temporary loss of shelter. Because these animals are nocturnal, if construction is performed at night, associated lighting likely would increase all of the above effects. Wise and Buchanan (2002) reviewed the adverse effects that may result from night time illumination on salamander species. Artificial lighting used during night time construction may increase predation of the California red-legged frog, if it occurs during periods of fall, winter, or spring rains, because the amphibians will lose the cover of darkness for movement. Nocturnal foraging by this listed animal may be affected by artificial lighting.

The loss of ground squirrel burrows and other dry season retreats will reduce the amount of

available upland habitat within the action area. The loss of the portion of West Antioch Creek where the on and off ramps will be constructed will result in reduced breeding opportunities for the California red-legged frog. The addition of impermeable surfaces resulting from the two freeway ramps will be accompanied by an increase in chemical runoff, which would include gasoline and oil, as well as silt runoff, which will reduce water quality in the project site.

The effect of habitat fragmentation on the California red-legged frog is potentially significant. Fragmentation can have to effects: (1) reduction in access to habitat as well as habitat suitability, and (2) disruption of movements, dispersal, and gene flow. The construction of the freeway ramps through listed frog habitat may restrict or block movement between West Antioch Creek and upland habitat. The likelihood of this effect will increase with larger road size, higher traffic volume, and the presence of fences or median barriers. In addition to limiting access to West Antioch Creek or upland habitat, roads also may reduce the suitability of habitat for the California red-legged frog by fragmentation into patches too small for effective use by the animals. As a habitat patch decreases in size, the number of individuals of this threatened animal the patch can support also decreases. This increases the probability that the animals will be extirpated from each habitat patch. The possibility for recolonization will depend upon the nature of the factors, e.g., roads, canals, development, etc., that are causing the fragmentation.

Fragmentation factors that effectively isolate patches and limit access also constitute barriers to California red-legged frog dispersal, and gene flow. Movements and dispersal corridors between breeding and upland habitat are critical to this animal's population dynamics, particularly because the animals currently persist as metapopulations with multiple disjunct population centers. Movement and dispersal corridors likely are important for alleviating over-crowding during years when California red-legged frog abundance is high, and also they are important for facilitating the recolonization of areas where the animal has been extirpated. Movement between population centers maintains gene flow and reduced genetic isolation. Genetically isolated populations are at greater risk of deleterious genetic effects such as inbreeding, genetic drift, and founder effects.

Roads have been documented as barriers to movements by a diversity of species, and this effect varies with road size and traffic volume. The inhibition of animal movements caused by roads produces a significant effect by fragmenting habitats and populations (Joly and Morand 1997). Roads were found to be significant barriers to gene flow among common frogs (*Rana temporaria*) in Germany and this has resulted in genetic differentiation among populations separated by roads (Reh and Seitz 1990). Similarly, significant genetic subdivision was detected in bank voles (*Clethrionomys glarelous*) populations separated by a 164 foot wide highway in Germany (Gerlach and Musolf 2000).

California red-legged frog mortality and injury occurs when the animals attempt to cross roads and are hit by cars, trucks, or motorcycles. The majority of strikes occur when the animals are moving to their breeding habitat. Thus, vehicle strikes are a direct source of mortality for the California red-legged frog. If vehicle strikes are sufficiently frequent in a given locality, this could result in reduced abundance of this animal. Especially problematic is the death of females prior to the laying of their eggs because this could result in the loss of an entire cohort, and

therefore, reduced recruitment of new individuals into the population.

Vehicles constitute a consistent source of mortality for the animal, based on the frequency with which vehicle strikes occur. Vehicular usage on California roads is increasing rapidly and directly with human population and urban expansion. During November 2002, California's estimated total vehicular travel on State highway system roads alone was 14.27 billion miles (this figure and subsequent vehicular-use data from Caltrans' Internet website which was accessed on January 2, 2003). From 1972 to 2001, State highway system total vehicular usage rose steadily from 67.11 to 167.81 billion miles annually. For the 23 California counties in which the California red-legged frog may occur, State highway system total annual vehicular usage in 1999, 2000, and 2001 was 53.27, 55.85, and 57.21 billion miles, respectively. The steady increase of vehicular use is thus continuing. We believe such figures illustrate (1) the general increase in vehicular usage that has been, and is still, occurring in many parts of the California red-legged frog's range, and (2) that additional increments of road-kill losses, which are already a potentially serious problem for the species, are likely occurring.

