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Business, Transportation and Housing Agency Department of Transportation, District 3

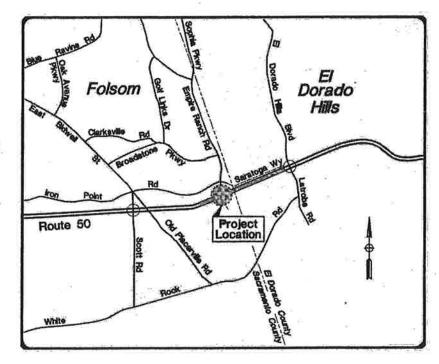
To: Jody Jones
District Director, District 3

**District Director** 

Date: January 2006 03-Sac-50 KP 36.1/37.2 03-ED-50 KP 0.0/1.4 03198-1C9500

## DRAFT PROJECT REPORT

On Route 50 at Empire Ranch Road between the East Bidwell Street/Scott Road Interchange and the El Dorado Hills Blvd/Latrobe Road Interchange



I have reviewed the right of way information contained in this Draft Project Report and the R/W Data Sheet attached hereto, and find the data to be complete, current, and accurate:

LINDY K. LEE, Chief, North Region Right of Way	Date	
APPROVAL RECOMMENDED:		a .
CLARK A. PERI, Project Manager Special Funded Projects	Date	,
APPROVED:		Caltrans
IODY IONES	Date	

Date: January 2006 03-Sac-50 KP 36.1/37.2 03-ED-50 KP 0.0/1.4 Empire Ranch Road/ Route 50 Interchange 03198-1C9500

This Draft Project Report has been prepared under the direction of the following registered civil engineer. The registered civil engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

Registered Professional Engineer Mark Thomas & Company, Inc.

1-31-06 Date



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## **Draft Project Report**

## 1. Introduction

This project will construct a new interchange on Route 50 in Folsom near the Sacramento/El Dorado County line. The interchange will connect Empire Ranch Road, which is a City of Folsom arterial roadway, linking new development in Folsom to Route 50. The project will also provide a connection to Route 50 from Green Valley Road, a major arterial facility in El Dorado County, via Empire Ranch Road/Sophia Parkway. The construction of the interchange will not provide a connection to the undeveloped lands south of Route 50; access control will be maintained along the south side of the interchange and Empire Ranch Road will be terminated in a cul-de-sac. The viable interchange alternative as presented herein is a Type L-2/Type L-7 configuration, which has been designed to allow for the expansion of the interchange to a Type L-9 partial cloverleaf interchange if future traffic volumes exceed the capacity of the initially constructed interchange. Construction of the new interchange connection to Route 50 would require mainline improvements, including auxiliary lanes in both directions between the Empire Ranch Road interchange and the El Dorado Hills Blvd/Latrobe Road interchange, which are included in this project.

Related projects that will need to be coordinated with the construction of the interchange and auxiliary lane include the extension of the HOV lanes on Route 50 from the El Dorado Hills Blvd/Latrobe Road interchange to the Bass Lake Grade truck climbing lane. To accommodate the extension of the HOV lanes, the undercrossing structures over El Dorado Hills Blvd (Latrobe Road UC, Bridge No. 25-0071L/R) will need to be replaced. This structure replacement is already planned as part of the Phase 3 improvements to the El Dorado Hills Blvd/Latrobe Road interchange. The Clarksville Road Undercrossing (Bridge No. 25-0072L/R) on Route 50 would also need to be widened to accommodate the extension of the HOV lanes. A new interchange is proposed on Route 50 at Silva Valley Parkway, 1.3 km (0.8 miles) east of El Dorado Hills Blvd. The previously approved environmental document and project report are being updated for this interchange. Silva Valley Parkway is proposed to cross over Route 50, which may allow for the removal of the existing undercrossing structures at Clarksville Road, rather than widening the structures with the extension of the HOV lanes.

The total estimated capital cost for the interchange varies from \$26.3 to \$28.8 million. The proposed improvements to Route 50 are estimated to cost between \$6.2 million and \$8.5 million. These estimates exclude project development costs. This project will be funded using a combination of local and state (STIP) funds. This is a Category 3 project; the project will require a revised freeway agreement for a new connection to Route 50.

#### 2. Recommendations

It is recommended that the Draft Environmental Document be approved for public circulation. As CEQA Lead Agency, the City of Folsom plans to coordinate circulation, plus hold a public hearing on this project with assistance and input from Caltrans.

## 3. Background

#### Existing Facility

The existing facility is a divided freeway, constructed in 1965, and widened in 2000/02. The facility is six through lanes (four mixed flow, and two HOV lanes) from Folsom Boulevard to El Dorado Hills Boulevard. The HOV lanes on Route 50 were constructed in 2002, beginning at Sunrise Boulevard and ending near El Dorado Hills Boulevard. From this point, Route 50 is made up of two eastbound and two westbound lanes to the Bass Lake grade, approximately 1.2 km east of El Dorado Hills Blvd. Within the project area, there are two existing and two planned interchanges. These consist of (1) a Type L-9 partial cloverleaf interchange at Scott Road/East Bidwell Street, (2) this proposed interchange at Empire Ranch Road, (3) modified L-1/L-8 interchange at El Dorado Hills Boulevard, and (4) a future interchange at Silva Valley Parkway, approximately 1.3 km east of El Dorado Hills Blvd.

Route 50 lane widths west of El Dorado Hills Blvd are 3.6 m, with inside and outside shoulder widths of 3.0 m. The median width is 13.8 m west of El Dorado Hills Blvd. There is an eastbound truck-climbing lane east of the Scott Road Interchange for slow trucks on the 7% mainline grade. This truck lane terminates at the approximate location of the proposed Empire Ranch Road interchange. East of El Dorado Hills Blvd, lane widths are 3.6 m, with an inside shoulder width of 1.5 m and an outside shoulder width of 2.4 m. The median width from east of El Dorado Hills Blvd to the Bass Lake grade is 21.3 m.

An additional eastbound truck climbing lane was constructed by widening within the median of Route 50 in 2001 beginning just east of the Clarksville Rd undercrossing, approximately 1.2 km east of El Dorado Hills Blvd, extending east to the Bass Lake Road interchange.

#### Project History

The City of Folsom and western El Dorado County have been experiencing rapid growth. Between 1993 and 2000, traffic volumes on Route 50 within the project limits have increased by an average of 5.4% per year. This increased traffic growth has resulted in peak hour congestion on Route 50 and several local arterials in the area.

In the early 1990's several land use proposals were developed for the Folsom "East Area". Projects in the "East Area" included Empire Ranch (then know as Russell Ranch), Broadstone Master Plan, The Parkway, and The Promontory (in El Dorado County). As part of the preliminary planning process for these proposals, the City of Folsom prepared the Route 50 Corridor Plan (1993 by Fehr & Peers Associates), which identified the need for improvements to Folsom Boulevard, Prairie City Road, and Scott/East Bidwell Interchanges, plus the construction of two new interchanges at Oak Avenue and Empire Ranch Road (then known as Russell Ranch Road). Also as part of the study, there were recommendations for major City arterial facilities parallel to Route 50. Of these projects, the interchange improvements at Folsom Boulevard,

Prairie City Road, and Scott/East Bidwell Street have been completed; additionally, Iron Point Road, ultimately a six lane arterial, has been constructed from Folsom Boulevard to Empire Ranch Road, with four lanes minimum, providing parallel capacity to Route 50 for local trips.

Empire Ranch (formerly known as Russell Ranch) is a 1738 acre community, primarily residential use, located immediately west of the El Dorado county line, and north of Route 50; this development was part of the overall East Area planning effort for the City of Folsom referenced above. The Empire Ranch Specific plan was approved in 2000. The East Area Facilities Plan, which identifies infrastructure necessary for buildout of the various developments noted above, included this Empire Ranch Road interchange at Route 50. A Project Study Report (Project Development Support) was prepared for the Empire Ranch Road interchange, and approved by Caltrans on April 2, 2002.

#### Other Related Projects

As noted above, the 1993 Route 50 Corridor Plan identified the need for improving existing interchanges in Folsom, in addition to new interchange access to Route 50. The City of Folsom and Caltrans have worked cooperatively in major interchange modifications projects to Folsom Boulevard interchange (completed in 2000), Prairie City Road interchange (completed in 1999), and Scott Road/East Bidwell Street (completed in 2001).

Recognizing the planned development in Folsom and western El Dorado County, and associated transportation demands, the Sacramento Area Council of Governments (SACOG), working cooperatively with the City of Folsom and El Dorado County Transportation Commission (EDTC), completed a Route 50 Major Investment Study (MIS) in 1997. The study recommended construction of HOV lanes on Route 50, improved transit including light rail extension to Folsom, and improvements to parallel facilities.

Route 50 HOV Lanes: Following the Route 50 MIS effort, the EDTC prepared a Project Study Report and Subsequent Project Report/Environmental Document for construction of HOV lanes on Route 50 from Sunrise Blvd in Sacramento County to El Dorado Hills Boulevard; these planning documents included an assumed connection to Route 50 at Empire Ranch Road. These improvements were constructed and open for traffic in 2002, as noted above in "existing facilities".

Light Rail Extension: Sacramento Regional Transit, in cooperation with the City of Folsom, is currently constructing the light rail extension from the easterly system terminus near Sunrise Boulevard to Folsom Boulevard and ultimately "old Folsom". The track construction is complete, with construction of stations, park-N-ride, and electrical systems underway; light rail service is scheduled to begin in 2006.

Route 50 HOV Lane extension: Also as a follow-up to the Route 50 MIS effort, Caltrans has begun planning for extension of Route 50 HOV lanes east of El Dorado Hills Boulevard. The lanes would be accommodated within the median; the project planning is considering extending

the lanes from El Dorado Hills Boulevard to South Shingle Road/Ponderosa Road, although the lanes could be built in segments, from west to east. Construction is funding dependent (combination of state and local funds), anticipated no earlier than 2006. A Project Report and Environmental Document has been completed for this project.

El Dorado Hills Blvd Interchange Improvements: El Dorado County has been working with Caltrans for improvements at this interchange, a Draft Project Report was approved in 2002, a Notice of Determination (NOD) was posted on May 24, 2000 and a Finding of No Significant Impact (FONSI) was approved on August 23, 2000. The baseline configuration for this interchange is a Type L-1 compact diamond for westbound movements (north side), and a Type L-8 partial cloverleaf for eastbound movements (south side). A series of phased improvements is proposed to accommodate increased traffic generated by existing and planned development. The phased improvements are briefly described as follows:

- Phase "0": Construct eastbound diagonal off-ramp (completed in 2001)
- Phase "1": Realign Saratoga Way, including construction of sound walls. Replace westbound diagonal ramps with loop off-ramp and relocated diagonal on-ramp, aligned opposite the Raley's Commercial Center. Relocate/widen eastbound diagonal on-ramp. Include ramp metering on the improved on-ramps. Construction anticipated in 2004/2005.
- Phase "2": Widen El Dorado Hills Blvd within interchange (requires replacement of the Latrobe Road Undercrossings) and provide additional turn lane capacity. Replace eastbound loop off-ramp. Construction anticipated after 2010.

Silva Valley Parkway Interchange: This is a proposed new interchange on Route 50 between El Dorado Hills Boulevard and Bass Lake Road interchange, which is intended to accommodate traffic generated from approved development in El Dorado Hills. The project would include a partial cloverleaf interchange approximately 1.5 km east of El Dorado Hills Boulevard, plus auxiliary lanes between the two interchanges. A Project Report for this interchange was approved in 1991. Construction of this interchange is not anticipated to occur earlier than 2007.

#### Community Interaction

A public workshop/scoping meeting was held at City of Folsom City Hall on September 3, 2003. The meeting was a map display/drop-in format. A total of fourteen members of the public attended. These individuals represented property owners/residents in the northwest quadrant of El Dorado Hill Blvd, and property owners south of Route 50. There were no objections raised to the project or related improvements, although comments were made regarding need to study air quality impacts, plus accident data (particularly for eastbound Route 50).

## 4. Need and Purpose

#### A. Problems, Deficiencies, and Justification

A new interchange is needed at this location to accommodate approved growth, per the City of Folsom's General Plan as adopted in 1993, within the east City Limits area of Folsom. Without the proposed interchange, the current circulation system for commuting traffic will go through residential neighborhood streets.

Included with the construction of the proposed interchange are operational improvements to Route 50. These include the extension of the eastbound truck climbing lane from its current terminus approximately 415 meters (1360 feet) to the east, where it merges into an auxiliary lane added with the eastbound loop on-ramp. The auxiliary lane continues approximately 965 meters (3165 feet) to the off-ramp to southbound Latrobe Road. The project will also include the construction of an 1135 meter (3725 foot) long westbound auxiliary lane from the on-ramp from El Dorado Hills Blvd to the Empire Ranch Road off-ramp. The extension of the truck climbing lane, and the construction of the auxiliary lanes, are needed to accommodate merge/diverge movements on Route 50.

Although not constructed with the Empire Ranch Road interchange, the HOV lanes on Route 50 will be extended from their current terminus from just west of El Dorado Hills Blvd to the base of the Bass Lake grade, approximately 1.5 km (0.9 miles) east of El Dorado Hills Blvd. This extension needs to occur prior to the construction of the Empire Ranch Road interchange. In order to extend the HOV lanes, the existing Latrobe Road undercrossings on Route 50 will need to be replaced; this replacement is planned with the reconstruction of the El Dorado Hills Blvd/Latrobe Road interchange.

#### B. Regional and System Planning

Route 50 is listed as a high priority route in the 1992 District 3 System Management Plan. The Route 50 Transportation Concept Report (approved April 1998) reflects the proposed Empire Ranch interchange, and shows the mainline concept facility as follows:

- Hazel Avenue to Sacramento/El Dorado County Line: Concept of six lanes, including HOV lanes, with ultimate of 8 lanes including HOV lanes. The Concept Level of Service is "E", although the Transportation Concept Report acknowledges that route concept as described may not provide the desired level of service.
- Sacramento County Line to east of the project limits: six lane freeway with consideration of HOV to Silva Valley IC. Ultimate facility is 8 lanes with HOV to west of Placerville, to be implemented concurrent with demand. The Concept Level of Service is "E" within this project area, although the Transportation Concept Report acknowledges that route concept as described may not provide the desired level of service.

The Empire Ranch Road interchange project is included in the most recent 2025 Sacramento

Metropolitan Transportation Plan (MTP), and the 2003/05 Metropolitan Transportation Improvement Program (MTIP). These plans were approved by the Sacramento Area Council of Governments (SACOG) board on July 18, 2002.

As noted above, construction of the Empire Ranch Road Interchange is consistent with the 1993 City of Folsom General Plan, as well as the US 50 Corridor Major Investment Study (adopted in 1997), and the Empire Ranch Specific Plan (adopted in 2000).

#### C. Traffic

This interchange project is intended to improve accessibility to planned development in eastern Folsom and western El Dorado Hills and to reduce congestion at other nearby Route 50 interchanges. Therefore, this project is expected to provide circulation benefits both regionally and locally. One quantitative measure of the area—wide benefits of a new interchange is the change in total travel distance and travel time. The table below summarizes the percent change in Year 2026 vehicle miles of travel (VMT) and vehicle hours of travel (VHT) at a local-area, subregional, and regional level. The boundaries for these areas are described below:

- Local-Area includes the area bounded by Riley Street (in Folsom) and Serrano Parkway (in El Dorado Hills) to the north, Route 50 to the south, Silva Valley Road to the east, and Oak Avenue Parkway to the west.
- Sub-Regional includes the area bounded by Natoma Street and Green Valley Road to the north, White Rock Road to the south, Silva Valley Road to the east, and Folsom Boulevard to the west.
- Regional includes portions of El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba counties (essentially the entire area covered in the 2002 version of the 2025 SACMET travel demand forecasting model).

Table 1  Percent Change In VMT And VHT – Design Year (2026) Conditions  No Build And Build Alternatives					
Performance Measure	No Build	Build Alternative	Percent Difference		
	Local	-Area			
VMT	1,048,600	1,057,100	0.81%		
VHT	28,860	28,770	-0.30%		
	Sub-Re	egional			
VMT	2,457,200	2,466,500	0.38%		
VHT	72,700	72,710	0%		
	Regi	onal			
VMT	65,666,100	65,715,300	0.07%		
VHT	1,842,650	1,841,980	-0.04%		
*	Not VMT – Vehicle VHT – Vehicle Source: <i>Fehr</i> (	Miles of Travel Hours of Travel	75.		

As shown, the proposed project will slightly increase the total VMT at the local-area level, while the total VHT reduces. This indicates that the project may result in travel routes with a slightly longer distance; however, the project will provide time savings as these routes will have quicker travel times.

The proposed project will result in a smaller reduction in total VHT on a regional scale compared to the local-area scale. The slight change in regional VMT indicates that the proposed project is only a small part of the regional network (i.e., the six-county area). However, the reduction in VHT is measurable even on a regional scale, suggesting that this relatively minor connection (compared to total regional lane miles) is being located in a significantly congested location, and that this connection is providing regional benefits.

#### Existing Traffic

The traffic analysis was conducted based on traffic flow, geometric roadway, and accident data. The following data was collected to complete the existing conditions analysis.

- The existing a.m. (7:00-9:00) and p.m. (4:00-6:00) peak period traffic volumes and lane configurations were collected on Route 50 between East Bidwell Street and El Dorado Hills Blvd by Fehr & Peers in June 2003.
- The a.m. and p.m. peak hour traffic volumes at the East Bidwell Street on- and off-ramps were collected by Fehr & Peers in June 2002.
- The a.m. and p.m. peak hour traffic volumes at the El Dorado Hills Blvd on- and offramps were collected by Prism Engineering in 2003.
- The most recent three year accident data available (July 2000 June 2003) was provided for Route 50 between East Bidwell Street and El Dorado Hills Blvd by Caltrans.

Table 2 Freeway Mainline LOS - Existing Conditions					
Freeway Mainline Segment	AM	Peak	PM	Peak	
Treeway Mannine Segment	V/C <sup>1</sup>	LOS <sup>2</sup>	V/C <sup>1</sup>	LOS <sup>2</sup>	
Route 50 Eastbound: E. East Bidwell Street to El Dorado Hills Blvd.	0.51	С	Ī	<sub>7</sub> 3	
Route 50 Eastbound: El Dorado Hills Blvd. to Bass Lake Road	0.38	В	<u>&gt;1.00</u>	<u>F</u>	
Route 50 Westbound: Bass Lake Road. To El Dorado Hills Blvd.	$\underline{\mathbf{F}}^3$		0.46	В	
Route 50 Westbound: El Dorado Hills Blvd to E. East Bidwell Street	<b><u>F</u></b> <sup>3</sup> 0.47		В		

#### Notes:

**Bold and underlined** font indicates unacceptable operations.

Source: Fehr & Peers, 2003.

As shown in Table 2, the Route 50 mainline segments between East Bidwell Street/Scott Road and Bass Lake Road operate unacceptably at LOS F in the peak directions (i.e. the westbound direction during the a.m. peak hour and the eastbound direction during the p.m. peak hour).

#### Forecasted Traffic Volumes (Year 2006 & Year 2026)

The traffic volume forecasts were generated using a modified version of the 2002 Metropolitan Transportation Plan (MTP) version of the 2025 SACMET model that is maintained by the Sacramento Area Council of Governments (SACOG). This is the latest approved version of the model. The modifications to the model included land use updates to reflect approved projects and roadway network refinements to be consistent with Tier 1 roadway improvements contained in the 2025 MTP. A summary of key modifications is provided below.

- <u>Split Traffic Analysis Zones (TAZs)</u> SACMET TAZs in the vicinity of the proposed project were refined to provide more land use detail in the study area.
- Adjust Base Year Land Uses The SACMET Base Year land uses were modified based on a review of detailed aerial photography and field visits.
- Modify Roadway Networks The SACMET roadway network was modified to include the proposed project, to match the existing and planned roadway systems and to maintain consistency with the Tier 1 roadway improvements contained in the MTP.

<sup>&</sup>lt;sup>1</sup> V/C is the volume to capacity ratio.

<sup>&</sup>lt;sup>2</sup> LOS based on the El Dorado County General Plan.

<sup>&</sup>lt;sup>3</sup> LOS F was identified at these locations based on the 2002 Congestion Report (Caltrans District 3, December 2002).

After making these modifications, Year 2025 a.m. and p.m. peak hour traffic volume forecasts were generated and adjusted to account for model error. A technical memorandum (see Appendix A) presenting the preliminary travel demand forecasts based on the roadway network and land use modifications for Year 2025 was submitted to the PDT for review. PDT comments are reflected in the final forecasts contained in this report and used in the traffic operations analysis.

Because the design year for this project is 2026, the 2025 forecasts were factored up to account for an extra year of growth. Ramp volumes were increased by four percent and the mainline Route 50 volumes were increased by two percent. These growth factors are based on the overall projected growth rates between 2002 and 2025 for the study area. A final adjustment to the 2026 forecasts was made by Caltrans after reviewing the projected traffic loadings between the El Dorado Hills Blvd, Empire Ranch Road, and East Bidwell Street interchanges. Some peak hour traffic was shifted from the adjacent interchanges to the Empire Ranch Road interchange to reflect more balanced traffic loading among the interchanges; presumably this adjustment was made as an assumption that this proposed new interchange would offer an attractive alternative point of connection when compared to adjacent heavily-used interchanges (i.e. El Dorado Hills and E. East Bidwell Street).

Construction year (2006) peak hour forecasts were developed by applying a linear growth rate between existing and 2025 conditions. An average annual growth rate of two percent was used for all locations except for the Route 50 westbound on-ramp at El Dorado Hills Blvd during the a.m. peak hour. For this location, it was assumed that the existing bottleneck on Route 50 at the on-ramp discourages some travelers from using the on-ramp during the a.m. peak hour. The planned elimination of the bottleneck as part of the El Dorado Hills Blvd interchange reconstruction (Phase 1 improvements are assumed to be completed by 2006) is likely to cause an increase in peak hour trips in addition to new trips from population and employment growth. These induced trips would occur from travelers adjusting their departure times, diverting from an alternative route, or shifting from another mode. Therefore, 30 percent of the traffic growth anticipated between existing and 2025 conditions was assumed to occur by 2006 although only 15 percent of the time has passed. For the planned facilities such as Empire Ranch Road and Iron Point Road, where the interpolation methodology was not applicable, the 2006 traffic forecasts were developed by factoring the 2026 forecasts after reviewing existing traffic counts and 2005 traffic forecasts developed using the regional SACMET model.

The construction year peak hour traffic forecasts were developed assuming that Iron Point Road would extend to the county line but would not connect to Saratoga Way by 2006. However, the construction year analysis includes traffic conditions both with and without a connection between Iron Point Road and Saratoga Way to compare the distribution of traffic between these two scenarios.

#### Traffic Operations

A traffic operations analysis was completed for the freeway mainline and freeway ramp junctions. Analysis methodologies and key assumptions are listed below.

#### Analysis Methodology

- All operations analyses were conducted using procedures and methodologies contained in the *Highway Capacity Manual 2000* (HCM 2000), Transportation Research Board, 2000.
- Freeway mainline segments and ramp junctions were analyzed using the thresholds contained in the El Dorado County General Plan. These LOS thresholds are based on the methodologies contained in the HCM 2000.
- Freeway ramp junctions were analyzed using the Highway Capacity Software (HCS), which applies the HCM 2000 procedures.

The construction year analysis presents the physical and operational characteristics of the roadway system under 2006 conditions. The design year analysis presents the physical and operational characteristics of the roadway system under 2026 conditions.

