Draft
Environmental Impact Report

Silva Valley Parkway Interchange

with

U. S. Highway 50

Lead Agency:

El Dorado County
Department of Transportation

Submitted by:

Jones & Stokes Associates, Inc.

June 1989
SCH #88050215

NOTICE OF DETERMINATION

FILE NO. Silva Valley Interchange

TO: COUNTY CLERK
County of El Dorado
330 Fair Lane
Placerville, CA 95667

FROM: EL DORADO COUNTY PLANNING DEPT.
360 Fair Lane
Placerville, CA 95667

SUBJECT: Filing of NOTICE OF DETERMINATION in compliance with Section 21108 or 21152 of the Public Resources Code.

NAME OF APPLICANT: El Dorado County Department of Transportation

ASSESSOR'S PARCEL NO. ______ SCH NO. ______

AREA PLAN: El Dorado Hills/Salmon Falls SECTION: ___ TOWNSHIP: ___ RANGE: ___

NEAREST COUNTY ROAD INTERSECTION: ______

☐ GENERAL PLAN AMENDMENT ☐ REZONING: FROM: ______ TO: ______

☐ TENTATIVE PARCEL MAP ☐ SUBDIVISIONS TO SPLIT ______ ACRES INTO ___ LOTS

SUBDIVISION (NAME) ______

☐ SPECIAL USE PERMIT TO ALLOW: ______

☒ OTHER: Location of the Silva Valley Interchange with U. S. Highway 50 - Ridge Design

The EL DORADO COUNTY Board of Supervisors has ☑ approved ☐ disapproved this project on 2-20-90 (date), and made the following determinations:

1) Project ☒ will ☐ will not, have a significant effect on the environment.
2) *☒ An Environmental Impact Report was prepared pursuant to provisions of CEQA.
*☐ A Negative Declaration was prepared pursuant to provisions of CEQA.
3) Mitigation Measures ☒ were ☐ were not, adopted for this project.
A Statement of Overriding Considerations ☐ was ☒ was not, adopted.

*The Environmental Impact Report or Negative Declaration and Record of Project Approval may be reviewed at the EL DORADO COUNTY PLANNING DEPT.

Margaret E Moody — Prepared by
2-20-90 — Date

Public Resources Code Section 21152(A) requires local agencies to submit this information to the County Clerk. The filing of the Notice starts a 30-day Statute of Limitations on court challenges to the approval of the project under Public Resources Code Section 21167. Failure to file the Notice results in the Statute of Limitations being extended to 180 days.

FOR USE BY COUNTY CLERK

2-20-90
Margaret E Moody

Copy Distribution: Original-Board/ Pink-Owner/ Yellow-Engineer/ Goldenrod-File

7/21/80

County of El Dorado

DEPARTMENT OF TRANSPORTATION

2441 Headington Rd.
Placerville, California 95667
Phone (916) 621-5900

SCOTT CHADD
Director of Transportation

June 16, 1989

SUBJECT: Draft Environmental Impact Report, Silva Valley Parkway Interchange with U. S. Highway 50 - Distribution and Notice of Availability

Interested Persons:

The El Dorado County Department of Transportation is forwarding this document for review and comment to all agencies, organizations, and interested persons indicated on the enclosed distribution list. Notice of the availability of this document is being sent to everyone indicated on the enclosed availability list.

The El Dorado County Planning Commission has been tentatively scheduled to review this document on Thursday, September 14, 1989, at 2:00 p.m., at 330 Fair Lane in Placerville.

Persons commenting on this document are urged to submit written comments to this office prior to the public hearing. Failure to do so, however, will not preclude your right to testify at the hearing. Written comments and verbal testimony submitted at the public hearing will be considered by this office and responded to in the Final EIR.

The Draft EIR, plus an addendum consisting of comments and responses to comments and any additional information, will constitute the Final EIR. The Draft EIR will not be recirculated unless substantial changes are made. Copies of the Final EIR will be sent to those who comment; therefore, it is requested that you keep the Draft EIR.

A copy of this document has been forwarded to the Placerville Library for public review. Copies also are available for review at the Department of Transportation (2441 Headington Road, Placerville) and Community Development Department (360 Fair Lane, Placerville).

If you have any questions regarding the project or the Draft EIR, please contact Bill Pearson at 916/621-5927.

Sincerely,

Scott Chadd
Director of Transportation

Enclosures

DRAFT
ENVIRONMENTAL IMPACT REPORT
FOR THE
SILVA VALLEY PARKWAY/U. S. HIGHWAY 50 INTERCHANGE

County of El Dorado, California

State Clearinghouse Number 88050215

Lead Agency:

County of El Dorado
Department of Transportation
2441 Headington Road
Placerville, CA 95667
Contact: Scott Chadd/Bill Pearson
916/626-2347

Technical assistance provided by:

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Michael J. Dwyer, Inc.
Geoconsultants, Inc.
Henderson Associates
Peak & Associates, Inc.

June 1989

This document should be cited as:

Jones & Stokes Associates, Inc. 1989. Draft environmental impact report - Silva Valley Parkway/U. S. Highway 50 Interchange. (JSA 87-128.) Sacramento, CA. Prepared for: County of El Dorado Department of Transportation, Placerville, CA.

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Project Sponsor
- Bissell & Karn, Inc. - Jim Ogren/Sally Reemsnyder/Susan Miller
- Bissell & Karn, Inc. - Pat O'Halloran
- El Dorado Hills Communities - Tony Mansour
- Gene Thorne & Associates - Gene Thorne
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- Regional Water Quality Control Board

Interested Agencies and Groups
- City of Folsom - Bill Kime
- El Dorado County Resource Conservation District - Joanne Mello
- El Dorado County Transportation Commission
- El Dorado Hills Community Services District
- El Dorado Hills Fire Department
- El Dorado Hills/Salmon Falls Area Plan Advisory Committee
- El Dorado Irrigation District - Lew Archuletta
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- EPIC - Bill Center
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- Sacramento County Planning Department - Al Freitas
- Sierra Club, Maidu Group - V. J. Harris/Robert Johnson
- Sierra Planning Organization - Barbara Hollatz

Federal Agencies
- U. S. Army Corps of Engineers
- U. S. Fish and Wildlife Service

Property Owners
- Byram, Arthur and Bonnie
- Dolder, Edward and Ann
- Douglas Grant Line Associates
- Pacific Gas and Electric Company - David Armi
- Patterson, L. B. and Sally
- Peerman, Jack and Betty
- Tong, Jess and Miriam

Interested Others
- Cemo, Sammy
- Coker-Ewing - Sam Miller
- Laurie, Maloney, & Wheatley - Bob Laurie
- Nielsen, J. Mark

NOTICE OF AVAILABILITY

Interested Individuals, Groups, and Others

Anderson, Kenneth and Irene
Annis, William
Arietta, Genevieve
Aveni, Gino and Michael
Baczewski, Matt
Batchelder, Dennis and Dora
Bayliss, Jim
Beauchamp, David
Bennett, L. F.
Brown, Gary and Patsy
Burdick, John
Burtis Corporation
Cable Data
California Construction Company
Camray Marketing - Steve Crosbie
Cecchettini, Gary and Ruth
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Cotton, Bill
Deuser, Doris
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Forst, Richard and John
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Ingemanson, Maryanne
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Lillya, Edward
Louis, G. D.
Luscher, Evelyn
Malakoff, Elmer
McKinney, Tim and Arlene
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Newman, Wilson and Marilyn
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Oki, Dick
Omar, Hal
Outlook
Pacific Bell
Pacific Gas and Electric Company
Patterson, Vernon and Rosalie
Pohto, Carl
Rasmussen, Harold
Renwick, Jean
Rice, Jack
River West Developments
Roboubi Ali Akbar
Roebbelen Engineering, Inc.
Rolf, Neil and Beatrice
Russler, Donald
Sacramento Regional Transit - Wendy Hoyt
Salud, Nelson and F. S.
Sidey, Stacy and Jim
Sierra Club Sacramento Valley Chapter
Sierra Club Mother Lode Chapter
Soldano, Donna
Statewide Rent-a-Fence
Terry, Marjorie
Tong, Francis
Tong, Harvey
Wagnon, Gary
Wollverton, Bertha Joerger et al.

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CHAPTER 1. Introduction

PURPOSE OF THE ENVIRONMENTAL IMPACT REPORT

This Draft Environmental Impact Report (EIR) has been prepared to assess the impacts of the Silva Valley Parkway/U. S. 50 Interchange, pursuant to the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000 et seq.), the State CEQA Guidelines (14 California Administrative Code Section 15000 et seq.), and the El Dorado County environmental review guidelines.

CEQA requires that all state and local government agencies consider the environmental consequences of projects over which they have discretionary authority. Approval and construction of an interchange constitutes a "project" under CEQA.

The EIR is a public document used to analyze the environmental effects of a proposed project, indicate possible ways to reduce or avoid the possible environmental damage, and to identify alternatives to the project. The EIR also must disclose significant environmental impacts that cannot be avoided, growth-inducing impacts, effects found not to be significant, and significant cumulative impacts of all past, present, and reasonably anticipated future projects.

The EIR is an informational document used in the local planning and decision-making process. It is not the purpose of the EIR to recommend either approval or denial of the project.

APPROACH TO THIS EIR

The State CEQA Guidelines (Section 15152) encourages agencies to tier EIRs to eliminate repetitive discussions of the same issues and to focus the EIR on the actual issues ripe for decision at each level of environmental review.

The approach to this EIR is to use the previous EIR for the El Dorado Hills Specific Plan (State Clearinghouse Number 86122912) as the prior EIR that discusses many of the broad environmental issues of developing the El Dorado Hills Specific Plan area. Construction of the Silva Valley Parkway interchange was identified in that EIR as a mitigation measure that would be needed to accommodate anticipated traffic. Copies of the prior EIR are available for review at the El Dorado County Department of Transportation and El Dorado County Department of Community Development Planning Division.

Construction of a new interchange is contingent on development of the El Dorado Hills area. If development does not occur, the interchange would not be constructed.

Development of the El Dorado Hills area to the densities allowed by current zoning would require a new interchange or would result in significant and unavoidable traffic impacts at the El Dorado Hills/U. S. 50 interchange and the Bass Lake Road/U. S. 50 interchange.

SCOPE OF THE EIR

As provided for in the State CEQA Guidelines, the focus of the EIR is limited to specific issues and concerns identified as significant or possibly significant in the Initial Study (Environmental Checklist Form). El Dorado County completed the Environmental Checklist Form for the Draft EIR for the project in April 1988 (Appendix A). The issues identified as significant or possibly significant included:

- earth
- air
- water
- plant life
- animal life
- noise
- light and glare
- population
- housing
- transportation/circulation
- aesthetics
- cultural resources

A Notice of Preparation (NOP) of an EIR was circulated in May and June of 1988. A scoping meeting was held on May 18, 1988 to obtain input from interested individuals and agencies. Verbal comments were received from various individuals and agencies at the scoping meeting and written comments were also submitted (Appendix B). The comments clarified and expanded on the identified issues and raised the following issues:

- land use
- public services

TERMINOLOGY USED IN THIS REPORT

This report identifies the following five levels of impacts:

- a "less-than-significant" impact is considered to cause no substantial adverse change in the environment;
- a "potentially significant" impact is one the author considers, but cannot determine for certain, to be significant;

- a "significant" impact is one that is considered to cause a substantial adverse effect on the environment;

- a "significant and unavoidable" impact is one that is considered to cause a substantial adverse effect on the environment and for which no mitigation is available to reduce the impact to a less-than-significant level; and

- a "beneficial" impact is one that is considered to cause a beneficial effect on the environment.

AGENCIES WHO WILL USE THIS REPORT

This EIR is intended to be used by several responsible agencies who also have review authority over the project. As stated in the State CEQA Guidelines, Section 15231:

> A Final EIR prepared by a Lead Agency or a Negative Declaration adopted by a Lead Agency shall be conclusively presumed to comply with CEQA for purposes of use by Responsible Agencies which were consulted pursuant to Sections 15072 or 15082 unless one of the following conditions occurs:
>
> (a) The EIR or Negative Declaration is finally adjudged in a legal proceeding not to comply with the requirements of CEQA, or
>
> (b) A subsequent EIR is made necessary by Section 15162 of these Guidelines.

One state agency is considered a Responsible Agency (public agency other than the County of El Dorado which has discretionary approval power over the project) and another state agency is considered a Trustee Agency (a state agency having jurisdiction by law over natural resources affected by a project which are held in trust for the people of the State of California).

The responsible agency is:

- California Department of Transportation (Caltrans) - Caltrans would issue an encroachment permit for all work within the state right-of-way.

One identified trustee agency is:

- California Department of Fish and Game (DFG) - state law gives this agency responsibility for protecting the state's interest in a natural resource. If any construction activity is proposed in a creek, it would be necessary to obtain a Streambed Alteration Agreement pursuant to Section 1603 of the Fish and Game Code.

In addition, it is considered possible that the project as currently designed would have an adverse impact on wetlands through dredging activities or the placement of fill. Under the Fish and Wildlife Coordination Act, the U. S. Fish and Wildlife Service (USFWS) advises the U. S. Army Corps of Engineers (COE) on projects involving dredge and fill activities in water and wetlands of the United States. Applicable legislation covering possible development on the project site may be Section 404 of the Clean Water Act.

The project site contains wetlands and the project may require a permit under Section 404 of the Clean Water Act.

ORGANIZATION OF THIS EIR

The content and format of this report are designed to meet the requirements of CEQA and the State CEQA Guidelines.

- Chapter 2, "Project Description," includes a thorough description of both alternatives, including design, construction methods and timing, and grading requirements. This chapter also discusses other alternatives considered but rejected.

- Chapter 3, "Summary of Findings," includes a list of significant and unavoidable impacts associated with each alternative and other CEQA impact conclusions, a summary table comparing impacts and mitigation measures for each alternative, and known areas of controversy. This chapter also identifies alternatives considered but rejected, and mitigation monitoring.

- Each of the following chapters (Chapters 4 through 13) is devoted to a single impact topic. Within each section, relevant environmental setting data are presented, the impacts common to both alternatives and those associated with each design are identified and evaluated, and then mitigation measures are suggested.

  El Dorado County and Caltrans are responsible for determining which mitigation measures would be required and implemented if either design is approved.

- Chapter 14, "Alternatives to the Proposed Project," qualitatively discusses the No-Project Alternative. Other alternatives considered but rejected are discussed in Chapter 2, "Project Description."

- Chapter 15, "Cumulative Impacts," discusses the cumulative effects of development within the project area based on the cumulative analysis completed for the EIR for the El Dorado Hills Specific Plan.

- Chapter 16, "Bibliography," identifies the documents and individuals consulted in preparing this report.

- o Chapter 17, "Report Preparation," lists those individuals and firms involved in preparing this report.
- o Technical appendices are included at the end of this report.

CHAPTER 2. Project Description

PROJECT LOCATION

The Silva Valley Parkway/U. S. 50 Interchange is proposed for U. S. 50 in western El Dorado County between the existing El Dorado Hills Boulevard/U. S. 50 and Bass Lake Road/U. S. 50 Interchanges (Figure 2-1). Sacramento lies about 23 miles west, San Francisco about 108 miles southwest, and Lake Tahoe about 70 miles east of the project area. The primary land uses in the project area are agriculture and single family residential.

PURPOSE OF THE EIR

The purpose of this EIR is to evaluate two alternative interchanges in equal level of detail, so the decision makers can make a sound selection of one of the two alternatives, or the No-Project Alternative.

This EIR evaluates two interchange locations and designs that were selected from a wide range of studied alternatives. Each of the alternatives, whether rejected or proposed, is located at either the ridge location or the existing White Rock Road undercrossing. These two locations are considered the only feasible sites for an interchange between the El Dorado Hills Boulevard/U. S. 50 Interchange and the Bass Lake Road/U. S. 50 Interchange. The interchange could not be located further west of the existing undercrossing because of minimum Caltrans requirements for weaving distances between interchanges. Topographic constraints restrict the possibility of locating the interchange further east or between the two proposed locations.

Caltrans has the right of review and approval for this project and would be responsible for approving an interchange location with a safe weaving distance. The existing undercrossing is located 4,200 feet from the El Dorado Hills Boulevard/U. S. 50 Interchange, and the ridge design is approximately 5,000 feet from the El Dorado Hills Boulevard/U. S. 50 Interchange.

The two alternatives evaluated in this EIR are referred to as the Ridge Design and the Undercrossing Design. The Ridge Design derives its name from a rise in the topography that would be spanned by the interchange overcrossing. The Undercrossing Design is so named because it would be implemented at the existing White Rock Road undercrossing. Figure 2-2 shows the proposed locations of the two alternatives in relation to each other.

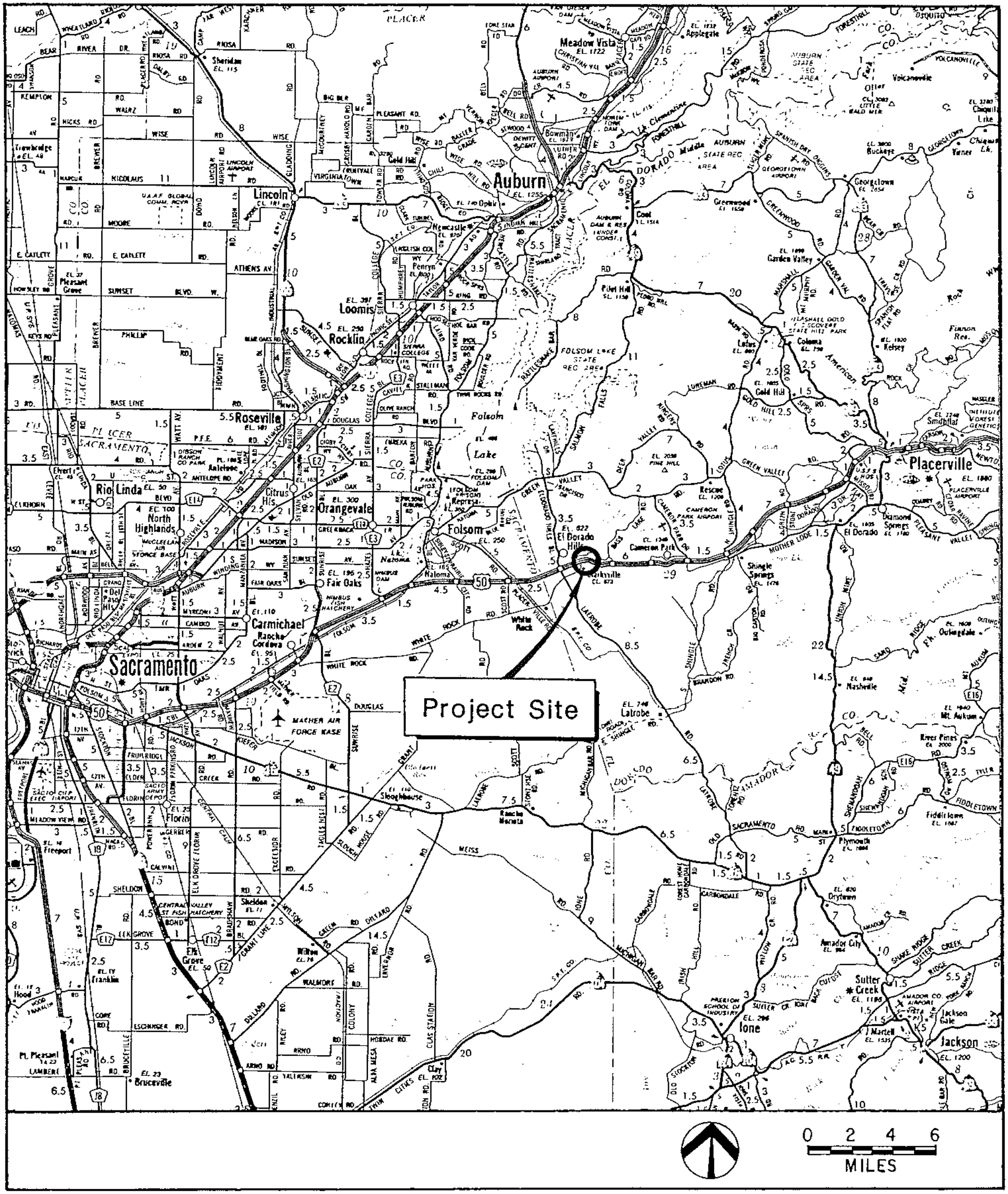


FIGURE 2-1. PROJECT LOCATION

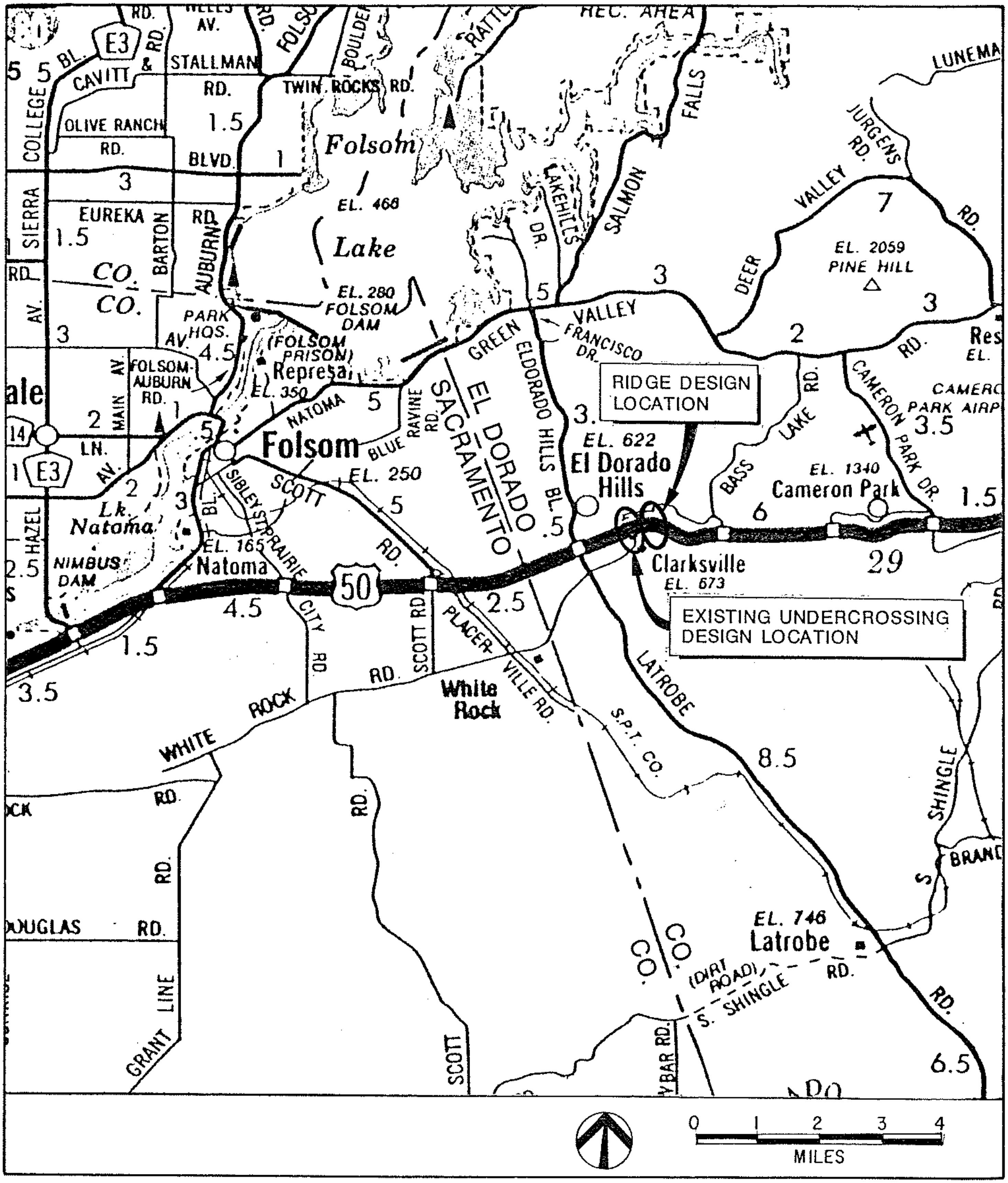


FIGURE 2-2. LOCATIONS OF THE TWO PROJECT ALTERNATIVES

PROJECT AREA DESCRIPTION

The project area is characterized by rolling grasslands, with oaks and intermittent drainage channels lined with riparian vegetation. A small wet area is located on the west side of White Rock Road. Development in the project vicinity includes residences north and south of U. S. 50, a Pacific Gas and Electric Company (PGandE) substation south of the highway, and power poles and power lines north and south of the highway.

The average daily traffic (ADT) on U. S. 50 between El Dorado Hills Boulevard and Bass Lake Road is 33,000. Aside from the freeway, two other through routes cross the project vicinity: Green Valley Road and White Rock Road.

Green Valley Road is a major east-west, two-lane arterial north of U. S. 50 through western El Dorado County and eastern Sacramento County that provides access to Folsom, Folsom Lake, and Placerville. White Rock Road is a minor two-lane arterial that provides access both to rural areas to the south of U. S. 50 in El Dorado County and to the Sunrise industrial area of Sacramento County.

NEED FOR THE PROJECT

An interchange is proposed to accommodate increased traffic resulting from planned growth in the area. El Dorado County has anticipated the need for a new interchange in this area for some time. Previous reports, including the El Dorado Hills/Salmon Falls Area Plan, the El Dorado Hills Business Park EIR, and the El Dorado Hills Specific Plan EIR (certified July 1988), all have identified the need for a new interchange to accommodate growth expected to occur over the next 20 years. A condition of approval for the El Dorado Hills Specific Plan was the development of an interchange to accommodate cumulative growth.

Construction of the Silva Valley Parkway interchange is a major transportation project required to accommodate cumulative growth. Without a new interchange, traffic circulation would be poor, at best, even with reconstruction of the El Dorado Hills Boulevard interchange and expansion of the Bass Lake Road interchange. Because of delays, the a.m. and p.m. peak hours at the El Dorado Hills interchange and surrounding roadways would last from 2 to 2.5 hours. Also, El Dorado Hills Boulevard would need to be 12 lanes wide at U. S. 50, and a grade separation at the Latrobe Road/White Rock Road intersection would be required.

Even with the addition of a new Silva Valley Parkway interchange, some delays in traffic would still occur. Traffic circulation, however, would be improved, and peak-hour a.m. and p.m. traffic would range from 1 to 1.5 hours. Reconstruction of the El Dorado Hills Boulevard interchange and expansion of the Bass Lake Road interchange would still be needed.

Traffic projections indicate that the volumes shown in Table 2-1 would need to be accommodated in 2010. Resolution 45-86, passed by the El Dorado County Board of

Table 2-1. Projected Traffic Volumes in 2010

Ridge Design	AM	PM	Undercrossing Design	AM	PM
Eastbound off-ramp	554	661	Eastbound on-ramp	1,111	2,006
Eastbound on-ramp (slip)	917	1,798	Eastbound off-ramp (slip)	300	393
Eastbound on-ramp (loop)	194	208	Eastbound off-ramp (loop)	254	269
Westbound off-ramp	1,795	1,234	Westbound on-ramp	596	615
Westbound on-ramp (slip)	242	282	Westbound off-ramp (slip)	187	215
Westbound on-ramp (loop)	354	333	Westbound off-ramp (loop)	1,618	1,019

Supervisors on February 18, 1986, required that the County request approval of a new interchange connection from the California Transportation Commission (CTC), enter into a cooperative agreement with Caltrans delineating the responsibilities relative to environmental review and construction of the interchange, and identify local sources that would provide 100 percent of the project financing.

CALTRANS DESIGN REQUIREMENTS

Regardless of which alternative is ultimately selected, the location and design must be approved by Caltrans and the County of El Dorado.

Two elements of highway interchanges that are subject to Caltrans standards include landscaping and lighting. A landscaping plan has not been prepared for the interchange alternatives. However, Caltrans landscaping requirements are discussed below. Similarly, a formal lighting plan has not been prepared for the interchange alternatives, but locations, types, and heights of lighting standards are proposed in conformance with Caltrans requirements.

Landscaping

In general, Caltrans' landscaping policy for new conventional highway projects states that Caltrans will limit plantings to revegetation, erosion control, and other functional purposes unless provided and maintained by others. In addition, it states that Caltrans will provide standard highway planting on new highway projects where adjacent properties are developed on or before June 30, 1987. If the adjacent area develops after June 30, 1987, planting on an existing highway is the responsibility of others.

Because the adjacent property is rural, Caltrans considers the area to be undeveloped. Consequently, Caltrans' obligation would be only functional planting of the interchange area. However, planting by others on Caltrans' right-of-way is allowed by obtaining an encroachment permit, by executing a state-administered contract funded partially or totally by others, or by leasing the area to be planted to the abutting property owner. Any landscaping improvement is to be guided by the master planting plan either prepared by or in coordination with Caltrans and by consideration of agreements and/or commitments based on previous Caltrans policy.

Lighting

Lighting would be necessary at the interchange on- and off-ramps and intersections in conformance with Caltrans criteria. At this time, a formal lighting plan has not been developed for the project. A conceptual plan, however, could implement the following typical elements:

- o 30-foot-tall standards with 200-watt bulbs located at the exits and merges of the ramps with Silva Valley Parkway and also at the intersections, and
- o 40-foot-tall standards with 310-watt bulbs located at the exits and merges of the ramps with U. S. 50 and may be along the loop ramps, in conformance with Caltrans criteria.

NECESSARY PERMITS AND APPROVALS

The following permits and approval would be necessary to develop the Silva Valley Parkway/U. S. 50 Interchange:

- o certification of the EIR by El Dorado County;
- o selection of a project by El Dorado County and Caltrans;
- o acquisition of affected private property and transfer of ownership to Caltrans, which could involve condemnation proceedings;
- o acquisition of a California Department of Fish and Game (DFG) Streambed Alteration Agreements (1601 and 1603), which may be necessary to implement changes to Carson Creek or other drainages; and
- o possible acquisition of a Section 404 permit from the U. S. Army Corps of Engineers, which may be necessary for placing box culverts in Carson Creek or other drainages, placing fill, or dredging the waterways. Note: although no jurisdictional determination has been made, it appears that the Undercrossing Design would eliminate more wetland than the Ridge Design.

DESCRIPTION OF THE TWO ALTERNATIVES

Regardless of which alternative is ultimately selected, the location and design must be approved by the County of El Dorado and Caltrans.

Ridge Design Description

Project Location

The Ridge Design site is located approximately 5,000 feet east of the El Dorado Hills Boulevard/U. S. 50 Interchange. The topography of the Ridge Design site is highly variable, with scattered hills, streamcourses, and gentle slopes. On the north side of U. S. 50, the site varies from fairly steep to more gradual in an east-west direction. The ridge rises immediately west of Carson Creek. Carson Creek passes through a triple 10-foot-wide box culvert under U. S. 50 and flows southward into Deer Creek and ultimately to the Cosumnes River.

On the south side of U. S. 50, the topography slopes gradually from east to west until reaching Carson Creek, where the slope drops off into the stream channel and then rises on the west side to the top of the ridge.

The primary land use in the vicinity is agriculture, with some scattered single family residences. Two houses and agriculturally related structures occupy gently sloping parcels on the north side of U. S. 50. The remaining parcels are vacant and used for horse and cattle grazing. Tong Road provides access to the houses on the north side of U. S. 50. The small community of Clarksville, which consists of several residences, miscellaneous structures, barns, and storage structures, lies to the south of U. S. 50. Land between Clarksville and U. S. 50 also is used for horse and cattle grazing. White Rock Road and the PGandE substation lie to the west of the ridge and south of the highway.

White Rock Road is a two-lane, roughly north-south county road that passes between two ridges. The road follows a small, unnamed drainage channel in the vicinity of the highway. White Rock Road is paved south of the highway and unpaved just north of the highway.

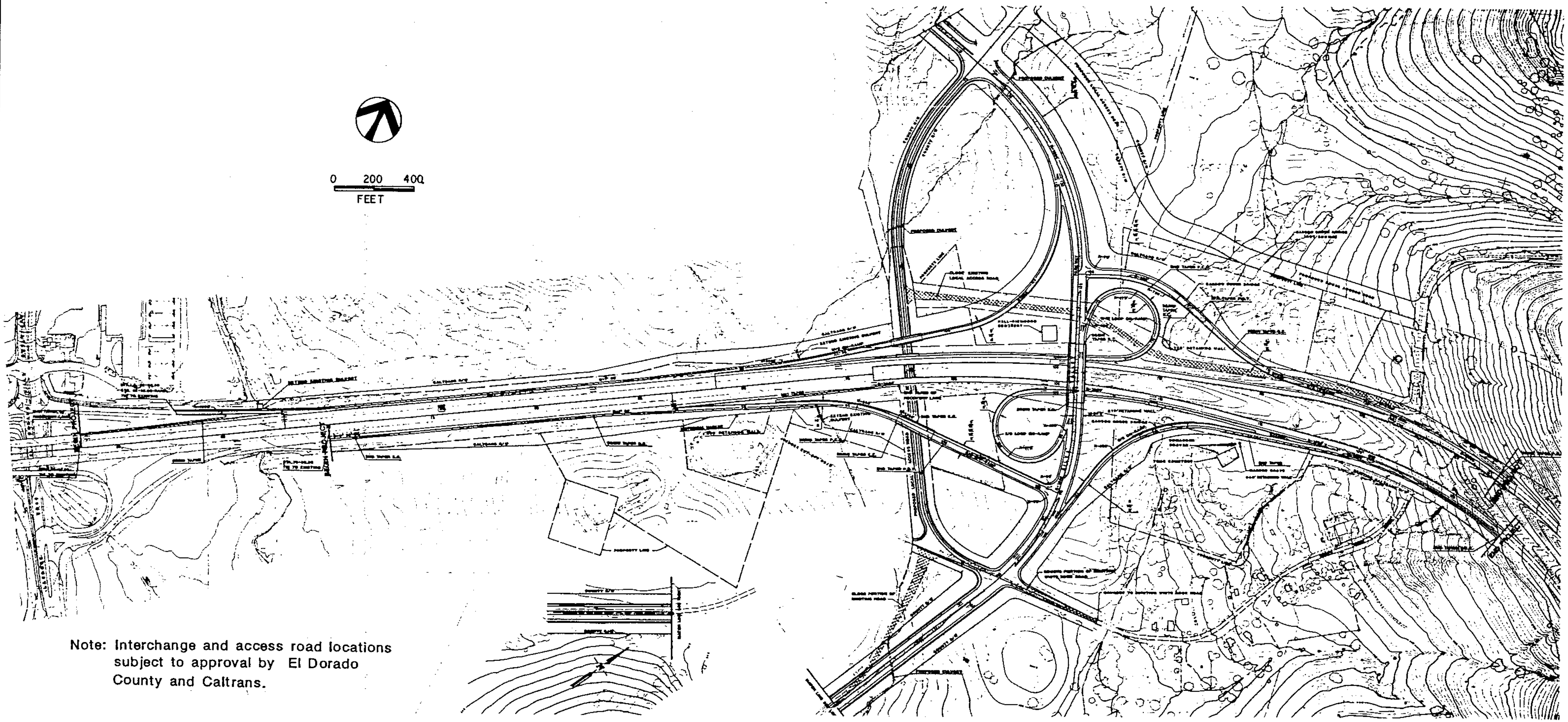
Design Features of the Ridge Design

The Ridge Design is called a "Parclo A" (partial cloverleaf with the loop on-ramps in the northeast and southwest quadrants) (Figure 2-3). Parclo A designs consist of two entrance ramps (a loop on-ramp and directional on-ramp) and one exit ramp in each direction of travel on the freeway. The overcrossing would span the ridge, yielding approximately 16.5 feet of vertical clearance over U. S. 50. This overcrossing would have four lanes for through traffic on Silva Valley Parkway.

The tapers for the loop on-ramps would begin at the end of the overcrossing. The overcrossing would have 8-foot-wide shoulders on the outside and a 20-foot-wide median (16-foot-wide divider with a 2-foot-wide curb clearance on each side) from edge of traveled way to edge of traveled way. The profile of the overcrossing shows a 6-percent grade on the south side of the highway and 4 percent on the north side of the highway, with a design speed of 50 mph. The loop on-ramps would be 28 feet wide, including a single 16-foot-wide lane and a 4-foot-wide left and 8-foot-wide right shoulder. These on-ramps would descend from the overcrossing at approximately a 6-percent grade. The radius of the loop on-ramps would be 175 feet, with a design speed of approximately 27 mph. The other two on-ramps and off-ramps would be 12-15 feet wide, with 8-foot-wide shoulders on the right sides, 4-foot-wide shoulders on the left sides, and a design speed of 40 mph or better.

The gradients for the eastbound on-ramp, eastbound off-ramp, westbound on-ramp, and westbound off-ramp would be approximately 1 percent, 4.5 percent, 6 percent, and 5.8 percent, respectively.

Auxiliary lanes are proposed between the El Dorado Hills Boulevard/U. S. 50 Interchange and the Silva Valley Parkway/U. S. 50 Interchange. A truck-climbing lane,



Preliminary Design August 1988

FIGURE 2-3.
RIDGE DESIGN ALTERNATIVE

Source: Bissell & Karn, Inc.

beginning at the eastbound U. S. 50 loop on-ramp, is also proposed, but only the portion within the interchange area would be constructed. The remainder of the lane would be funded and constructed sometime in the future by Caltrans.

In addition, implementation of the Ridge Design would entail the following tasks:

- realigning Silva Valley Parkway to the east and tying into White Rock Road,
- reconstructing a portion of White Rock Road to provide access to property south of the freeway,
- closing and removing a portion of the existing Tong Road north of the freeway and providing a new access road north of the four affected parcels,
- constructing bridges over Carson Creek for both the eastbound on-ramp and the westbound off-ramp,
- constructing a 290-foot-long retaining wall ranging in height from 4 to 28 feet where the eastbound off-ramp begins curving south to minimize impacts to the PGandE substation,
- constructing a 648-foot-long retaining wall ranging in height from 4 to 16 feet where the eastbound on-ramp joins the freeway to avoid the grave sites at the Tong Cemetery and the access road to the cemetery,
- constructing a 210-foot-long, 12-foot-high retaining wall where the existing eastbound freeway lane crosses Carson Creek to avoid impacts of the truck-climbing lane on an identified spring in Carson Creek, and
- constructing a 176-foot-long retaining wall, varying in height from 20 to 30 to 16 feet, along the outside of the northbound to westbound loop on-ramp to minimize impacts to Carson Creek.

Cut and Fill for the Ridge Design

A substantial amount of earth fill would be necessary for construction of this interchange design. Approximately 315,000 cubic yards of earth fill would be required, while only about 65,000 cubic yards of excavation would be obtained from the construction of this alternative. The additional import borrow required could be obtained from American River aggregate on White Rock Road. The majority of the excavation would be located on the north side of U. S. 50, primarily along the Silva Valley Parkway and the westbound loop on-ramp. The existing height of the hillside to the north of the frontage road on the north would be reduced by about 15 feet. The majority of the earth fill would be required south of U. S. 50 to build up the existing hillside and to fill in the valley to the west between Clarksville Substation and the existing White Rock Road. The portion of the Silva Valley Parkway near the existing intersection with White Rock Road would be about 15 feet higher than the existing roadway. The southern end of the existing hillside would be built up with the addition of earth fill. Approximately 74,000 cubic yards of fill would be required to raise the ground elevation of the valley west of White Rock Road by about 25 feet and allow construction of the eastbound off-ramp. The valley north of the highway and west of the existing undercrossing would also be raised by approximately 25 feet. Approximately 47,000 cubic yards of fill would be required for the construction of the eastbound on-ramp where the hill slopes down to the creek. Auxiliary lane construction would require approximately 11,800 cubic yards of fill and approximately 26,600 cubic yards of excavation.

The estimated capital, engineering, and contingency cost for the Ridge Design is $14,750,000 (1988 dollars). No right-of-way, landscaping, or mitigation costs are included in this estimate. See Table 2-2 for an itemized breakdown of this cost estimate.

Undercrossing Design Description

Project Location

The Undercrossing Design site would be located where existing White Rock Road passes under U. S. 50, approximately 4,200 feet east of the El Dorado Hills Boulevard/U. S. 50 Interchange and 800 feet west of the Ridge Design. Because the Undercrossing Design site location is proximate to the Ridge Design location, the site descriptions overlap.

Development north of the highway in the immediate vicinity of this alternative is limited to that along Tong Road. The houses mentioned earlier lie to the east of the undercrossing design site. The surrounding land is vacant and used for agriculture, primarily grazing. South of the highway, the PGandE substation is approximately 650 feet west of White Rock Road, a single family residence lies about 200 feet further to the west on a knoll, and the Clarksville Cemetery lies west of the house. Access to these properties is provided by the Joerger Cutoff Road.

Design Features of the Undercrossing Design

The undercrossing project design is called a "Parclo B" (partial cloverleaf with loop off-ramps in the northwest and southeast quadrants) (Figure 2-4). Parclo B interchanges have two exit ramps (a loop off-ramp and a directional off-ramp) and one entrance ramp for both directions of travel on the freeway.

Construction of the Undercrossing Design would require removing the existing U. S. 50 structure that spans the undercrossing and widening the existing undercrossing to accommodate four lanes of through traffic and two left-turn lanes, one in each direction, with a 20-foot-wide median (16-foot-wide divider with a 2-foot-wide curb clearance on each side) from edge of traveled way to edge of traveled way on White Rock Road/Silva Valley Parkway.

The loop off-ramps would be 16 feet wide, with 8-foot-wide shoulders on the inside, 4-foot-wide shoulders on the outside, and a radius of 175 feet. The eastbound loop off-ramp would descend at approximately a 5.2-percent gradient, and the westbound loop

Table 2-2. Cost Estimate for the Ridge Design

Items	Cost Estimate (1988 dollars)
Base and paving	$ 1,884,885
Earthwork	2,029,620
Drainage	981,884
Signs and striping	156,000
Signalization	200,000
Utilities	785,000
Miscellaneous items (fence, MBGR, C&G, lighting standards, erosion control, temporary road, S/W, frontage road)[a]	1,110,880
Subtotal	$ 7,148,269
Contingency (16 percent)	1,143,723
Subtotal (without structures)	$ 8,291,992
Structure Cost (Bridge & Retaining Walls)	3,802,965
Total (with structures)	$12,094,957
Engineering Fee (10 percent)	1,209,496
Total (without auxiliary lanes)	$13,304,453
Auxiliary Lanes	1,429,687
Total	$14,734,140

[a] MBGR = metal beam guard rail.
C&G = curb and gutter.
S/W = sidewalk.

Note: Landscaping would be required as designated in the Cooperative Agreement. Cost of right-of-way, landscaping, or mitigation are not included in this cost estimate.

Source: Bissell & Karn, Inc. 1989.

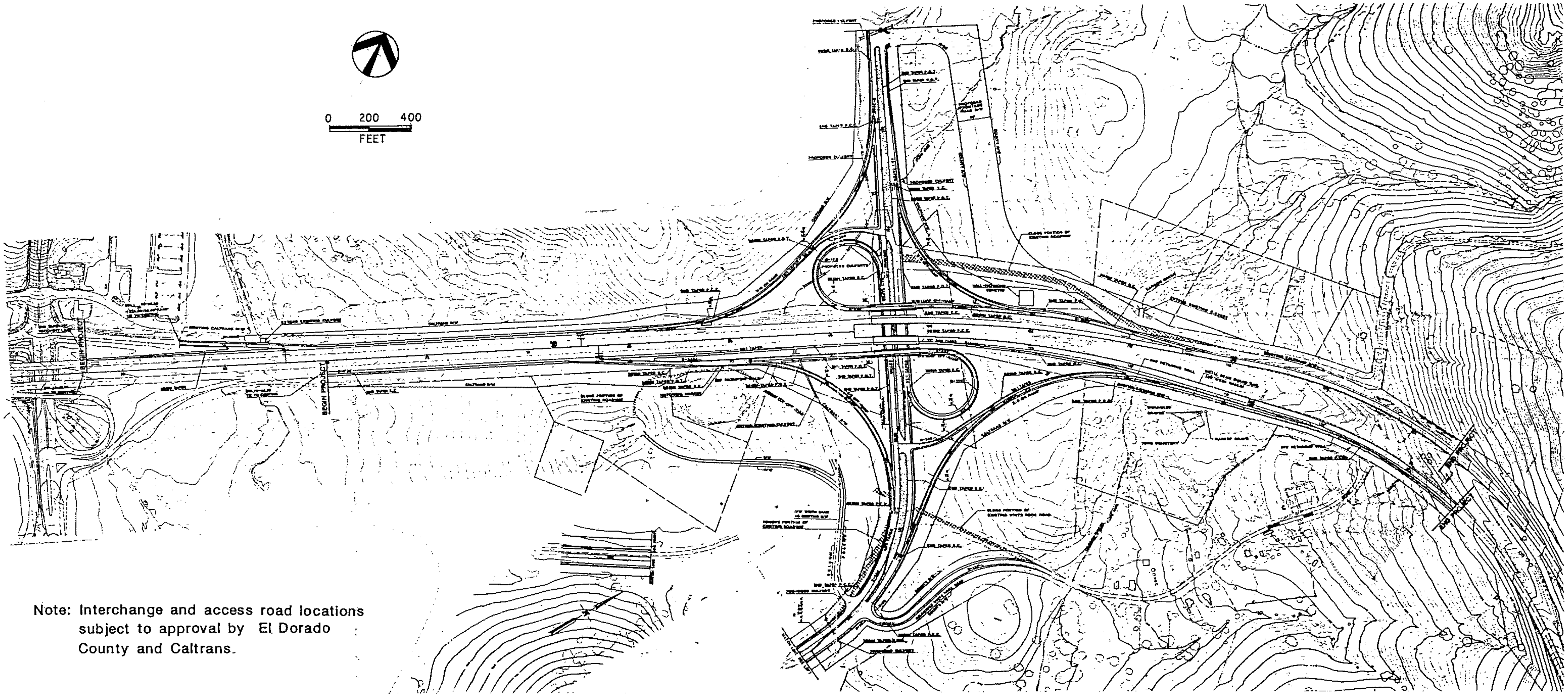
off-ramp would descend at approximately a 2.4-percent gradient. Design speeds for the loop off-ramps would be 25 mph or better.

The eastbound off-ramp would begin just west of the PGandE substation, curve with a radius of 700 feet, and descend the slope at a 6.7-percent gradient. The westbound off-ramp would begin close to the Hall/Richmond Cemetery, curve with a radius of 700 feet, and descend the slope at a 5-percent gradient. Each on-ramp would have two points of access, from northbound and southbound Silva Valley Parkway. The width of the on-ramp where these two accesses merge would be 36 feet and then would narrow to 24 feet, including shoulders. The eastbound on-ramp would ascend the slope at approximately a 7-percent gradient, while the westbound on-ramp would descend the slope at less than approximately a 2-percent gradient. The design speeds of the off- and on-ramps would be 35 mph or better.

Auxiliary lanes are proposed between the El Dorado Hills Boulevard/U. S. 50 Interchange and the Silva Valley Parkway/U. S. 50 Interchange. A truck-climbing lane for eastbound U. S. 50, beginning at the Clarksville undercrossing, is also proposed but only the portion within the interchange area would be constructed. The remainder of the truck climbing lane would be funded and constructed by Caltrans sometime in the future.

In addition, implementation of the Undercrossing Design would entail the following tasks:

- relocating El Dorado Irrigation District (EID) water and sewer lines in White Rock Road;
- constructing a 280-foot-long retaining wall, ranging in height from 4 to 16 feet, adjacent to the PGandE substation to minimize impacts to the access road and structures;
- constructing a 350-foot-long retaining wall, ranging in height from 8 to 26 feet, adjacent to the Tong property on the south side of U. S. 50 to minimize impacts to the Carson Creek spring;
- constructing a 670-foot-long retaining wall, ranging in height from 12 to 16 feet, adjacent to the Tong property on the south side of U. S. 50 to avoid impacts to the Tong Cemetery;
- realigning the Joerger Cutoff Road to provide access to a residence, the PGandE substation, and the Clarksville Cemetery;
- realigning White Rock Road to provide access to Clarksville;
- realigning Tong Road to provide access to properties to the north;
- extending the existing triple 10- by 10-foot box culvert for Carson Creek to the north to accommodate the relocation of the frontage road; and



Note: Interchange and access road locations subject to approval by El Dorado County and Caltrans.

Preliminary Design August 1988

FIGURE 2-4.
EXISTING UNDERCROSSING DESIGN ALTERNATIVE

Source: Bissell & Karn, Inc.

- o detouring traffic on U. S. 50 for at least 6 months while the new bridges on U. S. 50 are being constructed. (See Chapter 10 for a discussion of possible detours.)

Cut and Fill for the Undercrossing Design

Substantial amounts of excavation and earth fill would be required for construction of this interchange design. Approximately 312,000 cubic yards of excavation and approximately 178,000 cubic yards of fill would be required. The majority of the fill would be needed on the west side of Silva Valley Parkway to fill in low areas by the minor creek, primarily where the westbound loop off-ramp and the eastbound off-ramp would be located. Silva Valley Parkway would require about 44,000 cubic yards of fill, principally on the northern side of the highway. About 20 feet of fill would be placed in the valley in the southwest quadrant by the eastbound off-ramp. Constructing this interchange design would require reducing the height of the ridge east of Silva Valley Parkway by 25-30 feet both north and south of U. S. 50; it would not affect the hillside north of the frontage road, however. The majority of the excavation that would be required would occur east through this hillside. Constructing the eastbound on-ramp and the westbound off-ramp would require 70,000-80,000 cubic yards of excavation each. Constructing the Silva Valley Parkway would also require about 45,000 cubic yards of excavation, since the roadbed would be lowered 2-3 feet. Construction of the auxiliary lanes would require approximately 26,600 cubic yards of excavation and no earth fill.

The estimated capital, engineering, and contingency cost for the Undercrossing Design is $15,750,000 (1988 dollars). No right-of-way, landscaping, or mitigation costs are included in this estimate. See Table 2-3 for an itemized breakdown of this cost estimate.

ADVANTAGES AND DISADVANTAGES

Table 2-4 compares the advantages and disadvantages for the two alternatives in terms of geometrics, operations, construction impacts, and right-of-way impacts.

ALTERNATIVES CONSIDERED BUT REJECTED

As previously stated, several alternatives were considered and rejected during the preliminary engineering phase of this project, including:

- o Parclo A at the existing White Rock Road undercrossing,
- o Parclo A-B at the existing White Rock Road undercrossing,
- o diamond at the existing White Rock Road undercrossing,

Table 2-3. Cost Estimate for the Undercrossing Design

Items	Cost Estimate (1988 dollars)
Base and paving	$ 1,692,910
Earthwork	2,496,000
Drainage	1,550,609
Signs and striping	176,000
Signalization	200,000
Utilities	977,000
Miscellaneous items (fence, MBGR, C&G, lighting standards, erosion control, temporary detour, S/W, frontage road)[a]	1,750,930
Subtotal	$ 8,843,449
Contingency (16 percent)	1,414,952
Subtotal (without structures)	$10,258,401
Structure Cost (Bridge and retaining walls)	3,227,500
Total (with structures)	$13,485,901
Engineering fee (10 percent)	1,348,590
Total (without auxiliary lanes)	$14,834,491
Auxiliary lanes	913,283
Total	$15,747,774

[a] MBGR = metal beam guard rail.
C&G = curb and gutter.
S/W = sidewalk.

Note: Landscaping would be required as designated in the Cooperative Agreement. Cost of right-of-way, landscaping, and mitigation are not included in this cost estimate.

Source: Bissell & Karn, Inc. 1989.

Table 2-4. Advantages and Disadvantages of the Ridge Design and Undercrossing Design

	Ridge Design	Undercrossing Design
Geometrics:		
Advantages:	1. Would be located on existing "rise" requiring less earthwork.	1. The truck climbing lane would begin immediately east of the existing undercrossing on U. S. 50.
	2. Parclo A with dual entrance ramps is the interchange configuration generally preferred by Caltrans and the county.	2. The existing bridge structures on U. S. 50, which are approximately 25 years old, would be replaced by new bridge structures.
Disadvantages:	1. Steep (6 percent) downgrades on both loop on-ramps and WB directional on-ramp.	1. Steep (7 percent) grades on EB on-ramp and EB loop off-ramp (6 percent).
	2. EB off-ramp intersects with Silva Valley Parkway on a 6 percent grade. Grade of intersections preferred to be 4 percent or less.	2. EB off-ramp has 7 percent downgrade, which is greater than Caltrans generally prefers for maximum ramp grades.
	3. Steep grade on Silva Valley Parkway (6 percent).	3. Would require lowering existing profile of White Rock Road to obtain vertical clearance for bridges. This could require relocation of existing sewer and water lines.
	4. Would require 3,500 ft of additional roadway for Silva Valley Parkway.	4. Would require longer bridges on U. S. 50 to replace the existing bridges due to width (118 ft, which includes the roadway, median, shoulders, and sidewalks) of Silva Valley Parkway.
		5. EB on-ramp would cut through existing hill and require substantial excavation.
		6. Relocation of White Rock Road, access road to PGandE substation, and driveway access to Peerman residence would be required.
Operations:		
Advantages:	1. WB weaving section would be improved by providing two entrances onto the freeway, spreading the merging traffic along U. S. 50.	1. Would have single entrance and exit design on U. S. 50 for interchange.

Table 2-4. Continued

	Ridge Design	Undercrossing Design
	2. Both weaving distances would be longer than those of the undercrossing alternative.	
	3. EB directional on-ramp would have only NB Silva Valley Parkway traffic using it, providing greater capacity for ramp. Would require less constraining of project traffic.	
	4. White Rock Road (existing) could be used for bicycles, pedestrians, farm equipment, and excess traffic, providing greater capacity with smaller width (84 ft) on Silva Valley Parkway.	
Disadvantages:	1. EB weaving section would be at capacity/LOS F.	1. EB weaving length would be at the absolute minimum length of 1,600 ft and at LOS F.
	2. WB off-ramp would diverge from U. S. 50 on a horizontal curve at the end of a steep downgrade.	2. WB off-ramp diverges at the end of a steep downgrade on U. S. 50. Off-ramp itself would be on a steep downgrade.
		3. WB weaving section would be at WSD in the p.m. peak hour.
		4. Would add SB Silva Valley Parkway traffic to the NB Silva Valley Parkway traffic on the EB on-ramp, which is already over capacity. Traffic would be slowed by a 7 percent upgrade, further constraining the capacity of the ramp.
		5. Would require expansive width on cross street (118 ft) to obtain the same capacity and to provide for bicyclists and pedestrians. Farm equipment would also need to use the undercrossing.
		6. EB on-ramp traffic would have to merge with the truck climbing lane.
		7. Would reduce the speed of the vehicles on the loop exit ramps from a high speed facility to 25 mph, possibly encouraging run-off-the-road accidents.

Table 2-4. Continued

	Ridge Design	Undercrossing Design
Construction Impacts:		
Advantages:	1. Construction of interchange would be simplified. Initial development traffic could be handled by existing White Rock Road while Silva Valley Parkway/ U. S. 50 Interchange is being constructed. 2. No major detours would be required on U. S. 50.	
Disadvantages:	1. Usual construction impacts, noise, etc. would occur in project area.	1. As a minimum, the construction of the bridges on U. S. 50 would have to precede the residential development. Silva Valley Parkway would be reduced to one lane of traffic during construction of the U. S. 50 mainline bridges. 2. Requirement of detours for at least 6 months would be required on U. S. 50 while constructing new bridges. Loop ramp bridges could be used for temporary detour of U. S. 50 traffic while reconstructing mainline U. S. 50 bridges. 3. More difficult to maintain traffic on Silva Valley Parkway during construction of interchange.
Right-of-Way Impacts:		
Advantages:	1. No impact on PGandE substation with construction of retaining wall. 2. No relocation of Hall/Richmond Cemetery. 3. Would avoid Tong's Cemetery and unmarked graves with construction of retaining wall.	1. No need for structures over Carson Creek. 2. Would minimize impact to Tong's property, including the Cemetery. 3. Would require acquisition of approximately 0.3 acre of Byram's 5-acre parcel and approximately 0.3 acre of Dolder's 5-acre parcel. Would require minimum relocation of frontage road.

Table 2-4. Continued

	Ridge Design	Undercrossing Design
Disadvantages:	1. Mitigation would be required for Tong's spring. Would require construction of a structure on the EB on-ramp over Carson Creek to provide access to the spring used for watering livestock and wildlife.	1. Mitigation would be required for Tong's spring. A retaining wall would be required along the EB on-ramp to ensure the integrity of the spring used for watering livestock and wildlife.
	2. Impacts on Carson Creek would require two bridges and a retaining wall within interchange area.	2. Impacts on minor creek west of existing undercrossing. Would require box culverts for the many crossings of the creek.
	3. Impacts Tong's property by acquisition of approximately 1.3 acres.	3. Would require retaining wall to stay clear of PGandE substation. Would also require relocation of about 2,000 ft of roadway accessing substation and the Peerman residence.
	4. Would require acquisition of about 0.9 acre of approximately 5-acre Byram parcel and about 3.4 acres of approximately 5-acre Dolder parcel. Would require relocation of frontage road to serve these properties.	4. Loss of natural public open space in northwest quadrant of interchange. Public open space is designated in the approved Specific Plan.
	5. Would require relocation of 115-kV and 60-kV PGandE power lines.	5. Would require the relocation of Historical Marker #699 for the Mormon Tavern.
		6. Would require relocation of 115-kV and 60-kV PGandE power lines.
		7. Impacts to Carson Creek would require an extension of the existing box culvert on the north side.
		8. Hall/Richmond Cemetery could be undercut by the WB off-ramp.

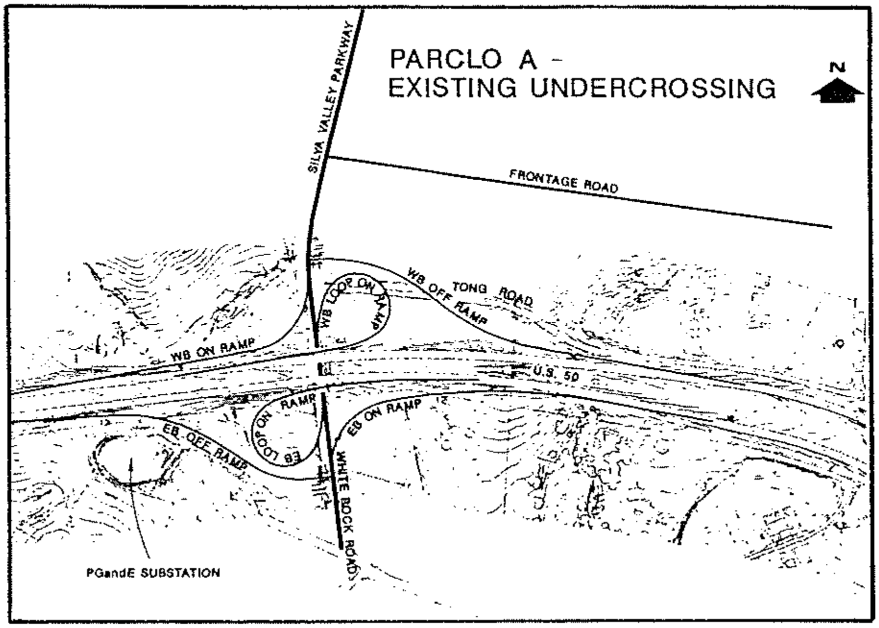
Source: Bissell & Karn, Inc. 1989. Draft Project Report and Attachments. Silva Valley Parkway/U. S. 50 Interchange, January 1989.

- Parclo B at the ridge, and
- diamond at the ridge.

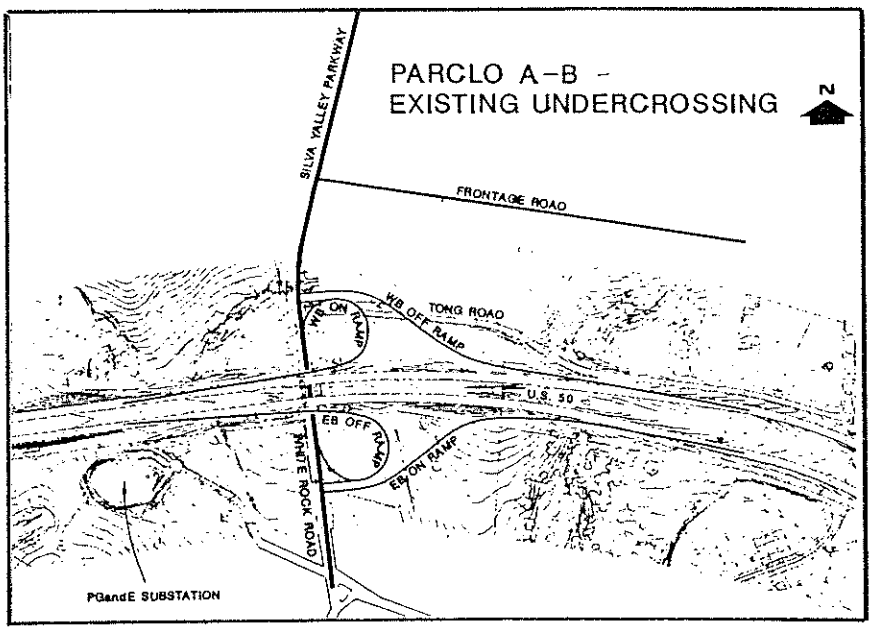
Each of these alternatives and the reason for its rejection are explained in detail below and are shown in Figures 2-5, 2-6, and 2-7.

NO-PROJECT ALTERNATIVE

CEQA requires analysis of feasible project alternatives. Numerous alternatives were considered and rejected because of their infeasibility or inability to meet the project objectives. The only other project alternative evaluated in this EIR is the No-Project Alternative. The No-Project Alternative assumes that an interchange would not be built. Detailed analyses of the No-Project Alternative are found in Chapter 10, "Transportation," Chapter 11, "Air Quality," and Chapter 12, "Noise." Additional information on the No-Project Alternative is found in Chapter 14, "Alternatives to the Proposed Project."

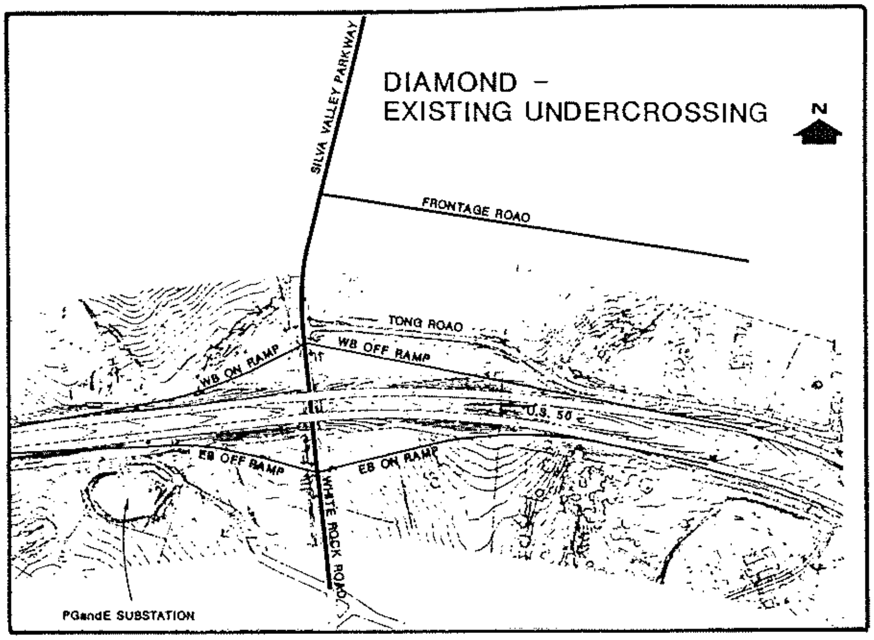


This design would result in a weaving distance between the El Dorado Hills Boulevard/U. S. 50 Interchange on-ramp and the eastbound off-ramp that would not meet the minimum requirements of Caltrans or El Dorado County. This short distance would create extremely hazardous conditions for motorists entering eastbound U. S. 50 from El Dorado Hills Boulevard and those maneuvering to exit the highway at the eastbound off-ramp. This alternative would have a substantial impact on the operation and maintenance of the PGandE substation and probably require its relocation.

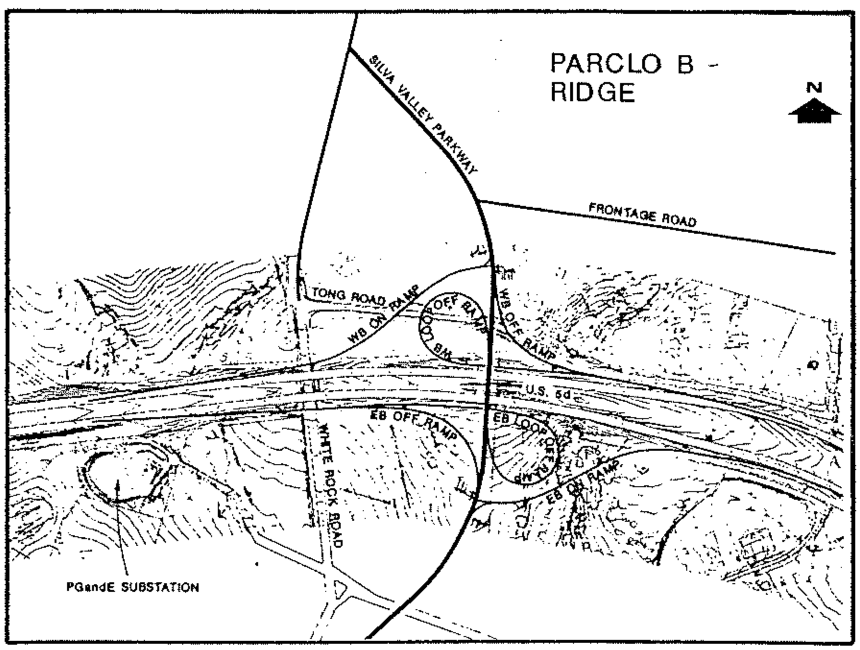


This unusual interchange includes two loop ramps on the east side of Silva Valley Parkway: a westbound loop on-ramp in the northeast quadrant and an eastbound loop off-ramp in the southeast quadrant. The capacity of this design is lower than that of either a Parclo A or Parclo B design because of the larger number of conflicting movements (left turns across lanes). This interchange design was rejected from further environmental review because it is a nonstandard configuration, it is not preferred by Caltrans, and it would not be able to accommodate the projected traffic volumes.

FIGURE 2-5. ALTERNATIVES CONSIDERED BUT REJECTED: PARCLO A - EXISTING UNDERCROSSING AND PARCLO A-B - EXISTING UNDERCROSSING

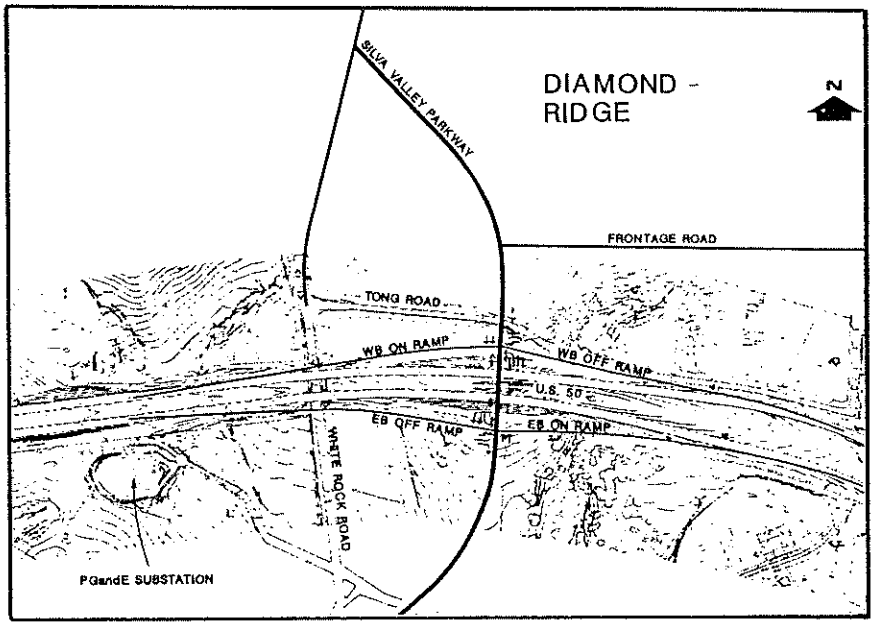


The capacity of a diamond interchange is low because of the large number of conflicting turning movements at the ramp intersections. Each intersection would require signalization. The existing undercrossing structure would constrain the storage provided for left-turn movements.



The capacity of a Parclo B design is lower than that of a Parclo A design because it has more conflicting movements. The weaving distance between the westbound on-ramp and the El Dorado Hills Boulevard/U. S. 50 Interchange would be shorter than that of the proposed Parclo A at this location. In addition, the loop off-ramps would require a rapid deceleration by motorists exiting the freeway at high speeds, increasing the likelihood of accidents. This interchange design was rejected from further environmental review because of these issues. This alternative would have a significant impact on Carson Creek on the south side of U. S. 50 and the Tong Cemetery.

FIGURE 2-6. ALTERNATIVES CONSIDERED BUT REJECTED: DIAMOND - EXISTING UNDERCROSSING AND PARCLO B - RIDGE



In addition to the aforementioned capacity constraints, the ridge structure would also require a wider overcrossing structure to accommodate left-turn pockets. Both diamond designs were rejected from further evaluation because of their low capacity and structural constraints and requirements.

FIGURE 2-7. ALTERNATIVES CONSIDERED BUT REJECTED: DIAMOND - RIDGE

CHAPTER 3. Summary of Findings

This chapter presents a summary of project impacts, mitigation measures, and a number of impact conclusions required by CEQA (State CEQA Guidelines Sections 15123 and 15126).

EFFECTS FOUND NOT TO BE SIGNIFICANT

The following effects were found not to be significant in the Environmental Checklist Form (Appendix A):

- natural resources
- risk of upset
- energy
- utilities
- human health
- recreation

SIGNIFICANT AND UNAVOIDABLE IMPACTS

The analysis in this report concludes that implementation of either design would result in the significant and unavoidable impact of substantial alteration of the natural landscape.

Implementation of the Ridge Design would result in the following additional significant and unavoidable impacts.

- LOS F during the p.m. peak hour at the EB slip on-ramp of the Silva Valley Parkway/U. S. 50 interchange.

- LOS E and F during the a.m. and p.m. peak hours, respectively, on the eastbound mainline of U. S. 50 between the Silva Valley Parkway and El Dorado Hills Boulevard interchanges due to weaving.

Implementation of the Undercrossing Design would result in the following additional significant and unavoidable impacts.

- Temporary degradation of springs/seepage areas.

- LOS F during the p.m. peak hour at the EB slip on-ramp of the Silva Valley Parkway/U. S. 50 interchange.

- o LOS E and F during the a.m. and p.m. peak hours, respectively, on the eastbound mainline of U. S. 50 between the Silva Valley Parkway and El Dorado Hills Boulevard interchanges due to weaving.
- o Substantial traffic detours of mainline U. S. 50 traffic for at least 6 months while constructing new bridges on U. S. 50.
- o Difficulty maintaining traffic on Silva Valley Parkway during construction.

ENVIRONMENTALLY SUPERIOR ALTERNATIVE

Implementation of any alternative, No-Project Alternative, Ridge Design, or Undercrossing Design would result in significant and unavoidable impacts.

The environmentally superior alternative is identified as the Ridge Design because the Undercrossing Design would result in additional significant and unavoidable impacts due to temporary degradation of springs/seepage areas, substantial traffic detours of mainline U. S. 50 traffic, and difficulty maintaining traffic on Silva Valley Parkway during construction. The No-Project Alternative would result in unacceptable traffic delays (peak-hour traffic ranging from 2 to 2.5 hours).

GROWTH INDUCEMENT

Section 15126 (g) of the State CEQA Guidelines provides the following guidance in discussing the growth-inducing impacts of a proposed action:

> Discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a wastewater treatment plant might, for example, allow for more construction in service areas). Increases in the population may further tax existing community service facilities, so consideration must be given to this impact. Also discuss the characteristics of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

1. Would the project foster economic or population growth or the construction of additional housing?

   No. The project would not foster (stimulate) development; however, the project is required to allow development of all the projects proposed in the area.

2. Would the project remove obstacles to population growth?

Yes. The project would provide for more capacity in accessing U. S. 50 in the transportation network, thereby removing a future obstacle to population growth. Implementation of the project would result in no direct increase in ozone precursors. However, the project would be growth-inducing, leading to an increase in ozone precursors and therefore adding to the difficulty in attaining the ozone standard.

3. Would the project tax existing community service facilities?

No. The analysis in Chapter 9, "Public Services and Facilities," explains that PGandE distribution and transmission facilities and EID facilities could be redesigned as part of the project.

4. Would the project encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively?

Yes. The growth-inducing impacts of this interchange are considered to be unavoidable. As a result, the regional air quality impacts related to induced growth are also considered to be unavoidable.

SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY

The project would remove a minor amount of land from Williamson Act contract.

IRREVERSIBLE ENVIRONMENTAL CHANGES

The project would result in an irretrievable commitment of energy and other nonrenewable resources used to construct the project.

KNOWN AREAS OF CONTROVERSY

The project is considered controversial. Testimony before the El Dorado County Board of Supervisors during the review process for the El Dorado Hills Specific Plan indicated opposition to the Ridge Design from various landowners. It is not known whether the Undercrossing Design would be opposed.

MITIGATION MONITORING

Assembly Bill 3180, passed by the California Legislature in the 1987-88 session, added Section 21081.6 to the Public Resources Code as follows:

> A public agency shall adopt a reporting or monitoring program for the changes to the project which it has adopted or made a condition of project approval in order to mitigate or avoid significant effects on the environment. This mitigation monitoring program applies to mitigation measures adopted as part of EIRs or Negative Declarations. Mitigation monitoring is required on all projects approved after December 31, 1988.

El Dorado County is required by state law to establish a mitigation monitoring program. The program should, at a minimum, identify the following: what department is responsible for monitoring the mitigation, what is being monitored and how, what schedule is required to provide adequate monitoring, and what identifies the monitoring as complete.

SUMMARY OF IMPACTS AND MITIGATION MEASURES

Tables 3-1, 3-2, and 3-3 present a summary of impacts and mitigation measures common to implementation of both alternatives, the ridge design, and the undercrossing design, respectively. For detailed discussions of these impacts and mitigation measures, refer to the appropriate chapters of the text following this chapter.

Table 3-1. Summary of Impacts and Mitigation Measures Common to Both Alternatives

Issue Area	Impact	Level of Significance	Mitigation Measure	Level of Significance After Mitigation
Land Use	Loss of grazing land (approximately 45 acres for the Ridge Design and 35 acres for the Undercrossing Design).	Less than significant.	No mitigation is required.	--
	Acquisition of private property.	Significant.	Provide "just compensation" to the property owners.	Less than significant.
	Land use conflicts between the interchange and existing low-density residential development.	Less than significant.	No mitigation is required.	--
	Possible land use conflicts with future planned land uses, although the timing of the interchange construction is estimated to be approximately 10 years from now, when the approved El Dorado Hills Specific Plan area would be at least partially developed.	Potentially significant.	Landscape the interchange area. Implement noise and aesthetic mitigation measures presented in this EIR and determine compatible land use designations for this area.	Less than significant.
	Removal of agricultural lands currently in Williamson Act contracts.	Less than significant.	No mitigation is required.	--
Aesthetics	Visual disparity with the existing rural setting caused by the alteration of viewsheds and increased ambient night lighting.	Less than significant.	No mitigation is required.	--
	Conflicts with the residential land uses planned for the area near the interchange.	Significant.	Landscape the interchange. Direct lighting away from surrounding land uses. Implement noise and land use mitigation measures presented in this EIR and determine compatible land use designations for this area.	Less than significant.
Geology and Soils	Substantial alteration of the natural landscape.	Significant and unavoidable.	No mitigation is recommended.	Significant and unavoidable.
	Modification of natural runoff patterns.	Less than significant.	No mitigation is required.	--

Table 3-1. Continued.

Issue Area	Impact	Level of Significance	Mitigation Measure	Level of Significance After Mitigation
Geology and Soils (Continued)	Temporary increased erosion.	Significant.	Expose as little new ground surface as possible, do not allow sidecasting, install adequate energy dissipators, remove excess rock and soil, stockpile topsoil, and develop and implement a project-wide erosion control program.	Less than significant.
	Temporary degradation of streams.	Significant.	Develop and implement a projectwide erosion control program.	Less than significant.
	Prevention of mineral resource extraction.	Less than significant.	No mitigation is required.	--
	Natural slope instability.	Less than significant.	No mitigation is required.	--
	Man-caused slope instability.	Potentially significant.	Undertake a detailed geotechnical investigation and perform grading observation and testing.	Less than significant.
	Exposure of structures to possible earthquakes.	Potentially significant.	Undertake a detailed geotechnical investigation.	Less than significant.
	Construction on expansive soils.	Less than significant.	No mitigation is required.	--
	Blasting effects for construction.	Potentially significant.	Comply with all applicable local, state, and federal safety regulations.	Less than significant.
Hydrology and Water Quality	A minor increase in impervious surfaces with minor changes in peak flow characteristics and runoff volumes.	Less than significant.	No mitigation is required.	--
	Alteration of topographic features and roadways, thereby altering runoff drainage paths.	Less than significant.	No mitigation is required.	--
	Installation of numerous culverts to convey onsite drainage and streamflows over the site and ease possible flooding problems (Ridge Design has fewer culverts and culvert extensions than the Undercrossing Design).	Potentially significant.	Size culverts in accordance with El Dorado County and Caltrans requirements. Acquire ponding easements from owners of affected properties.	Less than significant.

Table 3-1. Continued.

Issue Area	Impact	Level of Significance	Mitigation Measure	Level of Significance After Mitigation
Hydrology and Water Quality (Continued)	Increased flow velocities as water travels through the culverts.	Potentially significant.	Install erosion control measures at outlets and implement El Dorado County Resource Conservation District (RCD) requirements.	Less than significant.
	Possible alteration or covering of naturally occurring seeps.	Potentially significant.	Provide adequate subgrade drains as determined necessary by a geotechnical engineer.	Less than significant.
	Possible alteration of the flow of water from Carson Creek spring (Ridge Design has higher possibility because of greater activity in the spring area).	Potentially significant.	Require review of the design plans by a geotechnical engineer. Minimize activity in the spring area. Implement a water quality monitoring program.	Less than significant.
	Possible alteration of the livestock value of the spring if construction activities degrade the water quality.	Potentially significant.	Provide an alternate water supply for livestock.	Less than significant.
	Increased turbidity and sediment loading from construction and grading activities.	Significant.	Implement precautionary measures during construction to minimize water quality degradation.	Less than significant.
	Increased runoff containing sediment, oil, grease, and other pollutants from paved areas.	Less than significant.	No mitigation is required.	--
	No change to subsurface water quality because surface water would infiltrate the soil and be cleansed prior to possible use.	Less than significant.	No mitigation is required.	--
Vegetation, Wildlife, and Aquatic Resources	Diminished habitat for plants and wildlife.	Significant.	Prepare and implement a detailed biological mitigation plan.	Less than significant.
Vegetation	Elimination or disturbance of the annual grasslands in the project area.	Less than significant.	No mitigation is required.	--
Wildlife	Loss of annual grassland habitat, thereby displacing or eliminating wildlife species.	Less than significant.	No mitigation is required.	--

Table 3-1. Continued.

Issue Area	Impact	Level of Significance	Mitigation Measure	Level of Significance After Mitigation
Vegetation	Elimination of blue oaks (Ridge Design would eliminate 59 blue oaks [51 with dbh exceeding 12 inches and 8 with a dbh range of 6-12 inches]; Undercrossing Design would eliminate 20 blue oaks [15 with dbh exceeding 12 inches and 5 with a dbh range of 6-12 inches]).	Significant.	Design the project to save as many oak trees as possible. Protect oak trees from construction and landscaping impacts. Replant with native oaks.	Less than significant.
Wildlife	Loss or displacement of wildlife species of the blue oak woodland.	Significant.	Implement the blue oak woodland vegetation mitigation measures.	Less than significant.
Vegetation	Elimination of interior live oak trees and riparian shrubs.	Significant.	Protect riparian woodland from construction impacts. Replant riparian areas with woody vegetation.	Less than significant.
	Possible construction-related impacts to both creeks if debris or soil are sidecast into the channel from adjacent areas.	Potentially significant.	Protect riparian woodland from construction impacts.	Less than significant.
Wildlife	Loss of interior live oak woodland habitat and subsequent elimination or displacement of wildlife species associated with this habitat.	Significant.	Implement the live oak riparian woodland vegetation mitigation measures.	Less than significant.
Vegetation	Elimination of wetlands including freshwater marsh habitat dominated by dense sedge (Ridge Design would eliminate 1.6 acres including 1.1 acres of freshwater marsh and 0.5 acre of habitat dominated by dense sedge; Undercrossing Design would eliminate 7.5 acres including 4.5 acres of freshwater marsh and 3 acres of habitat dominated by dense sedge).	Significant.	Protect the marshes from construction impacts. Establish a wetland of equal acreage and value or enhance an existing degraded wetland. Design culvert outfalls that allow new ponds to form.	Less than significant.
Wildlife	Loss of marsh habitat, thereby eliminating sources of water for wildlife.	Significant.	Implement the freshwater marshes and seeps vegetation mitigation measures.	Less than significant.
Vegetation	Elimination of purple needlegrass grassland (Ridge Design 0.15 acre; Undercrossing Design 2.7 acres).	Significant.	Protect the purple needlegrass from construction impacts. Replant an area with purple needlegrass.	Less than significant.
Wildlife	Elimination of habitat for wildlife species associated with the purple needlegrass grassland.	Significant.	Implement the purple needlegrass grassland vegetation mitigation measures.	Less than significant.
Vegetation	No impacts to any special-status plant species.	--	No mitigation is required.	--

Table 3-1. Continued.

Issue Area	Impact	Level of Significance	Mitigation Measure	Level of Significance After Mitigation
Wildlife	Loss of possible foraging habitat for Swainson's hawks.	Less than significant.	No mitigation is required.	--
	Loss of possible foraging habitat for burrowing owls.	Less than significant.	No mitigation is required.	--
	No loss of possible habitat for the tricolored blackbird.	--	No mitigation is required.	--
	Loss of possible habitat for the red-legged frog.	Less than significant.	No mitigation is required.	--
	No loss of elderberry shrubs and, therefore, no impacts to valley elderberry longhorn beetle (VELB).	--	No mitigation is required.	--
	Elimination of foraging habitat for several special-status raptors.	Less than significant.	No mitigation is required.	--
Public Services and Facilities	Relocation of two 115-kV lines, one 60-kV transmission line, and two distribution lines (underbuilt on the 60-kV transmission line).	Significant.	Relocate the three transmission and two distribution lines outside the Caltrans right-of-way.	Less than significant.
	Conflict with the planned expansion of PGandE electric and gas facilities.	Significant.	Provide for electrical and gas line conduits in the interchange design.	Less than significant.
Transportation	Improvement from LOS E (No-Project Alternative) to LOS D during the p.m. peak hour at the Latrobe Road/U. S. 50 EB Ramps intersection.	Beneficial.	Reconstruct the El Dorado Hills Boulevard interchange and improve the Latrobe Road/U. S. 50 EB Ramps intersection.	--
	Improvement from LOS D (No-Project Alternative) to LOS C during the a.m. peak hour at the El Dorado Hills Boulevard/U. S. 50 WB Ramps intersection.	Beneficial.	No mitigation is required.	--
	No change from LOS D (No-Project Alternative) to LOS D during the p.m. peak hour at the Bass Lake Road/U. S. 50 EB Ramps intersection.	--	Reconstruct Bass Lake Road interchange and improve U. S. 50 EB Ramps intersection.	--

Table 3-1. Continued.