Vehicle-related mortality has significantly affected other listed or rare species. Rudolph *et al.* (1999) estimated that road-associated mortality may have depressed populations of Louisiana pine snakes (*Pituophis ruthveni*) and timber rattlesnakes (*Crotalus horridus*) by over 50% in eastern Texas, and this mortality may be a primary factor in local extirpations of this species of rattlesnake (Rudolph *et al.* 1998). Mortality from vehicles also is contributing to the reduction in the status of the prairie garter snake (*Thamnophis radix radix*) in Ohio (Dalrymple and Reichenbach 1984), and was a limiting factor in the recovery of the endangered American crocodile (*Crocodylus acutus*) in Florida (Kushland 1998).

The presence of roads in an area could result in the introduction of chemical contaminants to the site. Contaminants could be introduced in several ways. Substances used in road building materials or to recondition roads can leach out or wash off roads adjacent habitat. Vehicle exhaust emissions can include hazardous substances which may concentrate in soils along roads. Heavy metals such as lead, aluminum, iron, cadmium, copper, manganese, titanium, nickel, zinc, and boron are all emitted in vehicle exhaust (Trombulak and Frissell 2000). Concentrations of organic pollutants (e. Dioxins, polychlorinated biphenyls) are higher in soils along roads (Benfenati *et al.* 1992). Ozone levels are higher in the air near roads (Trombulak and Frissell 2000). Vehicles may leak hazardous substances such as motor oil and antifreeze. Although the quantity leaked by a given vehicle may be minute, these substances can accumulate on roads and then get washed into the adjacent environment by runoff during rain storms. An immense variety of substances could be introduced during accidental spills of materials. Such spills can result from small containers falling off passing vehicles, or from accidents resulting in whole loads being spilled. Large spills may be partially or completely mitigated by clean-up efforts, depending on the substance.

California red-legged frogs using areas adjacent to roads could be exposed to any contaminants that are present at the site. Exposure pathways could include inhalation, dermal contact, direct ingestion, ingestion of contaminated soil or plants, or consumption of contaminated prey. Exposure to contaminants could cause short- or long-term morbidity, possibly resulting in

reduced productivity or mortality. Carcinogenic substances could cause genetic damage resulting in sterility, reduced productivity, or reduced fitness among progeny. Contaminants also may have the same effect on California red-legged frog prey species. This could result in reduced prey abundance and diminished local carrying capacity for this listed amphibian.

Little information is available on the effects of contaminants on the California red-legged frog. The effects may be difficult to detect. Morbidity or mortality likely would occur after the animals had left the contaminated site, and more subtle effects such as genetic damage could only be detected through intensive study and monitoring

Construction of roads can facilitate the invasion and establishment by species not native to the area. Disturbance and alteration of habitat adjacent to roads may create favorable conditions for non-native plants and animals. These exotic species can spread along roadsides and then into adjacent habitat. Non-native animals may use modified habitats adjacent to road to disperse into California red-legged frog habitat. They could compete with California red-legged frogs for resources such as food or burrows, or directly injure or kill the threatened amphibian. Non-native plants and animals may reduce habitat quality for this frog species or their prey, and reduce the productivity or the local carrying capacity for the threatened animal.

Disturbed areas adjacent to roads provide favorable habitat conditions for a number of non-native plant species. Some of these taxa are aggressively invasive and they can alter natural communities and potentially affect habitat quality. A problematic species within the range of the California red-legged frog is yellow star thistle (*Centaurea melitensis*). Dense stands of this plant can form along roadsides and then spread into adjacent habitat. This plant displaces native vegetation, competes with native plants for resources, does not appear to be used by California red-legged frog prey, exhibits dense growth, and may be difficult for the listed amphibian to move through due its large size (up to 3.3 feet tall), and numerous sharp spines. Other species that may disperse along roads and invade adjacent habitat include mustards (*Brassica* species) and Russian thistle (*Salsola tragus*) (Tellman 1997).