The construction year (2006) traffic operations analysis was conducted for the initial transportation network. The design year (2026) traffic operations analysis was conducted for the no project and proposed ultimate project improvements. Figures displaying the peak hour traffic volumes, lane configurations, and traffic controls for both the interim and ultimate design years can be seen in Attachment F.

#### Freeway Operations (Construction Year Analysis - 2006)

Traffic operations for the freeway mainline segments and ramp junctions are shown in Table 3.

TABLE 3					
FREEWAY MAINLINE AND RAMP JUNCTION LOS – CO	NSTRUCTIO	N YEAR	(2006)		
PROPOSED PROJECT CONDITION			` ,		
AM Peak PM Peak					
Freeway Sections	V/C <sup>1</sup>	LOS <sup>2</sup>	V/C <sup>1</sup>	LOS <sup>2</sup>	
Freeway Mainline					
Eastbound Route 50: East Bidwell Street to Empire Ranch Road.	0.36	В	0.64	D	
Eastbound Route 50: Empire Ranch Road to El Dorado Hills Blvd.	0.52	C	0.86	D	
Eastbound Route 50: El Dorado Hills Blvd to Bass Lake Road.	0.39	В	0.87	D	
Westbound Route 50: Bass Lake Road to El Dorado Hills Blvd.	1.05	,	0.51	C ·	
Westbound Route 50: El Dorado Hills Blvd to Empire Ranch Road.	0.88	Ð	0.47	В	
Westbound Route 50: Empire Ranch Road to East Bidwell Street	0.99	E/F	0.52	С	
Freeway Ramp Junctions - all interchange alternatives	Density <sup>3</sup>	LOS <sup>2</sup>	Density <sup>3</sup>	LOS <sup>2</sup>	
Route 50 Eastbound off-ramp to Empire Ranch Road	19	В	30	D	
Route 50 Eastbound on-ramp from Empire Ranch Road	, 13	В	23 .	С	
Route 50 Westbound off-ramp to Empire Ranch Road	>43	F	16	В	
Route 50 Westbound on-ramp from Empire Ranch Road	37	E	21	С	
Notes:					

#### Notes

Bold and underlined font indicates unacceptable operations.

Shading denotes that the expected LOS would be worse than the calculated LOS shown in the table due to downstream LOS F conditions propagating upstream.

Source: Fehr & Peers, 2003.

The improvements on the Route 50 mainline (i.e., auxiliary lanes in each direction between Empire Ranch Road and El Dorado Hills Blvd and the extension of an eastbound lane on Route 50 to the Bass Lake Truck Climbing Lane) result in improved traffic operations over the existing conditions for most freeway facilities during the a.m. and p.m. peak hours. However, the following facilities would continue to operate unacceptably.

- Westbound Route 50 east of El Dorado Hills Blvd would operate at LOS F during the a.m. peak hour.
- Westbound Route 50 west of Empire Ranch Road would operate at LOS E/F during the a.m. peak hour.
- The westbound on- and off-ramp junctions with Route 50 will operate at LOS E and F, respectively, during the a.m. peak hour for the proposed interchange at Empire Ranch Road.

#### Freeway Operations (Design Year Analysis – 2026)

Traffic operations for the freeway mainline segments and ramp junctions are shown in Table 6. As shown, Route 50 would operate at LOS E or F in the peak directions (i.e. westbound during the a.m.

<sup>&</sup>lt;sup>1</sup> V/C is the volume to capacity ratio.

<sup>&</sup>lt;sup>2</sup> LOS calculations for mainline operations based on the El Dorado County General Plan. LOS calculations for ramp junctions based on the HCM 2000 procedures.

<sup>&</sup>lt;sup>3</sup> Density in passenger cars per mile per lane.

peak hour and eastbound during the p.m. peak hour) within the study area.

TABLE 4 FREEWAY MAINLINE AND RAMP JUNCTION LOS – CONSTRUCTION YEAR (2026) PROPOSED PROJECT CONDITIONS					
Freeway Sections	AM	Peak	PM F	Peak	
Freeway Sections	V/C <sup>1</sup>	LOS <sup>2</sup>	V/C <sup>1</sup>	LOS <sup>2</sup>	
Freeway Mainline			-		
Eastbound Route 50: East Bidwell Street to Empire Ranch Road.	0.52	В	0.79	D	
Eastbound Route 50: Empire Ranch Road to El Dorado Hills Blvd.	0.67	С	0.91	E	
Eastbound Route 50: El Dorado Hills Blvd to Bass Lake Road.	0.48	B	0.90	E	
Westbound Route 50: Bass Lake Road to El Dorado Hills Blvd.	0.85	D	0.58	C	
Westbound Route 50: El Dorado Hills Blvd to Empire Ranch Road.	0.85		0.67	C	
Westbound Route 50: Empire Ranch Road to East Bidwell Street	1.13	F	0.86	D	
3					
Freeway Ramp Junctions - all interchange alternatives	Density <sup>3</sup>	LOS <sup>2</sup>	Density <sup>3</sup>	LOS <sup>2</sup>	
Route 50 Eastbound off-ramp to Empire Ranch Road	25	C	36	E	
Route 50 Eastbound on-ramp from Empire Ranch Road	17	В	24	C	
Route 50 Westbound off-ramp to Empire Ranch Road <u>&gt;43</u> <u>F</u> <u>38</u> <u>E</u>					
Route 50 Westbound on-ramp from Empire Ranch Road	>43	<u>F</u>	33	D	
<b>XT</b>					

#### Notes:

Bold and underlined font indicates unacceptable operations.

Shading denotes that the expected LOS would be worse than the calculated LOS shown in the table due to downstream LOS F conditions propagating upstream.

Source: Fehr & Peers, 2003.

The programmed improvements on the Route 50 mainline (as contained in the SACOG 2025 MTP) result in improved traffic operations over the existing conditions for most freeway facilities during the a.m. and p.m. peak hours. The following comments regarding specific segments are noted:

- In general, the combination of an additional interchange to distribute ramp volumes among interchanges, plus the auxiliary lanes between Empire Ranch Road and El Dorado Hills Boulevard, improves operations on Route 50 between El Dorado Hills and Empire Ranch Road.
- Because the new interchange will attract some traffic that otherwise would use E. East Bidwell Street, the volumes between Empire Ranch Road and E. East Bidwell Street are increased, and traffic operations are not improved between these two interchanges.
- Eastbound Route 50 east of Empire Ranch Road would operate at LOS E during the p.m. peak hour.

<sup>&</sup>lt;sup>1</sup> V/C is the volume to capacity ratio.

<sup>&</sup>lt;sup>2</sup> LOS calculations for mainline operations based on the El Dorado County General Plan. LOS calculations for ramp junctions based on the HCM 2000 procedures.

<sup>&</sup>lt;sup>3</sup> Density in passenger cars per mile per lane.

- Westbound Route 50 west of Empire Ranch Road would operate at LOS F during the a.m. peak hour.
- The eastbound off-ramp would operate at LOS E during the p.m. peak hour.
- The westbound off-ramp would operate unacceptably at LOS F during the a.m. peak hour due to the capacity constraint on the westbound Route 50 mainline segment between El Dorado Hills Blvd and Empire Ranch Road.
- The westbound on- and off-ramp junctions with Route 50 will operate at LOS F during the a.m. peak hour for the proposed interchange at Empire Ranch Road.
- The westbound and eastbound off-ramps junctions with Route 50 will operate at LOS E during the p.m. peak hour for the proposed interchange at Empire Ranch Road.

The traffic operations analysis results above show that the proposed interchange and improvements to Route 50 will result in mainline levels of service generally consistent with the Transportation Concept Report.

#### Accident Data

Accident data from the Traffic Accident Surveillance and Analysis System (TASAS) for a three-year period is shown below, encompassing Route 50 between East Bidwell Street and El Dorado Hills Boulevard.

2	TABLE 5	2		300
ROUTE 50 ACCIDENT	r History - 2	001 THROUG	<b>GH 2004</b>	
Location	Total Accidents	Total Fatalities	Actual Accident Rate <sup>1</sup>	Average Accident Rate <sup>1</sup>
Eastbound Route 50: East Bidwell Street to El Dorado Hills Boulevard	145	1	1.52	0.55
Westbound Route 50: El Dorado Hills Boulevard to East Bidwell Street	70	0	0.73	0.55

Notes: 1 per million vehicles

Bold and underline indicates that the actual accident rate on this segment is greater than the average accident rate for similar facilities. Source: Final Traffic Study; Caltrans District 3 TASAS Table B, April 2001 to March 2004.

The above table shows that the actual accident rate on eastbound Route 50 in the vicinity of the proposed interchange is nearly three times the average accident rate for similar freeway facilities. In the three-year data collection period, 145 accidents occurred on eastbound Route 50 with one fatality. Seventy accidents occurred on westbound Route 50 with no fatalities, but with a higher-than-average accident rate. The table below categorizes the recorded accidents by type.

TABLE 6					
ROUTE 50 ACCIDENT HISTORY - NUMBER OF ACCIDENTS BY TYPE Accident Type					
Location	Rear End	Hit Object	Side- swipe	Other 1	Total
Eastbound Route 50: East Bidwell Street to El Dorado Hills Boulevard	110 (76%)	11 (8%)	16 (11%)	8 (5%)	145
Westbound Route 50: El Dorado Hills Boulevard to East Bidwell Street	32 (46%)	19 (27%)	7 (10%)	12 (17%)	70

Notes: 1 Other includes broadside, head-on, and over-turn collisions.

Source: Final Traffic Study and Caltrans District 3 TASAS Table B, April 2001 to March 2004.

As shown above, the most frequent type of accident on eastbound Route 50 in the project vicinity is rear-end collisions (76 percent). A high frequency of rear-end accidents is consistent with the stop-and-go peak direction traffic conditions that exist along this section of Route 50. Rear-end collisions were also the most frequent type of accident on westbound Route 50 (46%), with hit objects being the second most frequent type of accident (27%).

#### 5. Alternatives

#### A. Viable Alternatives

The improvements considered in this report include a new interchange connection (Project Element 1), auxiliary lanes between Empire Ranch Road and El Dorado Hills Boulevard (Project Element 2), and implementation of an approved extension of high occupancy vehicle lanes east of El Dorado Hills Boulevard. For purposes of this Draft Project Report, an analysis of alternatives was performed for project elements 1 and 2, and is summarized as follows:

#### Route 50/Empire Ranch Road Interchange (Project Element 1)

One viable alternative for Empire Ranch interchange is presented within this Draft Project Report, as follows:

Alternative 1 represents a modified hybrid L-2/L-7 partial cloverleaf interchange. In particular, following are anticipated elements of the interchange:

The overcrossing would be a two lane overcrossing with median and outside shoulders, plus sidewalk/pedestrian access on the west side. Empire Ranch Road would terminate in a dead-end on the south side of the freeway, without any break in access control. Should a connection to the south be deemed desirable in the future, there would need to be a separate project development process, leading to an environmental document, revised freeway agreement, and break in access control, to be determined at that time.

- A single lane westbound diagonal off-ramp would be provided, widening to two lanes at the ramp terminal.
- The westbound on-ramp would be a two lane diagonal ramp (one mixed flow plus one HOV bypass), merging to one lane prior to the Route 50 merge; the on-ramp would include ramp metering.
- A single lane eastbound diagonal off-ramp would be provided, remaining a single lane at the ramp terminal.
- The eastbound on-ramp would be a two lane loop on-ramp (one mixed flow plus one HOV bypass), merging to one lane prior to the Route 50 merge; the on-ramp would include ramp metering.
- The westbound ramp terminal intersection will be signalized; the eastbound ramp terminal intersection will not be signalized.

Although the project is not anticipated to promote pedestrian/bicycle traffic in the foreseeable future (until a future project extends the roadway south of Route 50), the project is being planned for improved pedestrian/bicycle safety at the ramp crossings. The ramp entrances have been modified from the standard design to slow vehicular traffic at the potential conflict points, thus allowing for safer crossing by pedestrians and bicyclists. The proposed geometric refinements are as follows:

- The entrance to the eastbound loop on-ramp is perpendicular to Empire Ranch Road. Because there is no connection to the south of Route 50 proposed by this project, a separate right turn/deceleration lane at the ramp entrance is not necessary. The single southbound lane on Empire Ranch Road over Route 50 includes the appropriate curb return radius at the eastbound loop on-ramp entrance to maintain Surface Transportation Assistance Act (STAA) truck movements.
- The entrance to the westbound diagonal on-ramp is located at the ramp intersection; one southbound lane on Empire Ranch Road becomes a right turn only/deceleration lane at the ramp entrance, with appropriate curb return radius to maintain STAA movements.
- Pedestrian crossing movements across the diagonal on-ramp would be signalized.

Future improvements at this interchange, should Empire Ranch Road be extended south of Route 50, would include widening of the overcrossing structure, plus construction of a westbound loop on-ramp and an eastbound diagonal on-ramp for a completed L-9 configuration. Provision has been included in this design to allow for structure widening and construction of additional ramps as noted, but actual design of these features would need to be evaluated by a subsequent Project Development Team, as noted above.

Alternative 1 would require that some excess material be exported, although this could be minimized with slope flattening/widening and contour grading.

The estimated project capital costs (i.e. not including support costs) for Alternative 1 of Project Element 1 are summarized as follows:

Roadway Items		\$17,130,000
Structure Items		\$4,851,000
Subtotal Construction		\$21,981,000
Right of Way Items	8	\$6,800,000
TOTAL ALTERNATIVE COST		\$28,781,000

#### Route 50 Mainline Improvements (Project Element 2)

As indicated elsewhere in this report, the existing eastbound Route 50 truck climbing lane begins near the Scott Road/East Bidwell Street interchange, merging with the mixed-flow lanes within the limits of the proposed Empire Ranch Road interchanges. Consequently, this project includes the extension of the truck climbing lane easterly; the next logical terminus is near the vicinity of El Dorado/Sacramento County line where it merges with the auxiliary lane added with the eastbound loop on-ramp. Due to the high off-ramp volumes at El Dorado Hills Blvd, this eastbound auxiliary lane is proposed to be continuous between the Empire Ranch Road loop on-ramp interchange and the off-ramp to southbound Latrobe Road. Additionally, the El Dorado County's Department of Transportation, as part of other ongoing planning processes, has identified a need for a westbound auxiliary lane between the El Dorado Hills Blvd on-ramp and the off-ramp to Empire Ranch Road.

Two alternatives were identified for the extension of the truck climbing lane and the construction of the auxiliary lanes. Alternative 1 would widen Route 50 within the median; Alternative 2 would widen Route 50 to the outside of the existing lanes. Due to concerns with the remaining median width if Route 50 were widened within the median, Alternative 1 was rejected by Caltrans and Alternative 2 was determined to be the viable alternative for the extension of the truck climbing lane and the construction of the auxiliary lanes.

Project Element 2, Alternative 2, for the extension of the truck climbing lane and the auxiliary lanes would be to widen to the outside of the existing lanes. The existing lane configuration would remain, including the existing thrie beam median barrier rail. Because the widening to the outside of the existing lanes, right of way would need to be acquired along both sides of Route 50 to accommodate the cuts and fills required with this widening.

The estimated project capital costs (i.e. not including support costs) for Alternative 2 of Project Element 2 are summarized as follows:

Roadway Items	\$7,797,000
Structure Items	\$0
Subtotal Construction	\$7,797,000
Right of Way Items	\$703,000
TOTAL PROJECT ELEMENT COST	\$8,500,000

#### B. Analysis of Proposal

#### Traffic Operations:

Detailed traffic operations analyses for the proposed project are included in the Traffic Report located in Attachment F. In addition, mainline traffic volumes and operations, including operations at ramp junctions, are discussed in Section 4(C) of this report. The following summarizes ramp intersection operations:

The study intersections were analyzed under 2006 conditions with and without the construction of the proposed Route 50/Empire Ranch Road interchange. The peak hour traffic operations are summarized in Table 7.

TABLE 7 INTERSECTION LOS – CONSTRUCTION YEAR (2006) NO PROJECT AND PROPOSED PROJECT CONDITIONS					
Intersection	Control	AM Per Delay 1	LOS 2	PM Peal Delay <sup>1</sup>	k Hour
No Project Conditions	<u> </u>		7		2:
Empire Ranch Road/Iron Point Road	Uncontrolled	0	A	0	A
Interchange Alternative 1		*	***************************************	<del> </del>	
Empire Ranch Road/ Route 50 Eastbound Ramps	Side Street Stop	0	A	0	A
Empire Ranch Road/Route 50 Westbound Ramps	Traffic Signal	27	С	20	В
Empire Ranch Road/Iron Point Road	Traffic Signal	17	В	15	В
Notes:  1 Delay in seconds per vehicle. 2 LOS calculations based on the 2000 HCM procedures. Source: Fehr & Peers, 2003.					

With the proposed Route 50/Empire Ranch Road interchange in place, the two ramp terminal intersections would operate at LOS C or better during both peak hours. No queuing problems are expected at the ramp terminal intersections during the peak hours under Year 2006 conditions; the eastbound ramp intersection does not have conflicting movements, and the westbound ramp terminal intersection operates well without excessive queuing.

#### **Intersection Operations**

The study intersections were analyzed under 2026 conditions with and without the construction of the proposed Route 50/Empire Ranch Road interchange. The peak hour traffic operations are summarized in Table 8.

TABLE 8 INTERSECTION LOS – CONSTRUCTION YEAR (2026) NO PROJECT AND PROPOSED PROJECT CONDITIONS					
Intersection	Control	AM Pea	ak Hour	PM Peal	
	Control	Delay 1	LOS 2	Delay 1	LOS 2
No Project Conditions					
Empire Ranch Road/Iron Point Road	Traffic Signal	18	В	30	С
Interchange Alternative 1					100
Empire Ranch Road/ Route 50 Eastbound Ramps	Side Street Stop	0	A	0	A
Empire Ranch Road/Route 50 Westbound Ramps	Traffic Signal	15	В	13	В
Empire Ranch Road/Iron Point Road	Traffic Signal	43	<u>D</u>	<u>57</u>	<u>E</u>
Notes: <sup>1</sup> Delay in seconds per vehicle. <sup>2</sup> LOS calculations based on the 2000 F Source: Fehr & Peers, 2003.	ICM procedures.				

With the proposed Route 50/Empire Ranch Road interchange in place, the two ramp terminal intersections would operate at LOS D or better during both peak hours. No queuing problems are expected at the ramp terminal intersections during the peak hours under Year 2026 conditions.

The intersection of Empire Ranch Road and Iron Point Road would operate unacceptably (LOS D or E) during both peak hours for all four interchange alternatives. A third through lane in each direction of Iron Point Road, on either side of Empire Ranch Road, along with providing a "free" right turn on the northbound and westbound intersection approaches would provide an expectable level of service (LOS C, based on the City of Folsom planning standards).

The traffic operations analysis shows that the proposed interchange and improvements to Route 50 will result in mainline levels of service generally consistent with the Transportation Concept report. Ramp intersection levels of service are acceptable for the build and design year.

#### Ramp Metering:

Ramp metering is proposed for all of the interchange on-ramps. HOV bypass lanes are also included on the on-ramps. An analysis was performed to assure adequate storage available on the ramps for expected queues. The ramp metering analysis shows that all of the proposed interchange on-ramps can accommodate the maximum number of projected peak hour trips with allowable ramp metering rates.

Effect of Special Funded Project on a State Highway:

The project, including associated mainline elements, has been designed to minimize mainline impacts. As indicated elsewhere in this report, the new interchange will allow better traffic distribution between adjacent interchanges. Additionally, the auxiliary lanes between the proposed interchange and the El Dorado Hills Blvd/Latrobe Road interchange will improve traffic operations because there is more room for vehicles to conduct merge and diverge movements between the interchanges. The extension of a third eastbound lane to the Bass Lake Grade Truck Climbing Lane would allows the HOV lane designation to end beyond the El Dorado Hills Blvd interchange, eliminating a merging of the HOV lane with the adjacent mixed flow lane in the vicinity of an already congested section of Route 50.

Even with the proposed mainline improvements, portions of Route 50 and some of the ramp merge/diverge areas will operate at unacceptable levels of service during peak hours for the Construction Year (2006) and Design Year (2026). The operational deficiencies at the ramp junctions can be attributed to the mainline capacity limits (as acknowledged in the Transportation Concept report) rather than with the interchange design itself.

In order to remedy the project-area mainline operational deficiencies in the Design Year, additional capacity (over and above the Route 50 roadway programmed in the MTP) would need to be added to Route 50 between East Bidwell Street and Bass Lake Road. This additional capacity could include auxiliary lanes and/or additional traveled lanes on Route 50, which are beyond the scope of this study. However, the auxiliary lane design as proposed in this report will reserve the median area for emergency use in the short term, and would allow for additional capacity in the long term.

Nonstandard Mandatory and Advisory Design Features:

The proposed project geometrics meet all design standards except as noted below:

#### Mandatory Design Exceptions

- Stopping Sight Distance at Grade Crests per Section 201.4 requires that the length of a crest vertical curve be designed as per Figure 201.4. The existing crest vertical curve on Route 50 immediately west of the proposed overcrossing location does not provide stopping sight distance required for the design speed on the highway due to steep grades on either side of the vertical curve. The stopping sight distance provided on the existing vertical curve exceeds 80 km/hr, but does not meet the design standard of 110 km/hr for a freeway.
- Stopping Sight Distance at Grade Sags per Section 201.5 requires that the minimum length of vertical curve provide headlight sight distance in grade sags for the appropriate design speed. The proposed sag vertical curve at the bottom of the westbound loop onramp does not provide headlight sight distance for an 80 km/hr design speed. Freeway

lighting will be provided at the entrance of the loop on-ramp, where speeds are expected to be less than 80 km/hr due to the horizontal geometrics of the loop.

• <u>Superelevation Rate</u> per Section 202.2 requires that superelevation rates meet the standards shown on Table 202.2. The superelevation rates at the first curve (in the direction of travel) on the westbound diagonal on-ramp does meet the requirements of Section 202.5(3), "Restrictive Situations", which states that for certain types of roadways, including <u>ramps</u>, where curve radius and length and tangents between curves are short, standard superelevation rates and/or transition lengths may not be attainable. In this case, less than standard superelevation rates are justified, with the superelevation on the curve providing a comfortable rate for the driver consistent with Figure 202.2.

#### **Advisory Design Exceptions**

- Superelevation Transitions per Section 202.5(1) requires that superelevation transitions meet the requirements of Figure 202.5. The proposed superelevation transitions do meet the requirements of Section 202.5(3), "Restrictive Situations", which states that for certain types of roadways, including ramps, where curve radius and length and tangents between curves are short, standard superelevation rates and/or transition lengths may not be attainable. In this case, the non-standard transition length shall be used, with the maximum rate of change for cross slope to be 4% per 20 m, which was the approach used herein.
- <u>Side Slopes</u> per Section 304.1(a) and (b) requires approval for slopes steeper than 1:4 due to safety and erosion control concerns. Due to the height of the cut and fill slopes, required due to the existing <u>terrain</u>, the profile of Route 50, and approved development adjacent to the north side of the freeway, slopes steeper than 1:4 will be necessary. Slopes will be constructed as flat as possible, but will approach 1:2 for fill slopes and 1:1.5 for cut slopes. Appropriate safety features, such as metal beam guard rail, will be provided along with dikes and downdrains to properly channelize runoff from erodible slopes.
- <u>Single Lane Ramps</u> per Section 504.3(5) requires that if a single lane ramp exceeds 300 meters in length, an additional lane should be provided on the ramp to permit passing maneuvers. The eastbound off-ramp will be constructed as a single lane ramp approximately 508 meters long. Design year p.m. peak hour volume on this ramp is 920 vehicles. On the Empire Ranch Road overcrossing, only one northbound lane will be constructed. Depending on future land use south of Route 50, there may be a need in the future for a second lane and auxiliary lane on the off-ramp, and nothing in the current configuration precludes the construction of an additional lane. The proposed interchange design will accommodate the design year traffic volumes with an acceptable level of service.