Issue Area	Impact	Level of Significance	Mitigation Measure	Level of Significance After Mitigation
Transportation (Continued)	Improvement from LOS F (No-Project Alternative) to LOS C during the p.m. peak hour at the White Rock Road/Latrobe Road intersection.	Beneficial.	No mitigation is required.	--
	Improvement from LOS F (No-Project Alternative) to LOS C during the a.m. peak hour at the EB on-ramp of the El Dorado Hills Boulevard/U. S. 50 interchange.	Beneficial.	No mitigation is required.	--
	No change from LOS F (No-Project Alternative) to LOS F during the p.m. peak hour at the EB on-ramp of the El Dorado Hills Boulevard/U. S. 50 interchange but a substantial reduction in the V/C ratio from 2.35 to 1.06.	Beneficial.	The EB on-ramp would need to be widened to two lanes. However, Caltrans generally considers widening of on-ramps to be infeasible where mainline capacity is not adequate. No mitigation is recommended.	--
	No change from LOS F (No-Project Alternative) to LOS F during the a.m. peak hour at the WB on-ramp of the El Dorado Hills Boulevard/U. S. 50 interchange but a reduction in the V/C ratio from 1.44 to 1.24.	Beneficial.	The WB on-ramp would need to be widened to two lanes. However, Caltrans generally considers widening of on-ramps to be infeasible where mainline capacity is not adequate. No mitigation is recommended.	--
	No change from LOS F (No-Project Alternative) to LOS F during the p.m. peak hour at the WB on-ramp of the El Dorado Hills Boulevard/U. S. 50 interchange.	--	No mitigation is required.	--
	Improvement from LOS F and E (No-Project Alternative) to LOS B during the a.m. and p.m. peak hour, respectively, at the WB slip off-ramp of the El Dorado Hills Boulevard/U. S. 50 interchange.	Beneficial.	No mitigation is required.	--
	Improvement from LOS F (No-Project Alternative) to LOS B during the a.m. and p.m. peak hour at the WB loop off-ramp of the El Dorado Hills Boulevard/U. S. 50 interchange.	Beneficial.	No mitigation is required.	--

Table 3-1. Continued.

Issue Area	Impact	Level of Significance	Mitigation Measure	Level of Significance After Mitigation
Transportation (Continued)	No change from LOS F (No-Project Alternative) to LOS F during the a.m. and p.m. peak hours, respectively, at the WB on-ramp of the Bass Lake Road/U. S. 50 interchange.	--	The WB on-ramp would need to be widened to two lanes. However, Caltrans generally considers widening of on-ramps to be infeasible where mainline capacity is not adequate. No mitigation is recommended.	--
	No change from LOS F (No-Project Alternative) to LOS F on the U. S. 50 mainline in the project vicinity.	Significant.	Widen U. S. 50.	Less than significant.
Air Quality	No direct increase in ozone precursors.	Less than significant.	No mitigation is required.	--
	Dust being generated during construction, causing a nuisance to neighboring land owners.	Significant.	Control fugitive dust.	Less than significant.
	Blasting emitting an indeterminable amount of fugitive dust into the atmosphere during construction as well as smoke from the blasting charges.	Potentially significant.	Notify local residents of blasting operations and comply with all applicable local, state, and federal safety and air quality regulations.	Less than significant.
	Construction equipment powered by internal combustion engines emitting an indeterminable quantity of nitrogen oxides, hydrocarbons, particulates, sulfur dioxides, and carbon monoxide.	Significant.	Use properly maintained construction equipment.	Less than significant.
	No violations of either the 1-hour or 8-hour state and federal CO standards in the immediate vicinity of the proposed interchange.	Less than significant.	No mitigation is required.	--
	Higher CO concentrations at the El Dorado Hills Boulevard interchange than the concentrations in the immediate vicinity of the proposed interchange (lower than concentrations under the No-Project condition) but approaching the 8-hour 9 ppm CO standard.	Potentially significant.	Reconstruct the El Dorado Hills Boulevard interchange.	Less than significant.

Table 3-1. Continued.

Issue Area	Impact	Level of Significance	Mitigation Measure	Level of Significance After Mitigation
	Lower concentrations at the Bass Lake Road interchange than CO concentrations in the immediate vicinity of the proposed interchange.	Less than significant.	No mitigation is required.	--
Noise	Temporary construction-related noise in proximity to existing residential land uses north and south of the project site.	Significant.	Limit construction activities to daytime hours.	Less than significant.
	Possible vibration-induced annoyance to residents or vibration-induced damage to structures on adjacent properties.	Potentially significant.	Advise area residents in advance of planned blasting. Design blasting operations to avoid damage to any vibration-sensitive structures on adjacent properties.	Less than significant.
Noise (Continued)	Peak hour Leq noise levels in excess of 60 dBA within approximately 350 feet of the centerline of U. S. 50 and within approximately 300 feet of the centerline of Silva Valley Parkway.	Significant.	Reduce traffic noise by either implementing land use measures or constructing noise barriers along both sides of U. S. 50 and Silva Valley Parkway.	Less than significant.
Cultural Resources	Possible adverse impacts to unknown sites.	Potentially significant.	Stop work if cultural resources are discovered during construction.	Less than significant.
	Disturbance to CA-Eld-558-H.	Less than significant.	No mitigation is required.	--
	Disturbance to portions of CA-Eld-585/H, including the adits, and possibly the stamp mill, cabin, and terraces, which lie near the edge of the proposed right-of-way.	Potentially significant.	Preserve CA-Eld-585/H or require additional work.	Less than significant.
	No adverse effects to the Tong Cemetery portion of CA-Eld-585-H, because a retaining wall has been designed to protect this portion of the site.	Less than significant.	No mitigation is required.	--
	No adverse effects to the Byram house.	Less than significant.	No mitigation is required.	--

Table 3-2. Summary of Additional Impacts and Mitigation Measures for the Ridge Design

Issue Area	Impact	Level of Significance	Mitigation Measure	Level of Significance After Mitigation
Land Use	Closure of Tong Road, which is the local access road to reach the private properties north of U. S. 50.	Significant.	Construct the alternative access road, provide driveways to the residential structures, and ensure that continuous access is provided during construction.	Less than significant.
Aesthetics	No additional impacts associated with the Ridge Design.	--	No additional mitigation is required.	--
Geology and Soils	Temporary degradation of springs/seepage areas.	Significant.	Continue the eastbound off-ramp retaining wall for approximately 100 additional feet. Temporarily fence the spring/seepage areas during construction.	Less than significant.
Hydrology and Water Quality	No additional impacts associated with the Ridge Design.	--	No additional mitigation is required.	--
Vegetation, Wildlife, and Aquatic Resources	Bypassing and eliminating creek channel habitat for culvert extension and new culverts.	Less than significant.	No mitigation is required.	--
Public Services and Facilities	No interference with the access road or encroachment on the PGandE substation property.	Less than significant.	No mitigation is necessary.	--
Transportation	LOS F during the p.m. peak hour at the EB slip on-ramp of the Silva Valley Parkway/U. S. 50 interchange.	Significant and unavoidable.	The on-ramp would need to be widened to two lanes. However, Caltrans generally considers widening of on-ramps to be infeasible where mainline capacity is not adequate. No mitigation is recommended.	Significant and unavoidable.

Table 3-2. Continued.

Issue Area	Impact	Level of Significance	Mitigation Measure	Level of Significance After Mitigation
Transportation (Continued)	LOS F during the p.m. peak hour at the WB off-ramp of the Silva Valley Parkway/U. S. 50 interchange. This requires an auxiliary lane in advance of the off-ramp.	Significant.	Improve the Silva Valley Parkway/U. S. 50 interchange and widen the WB off-ramp to two lanes. This requires an auxiliary lane in advance of the off-ramp.	Less than significant.
	LOS E and F during the a.m. and p.m. peak hours, respectively, on the eastbound mainline of U. S. 50 between the Silva Valley Parkway and El Dorado Hills Boulevard interchanges due to weaving.	Significant and unavoidable.	An additional through-lane to U. S. 50 would need to be added and the Silva Valley Parkway interchange would need to be shifted 700 feet eastward. Note: It is not possible to shift the interchange 700 feet east due to steep terrain. No mitigation is recommended.	Significant and unavoidable.
	No substantial construction impact.	--	--	--
Air Quality	No additional impacts associated with the Ridge Design.	--	No additional mitigation is required.	--
Noise	No additional impacts associated with the Ridge Design.	--	No additional mitigation is required.	--
Cultural Resources	Disturbance to a portion of CA-Eld-600/H.	Less than significant.	No mitigation is required.	--
	Possible disturbance to the Hall/Richmond Cemetery.	Potentially significant.	Protect the Hall/Richmond Cemetery during construction.	Less than significant.

Table 3-3. Summary of Additional Impacts and Mitigation Measures for the Undercrossing Design

Issue Area	Impact	Level of Significance	Mitigation Measure	Level of Significance After Mitigation
Land Use	Closure of a portion of the Joerger Cut-Off Road, which provides access to the PGandE substation and the Peerman residence.	Significant.	Provide an alternative access to the PGandE substation and Peerman residence.	Less than significant.
	Partial realignment of Tong Road west of the Dolder property.	Potentially significant.	Provide an alternative access road that ties into the existing Tong Road alignment.	Less than significant.
Aesthetics	No additional impacts associated with the Undercrossing Design.	–	No additional mitigation is required.	–
Geology and Soils	Temporary degradation of springs/seepage areas.	Significant and unavoidable.	Temporarily fence the spring/seepage areas during construction.	Significant and unavoidable.
Hydrology and Water Quality	No additional impacts associated with the Undercrossing Design.	–	No additional mitigation is required.	–
Vegetation, Wildlife, and Aquatic Resources	Bypassing and eliminating creek channel habitat, thereby eliminating a small number of willow, interior live oak, and valley oak trees.	Significant.	Replant riparian areas with woody vegetation.	Less than significant.
	Possible elimination of portions of the marsh adjacent to the project area by changes to the moisture regime resulting from construction in upslope portions of the marsh, or possible disturbance during construction by vehicle encroachment, materials and equipment staging, or the placement of fill or other debris.	Potentially significant.	Protect the marshes from construction impacts.	Less than significant.
Public Services and Facilities	Closure of a portion of the Joerger Cut-off Road beyond the entrance of the substation.	Potentially significant.	Maintain access to the PGandE substation as indicated on the design plans.	Less than significant.

Table 3-3. Continued.

Issue Area	Impact	Level of Significance	Mitigation Measure	Level of Significance After Mitigation
Public Services and Facilities (Continued)	Possible removal of some of the perimeter landscaping.	Potentially significant.	Replace landscaping with an equivalent aesthetic barrier.	Less than significant.
	Relocation of the onsite well and portions of the irrigation system to within the Caltrans right-of-way.	Significant.	Obtain an encroachment permit from Caltrans to reach irrigation facilities or provide a replacement water supply and irrigation system outside of the Caltrans right-of-way.	Less than significant.
	Conflict with the depth and location of EID water and sewer lines because of the need to lower the road to provide adequate clearance for traffic under the freeway.	Significant.	Relocate the EID water and sewer lines during construction.	Less than significant.
Transportation	LOS F during the p.m. peak hour at the EB slip on-ramp of the Silva Valley Parkway/U. S. 50 interchange.	Significant and unavoidable.	The EB on-ramp would need to be widened to two lanes. However, Caltrans generally considers widening of on-ramps to be infeasible where mainline capacity is not adequate. No mitigation is recommended.	Significant and unavoidable.
	LOS F during the a.m. and p.m. peak hour at the WB off-ramp of the Silva Valley Parkway/U. S. 50 interchange.	Significant.	Improve the Silva Valley Parkway/U. S. 50 interchange by splitting the off-ramps.	Less than significant.
	LOS E and F during the a.m. and p.m. peak hour, respectively, on the eastbound mainline of U. S. 50 between Silva Valley Parkway and El Dorado Hills Boulevard interchanges.	Significant and unavoidable.	An additional through-lane would need to be added to U. S. 50 and the Silva Valley Parkway interchange would need to be shifted 1,200 feet eastward. Note: It is not possible to shift the interchange 1,200 feet further east due to steep terrain. No mitigation is recommended.	Significant and unavoidable.
	Substantial traffic detours of mainline U. S. 50 traffic for at least 6 months while constructing new bridges on U. S. 50.	Significant and unavoidable.	Prepare and implement a detailed construction detour plan.	Significant and unavoidable.

Table 3-3. Continued.

Issue Area	Impact	Level of Significance	Mitigation Measure	Level of Significance After Mitigation
Transportation (Continued)	Difficulty maintaining traffic on Silva Valley Parkway during construction.	Significant and unavoidable.	No mitigation is recommended.	Significant and unavoidable.
Air Quality	No additional impacts associated with the Undercrossing Design.	–	No additional mitigation is required.	–
Noise	No additional impacts associated with the Undercrossing Design.	–	No additional mitigation is required.	–
Cultural Resources	Adverse effects on the State Historical Landmark monument designating the site of the Mormon Tavern.	Significant.	Relocate the State Historical Landmark monument.	Less than significant.
	Disturbance to the Hall/Richmond Cemetery, which would fall under the structural section of the WB off-ramp.	Significant.	Relocate the Hall/Richmond Cemetery.	Less than significant.

CHAPTER 4. Land Use

SETTING

Regional Land Use

The project site is located in western El Dorado County between the communities of El Dorado Hills and Cameron Park. Development in the region is mostly rural. However, the horse and cattle ranches and vast areas of open space characteristic of the region are rapidly being urbanized owing to the growth pressure from nearby large metropolitan centers in the Sacramento Valley and to the high quality of life available in this Sierra Nevada foothill county.

In the immediate vicinity of the project, land uses are typical of the region, with low density development and agricultural land use. Two houses and grazing land are located north of U. S. 50. The community of Clarksville, a PGandE substation, an isolated house, and agricultural land are located south of U. S. 50 (Figure 4-1).

The following detailed land use discussion is be divided into land uses north of U. S. 50 and land uses south of U. S. 50 because the highway bisects the land that would be affected by the interchange, thus creating a logical separation for the discussion.

Land Uses and Property Ownership North of U. S. 50

Land Uses

Six parcels north of U. S. 50 would be affected by both alternatives of the proposed project. The property owners, parcel size, assessor number, and existing land uses are shown in Table 4-1 and in Figure 4-2. Access to the parcels from U. S. 50 is provided by the El Dorado Hills Boulevard/Latrobe Road exit, northbound White Rock Road through the undercrossing, and eastbound Tong Road.

Miscellaneous Features

Miscellaneous features north of the highway include the Hall/Richmond cemetery and two water wells. The cemetery includes three or more burial sites of early settlers. The graves are not marked and there are no known descendants. Chapter 13, "Cultural Resources," discusses the Hall/Richmond cemetery in detail. One well is located on the Byram's property and another one is located on the Tong's property. The wells provide water year round for livestock and irrigation (Byram and Tong pers. comms.).

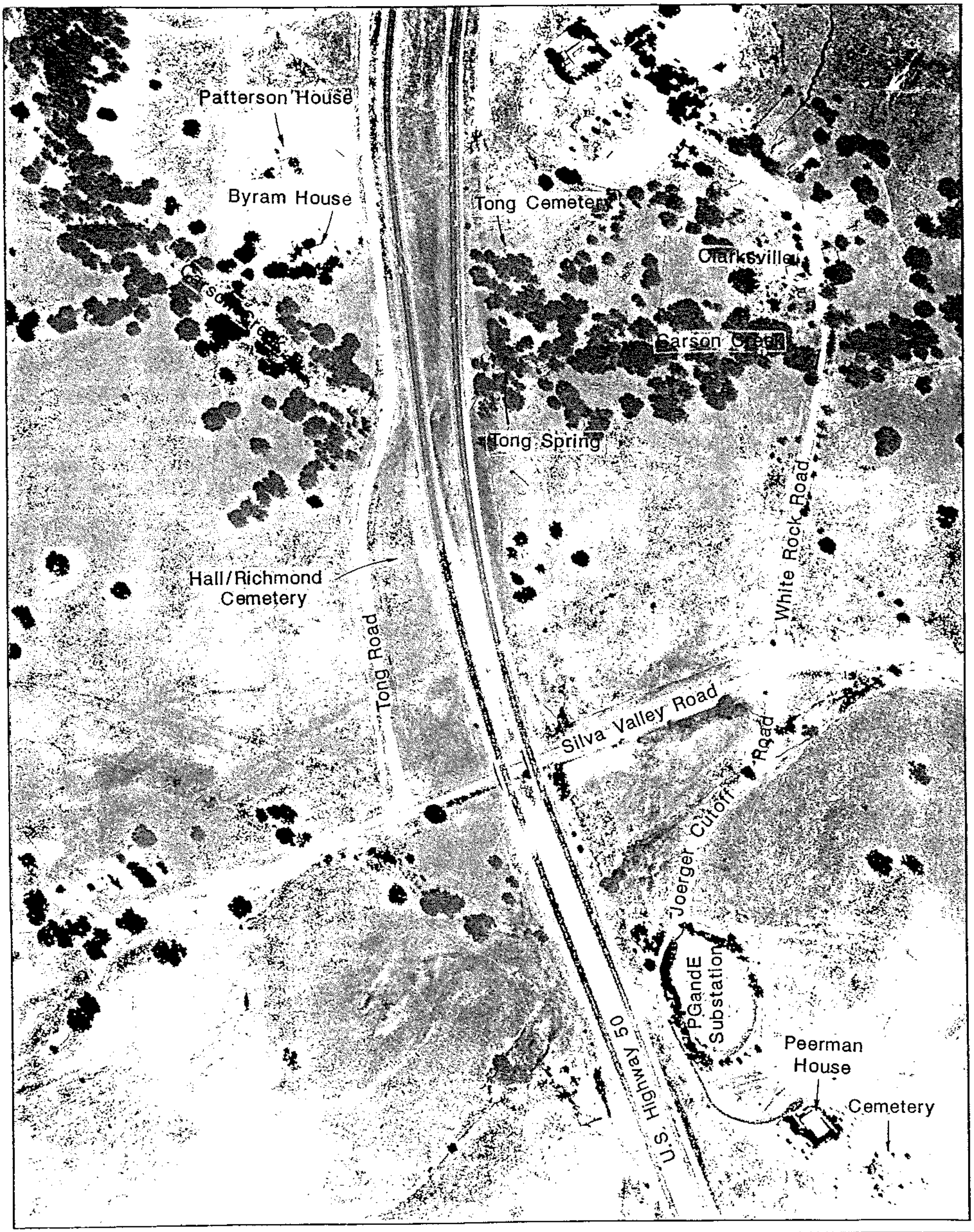
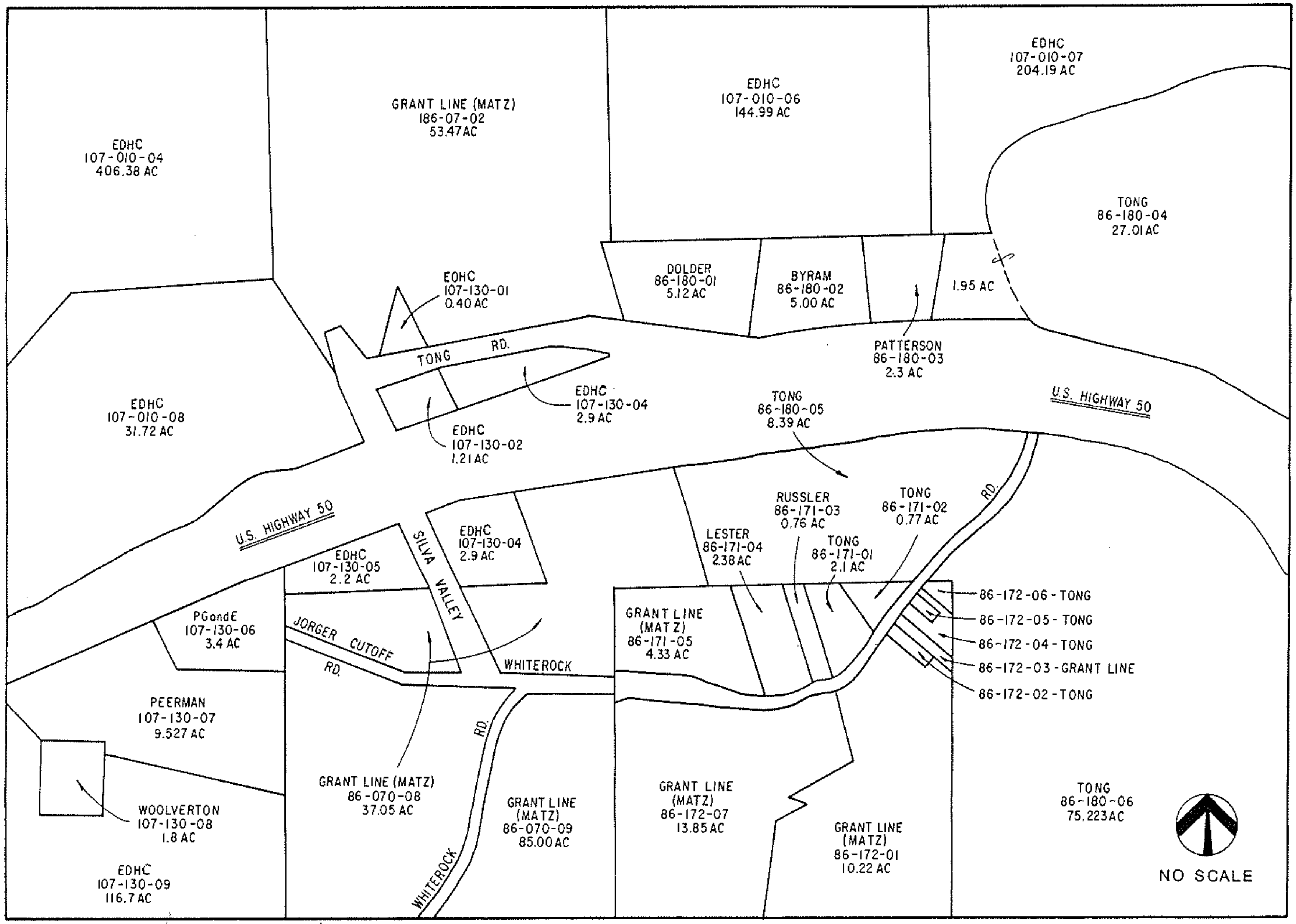


FIGURE 4-1. EXISTING LAND USES IN PROJECT VICINITY

Table 4-1. Land Use and Property Ownership Information

Property Owner	Assessor Parcel #	Size (acres)	Existing Land Use
	NORTH OF U. S. 50		
Byram	86-180-02	5.00	residential (rental) with horse stable
Dolder	86-180-01	5.12	horse grazing
Grant Line (Matz)	86-070-02	53.47	vacant
El Dorado Hills Communities	107-010-04	406.38	vacant
	107-010-06	144.99	vacant
	107-010-07	204.19	vacant
	107-010-08	31.72	vacant
	107-130-01	0.40	vacant
	107-130-02	1.21	vacant
	107-130-04	2.90	vacant
Patterson	86-540-03	2.30	residential
Tong	86-180-04	1.95	vacant
		27.01	cattle grazing
	SOUTH OF U. S. 50		
Grant Line (Matz)	86-070-08	37.05	vacant
	86-070-09	85.00	vacant
	86-171-05	4.33	residential
	86-172-01	10.22	vacant
	86-172-03	0.56	residential
	86-172-07	13.85	vacant
El Dorado Hills Communities	107-130-04	2.94	vacant
	107-130-05	2.20	vacant
	107-130-09	116.70	vacant
Lester	86-172-04	2.38	residential
Peerman	107-130-07	9.53	residential
PGandE	107-130-06	3.40	substation
Russler	86-171-03	0.76	residential
Tong (various family members)	86-171-01	2.10	grazing
	86-171-02	0.77	vacant
	86-172-02	0.16	residential
	86-172-05	0.10	residential
	86-172-06	0.25	residential
	86-180-06	75.22	grazing, corrals, barns
Woolverton	107-130-08	1.80	cemetery



Note: See Table 4-1 for land use description

FIGURE 4-2. PROPERTY OWNERSHIP IN THE PROJECT VICINITY

Source: El Dorado County Assessors Office

Land Use Designations and Zoning Districts

El Dorado Hills Specific Plan. The proposed interchange would be located within the recently approved El Dorado Hills Specific Plan (Specific Plan) area (Figure 4-3). The Specific Plan is a large land use plan that incorporates various uses including residential, commercial, open space, recreation, and public facilities.

Because of the uncertainty of both the final design and the location of the proposed interchange, an area of the Specific Plan was withheld from approval by the county pending determination of the interchange location (Figure 4-4). The purpose in setting aside the area in the vicinity of the interchange was to determine which land uses would be the most compatible with the selected interchange location and design.

Matz Development Proposal. The area set aside from approval included the entire Matz parçel north of the highway that was also part of another general plan and rezoning amendment application. (This project is also known as Douglas Grant Line Associates et al.) The Matz general plan amendment and rezoning application is on file at the community development department in El Dorado County and is for the entire 200 acres owned by Matz. An EIR is being prepared for the project. The project has not been approved but the application is considered active. (The portion [150 acres] south of U. S. 50 is discussed in the next section of this chapter.)

Proposed land uses for the Matz project on 50 acres north of the highway call for an office park, high-density residential, and open space. The extension of the Silva Valley Parkway for the Ridge Design would be the boundary between the office park and residential. The office park area would be located to the southwest and the residential to the northeast.

During the public review process of the Specific Plan, the following text was added to the Specific Plan in reference to the Matz property:

> In conjunction with the County's review of the Clarksville Interchange, the County shall consider an area located adjacent to Highway 50 and Silva Valley Parkway, and exclusive of designated open space areas, to provide opportunities for office and professional uses to service the community. Because this area is located in a visually important area, development of these uses will incorporate substantial landscaping, and buildings shall be limited to a maximum of two stories. In addition, pole signs shall be prohibited and, to the maximum extent feasible, a single monument sign shall be utilized for public identification of the center. Site design, architecture, and lighting shall be harmonious with the Specific Plan concept, and in particular, nearby residential uses located opposite Silva Valley Parkway.

Therefore, El Dorado County will consider office park uses for a portion of the Matz property north of the highway, but the existing land use designations will remain in effect until the county approves of the general plan amendment and rezoning. In addition, the other land use designations for the parcels north of U. S. 50 and within the disapproved

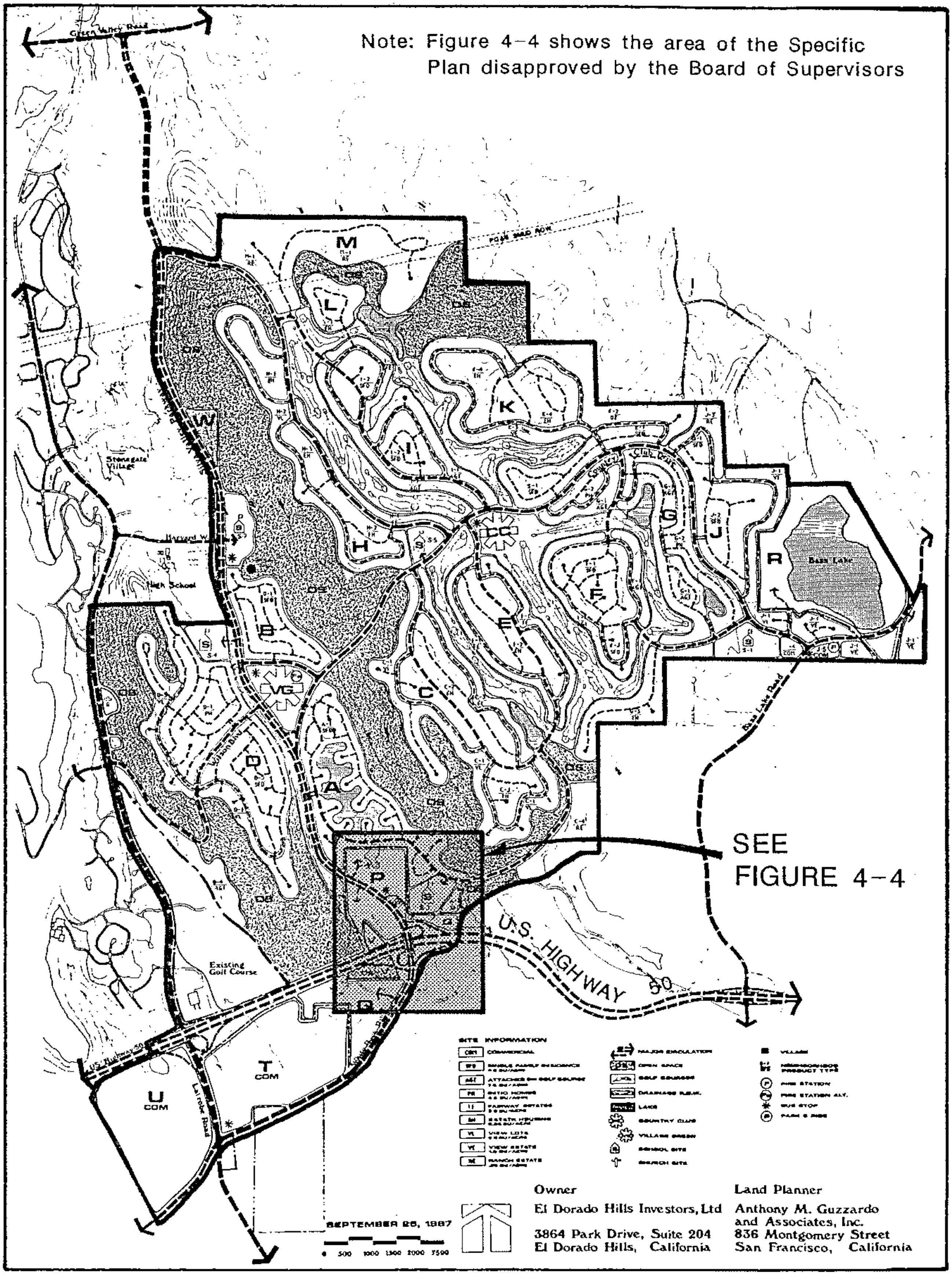


FIGURE 4-3. EL DORADO HILLS SPECIFIC PLAN LAND USE AND CIRCULATION MAP

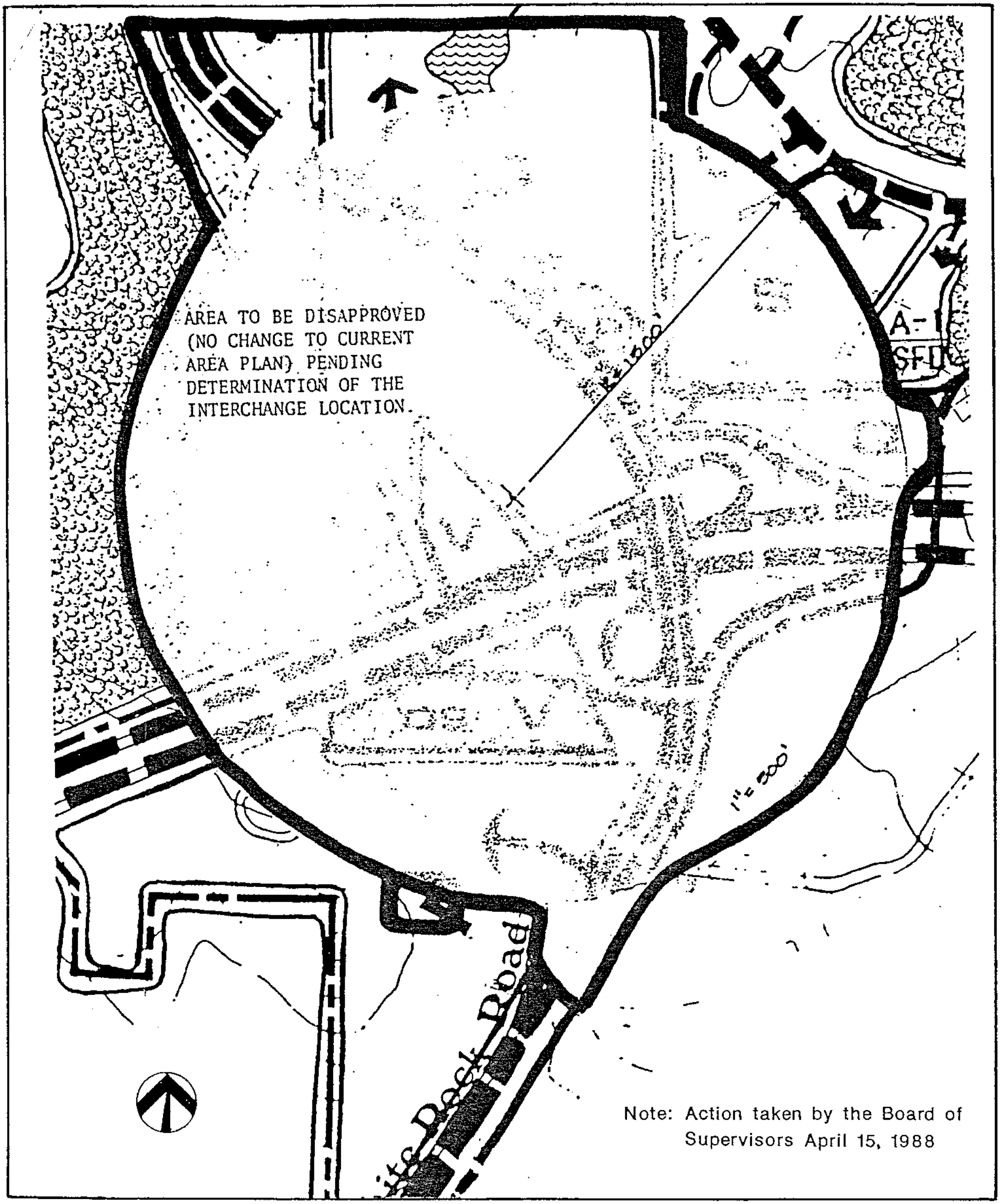


FIGURE 4-4. AREA DISAPPROVED FROM THE EL DORADO HILLS SPECIFIC PLAN

Source: Final Environmental Impact Report El Dorado Hills Specific Plan (Jones & Stokes Associates 1988) area would also remain as currently designated. In the future, El Dorado County may change the current land use designations to become more compatible with the proposed interchange.

Land Use Designations and Zoning Classifications. The current land use designations for the parcels north of U. S. 50 are High Density Residential (F) with a small area of Multifamily Residential (E) located along the proposed future extension of Silva Valley Parkway. The zoning districts for the parcels are Single Family Residential-One Acre Minimum (R1A), Exclusive Agriculture (Williamson Act Contracts, discussed below) (AE), Single Family Residential (R1), and Estate-Residential 10-Acre Minimum (RE-10). The land use designations are shown in Figure 4-5 and the zoning districts are shown on Figure 4-6.

Land Uses and Property Ownership South of U. S. 50

Land Uses

Four parcels south of U. S. 50 would be directly affected by both alternatives of the proposed project. Table 4-1 presents the existing land uses for each of these parcels.

Miscellaneous Features

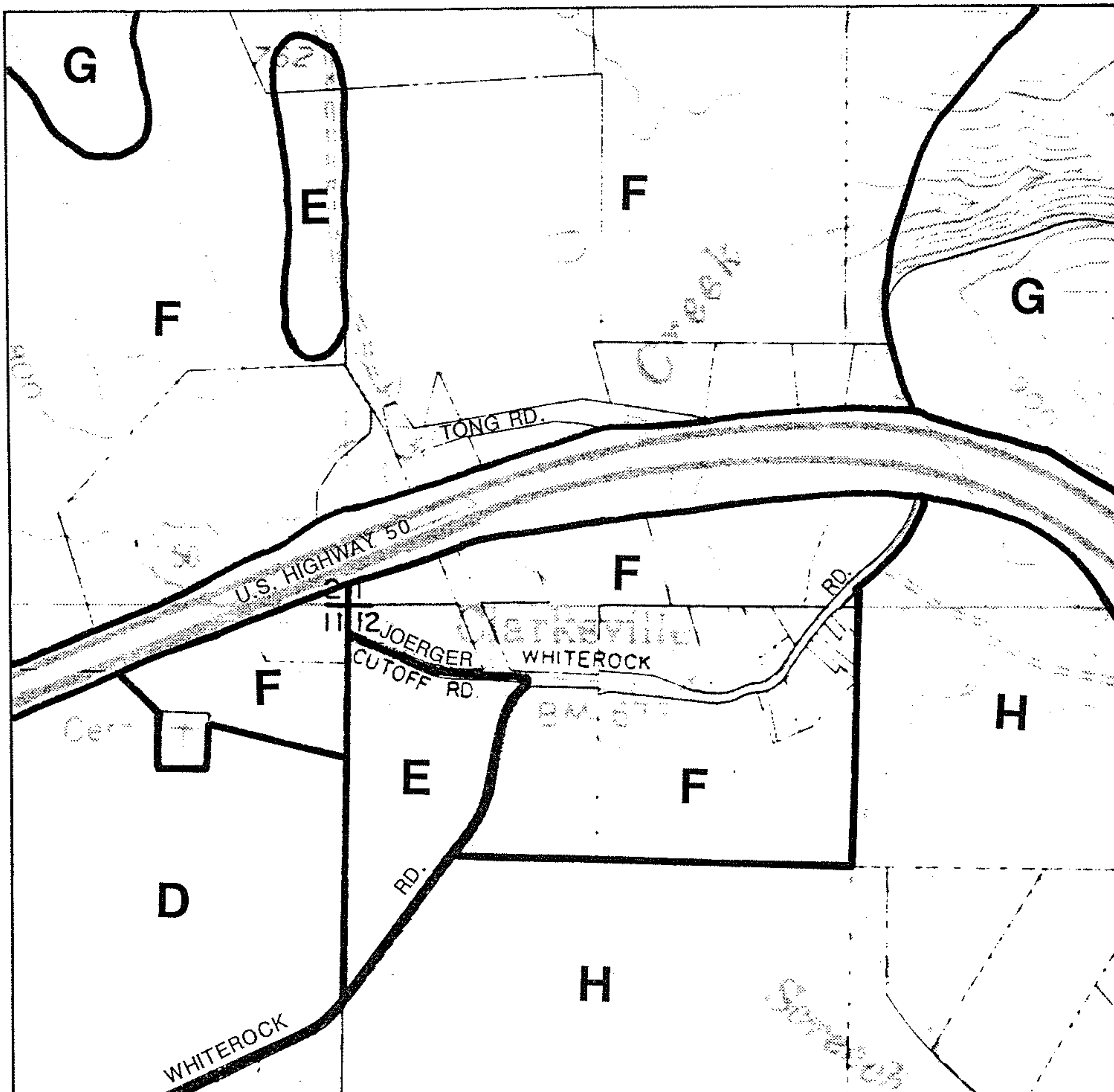
A spring is located in the Carson Creek stream channel on the Tong property south of the highway. The spring provides a year-round supply of water which they use for their livestock (Tong pers. comm.). The hydrogeological origin of the spring and possible project impacts are discussed in Chapter 7, "Hydrology and Water Quality."

The Tong family cemetery is located just south of the highway. This cemetery has been used for over 100 years and is highly revered by the family (Tong pers. comm.). The cultural resource value of the cemetery and possible project impacts are discussed in detail in Chapter 13, "Cultural Resources."

PGandE operates the Clarksville Substation, which is located south of the highway and west of White Rock Road. Access is provided by the Joerger Cutoff Road from White Rock Road. The substation converts 115 kilovolt (kV) voltage from two transmission lines into four 12 kV distribution circuits using two power transformers. A well located in the northeast corner of the property is used for irrigation of the landscaping. The issue of project impacts on the operation, maintenance, and future expansion plans of the substation and related facilities is discussed in detail in Chapter 9, "Public Services and Facilities."

Land Use Designations and Zoning Districts

El Dorado Hills Specific Plan. The land use designations for the property south of U. S. 50 that would be affected by the interchange were also included in the original El Dorado Hills Specific Plan. The area that was set aside (Figure 4-4) included some of the



EL DORADO HILLS/SALMON FALLS AREA PLAN DESIGNATIONS

- D COMMERCIAL
- E MULTI-FAMILY RESIDENTIAL
  - 12 du maximum per acre
  - 20 du maximum per acre with PD
- F HIGH DENSITY RESIDENTIAL
  - 5 du per acre
- G MEDIUM DENSITY RESIDENTIAL
  - 1 du/1.0–4.9 acres
- H LOW DENSITY RESIDENTIAL
  - 1 du/5–9.9 acres

NO SCALE

FIGURE 4-5. AREA PLAN DESIGNATIONS

Source: El Dorado Hills/Salmon Falls Area Plan

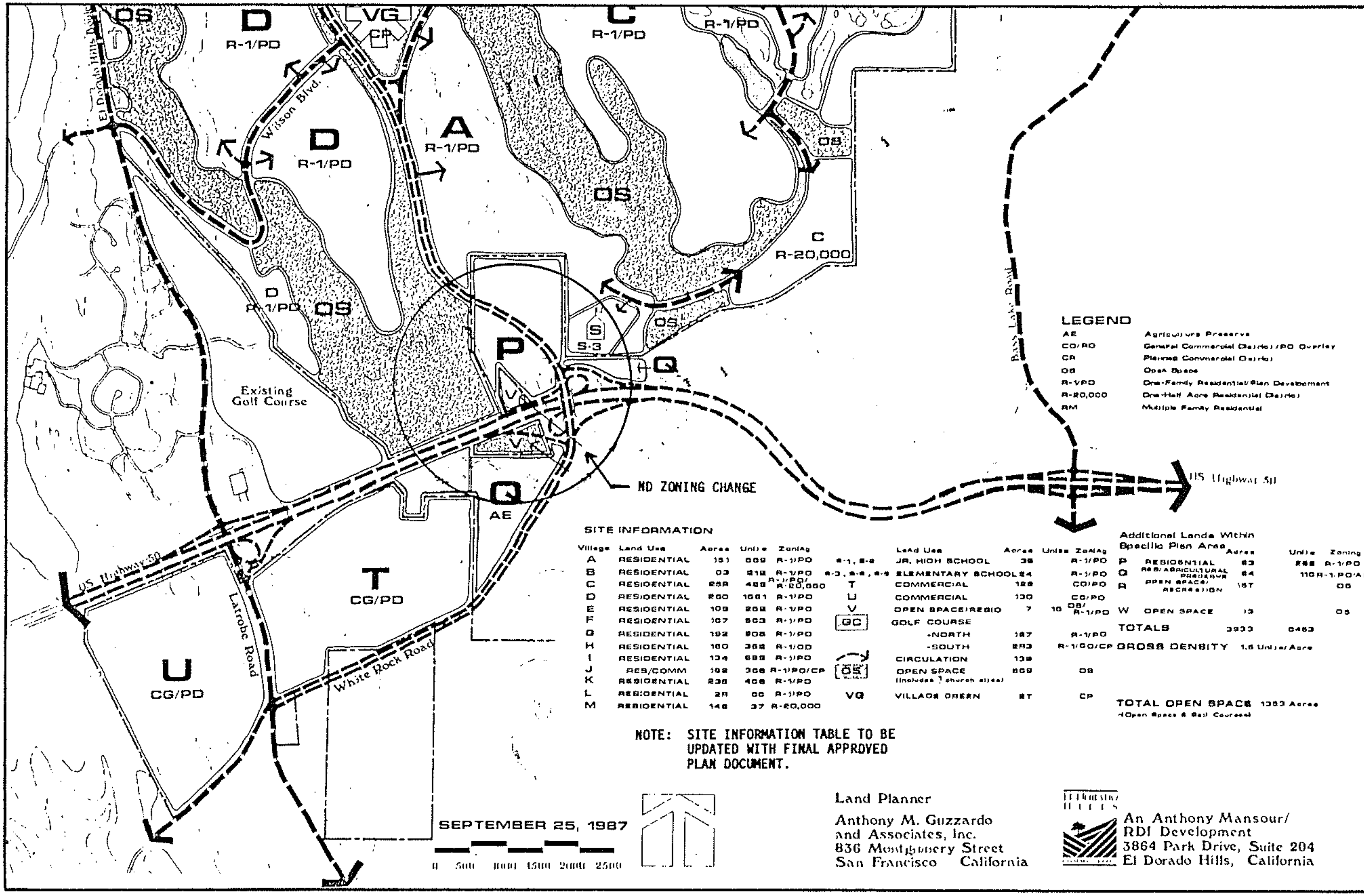


FIGURE 4-6. ZONING DISTRICTS

Matz, Tong, and El Dorado Hills Communities (EDHC) properties, and the existing land use designations for these parcels will remain in effect until El Dorado County changes the land use designations for the Specific Plan in this area.

Matz Development Proposal. As mentioned previously, a general plan amendment and rezoning application was filed with the county for 200 acres in the vicinity of the interchange and extending both north and south of the highway. The area to the south of the highway covers approximately 150 acres, a small portion of which was included in the part of the Specific Plan that was set aside pending environmental review of the interchange. The development proposal for the Matz property south of the highway includes commercial (highway commercial, office park, and regional shopping), park and recreation (open space and Clarksville Historical Park), and multifamily residential.

Land Use Designations and Zoning Classifications. The land use designations for the property south of the highway are Commercial (D), Multifamily Residential (E), High-Density Residential (F), and Low-Density Residential (H). The zoning districts for these parcels are Exclusive Agriculture (Williamson Act lands, discussed below) (AE) and Estate Residential 10-acre minimum (RE-10). The land use designations are shown in Figure 4-5 and the zoning districts are shown in Figure 4-6.

Agricultural Land Uses and the Williamson Act

The AE zoning district delineates areas of land subject to the California Land Conservation Act of 1965, commonly referred to as the Williamson Act. Williamson Act lands in the vicinity of the project are zoned Exclusive Agriculture (AE) and are located northeast of the project area and south of the highway (Figure 4-6). Some of the Williamson Act contracts (explained below) have a nonrenewal status (Holcomb pers. comm.).

Overview of the Williamson Act

In 1965, the State Legislature passed the Williamson Act because agricultural property tax burdens resulting from rapid land value appreciation became so great (Oliva 1988). The Williamson Act allows local governments to assess agricultural land owners based on the land's value for production, rather than the "highest and best use" value which had previously been the rule. The Legislature intended for the Williamson Act to bring some tax relief to farmers and thereby discourage the unnecessary and premature conversion of agricultural land to urban uses.

The Williamson Act works by allowing owners of agricultural or open space land to enter into contracts with local governments. The landowner agrees to restrict use of the property to agriculture, open space, or related uses during the term of the contract. The initial term of the contracts is 10 years and contracts are automatically renewed each year. The contract allows landowners to receive a tax break because the local government agrees to establish an agricultural preserve and base property tax assessments on the restricted use of the land.

The people of California support the program through "subventions," or direct payments to the participating cities and counties based on the types and amount of land under contract. Subventions are paid to local governments from the state's general fund. In 1988, El Dorado County received approximately $17,000 from the state. The state pays $1 per acre of prime agricultural land and $0.40 per acre of other lands under Williamson Act contracts.

Termination of a contract is allowed by either filing a notice of nonrenewal or canceling a contract. The process of contract cancellation allows a landowner to terminate a contract, subject to a public hearing. There must be specific findings by, and the concurrence of, local officials. Cancellation also carries a substantial penalty, equal to 12.5 percent of the property's fair market value. Recent court cases, however, determined that contract cancellation was to be used only under extraordinary circumstances, and that the process of nonrenewal was the preferred method for terminating a contract. Following notice of nonrenewal, either by the property owner or the local government, taxes are gradually returned to the level charged on equivalent, nonrestricted property, although land uses remain restricted until the contract expires.

Specific government codes regulate the type and location of public improvements on Williamson Act lands. These government codes are listed below.

> **Government Code Section 51290.** It is the policy of the state to avoid, whenever practicable, the location of any state or local public improvements and any improvements of public facilities, and the acquisition of land therefore, in agricultural preserves.
>
> **Government Code Section 51292.** No public agency or person shall acquire prime agricultural land covered under a contract pursuant to this chapter for any public improvement if there is other land within or outside the preserve on which it is reasonably feasible to locate the public improvement.

Thus, it is clear that the intent of the Williamson Act with respect to local government projects is to discourage the placement of public projects within agricultural preserves. However, the Government Code Section 51293 states that Section 51292 shall <u>not</u> apply to:

> the location or construction of improvements where the board or council administering the agricultural preserve approves or agrees to the location thereof.

Relationship of the Williamson Act to the Project

In conclusion, El Dorado County can select a location of the interchange on Williamson Act lands because it is the governmental agency administering the agricultural preserves.

IMPACTS

Impacts Common to Both Alternatives

Construction of either the Ridge Design or the Undercrossing Design would result in direct and indirect land use impacts. Direct land use impacts would result where the proposed interchange structure causes a change to an existing land use. Indirect land use impacts would result from changes to viewsheds, air quality, and noise levels. These indirect impacts are discussed in separate chapters (Chapter 5, "Aesthetics," Chapter 11, "Air Quality," and Chapter 12, "Noise"). Direct impacts are discussed in this chapter.

Direct Changes to Land Uses

Implementation of either design would result in:

- loss of grazing land (approximately 45 acres for the Ridge Design and 35 acres for the Undercrossing Design). This impact is considered less than significant because the loss represents such a low percentage (less than 0.01 percent) of grazing land available in the county. No mitigation is required.

- acquisition of private property (Table 4-2). This impact is considered significant. To reduce this impact to a less-than-significant level, provide "just compensation" to the property owners.

- land use conflicts between the interchange and existing low-density residential development. This impact is considered less than significant because the interchange would not be constructed unless the area urbanizes. No mitigation is required.

- possible land use conflicts with future planned land uses, although the timing of the interchange construction is estimated to be approximately 10 years from now, when the approved El Dorado Hills Specific Plan area would be at least partially developed. Therefore, the setting for the interchange would be more urban than present reducing land use conflicts. There is uncertainty, however, over planned land uses immediately adjacent to the interchange (see "Setting" discussion). Therefore, land use conflicts may occur. This impact is considered potentially significant. To reduce this impact to a less-than-significant level, landscape the interchange area, and implement noise and aesthetic mitigation measures presented in this EIR and determine compatible land use designations for this area.

- removal of agricultural lands currently in Williamson Act contracts. This impact is considered less than significant. No mitigation is required.

Table 4-2. Acreage Requirements for Each Design

Property Owner	Ridge Design	Undercrossing Design
Dolder	3.4	0.3
Byram	1.0	0.3
Patterson	0	0
Matz - north of U. S. 50	11.0	9.0
Matz - south of U. S. 50	16.0	11.0
Tong	1.3	0.07
EDHC - north of U. S. 50	8.8	13.0
EDHC - south of U. S. 50	5.0	5.1
PGandE	0.05	0.4
Peerman	0.7	1.1
Total	38.45	40.17

Source: Jones & Stokes Associates and Bissell & Karn, Inc. 1989.

Additional Impacts of the Ridge Design

Implementation of the Ridge Design would result in closure of the Tong Road, which is the local access road to reach the private properties north of U. S. 50. This impact is considered significant. To reduce this impact to a less-than-significant level, construct the alternate access road, provide driveways to the residential structures, and ensure that continuous access is provided during construction.

Additional Impacts of the Undercrossing Design

Implementation of the Undercrossing Design would result in:

- closure of a portion of the Joerger Cut-Off Road, which provides access to the PGandE substation and the Peerman residence. This impact is considered significant. To reduce to a less-than-significant level, provide an alternative access to the PGandE substation and Peerman residence.

- partial realignment of Tong Road west of the Dolder property. This impact is considered potentially significant. To reduce this impact to a less-than-significant level, provide an alternate access road that ties into the existing Tong Road alignment.

MITIGATION MEASURES

Mitigation Measures for Both Alternatives

Provide "Just Compensation" to the Property Owners

El Dorado County would be responsible for providing "just compensation" to acquire the necessary property for either design, including right-of-way. The amount of "just compensation" would have to be determined on a parcel-by-parcel basis based on appraised land values.

Landscape the Interchange Area

The design drawings for the interchange will include the basic landscaping required by Caltrans and additional landscaping to beautify the interchange.

Implement Noise and Aesthetic Mitigation Measures Presented in This EIR and Determine Compatible Land Use Designations for this Area

El Dorado County should select land use designations compatible with the proposed interchange for the area disapproved from the El Dorado Hills Specific Plan. The noise and aesthetic mitigation measures presented in this EIR should be implemented and should include selection of land use designations. If the land use designations differ from those analyzed in the EIR for the El Dorado Hills Specific Plan, then subsequent environmental review would be needed to effect a general plan amendment and rezoning.

Additional Mitigation Measures for the Ridge Design

Construct the Alternate Access Road, Provide Driveways to the Residential Structures, and Ensure that Continuous Access is Provided During Construction

El Dorado County should develop the alternate road shown on preliminary design drawings (8/88) of the ridge design to reach the properties along Tong Road. The road should be developed at no expense to the private property owners, maintained by the county, and constructed so that access to the homes is uninterrupted during construction. Individual driveways and any other necessary circulation improvement should be developed for each residence. Construction drawings of the driveways should be prepared in conjunction with the property owners.

Additional Mitigation Measures for the Undercrossing Design

Provide an Alternate Access to the PGandE Substation and the Peerman Residence

El Dorado County should provide an alternative access to the PGandE Substation for that portion of the Joerger Road Cut-Off Road that would be closed for the project. An alternative access road would also be required to reach the Peerman residence. The design drawings for this road should be developed in cooperation with the affected parties to ensure that the road meets their needs.

The county should ensure that access to these residences and the PGandE substation is maintained during project construction.

Provide an Alternate Access Road That Ties into the Existing Tong Road Alignment

El Dorado County should provide an alternate access road for that portion of the Tong Road that would be closed for the Undercrossing Design. This road should tie into the Tong Road west of the Dolder property so that the existing access to the houses would remain the same (i.e., from the south).

CHAPTER 5. Aesthetics

APPROACH AND METHODOLOGY

Approach

What constitutes an aesthetically pleasing project or not is a subjective judgment. Therefore, in analyzing the aesthetic impacts of the interchange designs, the authors are attempting to describe the before- and after-project landscape without using subjective terminology.

In determining significance, its aesthetic impact is considered important if the project changes the community's visual character substantially. If the project blends harmoniously with its environs, or if the project is screened from most views, the visual impact is considered less than significant.

The degree of the visual impact of any project also depends in part on the kind of land use affected. For example, residential and recreational land uses are more likely to be adversely affected if their viewsheds contain an interchange. Conversely, an interchange would not necessarily be out of character in an industrial, commercial, or office land use setting.

Methodology

This visual analysis documents the aesthetic setting of the project area with a series of photographs. The photographs were taken from adjacent areas north and south of the highway and from above the project area to the east. These viewpoints were selected to capture both public and private viewsheds. Then, on copies of these same photographs, a computer rendering of the interchange (each alternative is depicted) was overlain. The photographs were modified in minor detail to reflect areas of slope change, vegetation removal, and transmission line rerouting. The final product is a depiction of the postproject landscape.

SETTING

Landscape

The existing landscape setting for the interchange consists of rolling foothills with a predominance of oak and grassland vegetation. At a distance from the project site, U. S. 50 is the principal urban feature. As one travels on the highway past the project site, however, the travelers' view is drawn to the rural setting adjacent to the highway.

However, because the interchange would be constructed approximately 5-10 years from now, the setting for the interchange is likely to be more urbanized than at present. The aesthetics of the Specific Plan are described in the El Dorado Hills Specific Plan EIR (Jones & Stokes Associates 1987). Where applicable, the impacts of the interchange are placed in the context of the future setting of the Specific Plan development.

Light and Glare

Existing sources of light and glare near the interchange include headlamps from cars on U. S. 50 and local access roads, and residential structures north and south of the highway.

IMPACTS

Assumptions about Landscaping

As described in Chapter 2, "Project Description," Caltrans' obligation would encompass only functional planting of the interchange area. Functional planting means:

> vegetation in addition to erosion control, such as vines, shrubs, and trees and related irrigation systems, for traffic safety improvements such light glare reduction, fire hazard reduction, and traffic noise attenuation or other purposes.

Functional planting can be augmented by others, but such efforts must be formally acknowledged by obtaining an encroachment permit, by executing a state-administered contract funded partially or totally by others, or by leasing the area to be planted to the abutting property owner. In evaluating impacts of the ridge and undercrossing designs, it is assumed that only functional planting would be implemented.

Impacts Common to Both Alternatives

Existing Setting

An aerial view of the project location is shown in Figure 5-1. The existing and future views of the Ridge Design are depicted in Figures 5-2 through 5-9. The view from photo location #1 depicts the rural character of the project site without the Ridge Design (Figure 5-2) and with the Ridge Design (Figure 5-3).

The view from photo location #2 demonstrates views from residences north of U. S. 50 without the Ridge Design (Figure 5-4) and with the Ridge Design (Figure 5-5).

The view from photo location #3 was taken from White Rock Road in Clarksville looking northwest toward the project site (Figure 5-6). Figure 5-7 indicates that the interchange would not be visible from White Rock Road in Clarksville. The trees along Carson Creek and the topographic rise would shield the view. The retaining wall along the roadside, designed to prevent impacts to the Tong Cemetery, would be visible.

The view from photo location #4 incorporates the town of Clarksville and the scattered houses of El Dorado Hills without the Ridge Design (Figure 5-8) and with the Ridge Design (Figure 5-9).

The existing and future views of the Undercrossing Design are depicted in Figures 5-10 through 5-17.

The view from photo location #1 depicts the rural character of the project site without the Undercrossing Design (Figure 5-10) and with the Undercrossing Design (Figure 5-11).

The view from photo location #2 illustrates the views from residences north of U. S. 50 without the Undercrossing Design (Figure 5-12) and with the Undercrossing Design (Figure 5-13).

The photo taken from photo location #3 is from White Rock Road in Clarksville looking northwest toward the project site (Figure 5-14). Figure 5-15 demonstrates that the interchange would not be visible from White Rock Road in Clarksville. The topographic rise would shield the view.

Photo location #4 incorporates the town of Clarksville and the community of El Dorado Hills without the Undercrossing Design (Figure 5-16) and with the Undercrossing Design (Figure 5-17).

Implementation of either design would result in a visual disparity with the existing rural setting caused by the alteration of viewsheds and increased ambient night lighting. This impact is considered less than significant because the interchange would not be constructed unless the area urbanizes. No mitigation is required.

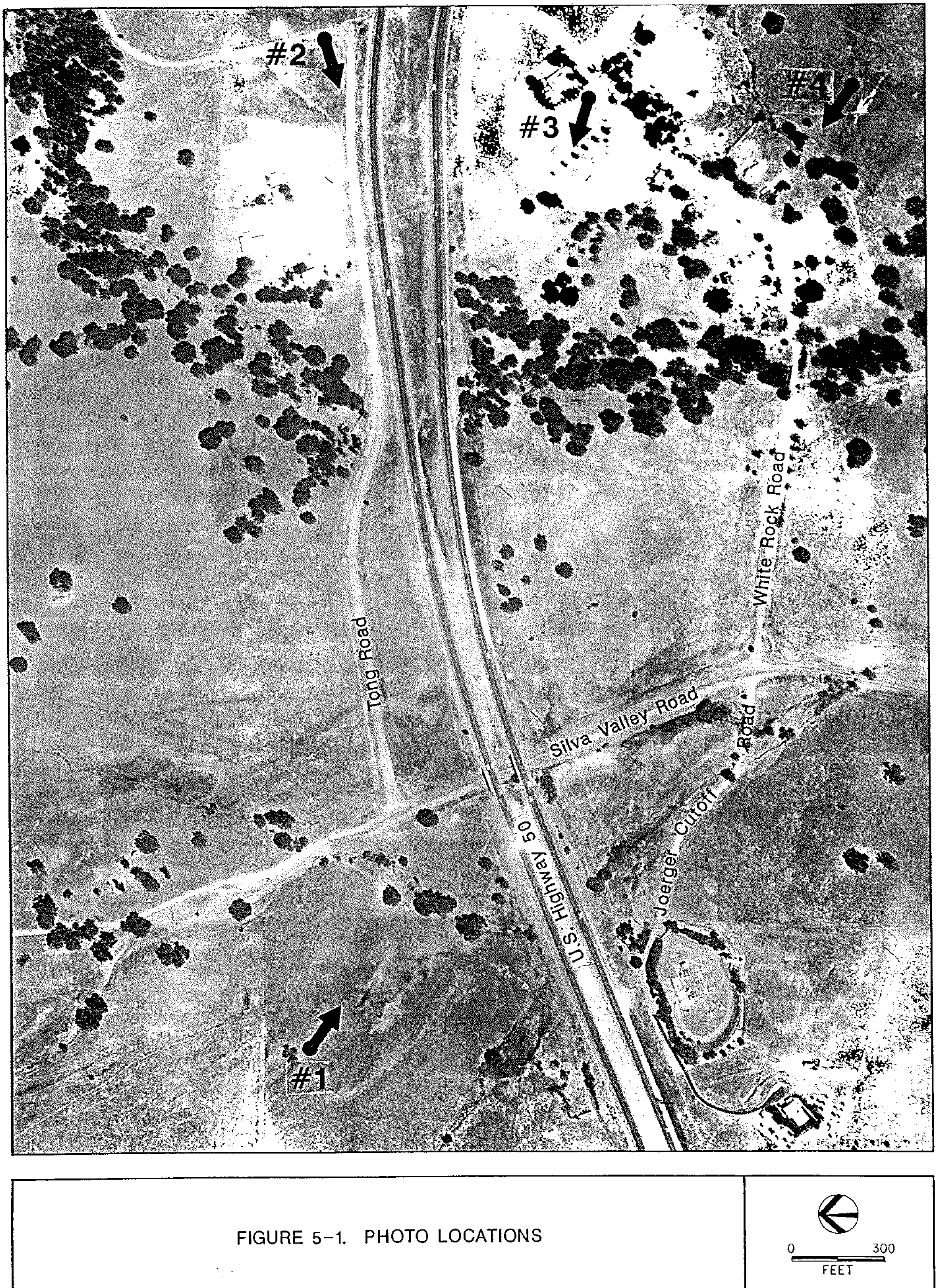
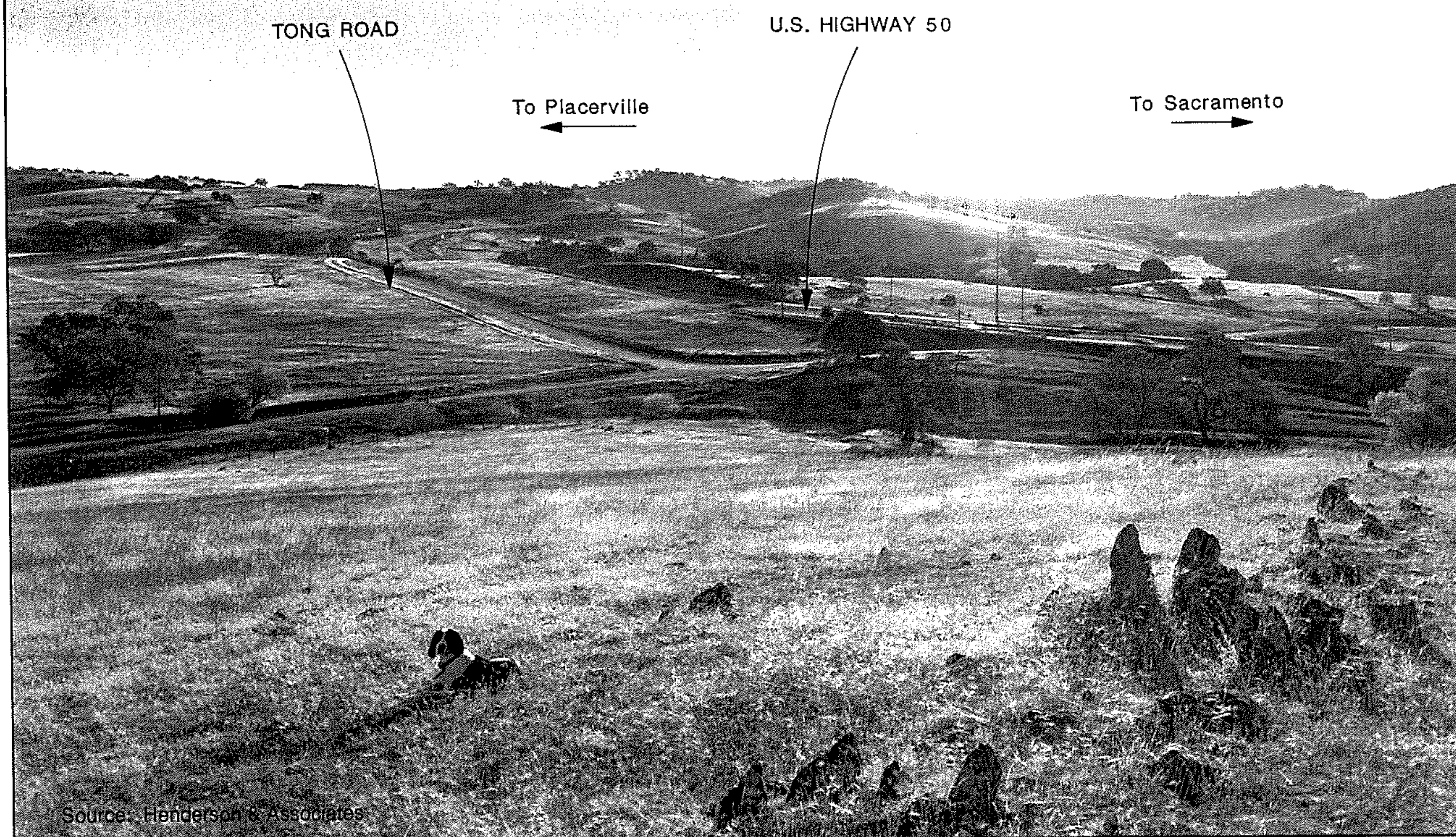


FIGURE 5-1. PHOTO LOCATIONS

FIGURE 5-2. VIEW FROM NORTHWEST OF THE PROJECT SITE (PHOTO LOCATION #1)



Source: Henderson & Associates

FIGURE 5-3. VIEW OF RIDGE DESIGN FROM PHOTO LOCATION #1

Source: Henderson & Associates

FIGURE 5-4. VIEW OF THE PROJECT SITE FROM RESIDENTIAL AREA NORTH OF U. S. HIGHWAY 50 (PHOTO LOCATION #2)

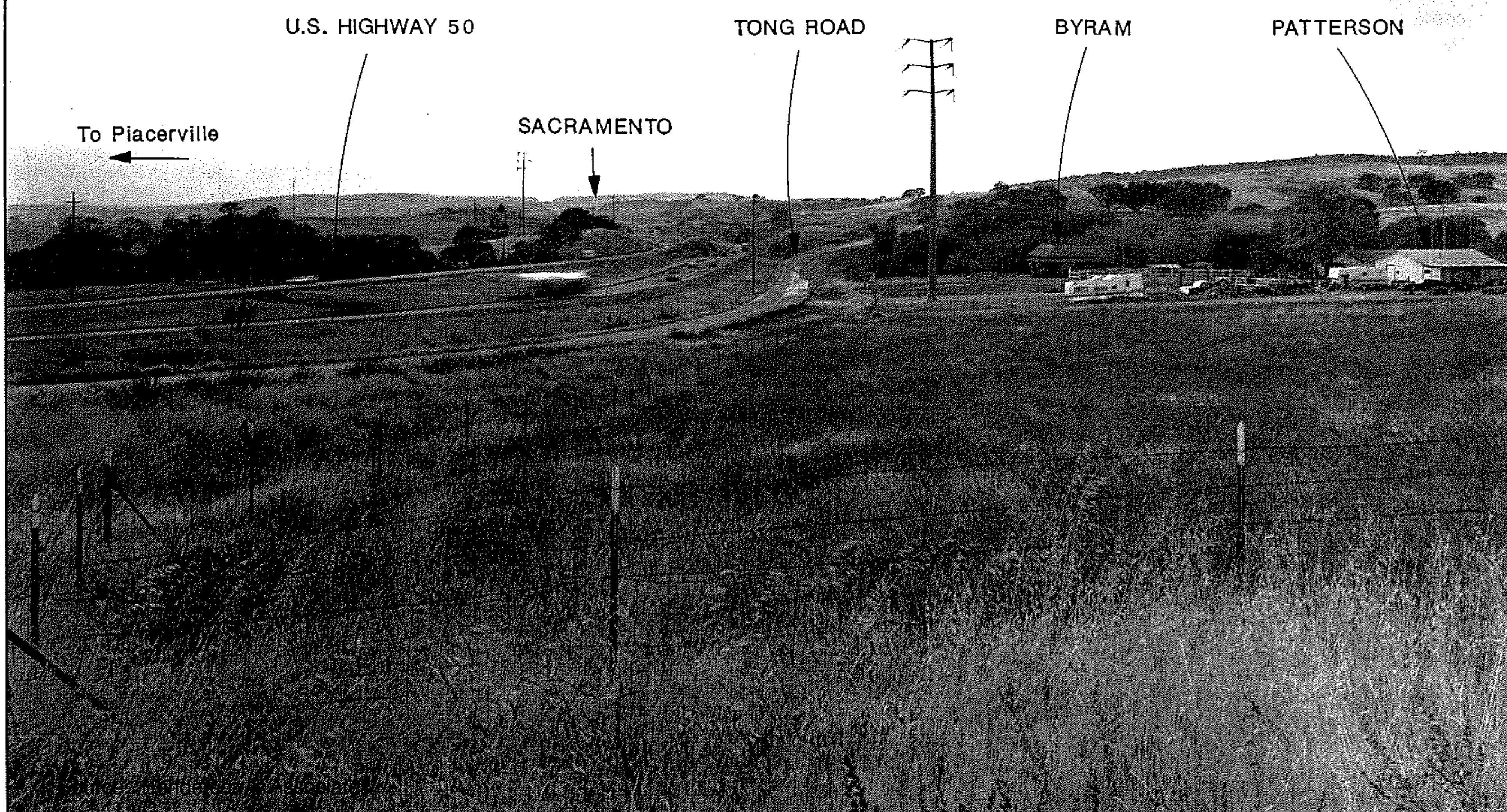


FIGURE 5-5. VIEW OF RIDGE DESIGN FROM PHOTO LOCATION #2

FIGURE 5-6. VIEW OF THE PROJECT SITE FROM WHITE ROCK ROAD IN CLARKSVILLE (PHOTO LOCATION #3)

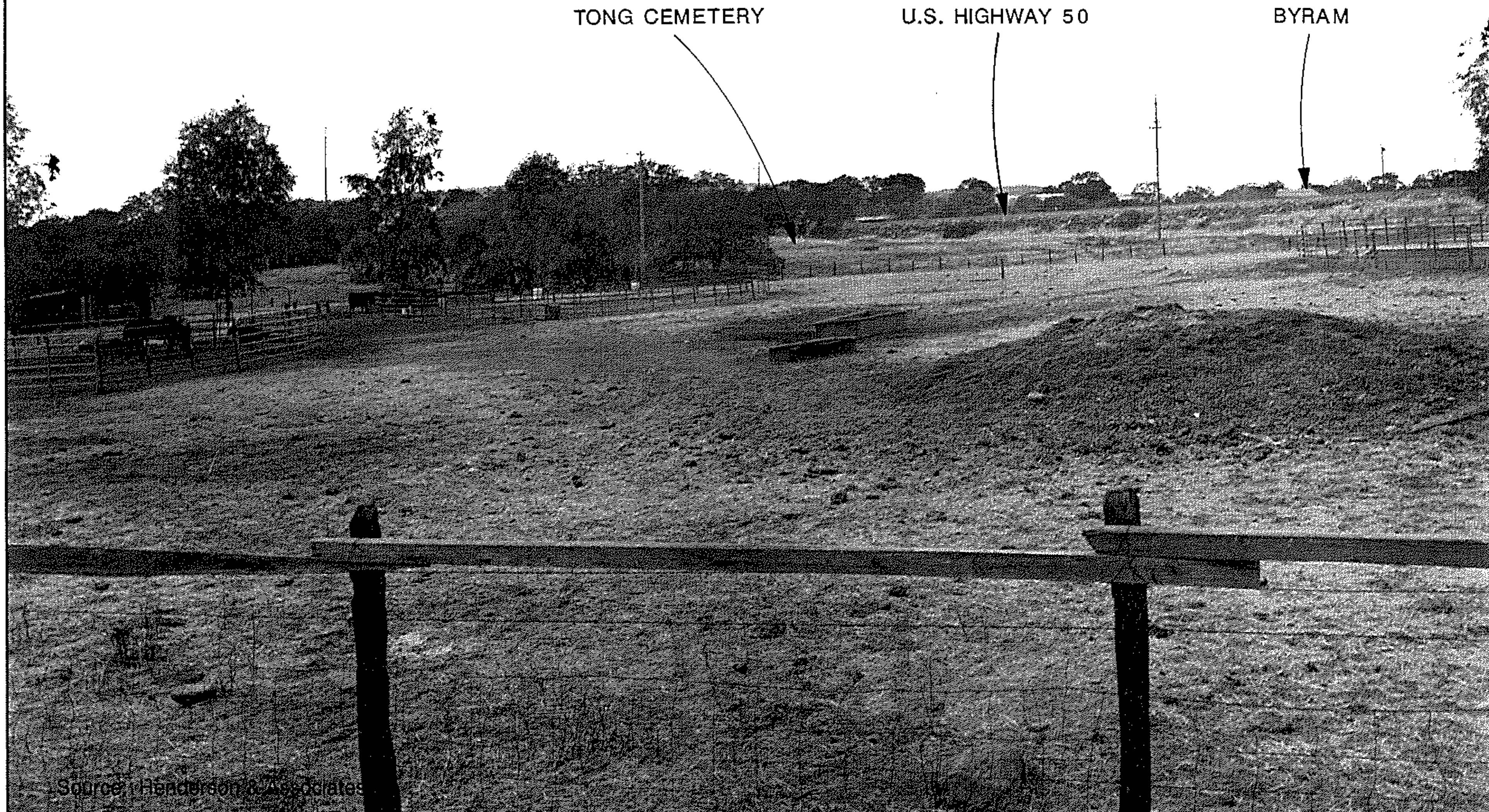
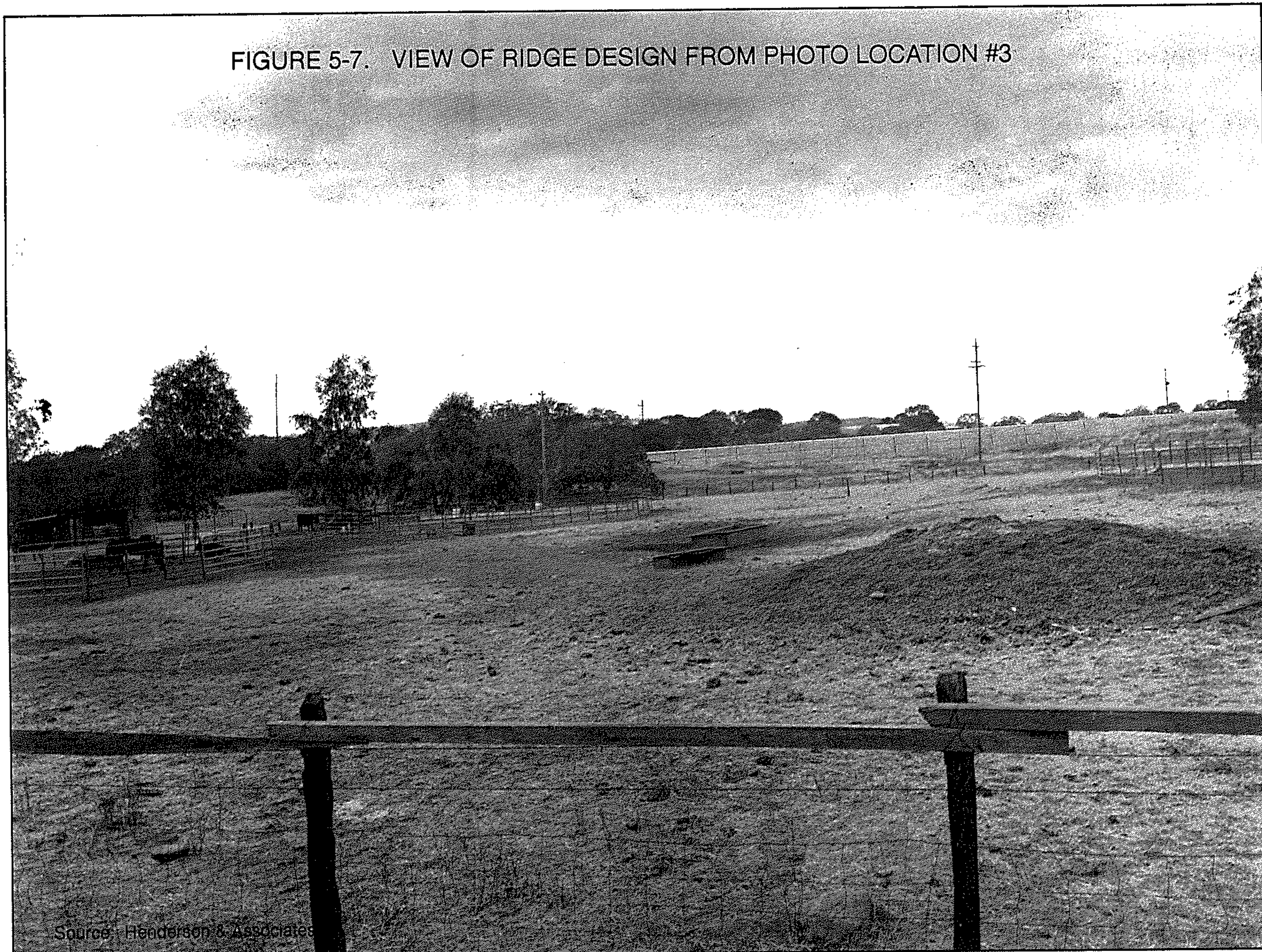


FIGURE 5-7. VIEW OF RIDGE DESIGN FROM PHOTO LOCATION #3



Source: Henderson & Associates

FIGURE 5-8. VIEW FROM SOUTHEAST OF THE PROJECT SITE (PHOTO LOCATION #4)

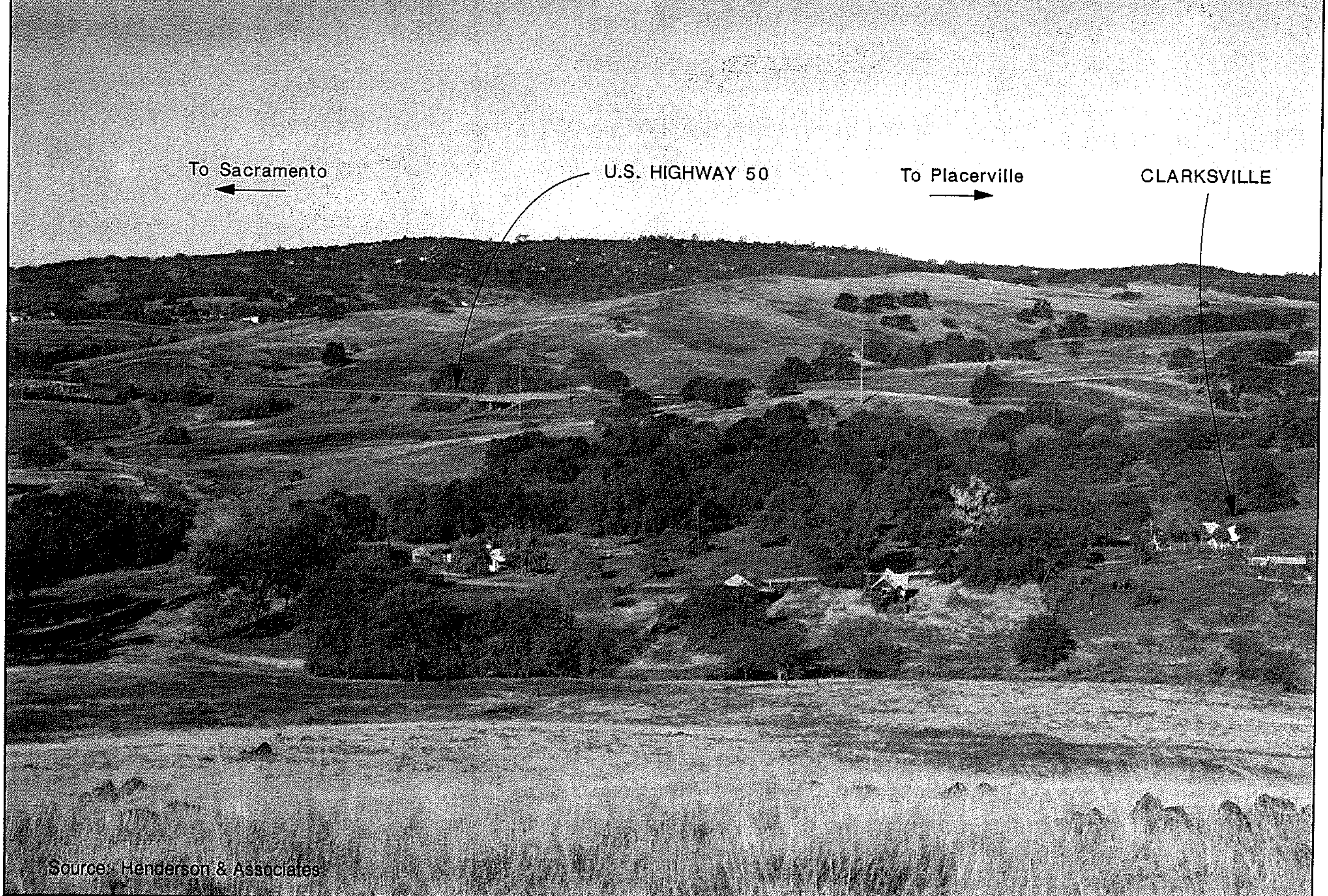
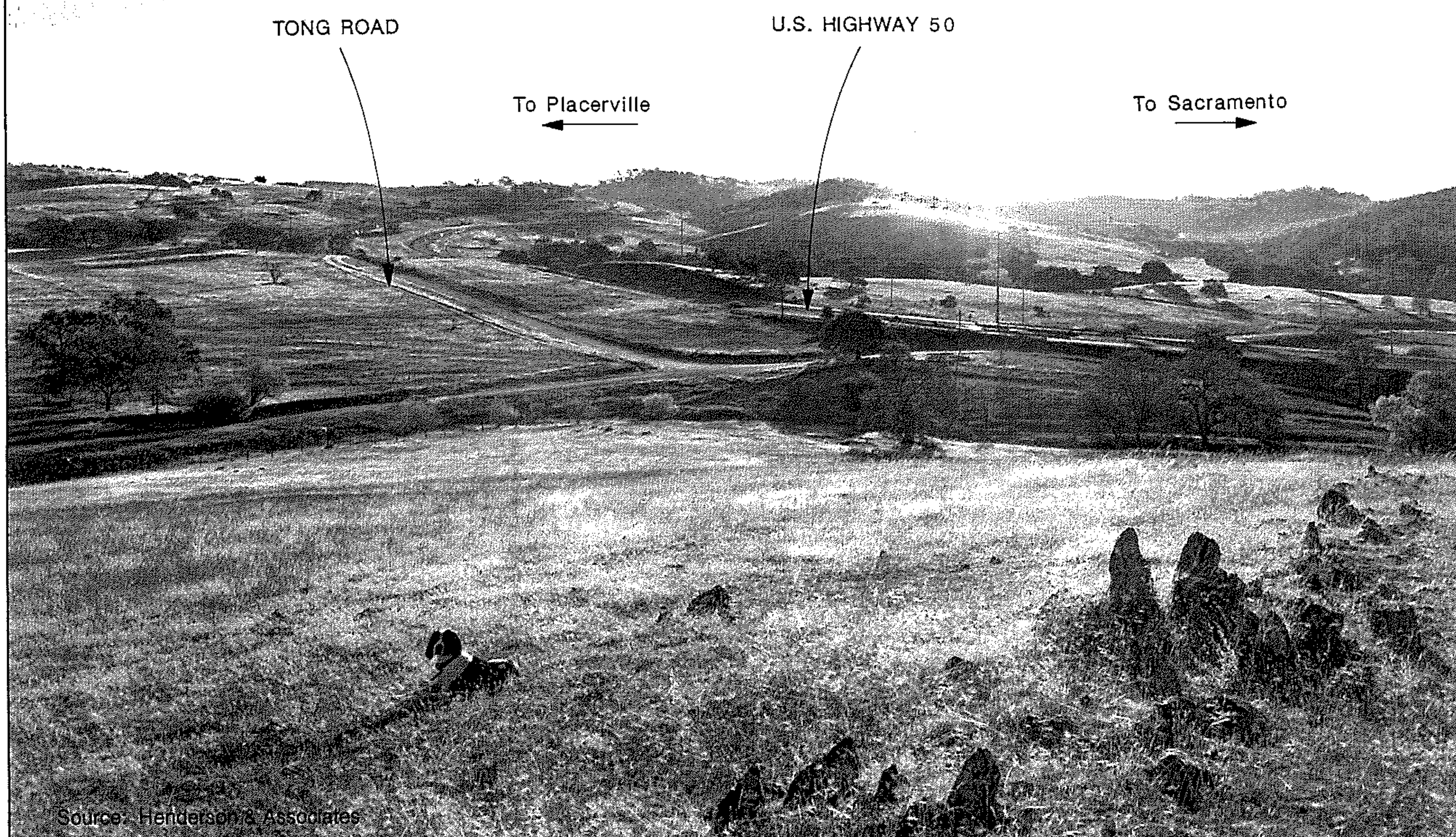