Negative effects to wildlife populations from roads may extend some distance from the actual road. The phenomenon can result from any of the effects already described in this biological opinion (e.g. vehicle-related mortality, habitat degradation, invasive exotic species, etc.). Forman and Deblinger (1998) described the area affected as the "road effect" zone. Along a 4-lane road in Massachusetts, they determined that this zone extend for an average of approximately 980 feet to either side of the road for an average total zone width of approximately 1970 feet. However, in places they detected an effect > 0.6 mile from the road. Rudolph *et al* (1999) detected reduced snake abundance up to 2790 feet from roads in Texas. They estimated snake abundance out to 2790 feet, so the effect may have been greater. Extrapolating to a landscape sale, they concluded the effect of roads on snake populations in Texas likely was significant, given that approximately 79% of the land area of the Lone Star State is within 1640 feet of a road. The "road-zone" effects can be subtle. Van der Zandt *et al.* (1980) reported that lapwings (*Vanellus vanellus*) and black-tailed godwits (*Limosa limosa*) feeding at 1575-6560 feet from roads were disturbed by passing vehicles. The heart rate, metabolic rate and energy expenditure of female bighorn sheep (*Ovis canadensis*) increases near roads (MacArthur *et al.*

1979). Trombulak and Frossell (2000) described another type of "road-zone" effect. Heavy metal concentrations from vehicle exhaust were greatest within 66 feet of roads, and elevated levels of metals in both soil and plants were detected at ≥660 feet of roads. The "road-zone" apparently varies with habitat type and traffic volume. Based on responses by birds, Forman (2000) estimated the effect zone along primary roads of 1000 feet in woodlands, 1197 feet in grasslands, and 2657 feet in natural lands near urban areas. Along secondary roads with lower traffic volumes, the effect zone was 656 feet. The "road zone" and the California red-legged frog has not been adequately investigated; however, it is possible it exists given the effects of roads on the animal.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

From 1995 to 2020, the human population is projected to increase by 18 percent for the San Francisco Bay hydrologic region, while at the same time agricultural crop land use in the region is projected to remain around 65,000 acres (California Department of Water Resources 998). According the California Department of Forestry, from 2000 to 2020, the human population within counties in the Bay Area region is expected to grow by 29 percent (5.3 million people to 6.8 million people), and by 60 percent from 2000 to 2040 (5.3 million people to 8.4 million people) (California Department of Forestry 1998). There will likely be many other development projects that occur during this timeframe due to increases in human population growth that will continue to imperil the California red-legged frog.

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Numerous non-Federal activities continue to negatively impact the California red-legged frog in the action area. Habitats are lost or degraded as a result of urbanization, road and utility construction and maintenance, overgrazing, agricultural expansion, and water irrigation and storage projects that may not be funded, permitted, or constructed by a Federal agency. Other threats include contamination, poisoning, increased predation, and competition from non-native species associated with human development. Small private actions that may impact listed species, such as conversion of land, ground squirrel reduction efforts, mosquito control, and residential development, may occur without consultation with or authorization by the Service or the California Department of Fish and Game pursuant to their respectively Endangered Species Act.

Within this region of Contra Costa County, there is a continued demand for new housing. Considering this, the remaining open space in the vicinity of the State Route 4 project likely is threatened by development. The development of wildlife habitat will continue to result in the loss of not only breeding, resting, and foraging habitat, but the loss of dispersal corridors between breeding populations, thereby further isolating and fragmenting wildlife populations.

CONCLUSION

After reviewing the current status of the California red-legged frog, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the State Route 4 Project is not likely to jeopardize the continued existence of this listed species. Critical habitat has been proposed for the California red-legged frog, however none is located in the action area, and therefore none will be affected by the proposed project.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are non-discretionary, and must be implemented by the California Department of Transportation so they become binding conditions of project authorization for the exemption under 7(o)(2) to apply. Caltrans has a continuing duty to regulate the activity that is covered by this incidental take statement. If the California Department of Transportation (1) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of 7(o)(2) may lapse.