- <u>Design Speed Considerations</u> per Section 504.2(4)(a) requires that decision sight distance shown in Table 201.7 should be provided at freeway exits. Due to the existing crest vertical curve on Route 50 just west of the proposed interchange location, standard decision sight distance at the exit nose cannot be provided. Overhead sign structures, in advance of the exit, will be provided to mitigate for the inadequate decision sight distance.
- Metered Multi-Lane Entrance Ramps per Section 504.3(2)(b) requires a taper of 50:1 when dropping a lane beyond the metering line. The proposed lane drops at the loop on-ramps are 30:1 in order to maximize storage lengths on the ramps. The proposed lane drop is acceptable because the radius of the loop ramp does not allow traffic to attain speeds to warrant a 50:1 taper.

#### Park and Ride Facilities:

There are no Park and Ride facilities proposed with this project. The Empire Ranch (Russell Ranch) Specific Plan includes provisions for a park and ride lot to be constructed within or adjacent to the proposed commercial development in the northeast quadrant of the interchange.

#### Utility and Other Owner Involvement:

The construction of the interchange will require the relocation of a number of overhead utilities. The utility companies have been notified of the project and the required relocations are being verified.

#### Railroad Involvement:

The project will not encroach onto rail right of way. No railroad involvement is anticipated for this project.

#### Highway Planting/Erosion Control:

During the design of the interchange, appropriate water pollution control measures will be determined and a temporary water pollution control plan will be developed. Highway planting plans will be developed and implemented for a separate construction contract that will follow the construction of the interchange, consistent with Caltrans policy. Excavated and embankment slopes will be as flat as practical, but will exceed the 1:4 standard. Dikes and gutters will be included as appropriate to channelize water to storm drain inlets. Appropriate outlet control measures will be implemented to minimize erosion and sediment transport.

#### Noise Barriers:

No noise barriers will be constructed as part of this project, but a sound wall has been constructed by others in the northwest quadrant of the interchange as part of the construction of a

single family residential subdivision (Empire Ranch Village No. 63). The construction of this sound wall was coordinated with this interchange project, and its design meets recommendations as outlined in the noise technical study of the accompanying Environmental Document regarding location and height of sound walls.

#### C. Alternatives Considered but Rejected

#### Route 50/Empire Ranch Road Interchange (Project Element 1)

Three interchange alternatives that were evaluated have been rejected and are not presented for further review/approval. These alternatives are described as follows:

Alternative 2 represents a modified hybrid Type L-2/L-8 partial cloverleaf interchange. In particular, the following are elements of the interchange:

- The overcrossing would be a two lane overcrossing similar to Alternative 1, with median and outside shoulders, plus sidewalk/pedestrian access on the west side. Empire Ranch Road would terminate in a dead-end on the south side of the freeway, without any break in access control.
- Westbound ramps would be the same as in Alternative 1.
- Eastbound ramps would consist of a single lane loop off-ramp and two lane diagonal onramp (one mixed flow plus one HOV bypass) merging to one lane prior to the Route 50 merge; the on-ramp would include ramp metering.
- As in alternative 1, the westbound ramp terminal intersection will be signalized; the eastbound ramp terminal intersection will not be signalized.

Alternative 2 would include similar bike/pedestrian friendly ramp intersections, as in Alternative 1, by providing more controlled movements at ramp terminal intersections.

As noted above, this alternative includes an eastbound loop off-ramp; these types of off-ramps tend to have a much higher accident rate than diagonal off-ramps. Also, this interchange design at this location will require that material be imported for the necessary embankments. Consequently because of safety and cost considerations, this alternative was rejected from further consideration.

The estimated project capital costs (i.e. not including support costs) for Alternative 2 of Project Element 1 are summarized as follows:

Roadway Items		\$14,567,000
Structure Items		\$4,851,000
Subtotal Construction		\$19,418,000
Right of Way Items		\$6,944,000
TOTAL ALTERNATIVE COST	0 3	\$26,362,000

Alternative 3 represents a modified hybrid Type L-7/L-8 partial cloverleaf interchange. In particular, the following are elements of the interchange:

- The overcrossing would be a two lane overcrossing similar to Alternative 1, with median and outside shoulders, plus sidewalk/pedestrian access on the west side. Empire Ranch Road would terminate in a dead-end on the south side of the freeway, without any break in access control.
- Westbound ramps would include a diagonal off-ramp and a loop on-ramp (Type L-7 configuration).
- Eastbound ramps would consist of a single lane loop off-ramp and two lane diagonal onramp (one mixed flow plus one HOV bypass) merging to one lane prior to the Route 50 merge; the on-ramp would include ramp metering.
- As in alternative 1, the westbound ramp terminal intersection will be signalized; the eastbound ramp terminal intersection will not be signalized.

Alternative 3 would include similar bike/pedestrian friendly ramp intersections, as in Alternative 1, by providing more controlled movements at ramp terminal intersections.

As noted above, this alternative includes an eastbound loop off-ramp; these types of off-ramps tend to have a much higher accident rate than diagonal off-ramps. Also, this interchange design at this location will require that material be imported for the necessary embankments. Consequently because of safety and cost considerations, this alternative was rejected from further consideration.

The estimated project capital costs (i.e. not including support costs) for Alternative 3 of Project Element 1 are summarized as follows:

Roadway Items	\$15,075,000
Structure Items	\$4,851,000
Subtotal Construction	\$19,926,000
Right of Way Items	\$6,944,000
TOTAL ALTERNATIVE COST	\$26,870,000

Alternative 4 represents a Type L-7 partial cloverleaf interchange. In particular, the following are elements of the interchange:

- The overcrossing would be a two lane overcrossing similar to Alternative 1, with median and outside shoulders, plus sidewalk/pedestrian access on the west side. Empire Ranch Road would terminate in a dead-end on the south side of the freeway, without any break in access control.
- Westbound ramps include a diagonal off-ramp, plus a loop on-ramp (Type L-7 configuration).
- Eastbound ramps would consist of a single lane diagonal off-ramp and two lane loop onramp (one mixed flow plus one HOV bypass) merging to one lane prior to the Route 50 merge; the on-ramp would include ramp metering.

As in alternative 1, the westbound ramp terminal intersection will be signalized; the eastbound ramp terminal intersection will not be signalized.

With the westbound loop on-ramp, all southbound to westbound traffic must make a left turn from Empire Ranch Road to the loop on-ramp; this movement represents the majority of the traffic in the a.m. peak hour, and would result in a lower level of service at the intersection of Empire Ranch Road and the westbound interchange ramps than with Alternative 1. Consequently this alternative was rejected.

The estimated project capital costs (i.e. not including support costs) for Alternative 4 of Project Element 1 are summarized as follows:

Roadway Items	\$16,161,000
Structure Items	\$4,851,000
Subtotal Construction	\$21,012,000
Right of Way Items	\$6,800,000
TOTAL ALTERNATIVE COST	\$27,812,000

#### Route 50 Mainline Improvements (Project Element 2)

One mainline improvement alternative that was evaluated has been rejected and is not presented for further review/approval. This alternative is described as follows:

Alternative 1 for the extension of the truck climbing lane and the auxiliary lanes would be to widen within the existing median, with a concrete median barrier, and to restripe the mainline to shift the mixed flow and HOV lanes over one lane to the left (in the direction of travel). The existing number 3 lane in each direction would become the auxiliary lanes. The recent HOV project constructed the median shoulder structural section to traveled way thickness, so the shoulder does not need to be replaced, but the cross slope of the median shoulder would need to be corrected so that the entire section is sloped to the outside of the highway. Because the widening of the mainline occurs within the existing median, no right of way acquisition would be required with this alternative for Project Element 2. It should be noted that the new median width with this alternative will be 6.6 m, which is less than the advisory standard of 10.8 m.

Caltrans considered that this alternative for mainline improvements, but rejected the alternative, indicating that insufficient justification was available for the less than standard median width; in addition, the median area should be reserved at this time.

The estimated project capital costs (i.e. not including support costs) for Alternative 1 of Project Element 2 are summarized as follows:

Roadway Items	\$6,240,000
Structure Items	\$0
Subtotal Construction	\$6,240,000
Right of Way Items	\$0
TOTAL PROJECT ELEMENT COST	\$6,240,000

## 6. Considerations Requiring Discussion

#### A. Hazardous Waste

Based on the Preliminary Geotechnical Investigation for the project, the rock formations at the proposed interchange and the area east of the interchange proposed for mainline improvements are not mapped as ultramafic rocks. It is reasonable to assume that serpentinitic material (NOA) is not present within the interchange location. The project corridor to the east of the Bear Mountains Fault and the fault zone itself is mapped as containing ultramafic rocks and therefore could have serpentinite material (NOA).

The possible presence of asbestos will be confirmed during the Materials Report investigation, and appropriate materials handling measures implemented to reduce potential for releases of airborne asbestos, including the preparation of a health and safety plan, obtaining appropriate permits from the local agencies, and wetting down the work area during excavation activities.

#### B. Value Analysis

No value analysis is required for this project, as the total cost within Caltrans right of way is less than \$25 million. However, the development of alternatives and subsequent alternatives analysis considered implementation costs. In addition, alternative construction methods and materials will be considered during the design phase.

#### C. Resource Conservation

The project has been designed to consider appropriate and judicious use of resources, described as follows:

- The project earthwork will be nearly balanced, minimizing need for off-haul.
- AC pavement in existing shoulders will need to be replaced with traveled way sections, but AC surfacing can be recycled and processed for reuse as aggregate base

#### D. Right of Way Issues

Right of way acquisition will be required for construction of this project. Final right of way certification will be required prior to advertisement of the project. A detailed summary of right of way impacts is included in the appendices to this report.

#### E. Environmental Issues

The City of Folsom is the state Lead Agency under the California Environmental Quality Act (CEQA). The Federal Highway Administration (FHWA) is Federal lead agency under the National Environmental Policy Act (NEPA). An Environmental Impact Report was prepared for this project by the City of Folsom, pursuant to CEQA and an Environmental Assessment was

prepared pursuant to NEPA. The combined EIR/EA has been prepared in accordance with Caltrans environmental procedures, as well as State environmental regulations. The attached EIR/EA is the appropriate document for this proposal. Some of the environmental impacts and associated mitigations are summarized below:

- Loss of 0.11 hectare (0.27 acres) of jurisdictional waters which meet the Corps of Engineers criteria for wetlands: Obtain permits from associated agencies, and provide replacement habitat and/or mitigation as agreed.
- Construction noise and air quality impacts: Implement appropriate requirements in special provisions for noise and dust control.
- Water Quality (construction phase and permanent): Implement Storm Water Pollution Prevention Plan (SWPPP) for construction phase, and include appropriate best management practices for drainage systems to minimize long-term impacts.

#### F. Air Quality Conformity

The project is included in the most recent 2025 Sacramento Metropolitan Transportation Plan (MTP) and the 2003/05 Metropolitan Transportation Improvement Program (MTIP). These plans, including findings of air quality conformity, were approved by the Sacramento Area Council of Governments (SACOG) board on July 18, 2002. Due to recent decisions by the courts system and the EPA, the air quality conformity finding for the SACOG area has lapsed. As SACOG staff works with federal agencies in evaluating future MTP and associated air quality, this project will be included in their analyses. Expected timing for the conforming air quality plan, including this project, is by Spring 2006.

#### G. Title VI consideration

There are minimal Title VI considerations with this project. The interchange has been designed with HOV bypass lanes for on-ramps, allowing enhanced use for transit vehicles should a route be added to the area. The interchange has been designed for more "friendly" use by pedestrians and bicycles, specifically at ramp intersections, with compliance to current ADA standards, should areas south of Route 50 be developed to attract such uses. There are no recreation uses, shopping, schools, or hospitals in the project area.

## 7. Other Considerations as Appropriate

#### Public Hearing Process

It is recommended that the draft environmental document be released for public review, and that a Public Hearing be scheduled.

#### Route Matters

Concurrent with environmental approvals, the California Transportation Commission (CTC) must approve the break in access control for the interchange. A revised freeway agreement will be required between Caltrans and the City of Folsom to address the new connection to Route 50.

#### Permits

Work within the northeast quadrant will impact approximately 0.27 acre of seasonal wetland. Consequently, a Section 404 permit from the U.S. Army Corps of Engineers and a Section 1600 permit from the California Department of Fish & Game may be required. A waiver or certification from the Regional Water Quality Control Board also will required.

A Notice of Construction (NOC) will need to be filed with Regional Water Quality Control Board (RWQCB) for grading activities exceeding 2.02 hectares (5 acres). A Storm Water Pollution Prevention Plan (SWPPP) will also be required.

#### Cooperative Agreements

A cooperative agreement between Caltrans and the City of Folsom will be required for design and project development, as well as construction and maintenance of the Empire Ranch Road interchange.

#### Transportation Management Plans (TMP)

The alternatives considered in this study cannot be constructed without some impact to traffic during construction, primarily due to driver curiosity, and temporary transitions between existing and new improvements. However, traffic impacts can be reduced with a well-planned stage construction/traffic handling plan and aggressive public awareness during construction. Temporary railing (Type K) will be used to separate construction zones from traffic. Some work-period lane closures will be required (i.e. for removing delineation, setting K-rail, pavement conforms, etc.) and would be performed during non-peak traffic hours. Following is a general description of construction sequencing for the various project elements:

Empire Ranch Road Interchange: The ramps can be constructed without impacting traffic. Work on ramps near the mainline will need to be done during off peak hours with closures of the outside shoulder and outside lanes. Erection and removal of falsework for the new overcrossing will require rerouting of mainline traffic; median crossovers are suggested.

Outside Paving (west of El Dorado Hills Boulevard): Outside paving for accommodation of eastbound truck climbing lane extension and westbound auxiliary lane can be accomplished

with shoulder closures and setting of K-rail. No lane closures or shifting of mainline will be required.

Consistent with District policy and procedures, it is expected that design of the project, especially staging and traffic control systems, would be coordinated closely with District TMP coordinator. It is also anticipated that there will be a Construction Zone Enhanced Enforcement Program (COZEEP) in place as part of traffic management during construction, including setting and removal of K-rails.

#### Stage Construction

Stage Construction and Traffic Handling plans are typically included within construction documents to assure smooth traffic flow and continuous access during construction. However, because there are no existing connections to Route 50 at Empire Ranch Road, stage construction requirements will be minimal. It is expected that the contractor will sequence operations based on earthwork balance. The "Order of Work" in the project special provisions will require Project Element 2 (Auxiliary lanes between Empire Ranch Road and El Dorado Hills Boulevard) be complete prior to opening of the interchange ramps to traffic.

#### Graffiti Control

Graffiti control measures will be considered during the design phase. There will be minimal visible walls within Caltrans right of way within the project limits; consequently, any graffiti control efforts would be focused on sign structures.

## 8. Programming

## A. Proposed Funding and Capital Support Resources

The project will be funded through a number of sources, and will be the subject of a cooperative agreement between the State, the City of Folsom, and El Dorado County. The interchange element will be funded through a combination of development fees (City of Folsom), supplemented by STIP (RIP) funds. The extension of the eastbound truck climbing lane, plus the construction of the westbound auxiliary lane between Empire Ranch Road and El Dorado Hills Blvd, will be funded through a combination of El Dorado County development fees and STIP (RIP) funds as available. The extension of HOV lanes east of El Dorado Hills Boulevard, a separate project but integral to the operations of Route 50, will be funded by El Dorado County development fees. At this time, no STIP (RIP) fees are programmed for this project.

#### B. Schedule:

Following is the anticipated schedule for completion of the Empire Ranch Road interchange project, pending availability of funding.

#### **Proposed Project Milestones:**

	03/03
10	02/06
	09/06
	12/06
	12/07
	12/07
	01/08
	01/08
	11/09
	and a

<sup>\*</sup> indicates funding dependent milestones

## 9. Project Reviews

This project has been reviewed by John Rocconova, Headquarters Project Development Coordinator. All comments have been incorporated in this report or otherwise addressed.

## 10. Project Contacts

Questions regarding this Project Report may be directed to:

#### Caltrans Representatives:

Clark Peri, Project Manager	(916) 274-0538
Christine Zdunkiewicz, Traffic Reviewer	(916) 274-0531
Lupe Jimenez, Environmental Reviewer	(916) 274-0597
Eric Fredrickson, Structures Reviewer	(916) 227-8916

#### Others:

Tom Garcia, Senior Engineer	(916) 355-7377
Gail Furness de Pardo	(916) 355-7248
City of Folsom	, ,

Russ Nygaard, Senior Engineer	(530) 621-5935
County of El Dorado	

Rob Himes, Project Manager (916) 381-9100 David Melis, Project Engineer Kim Erickson, Environmental Manager Lisa Pereira McClintock, Outreach Manager Mark Thomas & Company, Inc.

Ron Milam, Project Manager
Jason Isaac, Project Engineer
Fehr & Peers Associates
Traffic Consultants

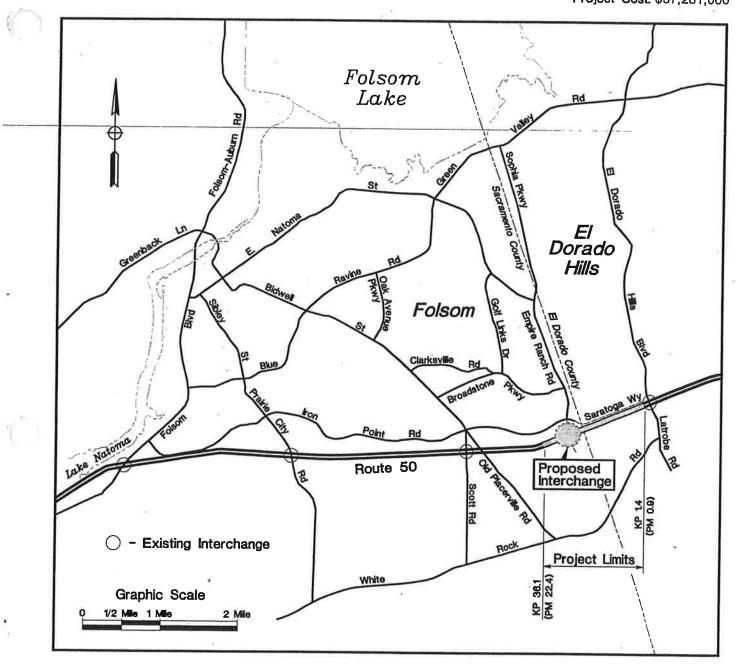
(916) 773-1900

## **Attachments**

Location Map
Project Geometrics
Alternatives Considered but Rejected
Advanced Planning Studies
Project Cost Estimates
Traffic Operations Report
Right of Way Data Sheet/Utility Information Sheet
Draft Environmental Impact Report (under separate cover)