FIGURE 5-9. VIEW OF RIDGE DESIGN FROM PHOTO LOCATION #4

Source: Henderson & Associates

FIGURE 5-10. VIEW FROM NORTHWEST OF THE PROJECT SITE (PHOTO LOCATION #1)

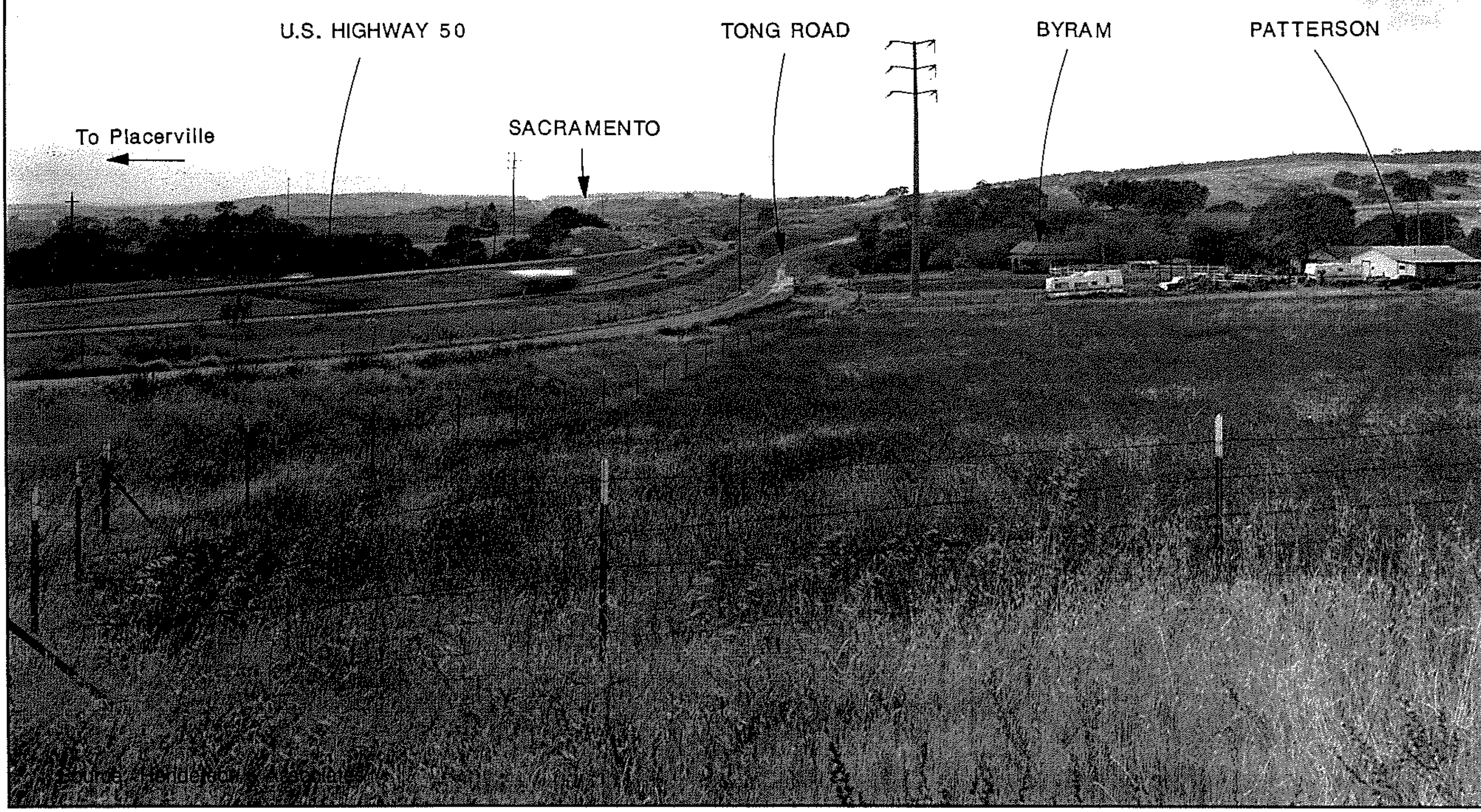


Source: Henderson & Associates

FIGURE 5-11. VIEW OF UNDERCROSSING DESIGN FROM PHOTO LOCATION #1

Source: Henderson & Associates

FIGURE 5-12. VIEW OF THE PROJECT SITE FROM RESIDENTIAL AREA NORTH OF U. S. HIGHWAY 50 (PHOTO LOCATION #2)



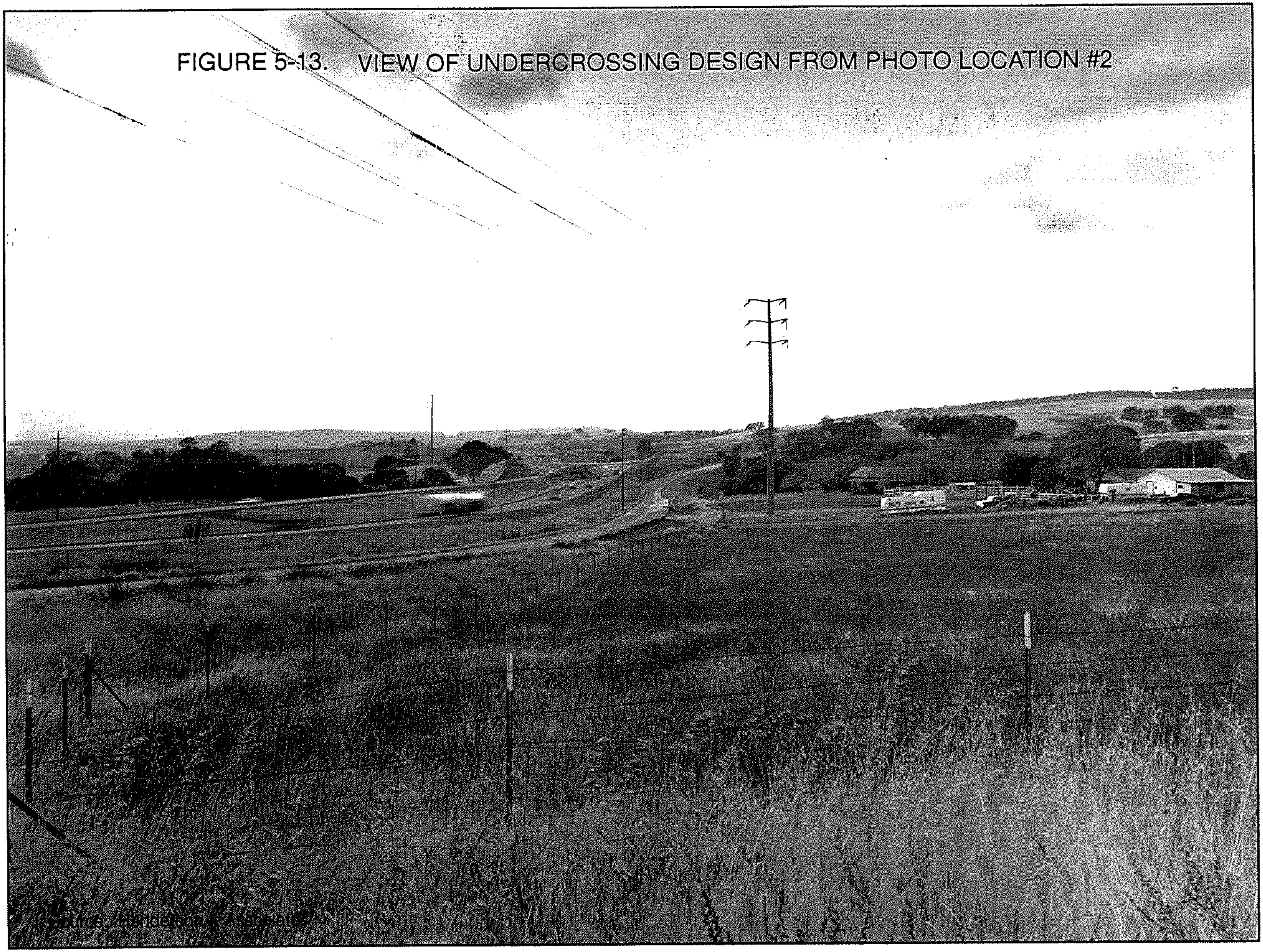


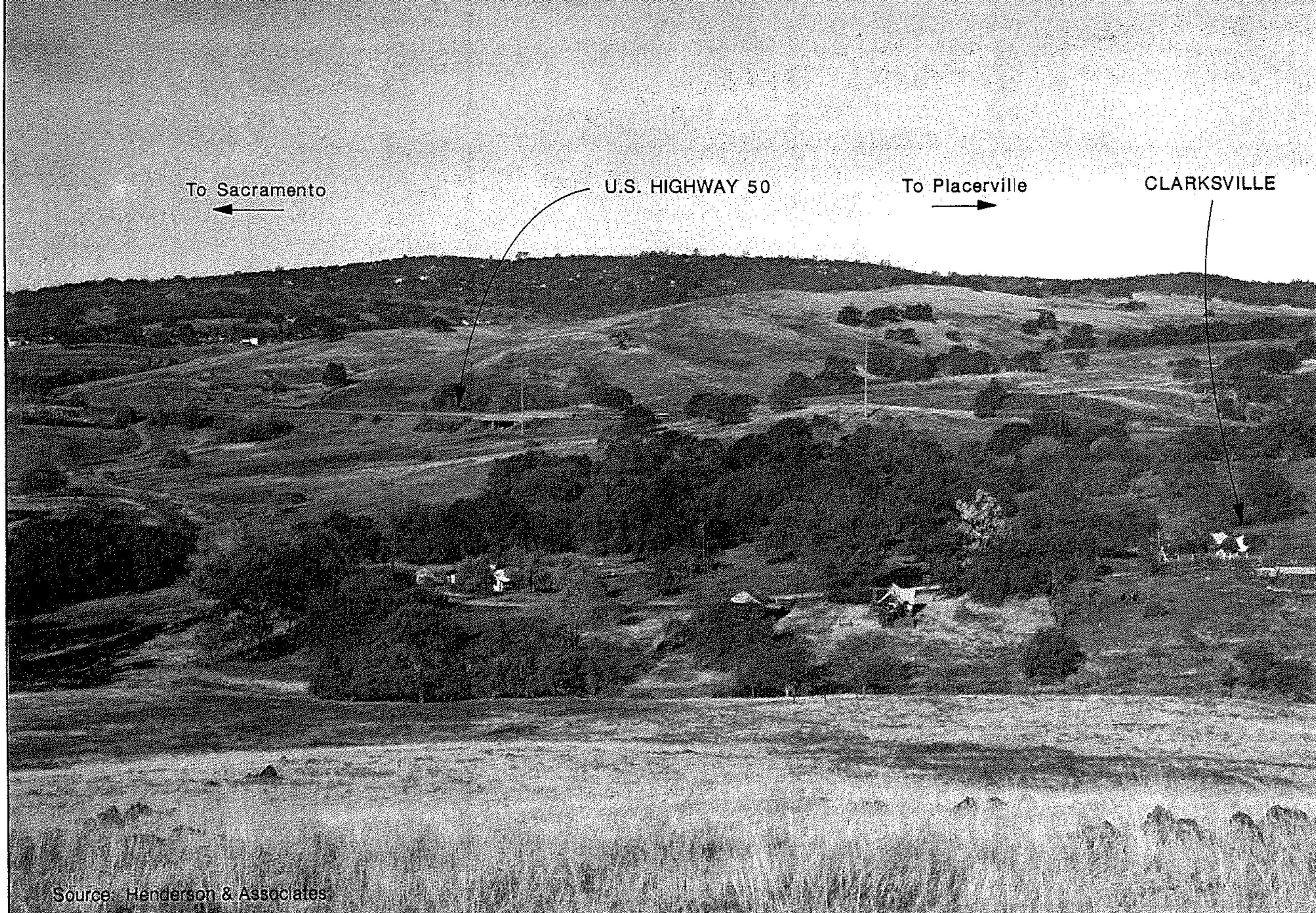
FIGURE 5-13. VIEW OF UNDERCROSSING DESIGN FROM PHOTO LOCATION #2

FIGURE 5-14. VIEW OF THE PROJECT SITE FROM WHITE ROCK ROAD IN CLARKSVILLE (PHOTO LOCATION #3)

FIGURE 5-15.   VIEW OF UNDERCROSSING FROM PHOTO LOCATION #3

Source: Henderson & Associates

FIGURE 5-16. VIEW FROM SOUTHEAST OF THE PROJECT SITE (PHOTO LOCATION #4)



Source: Henderson & Associates

FIGURE 5-17. VIEW OF UNDERCROSSING DESIGN FROM PHOTO LOCATION #4

Future Setting

As discussed in Chapter 4 and above, the development of the Specific Plan area will occur in 5-10 years, thereby altering the setting for the interchange project. As also discussed in Chapter 4, land uses surrounding the interchange have not been adopted in accordance with the Specific Plan. Therefore, visual impacts of the two designs in terms of land uses are evaluated in relation to existing land use designations.

Implementation of either design would result in conflicts with the residential land uses planned for the area near the interchange (Figure 5-5). This impact is considered significant. To reduce this impact to a less-than-significant level, landscape the interchange, direct lighting away from surrounding land uses, and implement noise and land use mitigation measures presented in this EIR and determine compatible land use designations for this area.

Additional Impacts of the Ridge Design

There are no additional impacts associated with the Ridge Design.

Additional Impacts of the Undercrossing Design

There are no additional impacts associated with the Undercrossing Design.

MITIGATION MEASURES

Mitigation Measures for Both Alternatives

Landscape the Interchange

The county should prepare a master planting plan for the interchange in coordination with Caltrans and a qualified biologist. The master planting plan should include the mitigation measures presented in Chapter 8, "Vegetation, Wildlife, and Aquatic Resources." Design goals of the landscaping plan should be to integrate the natural vegetation and slopes with the interchange plans and to buffer the visual impact from existing and future adjacent residential land uses. The plan should include long-term maintenance agreements and funding sources. The plans should be prepared, and then reviewed and approved by the county and Caltrans prior to construction.

Direct Lighting Away from Surrounding Land Uses

The county should direct the necessary lighting fixtures away from surrounding land uses thereby reducing the amount of light shed off the interchange area. The county should prepare a lighting plan identifying the location of the light standards, their height, wattage, type of lamps to be used, and direction of lighting. Caltrans would be responsible for reviewing and approving the lighting plan to ensure that minimum requirements are met prior to project construction.

Implement Noise and Land Use Mitigation Measures Presented in This EIR and Determine Compatible Land Use Designations for This Area

El Dorado County should select land use designations compatible with the proposed interchange for the area disapproved from the El Dorado Hills Specific Plan. The land use and noise mitigation measures presented in this EIR should be implemented and should include selection of land use designations. If the land use designations differ from those analyzed in the EIR for the El Dorado Hills Specific Plan, then subsequent environmental review would be needed.

Additional Mitigation Measures for the Ridge Design

No additional mitigation is required.

Additional Mitigation Measures for the Undercrossing Design

No additional mitigation is required.

CHAPTER 6. Geology and Soils

This chapter is based on a report prepared by Michael J. Dwyer, Inc.

The method of investigation consisted of reviewing readily available geologic literature and maps pertaining to the project site and surrounding area, performing a geologic reconnaissance of the project site, and interpreting stereo-paired aerial photographs.

SETTING

Existing Improvements

Numerous improvements exist within and peripheral to the project site. Several of the more important of these have been described in Chapter 2, "Project Description." In addition to the described improvements, there are numerous smaller and older improvements, such as hand-dug water wells, concrete water boxes, and a small concrete water retention structure located across an ephemeral drainage course on the west side of the project. Segments of some streambanks along the west side of the project site have also been lined with rock blocks. Presumably, this was done to dispose of over-sized rock generated during earlier construction work along U. S. 50. A modern, underground phone cable system also runs roughly east-west through the northern part of the project. Other buried facilities may also be present.

Existing Geologic Environment

Regional Geology/Seismicity

The project site is located in the west-central part of a northwest-trending belt of diverse metamorphic rocks that underlie the western slope of the Sierra Nevada. This belt extends from Mariposa on the south to Lake Almanor on the north, and the included rocks range from Paleozoic in age on the east to Mesozoic in age on the west.

The rocks of the belt are structurally dominated by a series of northwest-trending fault systems. These fault systems separate the rocks of the belt into three principal lithologic terrains that extend throughout the length of the belt. From about the latitude of Placerville and northwest, these terrains are referred to as the eastern, central, and western tectonic blocks, respectively (Loyd 1984). Each of the blocks is composed of thick accumulations of marine sedimentary and volcanic rocks of various types. The blocks have been faulted, deformed, intruded, and metamorphosed on a regional scale. Such features as bedding, foliation, and principal structures generally trend northwest and dip steeply to the east.

The project site lies within the western block of the Sierra Nevada Metamorphic Belt. This portion of the block is underlain by the Copper Hill Volcanics, Salt Springs Slate, and Gopher Ridge Volcanics (all of about mid-mesozoic age), and older volcanic and associated rocks of the Bear Mountain Ophiolite Complex. Two major intrusive bodies, the Rocklin Granodiorite Plutonic and Pine Hill Layered Gabbro Complex, are also present within this portion of the block.

The project site is underlain by a unit of the ophiolite rocks. The project geology is described in more detail in a following section.

Some of the principal faults within the Sierra Nevada Metamorphic Belt are the northwest trending Calaveras-Shoo Fly thrust, the Melones system, and the Bear Mountain fault zone. The Bear Mountain fault zone passes within approximately 2,500-3,000 feet of the project site on the west. According to Wheeldon and Associates (1987), the eastern and southern boundaries of the Sierra ranges are seismically active, while the center and western margin (project location) are experiencing low seismicity. According to the California Division of Mines and Geology (Hart 1985), there are no active (movement within the last 10,000 years) faults through the project site nor are there active faults in the general area. According to Terra Engineering (1983), the last movement on the adjacent Bear Mountain fault zone is estimated to have occurred between about 125,000 and 195,000 years ago. These estimates were made on the basis of soil stratigraphic age assessments of profiles exposed in trenches excavated well south of the project site.

Project Landforms

The area surrounding the project site is characterized by well developed, continuous northwest-trending ridges that are transversely separated from one another by low areas consisting of narrow valleys and subdued, rounded hills. The project site is situated near the southeast terminus of one of the low areas and consists predominantly of low hills that trend north-south, and of poorly developed stream valleys.

Carson Creek, the area's principal stream, passes from northeast to south through the site in a generally well incised, relatively broad drainage channel of moderate depth. During the field work (August 20 through August 21, 1988), Carson Creek was flowing north of U. S. 50 and intermittently immediately south of U. S. 50. A shorter, poorly incised ephemeral stream and tributary exists along the western part of the site. This system drains northwest to southeast through the site and is tributary to Carson Creek beyond the project on the southwest.

The maximum elevation is approximately 795 feet at the hillcrest in the north-central part of the project. The minimum project elevation is about 630 feet along the ephemeral stream channel, where it passes beyond the project boundary on the southwest.

Project Bedrock Geology and Structure

The area within which the project site is located is underlain by metamorphic volcanic rocks that comprise a unit within the Foothill Melange, a chaotic intermixture of metasedimentary and metavolcanics of varying lithologies and ages (Loyd 1984), and which in turn comprise a part of the Bear Mountain Ophiolite Complex. Within the site the metavolcanic rocks are mostly uniform in appearance. Where fresh rock is exposed, it is medium to dark greenish gray, mostly fine to occasionally medium grained, mostly slightly to moderately jointed (thoroughgoing plainer fractures), well to faintly foliated, and hard to very hard. Where weathered, the rock is olive brown and medium to moderately hard.

The foliation (closely spaced, plainer, parallel discontinuities that are penetrative at the scale of outcrop or hand specimen - Turner and Weiss 1963) is generally an obvious textural feature and is uniformly northwest striking and steeply northeast to vertically dipping. Strikes range between N20W - N45W, but average N35W. The predominate direction of jointing is parallel to foliation. The spacing between joints is mostly 1-3 feet or more. Cross joints (approximately at right angles to foliation) are occasionally to infrequently present.

While the foliation is generally well developed and obvious at outcrop/hand specimen scale, there are occasional to numerous zones from a few feet to several feet in width that display only faintly developed foliation. These zones trend parallel to the foliation direction and probably represent a slightly different pre-metamorphic composition and/or texture that was more resistant to foliation development. These zones consistently contain the very hardest rock encountered within the project.

Locations of larger outcrop areas and of measured foliation and joint attitudes are shown in Figure 6-1, Geologic Map. Wheeldon and Associates (1987) report that the metavolcanics found within the project site and surrounding area are part of a diabasic to gabbroic dike swarm whose present (postmetamorphic) mineralogy consists principally of feldspar, pyroxene, and chlorite. The Wheeldon report states that the individual dikes ranged in thickness from 1 or 2 inches to 1 foot or more. If these rocks were originally a dike swarm, it would be more appropriate to classify them as meta-igneous, rather than metavolcanics.

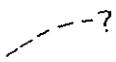
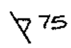
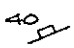
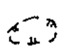
The geologic structure of the project site and surrounding area is complex and the result of long-term tectonic activity believed to be associated with broad scale ocean floor subduction and accretion during the Paleozoic to Mesozoic period (Loyd 1984). For additional information on the geology and structure of the area, the reader is referred to Loyd (1984), Saleeby (1981), and Springer (1971).

Project Surficial Geology

Surficial deposits within and peripheral to the project site consist of residual soils, colluvial soils, stream deposits, landslide deposits, and artificial fill.

Residual/colluvial soils predominate; landslide deposits are very minor; and stream deposits are localized along existing channels of Carson Creek and the unnamed ephemeral

MAP LEGEND

Symbol	Name	Description
Qls	Landslides	Deposits of intermixed silty, clayey soil and weathered rock fragments that have moved downslope as an earthflow failure.
Qco	Colluvium	Deposits of silty to clayey soil with intermixed rock fragments. Mostly located within topographic hollows on hillslopes. Grades into deposits of alluvium (Qco-Qal) at base of slopes. Only larger, thicker (up to about 5 feet maximum) deposits shown.
Qal	Valley Alluvium	Deposits of loose, thin (up to about 3 feet maximum), discontinuous gravel-sand-silt in Carson Creek. In smaller drainage areas, consists of silty, clayey soil with subordinate gravel. Between about 3-6 feet in maximum thickness. Only thicker deposits are shown.
Mmv	Meta-Volcanic Rocks	Mesozoic-aged, metamorphosed volcanic rock of the Foothill Melange (Ophiolite Terrace). Dark grayish green, fine to medium grained, hard, well foliated, moderately jointed and locally highly crumpled to sheared.
Af	Artificial Fill	Soil, rocky soil, and rock blocks used in highway and road construction and for erosion protection along drainage courses.
	Geologic Contact	Dashed where approximately located, queried where existence uncertain, dotted where concealed beneath younger deposits or features.
	Strike & Dip of Foliation	
	Vertical Foliation	
	Strike & Dip of Joints	
	Vertical Joints	
	Sheared Rock	
	Soil Creep Area	
	Rock Outcrop	
	Spring	
	Seepage Area	Often associated with active springs.
o (7')	Water Well	Approximate depth to standing water below existing ground surface.

NOTE: All geologic features shown are approximately located. This geologic map is intended solely for environmental assessment purposes.

Source: Michael J. Dwyer, Inc. 1988

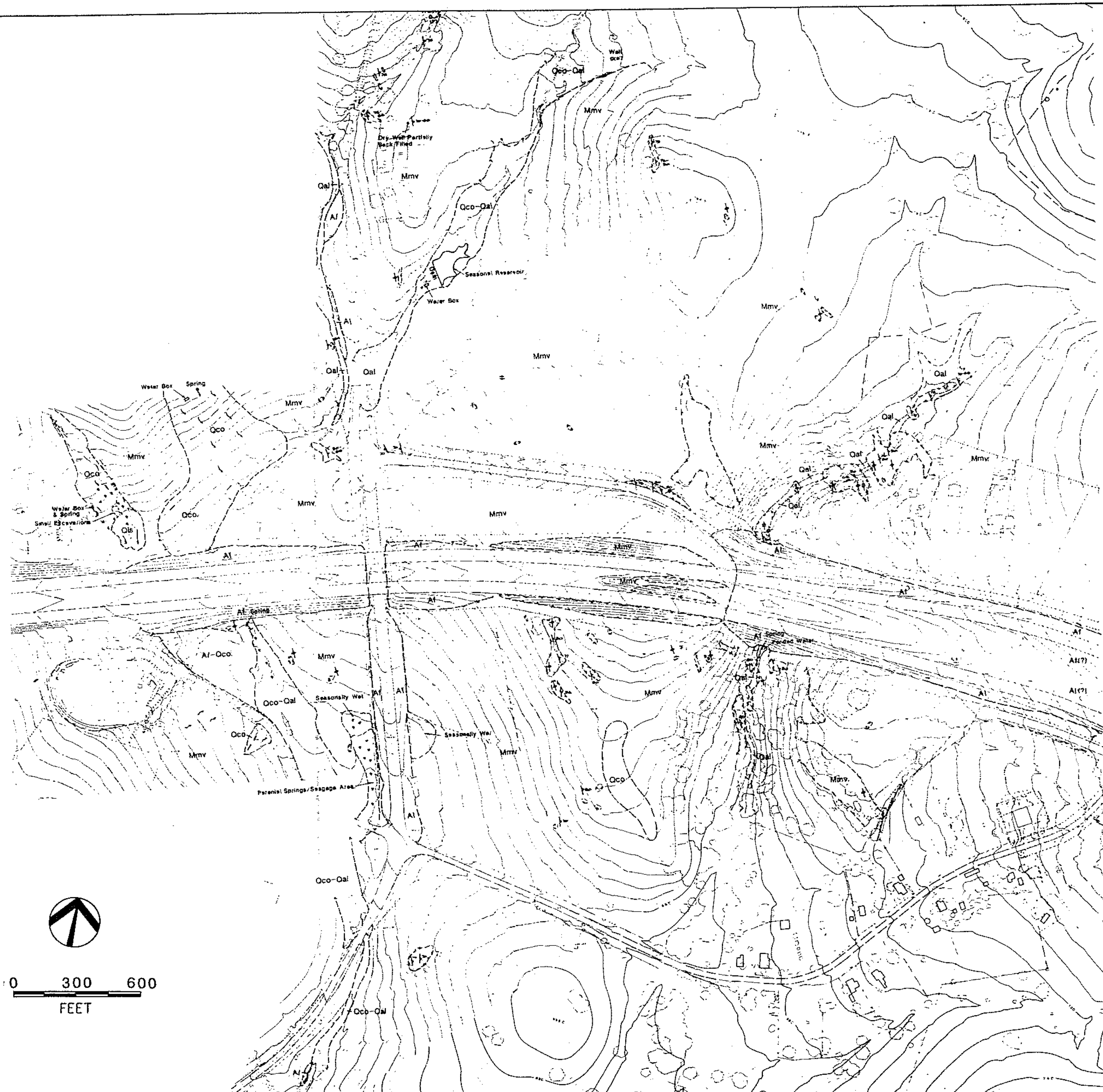


FIGURE 6-1.
GEOLOGY OF THE PROJECT SITE

Source: Michael J. Dwyer, Inc. 1988

stream to the west. Artificial fill is mostly localized along U. S. 50 and consists of embankments placed at the time the highway was constructed. The boundaries of mapped surficial deposits are shown in Figure 6-1.

Residual soils develop from the chemical/mechanical breakdown of bedrock on flat or very gently sloping areas such as the wide, gentle ridgetops and hills that range north to south through the center of the site. Residual soils remain at the origin point of their development. Colluvial soils develop through the same chemical and mechanical processes, but because of their position on sideslopes, slowly creep downslope under the influence of gravity. Rates of creep are usually quite slow, generally a fraction of an inch per year, and usually occur during the wet season when soils are weakest.

Because numerous sloping areas exist within the project area, colluvium is the principal surficial deposit present. As a result of locally converging slope directions, colluvial soils tend to concentrate and thicken in swale areas as they slowly progress downslope. Where swale deposits of colluvium become over-thickened, they also may become progressively less stable and eventually develop into landslides. This is particularly likely in the presence of year-round wetness caused by springs and/or steeply sloping swale surfaces. Undercutting of such areas through man's activities can also induce instability. Although colluvial soils are widespread, only one small landslide was mapped. This slide is associated with a spring area located along the western edge of the project site just north of U. S. 50.

Stream deposits are composed of discontinuing to locally continuous mixtures of unconsolidated gravels, cobbles, sand, and silt that occupy the active channels of the streams draining through the project area.

Residual soils are generally less than 2 feet thick throughout the site. Colluvial soils are also generally thin, but deeper accumulations occur in swale areas as previously described. Locally these accumulations may reach 5 feet or more. Stream channel deposits are mostly 2-3 feet in maximum thickness but thicknesses approaching 5 or more feet may occur locally. The landslide deposit described is probably 6-8 feet in maximum thickness. Artificial fill associated with U. S. 50 may reach thicknesses of 25-30 feet along the western portion of the project site.

The U. S. Soil Conservation Service (SCS) and U. S. Forest Service (USFS) have prepared a soil survey of El Dorado County (U. S. Soil Conservation Service 1974), in which the survey posits that the project site and surrounding area are underlain by Auburn silt loam and by Auburn very rocky silt loam. The Auburn silt loam is present over about 80 percent of the project area. The very rocky silt loam is limited to locations along the northeast portion of the project site. The loams are similar and are typically well drained, erodible under bare slope conditions, and underlain by hard metamorphic rocks at depths of between 12 to 26 inches. The surface of the soil is brown, about 3 inches thick, and consist of slightly acid silt loam. The subsoil is usually a reddish-yellowish, slightly acid silt loam. Field observations generally confirm the soil survey data, with the exception of locally greater soil thicknesses (colluvial deposits). Field observations show that the soils are buff to pale reddish brown, crumbly, very fine grained to slightly sandy, and slightly to occasionally very rocky silts or clayey silts.

Mineral Resources

The project site is located within the Folsom 15-minute quadrangle, which is the base map utilized by the California Division of Mines and Geology (Loyd 1984) to delineate and classify mineral resources of the area, including the project site. The resource evaluation encompasses a variety of metallic and nonmetallic minerals.

There are no known deposits of these minerals within or immediately adjacent to the site. For most of the minerals considered, the site is classified as Mineral Resource Zone-4 (MRZ-4), "areas where geologic information does not rule out the presence or absence of such mineral deposits." The site is classified as MRZ-3a for copper, zinc, and lode gold. A 3a classification is defined as a "land area with regional geologic characteristics favorable for the presence of these types of mineral deposits."

According to Loyd (1984), no substantial mining development, current or historical, has occurred within the project area and no prospect pits are shown within the site. Additionally, field reconnaissance did not reveal the presence of any readily identifiable surface evidence of past mining or prospecting activity. However, it is possible that the stream deposits along Carson Creek may have been worked for placer gold sometime in the past. These deposits within the project area are generally thin and patchy and do not represent an attractive location for substantial amounts of placer gold. Based on the foregoing information, it appears that the probability of finding commercially feasible mineral deposits within the project area is low.

Geologic/Seismic Hazards

No geologic hazards were observed within the project area that could preclude or severely constrain the proposed development. While active faults are not known to exist in the region, ground shaking is possible during the useful life of the project if distant faults should move. According to Wheeldon (1987), the maximum credible earthquake and maximum probable earthquake for the foothills region have been established at Magnitude 6.5 and Magnitude 5.0-5.5, respectively. Again, according to Wheeldon (1987), earthquakes of 5.0-5.5 magnitudes would cause accelerations of 0.2 g to 0.45 g at distances of up to 2 miles from a causative fault. These accelerations would decrease with increasing distance between the causative fault and a site.

Springs and Seepage Areas

Springs/seepage areas and locations of shallow groundwater were noted within the project area. The shallow groundwater locations were identified by the presence of several old, hand-dug shallow wells found north of U. S. 50. A very substantial spring/seepage area exists south of U. S. 50 along the southwest part of the project site. This area appears to be fed, at least in part, by a spring/seepage area north of U. S. 50, or beneath U. S. 50, whose waters infiltrate beneath the natural drainage course and then through and/or beneath the large box culvert that passes beneath the highway. Most of the wells observed are poorly covered and not fenced off. The locations of observed springs/seepage areas and wells are shown in Figure 6-1.

IMPACTS

Introduction

This section presents a description of impacts possible with implementation of the project. In compiling the impact description, the following framework assumptions were made:

- sufficiently detailed civil and geotechnical engineering design investigations will be undertaken for the project,
- modern, high-quality construction practices will be adhered to, and
- an adequate program of long-term maintenance will be implemented.

If these assumed conditions are not met, the probability, severity, and duration of identified impacts could increase substantially.

Definition of Possible Impacts

Definition of possible impacts of geologic origin are as follows:

- Alteration of Natural Landscape - Project earthworks construction would result in numerous cuts and fills estimated to range in height from a few feet to a few tens of feet, and in length from several tens to several hundred feet. In this manner, topographically low areas through which improvement corridors would pass would be filled and high areas cut down. The width of the areas disturbed in this manner would largely be a function of the width of the improvement at finish grade elevation relative to the existing elevation and the cut- or fillslope ratios employed. For example, an off-ramp 27 feet wide at grade elevation to be positioned 15 feet above an existing relatively flat low area, using typical fillslope ratios of 2:1 (horizontal to vertical), would result in a fill cross section 87 feet wide at ground level (30 + 27 + 30).
- Modification of Natural Runoff Pattern - This impact results from alteration of the landscape and construction of project facilities. The common result is that natural runoff is interrupted, concentrated, and redirected toward new areas located downslope of outfall points. The effect could increase erosion and siltation, cause changes in the shallow groundwater regime and, therefore,

changes in springs and/or seepage areas. The changes could include either a reduction or an increase in existing spring/seepage areas, and possibly the development of springs/seepage areas at new locations.

- o Erosion - Grading associated with earthworks construction exposes and loosens soils, thus increasing their susceptibility to erosion. Exposed faces of cuts and fills composed primarily of soil and/or severely weathered bedrock would also be susceptible to erosion. Effects can range from minor rilling to the development of gullies or the deepening of existing gullies. Depending on the severity of the erosion, materials may be transported and deposited in undesirable locations, causing clogging of drainage improvements or degradation of natural drainage courses. The effects of erosion are usually the greatest the first one to two wet seasons following construction. The effects are seen mostly within the vicinity of the project or within a few hundred feet of the project perimeter. If eroded materials make their way into streamcourses, the effects may extend well beyond project boundaries.

- o Degradation of Streams - The impact is caused by soil and/or rock debris being sidecast into or near the active channels of streams and gullies during the period of construction. The nearby materials can eventually work their way into the channel with time due to the force of gravity and/or surface runoff. The effect would be to cause turbidity in stream waters within and beyond the project, the silting in of the streambed, and possibly physical modification of the stream channel. The impacts could persist from a few to perhaps several years.

- o Degradation of Springs/Seepage Areas - This impact would be caused by burial of spring/seepage areas beneath fills or by the interruption of the surface/subsurface waters that feed such areas. Interruption could be caused by cutslope construction or construction of surface and subsurface drainage facilities that could change natural surface and subsurface flow patterns.

- o Prevention of Mineral Resource Extraction - This impact is caused by placing manmade features over or in proximity to the resource, thus precluding their future development for economic, social, and/or political reasons.

- o Geologic Hazards - These impacts result from natural or manmade geologic conditions or processes that present a risk or potential danger to life and property. Geologic conditions and processes that could produce hazardous impacts within the project area include landsliding, erosion/siltation, earthquake shaking, and expansive soils.

- o Blasting Effects - These impacts include risk or potential danger to life and property from ground shaking or falling debris caused by construction-related blasting.

Impacts Common to Both Alternatives

Implementation of either design would result in:

- o substantial alteration of the natural landscape. This impact is considered significant and unavoidable. No mitigation is recommended.

- o modification of natural runoff patterns. This impact is considered less than significant. No mitigation is required.

- o temporary increased erosion. This impact is considered significant. To reduce this impact to a less-than-significant level, implement the mitigation measures as described under "Mitigation Measures for Both Alternatives" (expose as little new ground surface as possible, do not allow sidecasting, install adequate energy dissipators, remove excess rock and soil, stockpile topsoil, and develop and implement a projectwide erosion control program).

- o temporary degradation of streams. This impact is considered significant. To reduce this impact to a less-than-significant level, implement the mitigation measures described under "Mitigation Measures for Both Alternatives" (develop and implement a projectwide erosion control program).

- o prevention of mineral resource extraction. This impact is considered less than significant. No mitigation is required.

- o natural slope instability. This impact is considered less than significant. No mitigation is required.

- o man-caused slope instability. This impact is considered potentially significant. To reduce this impact to a less-than-significant level, implement the mitigation measures described under "Mitigation Measures for Both Alternatives" (undertake a detailed geotechnical investigation and perform grading observation and testing).

- o exposure of structures to possible earthquakes (there are no known active faults in the vicinity). This impact is considered potentially significant. To reduce this impact to a less-than-significant level, implement the mitigation measures described under "Mitigation Measures for Both Alternatives" (undertake a detailed geotechnical investigation).

- o construction on expansive soils. This impact is considered less than significant. No mitigation is required.

- o blasting effects for construction. This impact is considered potentially significant. To reduce this impact to a less-than-significant level, implement the mitigation measure described under "Mitigation Measures for Both Alternatives" (comply with all applicable local, state, and federal safety regulations).

Additional Impacts of the Ridge Design

Implementation of the Ridge Design would result in temporary degradation of springs/seepage areas. This impact is considered significant. To reduce this impact to a less-than-significant level, continue the retaining wall for the eastbound off-ramp about an additional 100 feet and temporarily fence off all spring/seepage areas during construction.

Additional Impacts of the Undercrossing Design

Implementation of the Undercrossing Design would result in temporary degradation of springs/seepage areas. This impact is considered significant and unavoidable. To reduce this impact, but not to a less-than-significant level, temporarily fence off all spring/seepage areas during construction.

MITIGATION MEASURES

Mitigation Measures for Both Alternatives

1. Undertake a detailed geotechnical investigation as part of the project design process. The geotechnical investigation will need to include exploration and assessment of soil, groundwater, and subsurface geologic conditions to evaluate cut- and fillslope stability, and to provide soil engineering criteria for project grading, and bridge and retaining wall foundations. The investigation will need to be based on adequate surface and subsurface exploration, sampling, laboratory testing, and analyses.

2. Use properly qualified field engineers to perform grading observation and testing during construction. The site should be evaluated periodically by a certified engineering geologist and/or a geotechnical engineer.

3. Expose as little new ground surface as possible during project grading and construction activities. This step includes using cutslope ratios as steep as erosion, stability, and safety conditions permit. It also includes minimizing the areas used for the staging of construction equipment and related materials.

4. Do not sidecast excavated materials during site preparation, construction, and final grooming of cuts and fills, when such materials are in proximity to streams or gullies. Conduct grading in such a manner that the downslope roll of rocks, boulders, and other soil material is minimized.

5. Provide drainage outfalls sufficient in number and so positioned as to avoid an adverse increase in waterhead that would cause unnatural channel abrasion, incipient gullying on sideslopes, or siltation to the point where it would have an impact on streamwater quality. Install energy dissipators at all outfall locations except for those outfalling on firm rock located at the bottom of natural drainage courses.

6. Prepare a plan describing proposed earth and rock catchment devices for all construction areas where inadvertent sidecasting might allow such materials to reach project area watercourses. The plan should include suggestions for the removal of materials that reach streamcourses.

7. Make the contractor and project inspectors aware of required environmental mitigations to reduce impacts that might otherwise occur.

8. Remove and dispose of excess rock and soil (exclusive of topsoil) as engineered fill at an environmentally acceptable spoil location which has been properly investigated and designed. "Engineered" is hereby defined for the spoil sites to include such measures as keying, subdrainage, fill slopes generally no greater than 2:1 slope, benching as necessary, and proper compaction.

9. If borrow sites are necessary, require a separate environmental review of their locations. Do not locate borrow sites in environmentally sensitive areas, i.e., close to drainage courses, within or in proximity to springs and seepage areas, or on excessively steep slopes where soil erosion would result. Following their use, these sites should be reclaimed.

10. Stockpile topsoil removed during site preparation to use later where needed for revegetation.

11. Develop and implement a projectwide erosion control program that complies with the "El Dorado County Erosion Control Requirements and Specifications." Implement the program prior to the first winter rains. Monitor the progress of the program yearly for 3 years and require additional planting, mulching, and fertilizing as necessary.

13. Leave root crowns intact in areas requiring removal of vegetation, but not grading, so as to retard soil erosion.

14. Prepare and implement a program of long-term project maintenance to ensure satisfactory performance of the project components. The program will include the regular cleaning and maintenance of culverts, ditches, trash racks, inlet structures, etc.

15. Cover and/or fence all water wells, water boxes, and cisterns within the project right-of-way for safety reasons.

16. Protect all project springs and seepage areas and the sources of their waters. This can best be accomplished by avoiding such areas or by constructing bridges over them.

17. If project construction requires blasting, comply with all applicable local, state, and federal safety regulations.

18. Temporarily fence off all spring/seepage areas during the construction period to eliminate possible disturbance by equipment.

19. Temporarily fence off riparian corridors during construction.

20. Develop and implement a site-specific erosion control plan to minimize both short-term effects due to construction and the long-term effects resulting from permanent changes caused by the proposed facilities.

    Short-term control measures will include use of some of the following structures or procedures to minimize erosion, siltation, and stream degradation impacts:

    - filter berms,
    - sandbag or straw bale barriers,
    - siltation retention fences,
    - vegetation filter strips, and
    - erosion checks (installation of porous mat-like material in a slit trench and oriented perpendicular to the direction of flow).

    Also:

    - remove from active stream channels any collections of earthen debris or trash resulting from construction activities,
    - install drop inlets and risers to reduce discharge velocity and to capture silt,
    - keep the width of the corridor that would be disturbed by construction of project facilities to an absolute minimum by placing chain link fences and signs at the edge of the construction area, and
    - divert the waters of the project creeks past the construction area via culverts if construction occurs during the period of active flow.

    Long-term measures include:

- implementing the revegetation program described in the General Mitigations section, and,

- installing permanent erosion control facilities, as necessary, such as energy dissipators at all outfalls, hydraulic jumps on steep gradient ditches, and lining all drainage ditches on slopes steeper than 10 percent.

Additional Mitigation Measures for the Ridge Design

Continue the 290-foot-long retaining wall proposed for the eastbound off-ramp about an additional 100 feet. This would eliminate the need for an embankment along this interval and the related extension of the existing box culvert. The effect would be to reduce the possibility that year-round spring waters that issue from and around the culvert outfall would be disrupted. These waters are critical to maintaining the riparian area immediately south of the box culvert and are also probably critical to maintaining the large seepage area located a few hundred feet to the southeast.

Additional Mitigation Measures for the Undercrossing Design

No additional mitigation is required.

CHAPTER 7. Hydrology and Water Quality

SETTING

Climate

Summer temperatures in the project area are normally very warm with highs averaging approximately 95°F. Winter temperatures are cool to mild with average lows of approximately 36°F. Freezing temperatures occur every year but snowfalls are infrequent. The growing season duration (number of days between last freezing temperature of spring to first freezing temperature of fall) is typically 250 days (U. S. Soil Conservation Service 1974).

The project area receives an average annual rainfall of approximately 25 inches. With the exception of light, scattered thundershowers in summer, precipitation is generally limited to winter, when strong flows of marine air generate moderate to heavy rainfalls (U. S. Soil Conservation Service 1974).

Surface Hydrology

Most of the rainfall in the area is quickly converted to runoff and rapidly drains from the area via swales and streams. Rainfall tends to run off the steep slopes quickly. Little resistance or detention of runoff is offered by the relatively thin ground cover. Low-permeability soils allow little of the small amount of precipitation retained on the surface to infiltrate before it is evaporated or lost to evapotranspiration by vegetation. As a result, flows in swales and ephemeral streams are generally of short duration, and little groundwater recharge occurs onsite. The presence of a weir and water storage tanks near one of the larger ephemeral drainages suggests that some of the ephemeral streams may be sustained into late spring or early summer.

The project area is partially covered by impermeable surfaces associated with U. S. 50 and White Rock Road. In the project area, White Rock Road consists almost entirely of a two-lane roadway surface elevated above the existing topography only by the roadway base. Runoff from White Rock Road flows off the roadway surface and down the roadway embankment to the natural topography, in the form of sheet runoff. Unless this runoff is captured in a ditch or similarly trapped adjacent to the roadway, the runoff continues to flow as sheet runoff toward one of the natural swales that drain the area; alternatively, it infiltrates the soil.

Most of the runoff from cut sections (portions where the natural topography has been excavated to form the subgrade foundation of the roadway) of U. S. 50, does not flow directly off the roadway surfaces. Instead, runoff is generally conveyed to the highway median or to gutters along the roadside for discharge via storm drains. If the median is permeable, some of the runoff infiltrates the highway foundation, but most of it generally flows to a storm drain during large storm events. Because runoff is collected for disposal via storm drains, it accumulates into larger channelized flows before it is discharged to the surrounding topography. Runoff exiting U. S. 50 in this fashion tends to remain channelized as it continues toward swales and other drainage channels. Fill sections (portions with fill placed above the natural topography to form the subgrade foundation of the roadway) of U. S. 50 have runoff patterns similar to that of White Rock Road.

Three intermittent streams flowing through the project area drain the site and upstream watersheds. Carson Creek, the largest of the three streams, generally flows from early December to early June (Tong pers. comm.). The other two intermittent streams are unnamed; they eventually flow into Carson Creek south of the project site. Carson Creek is tributary to the Cosumnes River via Deer Creek.

Carson Creek streamflow is believed to be sustained primarily by runoff during wet months and later by groundwater in spring and early summer. Since streamflow in the two unnamed streams is sustained by similar sources, it is probable that flow durations in the other two streams are comparable to that of Carson Creek.

Carson Creek and the drainage near the White Rock Road underpass have downcut through the relatively shallow layer of soil to bedrock in much of their respective channels. The third stream near the U. S. 50 westbound offramp to El Dorado Hills Boulevard and the remainder of the other two streambeds is protected from erosion to a large degree by vegetation. Onsite soils have a slight to moderate erosion hazard. Vegetative cover and rock armoring in the streambeds and swales minimizes the loss of soil via water and wind erosion.

During the months that the three intermittent streams are flowing, flow rates vary in an estimated range of 5-100 cubic feet per second (cfs), with the larger flow rates generally found in Carson Creek. Heavy rainfall over the watersheds of these streams, however, can produce much heavier flows. Carson Creek has had floodwaters reach the top of the bridge at the intersection of White Rock Road and Carson Creek near Clarksville (Tong pers. comm.). Based on field observations of streambed slope and cross-sectional area at the White Rock Road bridge by Jones & Stokes Associates, flows of this magnitude are estimated to be on the order of several thousand cfs. Smaller streambeds and smaller watershed areas upstream of the project area tend to indicate smaller flood flows in the other two streams.

Though floodwaters flow over the project site, the Flood Insurance Rate Map (FIRM) prepared for the Flood Insurance Administration indicates a flood zone "C" designation for the project site. Zone "C" is defined as an area of minimal flooding. Zones of more frequent or more severe flooding are not found on the project area nor in proximity.

Historically large storm events have occasionally caused Carson Creek to overflow its banks and flood Latrobe Road. This localized street flooding was attributable to a limited flow capacity in the culvert and constriction of the Latrobe Road culvert from vegetation growth. Similar localized flooding problems at the El Dorado Hills Wastewater Treatment Plant and the El Dorado Hills Business Park have been corrected by channel modifications (Herrlie pers. comm.).

Minor floods also have occasionally flooded the Tong family's barn as a result of flow diversions created by U. S. 50. Generally, these small floods were diverted by hay bales placed by the Tong family and the floods did not cause substantial property damage (Tong pers. comm.).

Groundwater Hydrology

Subsurface hydrologic conditions vary throughout the project area. When the streams are flowing they recharge shallow groundwater in adjacent soils. During drier months soil moisture drains back to the streams. Groundwater may become seasonally perched on bedrock during the winter and may later form seeps as it drains.

Subsurface water may be present as moisture retained in the soil, shallow or perched groundwater, or emerge from fractured or foliated subsurface bedrock. Much of the fractured bedrock layers underlying the area are water bearing. Artesian conditions appear to be present in some locations. Several bedrock wells have been identified in the Clarksville area. These wells are believed to be directly recharged by Carson Creek flows (Wire pers. comm.).

A spring on the Tong property, located at the outlet of the Carson Creek culvert under U. S. 50, has yielded water without interruption for approximately the last 130 years (Tong pers. comm.). Water flowing from this spring is believed to emerge from a confined aquifer through fractured or foliated bedrock at the downstream end of the Carson Creek culvert under U. S. 50 (Geoconsultants 1988). A detailed report of the spring is found in Appendix C. Serving as a livestock water source throughout the year, the spring is considered invaluable by the Tong family in drought years when other water sources are not available.

Springs at the outlets of culverts for the other two streams crossing U. S. 50 in the project area are believed to have formed when scour holes at the culvert outlets eroded the streambed down to locally shallow groundwater tables. Construction of the foundation for U. S. 50 also may have altered local groundwater conditions. During the November 1988 site visit by Jones & Stokes Associates, these two springs and the Carson Creek spring were the only bodies of surface water identified on the project area. It is believed that the springs at the culvert outlets of the two unnamed streams did not exist prior to the construction of U. S. 50 along its existing route. The consistency with which these springs produce water is not known.

Construction of U. S. 50 or some other event has had other effects on local groundwater flows. Of particular interest is a drain in the culvert near White Rock Road that removes moisture from the highway foundation. During the site reconnaissance by Jones & Stokes Associates, this drain produced the only flowing water on the project site. The discharge for the drain is well above the water surface in the spring at the culvert outlet and was probably above the natural ground surface prior to construction of U. S. 50. It is not fully understood why this anomaly occurs; however, a plausible explanation is that operation of heavy equipment during highway construction and the overburden of the roadway foundation may have compacted the soil, forming a barrier to groundwater movement. Subsurface water flows and levels may have been altered by the barrier, creating the anomaly of a subgrade drain discharge above adjacent groundwater levels at the culvert outlet.

Water Quality

Water quality data are not available for surface water in the project area. Runoff generated upstream of the project area, in the Carson Creek watershed and the watershed drained by the stream crossing U. S. 50 near the White Rock Road underpass, is estimated to be of fairly high quality based on site observations and land use in the watershed.

Past and present grazing activities, however, have probably degraded the quality of these two streams to below pristine conditions. Consumption and trampling of vegetation by livestock increases erosion by diminishing the natural protection afforded by plant growth. Defecation in the streams by livestock, and fecal matter that is washed into the streams during rainfall, serves as a nutrient source for microorganisms in the water. As the microorganisms metabolize the animal wastes, they can reduce or deplete dissolved oxygen concentrations and form excessive growths of algae and other plant life. Water quality degradation as a result of grazing activity in a watershed can occur continuously when livestock drink from streams, but the decline in quality is generally most severe during runoff events.

The third stream near El Dorado Hills Boulevard is also estimated to have fairly high quality water even though a small portion of this watershed comprises an expanding urban area. The contribution of runoff from the urban development is estimated to be minimal; however, during substantial rainfalls urban pollutants would degrade water quality.

Runoff from paved surfaces, principally U. S. 50, contains many different pollutants, most of which are associated with gas, oil, various constituents of exhaust, and other miscellaneous gases given off by automobiles. Once it has left the roadway, most of the runoff from onsite paved surfaces is conveyed in the form of overland flow. As the runoff makes its way through the vegetation a certain amount of biofiltration occurs, which serves to remove some of the pollutants before they reach streams. Channelized flows from storm drains in cut sections of U. S. 50 have much less opportunity to remove pollutants before they reach the stream. Runoff from roads and highways has a limited effect on streamwater quality until rainfall reaches a volume sufficient to carry pollutants to the streams.

Subsurface water quality is also estimated to be high.

IMPACTS

Impacts of the project are first discussed generally in terms of impacts to surface hydrology, subsurface hydrology, and water quality before becoming specific in terms of the ridge design and impacts of the undercrossing design.

Impacts to Surface Hydrology

Construction of the project could produce the following changes, which may have an impact on existing surface drainage characteristics:

- changes in peak flow characteristics and runoff volumes,
- modified drainage flow paths,
- insufficient culvert capacity, and
- sections of natural streambed would be replaced with culverts.

A decrease in vegetated surfaces and an increase in impervious surfaces generally results in a shortened time to peak runoff rates and an increase in runoff volume. The volume of water infiltrating to the groundwater is also reduced. The impervious surface area added by either project would constitute a minor portion of the watershed area drained by the three streams flowing through the site.

On-ramps, off-ramps, and overcrossings would alter topographic features and add roadways that would act as a berms, thereby altering the natural flow paths of drainage. Sheet runoff encountering a roadway or other topographic obstruction would tend to aggregate into a channel at the foot of roadway foundations, change flow direction, and then continue to drain as channelized flow along the roadway foundation toward ultimate disposal into one of the streams. If slope conditions at roadway foundations are not conducive to flow, sheet runoff may accumulate into ponds and puddles. Channelization of runoff at the foot of roadway foundations could result in erosion of the roadway foundations and adjacent naturally occurring soils. Intermittent and ephemeral streams flowing through the site would be provided with culverts to minimize disruptions to watershed drainage via the streams.

Numerous culverts would be installed to convey onsite drainage and streamflows over the site. Cost-efficient culvert design would result in the installation of the smallest culvert capable of conveying the design flood flow. Should culvert capacity be reduced by debris clogging the culvert, or if a storm larger than the design storm generates sufficient volumes of runoff, water would accumulate behind the roadway, possibly flooding some portions of the project site.

The proposed extension of the culvert passing under U. S. 50 near White Rock Road could reduce culvert flow capacity. A reduction in capacity could prevent the culvert from conveying the design storm. Flooding may occur upstream of the culvert if sufficient water accumulates north of U. S. 50 from a reduction in culvert capacity.

Sections of natural streambed would be replaced by culverts at several locations in the project site. It is expected that flow velocities would increase as water travels through the culverts.

Impacts to Subsurface Hydrology

Since available information is insufficient to permit a complete understanding of local groundwater conditions, it is difficult to ascertain the impact of the project on groundwater hydrology. Construction of interchange appurtenances and roadways may compact the soil, which would create a barrier to groundwater movement, or it may open or close water-bearing fractures or foliations in bedrock. Possible impacts would depend on groundwater depth, flow rate, and direction of flow. Groundwater flow from springs may be augmented or new ones developed at culvert outlets if groundwater conditions similar to those at the culverts under U. S. 50 exist. Existing seeps and springs may be separated from their water source, thereby reducing or eliminating flow.

Groundwater seeps occur throughout the project area. Flows may be seasonal or continuous depending on local conditions. No flowing groundwater seeps were identified on the project site during the November 1988 site visit by Jones & Stokes Associates; however, seeps may be more active on the site seasonally or in years with greater rainfall.

Access is a fundamental factor in the value of the spring to the Tong family. Livestock may be unwilling or afraid to pass under the bridge to reach the spring. Activities during the construction of the eastbound on-ramp could also temporarily impair or prevent access to the spring.

Though it is unlikely, destruction of the spring is possible through collapse or a shift in the alignment of water-bearing fractures or foliations in local bedrock. Possible access problems may also exist.

Water Quality Impacts

Possible water quality impacts from this type of project would be of a temporary and recurring short-term nature. Temporary impacts would result from construction activities, whereas recurring short-term impacts would result from pollutants being washed from roadway surfaces into the local drainages and streams.

Increased turbidity and sediment loading from construction and grading activities would have a temporary impact on water quality. Pollutants can be released during construction and transported to water bodies via the following improper practices for the handling, disposal, and containment of pollutants. Washwater and solvents are often dumped in areas close to streams. Cement mixers, machinery, and tools cause water quality problems when they are cleaned close to waterways. Burial of oil and chemical wastes near construction sites can lead to seepage of pollutants. Heavy construction equipment can transport pollutants from construction sites to streams when construction takes place in or near streambeds.

The degree to which construction practices pollute water is partially determined by the time of year construction activities occur and the amount of rainfall. Summer construction activities tend to decrease sediment loads and other pollutant levels that may impact water quality. Likewise, construction during winter tends to cause more erosion and a buildup of sedimentation.

Recurring short-term impacts to water quality occur primarily as a result of runoff from paved areas that would enter streams flowing through the site. Runoff from roads, highways, and streets typically contains heavy metals, sediment, asbestos from brake linings, radiator additives, oil, grease, and other hydrocarbons. These pollutants are transported to onsite streams during rainfall events, degrading water quality in the streams and downstream water bodies.

The concentrations and loads of pollutants carried in runoff are extremely variable for several reasons. Stream water quality depends on the actual runoff quality, runoff rate, and volume of streamflow. Pollutants tend to collect during dry periods and are then released in a high concentration pulse during the next storm. Concentrations may fluctuate with such factors as the volume of runoff reaching storm drains, the amount of time that has passed since the last storm, traffic volumes, and the degree to which street cleaning occurs. Because of this variability, it is difficult to assign a "typical" or "average" pollutant concentration or loading to urban runoff.

Construction activities near the Carson Creek spring could cause sediment, solvents, and wastewater to be discharged during a washdown of equipment and materials. Contamination of spring water could prevent its use as a livestock water supply if the spring is to be used as a water source for livestock during construction periods.

Impacts Common to Both Alternatives

Implementation of either design would result in:

- a minor increase in impervious surfaces with minor changes in peak flow characteristics and runoff volumes. This impact is considered less than significant because the impervious surface area added by the project would constitute a nearly imperceptible portion of the watershed area drained by the three streams flowing over the site. No mitigation is required.

- alteration of topographic features and roadways, thereby altering runoff drainage paths. This impact is considered less than significant because the volume of water that would be diverted is expected to be low, and onsite soils have a slight to moderate erosion hazard (U. S. Soil Conservation Service 1974). No mitigation is required.

- installation of numerous culverts to convey onsite drainage and streamflows over the site and ease possible flooding problems (Ridge Design has fewer culverts and culvert extensions than the Undercrossing Design). This impact is considered potentially significant if the culvert capacity is inadequate. To reduce this impact to a less-than-significant level, size culverts in accordance with El Dorado County and Caltrans requirements and acquire ponding easements from owners of affected properties.

- increased flow velocities as water travels through the culverts. This impact is considered potentially significant because scour holes may form at culvert outlets. To reduce this impact to a less-than-significant level, install erosion control measures at outlets and implement El Dorado County RCD requirements.

- possible alteration or covering of naturally occurring seeps. This impact is considered potentially significant because of possible alterations in groundwater flow and subsurface drainage. To reduce this impact to a less-than-significant level, provide adequate subgrade drains as determined necessary by a geotechnical engineer.

- possible alteration of the flow of water from Carson Creek spring (Ridge Design has higher possibility because of greater activity in the spring area). This impact is considered potentially significant. To reduce this impact to a less-than-significant level, require review of the design plans by a geotechnical engineer, minimize activity in the spring area, and implement a water quality monitoring program.

- possible alteration of the livestock value of the spring if construction activities degrade the water quality. This impact is considered potentially significant. To reduce this impact to a less-than-significant level, provide an alternate water supply for livestock.

- increased turbidity and sediment loading from construction and grading activities. This impact is considered significant. To reduce this impact to a less-than-significant level, implement precautionary measures during construction to minimize water quality degradation.

- increased runoff containing sediment, oil, grease, and other pollutants from paved areas. This impact is considered less than significant because the concentrations and loads of pollutants are extremely variable and short term, and the major contribution of pollutants would continue to originate from U. S. 50. No mitigation is required.

- no change to subsurface water quality because surface water would infiltrate the soil and be cleansed prior to possible use. This impact is considered less than significant. No mitigation is required.

Additional Impacts of the Ridge Design

There are no additional impacts associated with the Ridge Design.

Additional Impacts of the Undercrossing Design

There are no additional impacts associated with the Undercrossing Design.

MITIGATION MEASURES

Mitigation Measures for Both Alternatives

Size Culverts in Accordance with El Dorado County and Caltrans Requirements

The design drawings for the project will be reviewed and approved by El Dorado County and Caltrans. All improvements will comply with the requirements of these two agencies.

Acquire Ponding Easements from Owners of Affected Properties

Modifications in site drainage produced by culvert installation and topographic alterations should be analyzed to determine areas of possible flooding from the 100-year flood consistent with Flood Insurance Administration criteria. Owners of parcels whose property could be inundated by design floodwaters should be informed of the risks and easements should be acquired to pond water on their property. Future owners would be informed before they purchased any of the affected parcels, because the easement would be recorded on the deed.

Install Erosion Control Measures at Outlets and Implement El Dorado County Resource Conservation District Requirements

Pursuant to El Dorado County RCD requirements, erosive velocities will be identified by the project engineer; riprap or other erosion control measures will be installed at all drainage outlets, if determined to be necessary.

Provide Adequate Subgrade Drains as Determined Necessary by a Geotechnical Engineer

The preliminary design drawings will be reviewed by a geotechnical engineer, experienced in the movement of groundwater, prior to approval by the county and Caltrans. Where adverse impacts of alterations of groundwater movement can be prevented by draining subsurface water, subgrade drains will be installed. Recommendations should be based on site reconnaissance, subsurface explorations, and consultation of applicable literature.

Require Review of the Design Plans by a Geotechnical Engineer

The preliminary design drawings will be reviewed by a geotechnical engineer, experienced in the movement of groundwater, prior to approval by the county and Caltrans. A report shall be prepared and reviewed by the El Dorado County Department of Transportation and Caltrans, indicating whether changes should be made to protect the spring area.

Minimize Activity in the Spring Area

Construction details, including the following, will be prepared to minimize activity in the spring area:

1. Before construction, install a 6-foot-high fence to delineate the boundaries of the environmentally sensitive areas within and in proximity to the project. Show these areas on final design drawings. These areas shall not be disturbed by construction activities either directly (by equipment or material) or indirectly (by sidecasting of soil and/or rock or other waste materials). The grading contractor and all other contractors shall be notified as to the existence of these sensitive areas.

2. The construction plans will include a detailed erosion control plan. The erosion control plan requires approval by the U. S. Soil Conservation Service, El Dorado County Department of Transportation, and Caltrans. The erosion control plan must be fully implemented between October 15 and May 15 of successive years. The plan will be reviewed prior to September 15 of the year grading commences. At this time, an inspection schedule of erosion control practices will be agreed on.

3. Install catchment devices for construction areas where inadvertent sidecasting might result in materials sliding or rolling into streamcourses.

4. Require cleanup of instream areas after completion of all construction.

Implement a Water Quality Monitoring Program

Purpose. Approval of the interchange could possibly cause short-term impacts for Carson Creek. Although it is recognized that this creek is ephemeral in nature, it has considerable flow during periods of high precipitation. Water quality impacts would occur primarily during construction activities and the two following years until vegetation reestablishes itself.

The following sections describe the water quality parameters suggested for monitoring, the rationale for their selection, and identify responsible parties who would oversee and monitor the program. A review and assessment of the monitoring program also is suggested to ensure that the goals of the monitoring program are being met. This review and assessment also would provide a mechanism for the monitoring program's future termination.

Objectives. The primary objective of the monitoring program is to ensure that the creek maintains its natural state and that water quality is suitable for a wide variety of recreational and aesthetic uses.

It should be noted that sediment loads in creeks, rivers, and other waterways can vary substantially between storm events and are dependent on various events. Suspended sediment loads can vary by orders of magnitude in unaffected streams. Baseline data on the variations in sediment loads prior to construction activities, are required to ensure proper implementation of any monitoring program.

Possible Construction Activity Impacts. Construction activities such as grading, bulldozing, leveling, and trenching could increase erosion and cause sediment to be transported to downstream areas. Although soil development in the project vicinity is not extensive, thin soil mantles have developed on the metasedimentary rocks that form the Sierra Nevada foothill belt.

To prevent transport of disturbed soils to the creek systems, a detailed erosion control plan will be developed as required by the El Dorado County RCD. The plan will include designs and will recommend other techniques for controlling sediment loss on project lands and prohibit construction activities when sediment transport potentials are high.

Water Sampling. Water samples from the creek should be collected during substantial storm events (equal to or greater than 0.5 inch of precipitation) to generate a set of data on the natural sediment loads and turbidity levels in the creek prior to construction. Table 7-1 shows the parameters recommended for sampling, rationale for sampling, and sampling interval. These data would provide the baseline upon which possible construction impacts could be evaluated. A minimum of two samples should be collected, one upstream of the project site and one downstream of the project site, during the storm events. This would assist in interpretation of data and ensure that representative samples are collected.

In the event that there is a dry year and no samples can be collected, samples should be taken the following year. Streamflow can either be estimated by a qualified person trained in streamflow gaging or be calculated from actual field measurements.

Water samples should be collected in appropriate containers provided by a contract laboratory and analyzed for the following parameters: total suspended solids, turbidity, and general minerals. Samples should be analyzed by a State of California certified laboratory. Total sediment loads for each creek for each storm event should be calculated using streamflow measurements or estimates and laboratory data.

Table 7-1. Recommended Water Quality Monitoring Program for Carson Creek: El Dorado County, California

Parameter	Rationale	Sampling Frequency
Streamflow	Required for sediment load calculations	Each sampling event
Turbidity	Measures water clarity; general indicator of suspended material	Four separate stations during each storm event
Total suspended solids	Measures suspended material. Required for load calculations	Four separate stations during each storm event
Total dissolved minerals	Measures content of salts and solids	Two locations during each storm event

Source: Jones & Stokes Associates 1988.

Reporting Requirements. Annual reports should include laboratory data, streamflow measurements, and interpretations of data. These reports would be forwarded to the RCD for review, thereby providing the RCD with an opportunity to evaluate the monitoring program and make the changes they feel are necessary to improve the monitoring program. Interpretation of data and preparation of reports should be conducted by a hydrologist, sedimentologist, or equally qualified individual.

Monitoring Program Review and Goal Assessment. The primary focus of the program is to protect the creek from negligent construction activities. Completion of the interchange is estimated to take place within 10 years. The program should be evaluated annually, subsequent to acquiring baseline information, to determine its effectiveness. If a review of annual reports indicates that the erosion control programs are working efficiently, RCD can decide to terminate the monitoring program. In contrast, if significant impacts are observed, RCD may make the necessary changes in the erosion control plans or increase water sampling and data collection.

Provide an Alternate Water Supply for Livestock

If access to the spring waters is inhibited or otherwise prevented, an alternate water supply for livestock should be provided during construction. If spring water could be consumed, or other direct contact uses were permitted by livestock or humans during construction, the construction site should be posted to prevent such an occurrence.

Implement Precautionary Measures During Construction to Minimize Water Quality Degradation

The design drawings for the project will include a detailed erosion control plan prepared to the satisfaction of El Dorado County RCD and Caltrans prior to approval of a grading permit.

The degree of water quality degradation that could occur during construction is greatly dependent on the precautions taken during the design and construction period. The following measures would help to ensure maintenance of water quality. These measures may be modified somewhat as a result of conditions imposed by various regulatory agencies; therefore, the following should not be regarded as a comprehensive list of all possible mitigation measures that would be implemented.

1. Cover any graded areas with a protective mulch as soon as soon as possible and reseed with adaptive plant species of value to wildlife.

2. Enforce strict rules to keep construction equipment and maintenance material out of swales, dry and flowing streambeds, and springs, particularly the spring at Carson Creek.

3. Collect and remove from the job site such pollutants as sanitary wastes and petroleum products.

4. Prepare a spill prevention and countermeasure plan prior to approval of a grading permit. The plan will be reviewed and approved by the El Dorado County Division of Environmental Health and Caltrans.

5. Use chemical toilets at all construction sites to prevent bacterial contamination of streams and springs.

6. Minimize surface disturbances to soil and vegetation as much as possible.

7. Dispose of excavated material appropriately, away from water sources.

8. Grade soil disposal and stockpile sites to minimize surface erosion.

9. Terrace and drain natural slopes to provide a sound foundation for embankments.

10. Revegetate graded areas to minimize erosion during wetter months of the year.

11. Install temporary sedimentation basins immediately downstream of the project site. Properly sized and designed sedimentation basins would substantially reduce discharges of sediment and other contaminants to downstream water bodies. Most soil erosion caused by construction generally occurs during construction and within the next two subsequent years following project completion. After 2 years, the basin or basins could be removed or continue their function of capturing sediment and pollutants.

Additional Mitigation Measures for the Ridge Design

No additional mitigation is required.

Additional Mitigation Measures for the Undercrossing Design

No additional mitigation is required.

CHAPTER 8. Vegetation, Wildlife, and Aquatic Resources

Descriptive site information is based on a review of pertinent literature, a record search of the DFG's Natural Diversity Data Base (NDDB) (1987), consultation with biologists from the DFG (Hinz pers. comm.) and the California Energy Commission (Estep pers. comm.), contacts with knowledgeable individuals, study of aerial photographs, and field surveys by a wildlife biologist and botanists on October 17, 1988. The common names of plant and animal species referred to in the text are included in Appendix D.

Field surveys also were performed by Jones & Stokes Associates' fishery biologists on February 19-20, 1987. The field survey included aquatic habitat within the El Dorado Hills Specific Plan area and is detailed in the Draft EIR for the El Dorado Hills Specific Plan on pages 12-12 through 12-14. This chapter summarizes the findings for Carson Creek, where appropriate.

SETTING

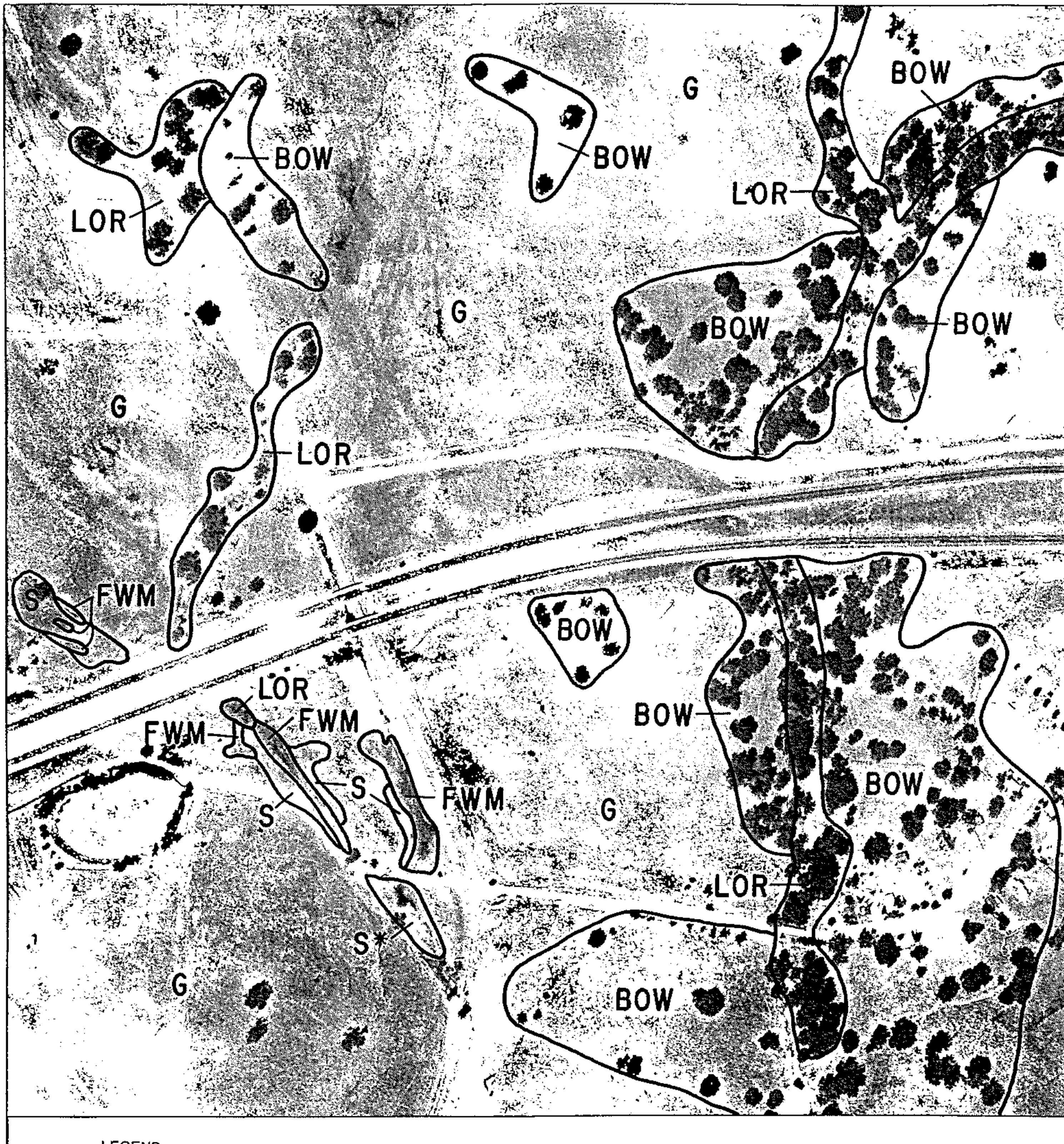
Habitats within the project area include annual grassland, blue oak woodland, live oak riparian woodland, and wetlands with marsh vegetation surrounded by stands of native purple needle grass (Figure 8-1). The term "wetland" as used in this chapter, does not mean wetland as defined by the U. S. Army Corps of Engineers (COE). Carson Creek also flows through the project area.

Annual Grassland

Annual grassland occurs as open rangeland and comprises the herbaceous layer of the blue oak woodland. Boundaries between annual grassland and blue oak woodland are indistinct in the project area because lone blue and interior live oaks occur randomly in wide grassland expanses.

Vegetation

Annual grassland is characterized by a diverse mix of non-native annual grasses and forbs intermixed with native forbs. Non-native grasses, including wild oats, ripgut brome, and soft chess, dominate the vegetation, but extensive amounts of tarweed also were noted during the fall survey, reflecting intensive grazing earlier in the year. Dominant grassland forbs include various clover, larkspur, brodiaea, popcorn flower, and lupine species with lesser amounts of goldfields, purple owl's clover, California poppy, and yellow star thistle.



LEGEND

- G GRASSLAND
- BOW BLUE OAK WOODLAND
- LOR LIVE OAK R(PARIAN WOODLAND
- S PURPLE NEEDLEGRASS GRASSLAND (HIGH DENSITY)
- S* PURPLE NEEDLEGRASS GRASSLAND (LOW DENSITY)
- FWM FRESHWATER MARSH/SEEP

FIGURE 8-1. HABITATS OF THE PROJECT AREA

Source: Jones & Stokes Associates

Wildlife

Annual grassland supports several breeding wildlife species including the western meadowlark, horned lark, California ground squirrel, and gopher snake. Grasslands provide foraging grounds for birds including the red-tailed hawk, mourning dove, lark sparrow, and lesser goldfinch.

The rocky soils in the project area are likely to provide habitats for small populations of burrowing rodents including the pocket gopher and ground squirrels. Cliff swallows forage in the grassland habitat and nest in culverts under U. S. 50 at Carson Creek and at the unnamed drainage to the west.

Blue Oak Woodland

Blue oak woodland occurs on arid, open hillsides of the project area. A gradual transition from blue oak woodland to a live oak riparian woodland occurs along Carson Creek. Blue oaks range in size up to 12 inches diameter at breast height (dbh).

Vegetation

Overstory cover varies from occasional lone blue and interior live oak trees with sparse cover to mixed stands of both species with cover exceeding 50 percent on slopes adjacent to Carson Creek. Interspersed on protected north slopes are a few buckeye, coffee berry, and poison-oak shrubs.

The herbaceous layers of blue oak woodland consist of an annual grassland that supports the same species listed for annual grassland. These species are clearly dominated by non-native annual grasses.

Wildlife

Blue oak woodland provides habitat for many wildlife species. Acorns are food sources for the acorn woodpecker, Lewis' woodpecker, scrub jay, western gray squirrel, and mule deer. Blue oaks host high insect populations which are fed upon by many species of birds including Nuttall's woodpecker, northern flicker, plain titmouse, bushtit, white-breasted nuthatch, ruby-crowned kinglet, and yellow-rumped warbler. Blue oaks also provide cavity nest sites for several wildlife species, including acorn woodpecker, western bluebird, plain titmouse, and white-breasted nuthatch.

Live Oak Riparian Woodland

Live oak riparian woodland occurs along the intermittent drainages of Carson Creek and along other unnamed intermittent creeks in the western portion of the project area.

A narrow band of vegetation lines the creek edges and extends partway upslope. The gradual transition from live oak riparian woodland to blue oak woodland is characterized by a shift from dense live oak stands to scattered blue and interior live oaks. No water was present in either creek at the time of the survey except for two small ponds south and adjacent to culvert outfalls that pass under U. S. 50.

Vegetation

Interior live oak dominates the woodland canopy of this habitat with large trees somewhat evenly spaced along the Carson Creek and more scarce along the unnamed creek. Occasional trees and saplings of valley oak, cottonwood, and Goodding's willow are interspersed along the creek channel. Channels support a sparse to dense shrub understory of arroyo willow, red willow, coffeeberry, buckeye, and button bush. Coffeeberry and buckeye extend upslope out of the riparian zone on protected north slopes.

Herbaceous vegetation is sparse along the rocky creek channel. Dominant herbs include deer grass, rabbitsfoot grass, boisduvalia, cocklebur, spanish clover, bermuda grass, spike rush, fiddle dock, Italian wild rye, umbrella sedge, smartweed, and sprangle top. A couple of small cattail stands occur at low, wet sites along Carson Creek.

The woodland of Carson Creek is relatively continuous and clearly dominated by evenly spaced interior live oaks along its edges and a consistent scattering of willows and button bush. Woodlands along the unnamed creeks have fewer interior live oaks, and tree cover is more spotty than that of Carson Creek, reflecting a more intermittent water supply. Woody vegetation is restricted to isolated plants or small clusters of trees and shrubs; however; most of the creek channels are devoid of woody vegetation. The canopy is dominated by valley oak and willows with an occasional interior live oak.

Wildlife

Interior live oak and its understory vegetation of buckeye, willow, button willow, and coffeeberry provides lush wildlife habitat. Acorns are food sources for acorn woodpecker, Lewis' woodpecker, northern flicker, scrub jay, and western gray squirrel. An abundance of insects in this habitat provide food for black phoebe, scrub jay, plain titmouse, bushtit, white-breasted nuthatch, Bewick's wren, ruby-crowned kinglet, western bluebird, and yellow-rumped warbler. Seeds produced by grasses and shrubs provide food for golden-crowned sparrow, white-crowned sparrow, house finch, and lesser goldfinch.

Freshwater Marshes and Seeps

A seep north of U. S. 50 at the western edge of the project area, and flat lowlands south of U. S. 50 along the unnamed creek, support marsh vegetation surrounded by small native perennial grasslands (described separately below). Wet land vegetation develops at these sites because a series of small springs surface on the hillside and along the creek channel, providing surface or subsurface water throughout the year.

Vegetation

The marsh vegetation consists of about 9 acres of habitat within and adjacent to the project area and encompasses two plant associations, both dominated by wetland indicator species. The wetter areas along the drainages support typical marsh vegetation dominated by narrow-leaved cattail, baltic rush, umbrella sedge, rice cut grass, spike rush, June century, rabbitsfoot grass, smartweed, and willow herb. A few arroyo and red willows are scattered along the drainage south of U. S. 50, forming a patchy overstory.

Drier margins of the marsh habitats are dominated by dense sedge with lesser amounts of baltic rush, June century, purple needlegrass, and pennyroyal.

Wildlife

Wetland habitats are of special importance because of their wildlife value. Two small marshes on the south side of U. S. 50 (each about 175 square feet in size) are present, one on Carson Creek and one on the unnamed creek to the west. These marshes are permanent water sources for wildlife in the project area. Bullfrogs and small (1- to 2-inch-long) unidentified fish were found in each marsh. Many wildlife species use surface water including pacific tree frog, raccoon, western gray squirrel, black phoebe, and cliff swallow.

Purple Needlegrass Grassland

Low terraces adjacent to the marsh habitat support dense stands dominated by purple needlegrass. Although not a wetland indicator species (U. S. Army Corps of Engineers 1987), purple needlegrass prefers sites where soil moisture is available during summer, unlike the adjacent uplands in the project area that have annual grassland vegetation. The late season moisture retained in the low terraces provides a suitable habitat that is required for the perennial purple needlegrass. Deeper soils adjacent to the marshes, and the groundwater provided by the springs, creates habitat conditions favorable for this species.

Purple needlegrass is believed to have been one of California's dominant grass species prior to the advent of Anglo Saxon settlement. Vast prairies of purple needlegrass were probably found in areas having deep soils and a high moisture content. Today, grasslands dominated by purple needlegrass are extremely uncommon in the Sierra foothills and Sacramento Valley, presumably having been eliminated by the combined effects of livestock grazing, introduction of non-native annual grasses, and fire suppression. No purple needlegrass grasslands are currently reported in El Dorado County (Holland pers. comm.).

Vegetation

Purple needlegrass grasslands in the project area are dominated by purple needlegrass, which contributes 80-90 percent of the total cover; small amounts of baltic rush, June century, hawkbit, spanish clover, medusa head, prickly lettuce, and soft chess are interspersed. The herb cover is dense and soil is only visible in areas disturbed by livestock.

Wildlife

Wildlife species of the purple needlegrass grassland include the same species described earlier for the annual grassland.

Special-Status Species

Vegetation

Special-status plants are defined to include:

- California rare, threatened, or endangered species (California Department of Fish and Game 1987),
- Federally listed, proposed, or candidate threatened or endangered species (50 Federal Register 39526-39584, September 27, 1985), and
- California Native Plant Society (CNPS) rare and endangered species (Smith and Berg 1988).

A list of special-status plants that could occur in the project area was compiled using the data and information contained in the NDDB database record search (1987), Smith and Berg (1988), CNPS (1985), Jones & Stokes Associates (1987a, 1988). The literature review provided a list of 13 special-status plant species that may occur in the foothills of El Dorado County (Table 8-1). No populations of special-status plants have previously been reported from the project site (Natural Diversity Data Base 1987, Jones & Stokes Associates 1987a).

The special-status plants listed in Table 8-1 are restricted to serpentine and gabbro substrates and vernal pools. The field survey and a review of the El Dorado County soil survey revealed that gabbro and serpentine substrates do not occur in the project area (U. S. Soil Conservation Service 1974). The field survey also revealed that no vernal pool habitat exists in the project area. Based on these observations, it was concluded that none of the special-status plants known from the region could occur in the project area.