Amount or Extent of Take

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when this amphibian is not in their breeding ponds, it inhabits the burrows of ground squirrels or other rodents, or may be difficult to locate due to their cryptic appearance and behavior; the sub-adult and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all California

red-legged frogs inhabiting 2.62 acres (permanent effects = 1.42 acres of upland and 0.15 acre of aquatic habitat; temporary effects = 0.02 acre of aquatic habitat and 1.04 of upland habitat), based on the Biological Assessment, April 1, 2005, field meeting, the June 1, 2005, meeting with Caltrans, and the Addendum to the Biological Assessment will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the State Route 4 Project in the form of harm, harassment, capture, injury, and death of the California red-legged frog caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

Effect of the Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the California red-legged frog. Critical habitat for the California red-legged frog has been proposed, however none is located in the action area, and therefore will not be affected by the proposed project.

Reasonable and Prudent Measures

The following reasonable and prudent measures are necessary and appropriate to minimize the effects of the State Route 4 Project on the California red-legged frog:

1. Caltrans shall implement conservation measures for the California red-legged frog to minimize (1) the effects of the loss of habitat that will occur as a result of the project; (2) the potential for harassment, harm, injury, and mortality to this listed species; and (3) the potential for inadvertent capture or entrapment of federally listed wildlife species during construction activities.

2. Caltrans shall ensure their compliance with this biological opinion.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Federal Highway Administration shall ensure Caltrans complies with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

A. The following Term and Conditions will implement Reasonable and Prudent Measure number one (1):

   1. Caltrans shall minimize the potential for incidental take of the California red-legged frog resulting from project related activities by implementation of the conservation measures as described in the Biological Assessment, the Addendum to the Biological Assessment, and appearing in the *Project Description* of this biological opinion.

2. Caltrans shall include Special Provisions that include the avoidance and minimization measures of this biological opinion in the solicitation for bid information. In addition, Caltrans will educate and inform contractors involved in the project as to the requirements of the biological opinion.

3. The Resident Engineer or their designee shall be responsible for implementing the conservation measures and *Terms and Conditions* of this biological opinion and shall be the point of contact for the State Route 4 Project. Their name and telephone number shall be provided to the Service at least thirty (30) calendar days prior to groundbreaking at the project.

4. As described in the June 1, 2005, meeting with Caltrans, and the Addendum to the Biological Assessment, 2.84 acres of upland habitat and 0.4 acre of aquatic habitat for the California red red-legged frog shall be permanently protected through (1) acquisition and management of appropriate off-site habitat, (2) purchase of an appropriate amount of credits at a Service-approved conservation bank; or (3) deposit of sufficient funds into a Caltrans account that will be used to purchase and manage appropriate habitat for the California red-legged frog as approved by the Service. The written approval of the Service shall be obtained by Caltrans prior to implementing the measure they have chosen for habitat compensation.

5. The Caltrans biologist shall have oversight over implementation of all the Terms and Conditions in this biological opinion, and shall have the authority to stop project activities, through communication with the Caltrans Resident Engineer, if any of the requirements associated with these Terms and Conditions are not being fulfilled. If biologist/construction liaison has requested a stop work due to take of any of the listed species the Service and the California Department of Fish and Game will be notified within one (1) working day via email or telephone

6. Permanent and temporary construction disturbances and other types of project-related disturbance to California red-legged frog habitat shall be minimized to the maximum extent practicable. To minimize temporary disturbances, all project-related vehicle traffic shall be restricted to established roads, construction areas, and other designated areas. These areas also should be included in preconstruction surveys and, to the maximum extent possible, should be established in locations disturbed by previous activities to prevent further adverse effects.

7. Project employees shall be provided with written guidance governing vehicle use, speed limits on unpaved roads, fire prevention, and other hazards.

8. Prior to initiation of ground breaking, the Caltrans or a Service-approved biologist will conduct an education and training session for all construction personnel. All individuals who will be involved in the site preparation or construction shall be present, including the project representative(s) responsible for reporting take to

the Service and the California Department of Fish and Game. Training sessions shall be repeated for all new employees before they access the project site. Sign up sheets identifying attendees and the contractor/company they represent shall be provided to the Service with the post-construction compliance report. At a minimum, the training shall include a description of the natural history of the California red-legged frog affected by the State Route 4 Project and include information on this listed species and its habitats. The training shall include the general measures that are being implemented to conserve this species as they relate to the project, the penalties for non-compliance, and the boundaries (work area) of the project. To ensure that employees and contractors understand their roles and responsibilities, training shall be conducted in languages other than English, as appropriate.