# Location Map

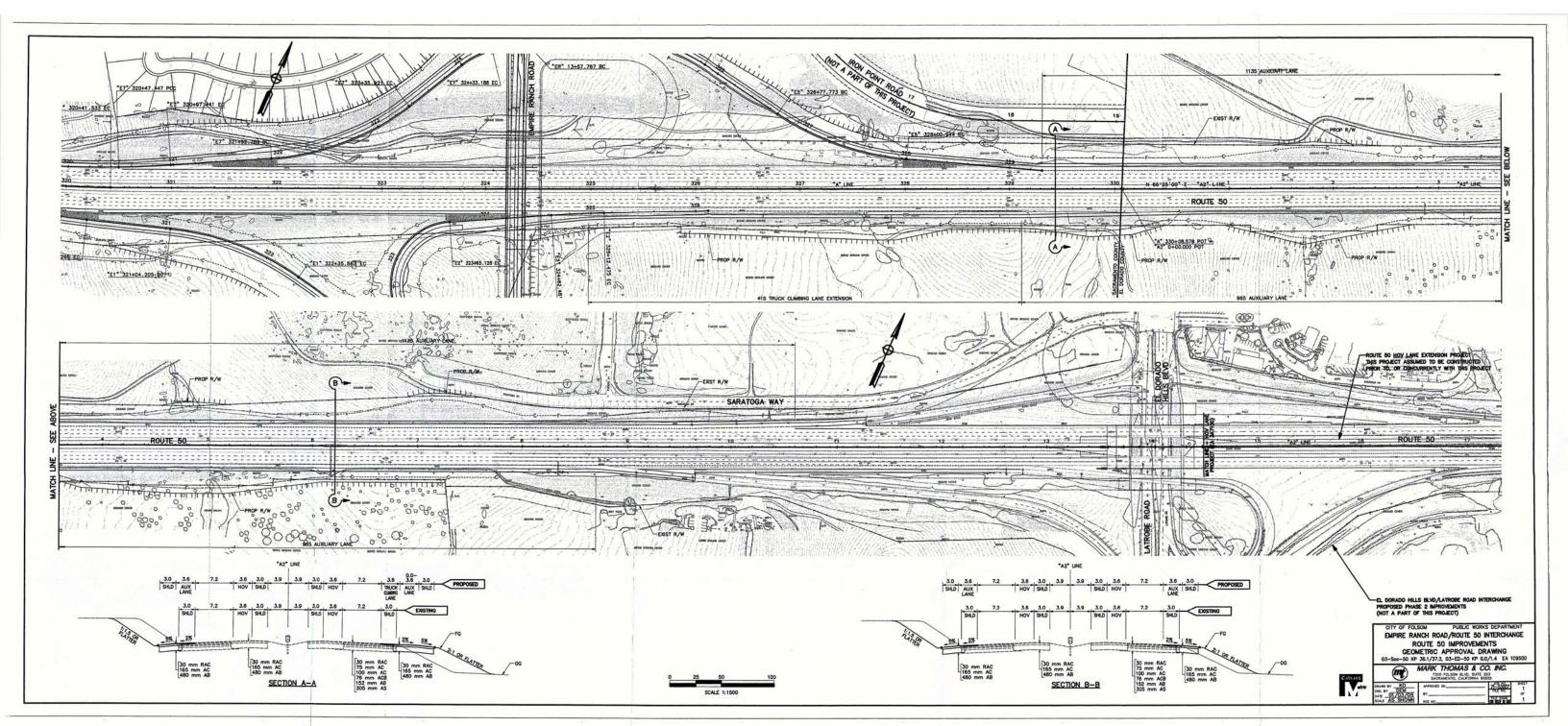
Attachment A

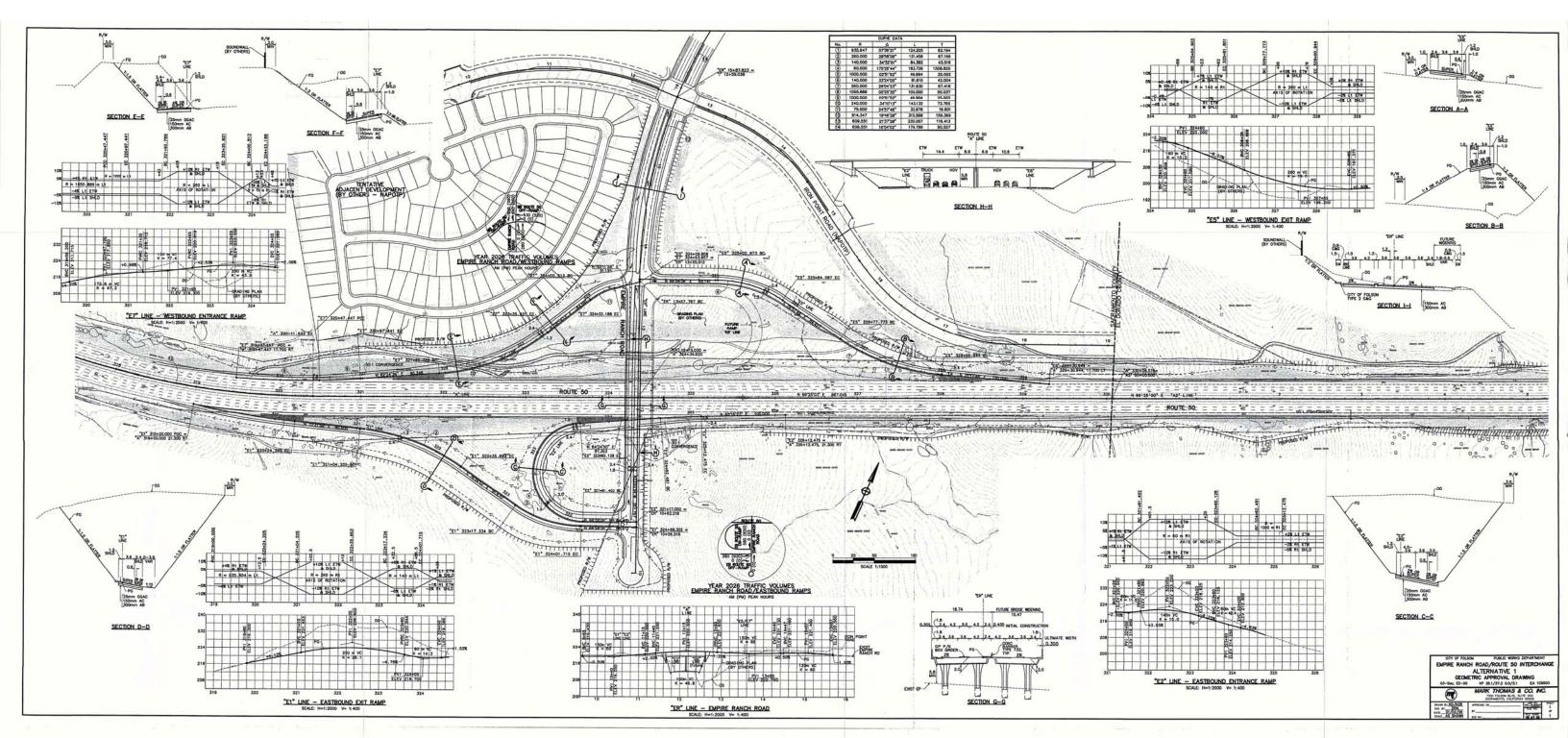


**Project Location Map** 

## Project Geometrics

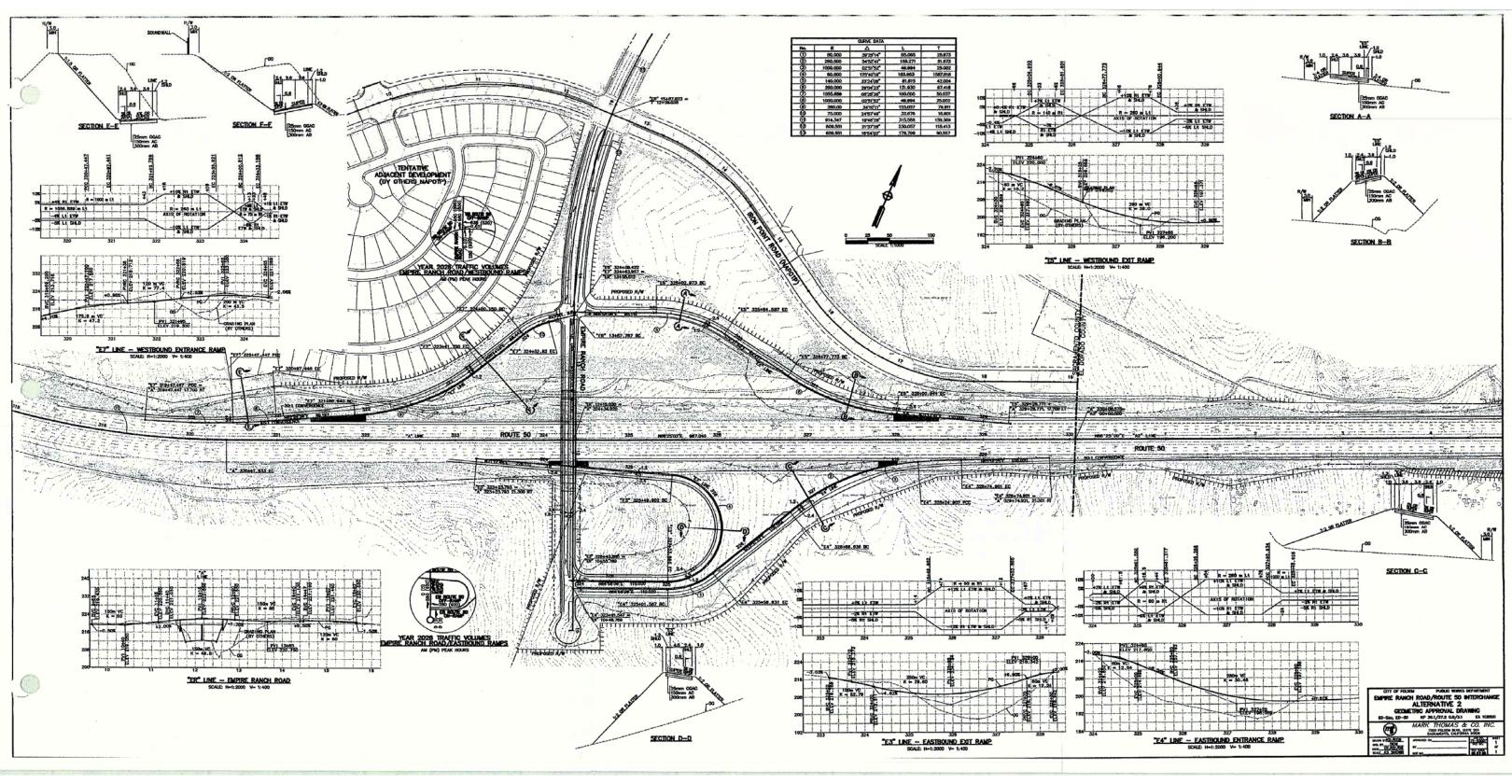
Attachment B

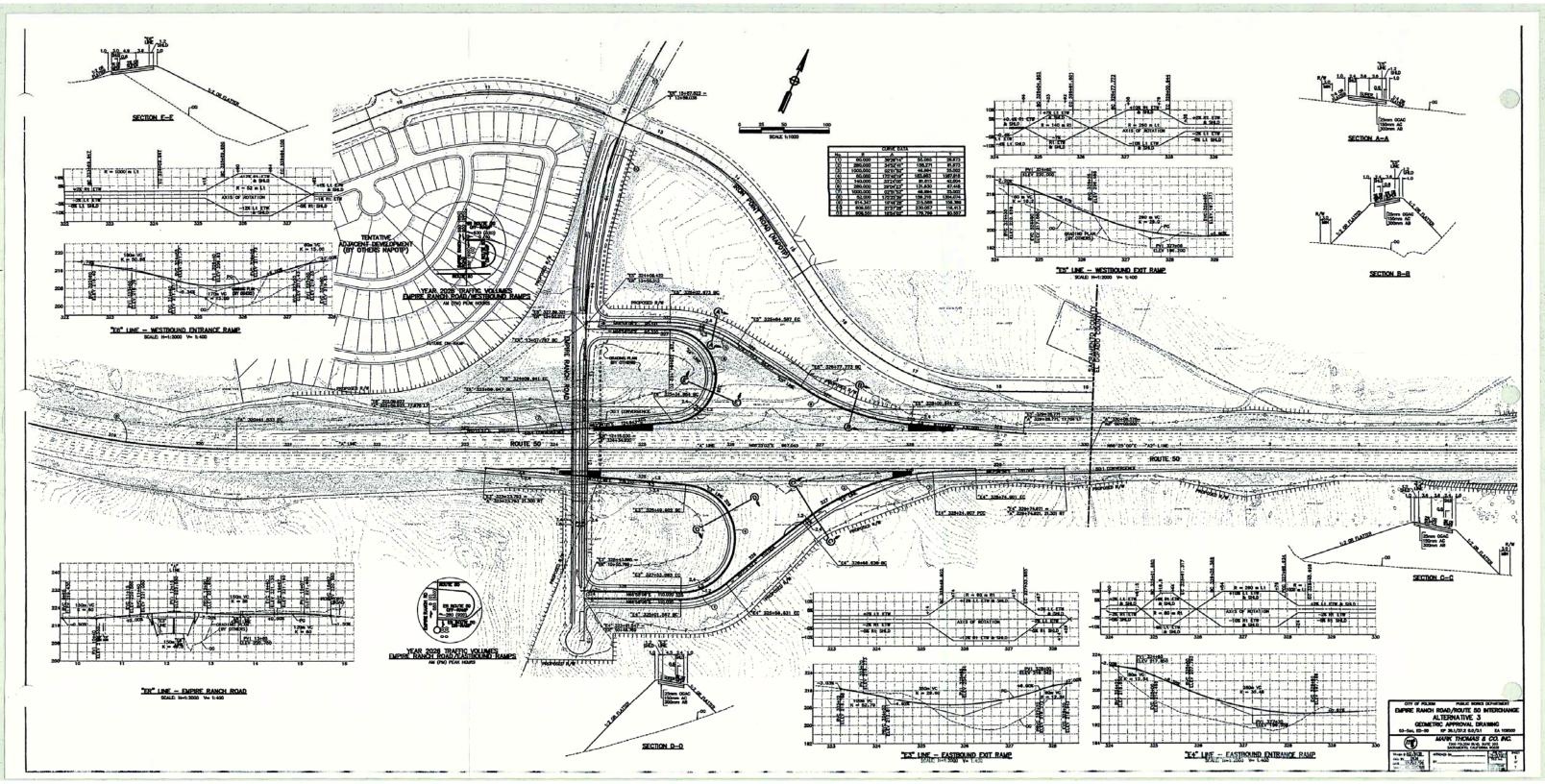


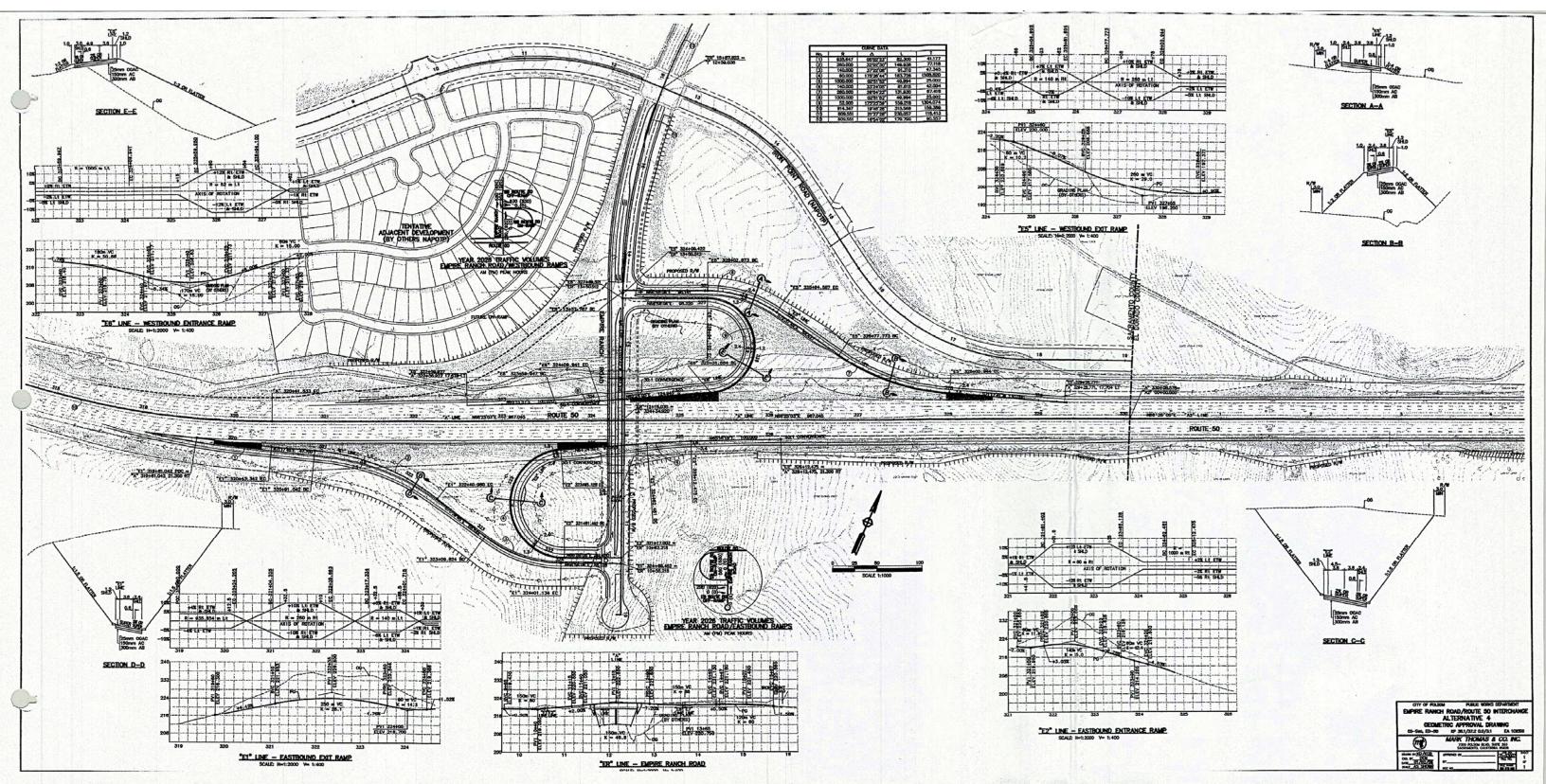


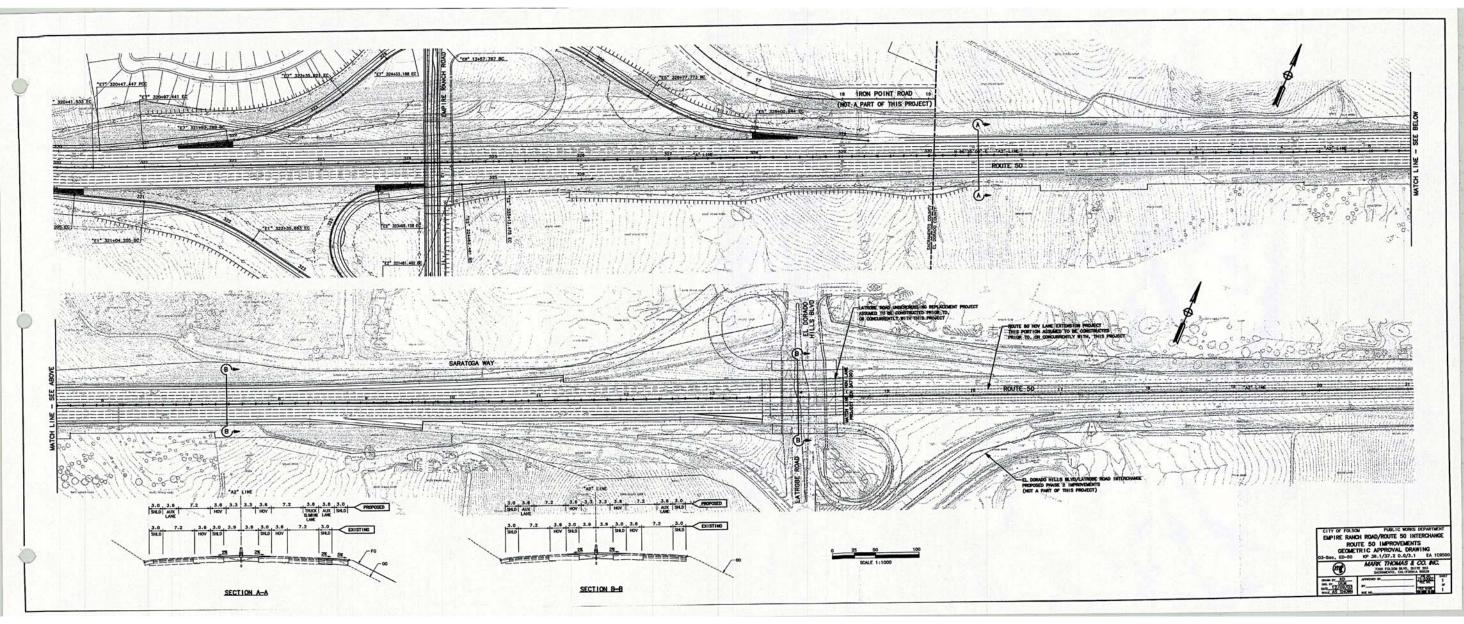
# Alternatives Considered but Rejected

Attachment C



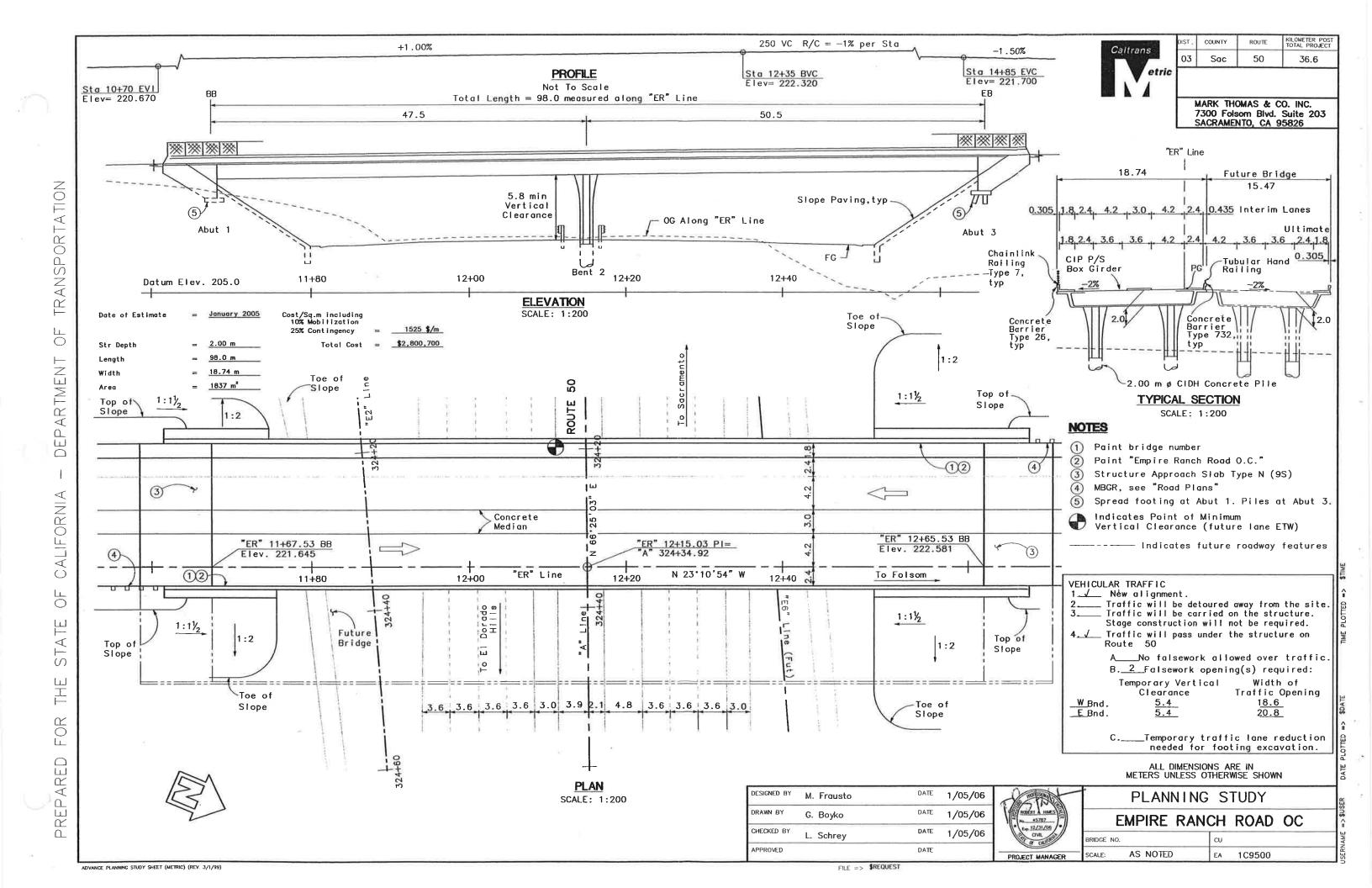






## Advanced Planning Study

Attachment D



## Project Cost Estimate

## Attachment E

		DIST - CO - RTE 03- Type of Estimate (Pr PSR, PR, etc.): Program Code: KP: 36.	e-PSR,
	h	EA: 10	
	Project Description:	PP No. :	
Limits:	On Route 50 from Empire Ranch Road in County Line)	n the City of Folsom (near	the Sacramento/El Dorado
Proposed Improvement: (Scope)	This project proposes to construct a new	interchange on Route 50 a	
Alternative:	Project Element 1 - Interchange Alternation	ve 1 (Type L-2/Type L-7)	
.9	ROADWAY ITEMS	\$17,130,000	and the second second
	STRUCTURE ITEMS	\$4,851,000	
	SUBTOTAL CONSTRUCTION	\$21,981,000	
	RIGHT OF WAY TOTAL ALTERNATIVE COST	\$6,800,000 <b>\$28,781,000</b>	
THE			
Reviewed by			
Program Manager	↑ (Signate	ле)	(Date)
Approved by	Davil 2. Melis	(916)-381-9100	01/31/06
Project Manager	(Signature)	(Phone)	(Date)

DIST - CO - RTE 03-Sac/ED-50 36.1/37.2, 0.0/3.1 EA: 1C9500 PP No.: 0 I. ROADWAY ITEMS Quantity <u>Unit</u> **Unit Cost** Section Cost Section 1 - Earthwork Roadway Excavation m³ 141,085 \$35.00 \$4,937,975 Imported Borrow m³ \$15.00 \$0 Clearing & Grubbing 1 LS \$75,000 \$75,000 **Develop Water Supply** LS \$20,000 \$20,000 Stormwater Treatment BMP's LS \$300,000 \$300,000 Total Earthwork \$5,332,975 Section 2 - Structural Section \* m<sup>3</sup> PCC Pavement ( Depth) \$0 PCC Pavement ( Depth) m³ \$0 Asphalt Concrete 7,618 mt \$70.00 \$533,260 Open Graded Asphalt Concrete 880 mt \$75.00 \$66,000 \$0 Aggregate Base 9,223 m³ \$45.00 \$415,013 Aggregate Subbase m³ \$20.00 \$0 Asphalt Treated Permeable Base m³ \$50.00 \$0 Blanket & Edge Drains \$15.00 m \$0 Edge Drain Outlet m \$40.00 \$0 Total Structural Section \$1,014,273 Section 3 - Drainage Extend Box Culvert \$0 Storm Drains LS \$793,000 \$793,000 Small Drainage Facilities \$0 \$0 Project Drainage (X-drains, overside, etc.) LS \$222,200 \$222,200 \$0