Table 8-1. Special-Status Plants That Could Possibly Occur in the Foothills of El Dorado County

Plants of Vernal Pools		Plants of the Gabbro Formation	
Species	Legal Status[a] Fed/State/CNPS	Species	Legal Status[a] Fed/State/CNPS
<u>Gratiola</u> <u>heterosepala</u> Bogg's Lake hedge-hyssop	C2/CE/1b	<u>Ceanothus</u> <u>roderickii</u> Pine Hill ceanothus	C2/CR/1b
<u>Juncus</u> <u>leiospermus</u> Red Bluff rush	C2/--/1b	<u>Chlorogalum</u> <u>grandiflorum</u> Red Hills soaproot	C1/--/1b
<u>Legenere</u> <u>limosa</u> Greene's legenere	C2/--/1b	<u>Fremontodendron</u> <u>decumbens</u> Pine Hill flannel bush	C2/CR/1b
<u>Orcuttia</u> <u>tenuis</u> Slender Orcutt grass	C1/CE/1b	<u>Galium</u> <u>californicum</u> ssp. <u>Sierrae</u> El Dorado bedstraw	C2/CR/1b
<u>Orcuttia</u> <u>viscida</u> Sacramento Orcutt grass	C1/CE/1b	<u>Helianthemum</u> <u>suffrutescens</u> Bisbee Peak rushrose	C2/--/1b
<u>Tuctoria</u> <u>greenei</u> Greene's tuctoria	C1/CE/1b	<u>Senecio</u> <u>layneae</u> Layne's butterweed	C2/CR/1b
		<u>Wyethia</u> <u>reticulata</u> El Dorado County mule ears	C2/--/1b

[a] <u>Status explanations</u>:

Fed = U. S. Fish and Wildlife Service (50 Federal Register 39526-39584 September 27, 1985).

C1 = In Category 1 of the list of species under review for federal protection. This includes species for which the U. S. Fish and Wildlife Service "presently has enough information on hand to support the biological appropriateness of their being listed as endangered or threatened species. Because of the large number of such species, and because of the necessity of gathering data concerning the environmental and economic impacts of listings and designations of critical habitats, it is anticipated that the development and publication of proposed and final rules concerning such species will require several years."

C2 = In Category 2 of the list of species under review for federal protection. This includes species for which the U. S. Fish and Wildlife Service presently has information that "indicated the probable appropriateness of listing as endangered or threatened, but for which sufficient information is not presently available to biologically support a rule. Further biological research and field study will usually be necessary to determine the status of taxa included in this category."

State = California Department of Fish and Game (1987).

CE = Designated endangered.

CR = Designated rare.

CNPS = California Native Plant Society (Smith and Berg 1988).

1b = Rare or endangered in California and elsewhere. Although most of these species are not yet designated rare or endangered by the State of California, all meet the criteria for eventual listing.

Wildlife

The project area could support several wildlife species that are protected under state or federal endangered species laws, based on the known distribution of species and their habitat requirements. Several species designated by the DFG as species of special concern could also occur.

The NDDB (1987) has no record of state- or federally listed species, candidates for listing, or special concern animals in the project vicinity. However, several of these species have been recorded within several miles of the project area. Table 8-2 lists the possible special-status wildlife species, along with their legal status, preferred habitat, and possibility for regular occurrence at the project area.

Swainson's Hawks. Swainson's hawks forage in croplands, pastures, and grasslands and nest in large trees including valley oaks and cottonwoods (Bloom 1980, Remsen 1978). The nearest known nest is in Sacramento County near Scott's Road and White Rock Road approximately 7 miles to the southwest (Estep pers. comm.). Swainson's hawks probably do not nest in the project area, but could forage there. Foothill annual grassland habitat is probably less suitable for foraging than agricultural lands (Detrich 1986). No large raptor nests were found during the field survey.

Burrowing Owl. Burrowing owls occur in a variety of habitats including grasslands and agricultural areas (Zarn 1974). These owls nest in burrows excavated by rodents, particularly the California ground squirrel. Burrowing owls were not observed during the field survey nor are they expected to nest in the project vicinity. However, they could forage there. Few ground squirrels or ground squirrel burrows were found during the field surveys. Rock outcrops, also used for nesting, were not present.

Tricolored Blackbird. Tricolored blackbirds typically nest in dense vegetation in freshwater marshes of the Central Valley and foothills (Jones & Stokes Associates 1987). Tricolored blackbirds are not expected to occur in the project area. No suitable nesting habitat occurs in the project area, and no tricolored blackbirds were observed during the field surveys. The blackbird was not observed during a 1987 survey in the El Dorado Hills Specific Plan area (Jones & Stokes Associates 1987).

California Red-legged Frog. Red-legged frogs occur in permanent wetlands, streams, and ponds of the foothills of California (Stebbins 1972). Two marshes on the south side of U. S. 50 provide suitable habitat for red-legged frogs, but no adult red-legged frogs were observed during the wildlife survey. The red-legged frog probably does not occur in these ponds because bullfrogs, a major predator on red-legged frogs, are common and escape cover is minimal. Red-legged frogs are usually excluded from ponds containing bullfrogs (Moyle 1973).

Valley Elderberry Longhorn Beetle. Valley elderberry longhorn beetles (VELB) are pith-borers on elderberry shrubs (Sambucus spp.) in riparian habitats. The closest known VELB populations occur on the American River downstream of Folsom Lake (Jones & Stokes Associates 1987b). No elderberry shrubs were present and VELB is not expected to occur in the project area.

Table 8-2. Special-Status Wildlife Species That Could Possibly Occur in the Foothills of El Dorado County

Species	Legal Status[a]	Preferred Habitats	Possibility for Regular Occurrence
Valley elderberry longhorn beetle	FT	Riparian with elderberry shrubs	low to none
California red-legged frog	FC, CP, SSC	wetlands	low
Swainson's hawk	FC, ST	agricultural lands, grasslands, riparian	low
Ferruginous hawk	FC	grasslands	low to moderate
Cooper's hawk	SSC	woodlands	low
Merlin	SSC	woodlands	low
Black-shouldered kite	CP	wetlands, grasslands, riparian	low to moderate
Burrowing owl	SSC	agricultural lands, grasslands	low
Tricolored blackbird	FC, SSC	wetlands, agricultural lands	low to none
Golden eagle	CP, SSC	grasslands	low
Northern harrier	SSC	wetlands, grasslands	low to moderate
Prairie falcon	SSC	open fields	low

[a] Status explanations:

FT = federally listed as threatened.
FC = a candidate species under review for federal listing.
ST = state listed as threatened.
SSC = state species of special concern.
CP = California protected.

Winter Raptors. Several species of special-status raptors could occur in the project area during winter, including ferruginous hawk, Cooper's hawk, merlin, black-shouldered kite, golden eagle, northern harrier, and prairie falcon. The ferruginous hawk, black-shouldered kite, golden eagle, northern harrier, and prairie falcon are wide-ranging species that occur during the nonbreeding season in open grassland habitats. These raptors probably occur on an irregular basis in the project area. Cooper's hawk and merlin probably occur irregularly in oak woodland-grassland habitats.

Aquatic Resources

Streams in the project area fall within the California Roach Zone described by Moyle (1976). Streams characteristic of this zone are small warm tributaries to larger streams or reservoirs and flow through open foothills of oak woodland. During the summer, fish are confined to stagnant pools that may exceed 30°C during the day. Native California roach or green sunfish are the predominant species. These streams can be used by other fishes migrating upstream to spawn during the winter and spring. Sacramento sucker, Sacramento squawfish, native minnows, and salmonids commonly use these types of streams for spawning. Fish can survive throughout the summer if pools are sufficiently large and deep.

Biologists surveyed representative reaches and sampled 185 meters of Carson Creek using electrofishing gear. Carson Creek is the largest stream in the general area (February 1987 flow estimated at 2 cfs). Lower Carson Creek near the project area is low gradient, with poor fish habitat. There is little cover, and silt and cobble substrates are predominant. Only one small (25 mm) green sunfish was sampled and one dead bluegill was found. No other fish were observed or sampled. The culvert under U. S. 50 precludes any seasonal fish migrations.

IMPACTS

Impacts Common to Both Alternatives

Implementation of either design would result in diminished habitat for plants and wildlife. This impact is considered significant. To reduce this impact to a less-than-significant level, prepare and implement a detailed biological mitigation plan.

Annual Grassland

Vegetation. Implementation of either design would result in elimination or disturbance of the annual grasslands in the project area. This impact is considered less than significant because annual grasslands are widespread throughout the region, are dominated by non-native species, and do not support any significant botanical attributes. No mitigation is required.

Wildlife. Implementation of either design would result in the loss of annual grassland habitat, thereby displacing or eliminating wildlife species. This impact is considered less than significant because most wildlife species occupying grasslands are common and widespread. No mitigation is required.

Blue Oak Woodland

Vegetation. Based on the review of the preliminary design drawings (8/88) of the ridge design, it was assumed that all oak trees within the project area would be eliminated except for those within 50 feet of the creek channel edges.

Implementation of either design would result in elimination of blue oaks (Ridge Design would eliminate 59 blue oaks [51 with dbh exceeding 12 inches and 8 with a dbh range of 6-12 inches]; Undercrossing Design would eliminate 20 blue oaks [15 with dbh exceeding 12 inches and 5 with a dbh range of 6-12 inches]). This impact is considered significant because of their increasing local and regional scarcity, the threats facing many of the locally remaining stands, their value to dependent wildlife and plant species, and because blue oaks are suffering from inadequate reproduction (Mayer et al. 1986, Lang 1988). To reduce this impact to a less-than-significant level, design the project to save as many oak trees as possible, protect oak trees from construction and landscaping impacts, and replant with native oaks.

Wildlife. Implementation of either design would result in the loss or displacement of wildlife species of the blue oak woodland. This impact is considered significant due to the local and regional declines of this habitat type. To reduce this impact to a less-than-significant level, implement the blue oak woodland vegetation mitigation measures.

Live Oak Riparian Woodland

Vegetation. Implementation of either design would result in:

- o elimination of interior live oak trees and riparian shrubs. This impact is considered significant because of the growing local and regional scarcity of riparian habitats and because the DFG has established a no-net-loss policy to help sustain riparian habitat. To reduce this impact to a less-than-significant level, protect riparian woodland from construction impacts, and replant riparian areas with woody vegetation.

- o possible construction-related impacts to both creeks if debris or soil are sidecast into the channel from adjacent areas. This impact is considered potentially significant. To reduce this impact to a less-than-significant level, protect riparian woodland from construction impacts.

Wildlife. Implementation of either design would result in the loss of interior live oak woodland habitat and subsequent elimination or displacement of wildlife species associated with this habitat. This impact is considered significant because this habitat is declining rapidly locally and regionally. To reduce the impact to a less-than-significant level, implement the live oak riparian woodland vegetation mitigation measures.

Freshwater Marshes and Seeps

Vegetation. Implementation of either design would result in elimination of wetlands including freshwater marsh habitat dominated by dense sedge (Ridge Design would eliminate 1.6 acres including 1.1 acres of freshwater marsh and 0.5 acre of habitat dominated by dense sedge; Undercrossing Design would eliminate 7.5 acres including 4.5 acres of freshwater marsh and 3 acres of habitat dominated by dense sedge). This impact is considered significant for the following reasons:

- its value to dependent plant and wildlife species,
- it provides a major year-round water source for wildlife,
- its increasing local and regional scarcity, and
- the DFG has established a no-net-loss policy for wetland habitats.

To reduce this impact to a less-than-significant level, protect the marshes from construction impacts, establish a wetland of equal acreage and value or enhance an existing degraded wetland, and design culvert outfalls that allow new ponds to form.

Wildlife. Implementation of either design would result in the loss of marsh habitat, thereby eliminating sources of water for wildlife. This impact is considered significant. To reduce this impact to a less-than-significant level, implement the freshwater marshes and seeps vegetation mitigation measures.

Purple Needlegrass Grassland

Vegetation. Implementation of either design would result in the elimination of purple needlegrass grassland (Ridge Design 0.15 acre; Undercrossing Design 2.7 acres). This impact is considered significant because it represents a remnant vestige of a once common habitat; the occurrence at the project area is the only one known for El Dorado County, and it is locally and regionally scarce. To reduce this impact to a less-than-significant level, protect the purple needlegrass from construction impacts, and replant an area with purple needlegrass.

Wildlife. Implementation of either design would result in the elimination of habitat for wildlife species associated with the purple needlegrass grassland. This impact is considered significant for the reasons described above. To reduce this impact to a less-than-significant level, implement the purple needlegrass grassland vegetation mitigation measures.

Special-Status Species

Vegetation. Implementation of either design would result in no impacts to any special-status plant species. No mitigation is required.

Wildlife. Implementation of either design would result in:

- o the loss of possible foraging habitat for Swainson's hawks. This impact is considered less than significant because annual grassland is common locally, and Swainson's hawks are not known to nest or forage near the project site. No mitigation is required.

- o the loss of possible foraging habitat for burrowing owls. This impact is considered less than significant because annual grassland is locally common. No mitigation is required.

- o no loss of possible habitat for the tricolored blackbird. No mitigation is required.

- o the loss of possible habitat for the red-legged frog. This impact is considered less than significant because red-legged frogs probably do not occur in the ponds. No mitigation is required.

- o no loss of elderberry shrubs and, therefore, no impacts to VELB. No mitigation is required.

- o elimination of foraging habitat for several special-status raptors. This impact is considered less than significant because annual grasslands are locally common. No mitigation is required.

Additional Impacts of the Ridge Design

Implementation of the Ridge Design would result in bypassing and eliminating creek channel habitat for culvert extension and new culverts. This impact is considered less than significant because of the general absence of woody vegetation in the affected reaches and because the intermittent creek would not be entirely eliminated in the culvert areas. No mitigation is required.

Additional Impacts of the Undercrossing Design

Implementation of the Undercrossing Design would result in:

- o bypassing and eliminating creek channel habitat thereby eliminating a small number of willow, interior live oak, and valley oak trees. This impact is considered significant because of the presence of woody vegetation along the affected reaches. To reduce this impact to a less-than-significant level, replant riparian areas with woody vegetation.

- o possible elimination of portions of the marsh adjacent to the project area by changes to the moisture regime resulting from construction in upslope portions of the marsh, or possible disturbance during construction by vehicle encroachment, materials and equipment staging, or the placement of fill or other debris. This impact is considered potentially significant. To reduce this impact to a less-than-significant level, protect the marshes from construction impacts.

MITIGATION MEASURES

Mitigation Measures for Both Alternatives

Prepare and Implement a Detailed Biological Mitigation Plan

The design drawings will include a detailed biological mitigation plan. The plan will be reviewed and approved by El Dorado County, Caltrans, and DFG before construction begins. The plan should describe impacts to the creek channels and associated riparian vegetation, identify the number of oak trees eliminated, explain the extent of impacts to wetland habitats and the purple needlegrass grassland, specify the location of fences to minimize impacts to existing vegetation, and describe the various plantings to be implemented.

Mitigation planting and wetland construction should occur simultaneously with grading and construction. Mitigation may be onsite or offsite.

Blue Oak Woodland

Design the Project to Save as Many Oak Trees as Possible. A qualified botanist will work with the design engineers to identify any oak trees that may be saved by minor revisions to the design.

Protect Oak Trees from Construction and Landscaping Impacts. The following guidelines ensure that oak trees not removed during construction are not inadvertently harmed or killed during the construction and landscaping phase of the project. The guidelines apply to all oak trees in the project area, as much as possible.

1. Have a qualified botanist work with the design engineers to identify all the oak trees to be saved. These trees will be protected by installation of a fence, which will be installed at the direction of the botanist prior to grading. The fence will protect the root zone, which is 1.5 times the radius of the trunk to the dripline. For example, an oak tree with a 40-foot-diameter canopy would require a fence 30 feet from the trunk.

2. Protect all oak trees greater than 6 inches dbh to the maximum extent feasible.

3. Do not attach signs, ropes, cables, or other items to oak trees.

4. Do not park, stockpile, or locate any vehicles, construction equipment, mobile offices, supplies, materials, or facilities within the root zone of oak trees.

5. Do not remove soil surface to a depth greater than 1 foot within the driplines of oak trees, and do not make any cuts whatsoever within 5 feet of the trunks.

6. Do not place earthen fill deeper than 1 foot within the driplines of oak trees, and do not place any fill whatsoever within 5 feet of the trunks.

7. If extensive cuts or fills have to be made near oak trees within the dripline, provide adequate drainage to mitigate the adverse effects caused by elevation changes.

8. Do not allow any trenching whatsoever within the driplines of oak trees. If it is absolutely necessary to install underground utilities within the dripline of oak trees, the trench will be either bored or drilled but not within 10 feet of the tree trunks.

9. Where soil compaction occurs within the dripline of an oak tree, take measures to restore soil condition, aeration, and permeability to water.

10. Stringently minimize paving within the driplines of oak trees. When it is absolutely necessary, porous materials will be used for paving, with consideration given to the need for aeration and water permeability.

11. Do not allow artificial irrigation within the driplines of oak trees.

12. Do not use landscaping within the dripline of oak trees except for nonplant materials such as boulders, cobbles, woodchips, etc.

Replant with Native Oaks. A qualified botanist will work with the design engineers and landscape architect for the project to replant the same species of oaks as are eliminated by the project. Replacement of oak trees will be based on the design guidelines found in the El Dorado Hills Specific Plan.

The oaks must be planted in the same environmental site conditions in which blue oaks and interior live oaks occur, considering such features as topography, drainage, water regime, soil type, and slope aspect. Maintenance of newly planted seedlings also must be considered, along with the planted site's compatibility with future landscaping objectives (see previous discussion).

It may be feasible to plant trees along the new roads and ramps or within cloverleafs. Other possible areas for planting of oaks would include designated open space areas within the El Dorado Hills Specific Plan area.

Live Oak Riparian Woodland

Protect Riparian Woodland from Construction Impacts. The design drawings will indicate the installation of fencing to avoid incidental impacts during construction in the vicinity of Carson Creek and the unnamed creek. The location and amount of fencing will be determined with the assistance of a qualified botanist. The fencing should be so located as to prevent unnecessary vehicle intrusion into the riparian areas and to prevent sidecasting of material into the riparian areas.

Replant Riparian Areas with Woody Vegetation. A qualified botanist will work with the design engineers to replant riparian areas with woody vegetation. Plantings should be made along the same creek corridor in which the impacts occur. Plantings should be attempted in areas lacking a tree canopy. A 2:1 planting ratio is acceptable for willows and cottonwoods. Maintenance and monitoring requirements are the same as those specified above under blue oak woodland.

Freshwater Marshes and Seeps

Protect the Marshes from Construction Impacts. The design drawings will indicate the installation of fencing to avoid incidental impacts during construction in the vicinity of the marshes and seeps. The location and amount of fencing will be determined with the assistance of a qualified botanist. The fencing should be erected around portions of the marsh that would not be eliminated by the project to prevent accidental encroachment or use of the site for material or equipment staging. In addition, temporary concrete barriers should be erected along U. S. 50 to prevent sidecast material from falling into the creek channels and marshes.

Establish a Wetland of Equal Acreage and Value or Enhance an Existing Degraded Wetland. A qualified botanist will work with the design engineers to establish a wetland of equal acreage and value to replace the wetland lost through construction. Alternatively, an existing degraded wetland may be enhanced.

A site with suitable wetland hydrology and topography could be identified for the creation of a new freshwater marsh habitat. The created marsh would have to replace acreages eliminated by the project and achieve the same ecosystem values by establishing the same kind and density of vegetation. The site would have to be protected in perpetuity to ensure full mitigation.

A second option entails locating a degraded seep or marsh in the vicinity and enhancing the site to recoup the values lost by elimination of the marsh in the project area. Enhancement could involve eliminating use by livestock, planting marsh vegetation, and providing a reliable water supply.

Regardless of the option selected, the site would have to be assured permanent protection.

Design Culvert Outfalls that Allow New Ponds to Form. A qualified botanist will work with the design engineers to identify possible culvert outfall structures in the project area that may be designed to allow the formation of small ponds below the outfalls.

Purple Needlegrass Grassland

Protect the Purple Needlegrass Grassland from Construction Impacts. The design drawings will indicate the installation of fencing to avoid unnecessary impacts on purple needlegrass during construction. The location and amount of fencing will be determined with the assistance of a qualified botanist.

Replant an Area with Purple Needlegrass. A qualified botanist will identify a local site with compatible soils and hydrology to be planted with purple needlegrass. The objective is to establish grassland of a density equal to that of the site eliminated. A number of degraded seeps in the local area are considered suitable for this purpose.

Additional Mitigation Measures for the Ridge Design

No additional mitigation is required.

Additional Mitigation Measures for the Undercrossing Design

No additional mitigation is required.

CHAPTER 9. Public Services and Facilities

This chapter of the EIR focuses on the Pacific Gas and Electric Company (PGandE) substation and associated facilities and the El Dorado Irrigation District (EID) water and sewer lines. Other public services would not be impacted by the interchange project.

SETTING

Existing PGandE Facilities

The following information was provided by PGandE (Armi pers. comm.).

PGandE operates the Clarksville Substation, which is located south of U. S. 50 and west of the White Rock Road undercrossing. The substation converts 115-kV voltage from two transmission lines (the Gold Hill-El Dorado steel pole lines) into four 12-kV distribution circuits (the Gold Hill-Martell wood pole line) using two power transformers.

The Gold Hill-El Dorado 115-kV transmission lines supply Clarksville and other major distribution substations in the area. These two 115-kV transmission lines consist of 715.5-kcm aluminum conductors supported by double circuit tubular steel poles. The Gold Hill-Martell 60-kV transmission line runs generally parallel to the two 115-kV lines in the area of the proposed interchange and is supported by wood poles (Figure 9-1). The 60-kV line is underbuilt with a 12-kV distribution circuit from Clarksville Substation.

An irrigation well, pump, and irrigation system are located on the north side of the substation area. The purpose of the system is to provide water for the perimeter landscaping. The security of the substation is maintained by a fence with a locked gate surrounding the perimeter of the substation.

Long-Term Expansion Plans for the Substation

The long-term expansion plans for the substation include the prospect of building three power transformers and installing twelve distribution circuits. Furthermore, as the electric load increases in the Clarksville area, additional distribution circuit outlets will be required from the Clarksville Substation. Some of the required circuits will have to cross U. S. 50 to reach the new load centers. Six 6-inch conduits for the distribution of electricity will be needed to cross the freeway in the vicinity of the proposed interchange.

Also, in planning for growth in Clarksville, PGandE would need to extend a gas transmission and distribution feeder line across U. S. 50. This could be accomplished by

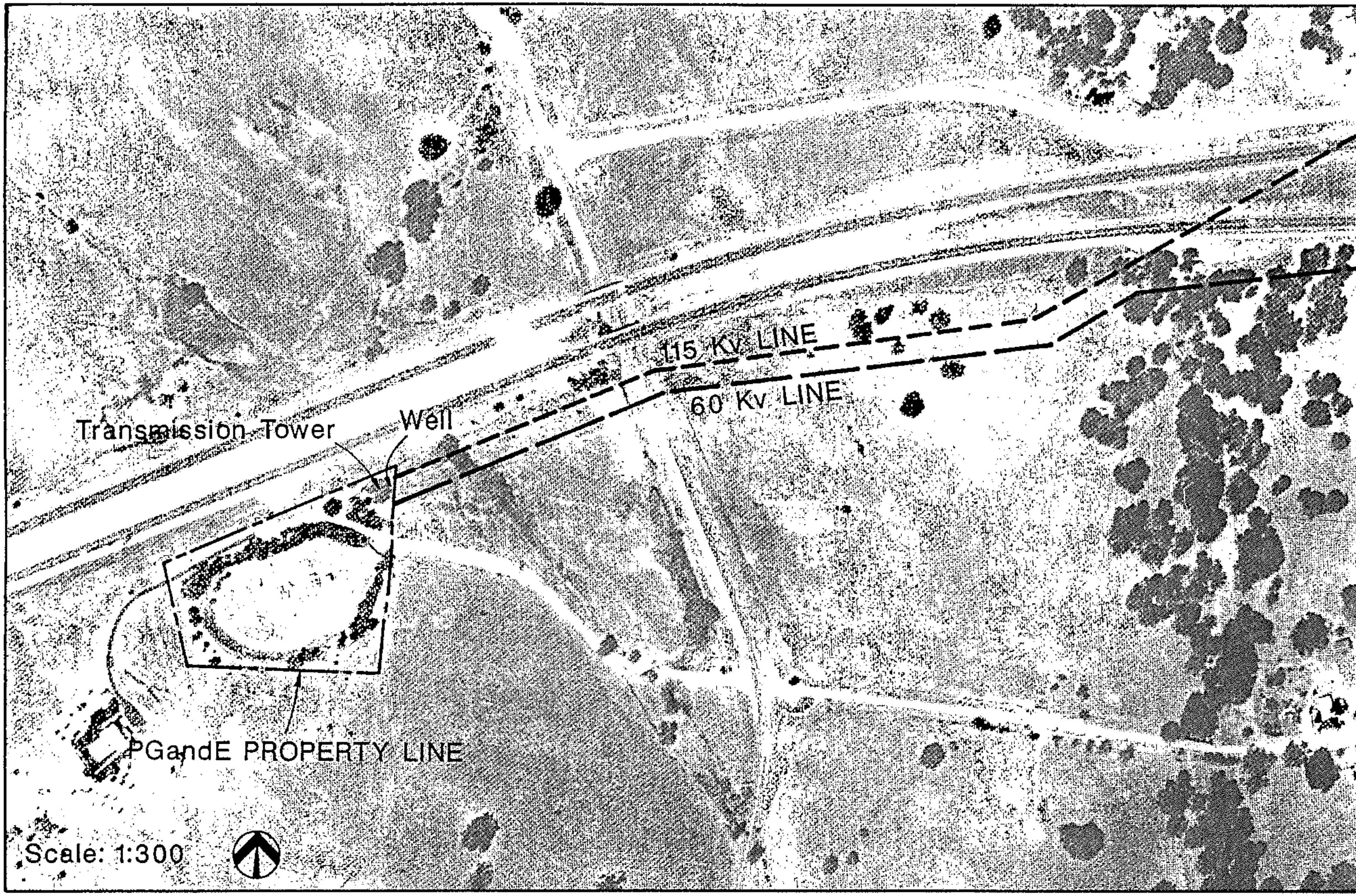


FIGURE 9-1. LOCATION OF PGandE FACILITIES

housing the gas transmission facilities in a 12-inch conduit in the proposed bridge (overcrossing) or existing undercrossing.

Existing EID Facilities

EID has two lines in White Rock Road as it crosses under the freeway. A 12-inch asbestos concrete water pipe is buried approximately 30 inches deep along the western side of the road. An 18-inch dipped iron sewer pipe is buried approximately 30 inches deep down the center of the road (McCurry pers. comm.).

IMPACTS

Impacts Common to Both Alternatives

Implementation of either design would result in:

- o relocation of two 115-kV lines, one 60-kV transmission line, and two distribution lines (underbuilt on the 60-kV transmission line). This impact is considered significant. To reduce this impact to a less-than-significant level, relocate the three transmission and two distribution lines outside the Caltrans right-of-way.
- o conflict with the planned expansion of PGandE electric and gas facilities. This impact is considered significant. To reduce this impact to a less-than-significant level, provide for electrical and gas line conduits in the interchange design.

Additional Impacts of the Ridge Design

Implementation of the Ridge Design would result in no interference with the access road or encroachment on the PGandE substation property. This impact is considered less than significant. No mitigation is necessary.

Additional Impacts of the Undercrossing Design

Implementation of the Undercrossing Design would result in:

- o closure of a portion of the Joerger Cutoff Road beyond the entrance of the substation. This impact is considered potentially significant. To reduce this impact to a less-than-significant level, maintain access to the PGandE substation as indicated on the design plans.

- possible removal of some of the perimeter landscaping. This impact is considered potentially significant. To reduce this impact to a less-than-significant level, replace landscaping with an equivalent aesthetic barrier.

- relocation of the onsite well and portions of the irrigation system to within the Caltrans right-of-way. This impact is considered significant. To reduce this impact to a less-than-significant level, obtain an encroachment permit from Caltrans to reach irrigation facilities or provide a replacement water supply and irrigation system outside of the Caltrans right-of-way.

- conflict with the depth and location of EID water and sewer lines because of the need to lower the road to provide adequate clearance for traffic under the freeway. This impact is considered significant. To reduce this impact to a less-than-significant level, relocate the EID water and sewer lines during construction.

MITIGATION MEASURES

Mitigation Measures for Both Alternatives

Relocate the Three Transmission and Two Distribution Lines Outside the Caltrans Right-of-Way

PGandE should prepare relocation plans for the 115-kV and 60-kV transmission and underbuilt distribution lines. These plans should be submitted to the El Dorado County Department of Transportation for site plan review prior to adoption of the relocation route and acquisition of right-of-way. El Dorado County would be required to convey or cause to be conveyed at no cost to PGandE all the necessary land, entitlements, and permits in a form satisfactory to PGandE.

The relocation route selection should not impact blue oak woodland, live oak riparian woodland, freshwater marshes, or the purple needlegrass grassland. If the route and pole placement result in the loss of acreage of any of these habitats, replacement plantings would be required.

The method of relocating the transmission lines should ensure that service to PGandE customers is not interrupted or degraded. This can be accomplished by erecting temporary lines (shoo-flies) around the interchange, reconnecting the shoo-flies to keep the lines and facilities served from the lines energized and operational, disconnecting the line sections to be relocated, removing and reinstalling the lines around the proposed interchange, reconnecting the relocated permanent lines, and then removing the shoo-flies.

A simplified and less costly method of relocating the transmission lines would be to build and connect new, permanent line sections around the proposed interchange and then remove the lines which are within the interchange right-of-way.

Provide for Electrical and Gas Line Conduits in the Interchange Design

El Dorado County should provide for six 6-inch conduits for distribution of electricity in the proposed interchange to help accommodate electric circuit expansion across the highway. The specifications should be prepared by PGandE and incorporated as part of the final construction drawings.

Additional Mitigation Measures for the Ridge Design

No additional mitigation is required.

Additional Mitigation Measures for the Undercrossing Design

Maintain Access to the PGandE Substation as Indicated on the Design Plans

The design drawings and construction requirements for the project should indicate that PGandE will need to maintain continual access to the substation.

Replace Landscaping with an Equivalent Aesthetic Barrier

El Dorado County should replant any landscaping that is removed during the construction of the interchange or replace the landscaping with an aesthetically pleasing barrier such as wooden fencing, attractive walls, or a combination of fences, walls, and landscaping.

Obtain an Encroachment Permit from Caltrans to Reach Irrigation Facilities or Provide a Replacement Water Supply and Irrigation System Outside of the Caltrans Right-of-Way

An encroachment permit or easement would be necessary for PGandE to gain access to the onsite well and portion of the irrigation system located on the northeast corner of the substation, because these facilities would be located within the Caltrans right-of-way. If an encroachment permit is not obtainable, then El Dorado County should provide for a replacement water supply and irrigation system so that PGandE can continue its irrigation practices.

Relocate the EID Water and Sewer Lines During Construction

EID should prepare relocation plans for the water and sewer lines in White Rock Road that would be impacted by lowering and widening White Rock Road.

These plans should be submitted to the El Dorado County Department of Transportation prior to acquisition of right-of-way.

CHAPTER 10. Transportation

This chapter was prepared by Jones & Stokes Associates and is based on traffic studies conducted by TJKM Transportation Consultants and Bissell & Karn, Inc.

SETTING

Existing Roadway Network

The project is located along U. S. Highway 50 (U. S. 50) between the El Dorado Hills Boulevard and Bass Lake Road interchanges near El Dorado Hills. Figure 10-1 is a map showing the major roads in the project vicinity. Four major roadways within the Silva Valley interchange study area are important to the traffic analysis, including U. S. 50, El Dorado Hills Boulevard/Latrobe Road, Bass Lake Road, and White Rock Road. These roads are described in detail below.

- U. S. Highway 50, in the El Dorado Hills area, is a grade-separated four-lane freeway. Access to the highway is provided via interchanges at El Dorado Hills Boulevard and Bass Lake Road. The highway provides service to Sacramento to the west and Placerville and Lake Tahoe to the east.

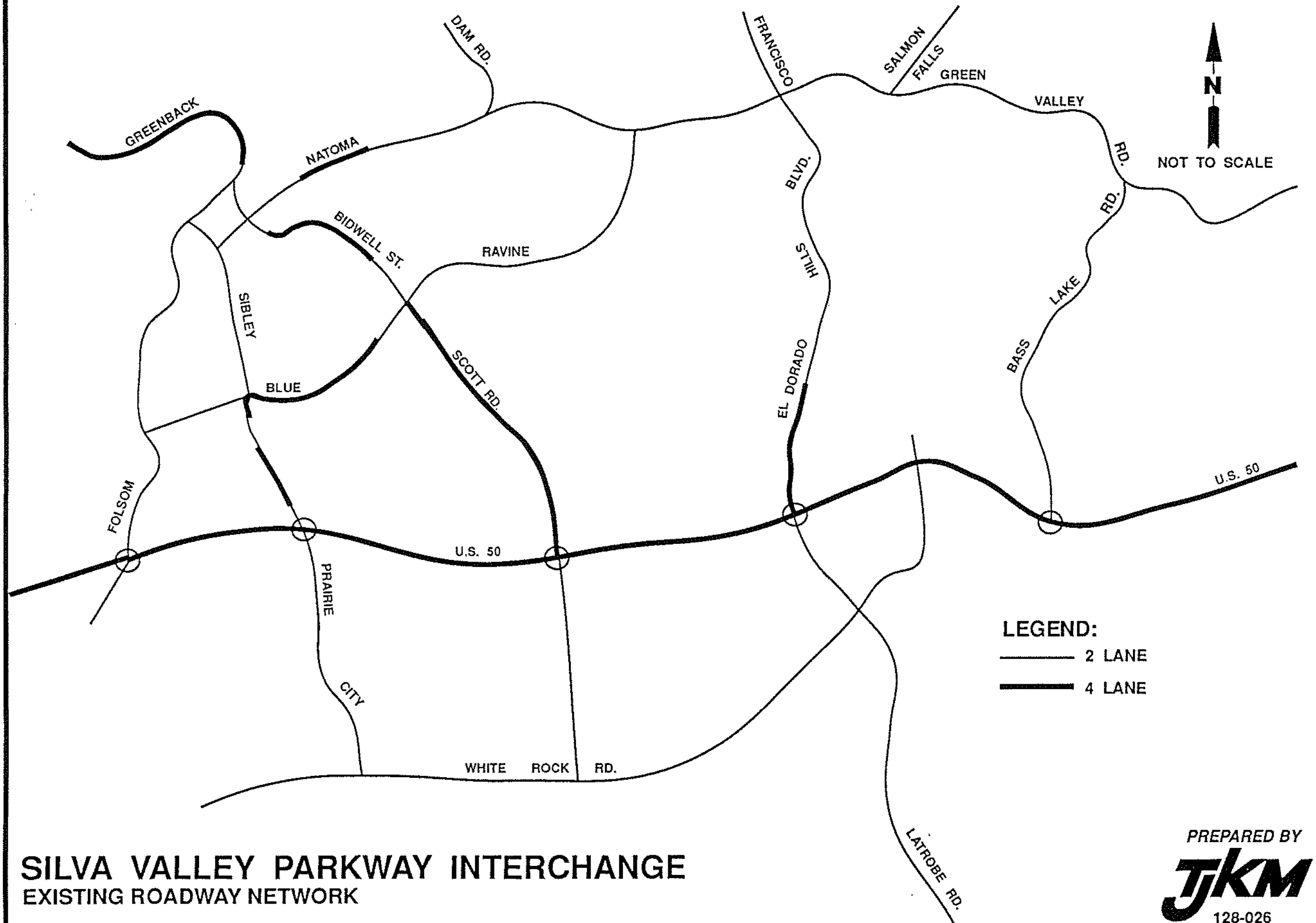
- El Dorado Hills Boulevard/Latrobe Road is a major four-lane/two-lane divided arterial north of U. S. 50 and a major two-lane rural arterial south of the highway. The road serves existing development in the El Dorado Hills area to the north and rural El Dorado County to the south.

- Bass Lake Road is a two-lane arterial that provides a north-south connection between U. S. 50 and Green Valley Road. This facility provides access to existing rural residential areas and Bass Lake.

- White Rock Road is currently a minor two-lane arterial that provides access to rural areas south of U. S. 50 in El Dorado County and the growing Sunrise Industrial Area in Sacramento County.

Also included in the total traffic model analysis area were major roadways in the City of Folsom and Cameron Park area of El Dorado County. The location of roadways in both the study area of the Silva Valley Parkway/U. S. 50 interchange and the total model analysis area are shown in Figure 10-1.

The proposed East Area Beltway (DKS and Associates n.d.), a grade-separated roadway that could connect Interstate 80 with U. S. 50, State Route 99, and Interstate 5, could pass through the west side of the model area through Folsom. This new facility



SILVA VALLEY PARKWAY INTERCHANGE

EXISTING ROADWAY NETWORK

FIGURE 10 - 1

would have very little impact on traffic volumes on the Silva Valley Parkway/U. S. 50 interchange but could provide an alternative to U. S. 50 for traffic in Sacramento County.

Critical Intersections

Seven critical intersections in the project vicinity were included in the traffic analysis. Five of the intersections exist presently; two would be constructed at a future date, or as part of the project. The seven critical intersections include:

- White Rock Road/Latrobe Road,
- El Dorado Hills Boulevard/U. S. 50 Westbound (WB) Ramps,
- Latrobe Road/U. S. 50 Eastbound (EB) Ramps,
- Bass Lake Road/U. S. 50 WB Ramps,
- Bass Lake Road/U. S. 50 EB Ramps,
- Silva Valley Parkway/U. S. 50 WB Ramps (future), and
- Silva Valley Parkway/U. S. 50 EB Ramps (future).

Existing Traffic Volumes

Existing turning movement information was gathered from counts done by OMNI-MEANS, Ltd. and TJKM Transportation Consultants. Traffic volumes for the p.m. peak hour at critical intersections in the study area are shown in Figure 10-2. Existing daily traffic and p.m. peak hour traffic volumes for roadway segments in the study area are shown in Figure 10-3.

Existing Traffic Conditions

Methodology

The quality of traffic service provided by a roadway system is measured by the level of service (LOS) concept. In this system a letter is assigned to describe traffic operating conditions. The letters "A" through "F" are used to describe the best through worst traffic conditions, respectively. The characteristics of traffic flow associated with each LOS are described in Table 10-1. Table 10-1 also shows the volume/capacity (V/C) ratio associated with each LOS for signalized intersections and freeway ramps.

Intersection Level of Service

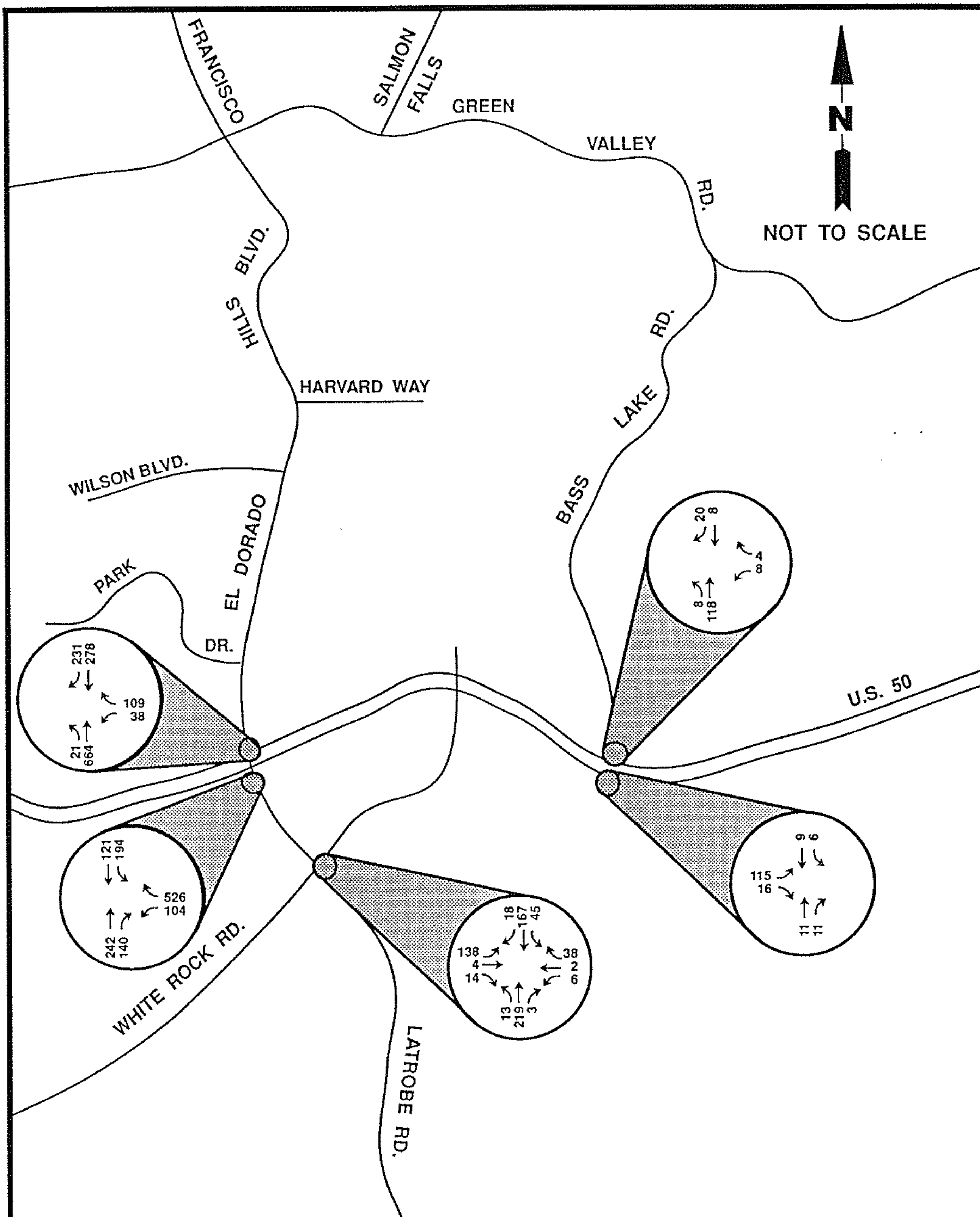
Traffic capacity analyses were conducted for the critical intersections using state-of-the-art analysis methods. For unsignalized intersections, the methods described in the 1985 Highway Capacity manual were employed (Transportation Research Board 1985).

Table 10-1. Traffic Flow Characteristics and Level of Service Criteria for Signalized Intersections and Ramp Segments

LOS	Description	V/C Ratio (Intersection)	V/C Ratio (Ramp) Merge	V/C Ratio (Ramp) Diverge
A	Free flow. Very slight or no delay. If signalized, conditions are such that no approach phase is fully utilized by traffic and no vehicle waits longer than one red indication. Turning movements are easily made, and nearly all drivers find freedom of operation.	0.00-00.60	0.00-0.30	0.00-0.33
B	Stable flow. Slight delay. If signalized, an occasional approach phase is fully utilized. Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles. This level is suitable operation for rural design purposes.	0.61-0.70	0.31-0.50	0.34-0.53
C	Stable flow. Acceptable delay. If signalized, a few drivers arriving at the end of a queue may occasionally have to wait through one signal cycle. Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted.	0.71-0.80	0.51-0.73	0.54-0.75
D	Approaching unstable flow. Tolerable delay. Delays may be substantial during short periods, but excessive back-ups do not occur. Maneuverability is severely limited during short periods due to temporary backups.	0.81-0.90	0.74-0.88	0.76-0.90
E	Unstable flow. Intolerable delay. Delay may be great, up to several signal cycles. There are typically long queues of vehicles waiting upstream of the intersection.	0.91-1.00	0.89-1.00	0.91-1.00
F	Forced flow. Excessive delay. Intersection operates below capacity. Jammed conditions. Back-ups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream back-up conditions.	Varies*	Varies*	Varies*

* In general, V/C ratios cannot be greater than 1.00, unless the lane capacity assumptions are too low. Also, if future demand projections are considered for analytical purposes, a ratio greater than 1.00 might be obtained, indicating that the projected demand would exceed the capacity.

Source: Transportation Research Board 1985 and Highway Research Board 1965.



SILVA VALLEY PARKWAY INTERCHANGE

EXISTING CRITICAL INTERSECTION
AND P.M. PEAK HOUR VOLUMES

FIGURE 10 - 2

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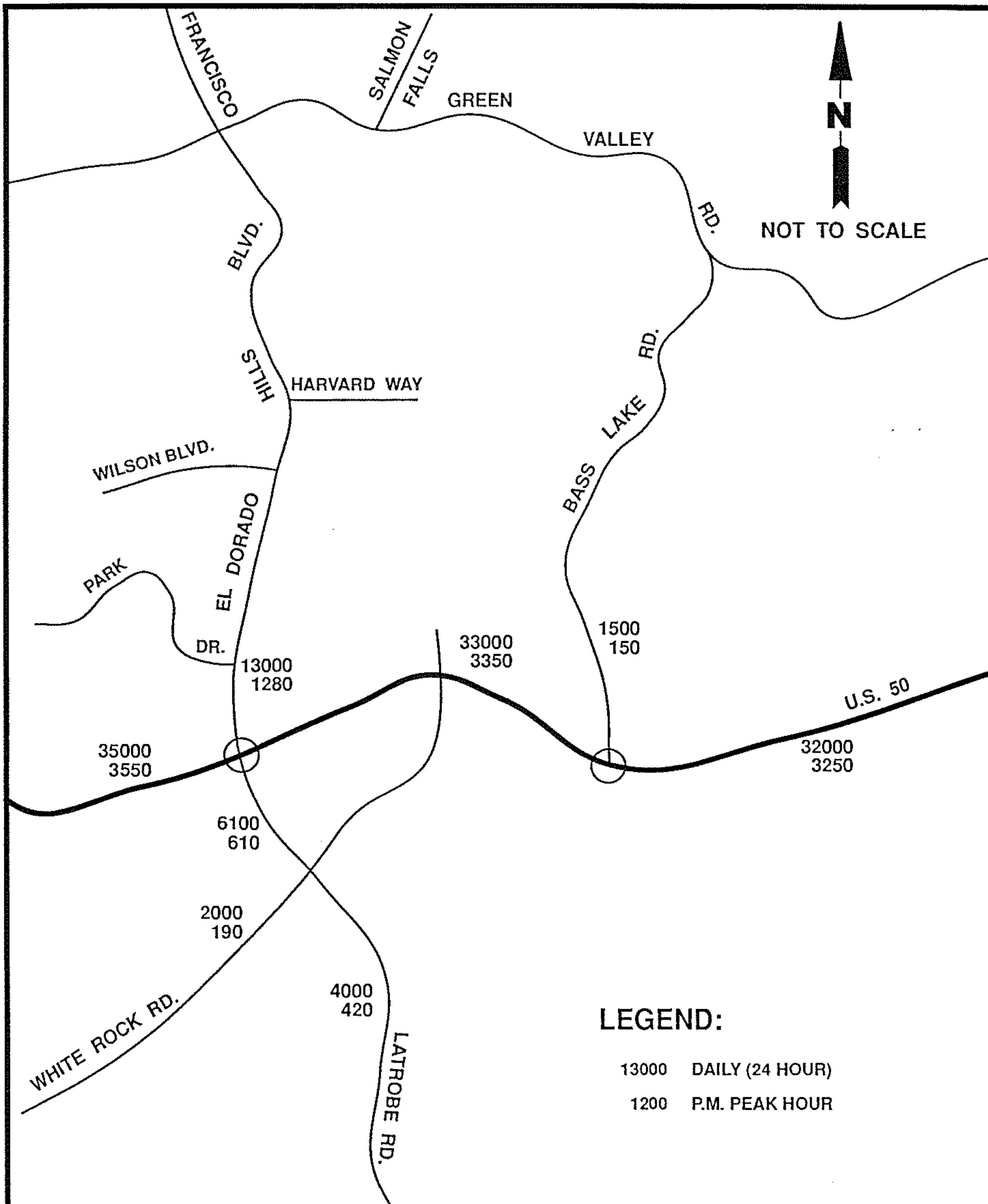

SILVA VALLEY PARKWAY INTERCHANGE

EXISTING TRAFFIC VOLUMES

FIGURE 10 - 3

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At signalized intersections a critical movement analysis similar to the planning analysis methods described in the 1985 Highway Capacity Manual was used.

The County of El Dorado considers LOS A, B, and C, which were determined by these methods, to be acceptable traffic operating conditions (Pearson pers. comm.).

Results of the intersection capacity analysis for existing conditions are shown in Table 10-2. The estimates show that, with two exceptions, the critical intersections are operating in the acceptable LOS range. The exceptions are the intersection of Latrobe Road/U. S. 50 EB Ramps and El Dorado Hills Boulevard/U. S. 50 WB Ramps. These intersections are currently operating at LOS D or worse. All of the remaining intersections are operating at a level of service that is considered acceptable by the County of El Dorado.

Freeway Merge/Diverge Level of Service

In addition to the intersection capacity analysis, eight freeway ramps were evaluated according to LOS criteria. A merge or diverge analysis was completed for each of the ramp terminals. The method of analysis used is described in the 1985 Highway Capacity Manual, Chapter 5.

The analysis technique determines the levels of service at freeway interchanges for on-ramps (merge) and off-ramps (diverge) at their connection with the freeway. The level of service depends on a number of factors, including number of freeway lanes (mainline capacity), number of ramp lanes, freeway mainline total and outside-lane peak-hour volumes (truck and auto), ramp peak-hour volumes (truck and auto), interchange ramp configuration, and terrain (hilly, flat, etc.). All of these factors affect the ability of a vehicle to enter or exit the mainline freeway. A detailed description of the merge/diverge level of service analysis method is described in the 1985 Highway Capacity Manual, Chapter 5.

Caltrans considers LOS A, B, C, and D to be acceptable traffic operating conditions on freeway ramps in urban areas (Allison pers. comm.). At buildout of the El Dorado Hills area, Caltrans has agreed that U. S. 50 and its ramps would be operating under urban conditions.

Table 10-2 also shows the results of the capacity analysis for the eight critical freeway ramps. Under existing conditions, all of the ramps operate at an acceptable LOS (LOS C) except the EB off-ramp diverge movement at the El Dorado Hills/U. S. 50 interchange (LOS D).

Mainline Level of Service

Under existing conditions in the project vicinity, the U. S. 50 mainline operates at LOS A during the a.m. and p.m. peak hours in both directions.

Table 10-2. Existing Intersection and Ramp LOS

INTERSECTION LEVEL OF SERVICE

Location	AM Peak Hour LOS	AM Peak Hour Reserve Capacity	PM Peak Hour LOS	PM Peak Hour Reserve Capacity
White Rock Rd./Latrobe Rd.	N/A	N/A	C	298
El Dorado Hills Blvd./ U. S. 50 WB Ramps	C	279	D	184
Latrobe Rd./U. S. 50 EB Ramps	D	188	F	0
Bass Lake Rd./U. S. 50 WB Ramps	A	1,042	A	806
Bass Lake Rd./U. S. 50 EB Ramps	A	857	A	753

U. S. 50 RAMP LEVEL OF SERVICE
MERGE/DIVERGE ANALYSIS

Location	PM Peak Hour LOS	PM Peak Hour V/C Ratio
El Dorado Hills Blvd.		
EB on-ramp (merge)	C	0.68
EB off-ramp (diverge)	D	0.80
WB on-ramp (merge)	B	0.35
WB off-ramp (diverge)	B	0.46
Bass Lake Rd.		
EB on-ramp (merge)	C	0.53
EB off-ramp (diverge)	C	0.59
WB on-ramp (merge)	B	0.32
WB off-ramp (diverge)	B	0.34

N/A = Not available.

Source: Unpublished data from TJKM Transportation Consultants 1988.

Public Transit

El Dorado Transit provides service to Placerville and other areas east of El Dorado Hills. The transit stop is at the Raley's Shopping Center on El Dorado Hills Boulevard.

An existing de facto park-and-ride facility (parking along the shoulders of a public road) is located on El Dorado Hills Boulevard north of U. S. 50.

Railroad Service

There is no railroad service to the study area.

Trucks

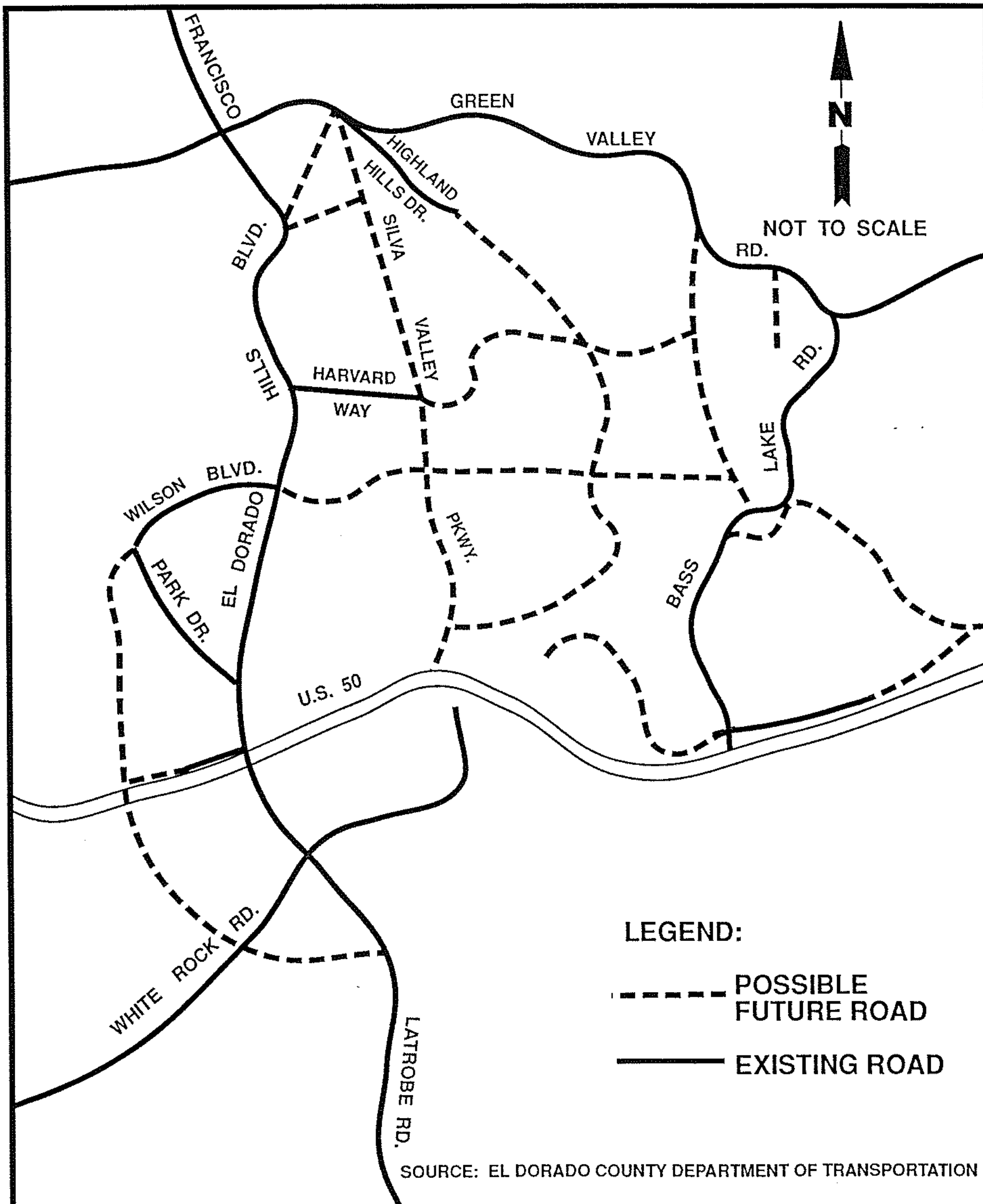
Trucks use U. S. 50 to serve Placerville, Lake Tahoe, and many other foothill and mountain towns and communities. However, the highway is not a major through-truck route. None of the other major roadways in the El Dorado Hills area is heavily impacted by trucks.

IMPACTS

Future Transportation Improvements

The County of El Dorado Department of Transportation conducted a future collector road location study in 1986 for the El Dorado Hills/Cameron Park area (El Dorado County 1986). Figure 10-4 shows the results of this study. The roads identified only show a general location and need for future roads, and none of them is currently funded for construction by the county. However, a fee ordinance program is in place to provide funding for future road improvements. It is estimated that the ordinance would result in $50-60 million for transportation improvements over the next 20 years.

A detailed alternatives study has been completed for the realignment and widening of Bass Lake Road from just north of the Bass Lake Road/U. S. 50 interchange to Green Valley Road (Gene E. Thorne & Associates, Inc. 1987). A number of roadway alignments were considered, but all alternatives include the widening of the road to a four-lane divided arterial. This facility is planned for construction in the next 5-10 years, depending on the pace of development along Bass Lake Road.



SOURCE: EL DORADO COUNTY DEPARTMENT OF TRANSPORTATION

SILVA VALLEY PARKWAY INTERCHANGE

ROAD LOCATION STUDY

FIGURE 10 - 4

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Potential improvements that could reduce traffic impacts to existing facilities include the construction of a new interchange with U. S. 50 at the El Dorado and Sacramento County line and an extension of Park Drive into the City of Folsom.

It was assumed that U. S. 50 would be widened to six lanes (three lanes in each direction) through the study area (U. S. 50 Route Concept Report).

Transportation improvements planned as part of the El Dorado Hills Specific Plan are substantial and include Silva Valley Parkway, a new four-lane divided north-south arterial. Figure 10-5 shows the location for the new roadways within the study area. The roadways have been sized to accommodate estimated future traffic in the El Dorado Hills area. The following transportation improvements were identified in the El Dorado Hills Specific Plan EIR as mitigation measures. Therefore, they have been included in the future roadway network as the basis for evaluating future traffic conditions. The improvements are as follows:

- Wilson Boulevard Extension: Extend Wilson Boulevard from El Dorado Hills Boulevard to Silva Valley Parkway, a two-lane arterial, except at El Dorado Hills Boulevard, where it should be four lanes.

- Village Green Drive: Construct a two-lane arterial from Silva Valley Parkway to Country Club Drive.

- Country Club Drive: Construct a four-lane undivided arterial from Silva Valley Parkway to Bass Lake Road.

- White Rock Road: Widen White Rock Road to a six-lane divided collector from Latrobe Road to U. S. 50.

- Silva Valley Parkway: Construct a four-lane divided/undivided arterial from U. S. 50 to Green Valley Road.

- Park-and-Ride Lot: Construct a park-and-ride lot on Silva Valley Parkway near U. S. 50.

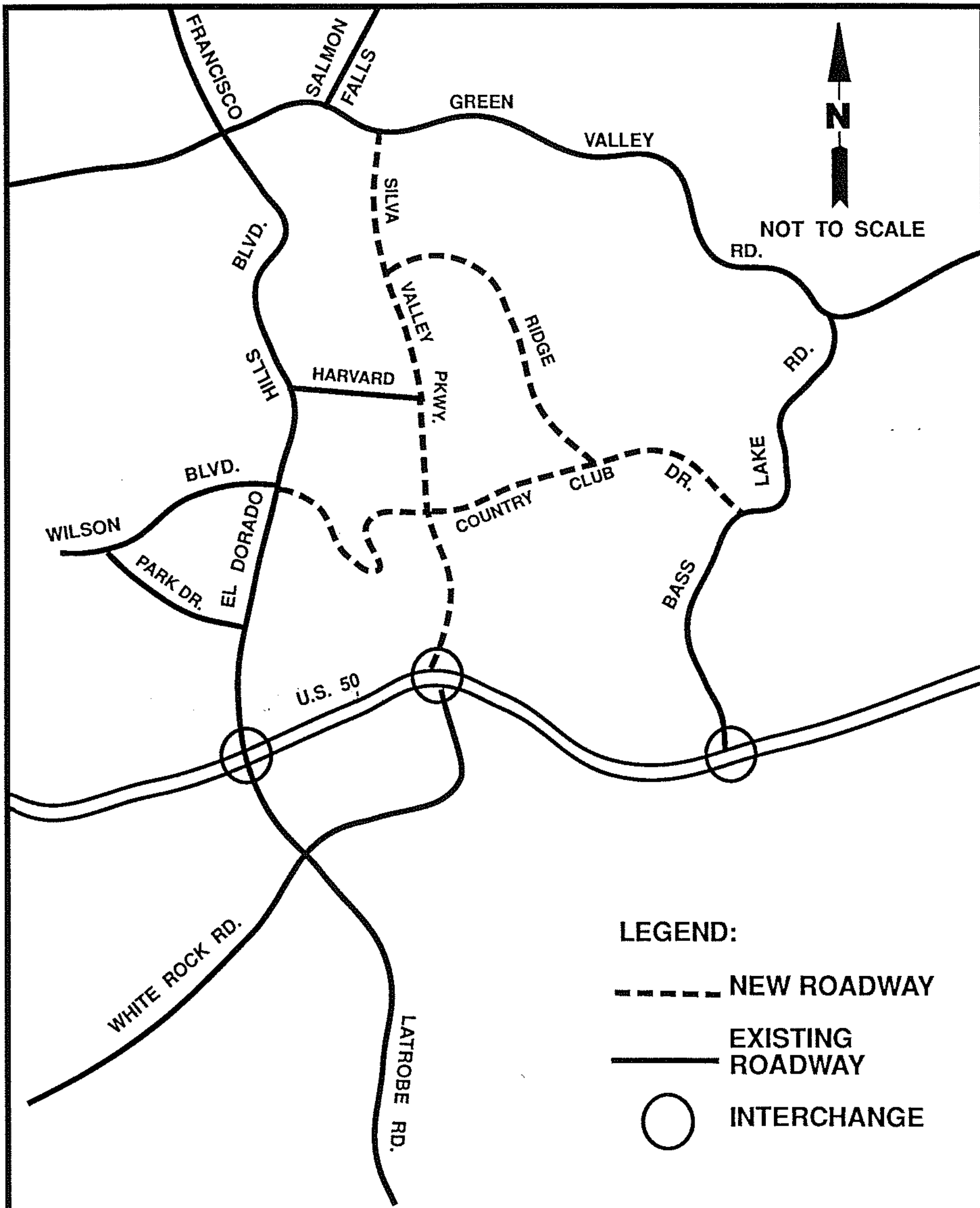
- El Dorado Hills Boulevard/Latrobe Road/U. S. 50 interchange: Reconstruct the interchange to include:

    - widening the El Dorado Hills Boulevard/U. S. 50 underpass to eight lanes,

    - construction of a new eastbound to southbound off-ramp,

    - widening of the existing westbound off-ramp to accommodate three lanes at El Dorado Hills Boulevard, and

    - construction of a new westbound to southbound off-ramp.



SILVA VALLEY PARKWAY INTERCHANGE

FUTURE MAJOR ROADWAY NETWORK IMPROVEMENTS

FIGURE 10 - 5

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- o Silva Valley Parkway/U. S. 50 interchange: Construct an interchange on Silva Valley Parkway at U. S. 50. A description of the need for this interchange is presented in Chapter 2, "Project Description."

- o Transportation System Management (TSM) Ordinance: Recent land use development proposals and approved projects in the El Dorado Hills area indicate a possible change in the fundamental character of the area. County of El Dorado staff have been directed to begin development and consideration of a TSM ordinance.

Methodology

Traffic volumes and resulting impacts for the El Dorado Hills area are presented in this section. Results were determined using the MINUTP transportation model software, the future roadway improvements described above, and the analysis methodology detailed in the following paragraphs.

Model Description

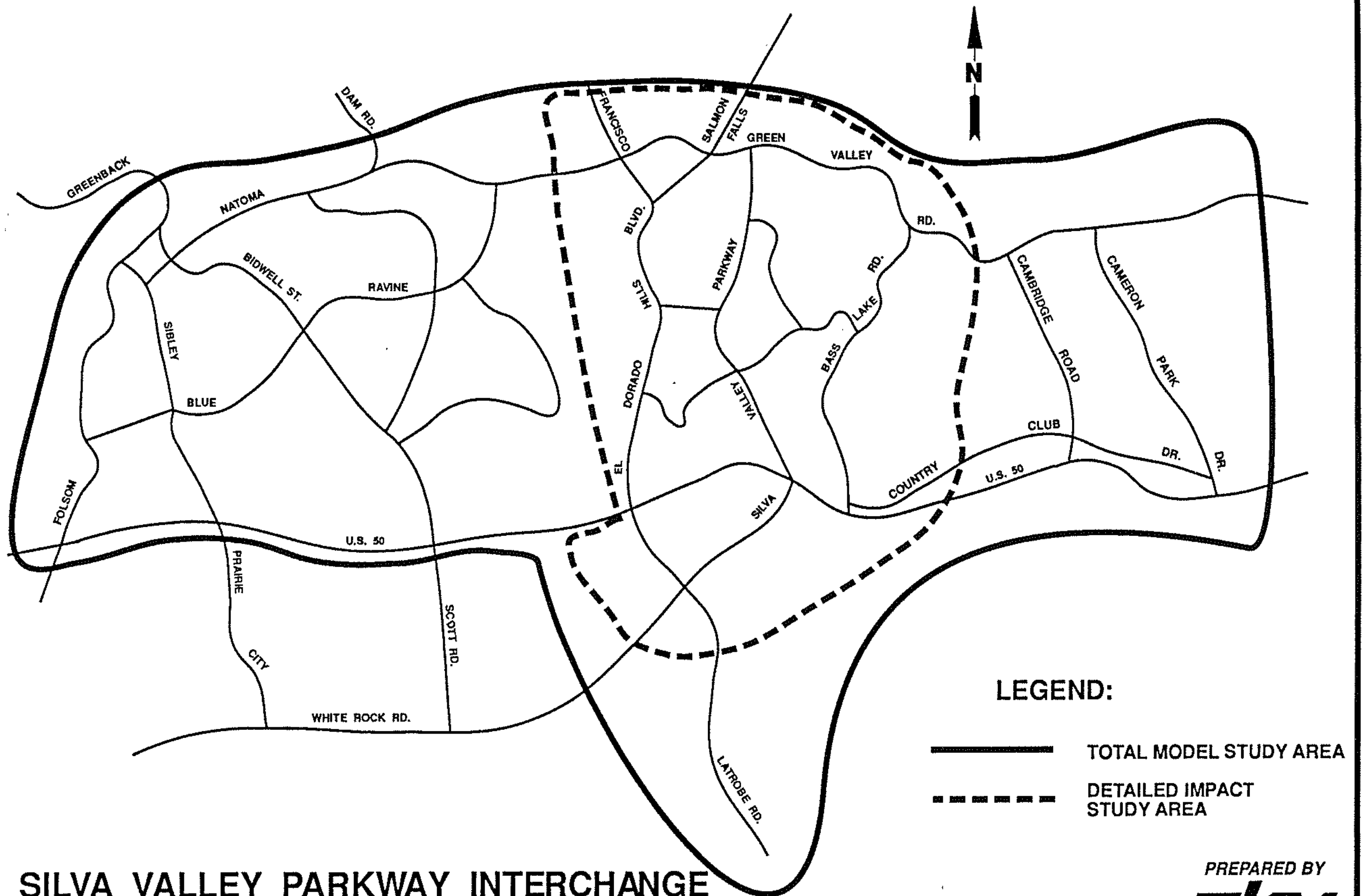
A computerized traffic modeling system was used to simulate existing conditions and project future traffic conditions in the Folsom/El Dorado Hills area. The MINUTP system, developed from the Federal Highway Administration (FHWA) transportation model software Urban Transportation Planning System (UTPS) for large mainframe computers, uses a gravity model technique to assign traffic to a street system based on projected land uses and existing traffic levels. The MINUTP system is one of the more sophisticated transportation planning software systems currently available for a microcomputer.

Model Development

To determine the traffic impacts of the project and other future developments in the Folsom/El Dorado Hills area, it was necessary to establish both a total study area and a detailed study area.

The total study area included development in both El Dorado Hills and the City of Folsom. The detailed study area was the Silva Valley Parkway/U. S. 50 interchange area. Figure 10-6 shows the study area boundaries used in the model. Although the City of Folsom was included in the study area, detailed recommendations for the Folsom street network are not included in this report. Wilbur Smith & Associates has completed a detailed study of the City of Folsom, and recommendations for Folsom's roadway network are included in the City of Folsom General Plan EIR (Wilbur Smith & Associates 1987).

The study area was divided into 138 traffic zones. The boundaries of the traffic zones were determined by examining the location of existing and future roads, land uses, and other physical boundaries.



SILVA VALLEY PARKWAY INTERCHANGE

TRAFFIC STUDY AREA BOUNDARIES

FIGURE 10 - 6

To account for travel to and from areas outside of the total impact study area, it was necessary to establish large super zones or cordons. The cordons included areas like eastern El Dorado County, Orangevale, and Sacramento. Table 10-3 shows the cordons and their service areas.

The model directly accounts for interaction between traffic zones within the study area (internal-internal trips) and between traffic zones and cordons (internal-external/external-internal trips). Trips that pass through the study area without any origin or destination in the area (external-external trips) were determined by calculating the existing number of through trips and then factoring those values by a growth rate of 1 percent per year.

Trip Generation

Model study area trip generation is determined by the types and quantities of land use within a traffic zone multiplied by a standard trip generation rate. The land use quantities for this study are reported in units of acres and dwelling units. Land use data for the study area were obtained from the El Dorado County Planning Division and the City of Folsom Community Development Department.

A summary of the trip generation rates is shown in Table 10-4. In general, trip generation for each zone is defined as productions and attractions. Residential uses are typically trip producers, and commercial and industrial uses are trip attractors.

Trip Distribution

To determine the interaction of travel within and between traffic zones and cordon stations, a standard gravity distribution model is used. In concept, the gravity model assesses the attractiveness of zones based on nonresidential activities. The model also assumes that destinations that are closer or require less travel time for a specific trip purpose are more attractive than destinations that are farther away. The total strength of the attractive force is a function of the size of the attraction and the difference in travel time to competing destinations.

In calculating the distribution of traffic within and through the study area, several parameters must be defined. The internal/external distributional split was determined for residentially generated trips or productions. To accomplish this it was necessary to divide both production and attraction trips into three trip categories: home-work, home-other, and nonhome based. Data on percentages of production trips in each of the home-based trip categories were derived from the Transportation and Traffic Engineers Handbook (Institute of Transportation Engineers 1982).

In addition to determining the internal/external distributions, a directional distribution for trips entering or leaving the model study area must be established. Trips were assigned to each external cordon by using the total internal/external productions and attractions by trip category and the cordon's access to residential, industrial, and commercial land uses.

Table 10-3. External Cordons Service Area Assumptions

Cordon Station Number	Cordon Station Name	Service Area
151	White Rock Road	Sacramento County Sunrise Area
152	Scott Road	South Sacramento County
153	Greenback Lane	Orangevale, Citrus Heights, Roseville
154	Francisco Drive	Northern El Dorado County
155	Salmon Falls Road	Northern El Dorado County
164	Green Valley Road	Placerville, East El Dorado County
163	Folsom Dam Road	Roseville, Placer County
159	Bass Lake Road	Southern El Dorado County
160	Latrobe Road	Southern El Dorado County
161	U. S. Highway 50	Sacramento
162	U. S. Highway 50	Cameron Park, Placerville, East El Dorado County

Source: Unpublished data from TJKM Transportation Consultants 1988.

Table 10-4. Trip Generation Rates

Land Use Type	AM Peak Hour		PM Peak Hour	
Single family				
Low density (0-1 DU/AC)	1.4	TE/DU	1.5	TE/DU
Medium density (2-4 DU/AC)	0.9	TE/DU	1	TE/DU
High density (5-7 DU/AC)	0.7	TE/DU	0.8	TE/DU
Multifamily (10+ DU/AC)	0.5	TE/DU	0.6	TE/DU
Neighborhood commercial	5	TE/ACRE	50	TE/ACRE
Highway commercial	10	TE/ACRE	100	TE/ACRE
Service commercial	3	TE/ACRE	30	TE/ACRE
Light industrial	10	TE/ACRE	10	TE/ACRE
Park	0.04	TE/ACRE	0.4	TE/ACRE
School	15	TE/ACRE	5	TE/ACRE
Office	18	TE/ACRE	18	TE/ACRE
Prison	2	TE/ACRE	2	TE/ACRE
Community center	2	TE/ACRE	20	TE/ACRE
Golf course	0.3	TE/ACRE	0.4	TE/ACRE
Open space	0.1	TE/ACRE	1	TE/ACRE

Notes: TE = Trip ends.
DU = Dwelling units.

Source: Transportation Research Board 1987, San Diego Association of Governments et al. 1985, and California Department of Transportation District 4 1986.

Traffic Assignment

A capacity restraint methodology was used in assigning the traffic generated by the study area to the street network. Capacity restraint is a trip assignment methodology employed where traffic is assigned to the study area roadway network by increment. As various facilities approach capacity, traffic is reassigned to less crowded facilities. This is done within the model through the gradual lowering of link speeds on facilities approaching or exceeding capacity.

Cumulative Study Area Land Use Assumptions

The future time period analyzed in the traffic study to determine impacts on the study area network was buildout of the El Dorado Hills area for 2010. To estimate the level of development in the City of Folsom for 2010, the City of Folsom General Plan was used (Folsom 1988). Note: The land use assumptions used in the El Dorado Hills Specific Plan EIR were updated to reflect the latest plans in the El Dorado Hills/Cameron Park area.

Future Roadway Network

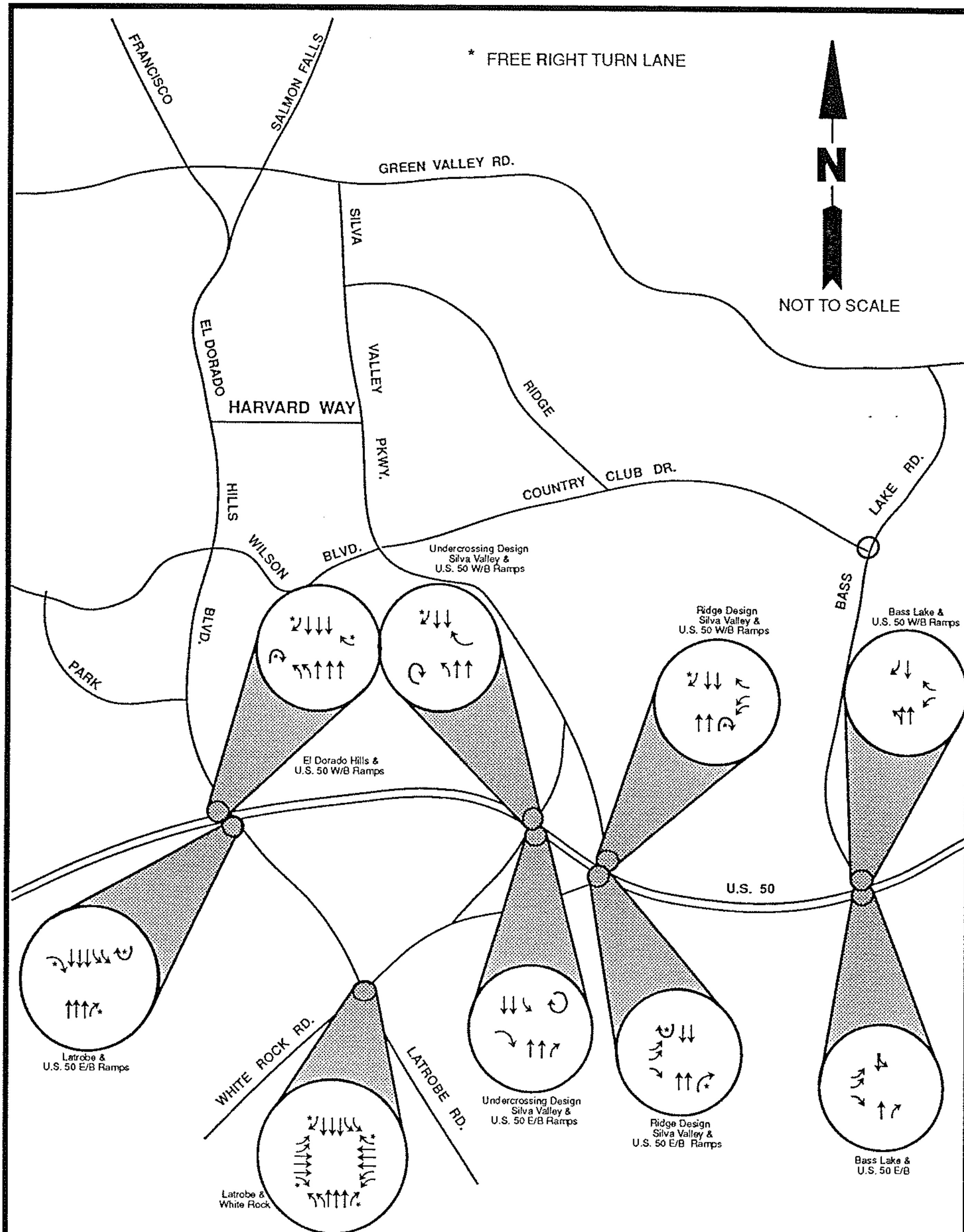
The roadway network assumed in the modified network included existing roadways, planned county improvements to existing roadways, including widening of Bass Lake Road, and future planned roadways. Figure 10-5 shows the network.

The assumed lane configurations for each of the critical intersections are shown in Figure 10-7. It was assumed that all of these intersections would be signalized for all of the future conditions studied and unsignalized for existing conditions.

Projected Traffic Impacts

The impacts of the project on traffic circulation were analyzed for three alternatives with 2010 traffic levels under a.m. and p.m. peak-hour conditions. The three future alternatives include:

- No-Project Alternative
- Ridge Design
- Undercrossing Design



SILVA VALLEY PARKWAY INTERCHANGE

ASSUMED LANE CONFIGURATIONS

FIGURE 10 - 7

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Determination of Significance

El Dorado County considers LOS A, B, or C as the desired LOS for sizing roadways to meet future traffic demands. Therefore, for the No-Project Alternative, LOS D, E, or F is considered a significant impact. Because the Silva Valley Parkway/U. S. 50 interchange is a major transportation project proposed to accommodate cumulative growth, the EIR authors also have compared the impacts of the proposed project to the No-Project condition. The following criteria, therefore, are used to determine the significance of the proposed project impacts (Allington pers. comm.):

- significant impact =LOS (No-Project Alternative) changes from A, B, or C to LOS (Project Alternative) D, E, or F <u>or</u>

  =LOS (No-Project Alternative) is D, E, or F and V/C (Project Alternative) increases by 0.02 or more

- beneficial impact =LOS (No-Project Alternative) changes from D, E, or F to LOS (Project Alternative) A, B, or C <u>or</u>

  =LOS (No-Project Alternative) is D, E, or F and V/C (Project Alternative) decreases by 0.1 or more

- no change in impact =LOS (No-Project Alternative) remains D, E, or F and V/C (Project Alternative) stays the same or changes (increase or decrease) 0.01 or less

Impacts of the No-Project Alternative

The impacts of the No-Project Alternative are summarized in Table 10-5. The No-Project Alternative represents the expected traffic impacts in 2010 without the proposed Silva Valley Parkway/U. S. 50 interchange. Other improvements shown in Figure 10-5 were assumed to be part of the future network. Figure 10-8 shows the estimated daily and p.m. peak-hour traffic volumes for the major roadways in the project vicinity. In areas where the capacity of the facility is exceeded (LOS F), the facility should be expanded. If no improvements are made, the traffic would spread out beyond the normal peak hour.

Intersection Level of Service. The a.m. and p.m. peak-hour turning movement volumes for the No-Project Alternative, based on cumulative development, are shown in Figures 10-9 and 10-10, respectively. The future LOS under this alternative for the critical intersections are shown in Table 10-6.

Implementation of the No-Project Alternative, assuming planned major roadway improvements, would result in:

- LOS F during the p.m. peak hour at the White Rock Road/Latrobe Road intersection. This impact is considered significant. To reduce this impact to a

Table 10-5. Summary of Transportation Impacts and Mitigation Measures for the No-Project Alternative

Impact	Impact Rating Before Mitigation	Mitigation Measures	Impact Rating After Mitigation
Intersections			
LOS F during the p.m. peak hour at the White Rock Road/Latrobe Road intersection.	Significant	Improve the White Rock Road/Latrobe Road intersection.	Less than significant
LOS D and E during the a.m. and p.m. peak hours at the Latrobe Road/U. S. 50 EB ramps intersection.	Significant	Reconstruct the El Dorado Hills Boulevard interchange and improve the Latrobe Road/U. S. 50 EB ramps intersection.	Less than significant
LOS D during the a.m. peak hour at the El Dorado Hills Boulevard/U. S. 50 WB ramps intersection.	Significant	Reconstruct the El Dorado Hills Boulevard interchange and improve the El Dorado Hills Boulevard/U. S. 50 WB ramps intersection.	Less than significant
LOS D during the p.m. peak hour at the Bass Lake Road/U. S. 50 EB ramps intersection.	Significant	Reconstruct the Bass Lake Road interchange and improve EB ramp intersection.	Less than significant
Freeway			
LOS E and F during the a.m. and p.m. peak hours, respectively, at the EB slip off-ramp of the El Dorado Hills Boulevard/ U. S. 50 interchange.	Significant	Reconstruct the El Dorado Hills Boulevard interchange and widen the EB slip off-ramp to two lanes. This requires an auxiliary lane in advance of the off-ramp.	Less than significant
LOS F during the a.m. and p.m. peak hours at the EB on-ramp of the El Dorado Hills Boulevard/U. S. 50 interchange.	Significant and unavoidable	The EB on-ramp would need to be widened to two lanes. However, Caltrans generally considers widening of on-ramps to be infeasible where mainline capacity is not adequate. No mitigation is recommended.	Significant and unavoidable
LOS F and E during the a.m. and p.m. peak hours, respectively, at the WB slip off-ramp of the El Dorado Hills Boulevard/U. S. 50 interchange.	Significant	Reconstruct the El Dorado Hills Boulevard interchange and widen the WB slip off-ramp to two lanes. This requires an auxiliary lane in advance of the off-ramp.	Less than significant
LOS F during the a.m. and p.m. peak hours at the WB loop off-ramp of the El Dorado Hills Boulevard/ U. S. 50 interchange.	Significant	Reconstruct the El Dorado Hills Boulevard interchange and widen the WB loop off-ramp to two lanes.	Less than significant
LOS F during the a.m. and p.m. peak hours at the WB on-ramp of the El Dorado Hills Boulevard/U. S. 50 interchange.	Significant and unavoidable	The WB on-ramp would need to be widened to two lanes. However, Caltrans generally considers widening of on-ramps to be infeasible where mainline capacity is not adequate. Therefore, no mitigation is recommended.	Significant and unavoidable
LOS F during the a.m. and p.m. peak hour, at the EB off-ramp of the Bass Lake Road/U. S. 50 interchange.	Significant	Reconstruct the Bass Lake Road interchange and widen the EB off-ramp to two lanes. This requires an auxiliary lane in aadvance of the off-ramp.	Less than significant

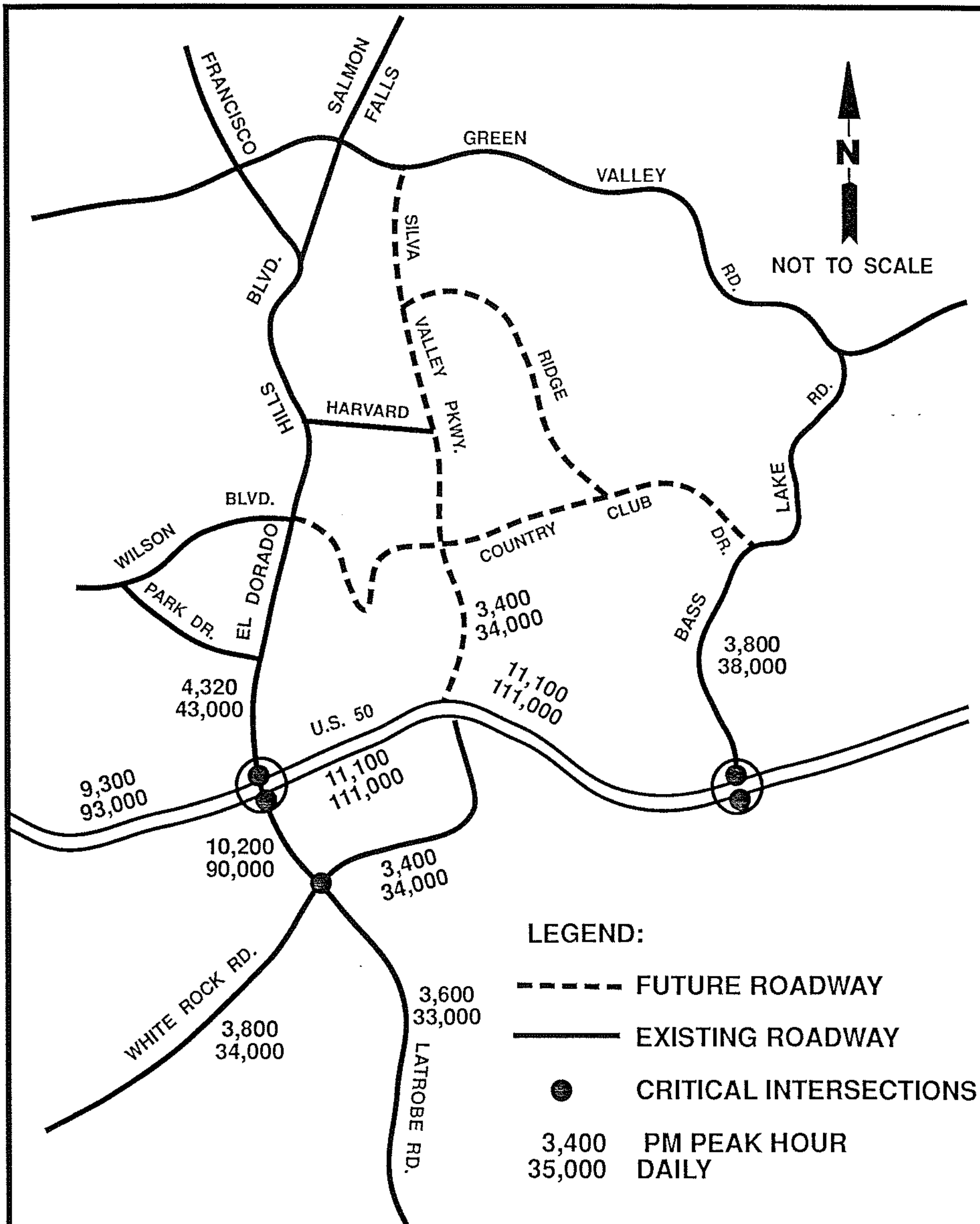
Table 10-5. Continued

Impact	Impact Rating Before Mitigation	Mitigation Measures	Impact Rating After Mitigation
LOS F during the a.m. and p.m. peak hours, respectively, at the WB on-ramp of the Bass Lake Road/U. S. 50 interchange.	Significant and unavoidable	The WB on-ramp would need to be widened to two lanes. However, Caltrans generally considers widening of on-ramps to be infeasible where mainline capacity is not adequate. Therefore, no mitigation is recommended.	Significant and unavoidable
Mainline U. S. 50			
LOS F on the U. S. 50 mainline in the project vicinity due to cumulative local and regional development.	Significant	Widen U. S. 50.	Less than significant

Note: The mitigation measures identified in this table are not included as part of the Silva Valley Parkway/U. S. 50 interchange project. They are identified here but would be designed, constructed, and funded as separate projects.