9. A litter control program shall be instituted at the State Route 4 project. All workers ensure their food scraps, paper wrappers, food containers, cans, bottles, and other trash from the project area are deposited in covered or closed trash containers. The trash containers shall be removed from the project area at the end of each working day.

10. All construction activity shall be confined within the State Route 4 project site, which may include temporary access roads, haul roads, and staging areas specifically designated and marked for these purposes, as described in Term and Condition 13 below. At no time shall equipment or personnel be allowed to adversely affect areas containing suitable California red-legged frog habitat outside the project site without authorization from the Service.

11. All grindings and asphaltic-concrete waste shall be stored within previously disturbed areas absent of habitat and at a minimum of 150 feet from any culvert, or stream.

12. As described at the June 1, 2005, meeting, Caltrans shall submit to the Service their draft proposal for the restoration of the 1.04 acre of California red-legged frog upland habitat that will be temporarily affected by the proposed project at least sixty (60) calendar days prior to initial ground breaking at the State Route 4 project; the final plan shall be submitted for approval by the Service prior to ground breaking at the proposed project. The plan shall include restoration and revegetation work associated with temporary effects using native California plant species from on-site or local sources (i.e., local ecotype). Plant materials from non-local sources shall be allowed only with written authorization from the Service. To the maximum extent practicable (i.e., presence of natural lands), topsoil shall be removed, cached, and returned to the site according to successful restoration protocols. Loss of soil from run-off or erosion shall be prevented with straw bales, straw wattles, or similar means provided they do not entangle, block escape or dispersal routes of listed animal species. The draft and final plan shall contain specific quantifiable criteria to evaluate the success of the restoration.

13. The State Route 4 Project construction area shall be delineated with high visibility temporary fencing at least four (4) feet in height, flagging, or other barrier to prevent encroachment of construction personnel and equipment onto any sensitive areas during project work activities. Such fencing shall be inspected and maintained daily until completion of the project. The fencing will be removed only when all construction equipment is removed from the site. Actions within the project area shall be limited to vehicle and equipment operation on existing roads. No project activities will occur outside the delineated project construction area.

14. Prior to any ground disturbance, pre-construction surveys shall be conducted by a Service-approved biologist for the California red-legged frog. These surveys shall consist of walking surveys of the project limits and adjacent areas accessible to the public to determine presence of the species.

15. Only Service-approved biologist(s) who are familiar with the biology and ecology of the California red-legged frog shall capture or handle this listed species.

16. Maintenance and construction excavations greater than two (2) feet deep either shall be covered or filled in at the end of each working day. The trench or pit shall be surveyed in the morning and late afternoon hours to ascertain whether a California red-legged frog has fallen into the trench or pit. If at anytime, a trapped California red-legged frog is discovered trapped in a trench or pit, the animal shall be carefully captured by a Service-approved biologist and released at a Service-approved location which contains suitable habitat and is outside of the construction area. The Service shall be notified by telephone and electronic mail within one (1) working day of the incident.

17. Tightly woven fiber netting or similar material shall be used for erosion control or other purposes at the State Route 4 Project site to ensure that a California red-legged frog does not get trapped. Plastic mono-filament netting shall not be used at the project site. This limitation will be communicated to the contractor through use of Special Provisions included in the bid solicitation package.

18. The following Term and Condition shall be implemented for borrow sites associated with the State Route 4 Project:

    a. Caltrans shall require as part of the construction contract that all contractors comply with the Act in the performance of the work necessary for project completion performed inside and outside the project right-of-way.

    b. Caltrans shall require documentation from the contractor that aggregate, fill, or borrow material provided for each project was obtained in

compliance with the Act. Evidence of compliance with the Act shall be demonstrated by providing the Resident Engineer any one of the following:

i. a letter from the Service stating use of the borrow pit area will not result in the incidental take of listed species;
ii. an incidental take permit for contractor-related activities issued by the Service pursuant to section 10(a)(1)(B) of the Act;
iii. a biological opinion or a letter concurring with a "not likely to adversely affect" determination issued by the Service to the Federal agency having jurisdiction over contractor-related activities;
iv. letter from the Service concurring with the "no effect" determination for contractor-related activities; or
v. Contractor submittal of information to the Caltrans Resident Engineer indicating compliance with the State Mining and Reclamation Act (SMARA) and provide the County of Contra Costa land use permits and California Quality Act (CEQA) clearance.

c. If a borrow site that is in compliance with the Act is not available, Caltrans shall either:

i. identify/select a site that the Service has concurred with the "no effect" determination, or;
ii. request reinitiation of formal consultation on the action considered herein based on new information.