Sheet: 2 of 6

\$1,015,200

Total Drainage

<sup>\*</sup> Attach sketch showing typical structural section elements of the roadway. Include (if available) T.I., R-Value, and date when tests were performed

u			KF EA PP No.		
	Quantity	<u>Unit</u>	Unit Cost	Section Cost	
Section 4 - Specialty Items Retaining Walls Soundwalls		$\frac{m^2}{m^2}$	\$550.00	\$0 \$0	
Equipment/Animal Passes		EA		\$0	8
Relocate Private Irrigation Facilities		m_		\$0	
Landscaping/Irrigation		HA		\$0	
Erosion Control	1,238,000	m <sup>2</sup>	\$1.50	\$1,857,000	
Slope Protection		m <sup>2</sup>		-\$0	
Barriers and Guardrails	1	LS	\$190,000	\$190,000	
Hazardous Waste Work		LS		\$0	
Environmental Mitigation	1	LS	\$100,000	\$100,000	
Minor Concrete (Curb, Gutter & Sidewalk	)	m3		\$0	
0.0004 (0.00 0.00 0.00 0.00 0.00 0.00 0.		46 2	and a section of the section of	\$0	Carrier or Inspector to
				Total Specialty Items	\$2,147,000
Section 5 - Traffic Items					
Lighting	1	LS	\$100,000	\$100,000	
Traffic Signals	1	EA	\$150,000	\$150,000	
Permanent Signing & Striping	1	LS	\$240,000	\$240,000	ä
Traffic Control Systems	1	LS	\$750,000	\$750,000	
Traffic Management Plan	1	LS	\$75,000	\$75,000	
Ramp Metering	2	EA	\$150,000	\$300,000	

**SUBTOTAL SECTIONS 1 - 5: \$11,124,448** 

Sheet: 3 of 6

DIST - CO - RTE 03-Sac/ED-50 KP: 36.1/37.2, 0.0/3.1 EA: 1C9500 PP No.: Section 6 - Minor Items (5-10%) Subtotal Sections 1 - 5 \$11,124,448 10% \$1,112,445 TOTAL MINOR ITEMS: \$1,112,445 Section 7 - Roadway Mobilization Subtotal Sections 1 - 5 \$11,124,448 Minor Items \$1,112,445 (5-10%) Sum \$12,236,892 X 10% \$1,223,689 TOTAL ROADWAY MOBILIZATION Section 8 - Roadway Additions Supplemental Subtotal Sections 1 - 5 \$11,124,448 Minor Items \$1,112,445 (5-10%) \$12,236,892 Sum 10% \$1,223,689 Contingencies Subtotal Sections 1 - 5 \$11,124,448 Minor Items \$1,112,445 Sum \$12,236,892 X 20% \* \$2,447,378 **TOTAL ROADWAY ADDITIONS** TOTAL ROADWAY ITEMS \$17,130,000 (Total of Sections 1 - 8) **Estimate** Prepared By: David E. Melis (916)-381-9100 31-Jan-06 (Print Name) (Phone) (Date)

<sup>\*</sup> Use 25% at the PSR stage or a higher or lower rate if justified.

v	a.			KP: 36 EA:	03-Sac/ED-50 5.1/37.2, 0.0/3: 1C9500	
I. STRUCTURES ITEMS	<sup>=</sup> #1	#2	#3	PP No. : #4	0 #5	<b>=</b> 0
Bridge Name Bridge No.	Empire Ranch Rd Overcrossing (New)		· · · · · · · · · · · · · · · · · · ·			5 × 10
Structure Type	CIP P/S Box Girder	P.	0	3		
Width (m) - out to out	18.74			X		×
Span Lengths (m)	98.0				-	
Total Area (m²)	1,836.5		2		(E)	,
Footing Type (pile/spread)  Cost per m <sup>2</sup> . Including: Mobilization: 10% Contingency: 25%	\$2,641.60	x.2	* ·		0 * 0	110.00
Bridge Removal Approach Slabs						i G
Total Cost For Structure	\$4,851,000		Y	v <u></u>		
.20		**	SUBTOTAL STR	UCTURES ITEMS	,	\$4,851,000
Railroad Related Costs						
COMMENTS: Bridge remov	val and approach slab	s cost have	TOTAL STRU	JCTURES ITEMS:		\$4,851,000
contingencies included.	vas arta approads i siabi	la.	1) 22			
rar	Đ.	n o		e'		
Estimate Prepared By:	David E. Melis	0	Ye	(916)-381-9100		31-Jan-06
1	(Print Name	e) (Print N	ame)	(Phone)	34	(Date)
				<b>.</b>		

DIST - CO - RTE 03-Sac/ED-50 KP: 3.1/37.2, 0.0/3.1 EA: 1C9500

PP No.: 0

#### **III. RIGHT OF WAY**

Right-of-Way estimates should consider the probable highest and best use and type and intent of improvements at the time of acquisition. Assume acquisition including utility relocation occurs at the right of way certification milestone as shown in the Funding and Scheduling Section of the report. For further guidance see Chapter 1, Caltrans Right of Way Procedural Handbook.

g.	× .	Current Value (Future Use)	Escalation Rate (%/yr)	525	Escalated Value *
Acquisition, including excess lar and damages to remainders	nds	\$6,766,800	5.00%		\$7,460,400
Utility Relocation (Project Cost)	; <del>.</del>	\$29,000	5.00%	_	\$32,000
Clearance / Demolition	E 2	6 <sup>8</sup>	5.00%	2	\$0
Relocation Assistance Program	_		5.00%	_	\$0-
Title and Escrow Fees		\$4,000	N/A	_	\$4,000
CONSTRUCTION CONTRACT	WORK _	6		_	
	HT OF WAY **_ NT VALUE)	\$6,800,000		SCALATED_ HT OF WAY	\$7,496,400
* - Escalated to assumed year	of advertising:	2008			
** - Current total value for use o	on sheet 1 of 6		ži.		12
708	:2:	4,4	120		F:
Estimate prepared by:	David E.		(916)-381-9100		31-Jan-06
E .	(Print Na	me)	(Phone)		(Date)
\$ 2	9	8	G.	Sheet 6	of 6

2	u 3	DIST - CO - RTE 03 Type of Estimate (P PSR, PR, etc.): Program Code:	re-PSR, PR
		EA: 10	.1/37.2, 0.0/3.1
	Project Description:	PP No. :	9300
	r rojour zacaripilari.		
Limits:	On Route 50 from Empire Ranch Road in	the City of Folsom to E	l Dorado Hills Blvd in
	El Dorado County		
	Construct Auxiliary Lanes by widening to Road IC and El Dorado Hills Blvd IC	the outside of Route 50	between Empire Ranch
	***************************************		
	Project Element 2 (Alternative 2) - Constr Route 50 between Empire Ranch Road IC		
* graduated food	ROADWAY ITEMS	#7 707 000	SIGN TO CONSTRUCT S
	STRUCTURE ITEMS	\$7,797,000 \$0	
	SUBTOTAL CONSTRUCTION	\$7,797, <b>000</b>	
	RIGHT OF WAY	\$703,000	2
	TOTAL ALTERNATIVE COST	\$8,500,000	** **
			*
Davienced built	11		
Reviewed by Program Manager	∧ (Signatu	ro)	(Date)
Program Manager	(Signatu	1 <b>6)</b>	(Date)
Approved by	March & M. Dis	(916)-381-9100	01/31/06
Project Manager	(Signature)	(Phone)	(Date)

			4.70		
				DIST - CO - RTE	N
8.	182 (3		0	03-Sac/ED-50	
			KP.	36.1/37.2, 0.0/3.1	
			EA:	1C9500	
			PP No.:	0	9
I. ROADWAY ITEMS			.,		
	Quantity	<u>Unit</u>	Unit Cost	Section Cost	
Section 1 - Earthwork	Same and	<u> </u>	OTHE COOK	OCCION COOL	
Roadway Excavation	25,294	m <sup>3</sup>	\$35.00	\$885,290	×.
Imported Borrow	<del></del> )	m <sup>3</sup>	\$15.00	\$0	
Clearing & Grubbing	1	LS	\$75,000	\$75,000	× ×
Develop Water Supply	1	LS	\$20,000	\$20,000	
Stormwater Treatment BMP's	1	LS	\$300,000	\$300,000	
72" 22			×	Total Earthwork	\$1,280,290
8	æ				
	é				
Section 2 - Structural Section *	>				
PCC Pavement ( Depth)		m <sup>3</sup>	1	\$0	
PCC Pavement ( Depth)		m <sup>3</sup>		\$0	
Asphalt Concrete	17,194	mt	\$70.00	\$1,203,580	
Rubbeazed Asphalt Concrete	660	mt_	\$75.00	\$49,500	V 2
				\$0	
Aggregate Base	11,800	m³	\$45.00	\$531,000	*
Aggregate Subbase		m <sup>3</sup>	\$20.00	\$0	×
Asphalt Treated Permeable Base		m <sup>3</sup>	\$50.00	\$0	
Blanket & Edge Drains		m	\$15.00	\$0	
Edge Drain Outlet			\$40.00	\$0	
	*		Tota	Structural Section	\$1,784,080
		~	€0	E: "	
Section 3 - Drainage		1 2	8		0.9
Extend Box Culvert		_LS_		\$0	
Storm Drains		LS	\$383,000	\$383,000	
Small Drainage Facilities		LS	\$0	\$0	
Project Drainage	4		0407.000	A407.005	
(X-drains, overside, etc.)		LS	\$107,300	\$107,300	
				<del>\$0</del> =	<b>A</b> 100 000
ω 				Total Drainage	\$490,300

<sup>\*</sup> Attach sketch showing typical structural section elements of the roadway. Include (if available) T.I., R-Value, and date when tests were performed

	Ę.				03-Sac/ED-50	
				KI	P: 36.1/37.2, 0.0/3.1	
	07			Ę,	A: 1C9500	
	3			PP No.	0	
	Section 4 - Specialty Items	Quantity	<u>Unit</u>	Unit Cost	Section Cost	
	Retaining Walls		_m²	\$550.00	\$0	
	Soundwalls		m²		\$0	*/
Ŷ	Equipment/Animal Passes		_EA_		\$0	
	Relocate Private Irrigation			a		
	Facilities		m_		<b>\$0</b>	
	Landscaping/Irrigation		<u>HA</u>		<b>\$0</b>	
	Erosion Control	21,000	m <sup>2</sup>	\$1.50	\$31,500	
	Slope Protection		m²		\$0	
	Barriers and Guardrails	1	LS	\$92,000	\$92,000	
	Hazardous Waste Work		LS		\$0	
	Environmental Mitigation		LS		\$0	
	Minor Concrete (Curb, Gutter & Sidewalk)		m3	2	\$0	
	KUNAMBS D S			reconstruction (CV)	\$0	
					Total Specialty Items	\$123,500
	Section 5 - Traffic Items					
	Lighting	1	LS ·	\$600,000	\$600,000	
	Traffic Signals		EA		\$0	
	<b>F</b>					

LS

LS

\$445,000

\$300,000

\$40,000

Permanent Signing & Striping

Traffic Control Systems

Ramp Metering

Traffic Management Plan

**SUBTOTAL SECTIONS 1 - 5:** \$5,063,170

\$445,000

\$300,000

Total Traffic Items

\$40,000

Sheet: 3 of 6

\$1,385,000

DIST - CO - RTE 03-Sac/ED-50 KP: 36.1/37.2, 0.0/3.1

EA: 1C9500 PP No.: Section 6 - Minor Items (5-10%)Subtotal Sections 1 - 5 \$5,063,170 X . 10% \$506,317 TOTAL MINOR ITEMS: \$506,317 Section 7 - Roadway Mobilization Subtotal Sections 1 - 5 \$5,063,170 Minor Items \$506,317 (5-10%) Sum \$5,569,487 10% \$556,949 TOTAL ROADWAY MOBILIZATION \$556,949 Section 8 - Roadway Additions Supplemental Subtotal Sections 1 - 5 \$5,063,170 Minor Items \$506,317 (5-10%)Sum \$5,569,487 10% \$556,949 Contingencies Subtotal Sections 1 - 5 \$5,063,170 Minor Items \$506,317 Sum \$5,569,487 X 20% \* \$1,113,897 TOTAL ROADWAY ADDITIONS \$1,670,846 TOTAL ROADWAY ITEMS \$7,797,000 (Total of Sections 1 - 8) Estimate Prepared By: David E. Melis (916)-381-9100 31-Jan-06 (Print Name) (Phone) (Date)

<sup>\*</sup> Use 25% at the PSR stage or a higher or lower rate if justified.

	9			IST - CO - RTE 03-Sac/ED-50	
23.			KP: 36 EA:	3.1/37.2, 0.0/3.1 1C9500	
# P	25		PP No. :	0	
I. STRUCTURES ITEMS	#1 % #.	2 #3	#4	#5	
Bridge Name Bridge No.					
Structure Type				14	Ψ,
Width (m) - out to out	y	3		**************************************	
Span Lengths (m)					
Total Area (m²)		9		(B)	
Footing Type (pile/spread)	9)		7	361	9
Cost per m <sup>2</sup> . ncluding: Mobilization: 10% Contingency: 25%	-	3 *		1 20	u ž
Bridge Removal	<del></del>			¥)	
Approach Slabs	5)	B:			5) ki
Total Cost For Structure	( <del>v. 17. 14. 14. 14. 14. 14. 14. 14. 14. 14. 14</del>			.=	
E E		SUBTOTAL S	STRUCTURES ITEMS	=	\$0
Railroad Related Costs				ş #	
COMMENTS: Bridge remove contingencies included.	/al and approach slabs cos		TRUCTURES ITEMS:	× 2	\$0
*:			5	>	12
Estimate Prepared By:	David E. Melis	0	(916)-381-9100		31-Jan-06
	(Print Name)	(Print Name)	(Phone)	30 - 3	(Date)
	5 5			_	4

DIST - CO - RTE 03-Sac/ED-50 KP: 3.1/37.2, 0.0/3.1 EA: 1C9500 PP No.: 0

#### III. RIGHT OF WAY

Right-of-Way estimates should consider the probable highest and best use and type and intent of improvements at the time of acquisition. Assume acquisition including utility relocation occurs at the right of way certification milestone as shown in the Funding and Scheduling Section of the report. For further guidance see Chapter 1, Caltrans Right of Way Procedural Handbook.

*	,,(F	uture Use)	Rate (%/yr)		Value *
A and the second second				-	
Acquisition, including excess lands and damages to remainders	8	\$549,600	5.00%	(=	\$605,900
Utility Relocation (Project Cost)	· • • • • • • • • • • • • • • • • • • •	\$146,000	5.00%	: : s=	\$161,000
Clearance / Demolition		i	5.00%		\$0
Relocation Assistance Program	Ş <del></del>	· · · · · · · · · · · · · · · · · · ·	5.00%		\$0
Title and Escrow Fees	<u> </u>	\$7,000	N/A	· :=	\$7,000
CONSTRUCTION CONTRACT WO	ORK			_	
TOTAL RIGHT ( CURRENT)		\$703,000		ESCALATED_ BHT OF WAY	\$774,000
* - Escalated to assumed year of a	dvertising:	2008			
** - Current total value for use on s	heet 1 of 6	- 20			
	~	9 a.	*		300
Estimate prepared by:	David E. Me	elis	(916)-381-9100		31-Jan-06
	(Print Name	.)	(Phone)		(Date)

2),		Type of Estimate (F	
	9	PSR, PR, etc.):	·
	14	Program Code:	FK
			5.1/37.2, 0.0/3.1
	8	EA: .10	
	Project Description:	PP No. :	,9500
n		11 110.	
Limits:	On Route 50 from Empire Ranch Road in	the City of Folsom (nea	r the Sacramento/El Dorado
	County Line)		
S			
roposea improvement:	This project proposes to construct a new i		at Empire Ranch Road
(Scope)			
3	<del></del>	<del></del>	
Alternative:	Project Element 1 - Interchange Alternation	ve 2 (Type L-2/Type L-8	)
(4 ) · · · · · · · · · · · · · · · · · ·		(CZ (X)PCZ Z/ T)PCZ C	
177			
n 50 a = 12 waii			
.75	ROADWAY ITEMS	\$14,567,000	8
	STRUCTURE ITEMS	\$4,851,000	
	SUBTOTAL CONSTRUCTION	\$19,418,000	
5	RIGHT OF WAY	\$6,944,000	2
	TOTAL ALTERNATIVE COST	\$26,362,000	
2 186 9 <del>8</del> 7		3	
Reviewed by		£	
Program Manager	(Signatu	Iro)	(Date)
r rogram manager	(Signati	116)	(Dale)
Approved by	hard & M. O.	(016) 391 0100	01/31/06
	Power - March	(916)-381-9100	
Project Manager	(Signature)	(Phone)	(Date)

(Date)

I. ROADWAY ITEMS	e	ji.	KP: _ EA: _ PP No. : _	DIST - CO - RTE 03-Sac/ED-50 36.1/37.2, 0.0/3.1 1C9500 0	*
Continue 4 Footbooks	Quantity	<u>Unit</u>	Unit Cost	Section Cost	
Section 1 - Earthwork Roadway Excavation Imported Borrow Clearing & Grubbing Develop Water Supply Stormwater Treatment BMP's	22,150 185,360 1 1 1	m³ LS LS LS	\$35.00 \$15.00 \$75,000 \$20,000 \$300,000	\$775,250 \$2,780,400 \$75,000 \$20,000 \$300,000	:5
				Total Earthwork	\$3,950,650
81 E	15		9	9	ŷ.
Section 2 - Structural Section * PCC Pavement ( Depth) PCC Pavement ( Depth)		m <sup>3</sup>	· ·	\$0 \$0	92
Asphalt Concrete	8,170	mt	\$70.00	\$571,900	
Open Graded Asphalt Concrete	953	mt	\$75.00	\$71,475	(*) (* ) (*)
Aggregate Base	9,680	m <sup>3</sup>	\$45.00	\$0 \$435,600	
Aggregate Subbase	9,000	m <sup>3</sup>	\$20.00	\$0	
Asphalt Treated Permeable Base		m <sup>3</sup>	\$50.00	\$0	
Blanket & Edge Drains		m	\$15.00	\$0	
Edge Drain Outlet		m	\$40.00	\$0	
		55	Tota	Structural Section	\$1,078,975
Section 3 - Drainage				8	
Extend Box Culvert	3	LS		\$0	
Storm Drains	1	LS	\$629,000	\$629,000	
Small Drainage Facilities		LS	\$0	\$0	3
Project Drainage	·			(40)	
(X-drains, overside, etc.)	1	_LS_	\$377,222	\$377,222	
				\$0	

<sup>\*</sup> Attach sketch showing typical structural section elements of the roadway. Include (if available) T.I., R-Value, and date when tests were performed

\$1,006,222

Total Drainage

		31 23	KF EA PP No.		· ·
	Quantity	<u>Unit</u>	Unit Cost	Section Cost	
Section 4 - Specialty Items Retaining Walls Soundwalls Equipment/Animal Passes Relocate Private Irrigation		m² m² EA	\$550.00	\$0 \$0 \$0	¥
Facilities		<u>m</u>		\$0_	
Landscaping/Irrigation Erosion Control	1 228 000	HA		\$0	
Slope Protection	1,238,000	$\frac{m^2}{m^2}$	\$1.50	\$1,857,000	
Barriers and Guardrails	1	LS	\$151,000	\$151,000	
Hazardous Waste Work		LS		\$0	
Environmental Mitigation	1	LS	\$100,000	\$100,000	
Minor Concrete (Curb, Gutter & Sidewali	k)	m3		\$0	
7 & 1.6 40	-			\$0	The second section of the second second
				Total Specialty Items	\$2,108,000
Section 5 - Traffic Items					
Lighting	· -1 »	LS	\$100,000	\$100,000	
Traffic Signals	1	EA	\$150,000	\$150,000	
Permanent Signing & Striping	1	LS	\$240,000	\$240,000	<u> </u>
Traffic Control Systems	1	LS	\$750,000	\$750,000	E
Traffic Management Plan Ramp Metering	1	LS	\$75,000	\$75,000	
ramp wetering	( <del>- 11 </del>	EA		\$0	
				Total Traffic Items	\$1,315,000

**SUBTOTAL SECTIONS 1 - 5:** \$9,458,847

Sheet: 3 of 6

DIST - CO - RTE 03-Sac/ED-50 KP: 36.1/37.2, 0.0/3.1

1C9500

Sheet: 4 of 6

EA:

PP No.: (5-10%) Section 6 - Minor Items Subtotal Sections 1 - 5 \$9,458,847 \$945,885 TOTAL MINOR ITEMS: Section 7 - Roadway Mobilization Subtotal Sections 1 - 5 \$9,458,847 Minor Items \$945,885 (5-10%) Sum \$10,404,732 10% \$1.040.473 TOTAL ROADWAY MOBILIZATION Section 8 - Roadway Additions Supplemental \* Subtotal Sections 1 - 5 \$9,458,847 Minor Items \$945,885 (5-10%)Sum \$10,404,732 10% \$1,040,473 Contingencies Subtotal Sections 1 - 5 \$9,458,847 Minor Items \$945,885 Sum \$10,404,732 X 20% \$2,080,946 \$3,121,420 TOTAL ROADWAY ADDITIONS **TOTAL ROADWAY ITEMS** \$14,567,000 (Total of Sections 1 - 8) **Estimate** Prepared By: David E. Melis (916)-381-9100 31-Jan-06 (Print Name) (Phone) (Date)

\* Use 25% at the PSR stage or a higher or lower rate if justified.

2	fi .	an G	10	KP: <u>36</u> .	3-Sac/ED-50 1/37.2, 0.0/3.1	
u *	) f			EA:	1C9500	
II. STRUCTURES ITEMS	#1	#2	#3	PP No. : #4	0 #5	
Bridge Name Bridge No.	Empire Ranch Rd Overcrossing (New)			·	<u> </u>	¥
Structure Type	CIP P/S Box Girder	110-146-1468				
Width (m) - out to out	18.74			***************************************		2
Span Lengths (m)	98.0	•	0			
Total Area (m²)	1,836.5		# <del>************************************</del>			
Footing Type (pile/spread)				· · · · · · · · · · · · · · · · · · ·		ë
Cost per m <sup>2</sup> . cluding: Mobilization: 10% Contingency: 25%	\$2,641.60		E 0		s s Far san	
Bridge Removal		· · · · · · · · · · · · · · · · · · ·	P		<del></del>	· 3.
Approach Slabs				* <del></del>		
Total Cost For Structure	\$4,851,351					s
¥ =	ge		SUBTOTAL STR	UCTURES ITEMS	: <u> </u>	\$4,851,351
Railroad Related Costs			2 <del></del>			
COMMENTS: Bridge remo	val and approach sial	os cost have	TOTAL STRU	CTURES ITEMS:	=	\$4,851,000
g w	8	a	8 2 7	161		¥
Estimate Prepared By:	David E. Melis		)	(916)-381-9100	T.	31-Jan-06
	(Print Nan	ne) (Print	Name)	(Phone)	F	(Date)

DIST - CO - RTE 03-Sac/ED-50 KP: 3.1/37.2, 0.0/3.1 EA: 1C9500

PP No. : 0

#### **III. RIGHT OF WAY**

Right-of-Way estimates should consider the probable highest and best use and type and intent of improvements at the time of acquisition. Assume acquisition including utility relocation occurs at the right of way certification milestone as shown in the Funding and Scheduling Section of the report. For further guidance see Chapter 1, Caltrans Right of Way Procedural Handbook.