TABLE 10-6
INTERSECTION LEVEL OF SERVICE ANALYSIS

	NO - PROJECT				RIDGE DESIGN				UNDERCROSSING DESIGN			
	A.M. PEAK		P.M. PEAK		A.M. PEAK		P.M. PEAK		A.M. PEAK		P.M. PEAK	
INTERSECTION	V/C	LOS	V/C	LOS	V/C	LOS	V\C	LOS	V/C	LOS	V/C	LOS
White Rock Rd./ Latrobe Rd.	0.76	C	1.24	F	0.57	A	0.76	C	0.57	A	0.76	C
Latrobe Rd./ US 50 EB Ramps	0.79	D	0.91	E	0.72	C	0.90	D	0.72	C	0.90	D
El Dorado Hills Blvd./ US 50 WB Ramps	0.89	D	0.79	C	0.76	C	0.76	C	0.76	C	0.76	C
Bass Lake Rd./ US 50 WB Ramps	0.60	A	0.77	C	0.54	A	0.75	C	0.54	A	0.75	C
Bass Lake Rd./ US 50 EB Ramps	0.68	B	0.88	D	0.66	B	0.88	D	0.66	B	0.88	D
Silva Valley Pkwy./ US 50 EB Ramps					0.78	C	0.64	B	0.63	B	0.47	A
Silva Valley Pkwy./ US 50 WB Ramps					0.69	B	0.60	A	0.41	A	0.39	A



SILVA VALLEY PARKWAY INTERCHANGE

FUTURE TRAFFIC VOLUMES
NO - PROJECT

FIGURE 10 - 8

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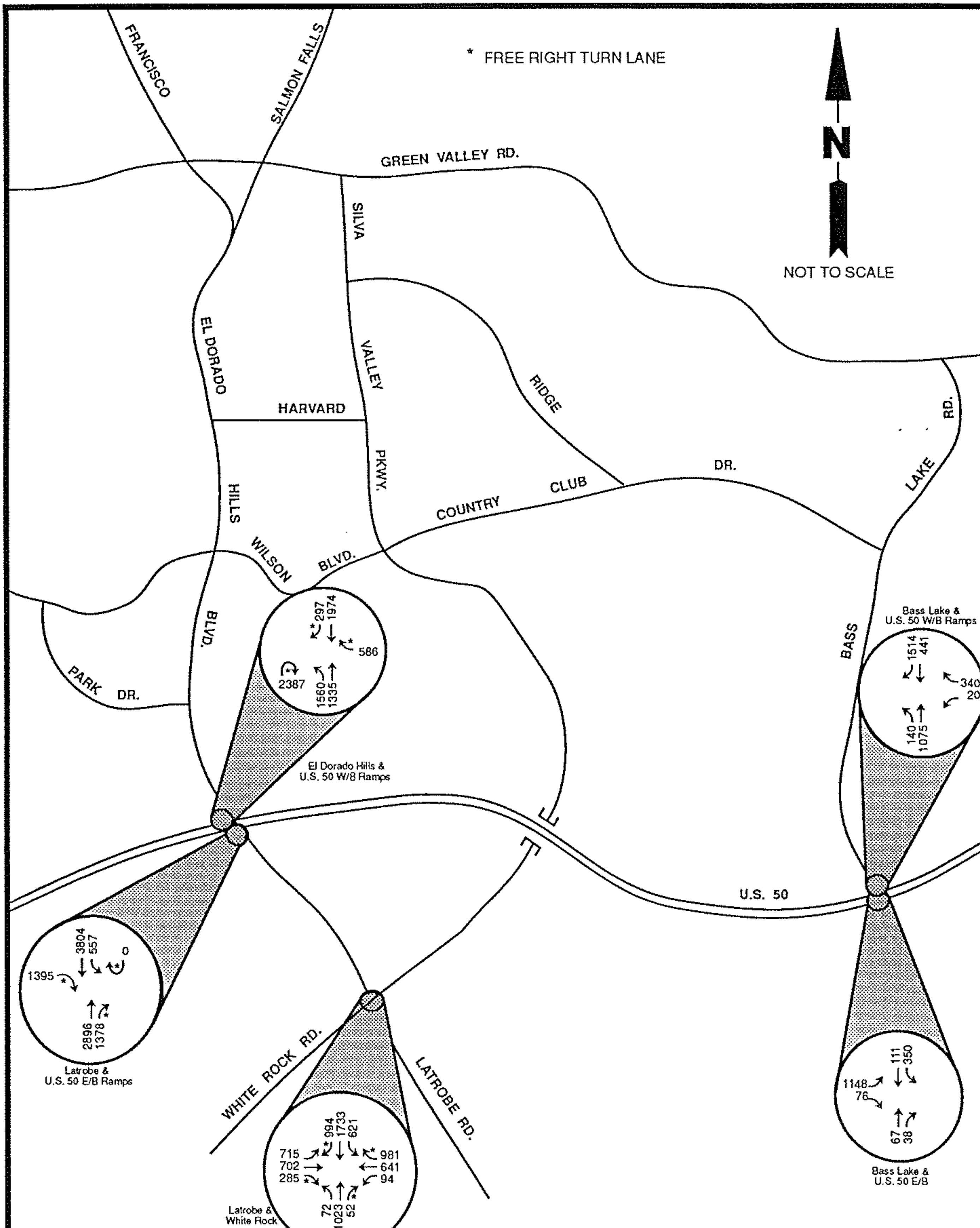

SILVA VALLEY PARKWAY INTERCHANGE

A.M. PEAK HOUR VOLUMES: NO - PROJECT ALTERNATIVE

FIGURE 10 - 9

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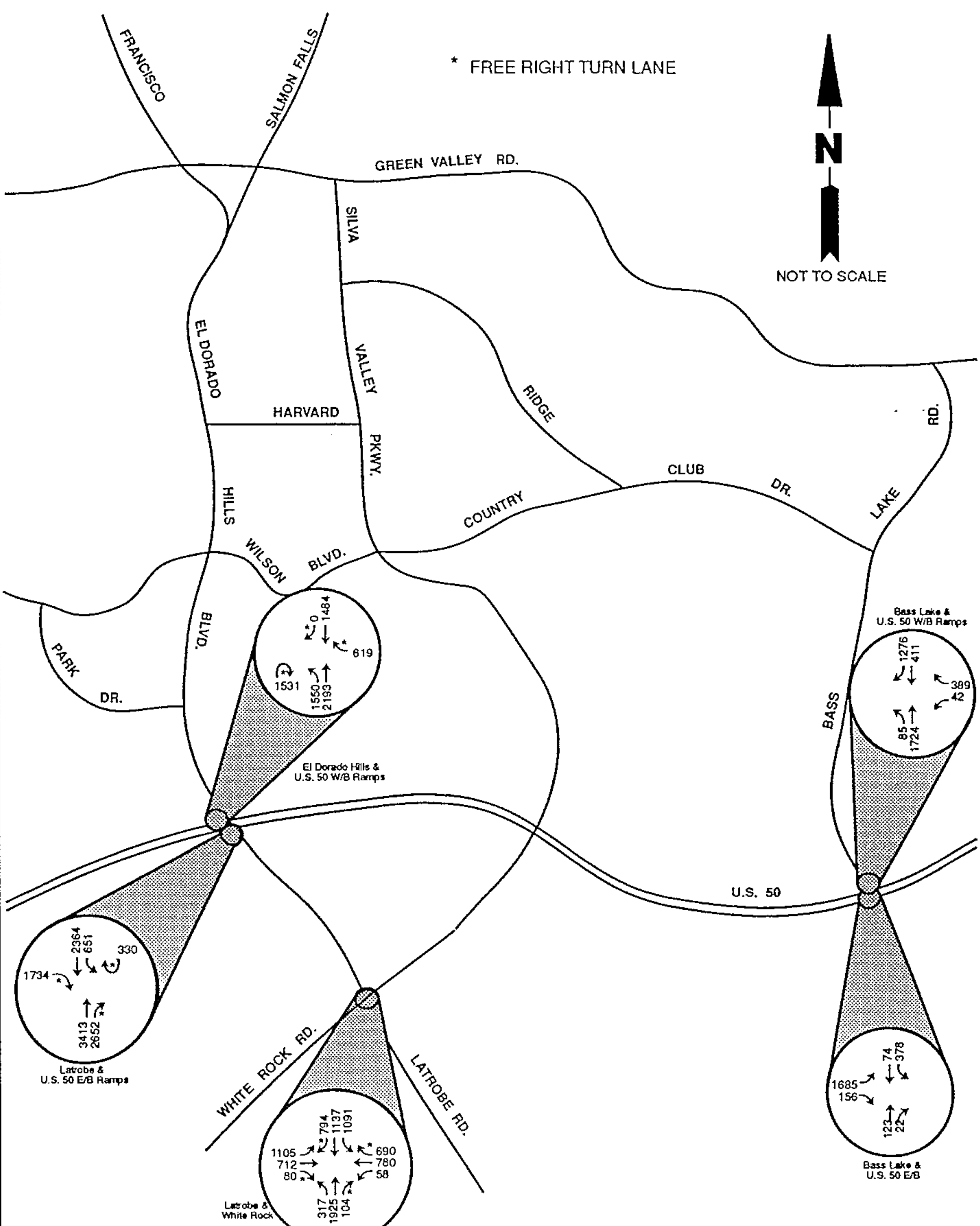

SILVA VALLEY PARKWAY INTERCHANGE

P.M. PEAK HOUR VOLUMES: NO - PROJECT ALTERNATIVE

FIGURE 10 - 10

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less-than-significant level, improve the White Rock Road/Latrobe Road intersection.

- o LOS D and E during the a.m. and p.m. peak hours at the Latrobe Road/U. S. 50 EB Ramps intersection. This impact is considered significant. To reduce this impact to a less-than-significant level, reconstruct the El Dorado Hills Boulevard interchange and improve the EB Ramp intersection.

- o LOS D during the a.m. peak hour at the El Dorado Hills Boulevard/U. S. 50 WB Ramps intersection. This impact is considered significant. To reduce this impact to a less-than-significant level, reconstruct the El Dorado Hills Boulevard interchange and improve WB Ramps intersection.

- o LOS D during the p.m. peak hour at the Bass Lake Road/U. S. 50 EB Ramps intersection. This impact is considered significant. To reduce this impact to a less-than-significant level, reconstruct the Bass Lake Road interchange and improve the EB Ramps intersection.

Freeway Merge/Diverge Level of Service

Table 10-7 shows the results of the freeway merge/diverge LOS analysis for all of the alternatives.

Implementation of the No-Project Alternative, based on cumulative development and assuming planned major roadway improvements, would result in:

- o LOS E and F during the a.m. and p.m. peak hours, respectively, at the EB slip off-ramp of the El Dorado Hills Boulevard/U. S. 50 interchange. This impact is considered significant. To reduce this impact to a less-than-significant level, reconstruct the El Dorado Hills Boulevard interchange and widen the EB slip off-ramp to two lanes. This requires an auxiliary lane in advance of the off-ramp.

- o LOS F during the a.m. and p.m. peak hours at the EB on-ramp of the El Dorado Hills Boulevard/U. S. 50 interchange. This impact is considered significant and unavoidable. To reduce this impact to a less-than-significant level during the p.m. peak hour, the on-ramp would need to be widened to two lanes. However, Caltrans generally considers widening of on-ramps to be infeasible where mainline capacity is not adequate (Hansen pers. comm.). Therefore, no mitigation is recommended.

- o LOS F during the a.m. and p.m. peak hours at the WB loop off-ramp of the El Dorado Hills Boulevard/U. S. 50 interchange. This impact is considered significant. To reduce this impact to a less-than-significant level, widen the WB loop off-ramp of the El Dorado Hills Boulevard/U. S. 50 interchange to two lanes.

TABLE 10-7
FREEWAY MERGE/DIVERGE LEVEL OF SERVICE ANALYSIS

LOCATION	MERGE/ DIVERGE CAPA-CITY	NO - PROJECT AM PEAK V/C	AM PEAK LOS	PM PEAK V/C	PM PEAK LOS	MERGE/ DIVERGE CAPA-CITY	BOTH DESIGNS AM PEAK V/C	AM PEAK LOS	PM PEAK V/C	PM PEAK LOS	CAPA-CITY	RIDGE DESIGN AM PEAK V/C	AM PEAK LOS	PM PEAK V/C	PM PEAK LOS	CAPA-CITY	UNDERCROSSING DESIGN AM PEAK V/C	AM PEAK LOS	PM PEAK V/C	PM PEAK LOS
El Dorado Hills Blvd.																				
EB off (slip)	2000	0.99	E	1.26	F	2000	0.99	E	1.15	F										
EB off (loop)	2000	0.43	B	0.62	C	2000	0.45	B	0.66	C										
EB on	2000	1.32	F	2.35*	F	2000	0.72	C	1.06	F										
WB off (slip)	2000	1.01	F	0.91	E	2000	0.42	B	0.39	B										
WB off (loop)	2000	1.45	F	1.09	F	2000	0.53	B	0.41	B										
WB on	2000	1.44	F	1.19	F	2000	1.24	F	1.21	F										
Bass Lake Rd.																				
EB off	2000	1.02	F	1.46	F	2000	1.06	F	1.51	F										
EB on	2000	0.63	C	0.83	D	2000	0.61	C	0.82	D										
WB off	2000	0.77	D	0.73	C	2000	0.77	D	0.72	C										
WB on	2000	1.52	F	1.27	F	2000	1.58	F	1.30	F										
Ridge Design																				
Silva Valley Pkwy.																				
EB off											2000	0.34	B	0.40	B					
EB on (slip)											2000	0.58	C	1.09	F					
EB on (loop)											2000	0.53	C	0.68	C					
WB off											2000	1.38	F	1.12	F					
WB on (slip)											2000	0.15	A	0.17	A					
WB on (loop)											2000	0.65	C	0.83	C					
Undercrossing Design																				
Silva Valley Pkwy.																				
EB on																2000	0.67	C	1.21	F
EB off																2000	0.34	B	0.40	B
WB on																2000	0.38	B	0.37	B
WB off																2000	1.38	F	1.12	F

NOTE: U.S. 50 assumed to have six lanes by 2010.

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- LOS F and E during the a.m. and p.m. peak hours, respectively, at the WB slip off-ramp of the El Dorado Hills Boulevard/U. S. 50 interchange. This impact is considered significant. To reduce this impact to a less-than-significant level, reconstruct the El Dorado Hills Boulevard interchange and widen the WB off-ramp to two lanes. This requires an auxiliary lane in advance of the off-ramp.

- LOS F during the a.m. and p.m. peak hours at the WB on-ramp of the El Dorado Hills Boulevard/U. S. 50 interchange. This impact is considered significant and unavoidable. To reduce this impact, but not to a less-than-significant level, the WB on-ramp would need to be widened to two lanes. However, Caltrans generally considers widening of on-ramps to be infeasible where mainline capacity is not adequate. Therefore, no mitigation is recommended.

- LOS F during the a.m. and p.m. peak hour, at the EB off-ramp of the Bass Lake Road/U. S. 50 interchange. This impact is considered significant. To reduce this impact to a less-than-significant level, reconstruct the Bass Lake Road interchange and widen the EB off-ramp to two lanes. This requires an auxiliary lane in advance of the off-ramp.

- LOS F during the a.m. and p.m. peak hours, respectively, at the WB on-ramp of the Bass Lake Road/U. S. 50 interchange. This impact is considered significant and unavoidable. To reduce this impact, but not to a less-than-significant level, the WB on-ramp would have to be widened to two lanes. However, Caltrans generally considers widening of on-ramps to be infeasible where mainline capacity is not adequate. Therefore, no mitigation is recommended.

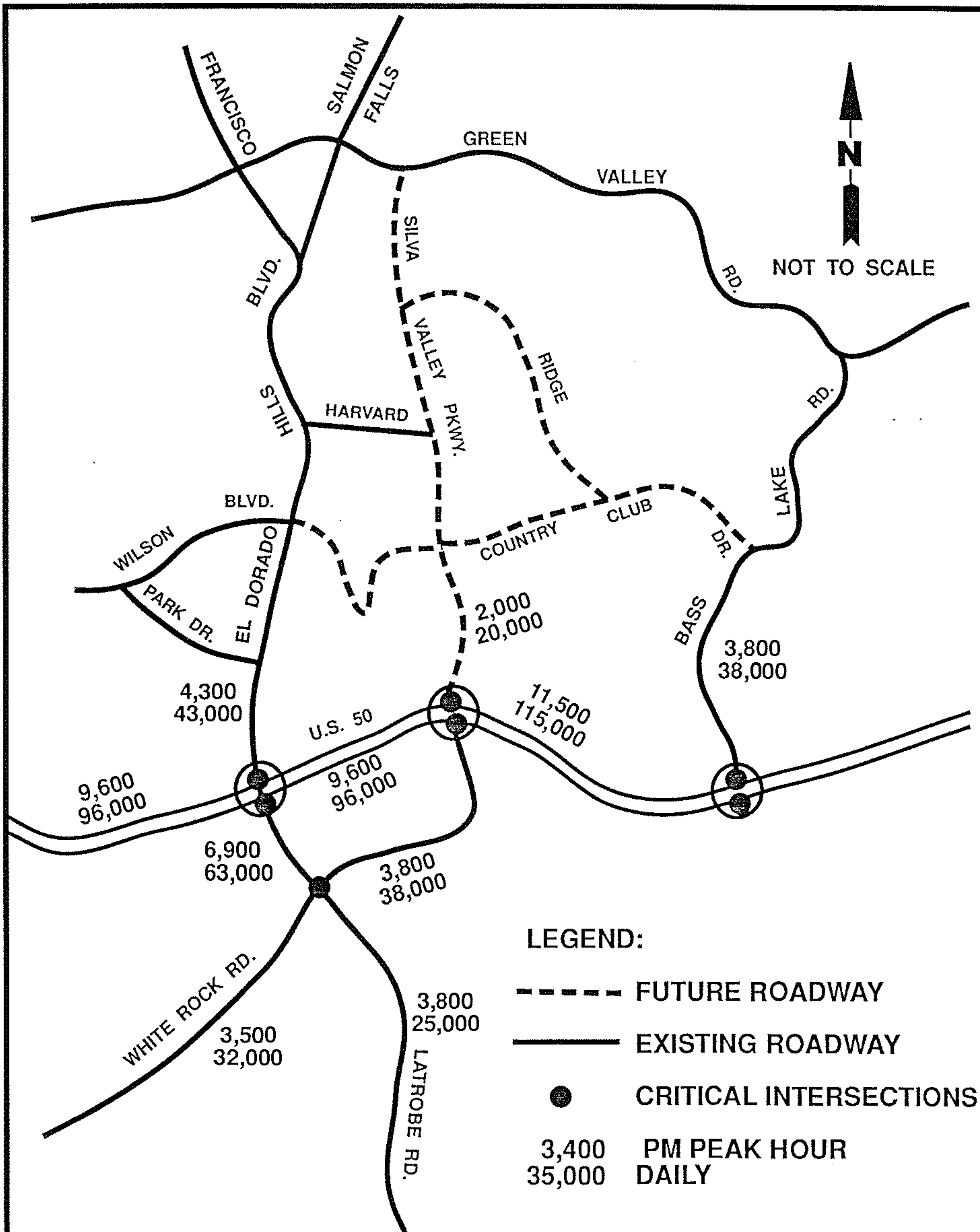
Mainline U. S. 50 Analysis. A substantial amount of traffic would be generated as a result of future planned development in the vicinity of the proposed interchange, and regionwide, whether or not the interchange is built.

Implementation of the No-Project Alternative, based on cumulative development, would result in LOS F on the U. S. 50 mainline in the project vicinity. This impact is considered significant. To reduce this impact to a less-than-significant level, widen U. S. 50.

Construction Impacts. None.

Impacts Common to Both Alternatives

The roadway network, shown in Figure 10-5, was assumed to be completed in this condition. Figure 10-11 shows the estimated daily and p.m. peak-hour traffic volumes for the major roadways in the project vicinity.



SILVA VALLEY PARKWAY INTERCHANGE

FUTURE TRAFFIC VOLUMES
WITH THE SILVA VALLEY INTERCHANGE

FIGURE 10 - 11

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Intersection Level of Service

The a.m. and p.m. peak-hour turning movement volumes common to both designs are shown in Figures 10-12 and 10-13, respectively. The future LOS under this scenario for the critical intersections is shown in Table 10-6.

Implementation of either design would result in:

- o improvement from LOS E (No-Project Alternative) to LOS D during the p.m. peak hour at the Latrobe Road/U. S. 50 EB Ramps intersection. This impact is considered beneficial; however, the LOS is still unacceptable because the county has an LOS C as a goal. To reduce this impact reconstruct the El Dorado Hills Boulevard interchange and improve the Latrobe Road/U. S. 50 EB Ramps intersection.

- o improvement from LOS D (No-Project Alternative) to LOS C during the a.m. peak hour at the El Dorado Hills Boulevard/U. S. 50 WB Ramps intersection. This impact is considered beneficial. No mitigation is required.

- o no change from LOS D (No-Project Alternative) to LOS D during the p.m. peak hour at the Bass Lake Road/U. S. 50 EB Ramps intersection; however, the LOS is still unacceptable. To reduce this impact reconstruct the Bass Lake Road interchange and improve the EB Ramps intersection.

- o improvement from LOS F (No-Project Alternative) to LOS C during the p.m. peak hour at the White Rock Road/Latrobe Road intersection. This impact is considered beneficial. No mitigation is required.

Freeway Merge/Diverge Level of Service

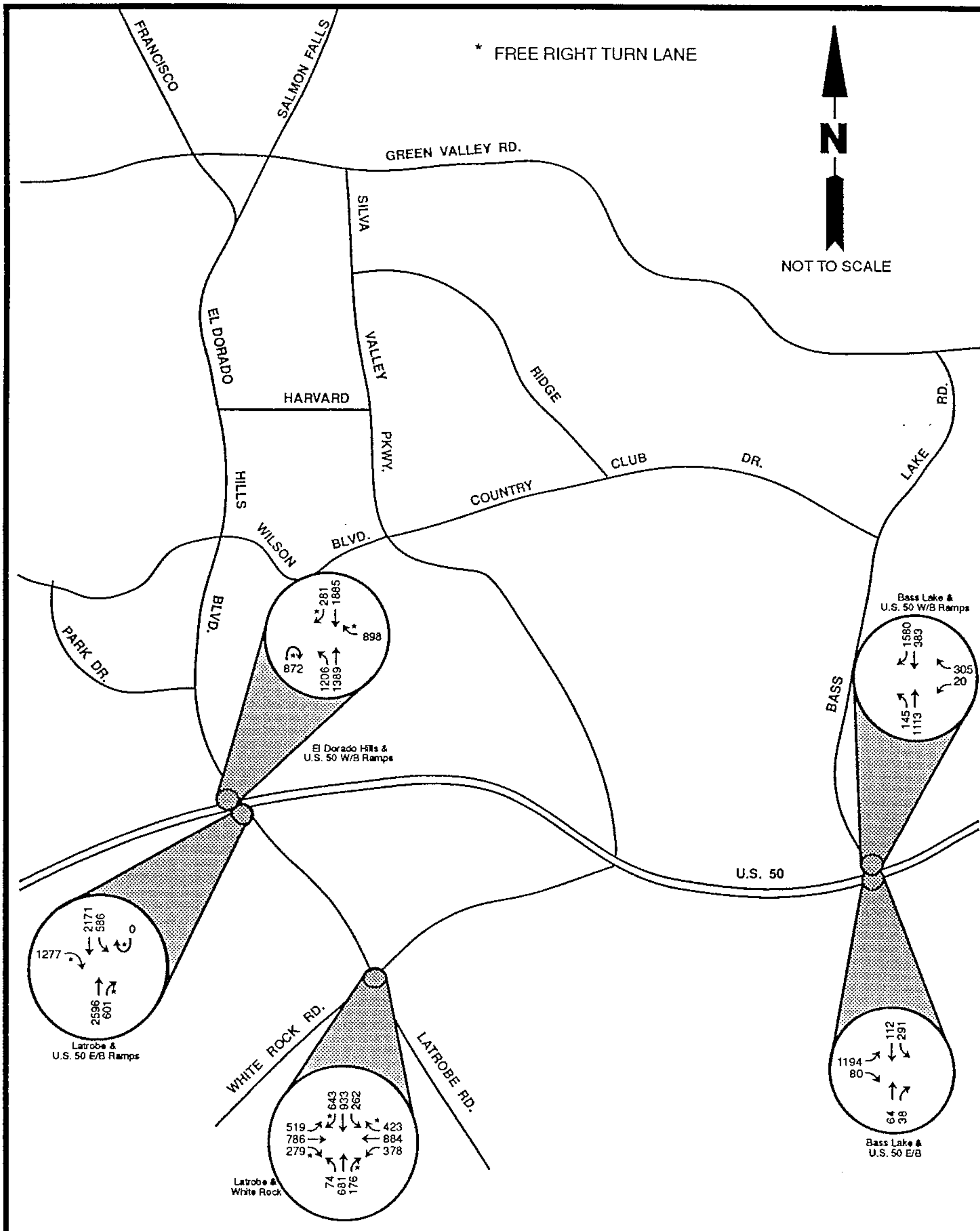
Table 10-7 shows the results of the freeway merge/diverge LOS analysis for both the Ridge Design and Undercrossing Design.

Implementation of either design would result in:

- o improvement from LOS F (No-Project Alternative) to LOS C during the a.m. peak hour at the EB on-ramp of the El Dorado Hills Boulevard/U. S. 50 interchange. This impact is considered beneficial. No mitigation is required.

- o no change from LOS F (No-Project Alternative) to LOS F during the p.m. peak hour at the EB on-ramp of the El Dorado Hills Boulevard/U. S. 50 interchange but a substantial reduction in the V/C ratio from 2.35 to 1.06. This impact is considered beneficial; however the LOS is still unacceptable. To reduce this impact the on-ramp would need to be widened to two lanes. However, Caltrans generally considers widening of on-ramps to be infeasible where mainline capacity is not adequate. Therefore, no mitigation is recommended.

- o no change from LOS F (No-Project Alternative) to LOS F during the a.m. peak hour at the WB on-ramp of the El Dorado Hills Boulevard/ U. S. 50 interchange but a reduction in the V/C ratio from 1.44 to 1.24. This impact is considered



SILVA VALLEY PARKWAY INTERCHANGE

A.M. PEAK HOUR VOLUMES: COMMON TO BOTH INTERCHANGE DESIGNS

FIGURE 10 - 12

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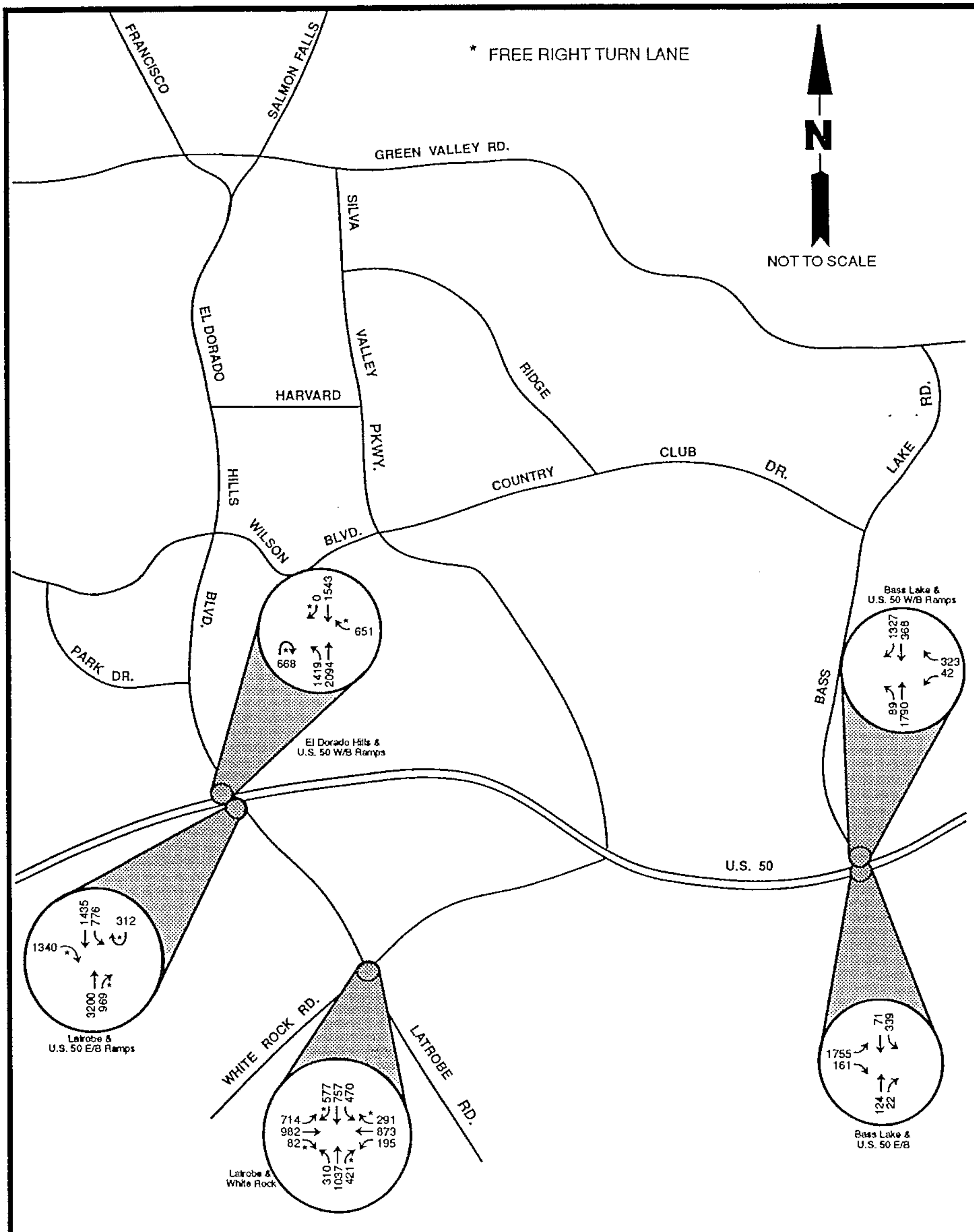

SILVA VALLEY PARKWAY INTERCHANGE

P.M. PEAK HOUR VOLUMES:
COMMON TO BOTH INTERCHANGE DESIGNS

FIGURE 10 - 13

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beneficial; however, the LOS is still unacceptable. To reduce this impact, the WB on-ramp would need to be widened to two lanes. However, Caltrans generally considers widening of on-ramps to be infeasible where mainline capacity is not adequate. Therefore, no mitigation is recommended.

- no change from LOS F (No-Project Alternative) to LOS F during the p.m. peak hour at the WB on-ramp of the El Dorado Hills Boulevard/U. S. 50 interchange; however, the LOS is still unacceptable. To reduce this impact the WB on-ramp would need to be widened to two lanes. No mitigation is recommended.

- improvement from LOS F and E (No-Project Alternative) to LOS B during the a.m. and p.m. peak hour, respectively, at the WB slip off-ramp of the El Dorado Hills Boulevard/U. S. 50 interchange. This impact is considered beneficial. No mitigation is required.

- improvement from LOS F (No-Project Alternative) to LOS B during the a.m. and p.m. peak hour at the WB loop off-ramp of the El Dorado Hills Boulevard/U. S. 50 interchange. This impact is considered beneficial. No mitigation is required.

- no change from LOS F (No-Project Alternative) to LOS F during the a.m. and p.m. peak hour at the EB off-ramp of the Bass Lake Road/U. S. 50 interchange; however, the LOS is still unacceptable. To reduce this impact, reconstruct the Bass Lake Road interchange and widen the EB off-ramp to two lanes. This requires an auxiliary lane in advance of the off-ramp.

- no change from LOS F (No-Project Alternative) to LOS F during the a.m. and p.m. peak hours, respectively, at the WB on-ramp of the Bass Lake Road/U. S. 50 interchange; however, the LOS is still unacceptable. To reduce this impact, the WB on-ramp would need to be widened to two lanes. However, Caltrans generally considers widening of on-ramps to be infeasible where mainline capacity is not adequate. Therefore, no mitigation is recommended.

Mainline U. S. 50 Analysis

A substantial amount of traffic would be generated as a result of future planned development in the vicinity of the proposed interchange and regionwide.

Implementation of either design, based on cumulative development, would result in no change from LOS F (No-Project Alternative) to LOS F on the U. S. 50 mainline in the project vicinity. The impact is considered significant. To reduce this impact to a less-than-significant level, widen U. S. 50.

Additional Impacts of the Ridge Design

The Ridge Design represents the expected traffic impacts in 2010 with construction of the interchange at the ridge location. The roadway network, shown in Figure 10-5, was assumed to be completed in this condition. Figure 10-11 shows the estimated daily and p.m. peak-hour traffic volumes for the major roadways in the project vicinity.

Intersection Level of Service

The a.m. and p.m. peak-hour turning movement volumes for the Ridge Design are shown in Figures 10-14 and 10-15, respectively. The future LOS under this scenario for the critical intersections is shown in Table 10-7. There are no additional impacts to the intersections for the Ridge Design.

Freeway Merge/Diverge Level of Service

Table 10-7 shows the results of the freeway ramp LOS analysis. Impacts at the El Dorado Hills Boulevard and Bass Lake Road interchanges would be the same with both designs. Impacts at the Silva Valley Parkway interchange would differ.

Implementation of the Ridge Design would result in:

- o LOS F during the p.m. peak hour at the EB slip on-ramp of the Silva Valley Parkway/U. S. 50 interchange. This impact is considered significant and unavoidable. To reduce this impact to a less-than-significant level, the on-ramp would need to be widened to two lanes. However, Caltrans generally considers widening of on-ramps to be infeasible where mainline capacity is not adequate. Therefore, no mitigation is recommended.

- o LOS F during the p.m. peak hour at the WB off-ramp of the Silva Valley Parkway/U. S. 50 interchange. This impact is considered significant. To reduce this impact to a less-than-significant level, improve the Silva Valley Parkway/U. S. 50 interchange and widen the WB off-ramp to two lanes. This requires an auxiliary lanes in advance of the off-ramp.

Mainline Level of Service

Table 10-8 is a summary of the mainline weaving analysis.

Implementation of the Ridge Design would result in LOS E and F during the a.m. and p.m. peak hours, respectively, on the eastbound mainline of U. S. 50 between the Silva Valley Parkway and El Dorado Hills Boulevard interchanges due to weaving. This impact is considered significant and unavoidable. To reduce this impact, but not to a less-than-significant level, an additional through-lane to U. S. 50 would need to be added and the Silva Valley Parkway interchange would need to be shifted 700 feet eastward. Note: It is not possible to shift the interchange 700 feet east due to steep terrain. No mitigation is recommended.

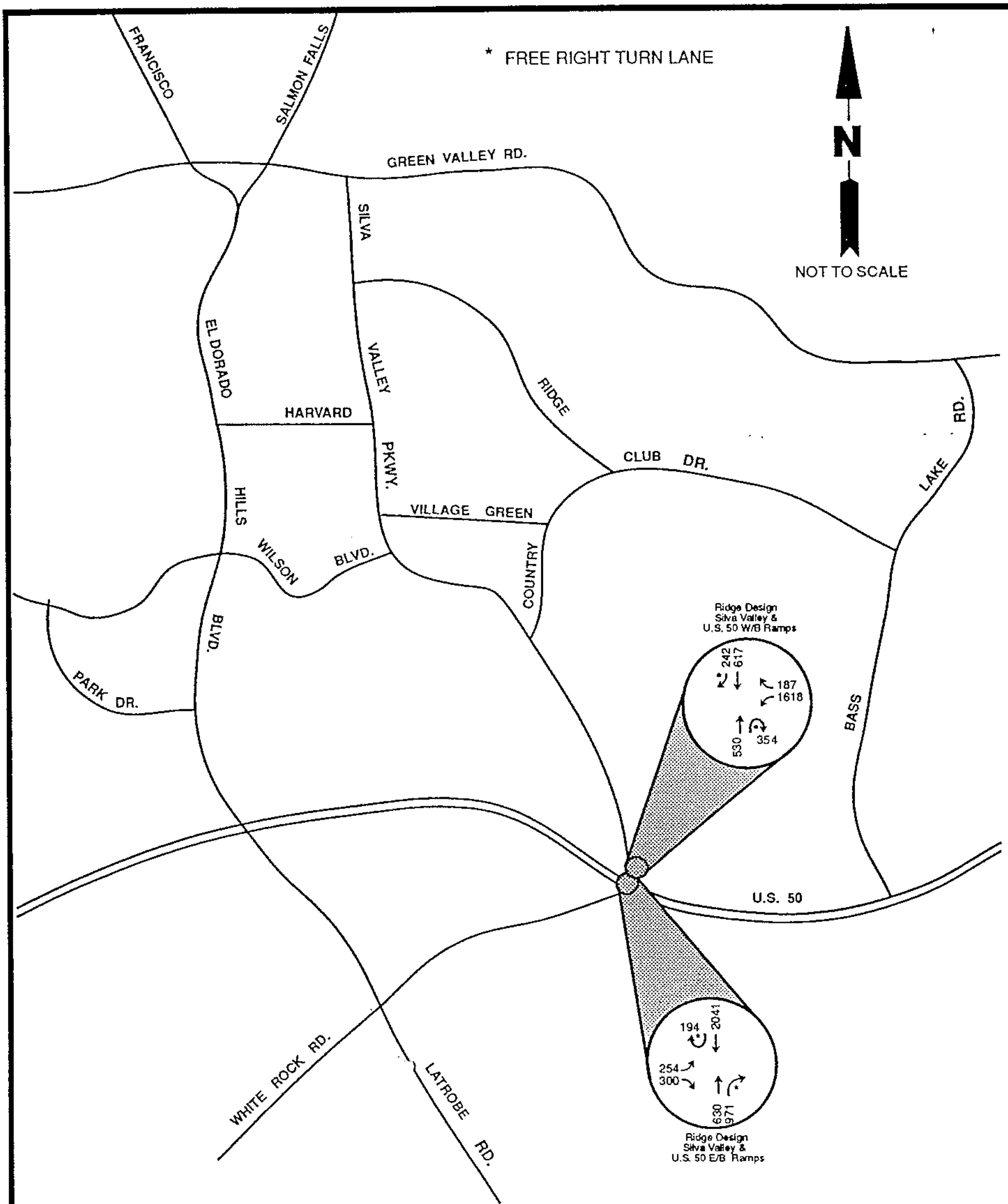
Table 10-8. Summary of Freeway Mainline Weaving Analysis
on U. S. 50 Between the Silva Valley Parkway and El Dorado Hills Boulevard Interchanges

		Westbound				Eastbound			
		AM Peak		PM Peak		AM Peak		PM Peak	
Alternative	Truck Traffic	LOS Weaving	LOS Freeway	LOS Weaving	LOS Freeway	LOS Weaving	LOS Freeway	LOS Weaving	LOS Freeway
Ridge Design	Without	B	B-	A	C	C	C	D	D
		48[a]	1,100[b]	51[a]	1,100[b]	44[a]	1,200[b]	39[a]	1,600[b]
	With	B	C-	B	C	D	E	D-	F
		46[a]	1,350[b]	47[a]	1,250[b]	39[a]	1,720[b]	35[a]	2,200[b]
Undercrossing Design	Without	B	C	B	C	C	C	D	D-
		47[a]	1,250[b]	47[a]	1,200[b]	42[a]	1,400[b]	37[a]	1,600[b]
	With	C	D	C	D	D	E	E	F
		44[a]	1,600[b]	44[a]	1,500[b]	37[a]	1,750[b]	32[a]	2,200[b]

Source: Unpublished data from Bissell & Karn, Inc. 1989.

[a] Design speed in miles per hour.
[b] Service rate in passenger cars per hour.

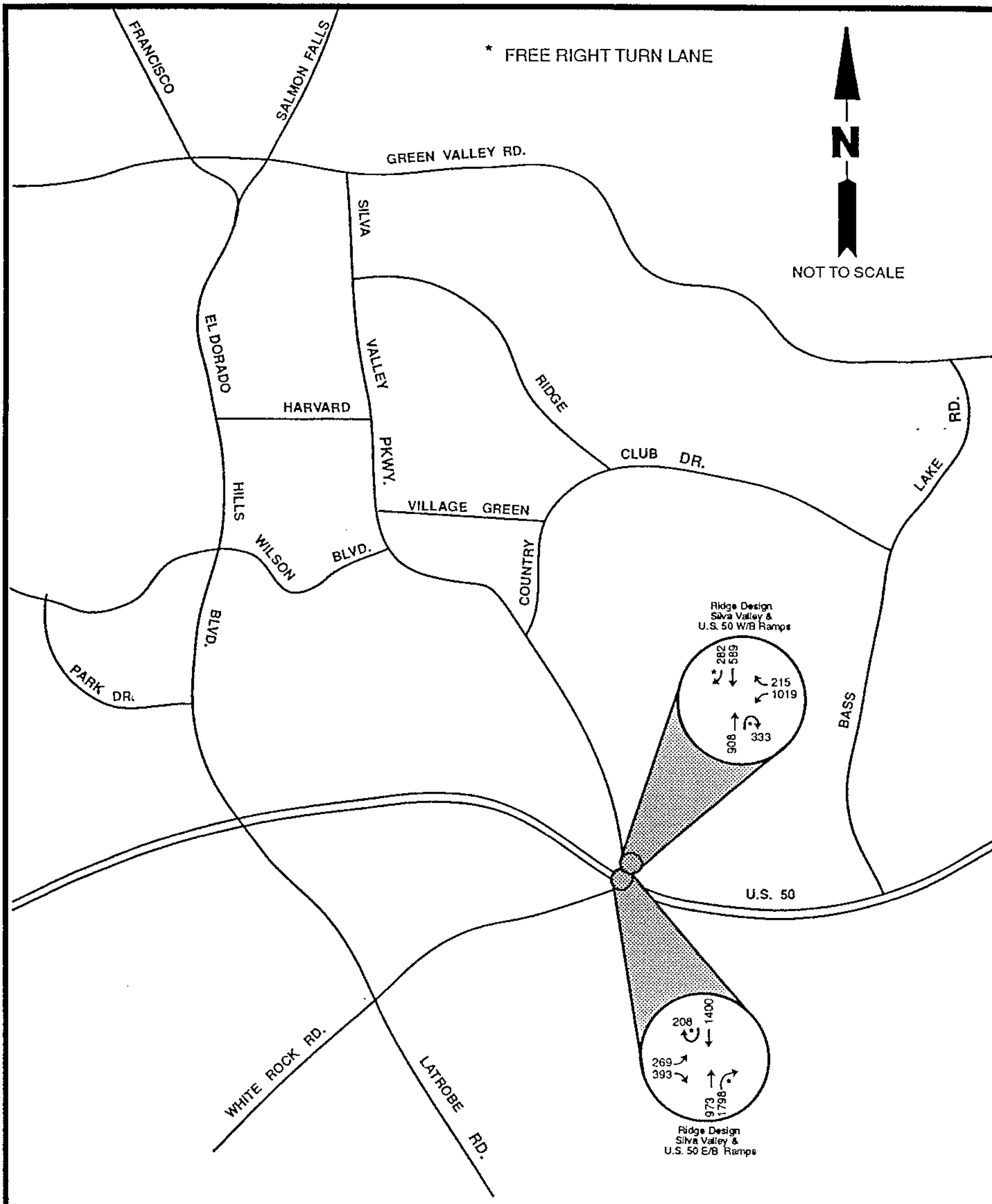
Note: The analysis assumes three lanes in each direction, plus an auxiliary lane, on U. S. 50 in 2010, as reported in the Caltrans Route Study Report.



SILVA VALLEY PARKWAY INTERCHANGE

A.M. PEAK HOUR VOLUMES: RIDGE DESIGN

FIGURE 10 - 14



SILVA VALLEY PARKWAY INTERCHANGE

P.M. PEAK HOUR VOLUMES: RIDGE DESIGN

FIGURE 10 - 15

Construction Impacts

Implementation of the Ridge Design would result in no substantial construction impacts.

Additional Impacts of the Undercrossing Design

The Undercrossing Design represents the expected traffic impacts in 2010 with the construction of the interchange at the existing White Rock Road undercrossing. The roadway network, shown in Figure 10-5, was assumed to be completed in this condition. Figure 10-11 shows the estimated daily and p.m. peak-hour traffic volumes for the major roadways in the project vicinity.

Intersection Level of Service

The a.m. and p.m. peak-hour turning movement volumes for the Undercrossing Design are shown in Figures 10-16 and 10-17, respectively. The future LOS under this alternative for the critical intersections are shown in Table 10-7. Impacts at the critical intersections would be the same for the Undercrossing Design as for the Ridge Design.

Freeway Merge/Diverge Level of Service

Table 10-7 shows the results of the freeway ramp LOS analysis for the Undercrossing Design. Impacts at the El Dorado Hills Boulevard and Bass Lake Road interchanges on U. S. 50 would be the same for the Undercrossing Design as for the Ridge Design. Impacts at the Silva Valley Parkway interchange would differ.

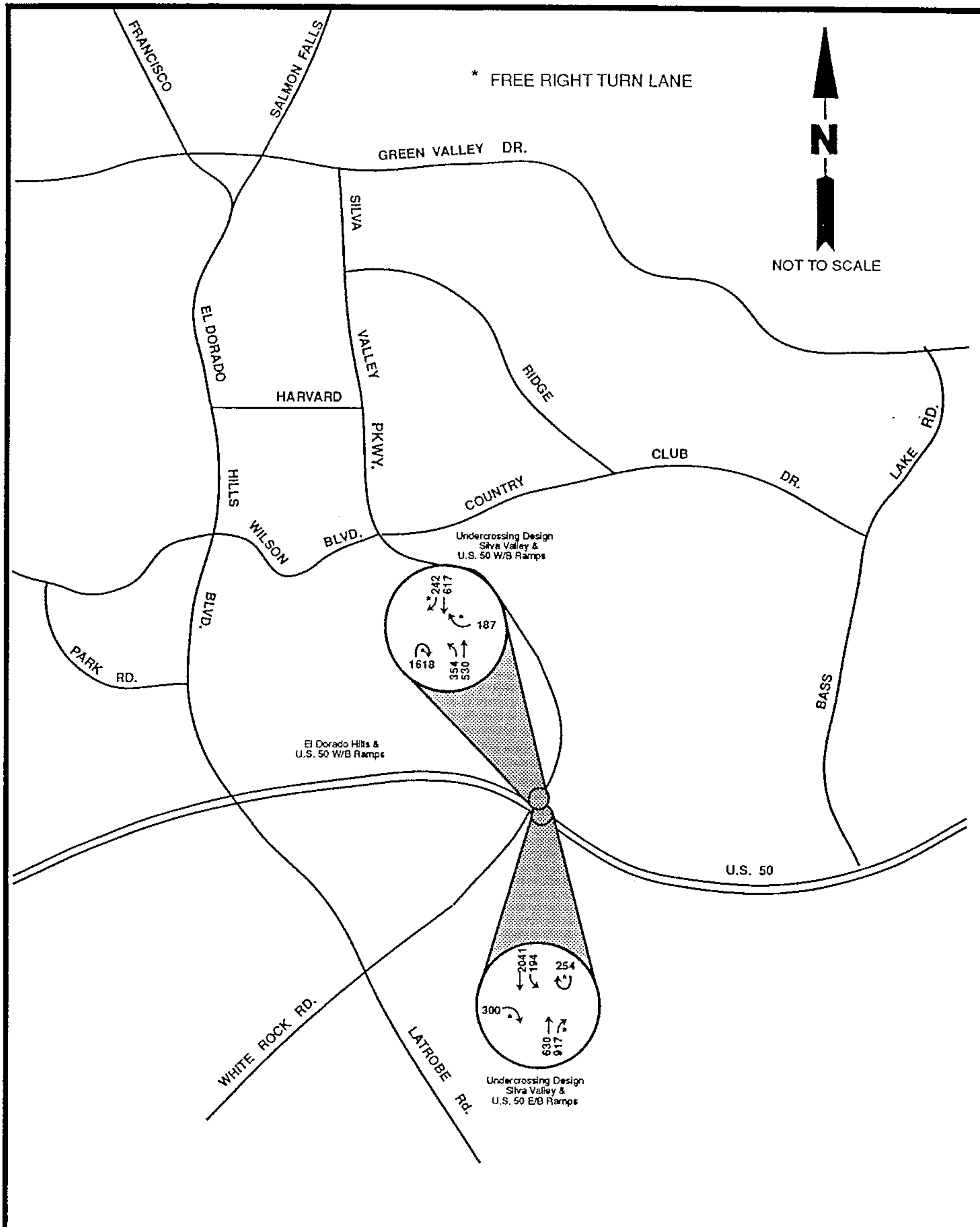
Implementation of the Undercrossing Design would result in:

- LOS F during the p.m. peak hour at the EB slip on-ramp of the Silva Valley Parkway/U. S. 50 interchange. This impact is considered significant and unavoidable. To reduce this impact to a less-than-significant level, the EB on-ramp would need to be widened to two lanes. However, Caltrans generally considers widening of on-ramps to be infeasible where mainline capacity is not adequate. Therefore, no mitigation is recommended.

- LOS F during the a.m. and p.m. peak hour at the WB off-ramp of the Silva Valley Parkway/U. S. 50 interchange. This impact is considered significant. To reduce this impact to a less-than-significant level, improve the Silva Valley Parkway/U. S. 50 interchange by splitting the off-ramps.

Mainline Level of Service

Table 10-8 is a summary of the mainline weaving analysis.



SILVA VALLEY PARKWAY INTERCHANGE

A.M. PEAK HOUR VOLUMES : UNDER CROSSING DESIGN

FIGURE 10 - 16

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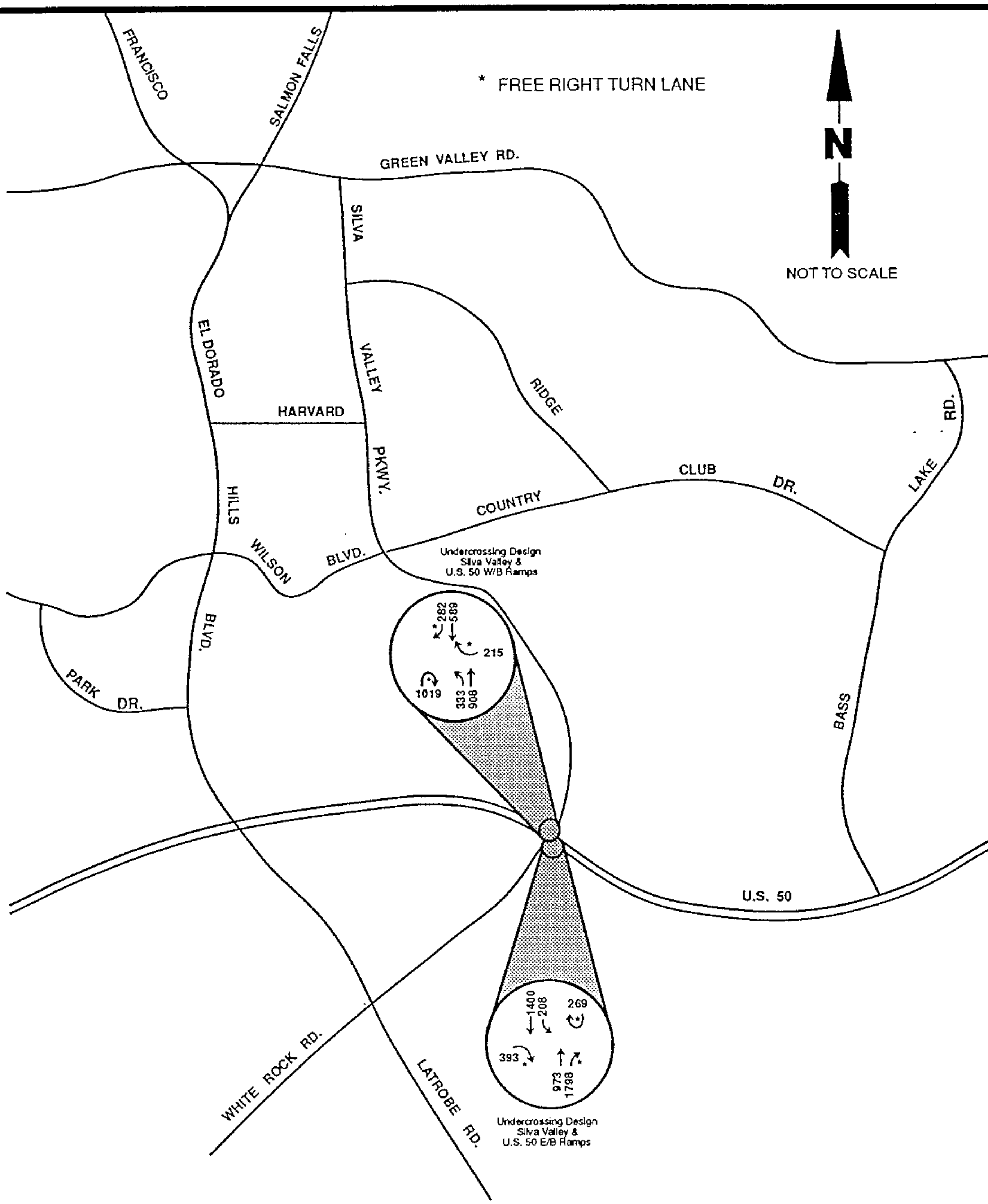

SILVA VALLEY PARKWAY INTERCHANGE

P.M. PEAK HOUR VOLUMES: UNDER CROSSING DESIGN

FIGURE 10 - 17

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Implementation of the Undercrossing Design would result in:

- o LOS E and F during the a.m. and p.m. peak hours, respectively, on the eastbound mainline of U. S. 50 between the Silva Valley Parkway and El Dorado Hills Boulevard interchanges. This impact is considered significant and unavoidable. To reduce this impact, but not to a less-than-significant level, an additional through-lane would need to be added to U. S. 50 and the Silva Valley Parkway interchange would need to be shifted 1,200 feet eastward. Note: It is not possible to shift the interchange 1,200 feet further east due to steep terrain. No mitigation is recommended.

Construction Impacts

Implementation of the Undercrossing Design would result in:

- o substantial traffic detours of mainline U. S. 50 traffic for at least 6 months while constructing new bridges on U. S. 50. This impact is considered significant and unavoidable. To reduce this impact, but not to a less-than-significant level, prepare and implement a detailed construction detour plan.

- o difficulty maintaining traffic on Silva Valley Parkway during construction. This impact is considered significant and unavoidable. No mitigation is recommended.

MITIGATION MEASURES

The following are mitigation measures that would be needed at critical intersections or freeway facilities in order to achieve an adequate LOS. The assumed adequate LOS used in this analysis was LOS C for the intersections and LOS D for freeway facilities. Results of the LOS analysis for mitigation measures are presented in Tables 10-9 and 10-10 for intersections and freeway ramps, respectively. Recommended improvements to mitigate the transportation impacts of the proposed interchange will be financed by a developer fee program fund administered by El Dorado County (Allington pers. comm.).

Mitigation Measures for the No-Project Alternative

The following improvements to the planned intersection and ramp lane configurations would be needed under 2010 traffic levels without the project (Figure 10-18).

Intersection Improvements

Improve the White Rock Road/Latrobe Road Intersection. For the impact to be reduced to a less-than-significant level, this intersection requires grade separation to

TABLE 10-9
INTERSECTION LEVEL OF SERVICE ANALYSIS WITH MITIGATIONS

	NO - PROJECT				RIDGE DESIGN				UNDERCROSSING DESIGN			
	A.M. PEAK		P.M. PEAK		A.M. PEAK		P.M. PEAK		A.M. PEAK		P.M. PEAK	
INTERSECTION	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
White Rock Rd./ Latrobe Rd.	N/A*	N/A	N/A*	N/A	0.57	A	0.76	C	0.57	A	0.76	C
Latrobe Rd./ US 50 EB Ramps	0.60	B	0.73	C	0.59	A	0.74	C	0.59	A	0.74	C
El Dorado Hills Blvd./ US 50 WB Ramps	0.79	C	0.71	C	0.76	C	0.76	C	0.76	C	0.76	C
Bass Lake Rd./ US 50 WB Ramps	0.60	A	0.77	C	0.54	A	0.75	C	0.54	A	0.75	C
Bass Lake Rd./ US 50 EB Ramps	0.51	A	0.72	C	0.50	A	0.73	C	0.50	A	0.73	C
Silva Valley Pkwy./ US 50 EB Ramps					0.78	C	0.64	B	0.63	B	0.47	A
Silva Valley Pkwy./ US 50 WB Ramps					0.69	B	0.60	A	0.41	A	0.39	A

* Grade Separate

TABLE 10-10
FREEWAY MERGE/DIVERGE LEVEL OF SERVICE ANALYSIS
WITH MITIGATIONS

LOCATION	MERGE/ DIVERGE CAPA- CITY	NO - PROJECT AM PEAK V/C	NO - PROJECT AM PEAK LOS	NO - PROJECT PM PEAK V/C	NO - PROJECT PM PEAK LOS	MERGE/ DIVERGE CAPA- CITY	BOTH DESIGNS AM PEAK V/C	BOTH DESIGNS AM PEAK LOS	BOTH DESIGNS PM PEAK V/C	BOTH DESIGNS PM PEAK LOS	CAPA- CITY	RIDGE DESIGN AM PEAK V/C	RIDGE DESIGN AM PEAK LOS	RIDGE DESIGN PM PEAK V/C	RIDGE DESIGN PM PEAK LOS	CAPA- CITY	UNDERCROSSING DESIGN AM PEAK V/C	UNDERCROSSING DESIGN AM PEAK LOS	UNDERCROSSING DESIGN PM PEAK V/C	UNDERCROSSING DESIGN PM PEAK LOS
El Dorado Hills Blvd.																				
EB off (slip)	2000	0.59	C	0.71	C	2000	0.56	C	0.53	C										
EB off (loop)	2000	0.43	B	0.62	C	2000	0.45	B	0.66	C										
EB on	2000	1.32	F	2.35*	F	2000	0.72	C	1.06	F										
WB off (slip)	2000	0.35	A	0.31	A	2000	0.42	B	0.39	B										
WB off (loop)	2000	0.91	E	0.63	C	2000	0.53	B	0.41	B										
WB on	2000	1.44	F	1.19	F	2000	1.24	F	1.21	F										
Bass Lake Rd.																				
EB off	2000	0.51	C	0.76	D	2000	0.56	C	0.79	D										
EB on	2000	0.63	C	0.83	D	2000	0.61	C	0.82	D										
WB off	2000	0.77	D	0.73	C	2000	0.77	D	0.72	C										
WB on	2000	1.52	F	1.27	F	2000	1.56	F	1.30	F										
Ridge Design																				
Silva Valley Pkwy.																				
EB off											2000	0.34	B	0.40	B					
EB on (slip)											2000	0.56	C	1.09	F					
EB on (loop)											2000	0.53	C	0.68	C					
WB off											2000	0.61	C	0.56	C					
WB on (slip)											2000	0.15	A	0.17	A					
WB on (loop)											2000	0.65	C	0.63	C					
Undercrossing Design																				
Silva Valley Pkwy.																				
EB on																2000	0.67	C	1.21	F
EB off																2000	0.34	B	0.40	B
WB on																2000	0.36	B	0.37	B
WB off (slip)																2000	0.87	D	0.67	C
WB off (loop)																2000	0.76	D	0.63	C

NOTE: U.S. 50 assumed to have six lanes by 2010.

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accommodate the projected 2010 traffic volumes without the Silva Valley Parkway/U. S. 50 interchange.

Interchange Improvements

Reconstruct the El Dorado Hills Boulevard Interchange. This mitigation measure was identified in the El Dorado Hills Specific Plan EIR and will need to be treated as a separate improvement project needed when the interchange V/C ratio reaches 0.75 (Allington pers. comm.)

- o Improve the Latrobe Road/U. S. 50 EB ramps intersection by adding a fourth northbound through lane to Latrobe Road.

- o Improve the El Dorado Hills/U. S. 50 WB ramps intersection by adding a fourth southbound through lane to El Dorado Hills Boulevard.

- o Widen the EB slip off-ramp to two lanes. This requires an auxiliary lane in advance of the off-ramp.

- o Widen the WB slip off-ramp to two lanes. This requires an auxiliary lane in advance of the off-ramp.

Impacts at the EB and WB on-ramps cannot be mitigated to a less-than-significant level.

Reconstruct the Bass Lake Road Interchange

- o Widen the EB off-ramp to two lanes. This requires an auxiliary lane in advance of the off-ramp.

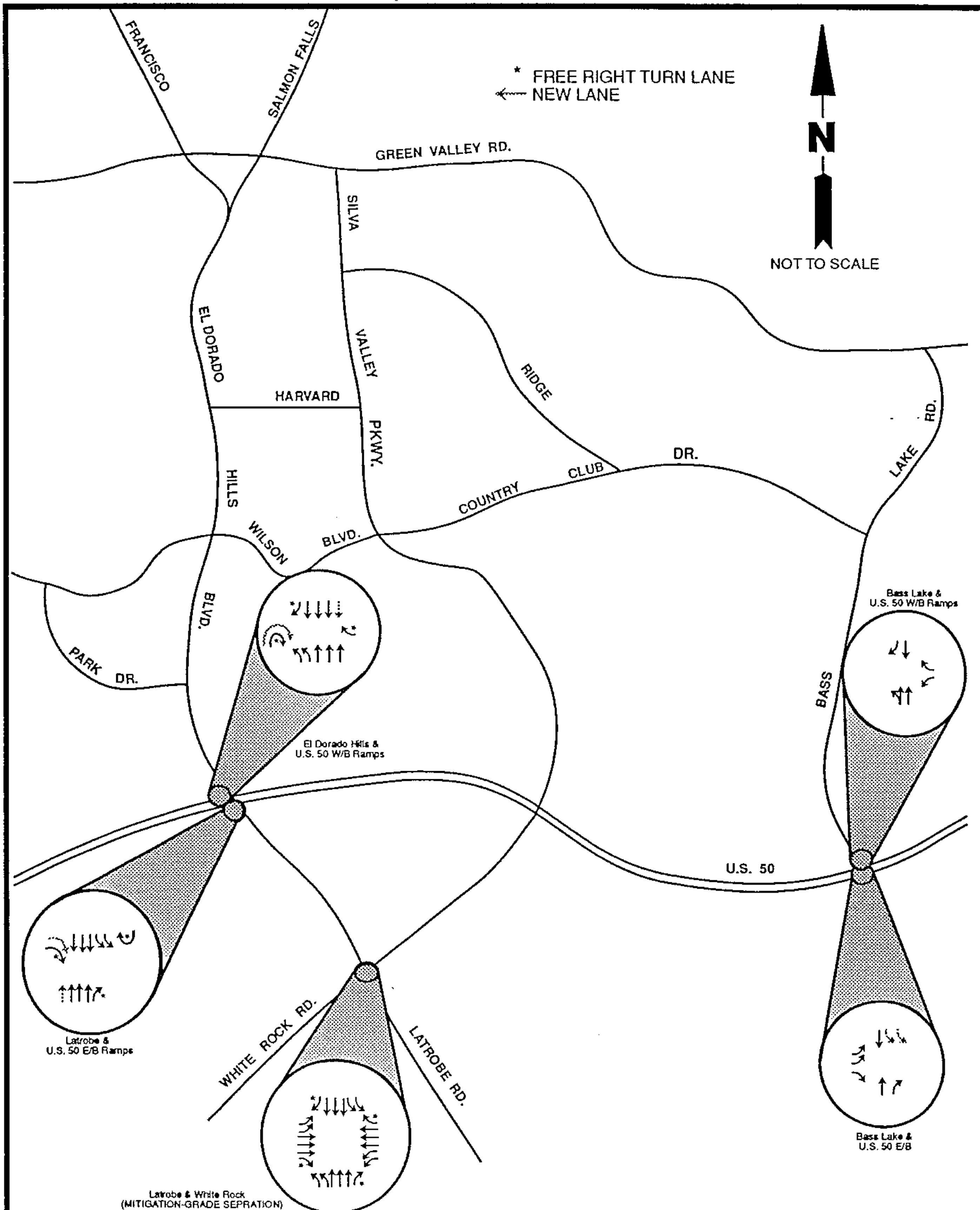
- o Add two southbound to eastbound left-turn lanes.

Other Mitigation Measures

Widen U. S. 50. To accommodate the cumulative traffic volumes projected for the No-Project Alternative at LOS D, under future year conditions, U. S. 50 would have to be eight lanes wide. This widening, of course, would be implemented in a phased manner as needed.

Mitigation Measures for Both Alternatives

The following improvements would be needed to the planned intersection and ramp lane configurations under 2010 traffic levels with either the Ridge Design or Undercrossing Design (Figure 10-19).

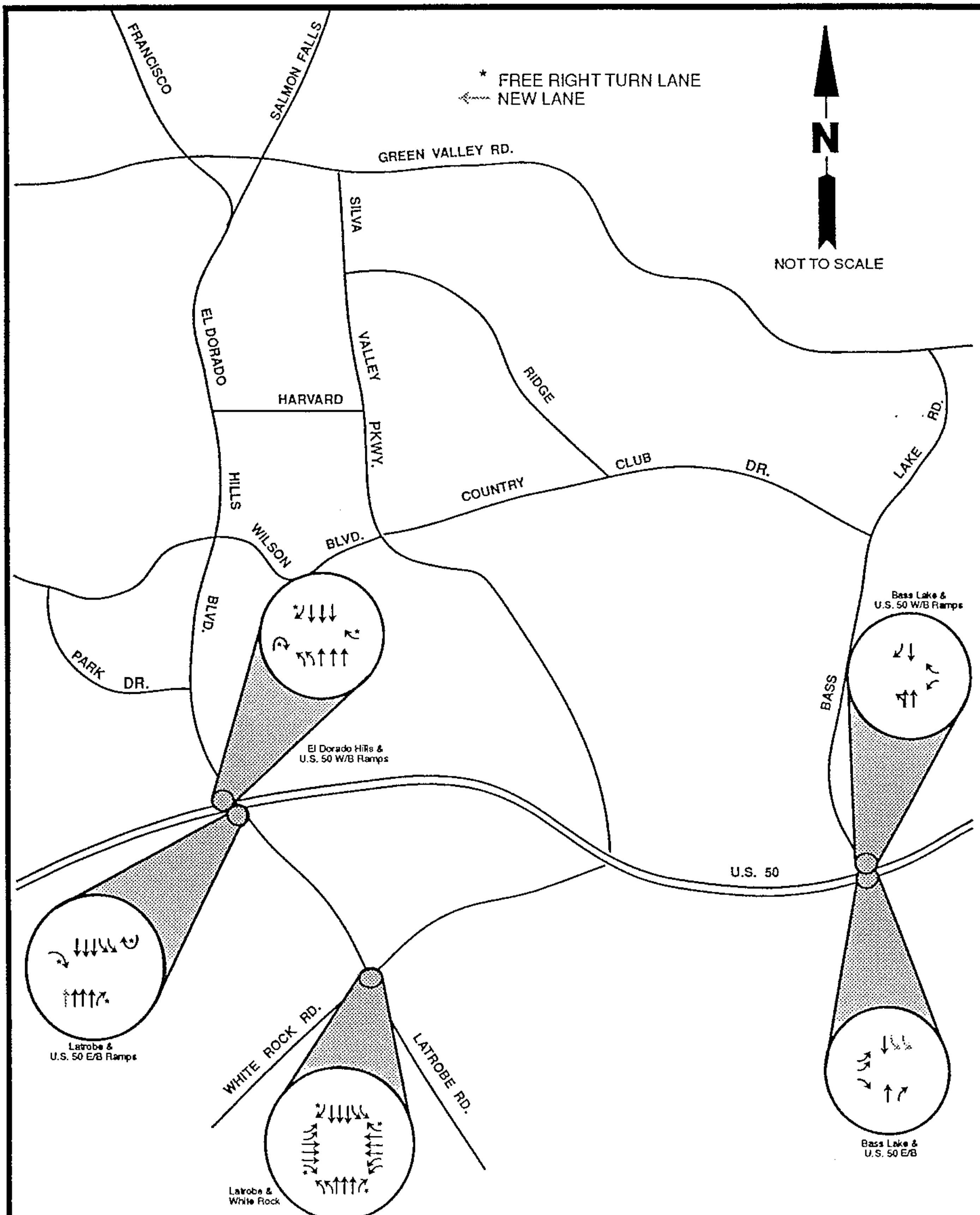


SILVA VALLEY PARKWAY INTERCHANGE

MITIGATED LANE CONFIGURATIONS : NO PROJECT ALTERNATIVE

FIGURE 10 - 18

PREPARED BY
TJKM
128-026
REV. 3-89



SILVA VALLEY PARKWAY INTERCHANGE

MITIGATED LANE CONFIGURATIONS: COMMON TO BOTH INTERCHANGE DESIGNS

FIGURE 10 - 19

PREPARED BY
TJKM
128-026
REV. 3-89

Interchange Improvements

Reconstruct the El Dorado Hills Boulevard Interchange. This mitigation measure was identified in the El Dorado Hills Specific Plan EIR and will need to be treated as a separate improvement project needed when the interchange V/C ratio reaches 0.75 (Allington pers. comm.).

- o Improve the Latrobe Road/U. S. 50 EB ramps intersection by adding a fourth northbound through lane to Latrobe Road.

Impacts at the EB and WB on-ramps cannot be reduced because the on-ramps cannot be widened.

Reconstruct the Bass Lake Road Interchange

- o Widen the EB off-ramp to two lanes. This requires an auxiliary lane in advance of the off-ramp.

- o Add two southbound to eastbound left-turn lanes.

Mainline Improvements

Widen U. S. 50. To accommodate the traffic volumes projected for either design at LOS D, under future year conditions, U. S. 50 would have to be eight lanes wide. This widening, of course, would be implemented in a phased manner as needed.

Additional Mitigation Measures for the Ridge Design

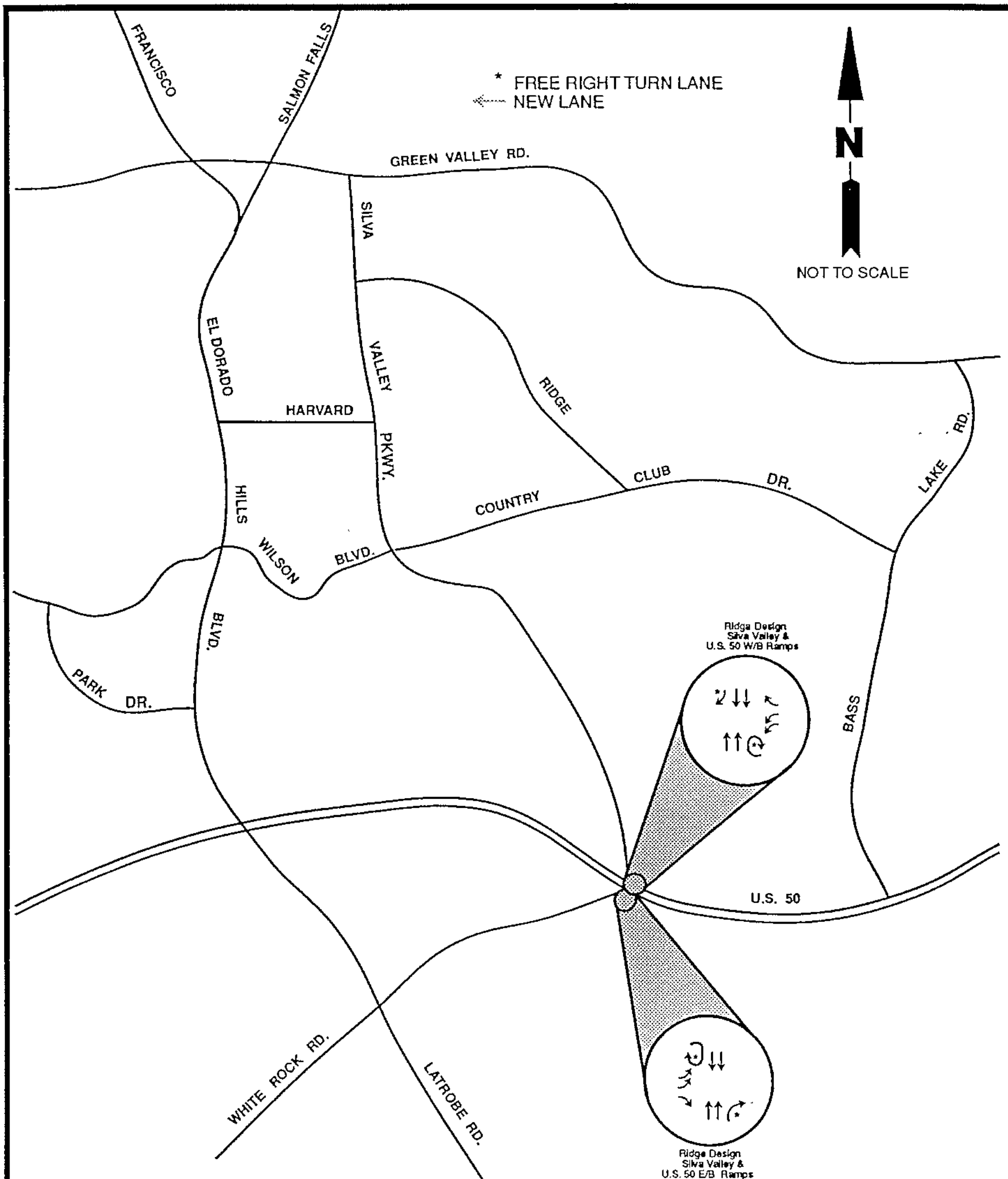
The following improvements would be needed in addition to the planned intersection and ramp lane configurations under 2010 traffic levels with the Ridge Design (Figure 10-21).

Interchange Improvement

Improve the Silva Valley Parkway/U. S. 50 Interchange. Add a second lane to the WB off-ramp. This requires an auxiliary lane in advance of the off-ramp.

Additional Mitigation Measures for the Undercrossing Design

The following improvements would be needed to the planned intersection and ramp lane configurations under 2010 traffic levels with the Undercrossing Design (Figure 10-20).



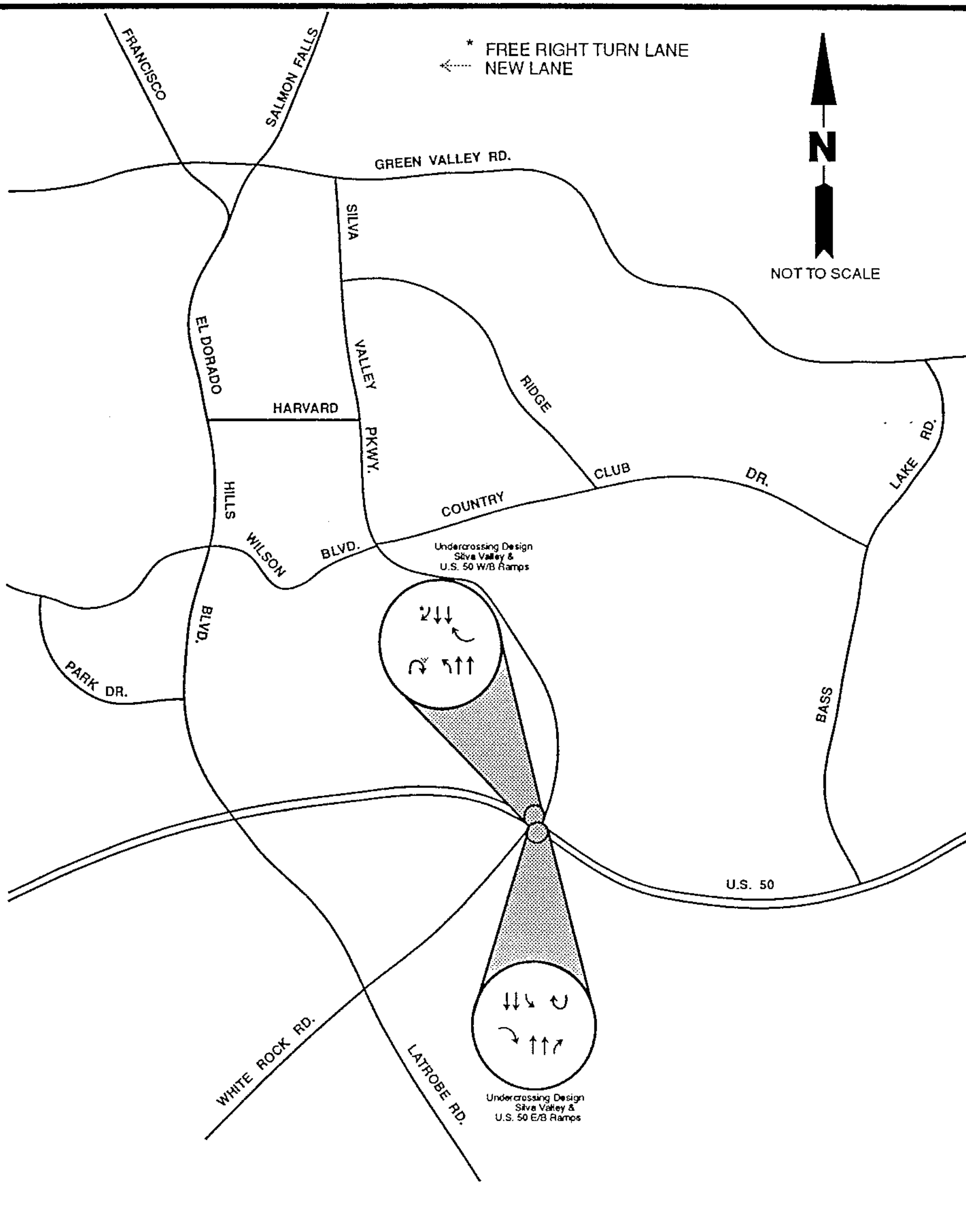
SILVA VALLEY PARKWAY INTERCHANGE

MITIGATED LANE CONFIGURATIONS: RIDGE DESIGN

FIGURE 10 - 20

PREPARED BY TJKM

128-026
REV. 3-89



SILVA VALLEY PARKWAY INTERCHANGE

MITIGATED LANE CONFIGURATIONS : UNDER CROSSING DESIGN

FIGURE 10 - 21

Interchange Improvement

Improve the Silva Valley Parkway/U. S. 50 Interchange. It is possible to split the off-ramps (Capaul pers. comm.) and get an adequate LOS at the diverge point. It should be noted, however, that the 1,618 vehicles during the a.m. peak hour is likely to exceed the capacity of the WB to SB loop off-ramp.

Construction

Prepare and Implement a Detailed Construction Detour Plan. The contractor shall maintain four lanes of traffic on U. S. 50. The construction of the U. S. 50 mainline bridges could be phased such that mainline traffic could be shifted from one existing bridge to a loop-ramp bridge during the construction of one new bridge. Upon completion of the new bridge, traffic could be shifted from the other existing bridge to the new bridge with the other direction traffic staying on the loop-ramp bridge. With completion of both bridges, mainline traffic could be shifted to the new bridges and the interchange could be completed.

CHAPTER 11. Air Quality

SETTING

Air Quality Standards

The federal Clean Air Act establishes air quality standards for several pollutants, and requires areas that violate these standards to prepare and implement plans to achieve the standards by certain deadlines. Both the State of California and the federal government have established a variety of ambient air quality standards. State and federal air quality standards are shown in Table 11-1. Table 11-1 divided into primary standards designated to protect the public health, and secondary standards intended to protect the public against such effects as visibility reduction, soiling, nuisance, and other forms of damage.

Transportation-related projects generally have the greatest potential for affecting concentrations of two pollutants: ozone and carbon monoxide (CO).

The state 1-hour ozone standard is 0.09 ppm (parts per million by volume), not to be exceeded. The federal 1-hour ozone standard is 0.12 ppm, which is not to be exceeded more than three times in any 3-year period.

State and federal CO standards have been set for both 1-hour and 8-hour averaging times. The state 1-hour CO standard is 20 ppm, while the federal 1-hour CO standard is 35 ppm. Both state and federal standards are 9 ppm for the 8-hour averaging period. State CO standards are phrased as values not to be exceeded. Federal CO standards are phrased as values not to be exceeded more than once a year.

Air Quality Planning

Section 107 of the Clean Air Act requires a status designation for all areas of California with respect to attainment of national ambient air quality standards. In response to the Clean Air Act requirements, the California Air Resources Board (ARB) and the U. S. Environmental Protection Agency (EPA) have designated the Mountain Counties Air Basin portion of El Dorado County as a nonattainment area for ozone. The area is designated "unclassified" for CO, nitrogen dioxide (NO2), and sulfur dioxide (SO2). The mountain counties air basin attains standards for total suspended particulates (TSP).

In response to the ozone designation, an ozone nonattainment plan has been prepared for El Dorado County. The nonattainment plan was developed in accordance with the rural area planning policy established by the EPA.