B. The following Terms and Conditions implement Reasonable and Prudent Measure two (2):

1. If requested, during or upon completion of construction activities, the on-site biologist, and/or a representative from Caltrans shall accompany Service or California Department of Fish and Game personnel on an on-site inspection of the site to review project effects to the California red-legged frog and its habitat.

2. The Federal Highway Administration shall ensure Caltrans complies with the *Reporting Requirements* of this biological opinion.

Reporting Requirements

Injured California red-legged frogs must be cared for by a licensed veterinarian or other qualified Service-approved person; dead individuals of this listed species must be preserved according to standard museum techniques and held in a secure location. The Service and the California Department of Fish and Game must be notified within one (1) working day of the discovery of death or injury to a California red-legged frog that occurs due to project related activities or is observed at the project site. Notification must include the date, time, and location of the incident

or of the finding of a dead or injured animal clearly indicated on a USGS 7.5 minute quadrangle and other maps at a finer scale, as requested by the Service, and any other pertinent information. The Service contacts are Chris Nagano, Chief of the Endangered Species Division at the Sacramento Fish and Wildlife Office (916/414-6600), and Scott Heard, Resident Agent-in-Charge of the Service's Law Enforcement Division at 916/414-6660.

Caltrans shall submit a post-construction compliance report prepared by the on-site biologist to the Sacramento Fish and Wildlife Office within sixty (60) calendar days of the date of the completion of construction activity. This report shall detail (i) dates that construction occurred; (ii) pertinent information concerning the success of the project in meeting compensation and other conservation measures; (iii) an explanation of failure to meet such measures, if any; (iv) known project effects on the California red-legged frog, if any; (v) occurrences of incidental take of this listed species, if any; and (vi) other pertinent information.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to implement recovery actions, to help implement recovery plans, to develop information, or otherwise further the purposes of the Act.

For the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations. We propose the following conservation recommendations:

1. Caltrans should assist the Service in implementing recovery actions identified in the *Recovery Plan for the California red-legged Frog* (U.S. Fish and Wildlife Service 2002).

2. Caltrans should incorporate culverts, tunnels, or bridges on highways and other roadways that allow safe passage by California red-legged frogs, other listed animals, and wildlife. Caltrans should include photographs, plans, and other information in their biological assessments if they incorporate "wildlife friendly" crossings into their projects.

3. The Federal Highway Administration and Caltrans should consider participating in the planning for a regional habitat conservation plan for the California red-legged frog, other listed species, and sensitive species.

4. Caltrans should consider establishing functioning preservation and creation conservation banking systems to further the conservation of the California red-legged frog, and other appropriate species. Such banking systems also could possibly be utilized for other required mitigation (i.e., seasonal wetlands, riparian habitats, etc.) where appropriate.

5. Sightings of any listed or sensitive animal species should be reported to the California

Natural Diversity Database of the California Department of Fish and Game. A copy of the reporting form and a topographic map clearly marked with the location the animals were observed also should be provided to the Service.

6. Caltrans should provide habitat for bats, including surfaces for bat roosts on the underside of bridges and other structures whenever possible.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the proposed State Route 4 (east) widening from Loveridge Road to State Route 160 in Contra Costa County, California. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions regarding this biological opinion on the State Route 4 Project, please contact the Chief of our Endangered Species Division at the letterhead address or at telephone 916/414-6600.