10 81 12 10 15 17	Current Value (Future Use)	Escalation Rate (%/yr)	ω ** 4	Escalated Value *
Acquisition, including excess lands and damages to remainders	\$6,910,800	5.00%	2 2 2	\$7,619,200
Utility Relocation (Project Cost)	\$29,000	5.00%		\$32,000
Clearance / Demolition		5.00%		\$0
Relocation Assistance Program	. A. A. SE. J.	5.00%	=	\$0-
Fitle and Escrow Fees	\$4,000	N/A	· .	\$4,000
CONSTRUCTION CONTRACT WORK			41	× s
TOTAL RIGHT OF WAY ** (CURRENT VALUE)	*\$6,944,000_		SCALATED HT OF WAY	\$7,655,200
* - Escalated to assumed year of advertising:	2008	140		
** - Current total value for use on sheet 1 of 6	5			
*	2	*		e.
The state of the s	E. Melis	(916)-381-9100		31-Jan-06
(Print N	lame)	(Phone)		(Date)
18		120	Sheet 6	of 6

DIST - CO - RTE 03-Sac/ED-50

		Type of Estimate (P	re-PSR,	
		PSR, PR, etc.):	PR	
		Program Code:		
		KP: 36	.1/37.2, 0.0/3	3.1
	2	EA: 10		
	Project Description:	PP No. :		2
Limits:	On Route 50 from Empire Ranch Road in	the City of Folsom (near	the Sacramer	nto/El Dorado
	County Line)		E1	
4 A				
٠٠•				
	This project proposes to construct a new i	nterchange on Route 50	at Empire Ran	ch Road
(Scope)				· · · · · · · · · · · · · · · · · · ·
	<u> </u>			
A 1445	Decided Flores 4.1 Voters bears Alternative	va 2 (Trans I 7/Trans I 9	`	
Alternative:	Project Element 1 - Interchange Alternativ	/e 3 (Type L-//Type L-8		
y 94				
*	2. C.	*(4a)   1/4:   1   10   10   10   1   1   1   1   1		
	ROADWAY ITEMS	\$15,075,000		
	STRUCTURE ITEMS	\$4,851,000		
	SUBTOTAL CONSTRUCTION	\$19,926,000		
烧	RIGHT OF WAY	\$6,944,000	10	
	TOTAL ALTERNATIVE COST	\$26,870,000		
	2 2			
	- S			
Reviewed by				
Program Manager	Λ (Signatu	іге)		(Date)
	10-06 701 0'	8	. /-	1/06
Approved by	Ward C. Wels	(916)-381-9100	01/3	1/06
Project Manager	(Signature)	(Phone)	- 4	(Date)

	120				
	*			DIST - CO - RTE	
24				03-Sac/ED-50	
8			KP:	36.1/37.2, 0.0/3.1	
140			EA:		Pr.
*			PP No. :		
I. ROADWAY ITEMS					
a 8 8	Quantity	<u>Unit</u>	Unit Cost	Section Cost	
Section 1 - Earthwork				760	
Roadway Excavation	12,860	m <sup>3</sup>	\$35.00	\$450,100	
Imported Borrow	233,760	m³ .	\$15.00	\$3,506,400	
Clearing & Grubbing	1	LS	\$75,000	\$75,000	
Develop Water Supply	1	LS	\$20,000	\$20,000	
Stormwater Treatment BMP's	, 1	LS	\$300,000	\$300,000	
			¥1	311	
	(5)			Total Earthwork	\$4,351,500
				÷=	
					120
Section 2 - Structural Section *					
PCC Pavement ( Depth)		m³		\$0_	
PCC Pavement ( Depth)		m <sup>3</sup>		\$0	
Asphalt Concrete	8,555	mt	\$70.00	\$598,850	
Open Graded Asphalt Concrete	1,010	<u>mt</u>	\$75.00	\$75,750	-
				\$0	
Aggregate Base	10,000	m <sup>3</sup>	\$45.00	\$450,000	
Aggregate Subbase		m <sup>3</sup>	\$20.00	\$0	
Asphalt Treated Permeable Base		m <sup>3</sup>	\$50.00	\$0	
Blanket & Edge Drains		m	\$15.00	\$0	
Edge Drain Outlet		<u>_m</u> -	\$40.00	\$0 =	04 404 000
		-	10	tal Structural Section	\$1,124,600
Section 3 - Drainage					
Extend Box Culvert		LS		\$0	81
Storm Drains	(R) 1	LS	\$685,000	\$685,000	
Small Drainage Facilities		LS -	\$000,000	\$000,000	
Project Drainage			φυ .	φυ	.53
(X-drains, overside, etc.)	1	LS	\$191,700	\$191,700	
(At diamis, overside, etc.)			Ψ131,700	\$191,700	
8				Total Drainage	\$876,700
				Total Drainage	ψυτυ,τυυ

<sup>\*</sup> Attach sketch showing typical structural section elements of the roadway. Include (if available) T.I., R-Value, and date when tests were performed

Sheet: 2 of 6

03-Sac/ED-50 KP: 36.1/37.2, 0.0/3.1 EA: 1C9500 PP No.: Section Cost Quantity <u>Unit</u> **Unit Cost** Section 4 - Specialty Items Retaining Walls  $m^2$ \$0 \$550.00 m² Soundwalls \$0 Equipment/Animal Passes EΑ \$0 Relocate Private Irrigation **Facilities** \$0 m Landscaping/Irrigation HA \$0 Erosion Control 1,238,000 m² \$1.50 \$1,857,000 Slope Protection m<sup>2</sup> \$0 1 Barriers and Guardrails LS \$164,000 \$164,000 Hazardous Waste Work LS \$0 \$100,000 Environmental Mitigation 1 LS \$100,000 Minor Concrete (Curb, Gutter & Sidewalk) \$0 \$0 \$2,121,000 Total Specialty Items Section 5 - Traffic Items Lighting \$100,000 \$100,000

EΑ

LS

LS

LS

1

1

\$150,000

\$240,000

\$750,000

\$75,000

Traffic Signals

Ramp Metering

Permanent Signing & Striping

Traffic Control Systems

Traffic Management Plan

**SUBTOTAL SECTIONS 1 - 5: \$9,788,800** 

\$150,000

\$240,000

\$750,000 \$75,000

Total Traffic Items

\$0

\$1,315,000

DIST - CO - RTE

Sheet: 3 of 6

DIST - CO - RTE 03-Sac/ED-50 KP: 36.1/37.2, 0.0/3.1 1C9500

EA:

**TOTAL ROADWAY ADDITIONS** 

(Total of Sections 1 - 8)

(916)-381-9100

(Phone)

TOTAL ROADWAY ITEMS

PP No.: (5-10%)Section 6 - Minor Items Subtotal Sections 1 - 5 \$9,788,800 Χ 10% \$978,880 TOTAL MINOR ITEMS: \$978,880 Section 7 - Roadway Mobilization Subtotal Sections 1 - 5 \$9,788,800 Minor Items \$978,880 (5-10%) Sum \$10,767,680 X 10% \$1,076,768 TOTAL ROADWAY MOBILIZATION \$1,076,768 Section 8 - Roadway Additions Supplemental Subtotal Sections 1 - 5 \$9,788,800 Minor Items \$978,880 (5-10%)Sum \$10,767,680 10% \$1,076,768 Contingencies Subtotal Sections 1 - 5 \$9,788,800 Minor Items \$978,880 Sum \$10,767,680 X 20% \$2,153,536

\* Use 25% at the PSR stage or a higher or lower rate if justified.

David E. Melis

(Print Name)

**Estimate** Prepared By:

Sheet: 4 of 6

\$3,230,304

\$15,075,000

31-Jan-06

(Date)

з	2.5		5	KP: <u>36</u> EA:	IST - CO - RTE 03-Sac/ED-50 6.1/37.2, 0.0/3.1 1C9500	
I. STRUCTURES ITEMS	#1 ·	#2	#3	PP No. : #4	0 #5	-
Bridge Name Bridge No.	Empire Ranch Rd Overcrossing (New)		7	-		- -
Structure Type	CIP P/S Box Girder	8				_
Width (m) - out to out	18.74					
Span Lengths (m)	98.0				Here to the second	
Total Area (m²)	1,836.5	3			7	<b>.</b>
Footing Type (pile/spread)					«н <del>е не-</del>	
Cost per m <sup>2</sup> . ncluding: Mobilization: 10% Contingency: 25%	\$2,641.60	a se	2			t. (8/8)
Bridge Removal		-	-	( <del></del>		
Approach Slabs		-		at at		e 8
Total Cöst För Structure	\$4,851,351			V		R
			SUBTOTAL ST	RUCTURES ITEMS		\$4,851,351
Railroad Related Costs				Marine School Pro-	٠	:
COMMENTS: Bridge remo contingencies included.	val and approach sla	abs cost have		UCTURES ITEMS:	, ,	\$4,851,000
				9		
Estimate Prepared By:	David E. Melis	¥.	0	(916)-381-9100		31-Jan-06
)	(Print Na	me) (Prin	t Name)	(Phone)		(Date)
				Sheet:	5	of 6

DIST - CO - RTE 03-Sac/ED-50 KP: 3.1/37.2, 0.0/3.1 1C9500

PP No.:

#### III. RIGHT OF WAY

Right-of-Way estimates should consider the probable highest and best use and type and intent of improvements at the time of acquisition. Assume acquisition including utility relocation occurs at the right of way certification milestone as shown in the Funding and Scheduling Section of the report. For further guidance see Chapter 1, Caltrans Right of Way Procedural Handbook.

* 8	Current Value (Future Use)	Escalation Rate (%/yr)	· 	Escalated Value *
Acquisition, including excess lands and damages to remainders	\$6,910,800	5.00%		\$7,619,200
Utility Relocation (Project Cost)	\$29,000	5.00%	:=	\$32,000
Clearance / Demolition	<u> </u>	5.00%	_	\$0
Relocation Assistance Program	o saw sa	5:00%	y =	\$0
Title and Escrow Fees	\$4,000	N/A	-	\$4,000
CONSTRUCTION CONTRACT WORK				*
TOTAL RIGHT OF WAY ** (CURRENT VALUE)	\$6,944,000		SCALATED_ HT OF WAY	\$7,655,200
* - Escalated to assumed year of advertising:	2008	W 28	Ŧ	
** - Current total value for use on sheet 1 of 6		£ .		
e e e e e e e e e e e e e e e e e e e		> *	8	
Estimate prepared by: David E		(916)-381-9100 (Phone)		31-Jan-06 (Date)
(i interv	u	(1 110110)	Sheet 6	-

		DIST - CO - RTE 03-	-Sac/ED-50
*		Type of Estimate (Pr	e-PSR,
A)		PSR, PR, etc.):	PR
₽		Program Code:	
	18		1/37.2, 0.0/3.1
		EA: 1C	
80	Project Description:	PP No. :	
≅l imits∙	On Route 50 from Empire Ranch Road in	the City of Folsom (near	the Sacramento/El Dorado
	County Line)	the city of I cibeth (near	
*	County Emey		
Pronosed Improvement	This project proposes to construct a new i	nterchange on Route 50 a	t Empire Ranch Road
(Scope)		nicichange on Route 30 a	t Empire Raien Road
(acope)			
× "			
A la sus adissas	Desired Piles and A. T. As all assessments	4 (Th T. 7)	
Alternative:	Project Element 1 - Interchange Alternativ	/e 4 (Type L-7)	
=			
1 20 II II SARKA DI	ROADWAY ITEMS	\$16,161,000	
	STRUCTURE ITEMS	\$4,851,000	£
	SUBTOTAL CONSTRUCTION	\$21,012,000	a a
	RIGHT OF WAY	\$6,800,000	
	TOTAL ALTERNATIVE COST	\$27,812,000	
	TOTAL ALTERNATIVE COST	Ψ21 ,0 12,000	-1
± 0			
Reviewed by	2 2		*
Program Manager	(Signatu	ле)	(Date)
	(2.9	· · - ·	, 1
Approved by	David & Melis	(916)-381-9100	01/31/06
Project Manager	(Signature)	(Phone)	(Date)

	n e - 5	<i>ti</i>		KP: EA: PP No. :	DIST - CO - RTE 03-Sac/ED-50 36.1/37.2, 0.0/3.1 1C9500 0	
I.	ROADWAY ITEMS	Quantity	<u>Unit</u>	Unit Cost	Section Cost	
	Section 1 - Earthwork Roadway Excavation Imported Borrow Clearing & Grubbing Develop Water Supply Stormwater Treatment BMP's	131,815	m³ LS LS LS	\$35.00 \$15.00 \$75,000 \$20,000 \$300,000	\$4,613,525 \$0 \$75,000 \$20,000 \$300,000	
					Total Earthwork	\$5,008,525
	Section 2 - Structural Section * PCC Pavement ( Depth) PCC Pavement ( Depth) Asphalt Concrete Open Graded Asphalt Concrete	8,005	m³ m³ mt	\$70.00 \$75.00	\$0 \$0 \$560,350 \$70,125	16
30.	Aggregate Base Aggregate Subbase Asphalt Treated Permeable Base Blanket & Edge Drains	9,545	m³ m³ m³	\$45.00 \$20.00 \$50.00 \$15.00	\$0 \$429,525 \$0 \$0	5 2:
	Edge Drain Outlet	-	<u>m</u>	\$40.00 Tota	\$0 =	\$1,060,000
e	Section 3 - Drainage Extend Box Culvert Storm Drains Small Drainage Facilities Project Drainage (X-drains, overside, etc.)	1	LS LS LS	\$759,000 \$0 \$212,400	\$0 \$759,000 \$0 \$212,400	[3 2
	* ·		•	V	\$0 Total Drainage	\$971,400

<sup>\*</sup> Attach sketch showing typical structural section elements of the roadway. Include (if available) T.I., R-Value, and date when tests were performed

Sheet: 2 of 6

	ę			DIST - CO - RTE	9 5
•			, KF	03-Sac/ED-50 2: 36.1/37.2, 0.0/3.1	
			EA		1
			PP No.		39
	0	1.124	LI-H CI	Cartian Cart	
Castian 4 Specialty Items	Quantity	<u>Unit</u>	Unit Cost	Section Cost	20 //2
Section 4 - Specialty Items Retaining Walls		$m^2$	\$550.00	\$0	
Soundwalls		$\frac{m^2}{m^2}$	\$330.00	\$0	
Equipment/Animal Passes	<del></del>	EA		\$0	
Relocate Private Irrigation			· · · · · · · · · · · · · · · · · · ·		
Facilities	0.00	m		\$0	
Landscaping/Irrigation		HA		\$0	
Erosion Control	1,238,000	m²	\$1.50	\$1,857,000	
Slope Protection		m <sup>2</sup>		\$0	
Barriers and Guardrails	1	LS	\$182,000	\$182,000	
Hazardous Waste Work		LS		\$0	
Environmental Mitigation	1	LS	\$100,000	\$100,000	
Minor Concrete (Curb, Gutter & Sidewalk)		m3		\$0	
emproper go to both of the				\$0	
***				Total Specialty Items	\$2,139,000
Section 5 - Traffic Items			2:		
Lighting	1	LS	\$100,000	\$100,000	
Traffic Signals	1	EA	\$150,000	\$150,000	
Permanent Signing & Striping	1	LS	\$240,000	\$240,000	¥ ×
Traffic Control Systems		LS	\$750,000	\$750,000	
Traffic Management Plan	1	LS	\$75,000	\$75,000	
Ramp Metering		EA	Ψ. 5,550	\$0	
· · · · · · · · · · · · · · · · · · ·				Total Traffic Items	\$1,315,000

**SUBTOTAL SECTIONS 1 - 5:** \$10,493,925

Sheet: 3 of 6

DIST - CO - RTE 03-Sac/ED-50 KP: 36.1/37.2, 0.0/3.1 EA: 1C9500 PP No. : 0

	2		
Section 6 - Minor Items	040 400	(5-10%)	W.
Subtotal Sections 1 - 5	\$10,493,925	X 10% \$1,049,393	•
(E) # 14		TOTAL MINOR ITEMS:	\$1,049,393
			Y)
Section 7 - Roadway Mobiliza	ation	*	
Subtotal Sections 1 - 5	\$10,493,925		
Minor Items	\$1,049,393	(5-10%)	
	Sum \$11,543,318	X 10% \$1,154,332	
		TOTAL ROADWAY MOBILIZATION	\$1,154,332
			ψ1,101,00 <u>2</u>
	W		
Section 8 - Roadway Addition	ns	#1 M	
Supplemental			
Subtotal Sections 1 - 5	\$10,493,925	20	
Minor Items	\$1,049,393	(5-10%)	8
	Sum \$11,543,318	X 10% <u>\$1,154,332</u>	0.50
Contingencies	A.	3	
Contingencies Subtotal Sections 1 - 5	\$10,493,925	E 5	
Minor Items	\$1,049,393		R S
Willion Rema	Sum \$11,543,318	X 20% * \$2,308,664	
* # # # # # # # # # # # # # # # # # # #	411,070,010	Λ_2070 Ψ2,000,004	
		TOTAL ROADWAY ADDITIONS	\$3,462,995
		TO THE NORDWITT REBITTENE	Ψ0,402,333
		120	
		TOTAL ROADWAY ITEMS	\$16,161,000
U 2 2		(Total of Sections 1 - 8)	11 5
Estimate		383 - 9	3.
Prepared By:	David E, Melis	(916)-381-9100	31-Jan-06
r repared by.	(Print Name)	(Phone)	(Date)
	(i micrazine)	(i none)	(Date)

<sup>\*</sup> Use 25% at the PSR stage or a higher or lower rate if justified.

Sheet: 4 of 6

	* ±			0 KP: <u>36.</u>	ST - CO - RTE 3-Sac/ED-50 1/37.2, 0.0/3.1	
				EA:	1C9500	
I. STRUCTURES ITEMS	#1	#2	#3	PP No. : #4	0 #5	
Bridge Name Bridge No.	Empire Ranch Rd Overcrossing (New)			12 is		*
Bridge 146.						2
Structure Type	CIP P/S Box Girder	1		V <del> </del>		51 m
Width (m) - out to out	18.74					(D)
Span Lengths (m)	98.0					
Total Area (m²)	1,836.5	T >:	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	<del></del>	4
Footing Type (pile/spread)				1 <u>111111111111111111111111111111111111</u>		×
Cost per m².	\$2,641.60			1	*	
cluding: Mobilization: 10% Contingency: 25%	A Maries		3		98 (388 H F)8	× ±0 0 E
Bridge Removal			: ( <del></del>	11		
Approach Slabs			2		•	
Total Cost For Structure	\$4,851,000	:				
2 15	į.		SUBTOTAL STF	RUCTURES ITEMS		\$4,851,000
Railroad Related Costs			·	160		**
×			*			
COMMENTS: Bridge remov	val and approach sl	abs cost have	TOTAL STRI	JCTURES ITEMS:	=	\$4,851,000
contingencies included.					72	
			·	**		37
Estimate Prepared By:	David E. Melis	!	0 *	(916)-381-9100	41	31-Jan-06
	(Print Na	ime) (Print	Name)	(Phone)		(Date)
A. Comment		~ ~	13	Sheet:	5	of 6

DIST - CO - RTE 03-Sac/ED-50 KP: 3.1/37.2, 0.0/3.1 EA: 1C9500 PP No. : 0

## III. RIGHT OF WAY

Right-of-Way estimates should consider the probable highest and best use and type and intent of improvements at the time of acquisition. Assume acquisition including utility relocation occurs at the right of way certification milestone as shown in the Funding and Scheduling Section of the report. For further guidance see Chapter 1, Caltrans Right of Way Procedural Handbook.

n e	Current Value (Future Use)	Escalation Rate (%/yr)	- A	Escalated Value.*
Acquisition, including excess lands and damages to remainders	\$6,766,800	5.00%		\$7,460,400
Utility Relocation (Project Cost)	\$29,000	5.00%		\$32,000
Clearance / Demolition	The state of the s	5.00%	s :	\$0
Relocation Assistance Program	· · · · · · · · · · · · · · · · · · ·	5.00%		
Title and Escrow Fees	\$4,000	N/A		\$4,000
CONSTRUCTION CONTRACT WORK	< ·			
TOTAL RIGHT OF (CURRENT VAL			ESCALATED OHT OF WAY	\$7,496,400
* - Escalated to assumed year of adve	ertising: 2008	2	10	F:
** - Current total value for use on shee	et 1 of 6			
*				
Estimate prepared by:	David E. Melis	(916)-381-9100		31-Jan-06
	(Print Name)	(Phone)	XI	(Date)
			Sheet 6	of 6

	Table 1	DIST - CO - IVIL 03-C	
		Type of Estimate (Pre	-PSR,
	×	PSR, PR, etc.):	PR
		Program Code:	
10	A		/37.2, 0.0/3.1
	96	EA: 1C9	
	Desired Descriptions		300
# N	Project Description:	PP No. :	
Limits:	On Route 50 from Empire Ranch Road in	the City of Folsom to El I	Oorado Hills Blvd in
	El Dorado County		
posed Improvement:	Construct Auxiliary Lanes by widening to	the outside of Route 50 be	etween Empire Ranch
	Road IC and El Dorado Hills Blvd IC		
(ocope)	Total TC and Er Donald Time Dive TC		
5.	<del></del>		
· · · · · · · · · · · · · · · · · · ·			
A164!	D : (D) (2(41) (1) (1) (1)	A. A. Million T. June a forement	
Alternative:	Project Element 2 (Alternative 1) - Constr		
	Route 50 between Empire Ranch Road IC	and El Dorado Hills Blvd	IC.
8			
2 4 7-12 12	Typewine company in the contract of the contra	and the commencer	54144 - 0.144
	ROADWAY ITEMS	\$6,240,000	
	STRUCTURE ITEMS	\$0	
	SUBTOTAL CONSTRUCTION	\$6,240,000	
	RIGHT OF WAY	\$0	3
	TOTAL ALTERNATIVE COST	\$6,240,000	
7.0	TOTAL ALTERNATIVE GOOT	ψο, <u>Σ</u> 10,000	
			11
Reviewed by	.6		*
(4 - 4	***************************************	<del></del>	/D-t-\
Program Manager	Λ (Signatu	ire)	(Date)
	1106 041		01/31/06
	1 10.0 7 1/1/1 0 0	(0.4.0) 0.04.04.00	<i></i>
Approved by	Dono C. Melox	(916)-381-9100	01/3//06

		3			
n ==			200	DIST - CO - RTE	50
2				03-Sac/ED-50	
			KP:	36.1/37.2, 0.0/3.1	
54			EA:	1C9500	
÷	35		PP No. :	0	
I. ROADWAY ITEMS		**	1000		
Oscillator Francisco	Quantity	<u>Unit</u>	Unit Cost	Section Cost	
Section 1 - Earthwork	45.055	3			a
Roadway Excavation	15,855	<del>3</del>	\$35.00	\$554,925	
Imported Borrow	S=============	m³	\$15.00	\$0	
Clearing & Grubbing	1	LS	\$75,000	\$75,000	
Develop Water Supply	1	_LS Z	\$20,000	\$20,000	361
Stormwater Treatment BMP's	1	LS	\$300,000	\$300,000	
å ×				Total Earthwork	\$949,925
8					
			10.0		
Section 2 - Structural Section *					
PCC Pavement ( Depth)	(4)	m³		\$0	T)
PCC Pavement ( Depth)		m <sup>3</sup>		\$0	
Asphalt Concrete	9,775	mt	\$70.00	\$684,250	
Rubberized Asphalt Concrete	660	mt	\$75.00	\$49,500	= 2:
6				\$0	
Aggregate Base	11,800	m³	\$45.00	\$531,000	
Aggregate Subbase		m <sup>3</sup>	\$20.00	\$0	
Asphalt Treated Permeable Base	-	m³ ·	\$50.00	\$0	
Blanket & Edge Drains		m e	\$15.00	\$0	
Edge Drain Outlet		m	\$40.00	\$0	
			Tota	al Structural Section	\$1,264,750
					2.0-2.02
Section 3 - Drainage					
Extend Box Culvert		LS		\$0	
Storm Drains		LS	\$277,000	\$277,000	
Small Drainage Facilities		LS	\$0	\$0	
Project Drainage				Ψ-	
(X-drains, overside, etc.)	1	LS	\$77,500	\$77,500	
, , , , , , , , , , , , , , , , , , , ,		<del></del> -	ψ11,000	\$0	
2 8		-		Total Drainage	\$354,500
	2		i i	TOWN DIGINISHE	Ψυυτιού

<sup>\*</sup> Attach sketch showing typical structural section elements of the roadway. Include (if available) T.I., R-Value, and date when tests were performed

Unit

Quantity

Section 4 - Specialty Items

DIST - CO - RTE
03-Sac/ED-50
KP: 36.1/37.2, 0.0/3.1
EA: 1C9500
PP No.: 0
Unit Cost Section Cost

Retaining Walls		m <sup>2</sup>	\$550.00	\$0	
Soundwalls		m²		\$0	
Equipment/Animal Passes		EA		\$0	
Relocate Private Irrigation				S	9
Facilities		m		\$0	
Landscaping/Irrigation		HA		\$0	-1
Erosion Control	21,000	m <sup>2</sup>	\$1.50	\$31,500	[+]
Slope Protection		m <sup>2</sup>		\$0	
Barriers and Guardrails	1	LS	\$66,000	\$66,000	
Hazardous Waste Work		LS		\$0	
Environmental Mitigation		LS		\$0	
Minor Concrete (Curb, Gutter & Sidewalk)		m3 ·		\$0	
names a la ministra	- 1		an area and the first	\$0	
				Total Specialty Items	\$97,500
Section 5 - Traffic Items				\$2 /st	
Lighting	1	LS	\$600,000	\$600,000	
Traffic Signals		EA		\$0	
Permanent Signing & Striping	1	LS	\$445,000	\$445,000	
Traffic Control Systems	1	LS	\$300,000	\$300,000	E) (#
Traffic Management Plan	1	LS	\$40,000	\$40,000	
Ramp Metering		EA	/	\$0	- 6
				Total Traffic Items	\$1,385,000

**SUBTOTAL SECTIONS 1 - 5:** \$4,051,675

Sheet: 3 of 6

DIST - CO - RTE 03-Sac/ED-50 KP: 36.1/37.2, 0.0/3.1

1C9500

Sheet: 4 of 6

EA:

PP No.: Section 6 - Minor Items (5-10%)Subtotal Sections 1 - 5 \$4,051,675 10% \$405,168 TOTAL MINOR ITEMS \$405,168 Section 7 - Roadway Mobilization Subtotal Sections 1 - 5 \$4,051,675 (5-10%) Minor Items \$405,168 \$445,684 Sum \$4,456,843 X· 10% TOTAL ROADWAY MOBILIZATION Section 8 - Roadway Additions Supplemental Subtotal Sections 1 - 5 \$4,051,675 Minor Items (5-10%) \$405,168 \$4,456,843 10% \$445.684 Sum Contingencies Subtotal Sections 1 - 5 \$4,051,675 \$405,168 Minor Items \$891,369 \$4,456,843 X 20% Sum \$1,337,053 TOTAL ROADWAY ADDITIONS TOTAL ROADWAY ITEMS \$6,240,000 (Total of Sections 1 - 8) Estimate Prepared By: David E. Melis (916)-381-9100 31-Jan-06 (Print Name) (Phone) (Date)

\* Use 25% at the PSR stage or a higher or lower rate if justified.