Table 11-1.
Ambient Air Quality Standards Applicable In California

Pollutant	Symbol	Averaging Time	Standard, as parts per million: California	Standard, as parts per million: National	Standard, as micrograms per cubic meter: California	Standard, as micrograms per cubic meter: National	Violation Criteria: California	Violation Criteria: National
Ozone	03	1 hour	0.09	0.12	180	235	if exceeded	if exceeded on more than 3 days in 3 years
Carbon Monoxide	CO	8 hours	9.0	9	10,000	10,000	if exceeded	if exceeded on more than one day per year
		1 hour	20	35	23,000	40,000		
(Lake Tahoe only)		8 hours	6	---	7,000	---		
Nitrogen Dioxide	N02	annual average	---	0.053	---	100	if exceeded	if exceeded
		1 hour	0.25	---	470	---		
Sulfur Dioxide	S02	annual average	---	0.03	---	80	if exceeded	if exceeded
		24 hours	0.05	0.14	131	365		if exceeded on more than one day per year
		1 hour	0.25	---	655	---		
Hydrogen Sulfide	H2S	1 hour	0.03	---	42	---	if equaled or exceeded	
Vinyl Chloride	C2H3C1	24 hours	0.010	---	26	---	if equaled or exceeded	
Particulate Matter, 10 microns or less	PM10	annual geometric mean	---	---	30	---	if exceeded	
		annual arithmetic mean	---	---	---	50		if exceeded
		24 hours	---	---	50	150		if exceeded on more than one day per year
Sulfate Particles	S04	24 hours	---	---	25	---	if equaled or exceeded	
Lead Particles	Pb	calendar quarter	---	---	---	1.5	if equaled or exceeded	if exceeded on more than one day per year
		30 days	---	---	1.5	---		

Notes: All standards are based on measurements at 25° C and 1 atmosphere pressure.
National standards shown are the primary (health effects) standards.
The California 24-hour standard for S02 applies only when state 1-hour 03 or 24-hour PM10 standards are being violated concurrently.

Air Quality Monitoring Data

No air quality monitoring stations exist for the El Dorado Hills area. Table 11-2 summarizes the air quality monitoring data for the monitoring sites closest to the project site. Between 1985 and 1987 the Citrus Heights monitoring station reported no violations for CO. However, the Citrus Heights and the Folsom stations have exceeded the ozone standard 4-17 days per year.

Existing Concentrations

Ozone

Ozone is a public health concern because it is a respiratory irritant that increases susceptibility to respiratory infections. Ozone also causes substantial damage to leaf tissues of crops and natural vegetation and damages many other materials by acting as a chemical oxidizing agent.

Ozone is not emitted directly into the atmosphere, but is the result of a complex series of chemical reactions involving other compounds that are directly emitted. The directly emitted pollutants involved in this reaction are hydrocarbons (HC) and nitrogen oxides (NOx). Hydrocarbons are sometimes measured as reactive organic gases (ROG). These directly emitted pollutants are known as precursors. Ozone impacts can occur many hours after emissions are produced and on a regional scale. The large amount of distance and time between production of emissions and formation of ozone allows many variables to affect the ultimate ozone concentrations.

Table 11-3 lists the sources of emissions that contribute to ozone problems in El Dorado County. The data include estimates of current-year emissions, projections of future-year emissions, and are disaggregated by emission source category.

Because the project area is currently undeveloped, the emissions due to existing levels of development are considered to be negligible.

Carbon Monoxide

CO levels are a public health concern because CO combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Relatively low concentrations of CO can substantially affect the amount of oxygen in the bloodstream since CO binds to hemoglobin 220-245 times more strongly than does oxygen. Both the cardiovascular system and the central nervous system can be affected when 2.5-4.0 percent of the hemoglobin in the bloodstream is bound to CO rather than to oxygen. State and federal ambient air quality standards for CO have been set at levels intended to keep CO from combining with more than 1.5 percent of the blood's hemoglobin (U. S. Environmental Protection Agency 1979 and California Air Resources Board 1982).

Table 11-2. Summary of Air Quality Monitoring Data

	Parameter	1985	1986	1987
		Year		
Carbon Monoxide				
Citrus Heights	Highest 1-hour[a]	9.0	11.0	8.0
	Highest 8-hour[a]	7.4	6.1	5.0
	Days exceeding standard	0	0	0
Ozone				
Citrus Heights	Highest 1-hour[a]	0.20	0.15	0.17
	Days exceeding standard	10	4	7
Folsom	Highest 1-hour[a]	0.17	0.15	0.16
	Days exceeding standard	13	7	17

Source: California Air Resources Board 1985-1987.

[a] 1-hour and 8-hour values given as ppm.

Table 11-3. Emissions Projections for Mountain Counties Air Basin Portion of El Dorado County in Tons per Day and Percent of Total

Reactive Organic Compounds

Source Category	1988 tn/dy	1988 percent	1990 tn/dy	1990 percent	1995 tn/dy	1995 percent	2000 tn/dy	2000 percent
Fuel Combustion	0.50	5.32%	0.60	6.45%	0.70	7.61%	0.80	7.34%
Agricultural Waste Burning	-	-	-	-	-	-	-	-
Other Waste Burning	0.10	1.06%	0.10	1.08%	0.10	1.09%	0.10	0.92%
Solvent Use	2.10	22.34%	2.20	23.66%	2.60	28.26%	2.90	26.61%
Petroleum Process, Storage and Transfer	0.60	6.38%	0.60	6.45%	0.60	6.52%	0.60	5.50%
Industrial Processes	-	-	-	-	-	-	-	-
Pesticide Application	0.20	2.13%	0.20	2.15%	0.20	2.17%	0.20	1.83%
Farming Operations	-	-	-	-	-	-	-	-
Construction & Demolition	-	-	-	-	-	-	-	-
Entrained Road Dust From Paved Sources	-	-	-	-	-	-	-	-
Entrained Road Dust From Unpaved Sources	-	-	-	-	-	-	-	-
Unplanned Fires	0.50	5.32%	0.50	5.38%	0.50	5.43%	0.50	4.59%
SUBTOTAL FOR STATIONARY SOURCES	4.00	42.55%	4.20	45.16%	4.70	51.09%	5.10	46.79%
On-Road Vehicles	3.80	40.43%	3.30	35.48%	2.50	27.17%	2.30	21.10%
Off-Road Vehicles	0.90	9.57%	1.00	10.75%	1.10	11.96%	1.20	11.01%
Other Mobile Sources	0.70	7.45%	0.80	8.60%	0.90	9.78%	2.30	21.10%
SUBTOTAL FOR MOBILE SOURCES	5.40	57.45%	5.10	54.84%	4.50	48.91%	5.80	53.21%
GRAND TOTAL FOR ALL SOURCES	9.40	100.00%	9.30	100.00%	9.20	100.00%	10.90	100.00%

Nitrogen Oxides

Source Category	1988 tn/dy	1988 percent	1990 tn/dy	1990 percent	1995 tn/dy	1995 percent	2000 tn/dy	2000 percent
Fuel Combustion	0.70	10.14%	0.80	11.76%	0.90	13.64%	1.10	15.49%
Agricultural Waste Burning	-	-	-	-	-	-	-	-
Other Waste Burning	-	-	-	-	-	-	-	-
Solvent Use	-	-	-	-	-	-	-	-
Petroleum Process, Storage and Transfer	-	-	-	-	-	-	-	-
Industrial Processes	-	-	-	-	-	-	-	-
Pesticide Application	-	-	-	-	-	-	-	-
Farming Operations	-	-	-	-	-	-	-	-
Construction & Demolition	-	-	-	-	-	-	-	-
Entrained Road Dust From Paved Sources	-	-	-	-	-	-	-	-
Entrained Road Dust From Unpaved Sources	-	-	-	-	-	-	-	-
Unplanned Fires	0.10	1.45%	0.10	1.47%	0.10	1.52%	0.10	1.41%
SUBTOTAL FOR STATIONARY SOURCES	0.80	11.59%	0.90	13.24%	1.00	15.15%	1.20	16.90%
On-Road Vehicles	5.30	76.81%	5.10	75.00%	4.70	71.21%	4.90	69.01%
Off-Road Vehicles	0.10	1.45%	0.10	1.47%	0.10	1.52%	0.10	1.41%
Other Mobile Sources	0.70	10.14%	0.70	10.29%	0.80	12.12%	0.90	12.68%
SUBTOTAL FOR MOBILE SOURCES	6.10	88.41%	5.90	86.76%	5.60	84.85%	5.90	83.10%
GRAND TOTAL FOR ALL SOURCES	6.90	100.00%	6.80	100.00%	6.60	100.00%	7.10	100.00%

Particulate Matter

Source Category	1988 tn/dy	1988 percent	1990 tn/dy	1990 percent	1995 tn/dy	1995 percent	2000 tn/dy	2000 percent
Fuel Combustion	1.80	5.37%	1.90	5.26%	1.60	3.96%	2.50	5.21%
Agricultural Waste Burning	-	-	-	-	0.54	1.34%	-	-
Other Waste Burning	0.20	0.60%	0.20	0.55%	0.87	2.15%	0.20	0.42%
Solvent Use	-	-	-	-	-	-	-	-
Petroleum Process, Storage and Transfer	-	-	-	-	-	-	-	-
Industrial Processes	-	-	0.10	0.28%	0.71	1.76%	0.10	0.21%
Pesticide Application	-	-	-	-	-	-	-	-
Farming Operations	0.80	2.39%	0.80	2.22%	6.38	15.79%	0.90	1.88%
Construction & Demolition	3.70	11.04%	3.90	10.80%	14.80	36.62%	5.40	11.25%
Entrained Road Dust From Paved Sources	19.80	59.10%	21.40	59.28%	5.68	14.06%	28.80	60.00%
Entrained Road Dust From Unpaved Sources	5.80	17.31%	6.30	17.45%	7.11	17.59%	8.40	17.50%
Unplanned Fires	0.50	1.49%	0.50	1.39%	0.22	0.54%	0.50	1.04%
SUBTOTAL FOR STATIONARY SOURCES	32.60	97.31%	35.10	97.23%	37.91	93.81%	46.80	97.50%
On-Road Vehicles	0.80	2.39%	0.90	2.49%	2.03	5.02%	1.00	2.08%
Off-Road Vehicles	-	-	-	-	0.02	0.05%	-	-
Other Mobile Sources	0.10	0.30%	0.10	0.28%	0.45	1.11%	0.20	0.42%
SUBTOTAL FOR MOBILE SOURCES	0.90	2.69%	1.00	2.77%	2.50	6.19%	1.20	2.50%
GRAND TOTAL FOR ALL SOURCES	33.50	100.00%	36.10	100.00%	40.41	100.00%	48.00	100.00%

Source: California Air Resources Board 1988.

Methodology. The CO air quality analysis performed for this EIR used CALINE3 and EMFAC7PC. CALINE3 is a line source air quality model developed by Caltrans to analyze localized air quality impacts (Benson 1979). EMFAC7PC is a model that estimates on-road emission factors for a vehicle fleet given the fleet mix, year, temperature and operating speeds. For a description of CALINE3 and EMFAC7PC and how it was used in this EIR, see Appendix E.

The CO air quality analysis used a roadway network that contained U. S. 50 under existing conditions, and U. S. 50 and the proposed Silva Valley Parkway under future year conditions. The air quality analysis used traffic data as described in Chapter 10, "Traffic."

The CALINE3 air quality analysis estimated CO concentrations at "receptors," which are specific geographic points representing locations where people would be exposed to CO. For each receptor, CALINE3 estimates the total of CO contributions from a network of roadway segments.

In this EIR, the receptor locations were determined by examining the project site area and aerial photographs. Buildings closest to U. S. 50 were chosen as receptor locations.

Results. Table 11-4 shows the estimated worst-case existing CO concentrations. Under such conditions, none of the receptor locations is expected to violate the state or federal 8-hour CO standard of 9 ppm. In addition, none of the receptor locations is estimated to violate the state 1-hour standard of 20 ppm or the federal 1-hour standard of 35 ppm.

IMPACTS

The quantitative air quality analysis in this EIR focuses on the project's possible contribution to CO violations in the vicinity of the proposed interchange. The interchange does not directly generate traffic nor does it directly generate ozone precursors. Therefore, this EIR does not quantitatively estimate ozone-related impacts attributable to the interchange. The general relationship of the project to regional air quality is discussed in Chapter 3, "Summary of Findings."

A qualitative discussion of CO concentrations in the vicinity of the El Dorado Hills Boulevard/Latrobe Road interchange and Bass Lake interchange also is presented.

Definition of Significance

According to the State CEQA Guidelines (Section 15064[e] and Appendix G), a project will normally have a significant adverse impact if it will "violate any ambient air quality standard, contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations." The CEQA Guidelines

Table 11-4. Predicted Worst-Case Carbon Monoxide Levels in Parts Per Million

Receptor Number and Location	Existing Conditions		Future Year (2010) No Project		Future Year (2010) Ridge Design		Future Year (2010) Undercrossing Design	
	Peak Hour Average	8-Hour Average	Peak Hour Average	8-Hour Average	Peak Hour Average	8-Hour Average	Peak Hour Average	8-Hour Average
EXISTING SENSITIVE RECEPTORS								
NORTHEAST OF INTERCHANGE SITE								
1. Structure on Byram Property 210 feet from U.S. 50	5.6	3.6	8.3	5.4	8.6	5.6	8.3	5.4
2. Structure on Patterson Property 290 feet from U.S. 50	4.8	3.1	6.2	4.0	8.8	5.7	7.7	5.0
3. Richmond/Hall Cemetery	5.5	3.6	8.3	5.4	7.4	4.8	7.7	5.0
SOUTHEAST OF INTERCHANGE SITE								
4. East end of White Rock Road	4.7	3.1	5.3	3.4	4.9	3.2	5.3	3.4
5. Tong Cemetery	4.9	3.2	6.3	4.1	7.0	4.5	8.4	5.4
6. Structure on Tong Property 350 feet from U.S. 50	4.5	2.9	4.8	3.1	5.8	3.7	5.8	3.7
7. Structure on Matz Property 710 feet from U.S. 50	4.4	2.9	3.8	2.4	4.4	2.8	4.5	2.9
8. Structure on Matz Property 1050 feet from U.S. 50	4.2	2.7	3.7	2.4	4.2	2.7	4.6	3.0
SOUTHWEST OF INTERCHANGE SITE								
9. PGandE substation	5.3	3.4	7.4	4.8	8.2	5.3	7.5	4.8
10. Structure on Peerman Property 350 feet from U.S. 50	5.6	3.6	9.7	6.3	11.0	7.1	10.6	6.9
POTENTIAL FUTURE SENSITIVE RECEPTORS								
NORTHEAST OF INTERCHANGE SITE								
11. 500 feet from proposed westbound U.S 50 off-ramp			4.7	3.0	4.7	3.0	5.3	3.4
12. 1000 feet from U.S. 50			4.5	2.9	4.7	3.0	4.8	3.1
NORTHWEST OF INTERCHANGE SITE								
13. 100 feet from U.S. 50			10.6	6.9	10.5	6.8	10.6	6.9
14. 200 feet from proposed on-ramp to westbound U.S. 50			6.4	4.1	7.6	4.9	8.4	5.4
15. 500 feet from proposed Silva Valley Parkway			4.2	2.7	5.3	3.4	4.7	3.0
OTHER LOCATIONS MODELED								
NORTHEAST OF INTERCHANGE SITE								
16. 200 feet from proposed off-ramp			7.8	5.0	7.0	4.5	8.0	5.2
17. 200 feet from U.S. 50			9.5	6.1	9.5	6.1	9.3	6.0
SOUTHEAST OF INTERCHANGE SITE								
18. 500 feet from U.S. 50			4.5	2.9	4.9	3.2	5.8	3.7
SOUTHWEST OF INTERCHANGE SITE								
19. 500 feet from proposed Silva Valley Parkway			3.9	2.5	4.9	3.2	6.1	3.9
20. 500 feet from proposed on-ramp			4.0	2.6	4.8	3.1	5.4	3.5

Notes:
- Federal and state 8-hour standards for CO = 9 parts per million (ppm)
- Federal 1-hour standard for CO = 35 ppm. State 1-hour standard for CO = 20 ppm.
- 8-hour average values = 0.65 x peak 1-hour average values based on relationship between peak-hour and 8-hour monitoring data
- For a description of assumptions and methodology, see Appendix F.
- Location of some receptors for the ridge design may be different than the location of the same receptor for the undercrossing design. Roadway locations for the two designs differ. Receptors were located to retain similar spatial relationship to the roadways.
- Source: Jones & Stokes Associates 1988

definition of significance is used when air quality impacts from the project are discussed in this section.

Contribution to Regional Air Quality Problems

A substantial portion of traffic using the interchange would be oriented toward land use development in the El Dorado Hills Specific Plan area. The regional air quality impacts of this land use development have been discussed and quantitatively analyzed in the El Dorado Hills Specific Plan EIR.

Relation to the Air Quality Management Plan

In proposing the institutional framework for future air quality planning efforts, the EPA has recently used metropolitan statistical areas (MSA) to define air quality planning areas. El Dorado County is in the Sacramento MSA. In the past, air quality planning efforts in El Dorado County and the Sacramento metropolitan area have been separate.

Both El Dorado County and the Sacramento Area Council of Governments (SACOG) have specifically requested that the EPA not include El Dorado County in the Sacramento air quality planning area (Young and Thompson pers. comms.). SACOG does not believe that El Dorado County contributes to air quality problems in the Sacramento area. El Dorado County states that no monitoring stations exist to support the EPA's inclusion of El Dorado County in the Sacramento air quality planning area. However, a monitoring station is expected to be set up in January 1989 in the El Dorado Hills area (Thompson pers. comm.).

Construction-Related Impacts

Construction-related air quality impacts would occur from equipment and vehicle exhaust emissions, blasting operations, paving activity, and dust generated by construction vehicles and equipment. Exhaust emissions from vehicles and equipment are normally small in quantity and short in duration. Blasting operations emit an indeterminable amount of dust emissions. Paving activity generates small amounts of hydrocarbons, particulate matter, and odors.

Construction of the project would cause an indeterminable quantity of dust particles to be emitted into the atmosphere as a result of wind eroding soil over exposed earth surfaces, and activity by construction vehicles and equipment. Dust generation is dependent on soil type and soil moisture. A major fraction of these dust particles would settle out on and immediately adjacent to the project site, while a minor fraction would contribute to the area's ambient particulate levels. In general, particles larger than 30 microns (effective aerodynamic diameter) would settle out within a short distance of the project site.

Potential for Localized CO Impacts

The microscale air quality model, CALINE3, was used in estimating the CO impacts of the project. Descriptions of the model and modeling assumptions that were used are included in Appendix E. Table 11-4 summarizes the predicted worst-case CO levels for existing conditions, future year No Project, future year Ridge Design, and future year Undercrossing Design.

The CO air quality analysis of future year conditions employed a roadway network that contained U. S. 50 and the proposed Silva Valley Parkway. The Ridge Design and the Undercrossing Design were modeled separately. The use of a detailed roadway network allowed analysis of all critical roadway segments in areas where CO was anticipated to be an issue. Figures 11-1 and 11-2 show the roadway networks used to analyze the Ridge Design and the Undercrossing Design.

The air quality analysis used traffic data as described in Chapter 10, "Transportation."

As noted earlier in this EIR, some existing receptors were determined by locating buildings on the project site and from aerial photographs. For future year conditions, where there were no existing buildings, some receptor points were located at set distances (100, 200, 500, and 1,000 feet) from the roadways. Figures 11-1 and 11-2 show the receptor locations used for both the Ridge Design and the Undercrossing Design.

In examining the receptors shown in Figures 11-1 and 11-2, please note that the location of some receptors for the Ridge Design may be different than the location of the same receptor for the Undercrossing Design. This occurs because roadway locations for the two designs differ. Receptors were located to retain the same spatial relationship to the roadways.

Impacts of the No-Project Alternative

The impacts of the No-Project Alternative are shown in Table 11-5. The highest predicted worst-case 8-hour average value under the future year No-Project Alternative is 6.9 ppm at a location 100 feet from U. S. 50, northwest of the interchange site (Receptor 13). The highest predicted worst-case 1-hour average value under this condition is 10.6 at the same location.

Implementation of the No-Project Alternative would result in:

- o no violations of either the 1-hour or 8-hour state and federal CO standards in the immediate vicinity of the proposed interchange. This impact is considered less than significant. No mitigation is required.

Table 11-5. Summary of Air Quality Impacts and Mitigation Measures for the No-Project Alternative

Impact	Impact Rating Before Mitigation	Mitigation Measures	Impact Rating After Mitigation
No violations of either the 1-hour or the 8-hour state and federal CO standards.	Less than significant	No mitigation is required.	--
Increased CO concentrations at the El Dorado Hills Boulevard interchange approaching the 8-hour 9 ppm CO standard.	Potentially significant	Reconstruct the El Dorado Hills Boulevard interchange.	Less than significant

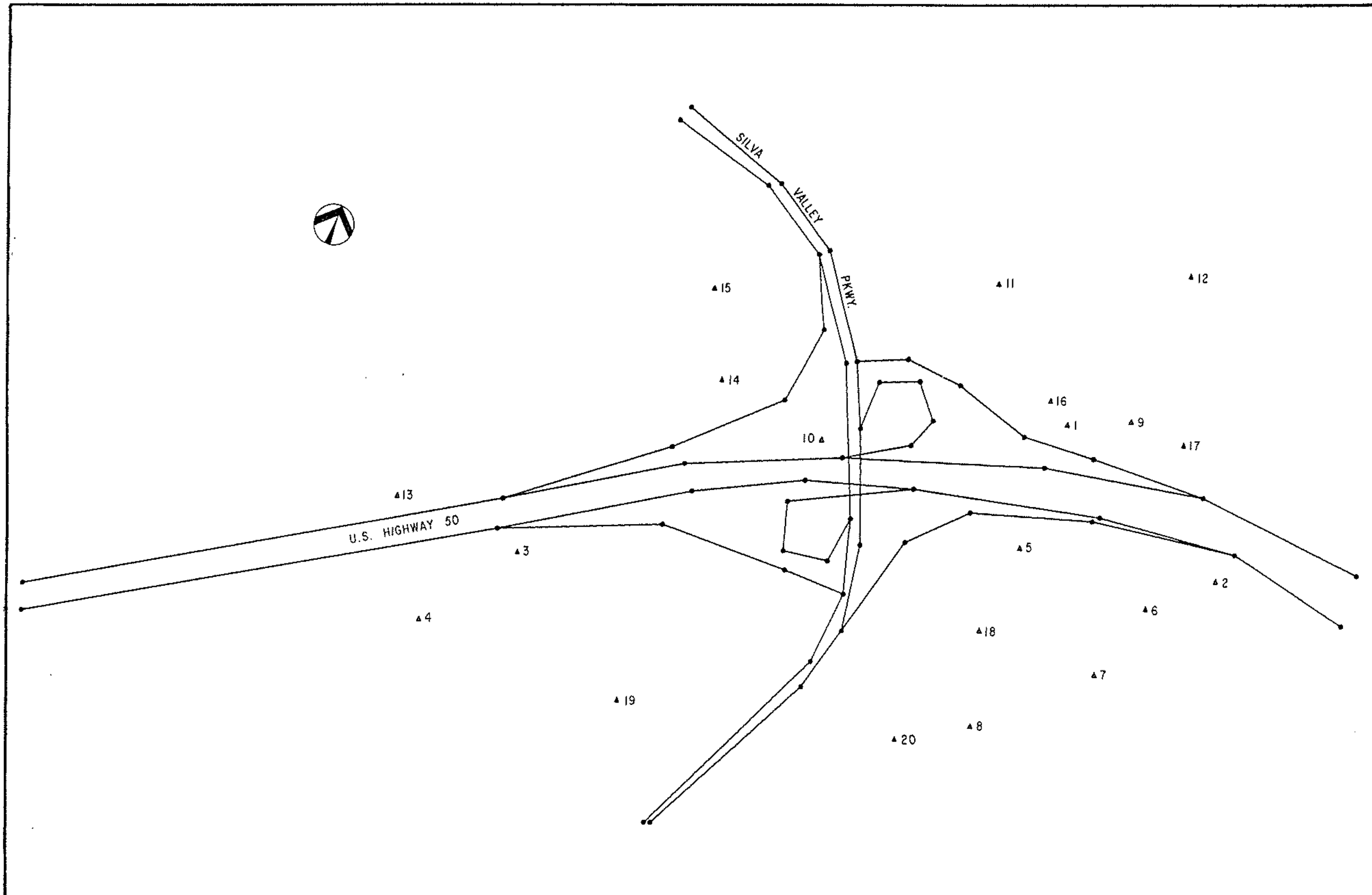


FIGURE 11-1. RIDGE DESIGN ALTERNATIVE ROADWAY NETWORK AND RECEPTORS USED IN CARBON MONOXIDE AIR QUALITY ANALYSIS

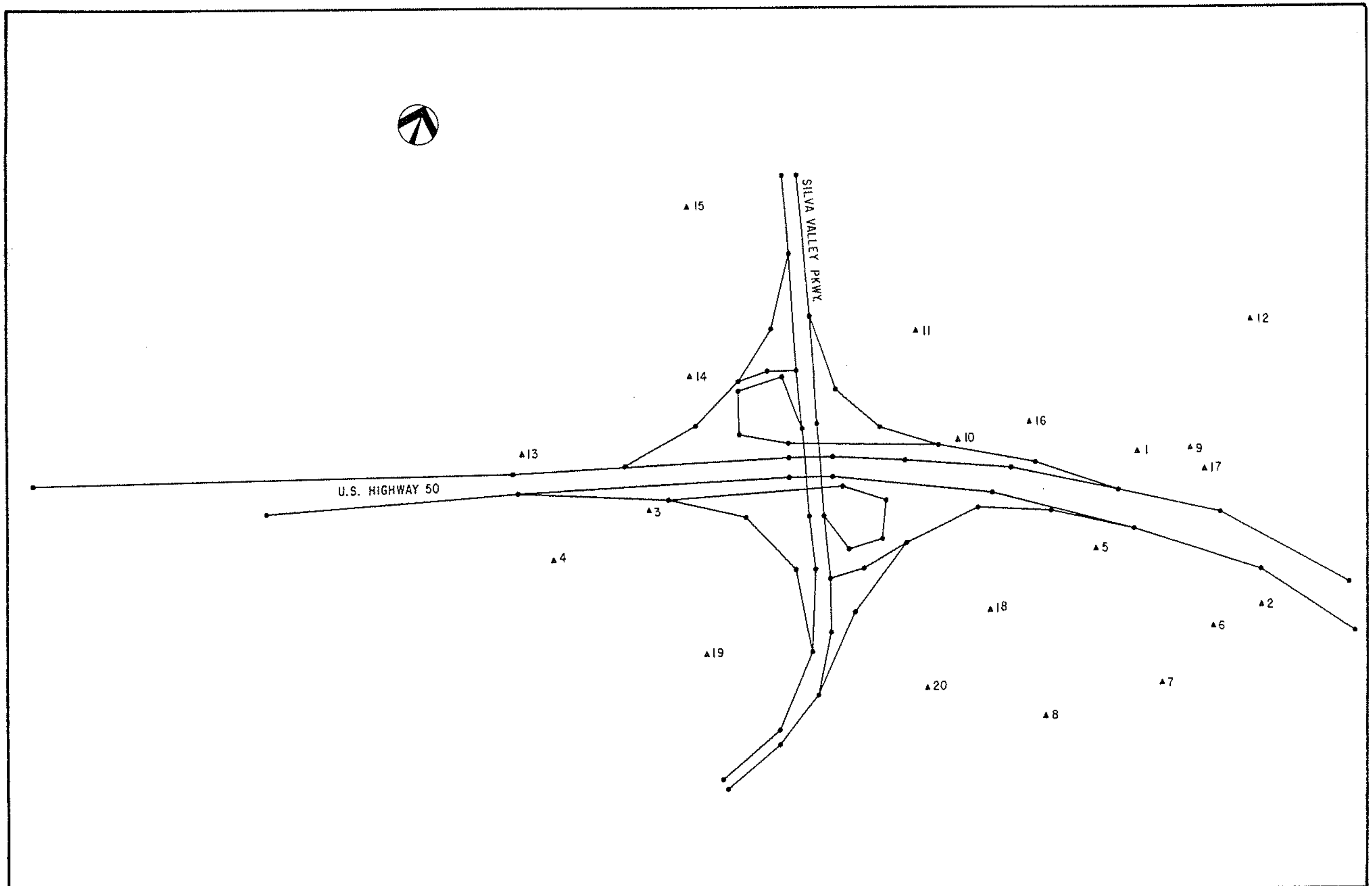


FIGURE 11-2. EXISTING UNDERCROSSING DESIGN ALTERNATIVE ROADWAY NETWORK AND RECEPTORS USED IN CARBON MONOXIDE AIR QUALITY ANALYSIS

- o increased CO concentrations at the El Dorado Hills Boulevard interchange approaching the 8-hour 9 ppm CO standard. This impact is considered potentially significant. To reduce this impact to a less-than-significant level, reconstruct the El Dorado Hills Boulevard interchange.

Impacts Common to Both Alternatives

Implementation of either design would result in:

- o no direct increase in ozone precursors. This impact is considered less than significant. No mitigation is required.
- o dust being generated during construction, causing a nuisance to neighboring land owners. This impact is considered significant. To reduce this impact to a less-than-significant level, control fugitive dust.
- o blasting emitting an indeterminable amount of fugitive dust into the atmosphere during construction as well as smoke from the blasting charges. This impact is considered potentially significant. To reduce this impact to a less-than-significant level, notify local residents of blasting operations and comply with all applicable local, state, and federal safety and air quality regulations.
- o construction equipment powered by internal combustion engines emitting an indeterminable quantity of nitrogen oxides, hydrocarbons, particulates, sulfur dioxides, and carbon monoxide. This impact is considered significant. To reduce this impact to a less-than-significant level, use properly maintained construction equipment.

The highest predicted worst case 8-hour CO average value under the future year is 7.1 ppm (Ridge Design) or 6.9 ppm (Undercrossing Design) at a structure on the Peerman property, 350 feet from U. S. 50, southwest of the interchange site (Receptor 10). The highest predicted worst-case 1-hour average value is 11.0 (Ridge Design) or 10.6 (Undercrossing Design) at the same location.

Implementation of either design would result in:

- o no violations of either the 1-hour or 8-hour state and federal CO standards in the immediate vicinity of the proposed interchange. This impact is considered less than significant. No mitigation is required.
- o higher CO concentrations at the El Dorado Hills Boulevard interchange than the concentrations in the immediate vicinity of the proposed interchange (lower than concentrations under the No-Project condition) but approaching the 8-hour 9 ppm CO standard. This impact is considered potentially significant. To reduce this impact to a less-than-significant level, reconstruct the El Dorado Hills Boulevard interchange.

- lower CO concentrations at the Bass Lake Road interchange than CO concentrations in the immediate vicinity of the proposed interchange. This impact is considered less than significant. No mitigation is required.

Additional Impacts of the Ridge Design

There are no additional impacts associated with the Ridge Design.

Additional Impacts of the Undercrossing Design

There are no additional impacts associated with the Undercrossing Design.

MITIGATION MEASURES

Mitigation Measures for the No-Project Alternative

Reconstruct the El Dorado Hills Boulevard Interchange

This mitigation measure is the same as that found in Chapter 10, "Transportation," for the No-Project Alternative.

Mitigation Measures for Both Alternatives

Control Fugitive Dust

Dust emissions related to construction can be reduced by as much as 50 percent by watering exposed earth surfaces during clearing, grading, earthmoving, and other site preparation work. The design plans will include provisions to control fugitive dust at all times either by use of water trucks or other methods.

Notify Residents of Blasting Operations and Comply with all Applicable Local, State, and Federal Safety and Air Quality Regulations

Local residents should be notified of blasting operations prior to their occurrence. This would allow residents to take precautions against fugitive dust emissions (e.g., closing windows and placing cars in garages). The design plans will include provisions to comply with all applicable local, state, and federal safety and air quality regulations.

Use Properly Maintained Construction Equipment

Properly maintained construction equipment will be required. Proper maintenance minimizes emissions from internal combustion engines.

Reconstruct the El Dorado Hills Boulevard Interchange

This mitigation measure is the same as that found in Chapter 10, "Transportation," for the No-Project Alternative.

Additional Mitigation Measures for the Ridge Design

No additional mitigation is required.

Additional Mitigation Measures for the Undercrossing Design

No additional mitigation is required.

CHAPTER 12. Noise

SETTING

Background Information of Noise

Sound travels through the air as waves of minute air pressure fluctuations caused by a vibration of some sort. In general, sound waves travel away from the noise source as an expanding spherical surface. The energy contained in a sound wave is consequently spread over an increasing area as it travels away from the source. This results in a decrease in loudness at greater distances from the noise source.

Most sound measurements are based on sound pressure levels at various frequency ranges, with results reported using a decibel (dB) scale. Decibel scales are a logarithmic index based on a ratio of the actual pressure fluctuations generated by sound waves compared to a standard reference pressure value.

Most sounds consist of a broad range of sound frequencies. Because the human ear is not equally sensitive to all frequencies, a large number of frequency weighing schemes have been used to develop noise measuring instruments that approximate the way the human ear responds to noise levels. The "A-weighted" decibel scale (dBA) is the most widely used for this purpose. Table 12-1 illustrates dBA levels associated with a variety of noise sources.

Varying noise levels are often described in terms of the equivalent constant decibel level. Equivalent noise levels (Leq) are used to develop single-value descriptions of average noise exposure over various periods. The Leq data used for these average noise exposure descriptors generally use A-weighted sound level measurements.

Other frequency weighing schemes are used for specialized purposes. In addition, a variety of methods have been developed for calculating 24-hour average noise levels. See Appendix F for more information on these methods of calculating and describing noise levels.

Working With Decibel Values

The logarithmic nature of dB scales means that individual dB ratings for different noise sources cannot be added directly to give the dB rating of the combination of these sources. Two noise sources producing equal dB ratings at a given location will produce a composite noise level 3 dB greater than either sound alone.

Table 12-1. Weighted Sound Levels and Human Response

Sound Source	dB(A)[a]	Response Criteria
	--150	
Carrier deck jet operation	--140	
		Painfully loud
	--130	Limit amplified speech
Jet takeoff (200 feet)	--120	
Discotheque		Maximum vocal effort
Auto horn (3 feet)		
Riveting machine	--110	
Jet takeoff (2,000 feet)		
Shout (0.5 foot)	--100	
N.Y. subway station		Very annoying
Heavy truck (50 feet)	-- 90	Hearing damage (8 hours)
Pneumatic drill (50 feet)		
	-- 80	Annoying
Freight train (50 feet)		
Freeway traffic (50 feet)	-- 70	Telephone use difficult
		Intrusive
Air conditioning unit (20 feet)	-- 60	
Light auto traffic (50 feet)		
	-- 50	Quiet
Living room		
Bedroom	-- 40	
Library		
Soft whisper (15 feet)	-- 30	Very quiet
Broadcasting studio	-- 20	
	-- 10	Just audible
	-- 0	Threshold of hearing

[a] Typical A-weighted sound levels taken with a sound-level meter and expressed as decibels on the scale. The A scale approximates the frequency response of the human ear.

Source: U. S. Council on Environmental Quality 1970.

Most people have difficulty distinguishing the louder of two noise sources that differ by less than 1.5 - 2.0 dB. In general, a 10 dB increase in noise level is perceived as a doubling in loudness. A 2 dB increase represents a 15 percent increase in loudness. Figure 12-1 illustrates the relationship between decibel changes and perceived loudness.

Sound levels from an isolated noise source will typically decrease by about 6 dB for every doubling of distance away from the noise source. When the noise source is essentially a line (i.e., vehicle traffic on a highway), noise levels decrease by about 3 dB for every doubling of distance.

Mathematical formulas and other considerations in working with decibel values are shown in the Noise Appendix.

Guidelines for Interpreting Noise Levels

Several federal, state, and local agencies have developed guidelines for evaluating the compatibility of different land uses and various noise levels. The following local and state guidelines are used in this report. Other guidelines are described in the Noise Appendix.

The desired maximum noise levels as recommended in the Noise Element of the El Dorado County General Plan (1979) are shown in Table 12-2. These values are used in this EIR to determine compatible noise levels (Lester pers. comm.) and the significance of impacts. The noise standards in Table 12-2 are classified by land uses and by period of the day.

The El Dorado Hills/Salmon Falls Area Plan contains High Density Residential land use designations for the land in the immediate vicinity of the project site (Figure 4-5). This corresponds to the "Residential: medium, high density" category shown in Table 12-2.

The traffic-related noise analysis in this EIR is based on the daytime peak-hour traffic data presented in Chapter 10, "Traffic." Therefore, the daytime noise levels shown in Table 12-2 are used as criteria for determining the significance of impacts.

The California Department of Housing and Community Development has adopted noise insulation performance standards for new hotels, motels, and dwellings other than detached single-family structures (California Administrative Code, Title 24, Division T25). These standards require that "interior community noise equivalent levels (CNEL) with windows closed, attributable to exterior sources, shall not exceed an annual CNEL of 45 dB in any habitable room."

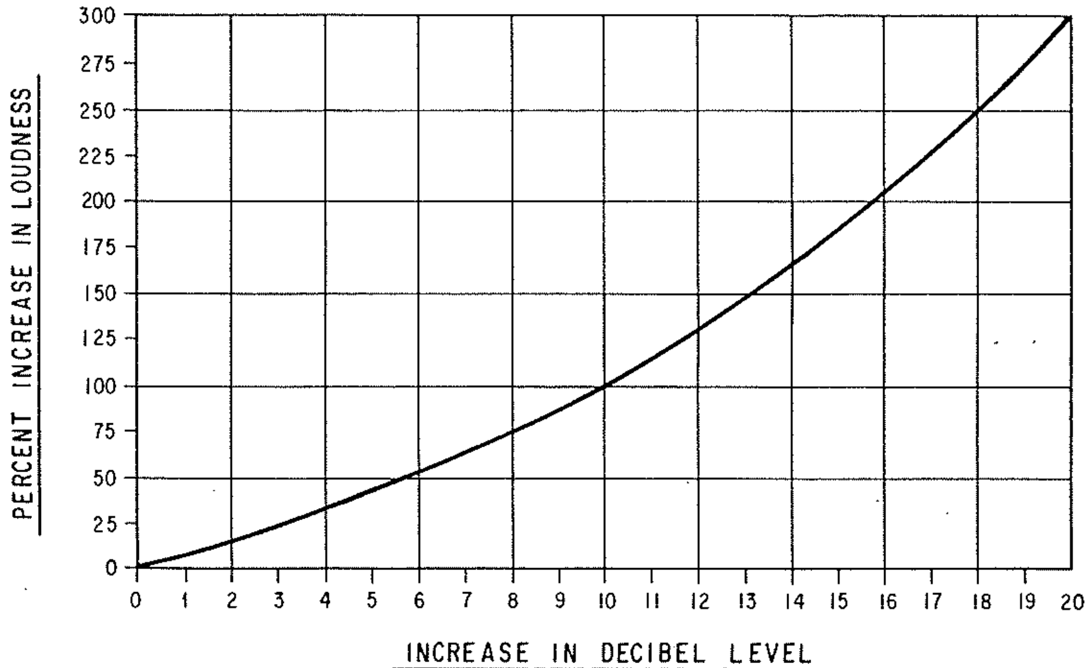
Table 12-2. El Dorado County Noise Level Standards

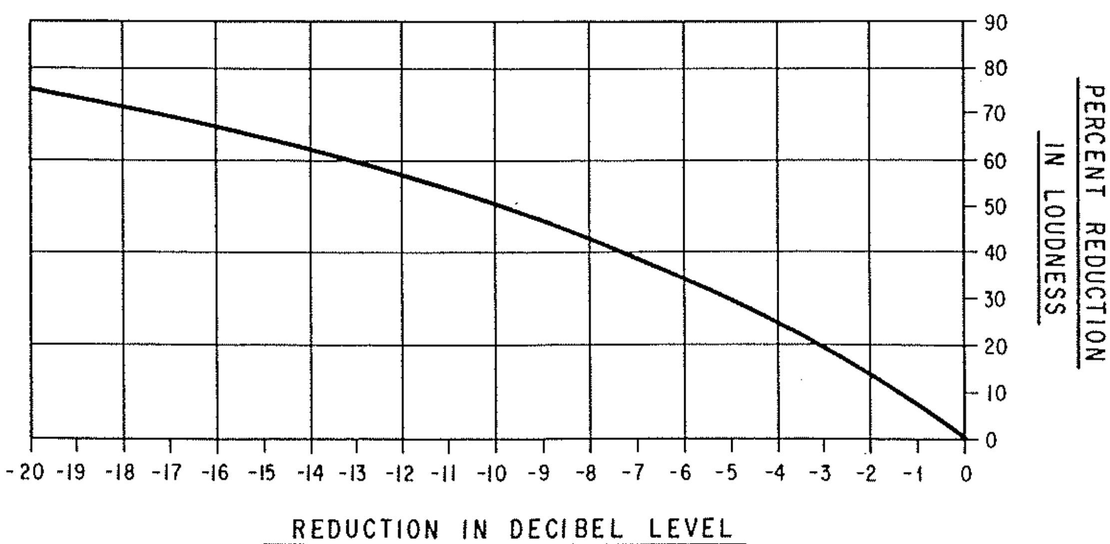
Land Use Classifications	Maximum Allowable Level L50 and Leq dBA
Residential: rural-suburban	
10 p.m. to 7 a.m.	40
7 a.m. to 10 p.m.	45-50
Residential: suburban	
10 p.m. to 7 a.m.	40
7 a.m. to 10 p.m.	50-55
Residential: low density, urban	
10 p.m. to 7 a.m.	50
7 a.m. to 10 p.m.	55-60
Residential: medium, high density	
10 p.m. to 7 a.m.	55
7 a.m. to 10 p.m.	60
Commercial zones: districts	
10 p.m. to 7 a.m.	60
7 a.m. to 10 p.m.	65
Industrial zones: districts	
24 hours	70-75

Source: El Dorado County Noise Element of the General Plan 1976.

FIGURE 12-1.

RELATIONSHIP BETWEEN DECIBEL CHANGES AND LOUDNESS





SOURCE: JONES & STOKES ASSOCIATES, INC.

Traffic Noise Simulation Modeling

Noise projections have been evaluated for the following development conditions: existing, future year without the project (No Project), future year with the Ridge Design, and future year with the Undercrossing Design.

Noise projections were evaluated using the Noise Barrier and Cost Reduction Procedure STAMINA 2.0/OPTIMA program prepared by the Federal Highway Administration (Bowlby, Higgins, and Reagan 1982). This model is structured to evaluate peak-hour Leq. The model is sensitive to assumptions about vehicle speed and the amount of truck traffic. The STAMINA 2.0/OPTIMA program also calculates noise barrier effectiveness.

Estimates of existing p.m. peak-hour traffic volumes are taken from Chapter 10, "Traffic." For each roadway in each of the development conditions, peak hour vehicle speeds were developed based on volume/capacity ratios and equations producing speed versus volume/capacity ratio curves presented in the Highway Capacity Manual (Highway Research Board 1965). These traffic volumes and vehicle speeds were incorporated into the STAMINA model.

The STAMINA noise model calculates noise levels at "receptors." Receptors are specific geographic points representing locations, such as residences and places of work, where people would possibly be exposed to unacceptable noise levels. The roadway network and receptors used for the noise analysis in this EIR are shown in Figures 12-2 through 12-4.

In addition to showing the roadway network and receptors used in the noise analysis, Figures 12-2 through 12-4 also show noise barriers. The noise barriers were analyzed only as possible mitigation measures; they are not considered part of the project. All of the noise levels shown in Table 12-3 and all of the noise level isopleth (contour) maps presented in this EIR show unmitigated conditions. Table 12-3 and the noise contour maps do not include the effect of noise barriers. The locations of noise barriers are shown in Figures 12-2 through 12-4 to provide information about these possible mitigation measures.

Existing Noise Levels

Estimated existing conditions noise levels are shown in Table 12-3. Based on existing traffic volumes, peak hour Leq noise levels in the vicinity of the project site range from 55.5 to 70.5 decibels. Noise level isopleths (contours) for existing conditions are shown in Figure 12-5. The dominant noise source in the vicinity of the project site is U. S. 50.

Receivers within approximately 600 feet of the centerline of the median of U. S. 50 experience peak hour noise levels higher than 60 dBA Leq. These noise levels are considered incompatible with the few existing residential uses in the vicinity of the project site.

Table 12-3. Predicted Peak Hour Noise Levels in Decibels (dB Leq)

Receptor Number and Location	Existing Conditions Noise Levels	Future Year No Project		Future Year Ridge		Future Year Undercrossing	
		Noise Levels	Change From Existing	Noise Levels	Change From No Project	Noise Levels	Change From No Project
EXISTING SENSITIVE RECEPTORS							
NORTHEAST OF INTERCHANGE SITE							
1. Structure on Byram Property 210 feet from U.S. 50	64.5	64.9	+ 0.4	64.4	- 0.5	62.9	- 2.0
2. Structure on Patterson Property 290 feet from U.S. 50	62.4	62.9	+ 0.5	62.1	- 0.8	60.8	- 2.1
3. Richmond/Hall Cemetery	68.7	68.4	- 0.3	65.6	- 2.8	66.2	- 2.2
SOUTHEAST OF INTERCHANGE SITE							
4. East end of White Rock Road	70.5	67.8	- 2.7	67.2	- 0.6	65.9	- 1.9
5. Tong Cemetery	66.6	67.9	+ 1.3	65.7	- 2.2	66.9	- 1.0
6. Structure on Tong Property 350 feet from U.S. 50	62.5	62.5	0	61.5	- 1.0	60.6	- 1.9
7. Structure on Matz Property 710 feet from U.S. 50	57.9	57.8	- 0.1	56.9	- 0.9	55.9	- 1.9
8. Structure on Matz Property 1050 feet from U.S. 50	55.5	55.9	+ 0.4	55.5	- 0.4	54.3	- 1.6
SOUTHWEST OF INTERCHANGE SITE							
9. PGandE substation	69.7	69.5	- 0.2	67.1	- 2.4	67.9	- 1.6
10. Structure on Peerman Property 350 feet from U.S. 50	62.3	63.1	+ 0.8	60.6	- 2.5	61.0	- 2.1
POTENTIAL FUTURE SENSITIVE RECEPTORS							
NORTHWEST OF INTERCHANGE SITE							
11. 100 feet from U.S. 50		69.8		67.6	- 2.2	67.9	- 1.9
12. 200 feet from U.S. 50		66.0		63.7	- 2.3	64.0	- 2.0
13. 200 feet from proposed on-ramp to westbound U.S. 50		62.0		59.8	- 2.2	61.2	- 0.8
14. 500 feet from proposed on-ramp to westbound U.S. 50		59.3		57.5	- 1.8	57.9	- 1.4
NORTHEAST OF INTERCHANGE SITE							
15. 500 feet from proposed U.S. 50 off-ramp		59.5		57.6	- 1.9	57.4	- 2.1
16. 200 feet from proposed U.S. 50 off-ramp		63.0		60.2	- 2.8	61.5	- 1.5
OTHER LOCATIONS MODELED							
SOUTHWEST OF INTERCHANGE SITE							
17. 100 feet from proposed southbound Silva Valley Parkway		66.4		66.4	0	66.3	- 0.1
18. 500 feet from proposed southbound Silva Valley Parkway		59.5		57.5	- 2.0	58.3	- 1.2
19. 200 feet from proposed eastbound U.S. 50 on-ramp		61.6		61.7	+ 0.1	61.9	+ 0.3
20. 500 feet from proposed eastbound U.S. 50 on-ramp		58.1		56.8	- 1.3	57.1	- 1.0

Notes:
- Location of some receptors for the ridge design may be different than the location of the same receptor for the undercrossing design. Roadway locations for the two designs differ. Receptors were located to retain similar spatial relationship to the roadways.

Source: Jones & Stokes Associates 1988

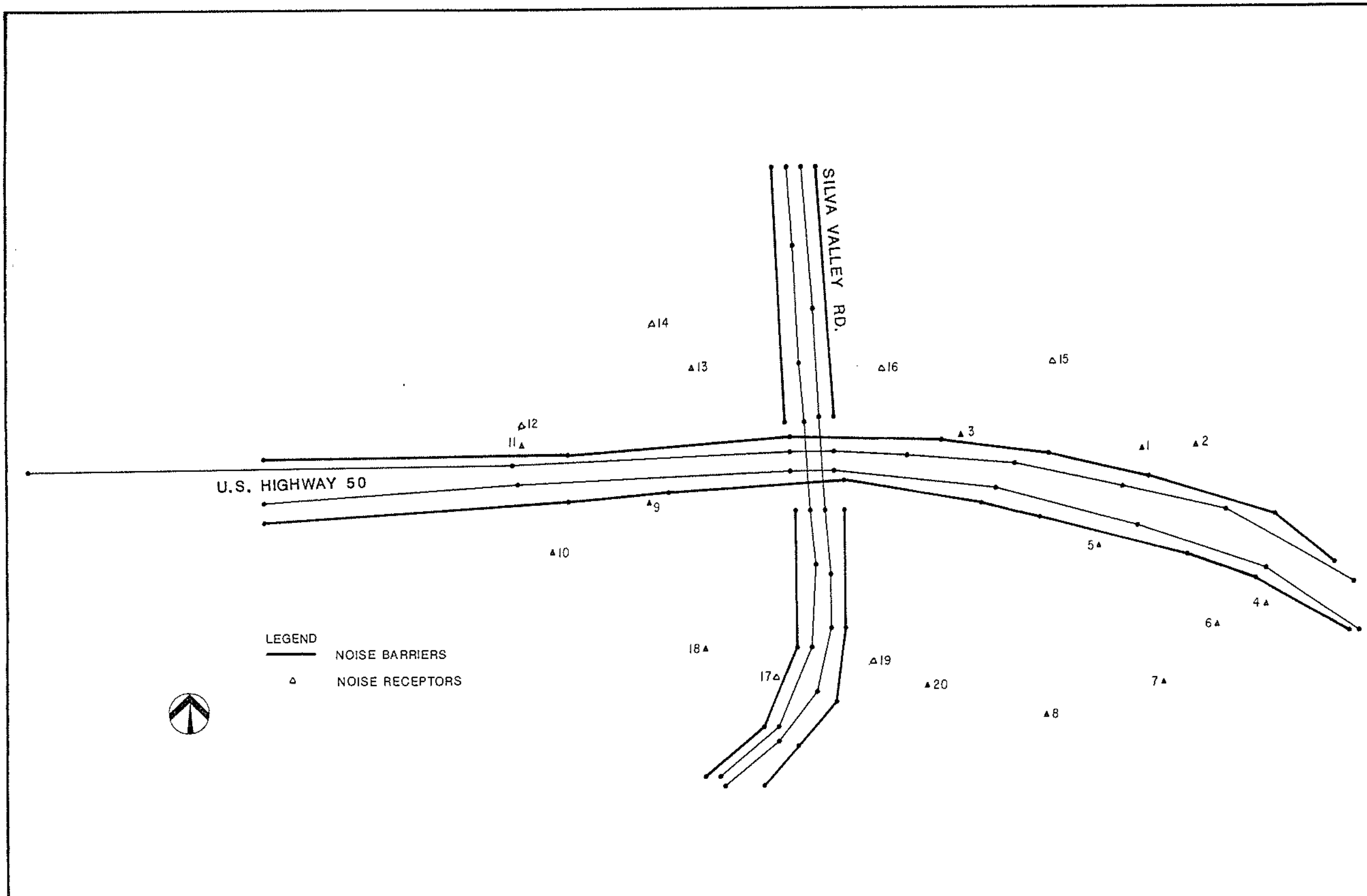


FIGURE 12-2. NO PROJECT ALTERNATIVE ROADWAYS, NOISE RECEPTORS, AND BARRIERS

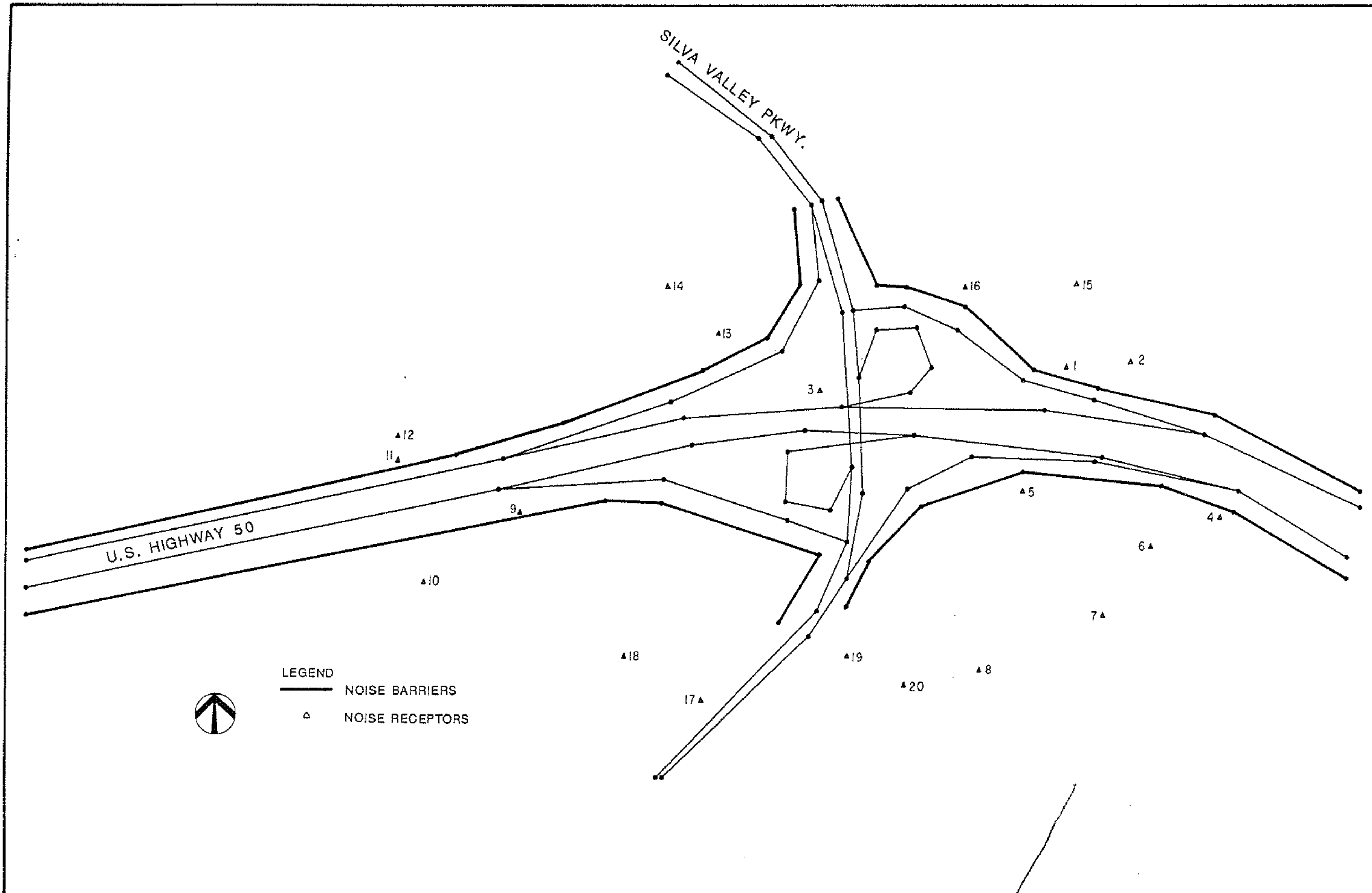


FIGURE 12-3. RIDGE DESIGN ROADWAYS, NOISE RECEPTORS, AND BARRIERS

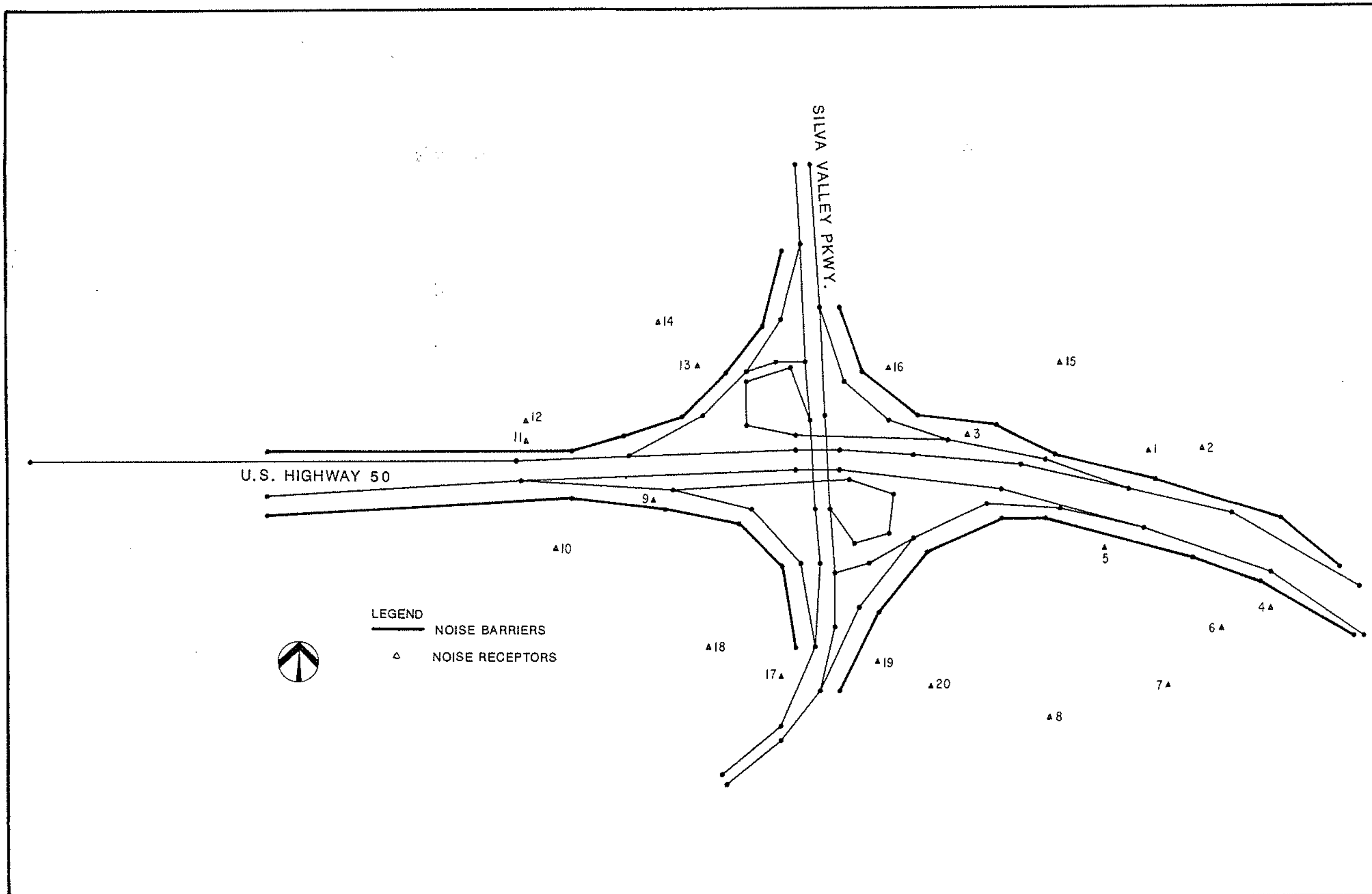


FIGURE 12-4. UNDERCROSSING DESIGN ROADWAYS, NOISE RECEPTORS, AND BARRIERS

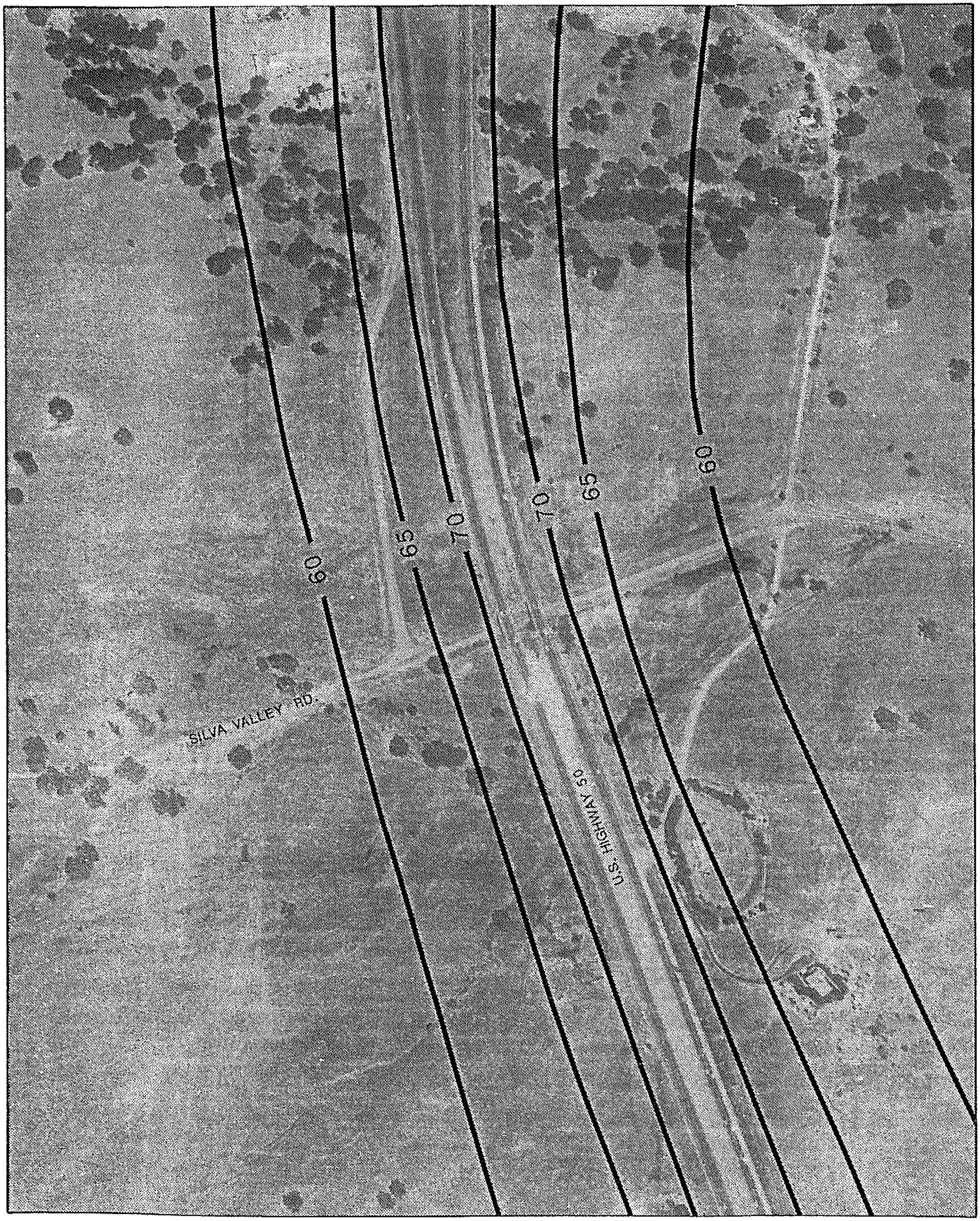
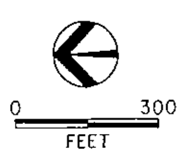


FIGURE 12-5. EXISTING CONDITIONS NOISE CONTOURS (DECIBEL LEVEL)



IMPACTS

Construction of either project alternative could contribute several sources of noise to the project area. Construction and blasting activities would occur under alternatives that involve development of an interchange; these activities would be a temporary noise source. The major long-term noise source would involve vehicle traffic passing through the project site.

Impacts of the No-Project Alternative

The impacts of the No-Project Alternative are shown in Table 12-4. The No-Project Alternative assumes that an interchange would not be built.

Construction Noise

Implementation of the No-Project Alternative would result in no construction-related noise being produced. This impact is considered less than significant. No mitigation is necessary.

Blasting Noise And Vibration

Implementation of the No-Project Alternative would result in no blasting-related noise or vibration being produced. This impact is considered less than significant. No mitigation is necessary.

Traffic Noise

Construction of the No-Project Alternative under future year conditions would result in generally higher traffic volumes and increased traffic congestion, compared to existing conditions. These two changes would tend to increase and decrease noise levels, respectively. The offsetting effects of these two changes result in traffic noise levels that are similar to existing noise levels.

Estimated future year No-Project Alternative noise levels are shown in Table 12-3. Peak hour Leq noise levels in the vicinity of the project site would range from 55.9 to 69.8 dBA.

Noise contours for the future year No-Project Alternative are shown in Figure 12-6. The dominant noise sources in the vicinity of the project site under this alternative would be U. S. 50 and Silva Valley Parkway.

As shown in Table 12-3, the greatest change from existing conditions to future year conditions would occur at the east end of White Rock Road, where peak hour Leq noise levels would decrease by 2.7 dBA; this change in noise levels would probably be noticeable

Table 12-4. Summary of Noise Impacts and Mitigation Measures for the No-Project Alternative

Impact	Impact Rating Before Mitigation	Mitigation Measures	Impact Rating After Mitigation
No construction-related noise being produced.	Less than significant	No mitigation is necessary.	--
No blasting-related noise or vibration being produced.	Less than significant	No mitigation is necessary.	--
Generally higher traffic volumes and increased traffic congestion tending to increase and decrease noise levels, respectively, resulting in traffic noise levels that are similar to existing noise levels.	Significant	Reduce traffic noise by either implementing land use measures or constructing noise barriers along both sides of U. S. 50 (12 feet high) and Silva Valley Parkway (8 feet high and a 50-foot landscaped buffer).	Less than significant

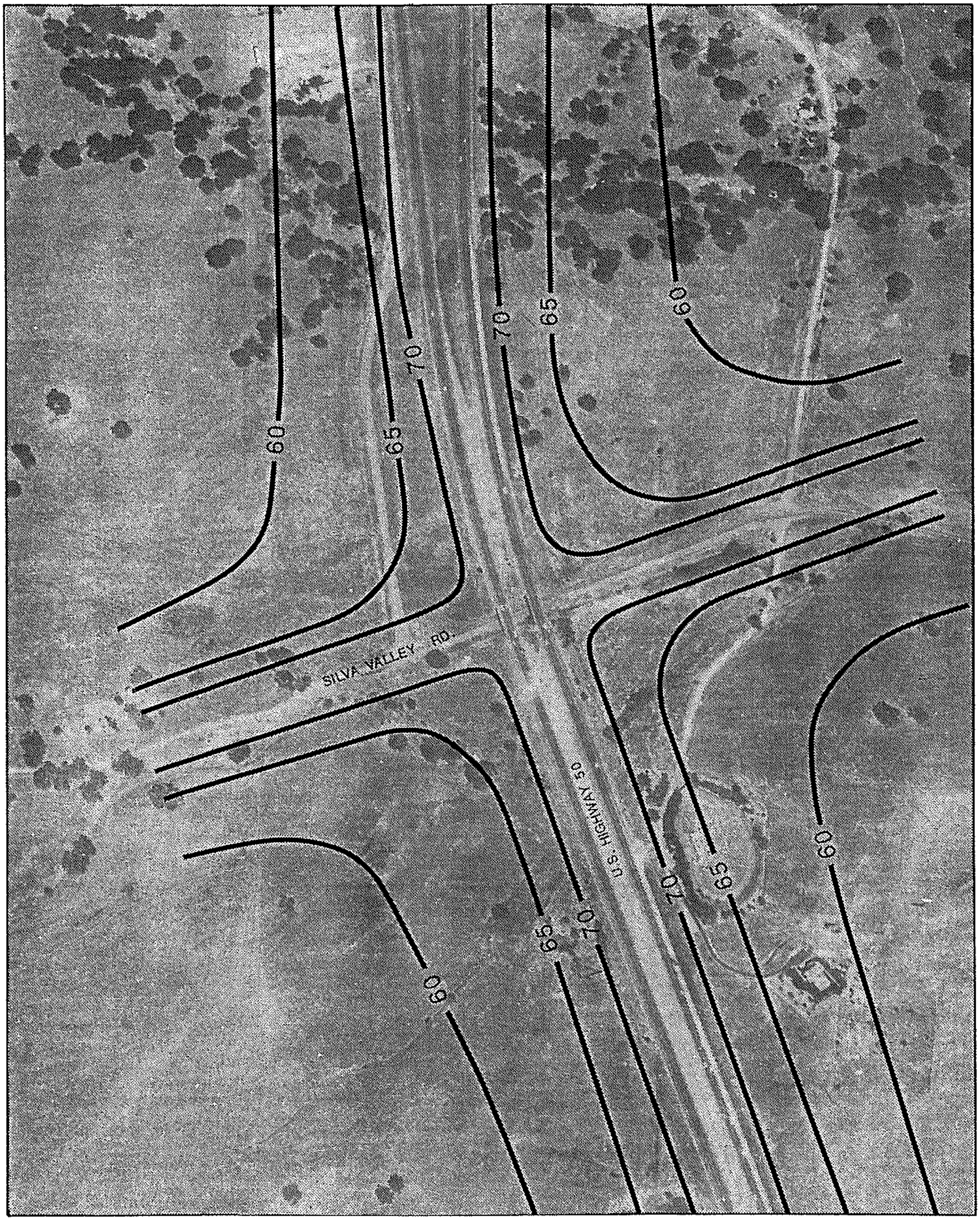


FIGURE 12–6. FUTURE YEAR NO–PROJECT ALTERNATIVE NOISE CONTOURS (DECIBEL LEVEL)

to the human ear. The next greatest change in noise levels would occur at the Tong Cemetery, where noise levels would increase by 1.3 dBA. As noted earlier in this chapter, changes in noise levels smaller than 1.5 to 2.0 dB would probably not be noticeable to the human ear.

As shown in Figure 12-6, construction of the No-Project Alternative would result in peak hour Leq noise levels in excess of 60 dBA within approximately 600 feet of the centerline of U. S. 50 and within approximately 400 feet of the centerline of Silva Valley Parkway. According to the El Dorado County General Plan Noise Element guidelines, noise levels in excess of 60 dBA would be incompatible with the residential land uses shown for the vicinity of the project site in the El Dorado Hills/Salmon Falls Area Plan.

Implementation of the No-Project Alternative would result in generally higher traffic volumes and increased traffic congestion to increase and decrease noise levels, respectively, resulting in traffic noise levels that are similar to existing noise levels. This impact is considered to be significant. To reduce this impact to a less-than-significant level, reduce traffic noise by either implementing land use measures or constructing noise barriers along both sides of U. S. 50 (12 feet high) and Silva Valley Parkway (8 feet high and a 50-foot landscaped buffer as shown in Figure 12-2).

Impacts Common to Both Alternatives

Construction Noise

Construction equipment and activities can generate noise levels of 80-95 dBA at 50 feet from the equipment. Figure 12-7 shows ranges of noise levels that can be expected from construction equipment.

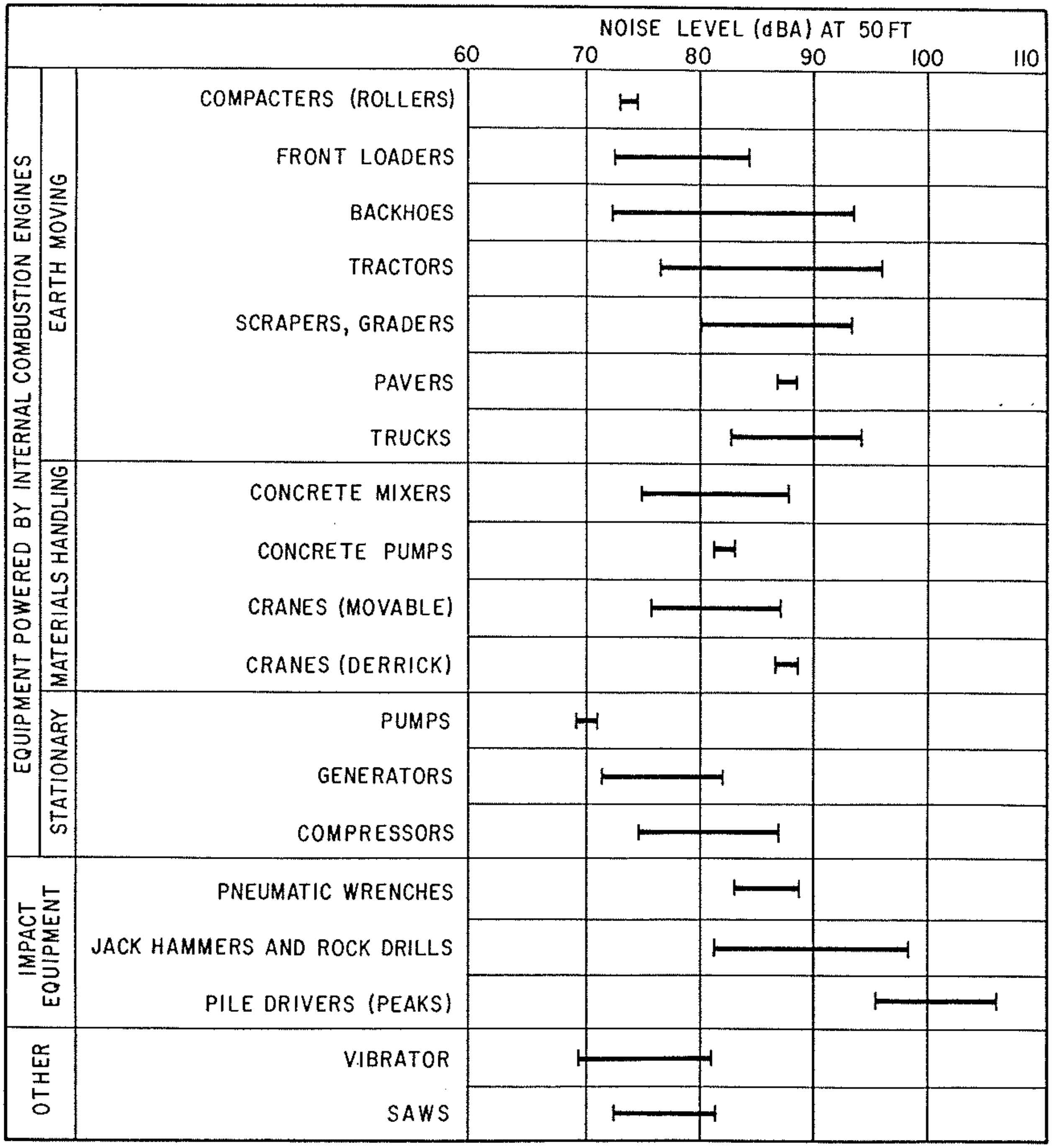
Offsite noise levels during project construction would vary considerably, depending on the location of construction activities and the types of equipment in use. Construction noise levels of up to 80 dBA can be expected near the project boundaries.

Implementation of either design would result in temporary construction-related noise in proximity to existing residential land uses north and south of the project site. This impact is considered significant. To reduce this impact to a less-than-significant level, limit construction activities to daytime hours.

Blasting Noise and Vibration

Construction of either design would probably require the use of blasting. No specific estimates are available to describe the location or extent of blasting operations.

Blast noise from explosives would tend to be directed upward more than laterally, and would be partially muffled by surrounding rock.



Note: Based on Limited Available Data Samples

FIGURE 12-7. CONSTRUCTION EQUIPMENT NOISE RANGES

Source: Bolt, Beranek, and Newman 1971.

Implementation of either design would result in possible vibration-induced annoyance to residents or vibration-induced damage to structures on adjacent properties. This impact is considered potentially significant. To reduce this impact to a less-than-significant level, advise area residents in advance of planned blasting and design blasting operations to avoid damage to any vibration-sensitive structures on adjacent properties.

Traffic Noise

Construction of either design under future year conditions would result in substantial traffic congestion along U. S. 50 and Silva Valley Parkway (See Chapter 10, "Traffic"). This would result in a suppression of noise levels near the project site.

Estimated future year Ridge Design and Undercrossing Design noise levels are shown in Table 12-3. Ridge Design peak hour Leq noise levels in the vicinity of the project site would range from 55.5 to 67.6 dBA. Peak hour Leq noise levels would range from 54.3 to 67.9 dBA.

Noise contours for the Ridge Design and Undercrossing Design are shown in Figure 12-8 and 12-9, respectively. The dominant noise sources in the vicinity of the project site under this alternative would be U. S. 50 and Silva Valley Parkway.

As shown in Table 12-3, the greatest change from future year No Project to either design conditions would occur at the Hall/Richmond Cemetery, where peak hour Leq noise levels would decrease by 2.2-2.8 dBA; this change in noise levels would probably be noticeable to the human ear. The only increase in noise levels would occur southwest of the interchange site, where noise levels would increase by 0.1-0.3 dBA. As noted earlier in this chapter, changes in noise levels smaller than 1.5-2.0 dB would probably not be noticeable to the human ear. The mean change in noise levels would be a decrease of approximately 1.5 dBA.

Implementation of either design would result in peak hour Leq noise levels in excess of 60 dBA within approximately 350 feet of the centerline of U. S. 50 and within approximately 300 feet of the centerline of Silva Valley Parkway. This impact is considered significant because, according to the El Dorado County General Plan Noise Element guidelines, noise levels in excess of 60 dBA would be incompatible with the residential land uses shown for the vicinity of the project site in the El Dorado Hills/Salmon Falls Area Plan. To reduce this impact to a less-than-significant level, reduce traffic noise by either implementing land use measures or constructing noise barriers along both sides of U. S. 50 (12 feet high north of U. S. 50 and 10 feet high south of U. S. 50) and Silva Valley Parkway (12 feet high north of U. S. 50 and 10 feet high south of U. S. 50 as shown in Figure 12-3).

Additional Impacts of the Ridge Design

There are no additional impacts associated with the Ridge Design.

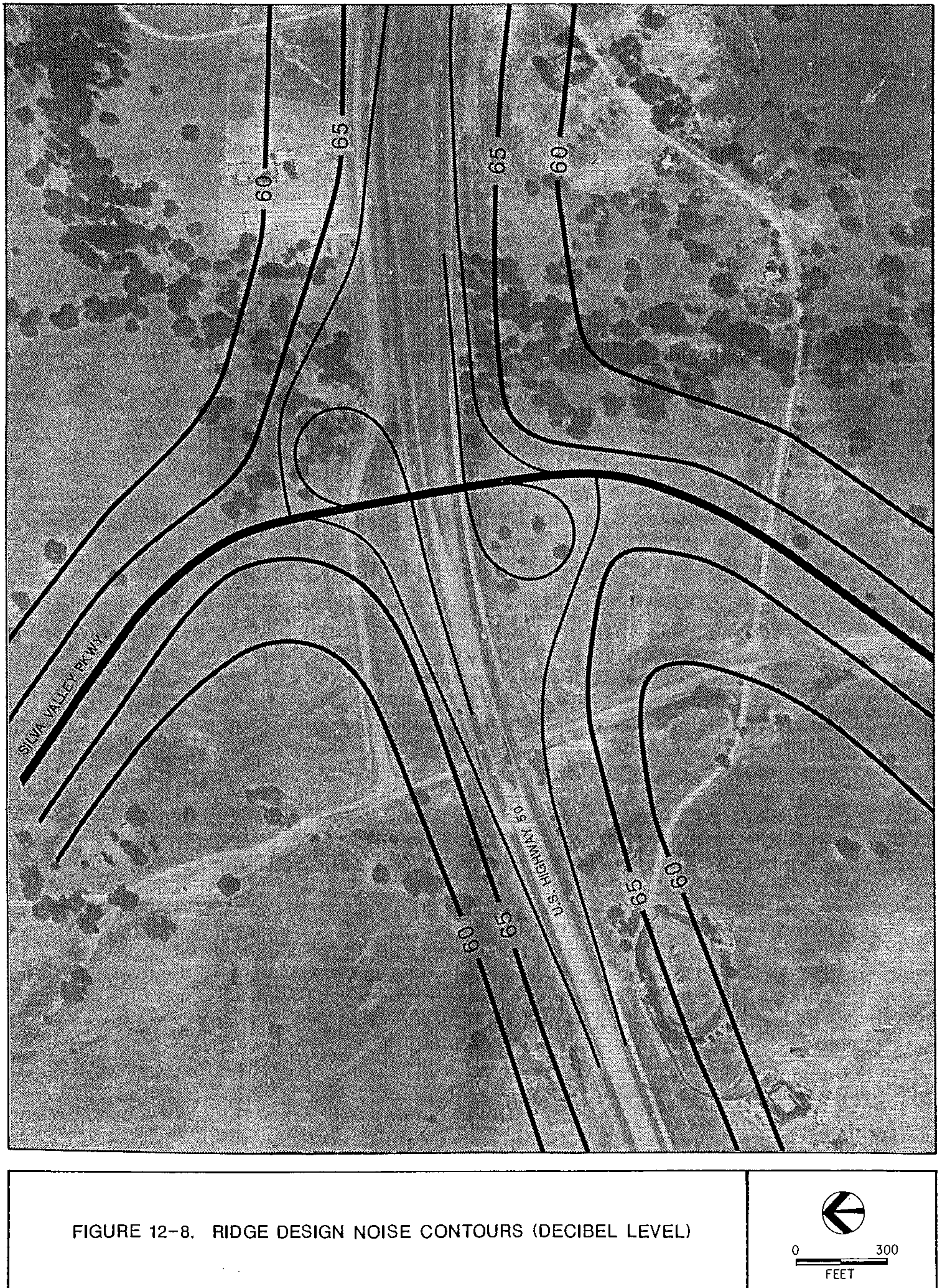


FIGURE 12-8. RIDGE DESIGN NOISE CONTOURS (DECIBEL LEVEL)

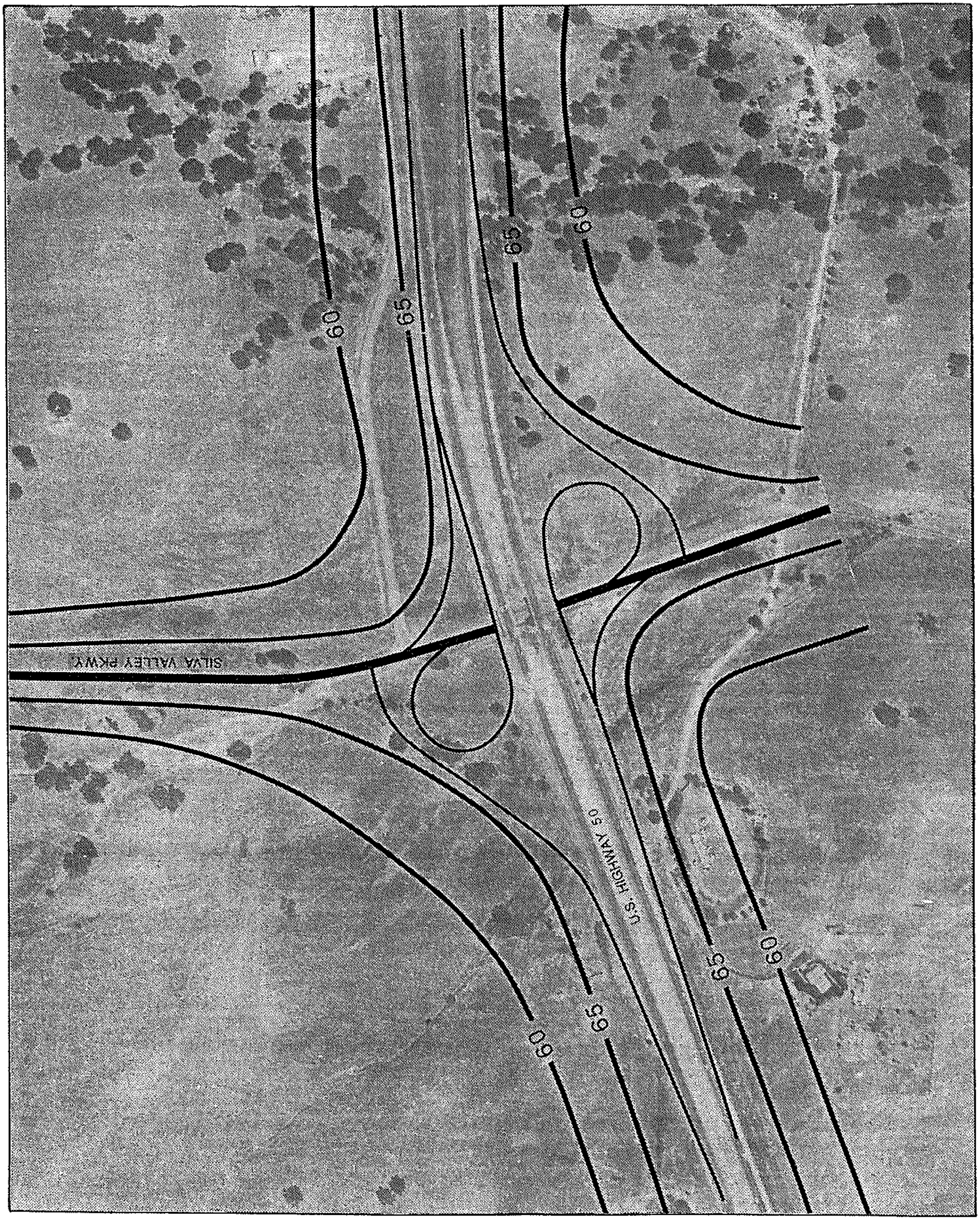


FIGURE 12-9. UNDERCROSSING DESIGN NOISE CONTOURS (DECIBEL LEVEL)

Additional Impacts of the Undercrossing Design

There are no additional impacts associated with the Undercrossing Design.