Sincerely,

for Cay C. Goude
Acting Field Supervisor

cc:
Susan Chang California Department of Transportation, Oakland, California
Dee Waremycia, California Department of Fish and Game, Sacramento, California
Janice Gan, California Department of Fish and Game, Yountville, California
Carl Wilcox, California Department of Fish and Game, Yountville, California
Scott Wilson, California Department of Fish and Game, Yountville, California
Warden Nicole Kozicki, California Department of Fish and Game, Yountville, California

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Appendix G Wetlands Only Practicable Alternative Finding

Appendix G: Wetlands Only Practicable Alternative Finding

Pursuant to Executive Order 11990 – Protection of Wetlands

Alternatives:

The Preferred Alternative for the State Route 4 (East) Widening Project: Loveridge Road to State Route 160 is the Build Alternative, which would widen State Route (SR) 4 from its current four lanes to eight lanes to provide one HOV and three mixed-flow lanes in each direction from approximately 1.3 kilometers (0.8 mile) west of the Loveridge Road Interchange to approximately 1.2 kilometers (0.7 mile) east of the Hillcrest Avenue Interchange. Widening SR 4 under the Build Alternative would include the addition of auxiliary lanes between interchanges to facilitate on and off traffic movements. The alignment of the widened SR 4 mainline would be shifted southward of the existing right-of-way west of Loveridge Road and northward between Loveridge Road and Century Boulevard.

SR 4 widening would require reconstruction of undercrossings, overcrossings, and interchanges within the project limits. At the SR 4 / Loveridge Road Interchange, the overcrossing would be reconstructed, the Stoneman Spur railroad underpass removed, and the interchange ramps reconstructed. To accommodate the planned widening of Century Boulevard (by others), the existing single-span structures carrying SR 4 over Century Boulevard would be replaced by two-span structures, while Century Boulevard would be lowered by 0.6 meter (2.0 feet). Also, the Lone Tree Way–A Street undercrossing structures would be widened, and the Somersville Road and Contra Loma Boulevard–L Street undercrossing structures and southbound Hillcrest Avenue overcrossing would be reconstructed. The ramps to and from the east at the SR 4 / G Street Interchange would be eliminated, and replacement access would be provided at the SR 4 / Contra Loma–L Street Interchange.

Five jurisdictional wetland areas are within the project corridor. These wetlands are identified in Table G-1, Wetland Impacts under the Preferred Alternative, and shown on project plans in Appendix A. Because the project involves the widening of an existing roadway, opportunities to avoid wetlands that run along or cross the roadway are limited. Most project alternatives and design concepts that were considered and withdrawn from consideration early in the design process would have had equal or greater impacts to wetlands. The Six-Lane Facility Alternative would have reduced wetland impacts, but would not have met the project purpose and need objectives of relieving traffic congestion and improving traffic operations and safety. This alternative also would have done nothing to encourage use of alternative modes or carpooling. Alternative L-4 would have created a single-point diamond interchange at the SR 4 / Contra Loma Boulevard–L Street Interchange with slightly fewer wetland impacts at West Antioch Creek than under the Build Alternative. Alternative L-4, however, would not have had acceptable traffic operations, would have been substantially more costly, and would have had severe right-of-way impacts. No impacts to wetlands would occur under the No-Build Alternative, except for the effects

of routine maintenance, but the No-Build Alternative would not meet the purpose and need of the project.

Table G-1 shows effects to wetlands under the Build Alternative.

Table G-1: Wetland Impacts under the Preferred Alternative

	Location	Acres*	
		Permanently Affected by Project	**Temporarily Affected by Project (Construction Phase)**
Wetlands	*West Kirker Creek*	0.0750	0.0075
	Unnamed Drainage (East of Loveridge)	0.0182	0.0000
	East Kirker Creek (Also called "Old" Kirker Creek)	0.0134	0.0000
	West Antioch Creek	0.0844	0.0176
	"Old" West Antioch Creek	0.0738	0.0000
Total Wetlands		**0.2648**	**0.0251**

Measures to Minimize Harm:

The project has been designed to minimize impacts to wetlands within the project corridor. Mitigation measures will be implemented for both permanent and temporary (construction phase) impacts of the project to ensure no net loss of wetlands. During project construction, all wetland areas adjacent to the project will be designated as Environmentally Sensitive Area (ESA). All wetland areas temporarily disturbed by construction will be fully restored following construction activities. Proposed project impacts to jurisdictional areas will be compensated either by contribution to an ACOE-approved land trust, purchase of mitigation credits in an ACOE-approved wetland mitigation bank, or restoration, enhancement or creation of in-kind wetlands.

Finding:

Based on the considerations reported above, it is determined that there is no practicable alternative to the proposed new construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands that may result from such use.