·	6	12		_	01ST - CO - RTE 03-Sac/ED-50 6.1/37.2, 0.0/3.1 1C9500 0	_	
II. STRUCTURES ITEMS	#1	#2	#3	#4	#5	- =	,
Bridge Name Bridge No.				-	*		
Structure Type				¥			
Width (m) - out to out		·				e: (*)	
Span Lengths (m)	-				/ <del></del>	€3	
Total Area (m²)							
Footing Type (pile/spread)					X <del>III</del>	2 •	
Cost per m <sup>2</sup> . cluding: Mobilization: 10% Contingency: 25%	110000	*		******** ** **	2		
Bridge Removal		<del></del>			\$ } <del></del>	6	
Approach Slabs	· · · · · · · · · · · · · · · · · · ·				: <del></del>	e	
Total Cost For Structure			-				
2		S	SUBTOTAL STRU	ICTURES ITEMS	6		\$0
Railroad Related Costs		8	<u> </u>		*	ğ	•
COMMENTS: Bridge remove contingencies included.	val and approach slab	s cost have	FOTAL STRUC	CTURES ITEMS	:		\$0
*		¥		ar j		×	
Estimate Prepared By:	David E. Melis	0		916)-381-9100	(1	31-Jan-0	6
<u>ن</u> .	(Print Name	e) (Print N	ame)	(Phone)	*)	(Date)	

DIST - CO - RTE 03-Sac/ED-50 KP: 3.1/37.2, 0.0/3.1 EA: 1C9500 PP No.: 0

#### **III. RIGHT OF WAY**

Right-of-Way estimates should consider the probable highest and best use and type and intent of improvements at the time of acquisition. Assume acquisition including utility relocation occurs at the right of way certification milestone as shown in the Funding and Scheduling Section of the report. For further guidance see Chapter 1, Caltrans Right of Way Procedural Handbook.

ž :	Current Value (Future Use)	Escalation Rate (%/yr)	W =	Escalated Value *
Acquisition, including excess lands				8
and damages to remainders	No.	5.00%		\$0
Utility Relocation (Project Cost)		5.00%	. 8	\$0
			-	
Clearance / Demolition	***************************************	5.00%		\$0
Relocation Assistance Program		5.00%	-	\$0
Title and Escrow Fees	3	N/A		\$0
CONSTRUCTION CONTRACT WORK			2=	
TOTAL RIGHT OF WA (CURRENT VALUE			SCALATED_ IT OF WAY	\$0
* - Escalated to assumed year of adverti	ising:2008		ž.	
** - Current total value for use on sheet	of 6			N 14
			0.267	
Estimate prepared by: Da	avid E. Melis	(916)-381-9100	8	31-Jan-06
(Pi	rint Name)	(Phone)		(Date)
		197	<b>.</b>	

Sheet 6 of 6

# Traffic Operations Report

Attachment F

# TRAFFIC REPORT

FOR THE EMPIRE RANCH ROAD/ROUTE 50 INTERCHANGE
PROJECT REPORT

This report was prepared under my direction and responsible charge. I attest to the technical information contained herein and have judged the qualification of any technical specialists providing engineering data upon which recommendations, conclusions, and decisions are based.

Alan Telford, P.E.

Registered Professional Engineer

Fehr & Peers Associates, Inc.

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## 1. INTRODUCTION

The purpose of this report is to describe the traffic operations analysis for the proposed Route 50 /Empire Ranch Road Interchange Project Report (PR). This project would construct a new interchange on Route 50 in the City of Folsom located between the East Bidwell Street/Scott Road interchange and the El Dorado Hills Boulevard interchange near the border between Folsom and El Dorado County. The new interchange would provide access to Empire Ranch Road, a new north-south arterial roadway that is planned to serve the eastern portion of Folsom and connect to Sophia Parkway in El Dorado County. The objective of this project is to improve accessibility to planned development in eastern Folsom and western El Dorado Hills and to reduce congestion at existing Route 50 interchanges in both jurisdictions.

The traffic operations analyses contained in this report include components of the freeway system and local arterial system that would be affected by the Empire Ranch Road/Route 50 interchange. The study area shown in Figure 1 includes Route 50 from East Bidwell Street/Scott Road to the future Silva Valley Parkway interchange. The remainder of this report contains the following chapters.

- Chapter 2 Traffic Operations Analysis Methodology
- Chapter 3 Existing Conditions
- Chapter 4 Project Description
- Chapter 5 2006 Operations Analysis
- Chapter 6 2026 Operations Analysis
- Chapter 7 Regional Circulation Issues

Chapter 2 describes the methodology used to develop traffic volume forecasts and analyze freeway and local arterial traffic operations. Chapter 3 presents the existing traffic operations in the study area. Chapter 4 describes the No Build alternative and the four proposed build alternatives. Chapters 5 and 6 present the results of the traffic operations analysis under construction year (2006) and design year (2026) conditions, respectively. Chapter 7 describes the regional circulation issues within the study area.

## 2. TRAFFIC OPERATIONS ANALYSIS METHODOLOGY

Prior to analyzing traffic operations for the various arterial and freeway facilities, the scope of work and methodologies for developing traffic volume forecasts and conducting traffic operations analysis were reviewed by the Project Development Team (PDT), which consisted of representatives from Caltrans, El Dorado County, the City of Folsom, Sacramento County, and Mark Thomas & Co. Inc. The methodology used to forecast future travel demand is described below followed by the methodologies used for the traffic operations analysis.

#### 2.1 TRAFFIC VOLUME FORECASTS

The traffic volume forecasts were generated using a modified version of the 2002 version of the 2025 SACMET model that is maintained by the Sacramento Area Council of Governments (SACOG). This is the latest approved version of the model. The modifications to the model included land use updates to reflect recently approved projects and roadway network refinements to be consistent with Tier 1 roadway improvements contained in the 2025 Metropolitan Transportation Plan (MTP). A summary of the key modifications is provided below.

- Split Traffic Analysis Zones (TAZs) SACMET TAZs in the vicinity of the project area were
  split where necessary to increase the level of land use detail in the study area.
- Adjust Base Year Land Use The SACMET Base Year land uses were modified based on a review of a detailed aerial photograph and field visits.
- Modify Roadway Networks The SACMET roadway network was modified to include the
  proposed project, to match the existing and planned roadway alignments, and to maintain
  consistency with Tier 1 roadway improvements contained in the MTP.

After making these modifications, 2025 a.m. and p.m. peak hour traffic volume forecasts were generated and adjusted to account for model error. A technical memorandum (see Appendix A) presenting the preliminary travel demand forecasts based on the roadway network and land use modifications for 2025 was submitted to the PDT for review. PDT comments are reflected in the final forecasts contained in this report and used in the traffic operations analysis.

Since the design year for this project is 2026, the 2025 forecasts were factored up to account for an extra year of growth. Ramp volumes were increased by four percent and the mainline Route 50 volumes were increased by two percent. These growth factors are based on the overall projected growth rates between 2002 and 2025 for the study area. A final adjustment to the 2026 forecasts was made by Caltrans after reviewing the projected traffic loadings between the El Dorado Hills Boulevard, Empire Ranch Road, and East Bidwell Street interchanges. At the request of Caltrans, some peak hour traffic was shifted from the adjacent interchanges to the Empire Ranch Road interchange to provide a more reasonable balance of traffic loading among the interchanges. This type of refinement is often required when using a regional travel demand model to develop local area traffic forecasts, and as a sensitivity analysis to "test" certain movements.

Construction year (2006) peak hour forecasts were developed by applying a linear growth rate between existing and 2025 conditions. An average annual growth rate of two percent was used for all locations except for the Route 50 westbound on-ramp at El Dorado Hills Boulevard during the a.m. peak hour. For this location, it was assumed that the existing bottleneck on Route 50 at the on-ramp discourages some travelers from using the on-ramp during the a.m. peak hour. The planned elimination of this bottleneck as part of the El Dorado Hills Boulevard interchange reconstruction (Phase 1 improvements are assumed to be completed by 2006) is likely to cause an increase in peak hour trips in addition to new trips from population and employment growth. These induced trips would occur from travelers adjusting their departure times, diverting from an alternative route, or shifting from another mode. Therefore, 30 percent of the traffic growth anticipated between existing and 2025 conditions was assumed to occur by 2006 although only 15 percent of the time has passed. For the planned facilities such as Empire Ranch Road and Iron Point Road, where the interpolation methodology was not applicable, the 2006 traffic forecasts were developed by factoring the 2026 forecasts after reviewing existing traffic counts and 2005 traffic forecasts developed using the regional SACMET model.

The construction year peak hour traffic forecasts were developed assuming that Iron Point Road would extend to the county line but would not connect to Saratoga Way by 2006. However, the construction year analysis includes traffic conditions both with and without a connection between Iron Point Road and Saratoga Way to compare the distribution of traffic between these two scenarios.

April 28, 2004

## 2.2 ANALYSIS METHODOLOGY AND KEY ASSUMPTIONS

A traffic operations analysis was completed for the freeway mainline, freeway ramp junctions, ramp terminal intersections, and ramp metering. Analysis methodologies and key assumptions are listed below.

## Analysis Methodology

- All operations analyses were conducted using procedures and methodologies contained in the Highway Capacity Manual 2000 (HCM 2000), Transportation Research Board, 2000.
- Freeway mainline segments were analyzed using the LOS thresholds contained in the El Dorado County General Plan. These LOS thresholds are based on the methodologies contained in the HCM 2000.
- Freeway ramp junctions were analyzed using the Highway Capacity Software (HCS), which applies the HCM 2000 procedures.
- Signalized intersections were analyzed using Synchro 5.0. Synchro's calculation of intersection delay is consistent with the procedures described in the HCM 2000. Unsignalized ramp terminal intersections were analyzed using Traffix 7.5 with the HCM 2000 methodology included.
- Ramp metering was analyzed using the methodologies contained in Highway Design Manual, Caltrans, 2001.
- The operations analysis does not quantitatively consider the system-wide operational effects
  on Route 50 and the connecting arterial system because a traffic simulation model was not
  used. However, the report qualitatively describes the locations where potential operational
  problems occur due to system-wide effects.

#### **Key Assumptions**

- A Peak Hour Factor (PHF) of 0.90 was used for freeway mainline, ramps and local roadways.
- A peak hour truck percentage of 4 percent for freeway mainline and ramps and 2 percent for local roadways were used for both peak hours.
- A free flow speed of 70 mph was used for the freeway mainline and 35 mph for the ramps.

- The intersection saturation flow rate was assumed to be 1,900 passenger cars per hour per lane.
- The percentage of high occupancy vehicles (HOV's) for the on-ramp traffic was assumed to be 14 percent, a typical value for commuter traffic.
- The HCM 2000 methodology for freeway operations analysis does not account for High Occupancy Vehicle (HOV) lanes. Therefore, this study reduced mainline volumes by the projected utilization percentages described below and excluded the HOV lanes from the ramp junction technical calculations. For eastbound Route 50 under 2026 conditions, HOV traffic was assumed to be 16 percent and 22 percent in the a.m. and p.m. peak hours, respectively, per direction from Caltrans. For westbound Route 50, HOV traffic was assumed to be 23 percent and 16 percent in the a.m. and p.m. peak hours, respectively. The HOV percentages for 2006 conditions were developed by interpolating between the existing HOV traffic counts and 2026 HOV traffic forecasts.
- The ramp metering queuing calculations were based on 15-minute interval traffic counts collected during the two-hour peak periods (7:00 to 9:00 a.m. and 4:00 to 6:00 p.m.).
- A vehicle length of 9 meters (29.5 feet, the distance from the front of one vehicle to the front of the next vehicle) was used to determine the ramp metering queue lengths.
- Ramp metering rates were set to the practical lower and upper limits of 240 and 1,000 vehicles per hour per lane, respectively.
- Ramp meters were assumed to operate during the entire two-hour a.m. and p.m. peak hour analysis periods.

The analysis methodology described above was used to measure a.m. and p.m. peak hour traffic operations for the study intersections and Route 50. The analysis results include a descriptive term known as level of service (LOS). LOS is a measure of traffic operating conditions, which varies from LOS A (the best) to LOS F (the worst). Tables 1 through 3 describe the LOS criteria from the *HCM 2000* for signalized intersections, unsignalized intersections, and freeway ramp junctions, respectively.

Table 1 Signalized Intersection LOS Criteria				
LOS	Description	Average Control Delay (seconds/vehicle)		
Α	Operations with very low delay occurring with favorable progression and/or short cycle length.	≤ 10		
В	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10 to 20		
С	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20 to 35		
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35 to 55		
E	Operations with high delay values indicating poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	> 55 to 80		
F	Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	> 80		
Source: Hig	hway Capacity Manual (Transportation Research Board, 2000)			

	Table 2 Unsignalized Intersection LOS Criteria	
LOS	Description	Average Control Delay (seconds/vehicle)
A	Little or no conflicting traffic.	≤ 10
В	The approach begins to notice absence of available gaps.	> 10 to 15
С	The approach begins experiencing delay for available gaps.	> 15 to 25
D	The approach experiences queuing due to a reduction in available gaps.	> 25 to 35
E	Extensive queuing due to insufficient gaps.	> 35 to 50
F	Insufficient gaps of suitable size to allow traffic demand to cross safely through a major traffic stream.	> 50
Source: High	way Capacity Manual (Transportation Research Board, 2000)	

April 28, 2004

LOS	Description	Density <sup>1</sup>
Α	Free-flow speeds prevail. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream.	≤10
В	Free-flow speeds are maintained. The ability to maneuver with the traffic stream is only slightly restricted.	> 10 to 20
С	Flow with speeds at or near free-flow speeds. Freedom to maneuver within the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver.	> 20 to 28
D	Speeds decline slightly with increasing flows. Freedom to maneuver with the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort.	> 28 to 35
Е	Operation at capacity. There are virtually no usable gaps within the traffic stream, leaving little room to maneuver. Any disruption can be expected to produce a breakdown with queuing.	> 35 to 43
F	Represents a breakdown in flow.	> 43

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

Although ramp junctions will govern freeway operations through the study area, the traffic operations analysis included a check of mainline Route 50 capacity using the LOS threshold capacities contained in Table 4.

Table 4 Freeway Mainline Peak Hour LOS Thresholds <sup>1</sup>						
Facility Type	Α	В	С	, D	Е	
2 Lanes	1,110 / 0.28	2,010 / 0.50	2,880 / 0.72	3,570 / 0.89	4,010 / 1.00	
2 Lanes + Auxiliary lane	1,410 / 0.28	2,550 / 0.51	3,640 / 0.72	4,490 / 0.89	5,035 / 1.00	
3 Lanes	1,700 / 0.28	3,080 / 0.51	4,400 / 0.73	5,410 / 0.89	6,060 / 1.00	
3 Lanes + Auxiliary lane	2,010 / 0.28	3,640 / 0.51	5,180 / 0.73	6,350 / 0.89	7,100 / 1.00	
4 Lanes	2,320 / 0.29	4,200 / 0.52	5,950 / 0.73	7,280 / 0.89	8,140 / 1.00	

(1) Numbers in each cell indicate traffic volume / volume-capacity ratio.

Source: El Dorado County General Plan.

## 2.3 ANALYSIS EVALUATION CRITERIA

The analysis evaluation criteria are used to determine acceptable traffic operating conditions. According to the State Route 50 Transportation Concept Report (Caltrans, District 3, April 1998), Caltrans has adopted LOS F as the route concept LOS for Route 50 within the project vicinity. The Sacramento County General Plan (1993) establishes LOS E as the LOS standard for Route 50 within the study area. However, for the purpose of this interchange design study, LOS D or better conditions are considered desirable for freeway facilities including freeway mainline, ramp junctions, and ramp terminal intersections in the study area.

The City of Folsom General Plan (1995) identifies LOS C for local roadways. Therefore, LOS C is used for the local study intersection.

## 3. EXISTING TRAFFIC OPERATIONS ANALYSIS

The existing conditions analysis presents the physical and operational characteristics of the roadway system in the vicinity of the proposed project. This information provides part of the context for the purpose and need to construct improvements.

#### 3.1 STUDY AREA

Route 50 and the existing key roadways in the study area are described below.

#### Route 50

Route 50 is a major east-west regional highway connecting Sacramento and the Central Valley with Lake Tahoe and the Sierra Nevada mountains. Beginning at the Interstate 80 separation, Route 50 travels through Yolo County, Sacramento County, El Dorado County, and ends at the California/Nevada State Line. Within the study area, Route 50 is four-lane divided freeway and runs east-west through the City of Folsom. As the transportation backbone facility in the City of Folsom and El Dorado County, Route 50 carries a significant amount of commuter traffic and recreational travel to ski resorts and Nevada casinos.

#### East Bidwell Street

East Bidwell Street is a four- to six-lane north-south arterial in the City of Folsom that extends from Route 50 to Coloma Street in the Folsom Historic District. East Bidwell Street becomes Scott Road south of Route 50. The East Bidwell Street/Scott Road interchange is located west of the proposed Empire Ranch Road interchange.

#### Iron Point Road

Iron Point Road is a four- to six-lane east-west arterial roadway in the City of Folsom that parallels Route 50 to the north from Folsom Boulevard to east of East Bidwell Street. This roadway is planned to extend east to Empire Ranch Road and eventually connect to Saratoga Way in El Dorado County.

#### El Dorado Hills Boulevard

El Dorado Hills Boulevard is a four- to six-lane north-south arterial roadway in El Dorado County that extends from Route 50 to Green Valley Road. El Dorado Hills Boulevard becomes Latrobe Road south of Route 50 and Salmon Falls Road north of Green Valley Road. The El Dorado Hills Boulevard/Latrobe Road interchange is located east of the proposed Empire Ranch Road interchange.

#### 3.2 STUDY LOCATIONS

The operations analysis under existing conditions includes the following freeway facilities.

#### **Freeway Mainline Segments**

- Route 50 eastbound: East Bidwell Street/Scott Road to El Dorado Hills Boulevard/Latrobe Road
- Route 50 eastbound: El Dorado Hills Boulevard/Latrobe Road to Bass Lake Road
- Route 50 westbound: Bass Lake Road to El Dorado Hills Boulevard/Latrobe Road
- Route 50 westbound: El Dorado Hills Boulevard/Latrobe Road to East Bidwell Street/Scott Road

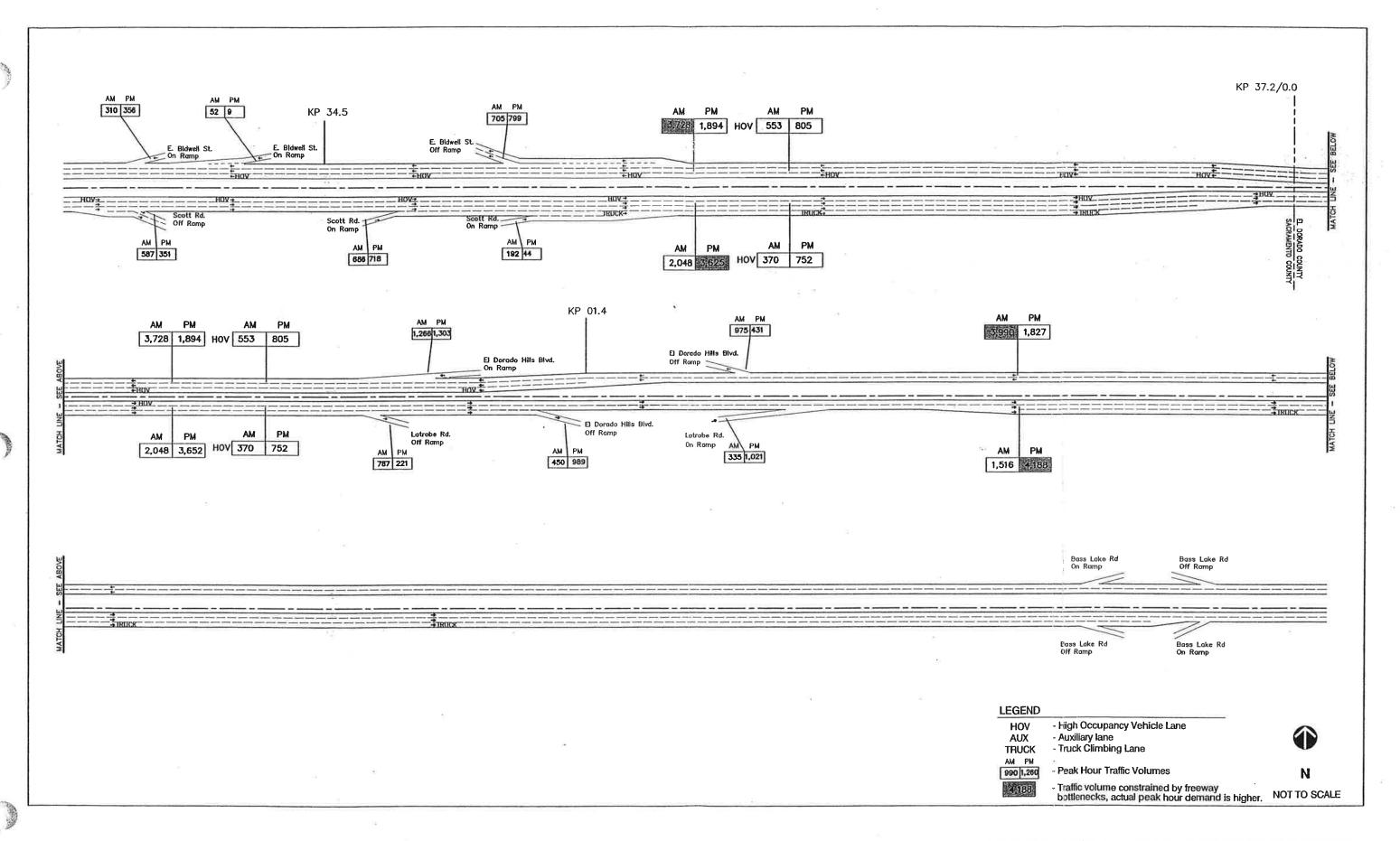
No existing conditions analysis was performed for the study intersections since none exist under current conditions.