MITIGATION MEASURES

Responsibility For Implementation of Mitigation Measures

Section III, "Policies," of the Noise Element of the El Dorado County General Plan (1979) states that, "The County of El Dorado supports the concept of user/benefit. It is the policy of the County of El Dorado to require that persons creating new noise sources be the ones to abate the noise." Section III of the Noise Element also states that, "Where a noise source exists, such as a highway, airport, industrial plant, it shall be the responsibility of those who wish to utilize adjacent lands to develop appropriate measures to mitigate the effects of the existing sources."

Future year noise in the vicinity of the project site would result from a mix of new noise sources and existing noise sources. Therefore, the responsibility for implementing the mitigation measures described below should rest with a mix of parties, including the project proponent and those who wish to use adjacent lands. The exact mix of responsibilities should be determined by the county and should vary for the different alternatives. In the case of the No-Project Alternative, the responsibility should rest primarily with those who wish to use land adjacent to the project site. In the case of the Ridge Design and Undercrossing Design, the responsibility should rest more equally between the project proponent and those who wish to use the adjacent land.

It should be noted that this EIR only describes mitigation measures needed in the immediate vicinity of the project site. In reality, future development of sensitive land uses all along both U. S. 50 and Silva Valley Parkway would require mitigation measures. The need and responsibility for mitigation measures away from the Silva Valley interchange project site should be defined as development of the land occurs all along U. S. 50 and Silva Valley Parkway.

Mitigation Measures for the No-Project Alternative

Reduce Traffic Noise by Either Implementing Land Use Measures or Constructing Noise Barriers Along Both Sides of U. S. 50 and Silva Valley Parkway

Traffic noise in the vicinity of U. S. 50 and Silva Valley Parkway would be incompatible with noise-sensitive uses under future year No-Project conditions. This impact could be reduced to a less-than-significant level by either implementing land use measures or constructing noise barriers. These two categories of mitigation measures are described below.

Implement Land Use Measures

Section VIII, "Implementation," of the Noise Element of the El Dorado County General Plan (1979) recommends general ways to control or manage noise. Two of the ways listed include "Plan future development to insure maximum separation between noise generators and noise sensitive uses" and "Provide for compatible use of land adjacent to heavily traveled highways."

- **Amend Land Use Designations.** Land uses on parcels with a projected peak hour Leq noise level of more than 65 dBA, as shown in Figure 12-6, should be restricted to industrial or open space uses. Land uses on parcels with a projected noise level between 60 and 65 dBA, as shown in Figure 12-6, should be restricted to industrial or commercial uses. Land uses on parcels with a projected noise level of up to 60 dBA, as shown in Figure 12-6, should not be restricted by noise levels.

- **Use Additional Noise Insulation in Non-Residential Structures.** Nonresidential structures planned to be constructed near U. S. 50 or Silva Valley Parkway should be designed to incorporate additional noise insulation features. Such features should include: minimizing the extent of windows and sliding doors facing major roadways; extra wall and ceiling insulation; double glazing for windows and sliding doors; airtight seals between window or door frames and exterior walls; and use of permanently closed windows with a fresh air supply system or air conditioning.

- **Strictly Enforce California Department of Housing and Community Development Building Noise Insulation Standards.** The No-Action Alternative insulation standards (California Administrative Code Title 24, Section T25-28) sets a maximum interior noise level of 45 dB (CNEL). This noise level applies to exterior noise sources with windows closed. The state noise insulation standards currently apply to multifamily residential development and transient lodging (hotels and motels).

  Strict application of the state building noise insulation standards for multifamily residential uses and transient lodging would allow these uses to be built in the area predicted to experience peak hour Leq noise levels in the range of 60-70 dBA.

  In addition to setting a maximum allowable interior noise level, the state standards require floor/ceiling assemblies to have a "sound transmission class" rating of at least 50, while entrance doors must have a sound transmission class rating of at least 30.

The state noise insulation standards also require that an acoustical analysis be prepared under the supervision of a person experienced in the field of acoustical engineering. The report must show that the structure has been designed to limit intruding noise levels to 45 dB (CNEL). The report must show the topographical relationship between noise sources and the structure site, identify noise sources and their characteristics, treat predicted noise spectra at the exterior of the proposed structure considering present and future land uses, explain the basis for the prediction (measured or obtained from published data), discuss noise attenuation measures to be applied, and offer an analysis of the noise insulation effectiveness of the proposed construction showing that the prescribed interior noise level requirements are met.

o **Implement Residential Building Design Considerations.** Because the area along U. S. 50 and Silva Valley Parkway would be exposed to evening and nighttime noise sources, interior noise levels at nearby residences may exceed desirable levels. Normal construction practices and materials for single family residences could result in interior noise levels as much as 20 dB below exterior levels (as long as windows and doors are closed). However, this reduction could be substantially degraded without proper attention to design and implementation of noise reduction features. An acoustical analysis should be prepared for all residential structures within approximately 1,000 feet of the centerline of U. S. 50 and within approximately 750 feet of the centerline of Silva Valley Parkway. The acoustical analysis should be able to ensure that interior noise levels do not exceed 45 dB Ldn.

The following are some examples of building and site design features that could reduce interior noise levels:

- minimize the extent of windows and sliding doors facing the U. S. 50 and/or Silva Valley Parkway;

- install extra wall and ceiling insulation;

- use double glazing for windows and sliding doors;

- install airtight seals between window or door frames and exterior walls; and

- shield bedrooms and other noise-sensitive areas of dwellings from exterior noise sources with other portions of the dwelling.

o **Implement Residential Site Design Considerations.** Residential areas within approximately 1,000 feet of the centerline of U. S. 50 and within approximately 750 feet of the centerline of Silva Valley Parkway should be planned and designed to minimize interior noise levels. Building design and orientation should minimize exposure of windows and sliding doors to vehicular traffic. Nonresidential buildings should be laid out to provide shielding of adjacent residential areas from traffic noise sources. Site planning for nonresidential uses in the vicinity of the project site should also give consideration to the placement and design of potential noise sources such as storage areas, loading docks, and parking lots in areas away from residential uses.

Construct Noise Barriers Along U. S. 50 and Silva Valley Parkway. Section VIII, "Implementation," of the Noise Element of the El Dorado County General Plan (1979) recommends general ways to control or manage noise. One of the ways listed is "Consider masonry barriers or fences where existing or proposed land use is adjacent to a highway, factory, etc."

If the land use mitigation measures described above are not implemented, construction of noise barriers will be necessary to reduce noise impacts of the future year No-Project Alternative condition to a less-than-significant level. The design drawings for Silva Valley Parkway without the interchange will include the following:

- construction of 12-foot noise barriers along both sides of U. S. 50,
- construction of 8-foot noise barriers along both sides of Silva Valley Parkway, and
- construction of a 50-foot landscaped buffer along both sides of Silva Valley Parkway between the roadway and noise barriers.

The height of the noise barriers will be relative to the elevation of the nearest edge of pavement and will be located as shown in Figure 12-2.

Noise barriers are often the only effective way to protect outdoor activity areas (yards, parks, etc.) from traffic noise. Aesthetic factors and cost are other considerations that influence the desirability of noise barriers.

The following are some additional aspects of the noise barriers:

- The barriers can provide substantial noise reductions (10-15) dB for areas within about 150 feet of the barrier. Noise reductions are generally less at greater distances from the barrier.
- Noise barriers typically involve earth berms, masonry walls, or combinations of walls on top of berms. To be effective, such noise barriers must block the line-of-sight between vehicle traffic and the area or building being protected.
- Barriers must also be rather long to minimize noise transmission around the ends of the barrier. It is desirable, therefore, that the noise barrier extend along the entire length of U. S. 50 and Silva Valley Parkway where adjacent sensitive land uses would be located. It is also desirable that the noise barrier be as continuous as possible, running without breaks from end to end.

- o The type of surface on the noise barrier facing the roadway would be an important factor. An acoustically absorptive material can substantially reduce noise reflection.

Mitigation Measures for Both Alternatives

Limit Construction Activities to Daytime Hours

The use of construction equipment powered by internal combustion engines, the use of impact equipment, or other construction activity that would result in disturbance of surrounding residential areas will be limited to the period between 7:00 a. m. and 7:00 p.m. (Monday through Friday only). This would limit any disturbance of residential areas to less sensitive periods of time.

Advise Area Residents in Advance of Planned Blasting

All residents in the project vicinity (1,000 feet of the project site) will be notified in advance of any planned blasting operations. The notice will provide the phone number of an appropriate person to contact regarding questions or concerns. A short form and a stamped return envelope also will be provided so that appropriate follow-up contacts can be made with residents who believe their property contains vibration-sensitive structures.

Design Blasting Operations to Avoid Damage to Any Vibration-Sensitive Structures

Blasting operations will be designed to minimize the potential for vibration damage to adjacent properties. Follow-up inspections will be made in response to complaints generated from blasting operations. Blasting complaints will be resolved by the County of El Dorado Department of Transportation.

Reduce Traffic Noise by Either Implementing Land Use Measures or Constructing Noise Barriers Along Both Sides of U. S. 50 and Silva Valley Parkway

Traffic noise in the vicinity of U. S. 50 and Silva Valley Parkway would be incompatible with noise-sensitive uses. This impact could be reduced to a less-than-significant level by either implementing land use measures or constructing noise barriers. These two categories of mitigation measures are described below.

Land Use Measures. Section VIII, "Implementation," of the Noise Element of the El Dorado County General Plan (1979) recommends general ways to control or manage noise. Two of the ways listed are to: "Plan future development to insure maximum separation between noise generators and noise sensitive uses," and "Provide for compatible use of land adjacent to heavily traveled highways." The following are specific mitigation measures that would be necessary to reduce the impacts of either design to a less-than-significant level.

- **Amend Land Use Designations.** Land uses on parcels with a projected peak hour Leq noise level of more than 65 dBA, as shown in Figures 12-8 and 12-9, should be restricted to industrial or open space uses. Land uses on parcels with a projected noise level between 60 and 65 dBA, should be restricted to industrial or commercial uses. Land uses on parcels with a projected noise level of up to 60 dBA, should not be restricted by noise levels.

- **Use Additional Noise Insulation in Non-Residential Structures.** Nonresidential structures planned to be constructed near U. S. 50 or Silva Valley Parkway should be designed to incorporate additional noise insulation features. Such features should include: minimizing the extent of windows and sliding doors facing major roadways; extra wall and ceiling insulation; double glazing for windows and sliding doors; airtight seals between window or door frames and exterior walls; and use of permanently closed windows with a fresh air supply system or air conditioning.

- **Strictly Enforce California Department of Housing and Community Development Building Noise Insulation Standards.** State noise insulation standards (California Administrative Code Title 24, Section T25-28) sets a maximum interior noise level of 45 dB (CNEL). This noise level applies to exterior noise sources with windows closed. The state noise insulation standards currently apply to multifamily residential development and transient lodging (hotels and motels).

  Strict application of the state building noise insulation standards for multifamily residential uses and transient lodging would allow these uses to be built in the area predicted to experience peak hour Leq noise levels in the range of 60-70 dBA.

  In addition to setting a maximum allowable interior noise level, the state standards require floor/ceiling assemblies to have a "sound transmission class" rating of at least 50, while entrance doors must have a sound transmission class rating of at least 30.

  The state noise insulation standards also require that an acoustical analysis be prepared under the supervision of a person experienced in the field of acoustical engineering. The report must show that the structure has been designed to limit intruding noise levels to 45 dB (CNEL). The report must show the topographical relationship between noise sources and the structure site, identify noise sources and their characteristics, treat predicted noise spectra at the exterior of the proposed structure considering present and future land uses, explain the basis for the prediction (measured or obtained from published data), discuss noise attenuation measures to be applied, and offer an analysis of the noise insulation effectiveness of the proposed construction showing that the prescribed interior noise level requirements are met.

- **Implement Residential Building Design Considerations.** Because the area along U. S. 50 and Silva Valley Parkway would be exposed to evening and nighttime noise sources, interior noise levels at nearby residences may exceed desirable levels. Normal construction practices and materials for single family residences could result in interior noise levels as much as 20 dB below exterior levels (as long as windows and doors are closed). However, this reduction could be substantially degraded without proper attention to design and implementation of noise reduction features. An acoustical analysis should be prepared for all residential structures within approximately 1,000 feet of the centerline of U. S. 50 and within approximately 750 feet of the centerline of Silva Valley Parkway. The acoustical analysis should be able to ensure that interior noise levels do not exceed 45 dB Ldn.

  The following are some examples of building and site design features that could reduce interior noise levels:

  - minimize the extent of windows and sliding doors facing the U. S. 50 and/or Silva Valley Parkway,

  - install extra wall and ceiling insulation,

  - use double glazing for windows and sliding doors,

  - install airtight seals between window or door frames and exterior walls, and

  - shield bedrooms and other noise-sensitive areas of dwellings from exterior noise sources with other portions of the dwelling.

- **Implement Residential Site Design Considerations.** Residential areas within approximately 1,000 feet of the centerline of U. S. 50 and within approximately 750 feet of the centerline of Silva Valley Parkway should be planned and designed to minimize interior noise levels. Building design and orientation should minimize exposure of windows and sliding doors to vehicular traffic. Nonresidential buildings should be laid out to provide shielding of adjacent residential areas from traffic noise sources. Site planning for nonresidential uses in the vicinity of the project site should also give consideration to the placement and design of potential noise sources such as storage areas, loading docks, and parking lots in areas away from residential uses.

Construct Noise Barriers Along U. S. 50 and Silva Valley Parkway. Section VIII, "Implementation," of the Noise Element of the El Dorado County General Plan (1979) recommends general ways to control or manage noise. One of the ways listed is to "Consider masonry barriers or fences where existing or proposed land use is adjacent to a highway, factory, etc."

If the land use mitigation measures described above are not implemented, construction of noise barriers will be necessary to reduce noise impacts of either design to a less-than-significant level. The design drawings will include barriers along both sides of U. S. 50 and Silva Valley Parkway. The barriers will be 12 feet in height north of U. S. 50 and 10 feet in height south of U. S. 50, relative to the elevation of the nearest edge of pavement.

Noise barriers are often the only effective way to protect outdoor activity areas (yards, parks, etc.) from traffic noise. Aesthetic factors and cost are other considerations that influence the desirability of noise barriers.

The following are some additional aspects of the noise barriers:

- The barriers can provide substantial noise reductions (10-15 dB) for areas within approximately 150 feet of the barrier. Noise reductions are generally less at greater distances from the barrier.

- Noise barriers typically involve earth berms, masonry walls, or combinations of walls on top of berms. To be effective, such noise barriers must block the line-of-sight between vehicle traffic and the area or building being protected.

- Barriers must also be rather long to minimize noise transmission around the ends of the barrier. It is desirable, therefore, that the noise barrier extend along the entire length of U. S. 50 and Silva Valley Parkway where adjacent sensitive land uses would be located. It is also desirable that the noise barrier be as continuous as possible, running without breaks from end to end.

- The type of surface on the noise barrier facing the roadway would be an important factor. An acoustically absorptive material can substantially reduce noise reflection.

Additional Mitigation Measures for the Ridge Design

No additional mitigation is required.

Additional Mitigation Measures for the Undercrossing Design

No additional mitigation is required.

CHAPTER 13. Cultural Resources

This chapter summarizes a report prepared by Peak & Associates, Inc. A copy of their report is included as Appendix G.

SETTING

Research

Records searches for the project area were conducted at the North Central Information Center of the California Archaeological Sites Inventory at California State University, Sacramento. Surveys have been conducted by Peak & Associates, Inc. that include most of the study area (Peak & Associates, Inc. 1987a, 1987b).

Three sites, CA-Eld-558-H, -600/H, and -585/H lie within the possible impact area of the Ridge Design Alternative. Additionally, five isolated features (IF-4, -5, -7, -8, and -9) lie within the impact area, as does the Hall/Richmond Cemetery (an unmarked cemetery).

One site (Eld-558-H), three isolated features (IF-4, -5, and -7), and the Hall/Richmond Cemetery have been recorded within the possible impact area of the undercrossing design.

One State Historic Landmark (SHL 699) lies within the project area, marking the Mormon Tavern site, a popular stage stop and a remount station for the Central Overland Pony Express (California Department of Parks and Recreation 1979).

Background

Ethnography

The project area lies in the territory attributed to the Nisenan, a branch of the Maidu group of the Penutian language family. Tribes of this family dominated the Central Valley, San Francisco Bay areas, and western Sierra Nevada foothills at the coming of the white man. The Nisenan controlled the drainages of the Yuba, Bear, and American Rivers, along with the lower portion of the Feather River.

The valley Maidu settlement pattern was basically oriented toward major river drainages, with ancillary villages located on tributary streams and sloughs. Major villages hostelry which they named Railroad House. The town had a population of several hundred, and reportedly had 13 hangings (Wooldridge 1931).

One-half mile west of Clarksville stood the Mormon Tavern. The stage stop was constructed in 1849 and later enlarged under the management of Franklin Winchell in 1851. The stage stop became a remount station of the Central Overland Pony Express, with Sam Hamilton changing horses here on the first eastbound trip in April 1860.

Mining in the project area undoubtedly began in the earliest years of the gold rush. Later mining included dragline dredging of Carson Creek at what was called the Jumbo Placer Mine in 1923 (Clark and Carlson 1956). Chromite mining also took place on the property, with several mines being worked in the region during World War I and again in the early 1940s (Clark and Carlson 1956).

Field Survey

Much of the "Area of Potential Effects" (APE) had been previously surveyed in February and April 1986 by Peak & Associates. An additional field survey of the existing highway right-of-way was conducted by Peak & Associates on January 27, 1988.

The area was completely covered on-foot during the three surveys. No new sites were located during the most recent survey. The sites within the project area were completely recorded in 1986, and site records have been filed with the North Central Information Center.

Descriptions of Archeological Sites

CA-Eld-558-H

This is the remnant of an enclosure surrounding a home and gardens and associated features of a ranch. The enclosure is formed by a series of poured concrete pillars that were stuccoed and painted red and green. The pillars formed a large rectangle, with the entry to the enclosure being placed on the east side. The pillars were connected across the top with sections of pipe, and presumably some fencing material was attached to the pillars. The entry walkway is lined by low walls, and there are a series of flat concrete slabs with designs traced into their surface. One is dated "33." Within the enclosure are two features: a large "shrine" of rock with a concrete tub below, and a four-compartment concrete "bath." Outside the enclosure are a number of features: two walls, a watering trough, dam, water storage tank, and a rock foundation for a barn, as well as historic debris both inside and outside the enclosure. It is difficult to determine the original configuration of features within the enclosure, and impossible to determine the function of most of the features.

CA-Eld-600/H

This site extends for more than a mile and includes a vast complex of both historic and prehistoric features. The prehistoric features include nine bedrock mortar stations along Carson Creek. Historic features include 15 dry-laid stone structures/structural remnants, two large stone corral areas, a dam and rock-lined ditch system, one stone and packed-earth check dam, a major roadway with dry-laid rock supports and bridge abutments, several minor roadways and ditches, rock cairns, one collapsed-frame structure, a number of dry-laid rock terraces and supports, introduced vegetation, and mining prospect pits and tailings.

Three of the site's bedrock mortar stations lie within the project area. Station A has one mortar cup, Station B has two cups, and Station C has one cup.

CA-Eld-585/H

The site is a large complex of historic features with an associated bedrock mortar station. The site includes the remnants of a dry-laid stone stamp mill, several dry-laid stone terraces, a road trace and rock bridge abutments, and the Tong Cemetery. The mine adit is located under U. S. 50. The cabin's occupancy was related to the operation of the mine (J. Tong pers. comm.).

There is also a small reservoir with a circular rock wall on the hill above the mill.

The Tong Cemetery includes a fenced-off area, with all family graves as well as the grave of a family friend dating to 1856. Outside the fence there is one grave with a headstone (no name, but a date of 1869), and a number of unmarked graves, distinguishable only by rings of emplaced rock.

Isolated Feature-4

The feature consists of a small glory hole and several historic artifacts. The feature is near the site of the Richmond house (M. Tong pers. comm.).

Isolated Features-5 and -7

Both features are remnants of dry-laid rock fences. IF-5 is a 1-meter-high fence that parallels White Rock Road. IF-7 is a low remnant that followed the old route of a toll road. The road itself is not evident within the project area, but it is well represented within CA-Eld-600/H.

Isolated Feature-8

The feature is a single shallow bedrock mortar cup on a small boulder, located on a hilltop.

Isolated Feature-9

This feature is another dry-laid rock fence line designating a land division, measuring 0.3 meter in height and 80 meters in length.

Hall/Richmond Cemetery

There is no surface physical evidence of this cemetery and therefore it was not recorded as an archeological site.

Mormon Tavern Monument

There is no physical trace of the Mormon Tavern or outbuildings. The monument was placed near the site of the barn, on a side road off the freeway, facing the freeway.

Byram House

The house is reputed by the land owners to date to the 1850s. The house has been totally remodeled in recent years, and the exterior appears to be new. The house, with its additions and improvements, lacks integrity of design, materials, and workmanship, the minimum requirements needed for an historic structure to be regarded as a significant or important resource.

Archival Research

After completion of the field surveys, additional research was undertaken on CA-Eld-558-H and -585/H to obtain information that would aid in their evaluation in terms of eligibility for the National Register of Historic Places. Research was also conducted on the Hall/Richmond Cemetery and the Mormon Tavern.

CA-Eld-558-H

The site is the remnant of the gardens of the Albert Fitch home. George Clinton Fitch, father of Albert, was one of the earliest settlers in the region. Details about the Fitch family are found in the Cultural Resources Appendix.

CA-Eld-585/H

The Tong family settled in the Clarksville area in 1855. Hezekiah and Margaret Tong took up land to the north and east of the town. They improved the road, established a toll gate, and conducted a hostelry call Railroad House. The Tongs also mined and ran cattle on their land.

When the town of Clarksville was organized in 1873, the Tongs claimed six of the lots in town. Through time, the Tongs remained the prominent family in the community, with Gilbert S. Tong serving as postmaster and justice of the peace, and William W. Tong also as postmaster.

The Tong family has maintained their cemetery and plans to continue interring family members there.

The dates of construction and operation of the mine, mill site, and associated reservoir are unknown.

Hall/Richmond Cemetery

A 1939 Department of Transportation (DOT) map was found showing the proposed alignment of U. S. 50. The map indicates a plot with the notation "Indian Graves" on the north side of the highway. The 1965 DOT map overlaid on the 1939 map indicates that the cemetery lies within the strip of land between the westbound lanes of the highway and Tong Road.

The cemetery has been identified as a pioneer cemetery, not an Indian cemetery (J. Tong pers. comm.). The cemetery lies on the edge of what was the Richmond and later the Hall property and includes gravesites ringed with rock.

The 1939 DOT surveyors apparently found the rock rings on the hillside above the highway and recognized them as graves. They erroneously labeled this area as "Indian Graves," based either on prior field experiences with Indian sites or because of the proximity of the two cemeteries on the south side of the highway.

During the 1965 construction of the additional highway lanes and Tong Road, the cemetery had brush piled on it. Some of the construction equipment was parked on the cemetery. After the construction was completed the brush was burned. Some bulldozing in the cemetery area may have obliterated surface evidence of the graves.

Mormon Tavern

The Mormon Tavern has been the subject of research by several individuals, the results of which are filed at the California Department of Parks and Recreation under the State Historic Landmark.

The structure was reportedly built in 1848 or 1849 by a Mormon named either Morgan or M. T. Altafer. Additional information about the structure is found in the Cultural Resources Appendix.

IMPACTS

Impacts Common to Both Alternatives

Implementation of either design would result in:

- o possible adverse impacts to unknown sites. These impacts are considered potentially significant. To reduce these impacts to a less-than-significant level, stop work if cultural resources are discovered during construction.

- o disturbance to CA-Eld-558-H. This impact is considered less than significant for the following reasons:

  - the site has been recorded and documented as to the date of construction, time of occupancy, and use;

  - the site lacks integrity and cannot provide information important in history;

  - the site has no research value; and

  - the isolated features also have been completely recorded and have no further research value.

  No mitigation is required.

- o disturbance to portions of CA-Eld-585/H including the adits, and possibly the stamp mill, cabin, and terraces, which lie near the edge of the proposed right-of-way. This impact is considered potentially significant. To reduce this impact to a less-than-significant level, preserve CA-Eld-585/H or require additional work.

- o no adverse effects to the Tong Cemetery portion of CA-Eld-585/H, because a retaining wall has been designed to protect this portion of the site. This impact is considered less than significant. No mitigation is required.

- o no adverse effects to the Byram house because the house is not considered a significant cultural resource in terms of design, materials, workmanship, and integrity. This impact is considered less than significant. No mitigation is required.

Additional Impacts of the Ridge Design

Implementation of the Ridge Design would result in:

- o disturbance to a portion of CA-Eld-600/H. This impact is considered less than significant because the portion to be impacted contains only bedrock mortars that have been completely recorded and have no further research value. No mitigation is required.
- o possible disturbance to the Hall/Richmond Cemetery. This impact is considered potentially significant. To reduce this impact to a less-than-significant level, protect the Hall/Richmond Cemetery during construction.

Additional Impacts of the Undercrossing Design

Implementation of the Undercrossing Design would result in:

- o adverse effects on the State Historical Landmark monument designating the site of the Mormon Tavern. This impact is considered significant. To reduce this impact to a less-than-significant level, relocate the State Historical Landmark monument.
- o disturbance to the Hall/Richmond Cemetery which would fall under the structural section of the WB off-ramp. This impact is considered significant. To reduce this impact to a less-than-significant level, relocate the Hall/Richmond Cemetery.

MITIGATION MEASURES

Mitigation Measures for Both Alternatives

Stop Work if Cultural Resources are Discovered During Construction

Other sites also may exist and be obscured by vegetation or as a result of historic activities, leaving no surface evidence. Should artifacts or unusual amounts of stone, bone, or shell be uncovered during vegetation clearance or other construction activities, the El Dorado County Department of Transportation and Caltrans will be notified immediately. An archeologist will be consulted for an on-the-spot evaluation. If any bone appears to be human, the El Dorado County Coroner and the Native American Heritage Commission (916-322-7791) must be contacted.

Preserve CA-Eld-585/H or Require Additional Work

Preservation of the resource is always the preferred alternative. Design drawings will be reviewed by an archeologist to determine if the stamp mill, terrace, and cabin can be protected from all construction impacts by erecting temporary fencing during construction. If this is determined infeasible by the archeologist, additional work may be necessary. Specific archival research will then be undertaken on those features of the sites that might be impacted by construction. A letter report will be prepared by an archeologist and reviewed by the El Dorado County Department of Transportation and Caltrans. Based on the results of that study, excavation of the feature(s) may be necessary.

Additional Mitigation Measures for the Ridge Design

Protect the Hall/Richmond Cemetery During Construction

Prior to final design drawings and construction, an archeologist will identify the limits of the Hall/Richmond Cemetery. A 6-foot-high chain link fence will be installed on the perimeter of the site to limit construction impacts on the cemetery. After construction is complete, a low post-and-cable or similar fence will be installed to provide protection but also allow access. It is recommended that no sign be installed to draw attention to this site.

Additional Mitigation Measures for the Undercrossing Design

Relocate the State Historical Landmark Monument

The State Historical Landmark can be relocated only with the approval of the State Office of Historic Preservation. Contact should be made immediately with the Office of Historic Preservation, through Mrs. Sandy Elder, to allow sufficient time for review of the proposed relocation of the monument. Maps should be sent with a letter request for the relocation identifying the present monument location and the proposed new location. If the new location for the monument is approved, the project proponents must bear all costs of the relocation. Should the wording on the plaque need to be changed due to the relocation of the monument, the project proponent must pay for this change.

Relocate the Hall/Richmond Cemetery

Relocating the Hall/Richmond Cemetery would involve the following tasks:

- defining the number and location of the graves, using geophysical means. A specialist experienced in this type of study should be consulted to determine the appropriate method, either ground-penetrating radar or proton magnetometer. There are at least three individuals buried there, and quite possibly there are several more.

- purchasing burial plots for the individuals to be moved. The most logical place for reinterment would be the Clarksville Cemetery.

- obtaining a written order from the El Dorado County Health Department or Superior Court authorizing the disinterment, removal, and transportation of the remains. The provisions of Division 7, Part 2, Article 1, of the Health and Safety Code should be followed, and all pertinent records maintained.

- disinterring the graves by a person approved by the county, and reinterment in another cemetery.

CHAPTER 14. Alternatives to the Proposed Project

CEQA REQUIREMENTS

CEQA requires a discussion of reasonable alternatives to the project, or to the location of the project, that could feasibly attain the basic objective(s) of the project. CEQA Section 15126 (d) provides the following guidelines for discussion of the project alternatives:

1. If there is a specific proposed project or a preferred alternative, explain why the other alternatives were rejected in favor of the proposal if they were considered in developing the proposal.

2. The specific alternative of "no-project" shall also be evaluated along with its impact. If the environmentally superior alternative is the "no project" alternative, the EIR shall identify an environmentally superior alternative among other alternatives.

3. The discussion of alternatives shall focus on alternatives capable of eliminating any significant adverse environmental effects or reducing them to a level of insignificance, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.

4. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed but in less detail than the significant effects of the project as proposed.

5. The range of alternatives required in an EIR is governed by "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The key issue in determining a reasoned choice is whether the selection and discussion of alternatives fosters informed decision-making and informed public participation. An EIR need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative.

IDENTIFIED ALTERNATIVES

As stated in Chapter 2, "Project Description," several alternatives were originally considered but later rejected because of their infeasibility or inability to meet the project objectives. Each of these alternatives is described and the reasons for rejection are presented in Chapter 2.

CEQA also requires a discussion of the No-Project Alternative. For the purposes of this analysis, it is assumed that the No-Project Alternative means a Silva Valley interchange would not be built.

The No-Project Alternative would result in poor traffic circulation, at best, even with reconstruction of the El Dorado Hills Boulevard interchange and expansion of the Bass Lake Road interchange. Due to delays, the a.m. and p.m. peak hours at the El Dorado Hills interchange and surrounding roadways would be approximately 2-2.5 hours. Also, El Dorado Hills Boulevard would need to be 12 lanes wide at U. S. 50, and a grade separation at the Latrobe Road/White Rock Road intersection would be required.

Implementation of the No-Project Alternative would result in:

- no land use conflicts or taking of private property;
- no adverse aesthetic impacts;
- no soils or geologic impacts;
- no change in runoff or water quality;
- no loss of vegetation, wildlife, or aquatic resources;
- no impact to the PGandE substation and facilities; and
- no impacts to cultural resources in the project area.

A detailed analysis of the No-Project Alternative was conducted in terms of traffic, air quality, and noise impacts. A summary of the traffic, air quality, and noise impacts and mitigation measures for the No-Project Alternative is presented in Table 14-1.

often supported a population of more than 500. The inhabitants were intimately acquainted with the environs of their territory.

The Nisenan, who occupied the foothill and lower Sierra Nevada mountain elevations, selected village sites on ridges and large flats or meadows near major streams. These villages tended to have smaller populations than those in the great valley, and it was not uncommon for family groups to have their dwellings located away from the main village (Wilson and Towne 1978).

Both the valley and foothill people lived by hunting and gathering, with the latter being more important. Acorns in the form of meal, soup, or bread were dietary staples, augmented by a wide variety of seeds and tubers. Hunting and fishing were engaged in regularly but provided less of the diet than vegetable foods. The bedrock mortar and pestle were employed to process acorn meats into flour, and mortar cups continue to be found throughout the range of oak trees. Both salmon and eel were caught at nearby Salmon Falls.

Archeology

The project area lies at the edge of the Central Valley in a poorly known archeological area. No excavations have been conducted and professionally reported on thus far within a similar environmental setting in either El Dorado or Sacramento Counties. The closest test excavation of any site is CA-Eld-44, near Rescue, about 7 miles northeast of the project area and within the pine-oak woodland.

History

After the discovery of gold in 1848, the Sierran foothills were overrun by thousands of miners seeking their fortunes. Many towns and camps sprang up to supply goods and services to the miners. Clarksville served as a way station for emigrants and later a mining camp. In early 1855, the town was called "Clarkson's Village," and shown on the Placerville Road. The Placerville Road was one branch of the Carson Emigrant Road, established in 1849. The road forked at Clarksville, with one branch going to Folsom, then on to Auburn and the gold camps on the North Fork of the American River. This fork of the road is a rough representation of the present-day alignment of Silva Valley Road.

The land around Clarksville was recognized for its value to stock grazing and dairying, and by 1866 the project area had been developed into an extensive system of fencing and roads and had added several settlers. The area of Allegheny and New York Creeks had several mines (Sioli 1883).

A post office was established in the town in July 1855, and postal authorities named the community "Clarksville."

Some of the early Clarksville settlers included the Tong family, who came across the Great Plains in 1855. The Tongs improved a road and established a toll gate at their

Table 14-1. Summary of Transportation, Air Quality, and Noise Impacts and Mitigation Measures for the No-Project Alternative

Impact	Impact Rating Before Mitigation	Mitigation Measures	Impact Rating After Mitigation
	TRANSPORTATION		
Intersections			
LOS F during the p.m. peak hour at the White Rock Road/Latrobe Road intersection.	Significant	Improve the White Rock Road/Latrobe Road intersection.	Less than significant
LOS D and E during the a.m. and p.m. peak hours at the Latrobe Road/U. S. 50 EB ramps intersection.	Significant	Reconstruct the El Dorado Hills Boulevard interchange and improve the Latrobe Road/U. S. 50 EB ramps intersection.	Less than significant
LOS D during the a.m. peak hour at the El Dorado Hills Boulevard/U. S. 50 WB ramps intersection.	Significant	Reconstruct the El Dorado Hills Boulevard interchange and improve the El Dorado Hills Boulevard/U. S. 50 WB ramps intersection.	Less than significant
LOS D during the p.m. peak hour at the Bass Lake Road/U. S. 50 EB ramps intersection.	Significant	Reconstruct the El Dorado Hills Boulevard interchange and improve EB ramps intersection.	Less than significant
Freeway			
LOS E and F during the a.m. and p.m. peak hours, respectively, at the EB slip off-ramp of the El Dorado Hills Boulevard/ U. S. 50 interchange.	Significant	Reconstruct the El Dorado Hills Boulevard interchange and widen the EB slip off-ramp to two lanes. This requires an auxiliary lane in advance of the off-ramp.	Less than significant
LOS F during the a.m. and p.m. peak hours at the EB on-ramp of the El Dorado Hills Boulevard/U. S. 50 interchange.	Significant and unavoidable	The EB on-ramp would need to be widened to two lanes. However, Caltrans generally considers widening of on-ramps to be infeasible where mainline capacity is not adequate.	Significant and unavoidable
LOS F and E during the a.m. and p.m. peak hours, respectively, at the WB slip off-ramp of the El Dorado Hills Boulevard/U. S. 50 interchange.	Significant	Reconstruct the El Dorado Hills Boulevard interchange and widen the WB slip off-ramp to two lanes. This requires an auxiliary lane in advance of the off-ramp.	Less than significant
LOS F during the a.m. and p.m. peak hours at the WB loop off-ramp of the El Dorado Hills Boulevard/ U. S. 50 interchange.	Significant	Reconstruct the El Dorado Hills Boulevard interchange and widen the WB loop off-ramp to two lanes.	Less than significant
LOS F during the a.m. and p.m. peak hours at the WB on-ramp of the El Dorado Hills Boulevard/U. S. 50 interchange.	Significant and unavoidable	The WB on-ramp would need to be widened to two lanes. However, Caltrans generally considers widening of on-ramps to be infeasible where mainline capacity is not adequate. Therefore, no mitigation is recommended.	Significant and unavoidable
LOS F during the a.m. and p.m. peak hour, at the EB off-ramp of the Bass Lake Road/U. S. 50 interchange.	Significant	Reconstruct the Bass Lake Road interchange and widen the EB off-ramp to two lanes. This requires an auxiliary lane in advance of the off-ramp.	Less than significant

Table 14-1. Continued

Impact	Impact Rating Before Mitigation	Mitigation Measures	Impact Rating After Mitigation
LOS F during the a.m. and p.m. peak hours, respectively, at the WB on-ramp of the Bass Lake Road/U. S. 50 interchange.	Significant and unavoidable	The WB on-ramp would need to be widened to two lanes. However, Caltrans generally considers widening of on-ramps to be infeasible where mainline capacity is not adequate. Therefore, no mitigation is recommended.	Significant and unavoidable
Mainline U. S. 50			
LOS F on the U. S. 50 mainline in the project vicinity.	Significant	Widen U. S. 50.	Less than significant
AIR QUALITY			
No violations of either the 1-hour or the 8-hour state and federal CO standards.	Less than significant	No mitigation is required.	--
Increased CO concentrations at the El Dorado Hills Boulevard interchange approaching the 8-hour 9 ppm CO standard.	Potentially significant	Reconstruct the El Dorado Hills Boulevard interchange.	Less than significant
NOISE			
No construction-related noise being produced.	Less than significant	No mitigation is necessary.	--
No blasting-related noise or vibration being produced.	Less than significant	No mitigation is necessary.	--
Generally higher traffic volumes and increased traffic congestion tending to increase and decrease noise levels, respectively, resulting in traffic noise levels that are similar to existing noise levels.	Significant	Reduce traffic noise by either implementing land use measures or constructing noise barriers along both sides of U. S. 50 (12 feet high) and Silva Valley Parkway (8 feet high and a 50-foot landscaped buffer).	Less than significant

CHAPTER 15. Cumulative Impacts

CEQA REQUIREMENTS FOR CUMULATIVE IMPACTS EVALUATION

"Cumulative impacts" refers to two or more individual effects that, when combined, are considerable or that compound or increase other environmental impacts. The State CEQA Guidelines require that EIRs include a discussion of cumulative impacts when they are significant. Section 15130 of the guidelines requires that the discussion reflect the severity of the impacts and the likelihood of occurrence, but the discussion need not be a detailed as the discussion of the impacts of the project alone. The discussion should be guided by the standards of practicality and reasonableness.

The following elements are necessary for an adequate discussion of cumulative impacts. Either:

- o a list of past, present, and reasonably anticipated future projects producing related or cumulative impacts, including those projects outside the control of the agency, or

- o a summary of projections contained in an adopted general plan or related planning document that is designed to evaluate regional or areawide conditions. Any such planning document shall be referenced and made available to the public at a location specified by the lead agency.

In addition, the following elements are also necessary:

- o a summary of the expected environmental effects to be produced by those projects with specific reference to additional information stating where that information is available; and

- o a reasonable analysis of the cumulative impacts of the relevant projects. An EIR shall examine reasonable options for mitigating or avoiding any significant cumulative effects of a proposed project.

APPROACH

Cumulative impacts of development in the project vicinity are evaluated in the El Dorado Hills Specific Plan EIR (Jones & Stokes Associates, Inc. 1988). This EIR is considered a supplement to that document. In addition to the discussion contained in the El Dorado Hills Specific Plan EIR, this EIR updates the traffic, air quality, and noise cumulative impact analysis (see Chapter 10, "Traffic," Chapter 11, "Air Quality," and Chapter 12, "Noise").

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PERSONAL COMMUNICATIONS

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CHAPTER 17. Report Preparation

This EIR has been prepared for the County of El Dorado by Jones & Stokes Associates, Inc. under contract to El Dorado Hills Communities. The persons involved in its preparation are listed below.

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APPENDIX A. Environmental Checklist Form

ENVIRONMENTAL CHECKLIST FORM

I. Background

1. Name of Proponent El Dorado County
2. Address and Phone Number of Proponent c/o Roger Allington
   El Dorado County Department of Transportation
   2441 Headington Road, Placerville, CA 95667
   916/626-2347
3. Date of Checklist Submitted April 13, 1988
4. Agency Requiring Checklist El Dorado County
5. Name of Proposal, if applicable Silva Valley Interchange

II. Environmental Impacts

(Explanations of all "yes" and "maybe" answers are required on attached sheets.)

	Yes	Maybe	No
1. Earth. Will the proposal result in:			
a. Unstable earth conditions or in changes in geologic substructures?			X
b. Disruptions, displacements, compaction or overcovering of the soil?	X		
c. Change in topography or ground surface relief features?	X		
d. The destruction, covering or modification of any unique geologic or physical features?			X
e. Any increase in wind or water erosion of soils, either on or off the site?		X	
f. Changes in deposition or erosion of beach sands, or changes in siltation, deposition or erosion which may modify the channel of a river or stream or the bed of the ocean or any bay, inlet or lake?			X
g. Exposure of people or property to geologic hazards such as earthquakes, landslides, mudslides, ground failure, or similar hazards?			X

	Yes	Maybe	No
2. Air. Will the proposal result in:			
a. Substantial air emissions or deterioration of ambient air quality?		X	
b. The creation of objectionable odors?			X
c. Alteration of air movement, moisture, or temperature, or any change in climate, either locally or regionally?			X
3. Water. Will the proposal result in:			
a. Changes in currents, or the course of direction of water movements, in either marine or fresh waters?			X
b. Changes in absorption rates, drainage patterns, or the rate and amount of surface runoff?		X	
c. Alterations to the course or flow of flood waters?			X
d. Change in the amount of surface water in any water body?			X
e. Discharge into surface waters, or in any alteration of surface water quality, including but not limited to temperature, dissolved oxygen or turbidity?			X
f. Alteration of the direction or rate of flow of ground waters?			X
g. Change in the quantity of ground waters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations?		X	
h. Substantial reduction in the amount of water otherwise available for public water supplies?			X
i. Exposure of people or property to water related hazards such as flooding or tidal waves?			X
4. Plant Life. Will the proposal result in:			
a. Change in the diversity of species, or number of any species of plants (including trees, shrubs, grass, crops, and aquatic plants)?	X		

	Yes	Maybe	No
b. Reduction of the numbers of any unique, rare or endangered species of plants?		X	
c. Introduction of new species of plants into an area, or in a barrier to the normal replenishment of existing species?			X
d. Reduction in acreage of any agricultural crop?			X
5. **Animal Life.** Will the proposal result in:			
a. Change in the diversity of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms or insects)?		X	
b. Reduction of the numbers of any unique, rare or endangered species of animals?		X	
c. Introduction of new species of animals into an area, or result in a barrier to the migration or movement of animals?			X
d. Deterioration to existing fish or wildlife habitat?		X	
6. **Noise.** Will the proposal result in:			
a. Increases in existing noise levels?	X		
b. Exposure of people to severe noise levels?		X	
7. **Light and Glare.** Will the proposal produce new light or glare?	X		
8. **Land Use.** Will the proposal result in a substantial alteration of the present or planned land use of an area?			X
9. **Natural Resources.** Will the proposal result in:			
a. Increase in the rate of use of any natural resources?			X
10. **Risk of Upset.** Will the proposal involve:			
a. A risk of an explosion or the release of hazardous substances (including, but not limited to, oil, pesticides, chemicals or radiation) in the event of an accident or upset conditions?			X

	Yes	Maybe	No
b. Possible interference with an emergency response plan or an emergency evacuation plan?			X
11. Population. Will the proposal alter the location, distribution, density, or growth rate of the human population of an area?		X	
12. Housing. Will the proposal affect existing housing, or create a demand for additional housing?	X		
13. Transportation/Circulation. Will the proposal result in:			
a. Generation of substantial additional vehicular movement?	X		
b. Effects on existing parking facilities, or demand for new parking?			X
c. Substantial impact upon existing transportation systems?	X		
d. Alterations to present patterns of circulation or movement of people and/or goods?	X		
e. Alterations to waterborne, rail or air traffic?			X
f. Increase in traffic hazards to motor vehicles, bicyclists or pedestrians?			X
14. Public Services. Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas:			
a. Fire protection?			X
b. Police protection?			X
c. Schools?			X
d. Parks or other recreational facilities?			X
e. Maintenance of public facilities, including roads?			X
f. Other governmental services?			X
15. Energy. Will the proposal result in:			
a. Use of substantial amounts of fuel or energy?			X

	Yes	Maybe	No
b. Substantial increase in demand upon existing sources or energy, or require the development of new sources of energy?			X
16. Utilities. Will the proposal result in a need for new systems, or substantial alterations to the following utilities: gas, electric, etc.?			X
17. Human Health. Will the proposal result in:			
a. Creation of any health hazard or potential health hazard (excluding mental health)?			X
b. Exposure of people to potential health hazards?			X
18. Aesthetics. Will the proposal result in the obstruction of any scenic vista or view open to the public, or will the proposal result in the creation of an aesthetically offensive site open to public view?		X	
19. Recreation. Will the proposal result in an impact upon the quality or quantity of existing recreational opportunities?			X
20. Cultural Resources.			
a. Will the proposal result in the alteration of or the destruction of a prehistoric or historic archaeological site?		X	
b. Will the proposal result in adverse physical or aesthetic effects to a prehistoric or historic building, structure, or object?		X	
c. Does the proposal have the potential to cause a physical change which would affect unique ethnic cultural values?			X
d. Will the proposal restrict existing religious or sacred uses within the potential impact area?			X

21. 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, 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

	Yes	Maybe	No
important examples of the major periods of California history or prehistory?	___	___	X
b. Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals? (A short-term impact on the environment is one which occurs in a relatively brief, definitive period of time while long-term impacts will endure well into the future.)	___	___	X
c. Does the project have impacts which are individually limited, but cumulatively considerable? (A project may impact on two or more separate resources where the impact on each resource is relatively small, but where the effect of the total of those impacts on the environment is significant.)	X	___	___
d. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	X	___	___

Determination

On the basis of this initial evaluation:

I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared. ☐

I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet have been added to the project. A NEGATIVE DECLARATION WILL BE PREPARED. ☐

I find the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required. ☒

April 20, 1988
Date

[signature]
Signature

For El Dorado County

Explanation of "Yes" and "Maybe" Answers

1. Earth. b. c. e. Grading and construction would result in localized changes in topography and short-term increases in erosion.

2. Air. a. Traffic using the interchange would contribute to deterioration of ambient air quality.

3. Water. b. g. Construction of the interchange would change the site-specific drainage patterns. A qualified geohydrologist will address the question of potential impacts to a spring/pool located where Carson Creek exits through a triple 10-foot-wide box culvert under U. S. 50.

4. Plant Life. a. b. Construction of the project would result in the removal of existing vegetation within the construction zone. A plant survey will be conducted to determine the potential impacts on plants and the potential for unique, rare, or endangered plant species.

5. Animal Life. a. b. d. Construction of the project would result in deterioration of existing wildlife habitat. A wildlife survey will be conducted to determine the potential impacts on wildlife.

6. Noise. a. b. Construction activity would result in increased short-term noise levels. The design of the proposed project would result in existing residences being exposed to additional traffic and traffic noise.

7. Light and Glare. The lights associated with the interchange would increase light and glare in the immediate vicinity.

11. Population. The project has been identified as necessary to accommodate planned growth in the El Dorado Hills/Salmon Falls Area Plan.

12. Housing. The project would affect existing residences located north of U. S. 50.

13. Transportation/Circulation. a. c. d. The project would generate substantial additional traffic during construction. Construction of the project would allow a substantial increase in the capacity of the transportation system in western El Dorado County and alter the present patterns of circulation.

18. Aesthetics. The project would contribute to a change in the area from rural to urban. Given that aesthetics is a subjective concept, this change may be viewed as offensive by various individuals.

20. Cultural Resources. a. b. The project has been designed to avoid impacts on known cultural sites. A site-specific cultural resources survey will be conducted to locate any unknown sites.

21. Mandatory Findings of Significance. c. d. The project would contribute to cumulative impacts in the El Dorado Hills/Salmon Falls area.

APPENDIX B. Comments Received on the Notice of Preparation of an EIR

May 9, 1988	El Dorado County Building Inspection Division Gary Delgado
May 12, 1988	El Dorado County Agricultural Commission Burton Threlkel
June 1, 1988	California Department of Transportation Brian Smith
June 1, 1988	Environmental Council of Sacramento Michael Eaton
June 3, 1988	El Dorado Irrigation District Tracey Eden
June 7, 1988	Ed Dolder
October 4, 1988	Pacific Gas and Electric Company David Armi

Linda

Keep with cards. R

EL DORADO COUNTY COMMUNITY DEVELOPMENT

INTEROFFICE MEMORANDUM

TO: Roger Allington, Deputy Director,
Department of Transportation

FROM: Gary Delgado, Building Official GD

DATE: May 9, 1988

SUBJECT: Silva Valley Parkway, Environmental Impact Report

The Building Inspection Division, will need to be informed of specific and possible impacts to housing and construction in the area for work planning purposes.

GD/kl

RECEIVED
MAY 11 1988
Dept. of Transportation

Ninaa - wi
note

County of El Dorado

AGRICULTURAL COMMISSION
311 Fair Lane Drive • Placerville, CA 95667
Phone (916) 626-2305

10

TO: Mr. Roger Allington, Deputy Director - Engineering
El Dorado County Department of Transportation
360 Fair Lane
Placerville, CA 95667

FROM: Burton Threlkel, Chairman
El Dorado County Agricultural Commission

DATE: May 12, 1988

RE: Silva Valley Parkway/U.S. 50 Interchange

The El Dorado County Agricultural Commission wishes to remain on your mailing list for all information pertaining to this Interchange.

The information should be directed to Edio P. Delfino, Secretary, El Dorado County Agricultural Commission, 311 Fair Lane, Placerville, CA 95667.

BT:EPD:mlb

RECEIVED
MAY 25 1988
Dept. of Transportation

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY GEORGE DEUKMEJIAN, Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 3
P.O. BOX 911, MARYSVILLE 95901
Telephone (916) 741-4498

June 1, 1988

03-ED-50
P. M. 0.8
Silva Valley
Road Interchange
333901

Mr. Roger Allington
El Dorado County
Department of Transportation
360 Fair Lane
Placerville, CA 95667

Dear Mr. Allington:

Thank you for the opportunity to review the notice of preparation of a draft EIR for Construction of the Silva Valley Parkway/U.S. Highway 50 Interchange.

The environmental checklist identifies a substantial amount of additional vehicular movement and impacts to the existing transportation system. The draft EIR should identify specific impacts to the Highway 50 mainline. This segment is currently operating at level of service C, but is expected to decline to level E by 1996 if no improvements are made. If necessary, feasible mitigation measures should be identified.

The traffic study should also analyze impacts of proposed intersection spacings in the interchange vicinity on future traffic operations at the intersections. We are specifically concerned about the intersection of White Rock Road and the frontage road in the northeast quadrant. Any intersections that will eventually require signals should be spaced at least 450 feet apart to allow for storage.

The project description on Page 4 places the interchange location 600 feet east of the Clarksville Undercrossing. The approved project study report identified the interchange as being 800 feet east of the undercrossing. The draft EIR should clarify the location of the interchange. The entire truck climbing lane is not being constructed as implied, but rather only that portion needed for accelerating on-ramp traffic will be constructed as part of the project. Caltrans would not allow staging of the interchange construction. The overcrossing and all ramps must be constructed under a single contract.

We recommend that the scope of the cultural resources study be sufficient to cover all alternative design features. Negative responses to checklist items 20(c) and 20(d) may be premature. Coordination with the local Native American community may identify cultural values, including sacred or religious uses associated with that group. The cultural resources survey should include this coordination. A "maybe" response to these items would be more appropriate.

Caltrans would issue an encroachment permit for all work within the State right of way and is, therefore, a Responsible Agency pursuant to CEQA.

If you have any questions on these comments, please contact Jeannie Baker, telephone (916) 741-4498.

Sincerely,

Brian J. Smith /JB

Brian J. Smith, Chief
Environmental Branch B

Environmental Council of Sacramento
909 Twelfth Street
Sacramento, CA 95814

June 1, 1988

Please respond to:
1823 11th St., 95814
Phone: 447-6099

Mr. Roger Allington
Deputy Director - Engineering
El Dorado Co. Dept. of Transportation
360 Fair Lane
Placerville, CA 95667

re: Comments on NOP, Silva Valley/50 Interchange

Dear Mr. Allington:

Thank you for including us in the mailing of the NOP. We offer the following comments:

1. The distribution list should include the Environmental Protection Agency, Region IX, because of the substantial air pollution and air pollution planning issues raised and the EPA's involvement in air pollution planning in the metropolitan Sacramento region.

2. The project is likely to have a substantial impact on air quality, regional traffic patterns, and land use. The cumulative impacts in these areas of development potentially served by this project should be evaluated in the DEIR. The basis for evaluation of impacts is the existing land uses in the area; to the extent that the interchange is a prerequisite to additional urban development, finding 8 of the checklist should be "yes" rather than "no." Mitigation measures that should be considered include transit system expansion, shuttle bus system, or other measures to reduce single-occupant vehicle trips.

3. The interchange poses major air pollution planning issues. The DEIR should examine the issue of consistency of the interchange and development to be served by the interchange with the existing Air Quality Plan for El Dorado County and current transportation plans.

Thank you for this opportunity to comment.

Sincerely,

Michael R. Eaton
Planning Chair

RECEIVED
JUN 03 1988
Dept. of Transportation

Copy to Kim Smith of Jones & Stokes. R

El Dorado Irrigation District

POST OFFICE BOX 1608 • 2890 MOSQUITO ROAD • PLACERVILLE • CALIFORNIA 95667 • PHONE (916) 622 4534

In reply refer to: E0688-440

June 3, 1988

El Dorado County
Department of Transportation
360 Fair Lane
Placerville, CA 95667

Attention: Scott Chadd

Subject: Notice of Preparation of the EIR for the Silva Valley Parkway/U.S. 50 Interchange

Ladies and Gentlemen:

This is in response to your Notice of Preparation of the EIR for the Silva Valley Parkway/U.S. 50 Interchange.

There are existing facilities in the vicinity of the proposed interchange. A 12-inch watermain and an 18-inch sewermain cross Highway 50 at the existing bridge. There is also a 12-inch watermain that runs parallel with Highway 50 West of the bridge, as shown on attached map.

Accessibility and minimum and maximum cover over the existing facilities should be considered. The District intends to continue maintaining these facilities in their existing locations. If design of the interchange requires relocation of EID facilities, the District would expect the developer to pay for any modification to them.

Please feel free to contact me at 622-4534 if you have any questions.

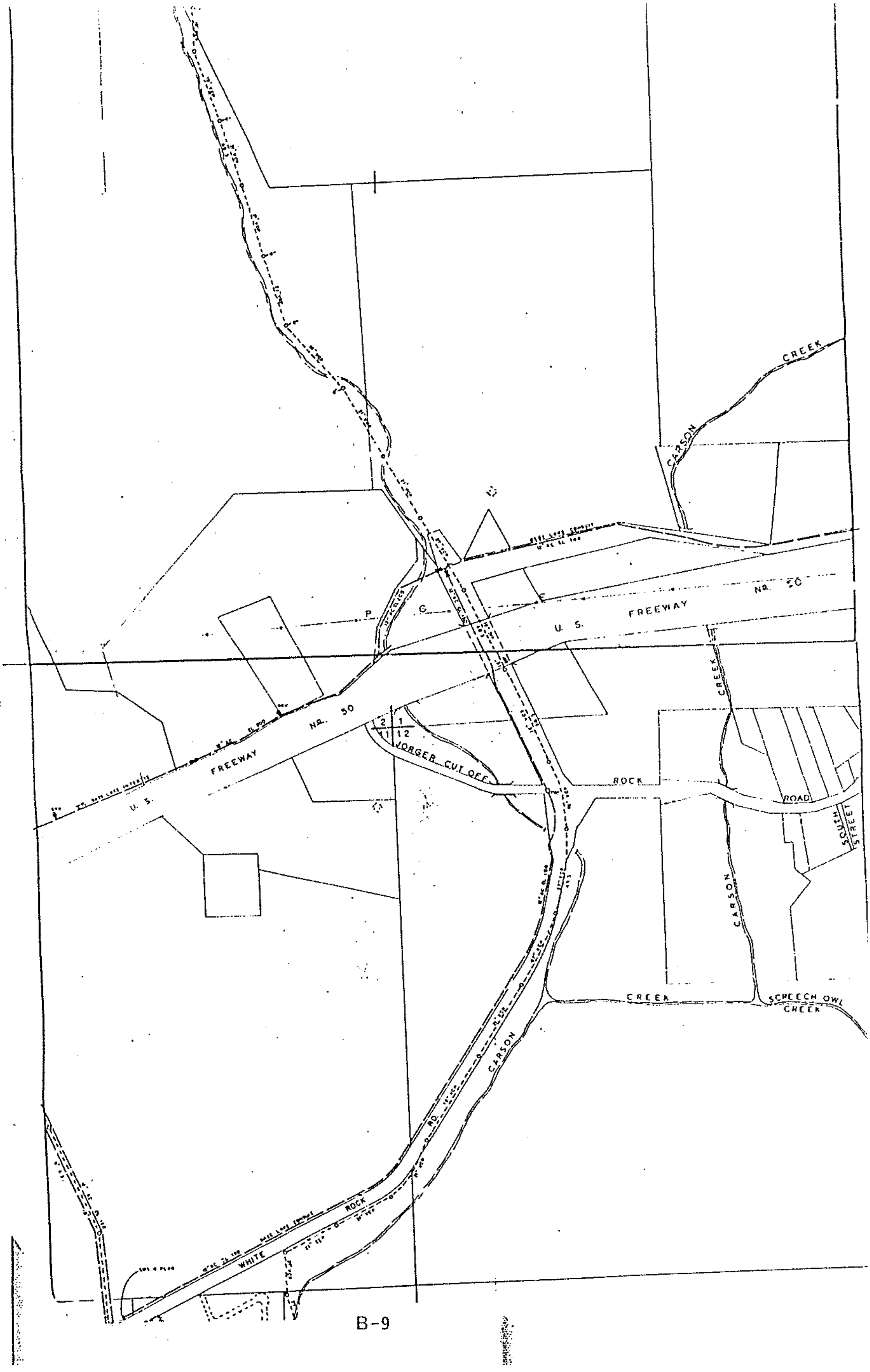
Very truly yours,

Tracey L. Eden
Assistant Engineer

TLE:alc

Roger A.

RECEIVED
JUN 07 1988
Dept. of Transportation


CREEK
CARSON
U. S. FREEWAY NR. 50
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CREEK
JORGER CUT OFF
ROCK
ROAD
SOUTH STREET
CARSON
CREEK
SCREECH OWL CREEK
CARSON
WHITE ROCK RD.

June 7, 1988

Jones & Stokes Associates, Inc.
1725 23rd St. Suite 100
Sacramento, CA 95816

Att: Bob Jones

Dear Bob:

I thank you for sending the Dolders a copy of the EIR notice for the Silva Valley Parkway/U.S. 50 Interchange.

This is our first official notice of a project that, in its present form, will wipe out our beautiful 5-acre property on Carson Creek just north of the freeway.

We did not know of this project until a friend sent us a news clipping from the Placerville newspaper.I wrote to the El Dorado County Board of Supervisors for official information and have not yet received any reply from the county. They have no trouble finding us here in Hawaii with their property tax bills.

Our property is the most westerly of the three 5-acre units often referred to in the news. We are just west of the Byram property. Our parcel number is 86-180-01.

The pros and cons of the interchange location leave me with an unpleasant feeling that Howard Ullrich's proposed location, representing the EDHC, 600 feet east of the White Rock Road overpass, is the location of most benefit(bottom line and area-wise) to the EDHC grandious development plans.

I spent the last eight years of my state career as chief of the Dept. of Transportation's Office of Environmental Policy and Planning and a part of this time Ullrich was deputy director, underJames Moe.

Often I was involved in very highly controversial projects in which I often was in conflict with highway engineers... so it is with a sense of wry humor that I think: "Are the engineers getting their revenge?"

Ann, mysecond wife(my first died in 1978) and I will be in California in July for a son's wedding. We will be visiting friends and relatives in the Sacramento area and will have an opportunity to look the project plans over on the ground.

Best regards,

Ed Dolder

EDWARD F. DOLDER
[illegible]
1?37 HAIKU ROAD
HAIKU, MAUI, HI 96708

Pacific Gas and Electric Company
Sacramento Valley Region

2740 Gateway Oaks Drive
Sacramento, CA 95833
916/923-7000

October 4, 1988

Ms. Kim C. Smith
Jones & Stokes Associates, Inc.
1725 23rd Street, Suite 100
Sacramento, CA 95814

Dear Ms. Smith:

Notice of Preparation of the EIR for
Silva Valley Parkway/U. S. 50 Interchange

We appreciated the opportunity to work with you and representatives of Bissell & Karn, Inc., El Dorado Hills Communities, and Gene Thorne & Associates, Inc., to more clearly identify impacts to PG&E facilities regarding the subject project.

For the purpose of the EIR, we offer the following comments regarding PG&E's Clarksville Substation, the Gold Hill - El Dorado 115kV steel pole line, the Gold Hill-Martell 60kV wood pole line which has a 12kV distribution underbuild, proposed gas facilities, and rights of way and permits. We suggest that maps which illustrate the location of these critical public facilities be included in the EIR.

1. Clarksville Substation. This distribution substation converts 115kV voltage from two transmission lines into four 12kV distribution circuits using two power transformers. The long term expansion plans for this substation include the potential for a total of three power transformers and twelve distribution circuits.

There are several aspects of the substation's design and operation which may be impacted by the proposed interchange:

Neither Alternative A nor Alternative B appears to impact access to the substation entrance; however, access to the substation must be maintained at all times during construction of the interchange.

The security of the substation is maintained by a fence with a locked gate surrounding the entire perimeter of the substation. Because of space limitations within the substation, future installation of additional equipment, and required minimum design clearances between the fence and existing substation equipment, the existing substation fence must not be impacted by any proposed interchange construction and right of way acquisition. As shown in the drawings dated August 24, 1988, neither Alternative A nor Alternative B appears to impact the existing substation fence.

As proposed in the drawing dated August 24, 1988, the "Existing Undercrossing - Parclo 'B' Alternative" will necessitate removing some of the existing substation landscaping and relocating a portion of PG&E's existing substation irrigation system including the well and pump. Restoration of damaged or removed landscaping including the irrigation well, pump, and irrigation system, and/or installation of an equivalent aesthetic barrier will be required under this alternative. Provided that these impacts are mitigated, PG&E has no objections to Alternative B.

In the "Ridgeline Location - Parclo 'A' Alternative" as proposed in the drawing dated August 24, 1988, the proposed interchange off ramp and CalTrans Right of Way do not appear to impact the operation or maintenance of the substation.

2. Electric Transmission Lines. There are three transmission lines which will be impacted by the proposed freeway interchange. The Gold Hill -El Dorado 115kV transmission lines #1 and #2 supply Clarksville and other major distribution substations in the area. These two 115kV transmission lines consist of 715.5 kcm aluminum conductors supported by double circuit tubular steel poles. The Gold Hill - Martell 60kV transmission line runs generally parallel to the two 115kV lines in the area of the proposed interchange and is supported by wood poles. The 60kV line is underbuilt with a 12kV distribution circuit from Clarksville substation.

All three transmission lines and the distribution underbuild will require relocation outside the CalTrans Right of Way for the interchange. In general, the construction plan for relocating electric utility facilities must include provisions for maintaining the status quo of the electric system as it exists before the relocation begins in order not to degrade reliability of service to PG&E customers.

A method of relocating the transmission and distribution lines would involve several steps including building temporary lines (shoo-flies) around the interchange, reconnecting the shoo-flies to keep the lines and the facilities served from the lines energized and operational, disconnecting the line sections to be relocated, removing and reinstalling the lines around the proposed interchange, reconnecting the relocated permanent lines, and then removing the shoo-flies.

A simplified and less costly method of relocating the transmission lines would be to build and connect permanent new line sections around the proposed interchange, and then remove the lines which are within the interchange Right of Way area, instead of building temporary shoo-flies as described above.

Two routing options for relocating the transmission lines were considered (see attached map). Option One reroutes the lines around and to the south of the proposed interchange, generally following White Rock Road and crossing the freeway to interconnect with existing facilities. Option Two reroutes the lines around and to the north of the proposed interchange. It crosses the freeway and circles across the end of the cloverleaf until it also interconnects with existing facilities. Both routes involve approximately the same circuit length of line to be relocated, approximately one mile for each line. The preliminary rough cost for completing the relocation of the two 115kV and the one 60kV transmission lines is $600,000 for both routing options, not including Right of Way costs.

We recommend that the new location and routing of the transmission lines be fully discussed by the Planning Commission as part of the Silva Valley Parkway Interchange EIR under Section 17.14.070 of the El Dorado County Zoning Ordinance No. 3471 (copy attached). Until the project proponent identifies the specific tower locations and numbers in relation to the final project plans, PG&E cannot determine a more accurate cost estimate for any relocation which may be required.

3. Electric Distribution Lines. There are three distribution outlets from Clarksville substation with a fourth scheduled for installation by end of summer, 1988. Two of the circuits will be impacted by the proposed interchange and will require relocation. The estimated cost to complete the relocation is approximately $185,000. Until the specific pole locations are identified in relation to the final project plans, PG&E cannot determine a more accurate cost estimate for any relocation which may be required. The routing for the distribution lines will generally follow the corridor required for the transmission lines and will be approximately one mile in length. This estimate assumes overhead distribution lines. If undergrounding is required, it will be substantially more expensive.

As the electric load increases in the Clarksville area, additional distribution circuit outlets will be required from Clarksville substation. Some of the required circuits will have to cross Highway 50 to reach the new load centers. Six 6" conduits for electric distribution will be needed to cross the freeway in the vicinity of the proposed interchange. If possible, a minimum of two conduits should be installed along Silva Valley Road beneath the highway overpass, and four conduits should be installed in the bridge during construction of the new interchange to help accommodate electric circuit expansion across the highway.

4. Gas Transmission and Distribution Lines. Growth in the Clarksville area will also impact PG&E's gas system. To accommodate this growth, a gas transmission and distribution feeder line will need to be extended across Highway 50. In addition to the conduits for electric facilities, a 12" conduit will be required in the bridge to house the gas facilities.

5. Right of Way and Permits. PG&E stipulates that under the proposed assessment district procedure, El Dorado County would be required to convey or cause to be conveyed at no cost to PG&E all the necessary land or land rights and permits in a form satisfactory to PG&E in order to permit PG&E to relocate and install the transmission and distribution lines in their new location.

I hope that our comments will be of some assistance to you during the preparation of the EIR. Should you have any questions, please contact Melody Kercheval at (916) 923-7239.

Sincerely,

David N. Armi wbg

David N. Armi
Supervisor of Land Acquisition

MRK:cla

cc: Mr. Roger Allington
Deputy Director - Engineering
El Dorado County
Department of Transportation
360 Fair Lane
Placerville, CA 95667

Sally Reemsnyder
Bissell & Karn, Inc.
4637 Chabot Drive, Suite 204
Pleasanton, CA 94566

Albert Hozbun
El Dorado Hills Communities
3864 Park Drive, Suite 204
El Dorado Hills, CA 95630

Attachment

GTP:db
8/9/84
17/14/070.ord

ORDINANCE No. 3471

THE BOARD OF SUPERVISORS OF THE COUNTY OF EL DORADO DOES ORDAIN AS FOLLOWS:

Section 1. Section 17.14.070 of Chapter 17.14 of Title 17 of the El Dorado County Ordinance Code is hereby repealed.

Section 2. Section 17.14.070 is hereby added to Chapter 17.14 of Title 17 of the El Dorado County Ordinance Code to read as follows:

17.14.070 Public utility distribution, transmission lines and/or facilities. Public utility distribution, transmission lines and/or facilities, both overhead and underground shall be allowed in all except AA zone districts; provided that the routes and site locations of the proposed transmission lines and/or facilities shall be submitted to the planning commission or the zoning administrator for site plan review or special use permit during the preliminary planning stages and prior to the adoption of the routes and site locations(s) or acquisition of right-of-ways therefore.

A. Public utility distribution, transmission lines, and/or facilities shall for the purposes of this section, mean: (1) Public utility towers and/or structures supporting power lines of fifty thousand volts potential and over; (2) Trunk telephone lines, supporting structures and saucers; (3) Sewer and water lines twelve inches or more inside diameter; (4) Natural gas pipe six inches or more inside diameter; (5) Sewer and water lift stations, telephone equipment buildings, and natural gas storage and distribution facilities;

B. Public utility distribution, transmission lines and/or facilities as described above are permitted by right without planning commission or zoning administrator review when said facilities do not exceed 15 feet more than the height limitation of the zone district and setbacks of the zone district, and do not create potential safety and health hazards to adjacent property owners, present or future.

(1) Notwithstanding, in all cases where construction is proposed in an AA Zone District, site plan review and approval is required.

C. Site plan review required:

(1) All cases where the public utility distribution transmission lines and/or facilities exceed height limitations of the zone district as set forth in subsection B and less than 150 feet in height or do not comply with setback requirements, shall be subject to site plan approval before the planning commission or zoning administrator.

(2) Notice of the site plan review hearing shall be provided to all property owners within 500 feet of the proposed location. Said notice shall be provided ten (10) days prior to the scheduled hearing.

D. Special use permit required:

(1) All cases where the construction of the public utility distribution transmission lines and/or facilities creates, as determined by the planning commission or zoning administrator, potential safety or health hazard to adjacent property owners, present or future, shall require a special use permit;

(2) All cases where the construction of the public utility distribution, supporting structures and/or facilities exceed 150 feet in height shall require a special use permit;

(3) The foregoing shall apply within the limitations of state and federal law preemption.

PASSED AND ADOPTED by the Board of Supervisors of the County of El Dorado at a regular meeting of said Board, held on the 7th day of August, 1984, by the following vote of said Board:

Ayes: Supervisors Lowe, Walker, Flynn, Stew

Noes: None
Absent: Dorr

/s/ PATRICIA R. LOWE
Chairman, Board of Supervisors

ATTEST
BILLIE MITCHELL, County Clerk and ex-officio Clerk of the Board of Supervisors

By /s/ Bette Culp
Deputy Clerk

I CERTIFY THAT:
THE FOREGOING INSTRUMENT IS A CORRECT COPY OF THE ORIGINAL ON FILE IN THIS OFFICE.

DATE Aug. 9, 1984

ATTEST: BILLIE MITCHELL, County Clerk and ex-officio Clerk of the Board of Supervisors of the County of El Dorado, State of California.

By [signature]
Deputy Clerk

APPENDIX C. Geohydrology Report on the Carson Creek Spring

GEOCONSULTANTS, INC.
Consultants in Geology, Hydrology, Engineering
1450 Koll Circle, Suite 114
San Jose, California 95112
Telephone: (408) 286-4251

Project G722-01
October 4, 1988

Ms. Lisa Larrabee
Jones & Stokes Associates, Inc.
1725 23rd Street, Suite 100
Sacramento, CA 95816

RE: FINAL REPORT
"SPRING" SOURCE STUDY FOR EIR
HIGHWAY 50 AND CARSON CREEK
EL DORADO COUNTY, CALIFORNIA

Dear Lisa:

Following your review of the draft report, enclosed with this letter is our final report concerning the subject study. We have assessed the potential impact that two alternatives involving the construction of an interchange at Highway 50 and Silva Valley (White Rock) Road might have on the flow of a "spring" source which apparently sustains the base flow of a portion of Carson Creek.

It has been a pleasure working with you on this project. If you have any further questions, please call.

Very truly yours,

GEOCONSULTANTS, INC.

Jeremy C. Wire
Engineering Geologist, EG-71

Copies: Addressee (1)

G722-01.1

GEOLOGIC STUDY FOR EIR
"SPRING" SOURCE
HIGHWAY 50 AND CARSON CREEK
EL DORADO COUNTY, CALIFORNIA

INTRODUCTION

In accordance with our proposal of May 3, 1988, and subsequent discussions, this report presents the results of our study of a "spring" source which sustains the base flow of Carson Creek at an existing bridge crossing of Highway 50 near Clarksville, El Dorado County, California.

We understand that the "spring" source could be impacted by the construction of a new interchange for Silva Valley (White Rock) Road and Highway 50. We further understand that two alternative designs are being contemplated, an Alternative A which would involve the construction of an entirely new overpass, and Alternative B which would largely involve the modification of the existing bridge structure.

Thus, the purpose of our study was to determine the geohydrologic factors which control the occurrence of the spring and what possible mitigating measures could be incorporated in the planning, design, and construction of the interchange in order to maintain the flow from the "spring."

The scope of our study included the review of available published geologic data* in the vicinity, review of some Caltrans documents relating to subsurface conditions in the area, a field reconnaissance of the site, evaluation of the resulting data, and the preparation of this report. No subsurface investigations such as drilling were to be completed within this scope of work.

SITE CONDITIONS

Existing geologic mapping (Wagner and others, 1981), Clark (1964, 1976), and our field reconnaissance indicates that the area in the vicinity of the "spring" source is underlain by greenstone (ancient rock originally of volcanic origin) which is a portion of the western Sierra Nevada belt of metamorphic rocks. The bedrock is well-exposed in the channel of Carson Creek, both upstream and downstream of the triple box culvert which supports the roadway of Highway 50.

Examination of exposures of the bedrock upstream and downstream of the culvert structure indicates that the rock consists of massive to foliated greenstone with some interlayered schist and greywacke (sandstone). The strike of the foliation appears to very consistent both upstream and downstream of the box culvert section, and varies from N 20 degrees W to N 30 degrees W, with the foliation dipping from nearly vertical to 65 degrees northeast. The consistency of

---

* Refer to Selected References

the foliation attitude both north and south of the box culvert suggests that the bedrock is not affected by major faulting in the vicinity. However, joint sets and fractures are locally present.

At the time of our field reconnaissance, which was on May 26, 1988, the bedrock channel of Carson Creek was dry above the box culvert, but a pool of standing water was present just downstream. This pool was slowly discharging into the creek channel at a rate of about 1 to 2 gallons per minute. About 1000 feet downstream, where the old highway bridge (BM 673) at Clarksville crosses the creek, about the same order of magnitude of flow was observed.

Hence, it appears as though most of the flow observed originates from beneath or immediately downstream of the box culvert structure. Inspection of the inside of the box culvert indicates that there is some downward movement of minor amounts of water through the construction joints. The only seepage that appeared to be originating from the bottom of the culvert was also minor, and occurred within 100 feet of the downstream headwall.

CONCLUSIONS AND RECOMMENDATIONS

General

We conclude from the available data that the origin of the "spring" source is within fractured bedrock at the downstream end of the existing box culvert. The fractured bedrock locally contains ground water as evidenced by: (1) the presence of several bedrock domestic wells in the

Clarksville community just downstream, and (2) the fact that during the initial subsurface exploration for the Clarksville undercrossing to the west, water flowing at an estimated rate of 0.5 gallon per minute was encountered in "greenschist" bedrock in one of the exploratory borings (Caltrans, 1964).

Mitigation Measures

It appears that Alternative B, as shown on the plan prepared by Bissell & Karn, Inc. dated September, 1986 would have the least impact on the "spring" source. This alternative would shift most of the construction to the west of Carson Creek, and would appear to use the existing box culvert structure with perhaps the addition of a retaining wall to assist in the support of an eastbound on-ramp. A new frontage road would be constructed to the north, but this should not affect subsurface conditions in the area under consideration.

Mitigating measures which could be included in the design of the retaining wall are weep holes or other means of allowing the ground water to move through the footing elements. The construction of a solid footing might result in the creation of a "cutoff" wall in the bedrock, preventing the flow of ground water. In addition, if any embankment fill is needed to provide the necessary roadway width for the on-ramp, then a blanket drain should be placed under the base of the fill section to assure the free flow of water from the underlying bedrock.

With Alternative B, the same mitigating measures could be included with respect to the east-bound on-ramp. This access road could also span the creek as an open bridge, which would totally avoid any construction in the creek channel. It appears that no special measures need to be taken for the westbound off-ramp, other than providing an adequate culvert section for the channel of Carson Creek.

* * * * * * *

SELECTED REFERENCES

Caltrans, 1964; Log of Test Borings, Clarksville Undercrossing, Bridge 25-72, Drawing 2572-9.

Clark, L.D., 1964; Stratigraphy and Structure of Part of the Western Nevada Metamorphic Belt, California; U.S. Geological Survey Professional Paper 410.

Clark, L.D., 1976; Stratigraphy of the North Half of the Western Nevada Metamorphic Belt, California; U.S. Geological Survey Professional Paper 923.

Wagner, D.L. and Others, 1981; Geologic Map of the Sacramento Quadrangle; Map No. 1A, Regional Geologic Map Series, California Division of Mines and Geology.

APPENDIX D. Biological Species Lists

Common Name	Scientific Name	Species Observed
INSECTS		
Valley elderberry longhorn beetle	Desmocerus californicus dimorphus	
AMPHIBIANS		
Red-legged frog	Rana aurora	
Bullfrog	Rana catesbeiana	*
REPTILES		
Gopher snake	Pituophis melanoleucus	
BIRDS		
Black-shouldered kite	Elanus caeruleus	
Northern harrier	Circus cyaneus	
Cooper's hawk	Accipiter cooperii	
Swainson's hawk	Buteo swainsoni	
Red-tailed hawk	Buteo jamaicensis	*
Ferruginous hawk	Buteo regalis	
Golden eagle	Aquila chrysaetos	
Merlin	Falco columbarius	
Prairie falcon	Falco mexicanus	
California quail	Callipepla californica	*
Mourning dove	Zenaida macroura	*
Burrowing owl	Athene cunicularia	
Lewis' woodpecker	Melanerpes lewis	*
Acorn woodpecker	Melanerpes formicivorous	*
Nuttall's woodpecker	Picoides nuttallii	
Northern flicker	Colaptes auratus	*
Black phoebe	Sayornis nigricans	*
Horned lark	Eremophila alpestris	
Cliff swallow	Hirundo pyrrhonota	
Scrub jay	Aphelocoma coerulescens	*
American crow	Corvus brachyrhynchos	*
Plain titmouse	Parus inornatus	*
Bushtit	Psaltriparus minimus	*
White-breasted nuthatch	Sitta carolinensis	*
Rock wren	Salpinctes obsoletus	*
Bewick's wren	Thryomanes bewickii	*

Common Name	Scientific Name	Species Observed
Ruby-crowned kinglet	Regulus calendula	
Western bluebird	Sialia mexicana	*
Yellow-rumped warbler	Dendroica coronata	*
Lark sparrow	Chondestes grammacus	
Golden-crowned sparrow	Zonotrichia atricapilla	*
White-crowned sparrow	Zonotrichia leucophrys	*
Dark-eyed junco	Junco hyemalis	*
Tricolored blackbird	Agelaius tricolor	
Western meadowlark	Sturnella neglecta	*
House finch	Carpodacus mexicanus	*
Lesser goldfinch	Carduelis psaltria	*
MAMMALS		
California ground squirrel	Spermophilus beecheyi	
Western gray squirrel	Sciurus griseus	*
Botta's pocket gopher	Thomomys bottae	
Raccoon	Procyon lotor	
Mule deer	Odocoileus hemionus	

APPENDIX E. Air Quality

DISPERSION MODELING

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

Gaussian dispersion models treat pollutant emissions as being carried downwind in a defined plume, subject to horizontal and vertical mixing with the surrounding atmosphere. The plume spreads horizontally and vertically with a reduction in pollutant concentrations as it travels downwind. Mixing with the surrounding atmosphere is greatest at the edge of the plume, resulting in lower pollutant concentrations outward (horizontally and vertically) from the center of the plume. This decrease in concentration outward from the center of the plume is treated as following a Gaussian ("normal") statistical distribution. Horizontal and vertical mixing generally occur at different rates. Because turbulent motions in the atmosphere occur on a variety of spatial and time scales, vertical and horizontal mixing also vary with distance downwind from the emission source.

The CALINE3 Model

The ambient air quality effects of highway traffic emissions were evaluated using the CALINE3 dispersion model (Benson 1979). CALINE3 is a Gaussian dispersion model specifically designed to evaluate air quality impacts of highway projects. Each highway link analyzed in the model is treated as a sequence of short segments. Each segment of a highway link is treated as a separate emission source producing a plume of pollutants which disperses downwind. Pollutant concentrations at any specific location are calculated using the total contribution from overlapping pollution plumes originating from the sequence of roadway segments.

The discussion of "pollution plumes" above may suggest that pollution concentrations at a given location would be the average, not the sum, of the incremental concentrations from each overlapping plume. Even though pollution plume terminology suggests the analogy of physically mixing fluids with different pollutant concentrations, such an analogy is inappropriate in the case of atmospheric dispersion models. The flaw in the fluid mixing analogy involves the total volume of fluid present as additional source contributions are added. The volume of "carrier fluid" (air) at a receptor point remains constant regardless of the number of overlapping pollution plumes affecting the site.

The faulty fluid mixing analogy can be visualized as buckets of water with different salt concentrations poured into an empty swimming pool. The resulting pollutant (salt) concentration is the average of the concentrations in the incremental additions of salty water. The actual situation with atmospheric dispersion modeling, however, is more like pouring different-sized jars of salt into a swimming pool already filled with water. The resulting pollutant (salt) concentration is the sum of the effects of the incremental additions of salt.

When winds are essentially parallel to a highway link, pollution plumes from all roadway segments overlap. This produces high concentrations near the roadway (near the center of the overlapping pollution plumes), and low concentrations well away from the highway (at the edges of the overlapping pollution plumes). When winds are at an angle to the highway link, pollution plumes from distant roadway segments make essentially no contribution to the pollution concentration observed at a receptor location. Under such cross-wind situations, pollutant concentrations near the highway are lower than under parallel wind conditions (fewer overlapping plume contributions), while pollutant concentrations away from the highway may be greater than would occur with parallel winds (near the center of at least some pollution plumes).

The CALINE3 model employs a "mixing cell" approach to estimating pollutant concentrations over the roadway itself. The size of the mixing cell over each roadway segment is based on the width of the "traffic lanes" of the highway plus an additional turbulence zone on either side. Parking lanes and roadway shoulders are not counted as traffic lanes. The height of the mixing cell is set at 10 feet.

Pollutants emitted along a highway link are treated as being well mixed within the mixing cell volume due to mechanical turbulence from moving vehicles and convective mixing due to the temperature of vehicle exhaust gases. Pollutant concentrations downwind from the mixing cell are calculated using horizontal and vertical dispersion rates which are a function of various meteorological and ground surface conditions.

Modeling Procedures

Roadway and Traffic Conditions

The air quality analysis used p.m. peak-hour traffic volumes and volume:capacity ratios described in Chapter 10 of this EIR (Traffic).

For each of the levels of traffic, peak hour vehicle speeds were developed based on volume:capacity ratios and equations producing speed versus volume:capacity ratio curves presented in the Highway Capacity Manual (Highway Research Board 1965). Roadway segments were treated as nondirectional; traffic volumes and speeds in both directions were assigned to a single segment.

Receptor Locations

As noted in Chapter 11 of this EIR (Air Quality), receptor locations were chosen to analyze sensitive receptors. In the case of this project, sensitive receptors are primarily residences. The receptor locations are shown in Table 11-4 and Figures 11-1 and 11-2.

Vehicle Emission Rates

Vehicle emission rates have been estimated using the California Air Resources Board's EMFAC6D computer program. The EMFAC6D program estimates vehicle emission rates as a function of seven parameters: calendar year of interest; air temperature; vehicle fleet mix (six basic vehicle types); age distribution of each vehicle type; accumulated mileage for each vehicle type by vehicle age; average vehicle speed; and vehicle operating mode (a function of prior parking duration, engine type, and time since the engine was started). The EMFAC6D program uses a standard set of vehicle age distributions and mileage accumulation parameters. The other five parameter sets can be varied to produce vehicle emission rate estimates for a wide variety of conditions.

All vehicle emission rates used for the air quality analyses in this EIR were developed for 1985 and 2010 conditions with typical winter air temperatures (40°F). The vehicle fleet mix and operating mode percentages and the resulting CO emission rates at various average speeds are summarized in Table E-1.

CALINE3 Parameters

The CALINE3 model was run using an averaging time of 60 minutes; a surface roughness factor of 150 centimeters; and settling and deposition velocities of 0 centimeters/second. Receptor heights were set at 5 feet. Mixing zone widths were based on the number of lanes, assuming a standard width of 12 feet, or on information provided by the project applicant. An adjacent turbulence zone of 0, 5, or 10 feet (depending on adjacent roadway speeds) was added to each side of the roadway.

All CALINE3 runs assumed a wind speed of 1.0 meters/second (2.2 mph), a ground-level temperature inversion (stability class F), and a mixing height limit of 1,000 meters (3,230 feet). Wind directions were varied in 10-degree increments to identify the situation producing the highest total pollutant concentration at each receptor location, considering the alignments of all modeled roadways.

Potential 8-hour average CO levels were estimated from predicted peak hour levels. Data from permanent monitoring stations and special studies have shown that 8-hour CO levels typically are 55-75 percent of the included peak hour value. Based on these ratios, 8-hour CO levels were estimated at 65 percent of the afternoon peak hour value.

Background Concentrations

The air quality analysis assumed peak hour ambient (background) levels shown in Table E-2. The values are based on a 2.5 ppm current year, 8-hour average ambient level recommended by the EPA (U. S. Environmental Protection Agency 1978). The value recommended by EPA was adjusted to reflect lower future year CO emission rates, and adjusted to reflect the 65 percent 8-hour:peak hour ratio.

Table E-1. Weighted Composite Emission Rates for Carbon Monoxide

Speed	Composite Emission Rate 1985	Composite Emission Rate 2010
5	121.27	52.32
6	112.83	49.93
7	104.38	47.53
8	95.94	45.14
9	87.49	42.74
10	79.05	40.35
11	74.93	38.62
12	70.82	36.89
13	66.70	35.16
14	62.59	33.43
15	58.47	31.70
16	55.86	30.40
17	53.24	29.09
18	50.63	27.79
19	48.01	26.48
20	45.40	25.18
25	35.97	20.17
30	28.83	16.28
35	23.44	13.25
40	19.47	10.89
45	16.67	9.07
50	14.70	7.70
55	13.09	6.72

Assumptions:

Operating mode mix percentages assumed for 1985 and 2010

Cold Start	18.3
Hot Start	9

Percentage of catalyst vehicles assumed

1985	71
2010	90.5

VMT Mix

Year	%LDA	%LDT	%MDT	%HDG	%HDD	%MC
1985	64.3	25.8	2.6	2.6	3.6	1.1
2010	64.3	25.9	2.6	2.6	3.6	1.1

Notes:

1. Composite emission rates developed using California Air Resources Board's EMFAC7PC emissions program.

Table E-2. Background carbon monoxide concentrations in parts per million

	Peak Hour	8-Hour Average
Current Year	3.9	2.5
Future Year	2.15	1.4

Source: U. S. Environmental Protection Agency 1978.

APPENDIX F. Noise Analysis

DESCRIBING NOISE LEVELS

General Purpose Decibel Scales

Most sounds consist of a broad range of sound frequencies. Because the human ear is not equally sensitive to all frequencies, a large number of frequency weighting schemes have been used to develop noise measuring instruments that approximate the way the human ear responds to noise levels. The "A weighted" decibel scale (dBA) is the most widely used for this purpose. The A weighting scale is primarily used in this EIR and is described in Chapter 12 "Noise".

Other frequency weighting schemes are used for specialized purposes. The "C weighted" decibel scale (dBC) is often used to characterize low frequency sounds capable of inducing vibrations in buildings or other structures. The C weighting scale does not significantly reduce the measured pressure level for low frequency components of a sound.

Varying noise levels are often described in terms of the equivalent constant decibel level. Equivalent noise levels (Leq) are used to develop single-value descriptions of average noise exposure over various periods of time.

Decibel Scales Reflecting Annoyance Potential

Average noise exposure over a 24-hour period is often presented as a day-night average sound level (Ldn). Ldn values are calculated from hourly Leq values, with the Leq values for the nighttime period (10 p.m. - 7 a.m.) increased by 10 dB to reflect the greater disturbance potential from nighttime noises.

The community noise equivalent level (CNEL) is also used to characterize average noise levels over a 24-hour period, with weighting factors for evening and nighttime noise levels. Leq values for the evening period (7 p.m. - 10 p.m.) are increased by 5 dB while Leq values for the nighttime period (10 p.m. - 7 a.m.) are increased by 10 dB. Except in unusual situations, the CNEL descriptor will be within 1.5 dB of the Ldn descriptor.

It should be noted that single-value average noise descriptors (such as CNEL or Ldn values) are most appropriately applied to variable but relatively continuous sources of noise. Typical urban noise conditions, highway traffic, and major commercial airports are examples where CNEL and Ldn descriptors are most appropriate.

Noise Descriptors for Brief Noise Events

Peak noise levels, the duration of individual noise events, and the repetition pattern of events are often used to describe intermittent or short duration noise conditions.

Statistical descriptions (percent of time when noise levels exceed various thresholds) are also used to characterize noise conditions over relatively brief periods of time. Noise events lasting more than half a minute can be characterized by the Leq of the event.

Individual noise events of brief duration (no more than several seconds) are sometimes characterized using the single event noise exposure level (SENEL) descriptor. The SENEL of a noise event is calculated as the cumulative (not average) A- weighted sound exposure during a discrete noise event, integrated with respect to a 1 second time frame. The SENEL calculation is sometimes restricted to that portion of a noise event when sound levels exceed some particular threshold level. In other cases, the calculations are restricted to that portion of the noise event when sound levels are within 10 dBA of the peak sound level.

FACTORS AFFECTING NOISE ATTENUATION

Noise levels at a different distances from a noise source are influenced by factors other than just distance from the noise source. Topographic features and structural barriers can absorb, reflect, or scatter sound waves, resulting in lower noise levels (increased sound attenuation rates). Atmospheric conditions (wind speed and direction; humidity levels; temperatures) and the frequency characteristics of the sound itself also affect sound attenuation rates.

The atmosphere absorbs some of the energy content of sound waves, thus increasing sound attenuation rates over large distances. Such atmospheric absorption is greatest for high frequency components of a sound, resulting in a lower pitch to the sound at greater distances. Atmospheric absorption is also dependent on temperature and humidity conditions, with a somewhat complex relationship among temperature, humidity, and frequency components of the sound.

Humidity effects are most significant for higher sound frequencies and cool temperatures. For a particular frequency range, there will be a relative humidity at which maximum atmospheric absorption occurs. Atmospheric absorption will be less at higher and lower relative humidities. For any particular temperature, maximum atmospheric absorption occurs at somewhat lower relative humidities for low frequency sounds and at somewhat higher relative humidities for high frequency sounds. At warm temperatures, maximum atmospheric absorption occurs at low humidities for all sound frequencies.

Temperature effects on atmospheric absorption are greatest at low humidities, but are generally less significant than humidity effects. Generally, there is a temperature at which maximum atmospheric absorption occurs; absorption is less at both higher and lower temperatures. Maximum absorption occurs at low temperatures for low frequencies and at higher temperatures for high frequencies. At high relative humidities, atmospheric absorption is greatest at low temperatures for all sound frequencies.

Overall, atmospheric absorption is greatest for high frequency sounds under conditions of low relative humidities and moderately cool temperatures. Atmospheric absorption is least for low frequency sounds at high relative humidities and warm temperatures.

Echoes off topographic features or buildings can sometimes result in higher sound levels (lower sound attenuation rates) than expected. Temperature inversion and altitudinal changes in wind conditions can at times diffract and "focus" sound waves to a location at considerable distance from the noise source. In such situations, the vertical changes in atmospheric conditions affect sound waves much the way lenses and prisms can bend and focus light rays. Focusing effects are usually noticeable only for very intense noise sources such as blasting operations.

MATHEMATICAL FORMULAS FOR WORKING WITH DECIBELS

Adding Decibels

Cumulative dB = 10*LOG[10EXP(0.1*dB1)+10EXP(0.1*dB2)+...+10EXP(0.1*dBn)]

Where: * = multiplication
LOG = logarithm, base 10
EXP = power function [i.e., 10EXP(0.1*dB1) = 10 to the 0.1*dB1 power] dB1, dB2,...,dBn = individual decibel levels being added together

Example: 63 dB + 72 dB + 58 dB + 60.5 dB = 10 * LOG[10EXP6.3 + 10EXP7.2 + 10EXP5.8 + 10EXP6.05] = 72.9 dB

Percent Change in Loudness

% Change = [2EXP{0.1*(dB2-dB1)} - 1]*100
= [2EXP{0.1*(dB change)} - 1]*100

Where: * = multiplication
EXP = power function (i.e., 2EXP3.5 = 2 to the 3.5 power)
dB1 = initial dBA level
dB2 = final dBA level

Example: Change from 63 dBA to 67 dBA = +31.95%
Example: Change from 67 dBA to 63 dBA = -24.21%
Example: Change of +7.5 dBA = +68.18%
Example: Change of -3.2 dBA = -19.89%

Calculation of Leq From Sample Measurements

Leq(T) = 10*LOG[{1/SUM(t1+t2+t3+...+tn)}*
{t1*[10EXP(0.1*dB1)]+t2*[10EXP(0.1dB2)]+...
+tn*[10EXP(0.1*dBn)]}]

Where:
- * = multiplication
- / = division
- T = total time interval involved; = SUM(t1+t2+t3+...+tn)
- LOG = logarithm, base 10
- EXP = power function [i.e., 10EXP(0.1*dB1) = 10 to the 0.1*dB1 power] dB1, dB2,...,dBn = individual decibel level data t1,t2,t3,...,tn = time interval durations represented by the respective decibel levels dB1, dB2, etc.

Example: Calculate a 12 minute Leq based on the following dBA measurements made at the indicated time intervals:

dBA	Clock Time (seconds)	dBA	Clock Time (seconds)
53	5	60	375
56	35	59	435
59	80	57	465
61	115	54	505
60	155	58	545
57	205	62	595
63	250	67	630
59	295	65	670
61	325	61	700
64	345	57	720

Leq(720 seconds) = 61.0 dB

Note: Assume each dBA measurement represents average dBA level during preceding time interval; length of time intervals calculated by subtracting current clock time from previous clock time.

Calculation of Ldn

Ldn = 10*LOG[(1/24)*{15*[10EXP(0.1*Ld)]+9*[10EXP(0.1*{Ln+10})]}]

Where:
- * = multiplication
- / = division
- LOG = logarithm, base 10
- EXP = power function [i.e., 10EXP(0.1*dB1) = 10 to the 0.1*dB1 power]

Ld = Leq for the 15-hour daytime period (7 a.m. to 10 p.m.)
Ln = Leq for the 9-hour nighttime period (10 p.m. to 7 a.m.)

Example: Ld = 63 dB; Ln = 51.5 dB

Ldn = 62.5 dB

Calculation of CNEL

CNEL = 10*LOG[(1/24)*
{12*[10EXP(0.1*Ld)]+3*[10EXP(0.1*{Le+5})]+
9*[10EXP(0.1*{Ln+10})]}]

Where:
* = multiplication
/ = division
LOG = logarithm, base 10
EXP = power function [i.e., 10EXP(0.1*dB1) = 10 to the 0.1*dB1 power]
Ld = Leq for the 12-hour daytime period (7 a.m. to 7 p.m.)
Le = Leq for the 3-hour evening period (7 p.m. to 10 p.m.)
Ln = Leq for the 9-hour nighttime period (10 p.m. to 7 a.m.)

Example: Ld = 63 dB; Le = 63 dB; Ln = 51.5 dB

CNEL = 63.6 dB

Note: this is the CNEL equivalent of the preceding Ldn example.

Distance Attenuation Calculations

Drop-off rate coefficient (a) = (1/3)*(dB drop-off rate per doubling of distance)

i.e., a = 1.0 for 3.0 dB drop-off rate (line source, no ground absorption)
= 1.5 for 4.5 dB drop-off rate (line source, ground absorption)
= 2.0 for 6.0 dB drop-off rate (point source, no atmospheric absorption)

Calculating dB level at different distances from a source given a known dB level for a known distance:

dB2 = dB1 - 10*a*LOG(R2/R1)

Where:
* = multiplication
/ = division
LOG = logarithm, base 10
a = dB drop-off rate coefficient

dB1 =	dB level at known distance from source, R1
dB2 =	dB level at another distance from source, R2
R1 =	known distance from source for known decibel level dB1
R2 =	second distance from source for which noise level estimate (dB2) is desired

Example: Given a noise level of 67.8 dBA at 175 feet from the centerline of a roadway, estimate the noise level at 400 feet from the roadway centerline assuming open landscaped terrain (i.e., ground absorption situation).

dB2 = 62.4 dBA
a = 1.5 = 4.5 dB drop-off rate

Example: Same situation as above, except paved area terrain (no ground absorption).

dB2 = 64.2 dBA
a = 1.0 = 3.0 dB drop-off rate

Calculating distance to a specific dB level given a known dB level at a known distance from the source:

R2 = R1*[10EXP{(dB1-dB2)/(10*a)}]

Where:		
	* =	multiplication
	/ =	division
	LOG =	logarithm, base 10
	EXP =	power function [i.e., 10EXP(0.1*dB1) = 10 to the 0.1*dB1 power]
	a =	dB drop-off rate coefficient
	dB1 =	dB level at known distance from source, R1
	dB2 =	specific dB level for which a distance estimate (R2) is desired
	R1 =	known distance from source for known decibel level dB1
	R2 =	distance from source at which specific dB level (dB2) is expected to occur

Example: Given a noise level of 67.8 dBA at 175 feet from the centerline of a roadway, calculate the expected distance at which the noise level will be 60 dBA assuming open landscaped terrain.

R2 = 579.5 feet
a = 1.5 = 4.5 dB drop-off rate

Example: Same situation as above, except paved area terrain.

R2 = 1,054.5 feet
a = 1.0 = 3.0 dB drop-off rate

Calculating site-specific drop-off rate coefficient from dB measurements at different distances from a noise source:

a = (dB1-dB2)/[10*LOG(R2/R1)]

Where:
- * = multiplication
- / = division
- LOG = logarithm, base 10
- a = dB drop-off rate coefficient
- dB1 = dB level at known distance R1 from source
- dB2 = dB level at known distance R2 from source
- R1 = known distance from source for known decibel level dB1
- R2 = known distance from source for known decibel level dB2

Example: Calculate a site-specific drop-off coefficient given noise levels of 73.5 dBA at 62 feet and 60.3 dBA at 265 feet.

a = 2.1
dB drop-off rate = 2.1*3 = 6.3 dB per doubling of distance

GUIDELINES FOR INTERPRETING NOISE LEVELS

Several federal, state, and local agencies have developed guidelines for evaluating the compatibility of different land uses and various noise levels.

Federal Guidelines

The U. S. Environmental Protection Agency (1974) has identified indoor and outdoor noise limits to protect public health and welfare "with an adequate margin of safety". Ldn values of 55 dB (outdoors) and 45 dB (indoors) were identified as desirable for residential, educational, and health care areas. Noise level criteria for commercial and industrial areas were identified as 24-hour Leq values of 70 dB (both outdoors and indoors).

The U. S. Federal Highway Administration (1982) has adopted criteria for evaluating the acceptability of noise impacts associated with federally-funded highway projects. These criteria are based on peak hour Leq noise levels, not Ldn or 24- hour Leq values. Criteria for residential, educational, and health care facilities are 67 dB (outdoors) and 52 dB (indoors). The criterion for commercial and industrial areas is 72 dB (outdoors).

The U. S. Department of Housing and Urban Development (HUD) has established guidelines for evaluating noise impacts on residential projects seeking financing support under various HUD programs. Sites are generally considered acceptable for residential use if they are exposed to outdoor Ldn values of 65 dB or less. Sites are considered "normally unacceptable" if they are exposed to outdoor Ldn values of 65 - 75 dB. Sites are considered unacceptable if they are exposed to outdoor Ldn values above 75 dB.

State Guidelines

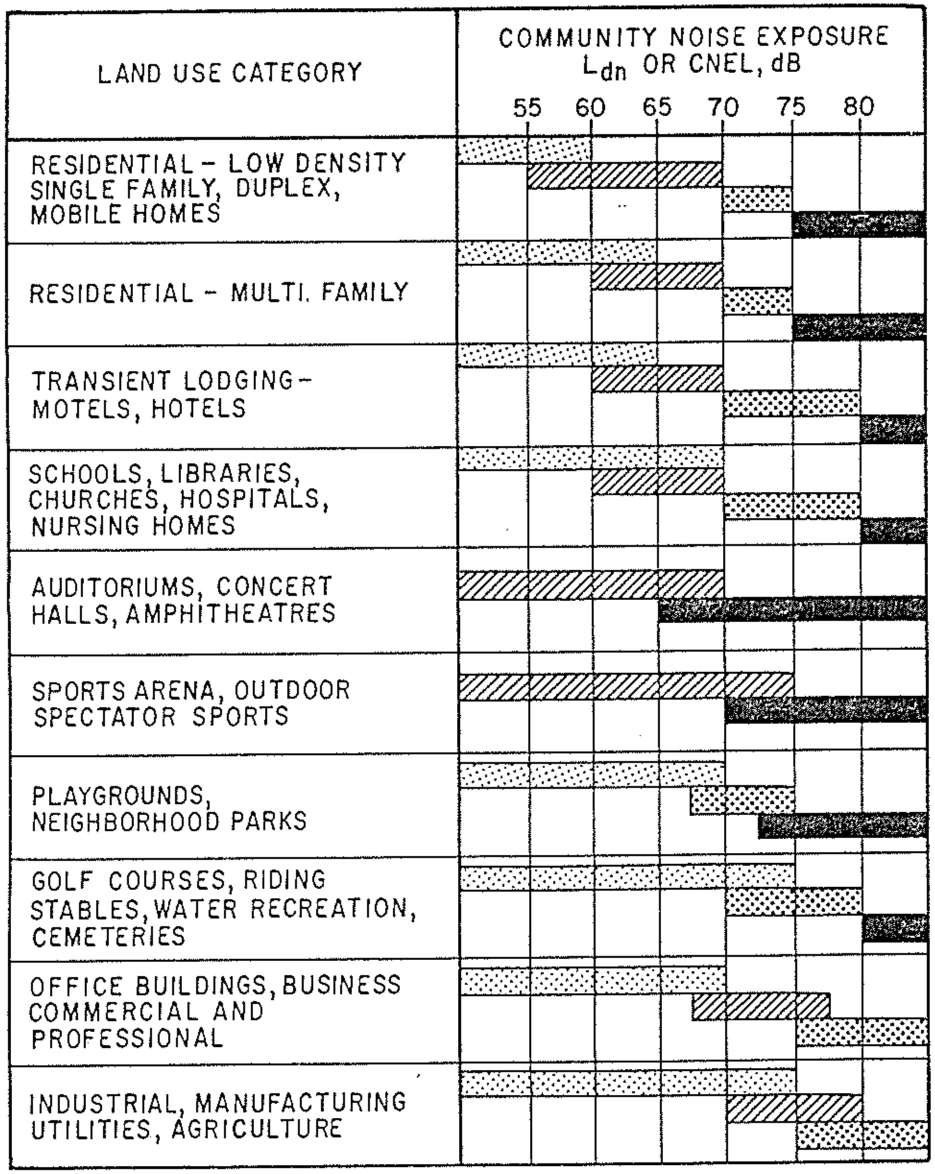
The California Department of Health Services Office of Noise Control has published guidelines for the noise element of local general plans. These guidelines include a noise level/land use compatibility chart (see Figure F-1). That chart categorizes various outdoor Ldn ranges into as many as four compatibility categories (normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable) depending on land use. For many land uses, the chart shows overlapping Ldn ranges for two or more compatibility categories. These overlapping Ldn ranges indicate that local conditions (existing noise levels and community attitudes toward dominant noise sources) should be considered in evaluating land use compatibility at specific locations.

The normally acceptable range for low density residential uses is identified as less than 60 dB, while the conditionally acceptable range is 55 - 70 dB. The normally acceptable range for high density residential uses is identified as Ldn values below 65 dB, while the conditionally acceptable range is identified as 60 - 70 dB. For educational and medical facilities, Ldn values below 70 dB are considered normally acceptable, while Ldn values of 60 - 70 dB are considered conditionally acceptable. For office and commercial land uses, Ldn values below 70 dB are considered normally acceptable, while Ldn values of 67.5 - 77.5 are categorized as conditionally acceptable.

The California Department of Housing and Community Development has adopted noise insulation performance standards for new hotels, motels, and dwellings other than detached single- family structures (California Administrative Code, Title 24, Division T25). These standards require that "interior community noise equivalent levels (CNEL) with windows closed, attributable to exterior sources, shall not exceed an annual CNEL of 45 dB in any habitable room."

Local Guidelines

The Noise Element of the El Dorado County General Plan (1979) contains a set of desired maximum noise levels for several land use categories. The Noise Element maximum noise levels are described in Table 12-2.



INTERPRETATION

NORMALLY ACCEPTABLE

Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

CONDITIONALLY ACCEPTABLE

New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

NORMALLY UNACCEPTABLE

New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

CLEARLY UNACCEPTABLE

New construction or development should generally not be undertaken.

FIGURE F-1. LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENTS

Source: California Department of Health, Office of Noise Control 1976.

APPENDIX G. Cultural Resource Study

ARCHEOLOGICAL SURVEY REPORT FOR THE PROPOSED INTERCHANGE ALTERNATIVES ALONG U.S. HIGHWAY 50 AT FUTURE SILVA VALLEY PARKWAY, EL DORADO COUNTY, CALIFORNIA

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November 1, 1988

INTRODUCTION

The Silva Valley Parkway/U.S. Highway 50 (U.S. 50) Interchange is proposed on U.S. 50 in western El Dorado County between the El Dorado Hills Boulevard and Bass Lake Road interchanges (Map 1). Sacramento lies about 23 miles west, San Francisco about 108 miles southwest, and Lake Tahoe about 70 miles east of the project area. The primary land uses in the project area are agriculture and single family residential.

The two alternatives evaluated in this report are referred to as the ridge design and the undercrossing design alternatives. The ridge design derives its name from a rise in the topography that would be spanned by the interchange overcrossing (Map 2). The undercrossing design alternative is so named because it would be implemented at the existing White Rock Road undercrossing location (Map 3).

Ridge Design Site Description

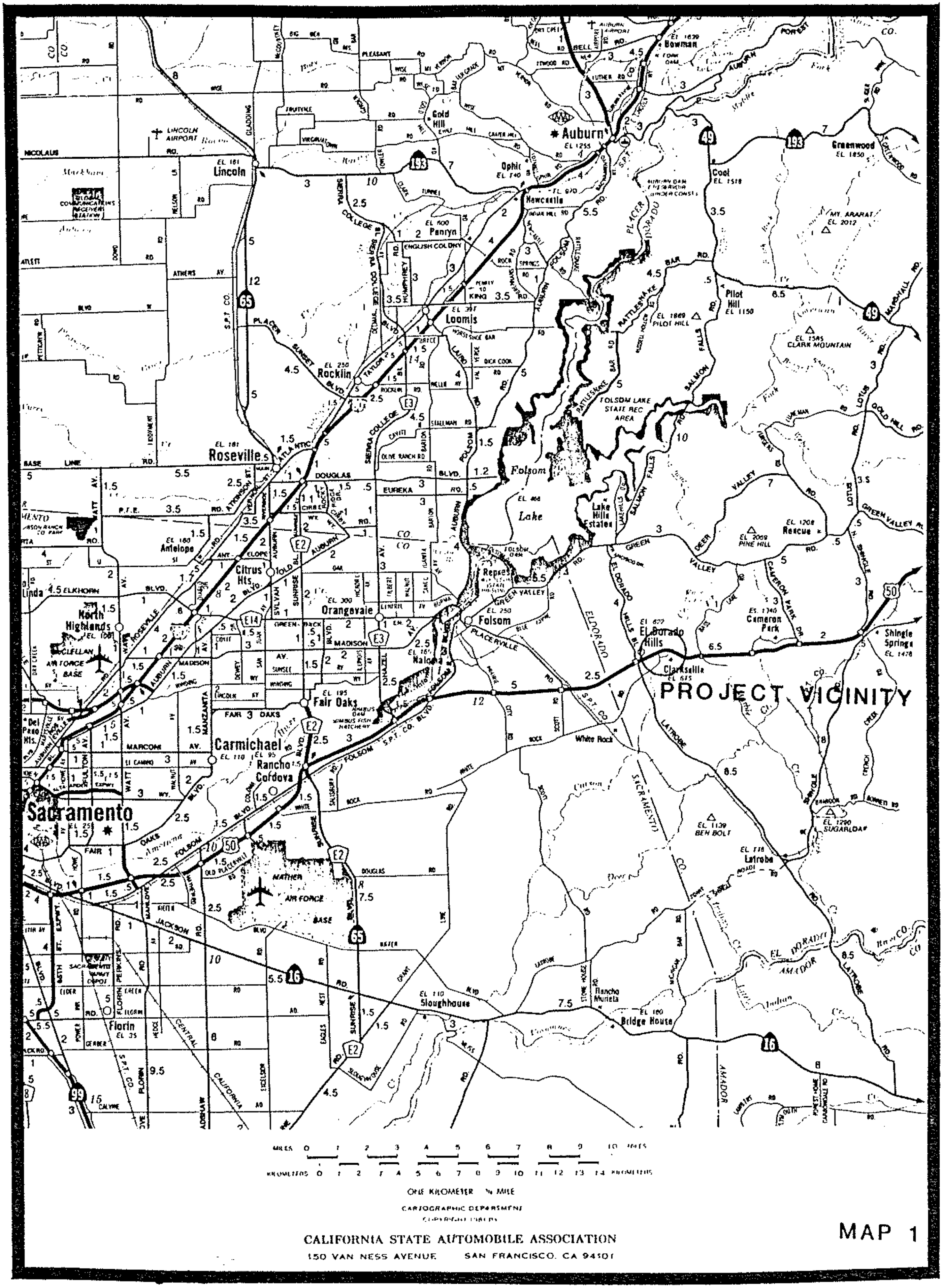
The Ridge Design Alternative site is located approximately 5000 feet east of the El Dorado Hills Boulevard/U.S. 50 Interchange. The topography of the Ridge Design Alternative site is highly variable, with scattered hills, stream courses, and gentle slopes. On the north side of U.S. 50, the site varies from fairly steep to more gradual in an east-west direction. The ridge rises immediately west of the creek. Carson Creek passes through a triple 10-foot-wide box culvert under U.S. 50 and flows southward into Deer Creek and ultimately to the Cosumnes River.

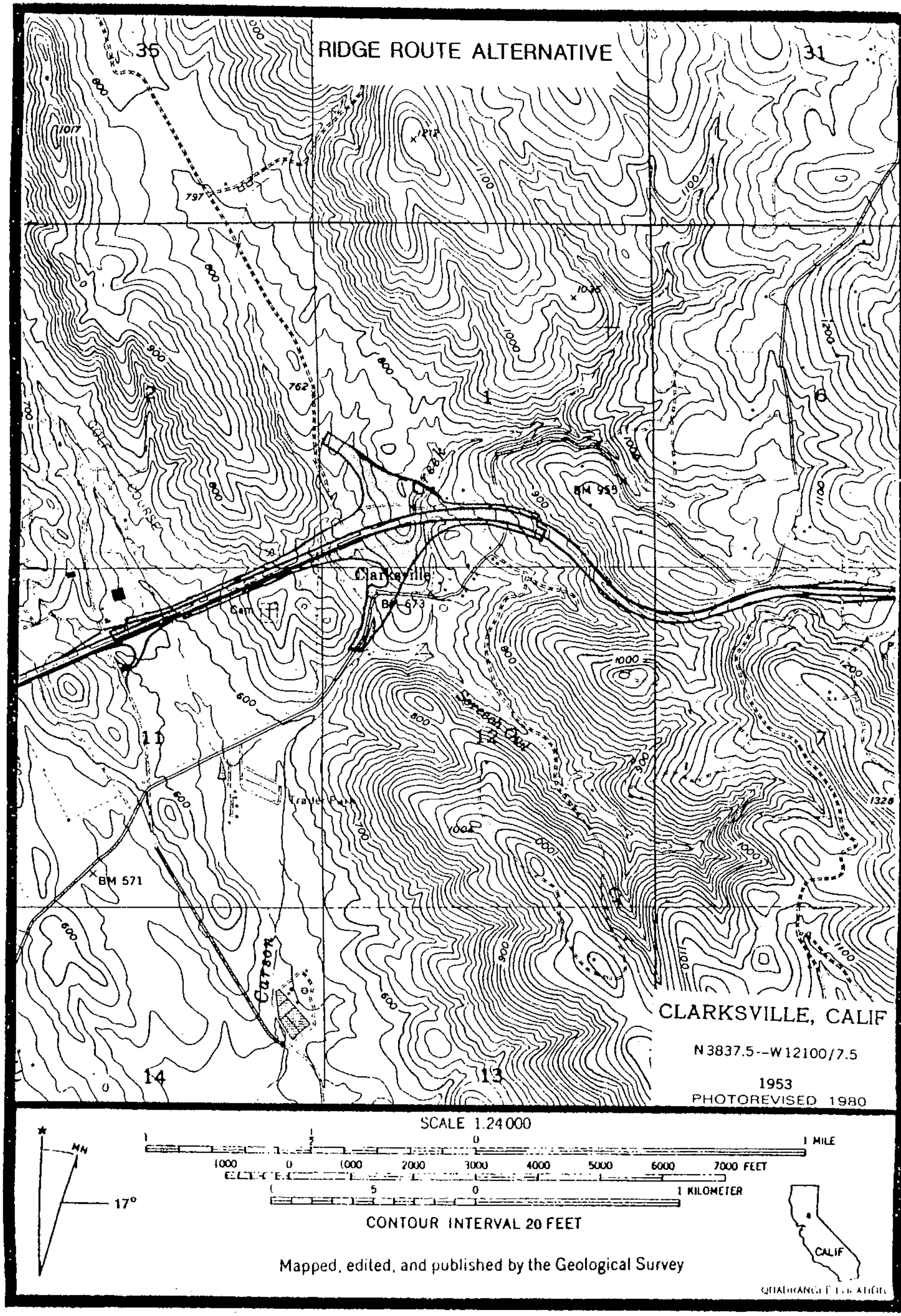
On the south side of U.S. 50, the topography slopes gradually from the east to the west until reaching Carson Creek, where the slope drops off into the stream course and then rises on the west side to the top of the ridge.

The primary land use in the vicinity is agriculture, with some scattered single family residences. Two houses and agriculturally related structures occupy gently sloping parcels on the north side of U.S. 50. The remaining parcels are vacant and used for horse and cattle grazing. Tong Road provides access to the houses on the north side of U.S. 50. The small community of Clarksville, which consists of several residences, miscellaneous structures, barns, and storage structures, lies to the south of U.S. 50. Land between Clarksville and U.S. 50 also is used for horse and cattle grazing. White Rock Road and the PGandE substation lie to the west of the ridge and south of the highway.

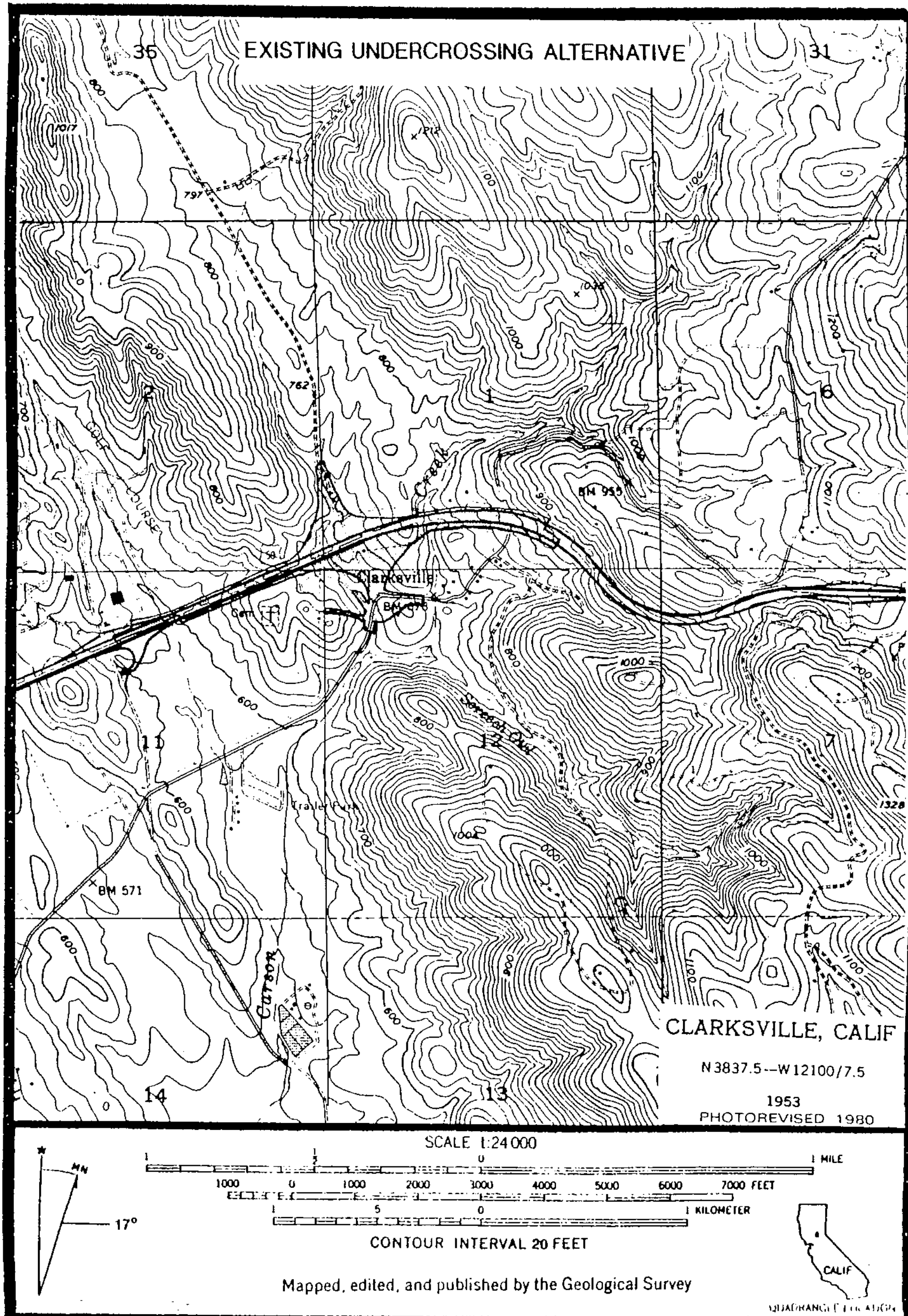
White Rock Road is a two-lane, roughly north-south county road that passes between two ridges. The road follows a small, unnamed drainage channel in the vicinity of the highway. White Rock Road is paved south of the highway and unpaved just north of the highway.

The ridge design is called a "Parclo A" (partial cloverleaf with the loop on-ramps in the northeast and southwest quadrants). Parclo A designs consist of two entrance ramps (a loop on-ramp and directional on-ramp) and one exit ramp in each direction of travel on the freeway. The overcrossing would span the ridge, yielding approximately 16.5 feet of vertical clearance above U.S. 50. This overcrossing would have four lanes for through traffic on Silva Valley Parkway. The tapers for the loop on-ramps would begin at the end of the overcrossing, and the overcrossing would have 8-foot-wide shoulders on the outside


PROJECT VICINITY
Auburn
Lincoln
Newcastle
Penryn
Loomis
Rocklin
Roseville
Folsom Lake
Folsom
Antelope
Citrus Hts.
Orangevale
North Highlands
Fair Oaks
Carmichael
Rancho Cordova
Sacramento
Mather Air Force Base
McClellan Air Force Base
El Dorado Hills
Cameron Park
Shingle Springs
Clarksville
White Rock
Latrobe
Sloughhouse
Rancho Murieta
Bridge House
Florin
Gold Hill
Ophir
Cool
Pilot Hill
Greenwood
Rescue
Bowman
Folsom Lake State Rec Area
Lake Hills Estates
Sugarloaf
MILES
KILOMETERS
CARTOGRAPHIC DEPARTMENT
CALIFORNIA STATE AUTOMOBILE ASSOCIATION
150 VAN NESS AVENUE SAN FRANCISCO, CA 94101
MAP 1


RIDGE ROUTE ALTERNATIVE
Clarksville
BM 955
BM 571
Trailer Park
Carson
CLARKSVILLE, CALIF
N3837.5--W12100/7.5
1953
PHOTOREVISED 1980
SCALE 1:24 000
1 MILE
7000 FEET
1 KILOMETER
CONTOUR INTERVAL 20 FEET
Mapped, edited, and published by the Geological Survey
MN
17°
CALIF

MAP 2


EXISTING UNDERCROSSING ALTERNATIVE
35
31
Clarksville
Creek
BM 955
Trailer Park
BM 571
Carson
CLARKSVILLE, CALIF
N3837.5--W12100/7.5
1953
PHOTOREVISED 1980
SCALE 1:24 000
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER
CONTOUR INTERVAL 20 FEET
Mapped, edited, and published by the Geological Survey
MN
17°
CALIF

and a 16-foot-wide median. The profile of the overcrossing shows a 6-percent grade on the south side of the highway and 4-percent on the north side of the highway with a design of 50 mph. The loop on-ramps would be 28 feet wide, including a single lane and shoulders on either side. These on-ramps would descent from the overcrossing at a 6-percent grade. The radius of the loop on-ramps would be 175 feet, with a design speed of 27 mph. The other two on-ramps and off-ramps would be 12-15 feet wide, with 8-foot-wide shoulders on the right sides, 4-foot-wide shoulders on the left sides, and a design speed of 40 mph or better. The gradients for the east-bound on-ramp, eastbound off-ramp, westbound on-ramp, and westbound off-ramp would be 1 percent, 4.5 percent, 6 percent, and 5.8 percent, respectively.

Auxillary lanes are proposed between the El Dorado Hills Boulevard/U.S. 50 Interchange and the Silva Valley Parkway Interchange. A truck-climbing lane, beginning at the eastbound U.S. 50 loop on-ramp, is also proposed, but only the portion within the interchange would be constructed. The remainder of the lane would be funded and constructed sometime in the future by Caltrans.

In addition, implementation of the ridge design would entail the following tasks:

* realigning White Rock Road to the east;
* reconstructing a portion of White Rock Road to provide access to property south of the freeway;
* closing and removing a portion of the existing Tong Road north of the freeway and providing a new local access road north of the four affected parcels;
* constructing bridges over Carson Creek for both the eastbound on-ramp and the westbound off-ramp;
* constructing a 290-foot-long retaining wall ranging in height from 4 to 28 feet where the eastbound off-ramp begins curving south to minimize impacts to the PGandE substation;
* constructing a 648-foot-long retaining wall ranging in height from 4 to 16 feet where the eastbound on-ramp joins the freeway to avoid the grave sites at the Tong Cemetery and the access road to the cemetery;
* constructing a 210-foot-long, 12-foot-high retaining wall where the existing eastbound freeway lane crosses Carson Creek to avoid impacts of the truck-climbing lane to an identified spring in Carson Creek; and
* constructing a 176-foot-long retaining wall, varying in height from 20 to 30 to 16 feet, along the outside of the northbound to westbound loop on-ramp to minimize impacts to Carson Creek.

Existing Undercrossing Design Site Description

The Existing Undercrossing Design site would be located where existing White Rock Road passes under U.S. 50, approximately 4200 feet east of the El Dorado Hills

Boulevard/U.S. 50 Interchange and 800 feet west of the Ridge Design Alternative. Because the Existing Undercrossing Design Alternative site location is proximate to the Ridge Design Alternative location, the site descriptions overlap.

Development north of the highway in the immediate vicinity of this alternative is limited to that along Tong Road. The houses mentioned earlier lie to the east of the undercrossing design site. The surrounding land is vacant and used for agriculture, primarily grazing. South of the highway, the PGandE substation is approximately 650 feet west of White Rock Road, a single family residence lies about 200 feet further to the west, on a knoll, and the Clarksville Cemetery lies west of the house. Access to these uses is provided by the Joerger Road cutoff.

The undercrossing project design is called a "Parclo B" (partial cloverleaf with loop off-ramps in the northwest and southeast quadrants). Parclo B interchanges have two exit ramps (a loop off-ramp and a directional off-ramp) and entrance ramps for both directions of travel on the freeway.

Construction of the Existing Undercrossing Design Alternative would require removing the existing U.S. 50 structure that spans the undercrossing and widening the existing undercrossing to accommodate four lanes of through traffic and two left-turn lanes, one in each direction, with a 16-foot-wide median on White Rock Road. The loop off-ramps would be 16 feet wide, with 8-foot-wide shoulders on the inside, 4-foot-wide shoulders on the outside, and a radius of 175 feet. The eastbound loop off-ramp would descend at a 5.2-percent gradient, and the westbound loop off-ramp would descend at a 2.4-percent gradient. The eastbound off-ramp would begin just west of the PGandE substation, curve with a radius of 700 feet, and descend the slope at a 6.7-percent gradient. The westbound off-ramp would begin close to the Hall-Richmond Cemetery, curve with a radius of 700 feet, and descend the slope at a 5-percent gradient. Each on-ramp would have two points of access, from northbound and southbound Silva Valley Parkway. The width of the on-ramp where these two accesses merge would be 36 feet and then would narrow to 24 feet, including shoulders. The eastbound on-ramp would ascend the slope at the 7-percent gradient, while the westbound on-ramp would descend the slope at less than a 2-percent gradient.

Auxillary lanes are proposed between the El Dorado Hills Boulevard/U.S. 50 Interchange and the Silva Valley Parkway/U.S. 50 Interchange. A truck-climbing lane for eastbound U.S. 50, beginning at the Clarksville undercrossing, is also proposed, but only the portion within the interchange would be constructed. The remainder of the lane would be funded and constructed by Caltrans sometime in the future.

In addition, implementation of the Existing Undercrossing Design Alternative would include the following features:

* a 280-foot-long retaining wall, ranging in height from 4 to 16 feet, adjacent to the PGandE substation to minimize impacts to the access road and structures;

* a 350-foot-long retaining wall, ranging in height from 8 to 26 feet, adjacent to the Tong property on the south side of U.S. 50 to minimize impacts to the Carson Creek spring;

* a 670-foot-long retaining wall, ranging in height from 12 to 16 feet, adjacent to the Tong property on the south side of U.S. 50 to avoid impacts to the Tong Cemetery;

* a realignment of the Joerger Road cutoff to provide access to a residence, the PGandE substation, and the Clarksville Cemetery;

* a realignment of White Rock Road to provide access to Clarksville;

* a realignment of Tong Road to provide access to properties to the north;

* an extension to the north of the existing triple 10- by 10-foot box culvert for Carson Creek to accommodate the relocation of the frontage road; and

* a U.S. 50 traffic detour for at least 6 months while the new bridge on U.S. 50 is being constructed.

RESEARCH

Records searches for the project area were conducted at the North Central Information Center of the California Archaeological Sites Inventory at California State University, Sacramento. Surveys have been conducted by Peak & Associates, Inc., that include most of the study area (Peak & Associates, Inc. 1987a, 1987b). Three sites, CA-Eld-558-H, -600/H, and -585/H lie within the proposed impact area of the ridge design alternative. Additionally, five isolated features (IF-4, IF-5, IF-7, IF-8, IF-9) lie within the impact area, as does the Hall/Richmond Cemetery. Within the impact area for the undercrossing alternative, one site has been recorded, CA-Eld-558-H, and three isolated features, IF-4, IF-5, IF-7. The Hall/Richmond Cemetery, an unmarked cemetery, also lies within the impact area.

One State Historic Landmark (SHL) lies within the project area (SHL 699), marking the Mormon Tavern site -- a popular stage stop and a remount station of the Central Overland Pony Express (Resources Agency 1976, 1982). The undercrossing alternative will necessitate the relocation of the monument for the landmark.

BACKGROUND

Environment

The project area lies at the edge of the Great Valley plant belt. With the exception of the drainages, the project area is a dry grassland habitat. The original native bunchgrass cover has been replaced by annuals. The drainages are bordered with willow and oak and have been modified by upstream damming and the construction of U.S. 50.

Ethnography

The project area lies in the territory attributed to the Nisenan -- a branch of the Maidu group of the Penutian language family. Tribes of this family dominated the Central

Valley, San Francisco Bay areas, and western Sierra Nevada foothills at the coming of the white man. The Nisenan controlled the drainages of the Yuba, Bear, and American rivers, along with the lower portion of the Feather River. The tribes of this whole region referred to themselves as Nisenan, meaning "people," in contrast to the surrounding tribes, in spite of close linguistic and cultural similarities. For this reason, they are usually named by this term rather than the more technical "Southern Maidu." In any event, the local main village was of more importance to the people than the tribal designation, and groups identified themselves by the name of the central village.

The northern boundary has not been clearly established due to similarity in language to neighboring groups. The eastern boundary was the crest of the Sierra Nevada mountains. Probably a few miles south of the confluence of the American and Sacramento rivers on the valley floor was their southern boundary. The western boundary extended from this point upstream to the mouth of the Feather River.

The Valley Maidu settlement pattern was basically oriented to major river drainages, with ancillary villages located on tributary streams and sloughs. Major villages often supported a population exceeding five hundred people. The inhabitants had an intimate knowledge of the environs within their territory.

The Nisenan who occupied the foothill and lower Sierra Nevada mountain elevations selected village sites on ridges and large flats or meadows near the major streams. These villages tended to have smaller populations than those in the great valley, and it was not uncommon for family groups to have their abodes located away from the main village (Wilson and Towne 1978:389).

Both the valley and foothill people lived by hunting and gathering, with the latter being more important. Acorns in the forms of meal, soup or bread provided the staple diet, augmented by a wide variety of seeds and tubers. Hunting and fishing were regularly practiced, but provided less of the diet than vegetable foods. The bedrock mortar and pestle were employed to process the acorn meats into flour, and the mortar cups are frequently found throughout the range of oak trees. Both salmon and eel were caught at nearby Salmon Falls.

Religion was in the form of the "Kuksu Cult," a widespread pattern among the California Indians. Ceremonies concentrated in the semisubterranean dance house located at the central village and at "cry sites" where the annual mourning ceremony for the dead took place. Later, the religious revival of the ghost dance also affected this area.

In 1833, the great epidemic swept through the Sacramento Valley. This epidemic has been attributed to malaria (Cook 1955:308), and is estimated to have killed 75 percent of the native population, leaving only a shadow of the original Maidu to face the intruding miners and settlers. The Nisenan of the mountain areas felt little of the impact of European settlement in California as compared to the Valley Nisenan, who were subjected to some missionization by the Spanish, and then were virtually destroyed by the great epidemic of 1833. After 1839, many of the survivors worked for Sutter. The Mountain Nisenan, remote from these early impacts, were overwhelmed by the gold rush. Native ways of life were almost totally abandoned, and today only a few families in Placer, Nevada, Yuba, and El Dorado counties identify themselves as Nisenan and can speak the language (Wilson and Towne 1978).

Archeology

The project area lies at the edge of the Central Valley, in an area archeologically poorly known. No excavations have been conducted and professionally reported on within a similar environmental setting in El Dorado or Sacramento counties to date. The closest test excavation of any site is CA-Eld-44, near Rescue, about seven miles northeast of the project area and within the pine-oak woodland.

Due to its location within the Great Valley province, and lack of other pertinent regional sequences, the following summary of Central Valley archeology is presented.

The project region was among the first in the state to attract intensive fieldwork, and research has continued to the present day. This has resulted in a substantial accumulation of data. In the early decades of the 1900s, E. J. Dawson explored numerous sites near Stockton and Lodi, later collaborating with W. E. Schenck (Schenck and Dawson 1929). By 1933, the focus of work was directed to the Cosumnes locality, where survey and exploration were conducted by the Sacramento Junior College (Lillard and Purves 1936). Excavation data, in particular from the stratified Windmiller site (CA-Sac-107), suggested two temporally distinct cultural traditions. Later work at other mounds by Sacramento Junior College and the University of California enabled the investigators to identify a third cultural tradition, intermediate between the previously postulated early and late Horizons. The three-horizon sequence, based on discrete changes in ornamental artifacts and mortuary practices, as well as on observed differences in soils within sites (Lillard, Heizer and Fenenga 1939), was later refined by Beardsley (1954). An expanded definition of artifacts diagnostic of each time period was developed, and application extended to parts of the central California coast. Traits held in common allow the application of this system within certain limits of time and space to other areas of prehistoric central California.

The Windmiller Culture (Early Horizon) is characterized by ventrally-extended burials (some dorsal extensions are known), with westerly orientation of heads, a high percentage of burials with grave goods, frequent presence of red ochre in graves, large projectile points, of which 60 percent are of materials other than obsidian; rectangular Haliotis beads; Olivella shell beads (types Ala and L); rare use of bone; some use of baked clay objects; and well-fashioned charmstones, usually perforated.

The Cosumnes Culture (Middle Horizon) displays considerable changes from the preceding cultural expression. The burial mode is predominately flexed, with variable cardinal orientation and some cremations present. There is a lower percentage of burials with grave goods, and ochre staining is common in graves. Olivella beads of types C1, F and G predominate, and there is abundant use of green Haliotis sp. rather than red Haliotis sp. Other characteristic artifacts include perforated canid teeth, asymmetrical and "fishtail" charmstones, usually unperforated; cobble mortars and evidence of wooden mortars; extensive use of bone for tools and ornaments; large projectile points, with considerable use of rock other than obsidian; and use of baked clay.

Hotchkiss Culture (Late Horizon) -- The burial pattern retains the use of the flexed mode, and there is widespread evidence of cremation, lesser use of red ochre, heavy use of baked clay, Olivella beads of Types E and M, extensive use of Haliotis ornaments of many elaborate shapes and forms, shaped mortars and cylindrical pestles, bird-bone tubes with elaborate geometric designs, clamshell disc beads, small projectile points indicative of the introduction of the bow and arrow, flanged tubular pipes of steatite and schist, and use of magnesite. (The above adapted from Moratto 1984:181-183.) The characteristics noted are not all-inclusive, but cover the more important traits.

Recently, Schulz (1981), in an extensive examination of the central California evidence for the use of acorns, used the terms Early, Middle and Late complexes, but the traits attributed to them remain generally the same. While it is not altogether clear, Schulz seemingly uses the term "Complex" to refer to the particular archeological entities (above called "Horizons") as defined in this region. Ragir's (1972) cultures are the same as Schulz's complexes.

More recently, Bennyhoff and Hughes (1984) have presented alternative dating schemes for the Central California Archeological Sequence. The primary emphasis is a more elaborate division of the Horizons to reflect what is seen as cultural/temporal changes within the three horizons and a compression of the temporal span.

There have been other chronologies proposed -- importantly, Fredrickson (1973) -- and, since it is correlated with Bennyhoff's (1977) work, it does merit discussion. The particular archeological cultural entities Fredrickson has defined, based upon the work of Bennyhoff, are patterns, phases and aspects. Bennyhoff's (1977) work in the Plains Miwok area is the best definition of the Cosumnes District, which likely conforms to Fredrickson's pattern. The interested reader is referred to Fredrickson for full details of the entities. Fredrickson also proposed periods of time associated heavily with economic modes, which provides a temporal term for comparing contemporary cultural entities. It corresponds with Willey and Phillips' (1958) earlier "tradition," although tied more specifically to the archeological record in California.

Period and Dating

Fredrickson

Emergent Period -- A.D. 500 to 1800
Upper Archaic -- 1000 B.C. to A.D. 500
Middle Archaic 3000 to 1000 B.C.
Lower Archaic -- 6000 to 3000 B.C.
Paleo Indian -- 10,000 to 6000 B.C.
Early Lithic 10,000 B.C. to ?

(Fredrickson 1973)

Bennyhoff, Heizer and Schulz

Phase 2, Late Horizon -- A.D. 500 to 1500
Phase 1, Late Horizon -- A.D. 500 to 1500
Middle Horizon -- 1000 B.C. to A.D. 500
Early Horizon -- 2500 to 1000 B.C.

(Bennyhoff and Heizer 1958; Fredrickson 1973; Schulz 1981)

Recent investigations in the project region, other than reexaminations of older collected data (Ragir 1972; Schulz 1981; Doran 1980) have focussed upon very detailed archival research of Spanish sources (Bennyhoff 1977) and the archeological investigations at a number of small sites (Schulz et al. 1979; Schulz and Simons 1973; Soule 1976a). Several of these sites probably represent satellite encampments or small villages of major villages investigated before World War II and/or which are now destroyed.

History

After the discovery of gold in 1848, the Sierran foothills were enmassed by thousands seeking their fortune. Many towns and camps rapidly developed to supply goods and services to the miners. Clarksville served as a way station for emigrants and was later a mining camp. In early 1855, the town was called "Clarkson's Village," and shown on the Placerville Road. The Placerville Road was one branch of the Carson Emigrant Road, established in 1849. The road forked at Clarksville, with one branch going to Folsom, then on to Auburn and the gold camps on the North Fork of the American River. This fork of the road is roughly the present-day alignment of Silva Valley Road.

An even earlier road in the region was the Coloma Road, running from Sacramento to Folsom, then along the route of present-day Green Valley Road, then on to Coloma (Hoover, Rensch and Rensch 1970:76; GLO 1856).

The value of the land around Clarksville for stock grazing and dairying was recognized and, by 1866, the project area had an extensive system of fencing, roads and several settlers. The area of Allegheny and New York creeks had a number of mines (Sioli 1883:112; GLO 1866).

A post office was established in the town in July, 1855, and the name fixed by the postal authorities as "Clarksville" (Salley 1977).

Some of the early settlers in Clarksville were the Tong family, who came across the plains in 1855. The Tongs improved a road and established a toll gate at their hostelry named Railroad House. The town had a population of several hundred, and reportedly had 13 hangings (Wooldridge 1931).

One-half mile west of Clarksville stood the Mormon Tavern. The stage stop was constructed in 1849 and enlarged and operated by Franklin Winchell in 1851. It became a remount station of the Central Overland Pony Express, with Sam Hamilton changing horses here on the first eastbound trip in April 1860 (Resources Agency 1979).

Clarksville lost most of its freighting business in 1866, when the railroad line was completed from Sacramento to Placerville, bypassing the town. Freight could be sent more efficiently on the train to Placerville, then sent by wagon over the Carson road to Nevada. The freighting business suffered a further blow when the Central Pacific Railroad was completed in 1867, diverting the overland traffic from the Placerville Road.

In 1874, a Grange was established at Clarksville. Early settlers in the region who joined the Clarksville Grange include George Fitch, Joseph Joerger, and W. D. and Amelia Rantz, who owned portions of the specific plan area.

Bass Lake is an early reservoir, dating to at least 1866. By 1925, its ownership had passed to the Diamond Ridge Water Company.

Mining in the project area undoubtedly began in the earliest years of the gold rush. Later mining included dragline dredging of Carson Creek at what was called the Jumbo Placer Mine in 1923 (Clark and Carlson 1956:434). Chromite mining also took place on the property, with several mines in the region worked during World War I and again in the early 1940s (Clark and Carlson 1956:387, 393).

Until 1939, the U.S. 50 Highway from Sacramento to Placerville went through Clarksville. But the establishment of the nearby community of El Dorado Hills, with a modern supermarket and other facilities and the re-routing of the highway north of the town, caused the final decline of Clarksville as a service center for the region. There are no commercial enterprises, and only a few residences remain.

FIELD SURVEY

Much of the "Area of Potential Effects" (APE) had been previously surveyed in February and April, 1986, by Peak & Associates, Inc., for two proposed developments. Field personnel for the surveys included Melinda Peak, Robert Gerry, Mary Peters and Neal Neuenschwander. Resumes for all personnel are included in Appendix 1. Additional field survey of the existing CalTrans right-of-way was conducted by Neal Neuenschwander on January 27, 1988.

The area was completely covered on-foot during the three surveys. Within the areas surveyed by the team, each crew member lined up 15 meters apart and covered the area, zigzagging across their transect. The remainder of the survey, inside the existing fenced right-of-way, involved narrow strips of land, which were completely covered by the surveyor.

No new sites were located during the most recent field survey. The sites within the project area were completely recorded in 1986, and site records are included in Appendix 2. The isolated features were recorded and forms are included in Appendix 3.

Site in Impact Area of Both Alternatives

CA-Eld-558-H -- This is the remnant of an enclosure surrounding a home and gardens and associated features of a ranch. The enclosure is formed by a series of poured concrete pillars that were stuccoed and painted red and green. The pillars formed a large rectangle, and the entry to the enclosure is on the east. The pillars were connected across the top with sections of pipe and presumably some fencing material attached to these. The entry walkway is lined by low walls, and there are a series of flat concrete slabs with designs traced into their surface. One is dated "33." Within the enclosure are two features -- a large "shrine" of rock with a concrete tub below, and a four-compartment, concrete "bath." Outside the enclosure are a number of features --two walls, a watering trough, dam and water storage tank, and a rock foundation for a barn, as well as historic debris --both inside and outside the enclosure. It is difficult to determine the original configuration of features within the enclosure, and impossible to determine the function of most of the features.

Sites in Impact Area of Ridge Design Alternative

CA-Eld-600/H -- The site is a vast complex of both historic and prehistoric features extending over a mile. The prehistoric features include nine bedrock mortar stations along Carson Creek. Historic features include 15 dry-laid stone structures/structural remnants, two large stone corral areas, a dam and rock-lined ditch system, one stone and packed-earth check dam, a major roadway with dry-laid rock supports and bridge abutments, several minor roadways and ditches, rock cairns, one collapsed-frame structure, a number of dry-laid rock terraces and supports, introduced vegetation, and mining prospect pits and tailings.

Within the project area are three of the site's bedrock mortar stations. Station A has one mortar cup, Station B has two cups, and Station C has one cup.

CA-Eld-585/H -- The site is a large complex of historic features with an associated bedrock mortar station. The site includes the remnants of a dry-laid stone stamp mill, several dry-laid stone terraces, a road trace and rock bridge abutments, and the Tong family cemetery. The mine adit is located under U.S. 50. The stamp mill machinery was sold about 70 years ago to Bob Craig and moved to another mine in the region. The cabin's occupancy was related to the operation of the mine (Jess Tong, personal communication).

There is also a small reservoir with a circular rock wall on the hill above the mill.

The Tong cemetery includes a fenced-off area, with all family graves as well as the grave of a family friend dating to 1856. Outside the fence, there is one grave with a headstone (no name, but a date of 1869), and a number of unmarked graves, distinguishable only by rings of emplaced rock.

Isolated Features in Impact Area of Both Alternatives

IF-4 -- The feature consists of a small glory hole and several historic artifacts. The feature is near the site of the Richmond house (Mimi Tong, personal communication).

IF-5 and -7 -- Both features are remnants of dry-laid rock fences. IF-5 is a one-meter-high fence that parallels White Rock Road. IF-7 is a low remnant that followed the old route of a toll road. The road itself is not evident within the project area, but it is well-represented within CA-Eld-600/H.

Isolated Features in Impact Area of Ridge Design Alternative

IF-8 -- The feature is a single shallow bedrock mortar cup on a small boulder, located on a hilltop.

IF-9 -- This feature is another dry-laid rock fence line designating a land division, measuring 0.3 meters in height and 80 meters in length.

Other Cultural Resource Concerns

Hall/Richmond Cemetery -- There is no surface physical evidence of this cemetery and, therefore, it was not recorded as an archeological site.

Mormon Tavern Monument -- There is no physical trace of the Mormon Tavern or outbuildings. The monument was placed near the site of the barn, on a side road off the freeway, to facilitate visitation by the public.

Byram House -- The proposed ridge route design alternative will cross a portion of a parcel that contains a rental house. This house is reputed by the land owners to date to the 1850s. The house has been totally remodelled in recent years and, on the exterior, appears to be a new house. The house, with its additions and improvements, lacks integrity of design, materials, and workmanship, the minimum requirements to be able to regard an historic structure as a significant or important resource.

ARCHIVAL RESEARCH

After the completion of the field surveys, additional research was undertaken on CA-Eld-558-H and -585/H by Melinda Peak, to provide information to aid in their evaluation, with respect to their eligibility to the National Register of Historic Places. Research was also conducted on the Hall/Richmond Cemetery and the Mormon Tavern.

CA-Eld-558-H

The site is the remnant of the gardens of the Albert Fitch home. George Clinton Fitch, father of Albert, was one of the earliest settlers in the region. He filed a pre-emption claim in February 1856 for 160 acres for agricultural and grazing purposes on Bucks Flat (Pre-emptions C:439). Bucks Flat is the original name of what is now called Silva Valley. Albert Fitch was born on December 18, 1863, on the family ranch. In 1870, he was the youngest of four children, living with his parents and maternal grandmother. His mother died in June, 1871, and, by 1880, the Fitch household consisted of George, his sons Wilbur and Albert, ages 27 and 17, and a daughter, Addie. George and Albert Fitch were farmers, and Wilbur was working as a dairyman, probably for one of the neighboring ranches (1870 and 1880 census). In 1891, Albert Fitch bought a 34.6-acre parcel from his brother, Wilbur (Deeds 41:191). Wilbur may have built a house on the property by this point. In 1894, George Fitch sold all his holdings to Frank X. Walker (Deeds 46:8). At this point, George may have moved into his son's home. In 1900, he lived in Albert Fitch's household with Wilbur Fitch, who was a nearby neighbor (1900 census). George Fitch died in 1904, and was buried in the Clarksville cemetery (Bayless and Mello 1982:2).

Albert Fitch accumulated other parcels of land in the Clarksville vicinity, including the parcel immediately to the south of his homesite. He lived in the Clarksville area until his death in 1955.

Jess Tong remembers that Fitch lived in a fairly large two-story-frame home within the enclosure identified as CA-Eld-558-H. The house had a large veranda facing west.

From the 1930s on, Fitch worked on his garden area. He would take his horse and wagon out to the local creeks and collected sand and rocks. He also collected rock from structural remnants of the lots he owned in the town of Clarksville. Fitch would go to Folsom for cement, then made his concrete for the pillars and features of the enclosure. The main entry to the home was through the decorative archway on the east side of the enclosure. Fitch bought inexpensive urns for each of the pillars and placed an ox yoke over the entry on the west side. When the yoke began to deteriorate, he plastered it.

Fitch was an avid gardener. He wanted to have a tree from every country in the world on his property, hence the great variety of tree species within the enclosure. The tubs on the site were used for water storage, and windmills were used to pump the water for the gardens. The "shrine" is what Fitch called his rock garden. He planned to use it as a fountain, but water was too scarce to ever have provided a regular source for this purpose (Jess Tong, personal communication).

Albert Fitch's home completely burned in the early 1950s. Fitch ran back into the home to recover his possessions and came out with his clothes aflame. He then had to be restrained to prevent his reentry into the home. The fire drove out a number of bats apparently living in the attic or upper story rooms. Fitch then moved into Clarksville to the Kyburz house, which had belonged to his sister, Jennie Kyburz, and also to his brother, Wilbur. Fitch lived in this house until his death at age 91 (Mimi Tong, personal communication).

CA-Eld-585/H

The Tong family settled in the Clarksville area in 1855. Hezekiah and Margaret Tong took up land to the north and east of the town. They improved the road, established a toll gate, and conducted a hostelery called Railroad House (Wooldridge 1931:468). The Tongs also mined and ran cattle on their land.

When the town of Clarksville was organized in 1873, the Tongs claimed six of the lots in town. Through time, the Tongs remained the prominent family in the community, with Gilbert S. Tong serving as postmaster and justice of the peace, and William W. Tong also as postmaster (Wooldridge 1931:468).

The Tong family has maintained their cemetery and plan to continue to inter family members there.

The dates of construction and operation of the mine, mill site, and associated reservoir are unknown. Jess Tong recalls that the site had not been abandoned too long before the time of his brother's recollections (about 70 years ago). He reported that the mill's machinery was sold to Bob Craig and moved to another site.

Unfortunately, the site is within the township that was mapped by the General Land Office in 1858, and little detail is recorded within the sections. The land always belonged to the Tong family, and they may have leased it to others. Jess Tong did not remember a family association of the initiation or working of the mine.

The cabin on the west side of the creek was reportedly occupied in conjunction with the operation of the mine and mill. The small holding pond/reservoir on the hill above the mill is undoubtedly related to the mill's operation. As Carson Creek is almost totally dry in the summer and fall, another water source would be necessary for milling during the dry season.

Hall/Richmond Cemetery

A 1939 Department of Transportation (D.O.T.) map was found showing the proposed alignment of U.S. 50. The map indicates a plot with the notation "Indian Graves" on the north side of the highway. The 1965 D.O.T. map overlaid on the 1939 map indicates that the cemetery lies within the strip of land between the westbound lanes of the highway and Tong Road. Peak & Associates, Inc., have prepared a map to indicate the relationship of the proposed Silva Valley interchange and the "Indian Graves."

An interview was conducted with Mr. Jess Tong, who identified the cemetery as a pioneer cemetery -- not an Indian cemetery. The cemetery lies on the edge of what was the Richmond and later the Hall property. William Hall died in 1930 at the age of 86 in the County Hospital (Burial Permit 1338, on file with the County Recorder). Albert Fitch, who lived on the parcel to the north, had been deeded Hall's property, with the provision that he be responsible for Hall's burial when necessary. Hall had gone blind and had been in Placerville for eight years. Mr. Tong recalls that Fitch went to Placerville with his Model T truck and brought the body back in a county-supplied pine box covered with an old army blanket. The highway ran through town, and a couple of boys in town went over to the grave site. The grave had been dug by Bill Leaky and Al Griggs. Mr. Tong remembers that the grave was near the graves of Alex and Lucy Richmond and two other graves. There were no tombstones, but the graves were ringed with rock and one had a large quartz boulder on one end. No service was conducted for Hall.

Tong recalls the day as being extremely hot. Since the burial permit indicates the date of death as August 5, Mr. Tong's boyhood recollection might be regarded as very accurate.

A bull, pastured in the field, dug up the grave several days later. Jess Tong and his friend, Albert Griggs, went to view the grave, and the horrifying sight caused the boys to rush back home. No tombstone was ever installed on Hall's grave.

The 1939 D.O.T. surveyors apparently found the rock rings on the hillside above the highway, and recognized them as graves. They erroneously labeled this area as "Indian Graves," either based on prior field experiences with Indian sites or because of the proximity of the two cemeteries on the south side of the highway.

During the 1965 construction of the additional highway lanes and Tong Road, the cemetery had brush piled on it. Some of the construction equipment was parked on the cemetery. After the completion of the construction, the brush was burned. Some bulldozing in the cemetery area may have occurred, obliterating surface evidence of the graves.

Tong took Melinda Peak to the cemetery site. Although he could not positively point out the exact boundaries of the cemetery, he was able to point out the site to the best of his recollection. It lies on the side of the hill, to the east of the 1939 mapped location. There are several large stones on the ground surface that have been brought onto the site. They may be the disturbed remnants of the rock rings. Tong marked the four corners of the area believed to be the cemetery.

The Richmonds were some of the earliest settlers in Clarksville. In March of 1854, Lucinda Richmond filed a document with the county to allow her to maintain a business in her own name. Her business was listed as "hotel keeping, teaming and trading generally." In 1859, she filed a pre-emption claim for 160 acres south of Clarksville, containing much of the project area (Pre-emptions D:1158). John and Lucinda Richmond refiled on the land as a homestead in 1861 (Homesteads B:34). Clear land title to the 120-acre parcel in the northwest quarter of section 12 to the west and south of the town of Clarksville was finally conferred to Alex Richmond in 1888 (Patents D:70). The various parcels owned by the Richmonds in Clarksville are mentioned in the survey notes for the platting of the town. Mrs. Richmond claimed lot 8 of block 1 and lots 1 and 7 of block 2.

The Richmond/Hall association dates back to at least 1870. In that year, Hall, 27, a farm laborer, lives in the Richmond household. The Richmond family consists of John W., 62, a farmer with real estate valued at $12,000 and personal estate of $280; Lucinda, 45, with a personal estate of $1580; son, John "Alex," 25, a constable; and son, George, age 11. There were two other boarders in the household: Moses Hughland, 12, and John D. Long, 38, also a farm laborer. Twenty years later, Hall was the family's sole boarder. The other family members included Lucinda and Alex, who were both listed as farmers (1880 census). In 1900, Hall was one of three boarders with Lucinda Richmond (1900 census).

Mormon Tavern

The Mormon Tavern has been the subject of research by several individuals. The results of their research are filed at State Parks and Recreation in the file for the State Historic Landmark.

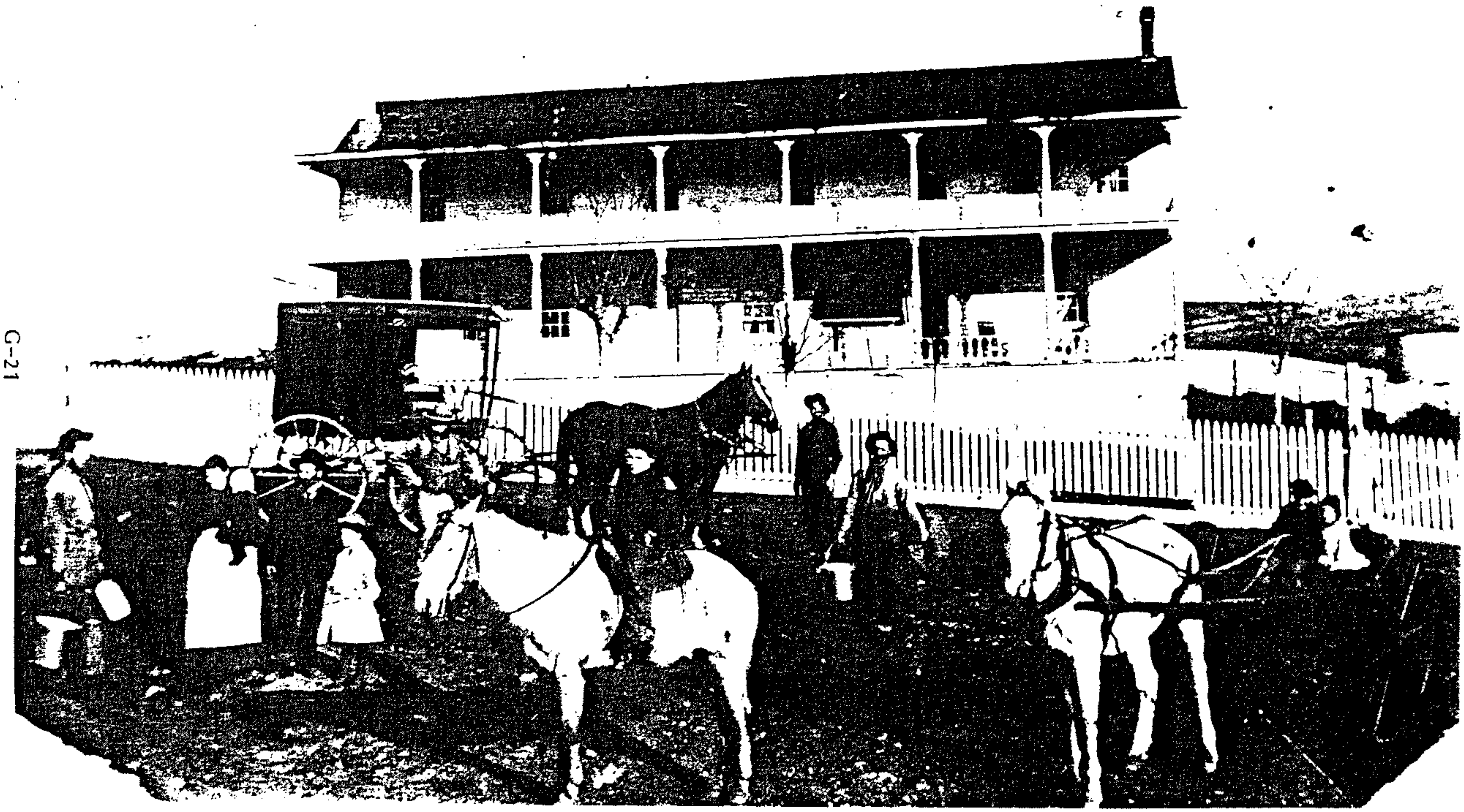
The structure was reportedly built in 1848 or 1849 by a Mormon named Morgan or M.T. Altafer. The structure was assessed to A. A. Lathrop in the El Dorado County tax rolls for 1850. For the next five years, the tavern was the subject of various transfers, sales and legal actions. The first owners to keep the structure for a number of years were F. F. and Polly Winchell.

The local tradition was that the beams and sides of the building were milled in the East and shipped around the Horn. In its heyday as a waystation, the Mormon Tavern was described as a two-story building, with the ground floor containing a saloon and a 100-foot-long dining room. Upstairs, there was a dance hall and rooms for a hundred quests. Across the road was a fine barn, capable of handling scores of animals (Halbert 1976; Joerger interview 1959).

In 1878, Joseph Joerger, Sr. purchased the Mormon Tavern and associated ranch. Joerger was a native of Germany, born in 1830. He came to California in 1851 and, for six years, mined near Ashland and in the Prairie City district. He then purchased a ranch and cattle in the Clarksville area (The Folsom Telegraph:1-16-1914).

Joerger made a number of changes to the Mormon Tavern, including changing the dance hall upstairs into bedrooms. The Joerger family retained ownership of the structure until 1960. The two-lane route of U.S. 50 had been built between the home and the barns (The Sacramento Bee 6-5-1960; Joerger interview 1959). The route of the expansion to four lanes was placed directly across the Mormon Tavern. This significant structure was burned as a training exercise for a local fire department to remove it from the right-of-way for the road improvement (newspaper clipping n.d.; Mimi Tong, personal communication, 1987).

The Joergers' grandson, Cal McKinley, had built a home behind the Mormon Tavern in about 1950. This structure was torn down when the freeway was expanded in 1964. The retaining walls, water tanks, and partial foundation lie just outside the project area.



Joerger family and dairy workers in front of the Mormon Tavern, 1880s.
(Courtesy of the California Section, California State Library)

IMPACTS

Ridge Design Alternative

CA-Eld-558-H has been recorded and documented as to date of construction, time of occupancy, and use. The site lacks integrity and cannot provide information important in history. The site has no research value and no further work is necessary. The isolated features have also been totally recorded and have no further research value. Therefore, the impact to this site and the features will not be significant.

Additionally, portions of CA-Eld-600/H and CA-Eld-585/H will be impacted. The portion of CA-Eld-600/H to be impacted contains only bedrock mortars, which have been completely recorded and have no further research value. The portion of CA-Eld-585/H to impacted includes the adits, and possibly the stamp mill, cabin and terraces, which lie quite close to the edge of the proposed right-of-way. The Tong cemetery portion of CA-Eld-585/H lies adjacent to the on-ramp, but a retaining wall has been designed to protect this portion of the site. The Byram house is not a significant resource and will not be impacted directly by this alternative.

Impact to the Hall/Richmond Cemetery could occur if the site is not fenced prior to the start of construction.

Undercrossing Alternative

The use of the existing undercrossing will cause the least amount of impact to cultural resources. As discussed above, CA-Eld-558-H and the isolated features will be impacted by the project. All have been documented and lack further research value, so the impact will not be significant.

The State Historical Landmark monument can be relocated only with the approval of the Office of Historic Preservation. If the new location for the monument is approved, the project proponents must bear all costs of the relocation. Should the wording on the plaque need to be changed due to the relocation of the monument, the project proponent must pay for this change.

CA-585/H lies quite close to the proposed on-ramp. Indirect construction impacts could occur from heavy equipment movement or yarding outside the right-of-way.

Impact to the Hall/Richmond Cemetery could occur if the cemetery is not fenced off prior to the start of construction.

MITIGATION MEASURES

General

There is a possibility that other sites may exist and be obscured by vegetation or historic activities, leaving no surface evidence. Should artifacts or unusual amounts of stone, bone, or shell be uncovered during vegetation clearance or other construction activities, an archeologist should be consulted for on-the-spot evaluation. If the bone appears to be human, the El Dorado County coroner and the Native American Heritage Commission (916-322-7791) must be contacted.

Both Alternatives

CA-Eld-585/H -- Preservation of the resource is always the preferred alternative. If the stamp mill, terrace, and cabin cannot be protected from all construction impacts by fencing, additional work may be necessary. Specific archival research should be undertaken on those features of the sites that might be impacted by construction. Based on the results of that study, excavation of the feature/s may be necessary.

Hall/Richmond Cemetery -- Prior to the start of construction, a fence should be erected to limit construction impacts within the cemetery boundaries. After the roadway is completed, a low post-and-cable or similar fence should be installed to provide protection but also allow access. It is recommended that no sign be installed to draw attention to the site.

Undercrossing Alternative -- Contact should be made immediately with the Office of Historic Preservation, through Mrs. Sandy Elder, to allow sufficient time for review of the proposed relocation of the monument. Maps should be sent with a letter request for the relocation identifying the present monument location and the proposed new location.

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El Dorado County Recorder
Burial permits.
Deeds.
Patents and Homesteads.
Pre-emptions.
Townsite survey field notes.

APPENDIX 1

RESUMES

PEAK & ASSOCIATES, INC.

RESUME

MELINDA A. PEAK June 1, 1988
Secretary/Treasurer
Staff Archeologist/Historian

PROFESSIONAL EXPERIENCE

Ms. Peak has been a crew chief, assistant director, and director on a wide range of prehistoric and historic excavations throughout California. She has directed laboratory analyses of archeological materials, including the historic period. She has also conducted a wide variety of cultural resource assessments in California, including documentary research, field survey and report preparation. In addition, Ms. Peak has developed a second field of expertise in applied history. She is a registered professional historian and has completed a number of historical research projects.

EDUCATION

M.A. candidate - history - California State University, Sacramento
B.A. - anthropology - University of California, Berkeley, 1976

RECENT PROJECTS

In 1987, Ms. Melinda Peak completed three major surveys projects -- the 39-mile Collierville transmission line in Calaveras, Stanislaus and San Joaquin counties as well the 3500+ acre El Dorado Hills project and the 110-mile Verdi to Rancho Cordova AT&T fiberoptic line. Ms. Peak not only directed the surveys but also prepared all three reports.

In 1986, Ms. Melinda Peak directed 15 surveys, including an 840-acre parcel in El Dorado County, and participated in an excavation on a site in Merced County.

In 1984 and 1985, she participated in 47 surveys, completed four major historical research projects, led the excavation of CA--Sac-43, and developed a memorandum of agreement with the Native Americans for the proposed Governors Mansion development at CA-Sac-99.

Ms. Peak's thesis project is a detailed study of the Feather Fork Gold Gravel Company, Limited, a Scottish firm involved in the financing of mining activities in Sierra and Plumas counties from 1886 to 1902.

Ms. Peak was largely responsible for the preparation of the nomination forms to the National Register of Historic Places for the Coulterville Main Street Historic District.

RESUME

January 1, 1988

ROBERT A. GERRY
Vice-President

PROFESSIONAL EXPERIENCE

Mr. Gerry has over fifteen years of extensive experience in both the public and private sectors, and has directed all types of cultural resource-related projects, ranging from field survey, test excavations, data recovery programs, intensive archival research and cultural resource management. He has completed archeological work in most cultural areas of California and the western Great Basin.

EDUCATION

Graduate studies - anthropology - California State University, Sacramento, 1972-1977
B.A. - anthropology - University of Illinois, Chicago Circle, 1972
Undergraduate studies - engineering - University of Illinois and Wayne State University, 1964-1968

RECENT PROJECTS

Mr. Gerry served as logistical coordinator for the North Fork Stanislaus project. He will prepare all graphics for the draft and final report volumes.

He was assistant director for site recording on the Lake Britton project, Shasta County, for Pacific Gas and Electric Company. He also supervised production of report graphics.

He produced the computer program that stored, sorted and printed out data abstracts for 1604 sites involved in the Enlarged Shasta Dam and Alternatives Class I Cultural Resources Overview for the Bureau of Reclamation.

He was field director and primary report writer on several lineal surveys of considerable length -- including the San Joaquin Valley Pipeline (157 miles) for Shell Oil, the Point Arena-Dunnigan fiberoptic cable (137 miles) for AT&T, and the Medford, Oregon, to Redding, California fiberoptic cable (151 miles) for AT&T.

He directed the transit-and-stadia mapping of a prehistory/historic site complex covering some 170 acres in El Dorado County and drafted the final map.

PEAK & ASSOCIATES, INC.

RESUME

NEAL NEUENSCHWANDER **June 1, 1988**
Staff Archeologist

PROFESSIONAL EXPERIENCE

Mr. Neuenschwander has compiled an excellent record of supervision of successful archeological survey projects for both the public and private sectors over the previous seven years. He has supervised the fieldwork of over sixty archeological survey and excavation projects throughout the northern and central California.

EDUCATION

M.A. candidate - anthropology - California State University, Chico
B.A. - anthropology - California State University, Chico, 1981
B.A. - geography - California State University, Chico, 1981

RECENT PROJECTS

Mr. Neuenschwander has directed the fieldwork for a twenty-five week, two-season excavation for the North Fork Stanislaus River Hydroelectric Development Project in the central Sierra Nevada. He also authored a report covering the excavation of one of sites involved in this project. The data obtained during the course of this excavation will substantially alter the way archeologists view man's early settlement of the Sierra Nevada mountains.

More recently, Mr. Neuenschwander directed the fieldwork for surveys and excavations in Calaveras, El Dorado, Sacramento, Solano and Yolo counties. He is currently authoring the reports covering these projects.

Mr. Neuenschwander has developed and tested a computer model for predicting prehistoric settlement patterns in the North Coast region of California. This research orientation adds to the extension survey experience in numerous surveys throughout northern, central and southern California conducted over the previous ten years.

Mr. Neuenschwander, prior to joining Peak & Associates, Inc., had run a successful partnership in the private consulting firm of Professional Archaeological Services with a perfect record of successful, on time completion for a variety of archeological surveys and excavations.

MARY P. PETERS
Associated Consultant

PROFESSIONAL EXPERIENCE

An ethnographer who has been actively involved in California ethnography and cultural resource studies since 1979, Ms. Peters received her M.A. in anthropology in the spring of 1984. She has conducted research regarding Native American values for the U.S. Forest Service, Southern California Edison Company and others. Ms. Peters has worked with several Native American groups in northern and central California and co-authored an ethnographic inventory pursuant to the American Religious Freedom Act (P.L. 95-341) for Shasta-Trinity National Forest, and a cultural/historical overview of the Six Rivers National Forest.

EDUCATION

M.A. - anthropology - California State University, Sacramento, 1984
B.A. - anthropology - California State University, Sacramento, 1979

RECENT PROJECTS

As an independent consultant for California ethnography and cultural resource management studies, especially Native American cultural studies, her recent work has involved feasibility and planning studies and mitigative procedures, liaison between Native American communities and contractors, contact with governmental offices, and research with regional, state and county sources.

Ms. Peters is the ethnographer for the North Fork Stanislaus Hydroelectric Development project. She will interview both Miwok and Washoe people to gather information on area use.

Ms. Peters worked with Peak & Associates, Inc. as an ethnographic consultant on the Pit 3,4,5 FERC-233 project, facilitating communication between tribal elders and the project ethnographer and contracting officers, and providing research and analysis concerning contemporary Native American spiritual/cultural values.

APPENDIX 2

CONFIDENTIAL

SITE SURVEY FORMS