#### 3.3 DATA SOURCES

The traffic analysis was conducted based on traffic flow, geometric roadway, and accident data. The following data was collected to complete the existing conditions analysis.

- The existing freeway mainline a.m. (6:00-8:30) and p.m. (4:00-6:00) peak period traffic volumes and lane configurations on Route 50 between East Bidwell Street and El Dorado Hills Boulevard were collected by Fehr & Peers in June 2003.
- The a.m. and p.m. peak hour traffic volumes at the East Bidwell Street on- and off-ramps were collected by Fehr & Peers in June 2002.
- The a.m. and p.m. peak hour traffic volumes at the El Dorado Hills Boulevard on- and off-ramps were collected by Prism Engineering in 2003.

Figure 2 displays the existing freeway mainline peak hour traffic volumes and lane configurations.



#### 3.5 Existing Freeway Mainline Level of Service

Table 5 summarizes the AM and PM peak hour LOS on Route 50 between East Bidwell Street/Scott Road and El Dorado Hills Boulevard/Latrobe Road. For locations with constrained traffic volumes, Caltrans travel time analysis from the 2002 Congestion Report (Caltrans District 3, December 2002) was used to estimate LOS.

Table 5 Freeway Mainline LOS - Exi	STING CONDI	rions		
	AM I	Peak	PM Peak	
Freeway Mainline	V/C <sup>1</sup>	LOS 2	V/C 1	LOS 2
Route 50 Eastbound: E. Bidwell St. to El Dorado Hills Blvd.	0.51	С	1 <u>I</u>	ρ3
Route 50 Eastbound: El Dorado Hills Blvd. to Bass Lake Rd.	0.38	В	<u>&gt;1.00</u>	<u>F</u>
Route 50 Westbound: Bass Lake Rd. To El Dorado Hills Blvd	<u>F</u> <sup>3</sup>		0.46	В
Route 50 Westbound: El Dorado Hills Blvd. to E. Bidwell St.	F	3	0.47	В

#### Notes:

- (1) V/C is the volume to capacity ratio.
- (2) LOS based on the El Dorado County General Plan.
- (3) LOS F was identified at these locations based on the 2002 Congestion Report (Caltrans District 3, December 2002).

Bold font with underscore indicates unacceptable operations.

Source: Fehr & Peers, 2003.

Table 5 shows that the Route 50 mainline segments between East Bidwell Street/Scott Road and Bass Lake Road operate unacceptably at LOS F in the peak directions (i.e., westbound during the a.m. peak hour and eastbound during the p.m. peak hour). The Caltrans 2002 Congestion Report defines congestion delay as a condition lasting for 15 minutes or longer where travel demand exceeds freeway design capacity, as evidenced by vehicular speeds of 35 mph or less during peak commute periods on a typical incident-free weekday (see Appendix B for Caltrans 2002 Congestion Map).

#### 3.6 TRAFFIC SAFETY

Table 6 shows a summary of a three-year traffic accident history on Route 50 between East Bidwell Street/Scott Road and El Dorado Hills Boulevard/Latrobe Road in the project vicinity. The TASAS database maintained by Caltrans is the source for this information. The data shown is for the three-year period between July 1999 and June 2002.

Table 6 Route 50 Accident History - July	1999 Through	I JUNE 2002		
Location	Total Accidents	Total Fatalities	Actual Accident Rate <sup>1</sup>	Average Accident Rate <sup>1</sup>
Route 50: between E. Bidwell St. and El Dorado Hills Blvd. (Post Mile SAC 21.500 to ED 0.859)	136	0	0.72	0.68

Notes:

Bold type indicates that the actual accident rate on this segment is greater than the average accident rate for similar facilities.

Source: Caltrans District 3 TASAS Table B, July 1999 to June 2002.

The above table shows that the actual accident rate on mainline Route 50 in the vicinity of the proposed Empire Ranch Road interchange is slightly higher than the average accident rate for similar freeway facilities. In the three-year data collection period, 136 accidents occurred with no fatalities. Table 7 categorizes the recorded accidents by type.

TABLE ROUTE 50 ACCIDENT HISTORY – N		Accidents i	ч Түре		
	Accident Type				
Location	Rear End	Hit Object	Side- swipe	Other <sup>1</sup>	Total
Route 50; between E. Bidwell St. and El Dorado Hills Blvd. (Post Mile SAC 21.500 to ED 0.859)	87 (64%)	16 (12%)	15 (11%)	18 (13%)	136

Notes:

(1) Other includes broadside, head-on, over-turn collisions.

Source: Caltrans District 3 TASAS Table B, July 1999 to June 2002.

As shown in Table 7, the most frequent type of accident on Route 50 is rear-end collisions (64 percent). A high frequency of rear-end accidents is consistent with the stop-and-go peak direction traffic conditions that exist along this section of Route 50.



<sup>(1)</sup> Per million vehicles.

# 4. PROJECT DESCRIPTION

The construction of the Empire Ranch Road interchange is an integral component of the City of Folsom transportation network to accommodate approved growth since the development of its General Plan in the early 1990s. El Dorado County has also incorporated the interchange as part of its growth plans by cooperatively working with the City to provide connections between Saratoga Way and Iron Point Road and between Sophia Parkway and Empire Ranch Road. The proposed interchange would be located on Route 50 between the East Bidwell Street/Scott Road and El Dorado Hills Boulevard/Latrobe Road interchanges near the border between Sacramento and El Dorado Counties. Detailed descriptions of the project alternatives are provided below.

#### 4.1 NO BUILD ALTERNATIVE

For comparison purposes, a "do-nothing" or No Build alternative is analyzed in this study and includes the following roadway improvements within the study area.

- The proposed Empire Ranch Road interchange is not constructed on Route 50.
- Tier 1 roadway improvements (i.e., these improvements have reasonably expected revenues)
- contained in the 2025 Sacramento Metropolitan Transportation Plan (MTP) are assumed to be in place depending on their completion dates (see Table 8).
- Other future roadway improvements committed to by the City of Folsom and El Dorado County that could affect traffic circulation in the study area.

Table 8 lists the Tier 1 roadway improvements within the study area and the expected completion year. Chapter 7 discusses the coordination and timing of these improvements in more detail.

OVEMENTS IN MTP	
Roadway Improvements	Year
Add HOV lanes	2010
Add a new interchange	2008
Reconstruct interchange (phase 1) and construct new two-lane extension of Saratoga Way to Arrowhead Drive	2006
Construct four-lane section	2006
Extend with four-lane section to El Dorado County	
Construct a new four-lane undivided road	2018
Construct a new four-lane divided road	2006
	Roadway Improvements  Add HOV lanes  Add a new interchange  Reconstruct interchange (phase 1) and construct new two-lane extension of Saratoga Way to Arrowhead Drive  Construct four-lane section  Extend with four-lane section to El Dorado County  Construct a new four-lane undivided road

According to Table 8, no major improvements would be made to the Route 50 freeway mainline before 2006. However, the following improvements would be in place on Route 50 within the project vicinity by 2010.

- A new interchange would be constructed on Route 50 at Silva Valley Parkway, which is located halfway between El Dorado Hills Boulevard/Latrobe Road and Bass Lake Road. This interchange would consist of one off-ramp and two on-ramps serving each direction of Route 50. These on-and off-ramps would be connected with the ramps at adjacent interchanges (i.e., El Dorado Hills Boulevard interchange to the west and Bass Lake Road interchange to the east) using auxiliary lanes.
- HOV lanes would be added to Route 50 between El Dorado Hills Boulevard/Latrobe Road and South Shingle Springs Road/Ponderosa Road. Therefore, the Route 50 freeway mainline between El Dorado Hills Boulevard/Latrobe Road and Bass Lake Road would be widened from two mixed-flow lanes to a total of four lanes (i.e., two mixed-flow lanes plus a HOV lane and an auxiliary lane) in both directions.

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## 4.2 BUILD ALTERNATIVES

The build alternatives propose to construct a new interchange on Route 50 between East Bidwell Street/Scott Road and El Dorado Hills Boulevard/Latrobe Road at Empire Ranch Road. Four project design alternatives have been selected for evaluation. These design alternatives have been identified as Build Alternatives 1 to 4 (see Figure 3). Each alternative includes the following elements, which may be constructed as one entire project or in phases.

- Element 1 Construct a new interchange on Route 50 at Empire Ranch Road
- Element 2: Extend the eastbound truck-climbing lane and construct westbound auxiliary lane from Empire Ranch Road to El Dorado Hills Boulevard/Latrobe Road by widening 2510 within the median of Route 50

Modify the El Dorado Hills Boulevard/Latrobe Road interchange undercrossing and Element 3: construct an additional eastbound lane in the median to the Bass Lake grade truckclimbing lane. The HOV lane designation on this additional eastbound lane will be extended from its current terminus (west of the El Dorado Hills Boulevard interchange) to approximately 1/4 mile west of the start of existing Bass Lake grade truck-climbing lane

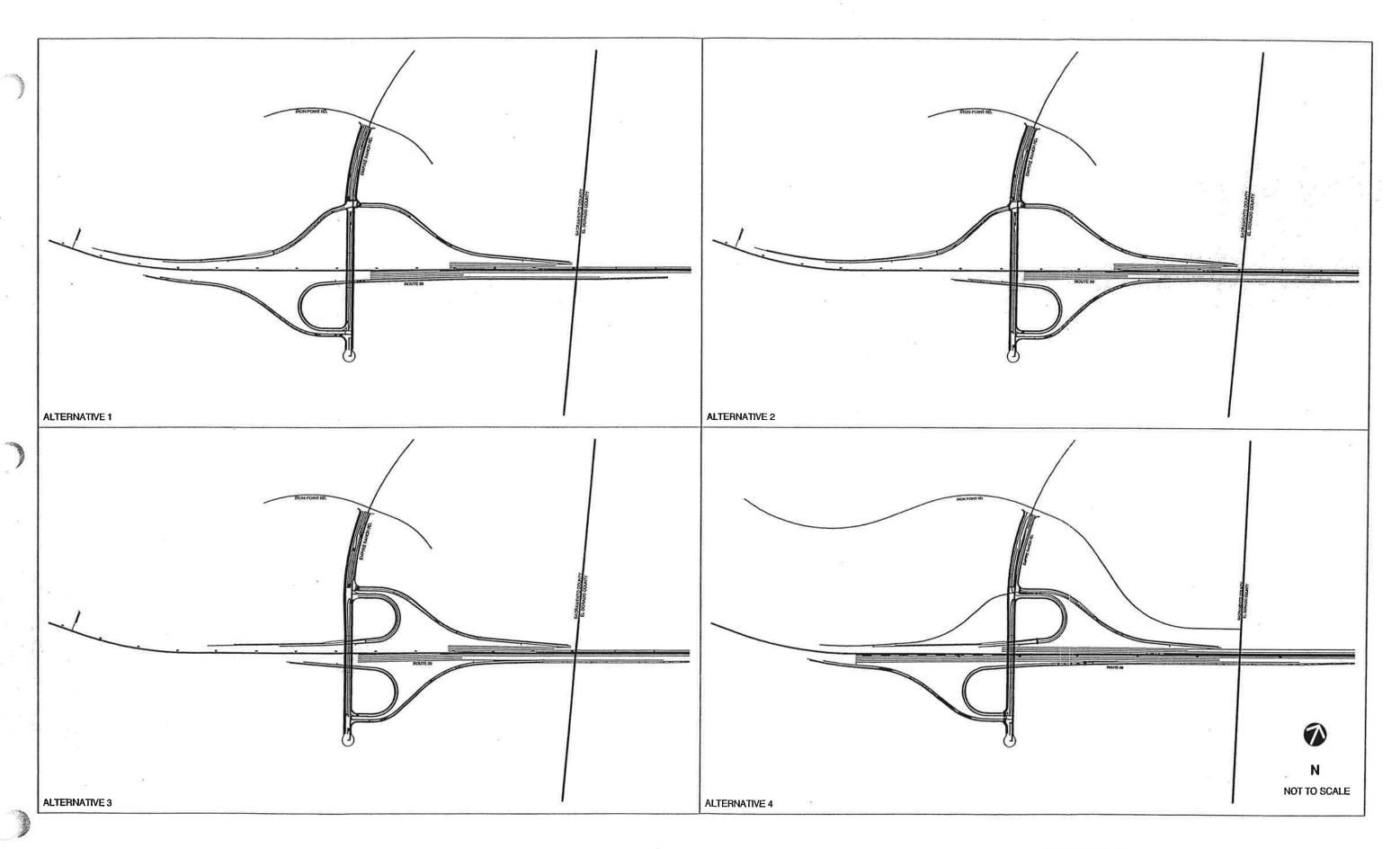
The Empire Ranch Road interchange configurations (Element 1) vary between alternatives while Elements 2 and 3 would be same for all four alternatives. Figure 4 shows the location of the interchange and its spacing with adjacent interchanges for Alternatives 1 through 4.

The proposed interchange has an expected opening date of 2006. Therefore, 2006 was used for the construction year and 2026 was used for the design year analysis. Each of the alternatives is described below and depicted in Conceptual Geometric Drawings.

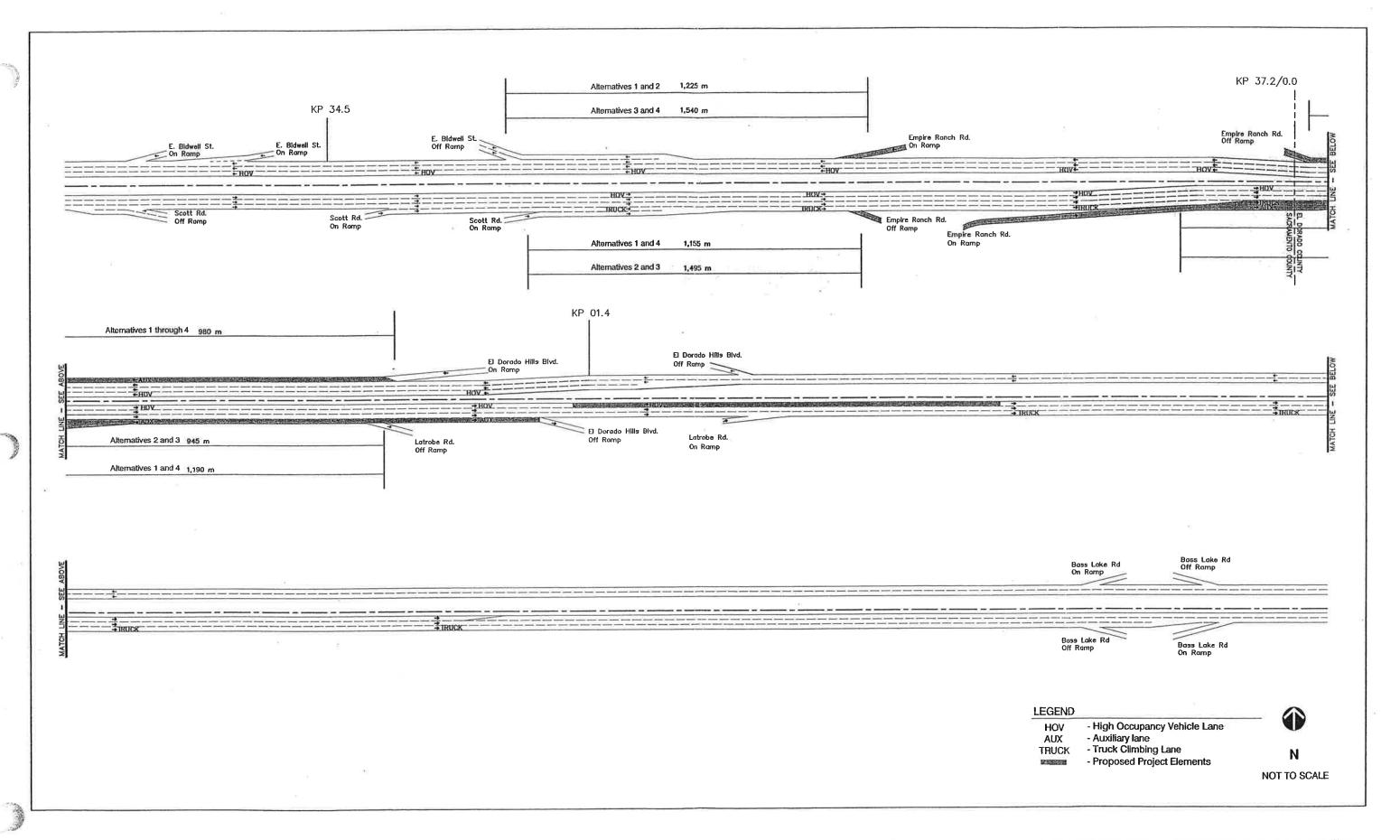
#### Alternative 1

Alternative 1 proposes to construct a combination of Type L-2 and Type L-7 partial cloverleaf interchange with a two-lane overcrossing (see Figure 3 for design plan). Although the 2025 MTP identifies the Empire Ranch Road interchange as a four-lane overcrossing, a two-lane overcrossing was proposed for this interchange based on the projected design year (2026) traffic demand on Empire Ranch Road. However, the right of way (ROW) for a four-lane overcrossing was reserved on Empire Ranch Road for the future widening as needed.

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EMPIRE RANCH ROAD/ROUTE 50 DESIGN PLAN -ALTERNATIVES 1 THROUGH 4



The major roadway improvements proposed in Alternative 1 are listed below.

- Eastbound Route 50 between Empire Ranch Road and El Dorado Hills Boulevard would be widened to a four-lane section including an HOV lane, two mixed-flow travel lanes, and an auxiliary lane (extension of the truck climbing lane exiting at Latrobe Road).
- Westbound Route 50 between El Dorado Hills Boulevard/Latrobe Road and Empire Ranch Road
  would be widened to a four-lane section including an HOV lane, two mixed-flow travel lanes, and
  an auxiliary lane. No improvements would be made on westbound Route 50 between Empire
  Ranch Road and East Bidwell Street.
- The Empire Ranch Road overcrossing would be constructed as a two-lane roadway with a four-lane ROW reserved for future need. North of this interchange, Empire Ranch Road would be constructed as a four-lane roadway and form a four-way signalized intersection with Iron Point Road approximately 700 feet north of the Empire Ranch Road/Westbound Route 50 Ramps intersection. Empire Ranch Road would terminate at a cul-de-sac south of Route 50. Traffic signal control at the westbound ramps and stop-control at the eastbound ramps would be installed at the two ramp terminal intersections.

For Alternative 1, the single lane eastbound diagonal off-ramp would include a deceleration length of 45 meters. The two-lane eastbound loop-on-ramp would include ramp metering (one metered lane plus one HOV bypass) and an auxiliary lane length of 1,190 meters, while the single lane westbound diagonal off-ramp would include an auxiliary lane length of 980 meters. The two-lane westbound diagonal on-ramp would include ramp metering (one metered lane plus one HOV bypass) and an acceleration lane length of 180 meters.

The interchange configuration analyzed would accommodate future extension of Empire Ranch Road south of Route 50, which would require a future project development and approval process, including CTC approval for break in access. The extension, if needed, would trigger widening the overcrossing structure, and construction of a westbound loop on-ramp and an eastbound diagonal on-ramp for a Type L-9 configuration. If an extension south of Route 50 occurs, special attention should be paid to the spacing between the eastbound ramp terminal intersection and the next signalized intersection to the south. A minimum spacing of 1,200 feet is desired.

# Alternative 2

Alternative 2 proposes to construct a combination of Type L-2 and Type L-8 partial cloverleaf interchange with a two-lane overcrossing (refer to Figure 3 for design plan). Under this alternative, all interchange configurations would be the same as in Alternative 1 (as shown in Table 9) with the following exceptions.

- The eastbound ramps would consist of a single lane loop off-ramp and a two-lane (one mixedflow one HOV bypass) diagonal on-ramp with an approximately 950-meter auxiliary lane connected with the Latrobe Road off-ramp.
- The ramp terminal intersection of Empire Ranch Road and Eastbound Route 50 Ramps would also be reconfigured.

#### Alternative 3

Alternative 3 proposes to construct a combination of Type L-7 and Type L-8 partial cloverleaf interchange with a two-lane overcrossing (refer to Figure 3 for design plan). Under this alternative, all interchange configurations would be the same as in Alternative 1 (as shown in Table 9) with the following exceptions.

- The eastbound ramps would be the same as Alternative 2.
- The westbound on-ramp would consist of a two-lane loop on-ramp (one mixed-flow and one HOV bypass) that merges to one lane prior to the Route 50 merge.
- The two ramp terminal intersections would be reconfigured.

#### Alternative 4

Alternative 4 proposes to construct a standard Type L-7 partial cloverleaf interchange with a two-lane over-crossing (refer to Figure 3 for design plan). Under this alternative, all interchange configurations would be the same as in Alternative 1 (as shown in Table 9) with the following exceptions.

- The westbound ramps would be the same as Alternative 3.
- The westbound ramp terminal intersections would be reconfigured.

# 5. CONSTRUCTION YEAR (2006) OPERATIONS ANALYSIS

The 2006 operations analysis presents the physical and operational characteristics of the roadway system under construction year conditions.

### 5.1 PLANNED IMPROVEMENTS

As mentioned in Chapter 4, the following improvements as identified in the 2025 MTP were assumed in place under 2006 conditions.

- Phase 1 reconstruction of the El Dorado Hills Boulevard/Latrobe Road interchange is scheduled for completion by 2006. These improvements would include re-construction of the eastbound loop off-ramp, constructing a new two-lane westbound loop off-ramp, widening of El Dorado Hills Boulevard from five to six lanes from the Park Drive/Saratoga Way intersection to the Route 50 westbound ramps, and constructing a new two-lane extension of Saratoga Way from Park Drive to Arrowhead Drive (refer to Chapter 7 for further discussion of these improvements).
- Iron Point Road would be extended east of East Bidwell Street to the El Dorado County line.
- Empire Ranch Road would be constructed as a four-lane roadway from the El Dorado County line (connecting to Sophia Parkway) south to Iron Point Road.

No freeway mainline or ramp terminal intersection improvements were assumed under 2006 analysis conditions beyond completion of the Empire Ranch Road interchange project. As previously mentioned, the connection between Iron Point Road and Saratoga Way is not assumed to be in place by 2006.

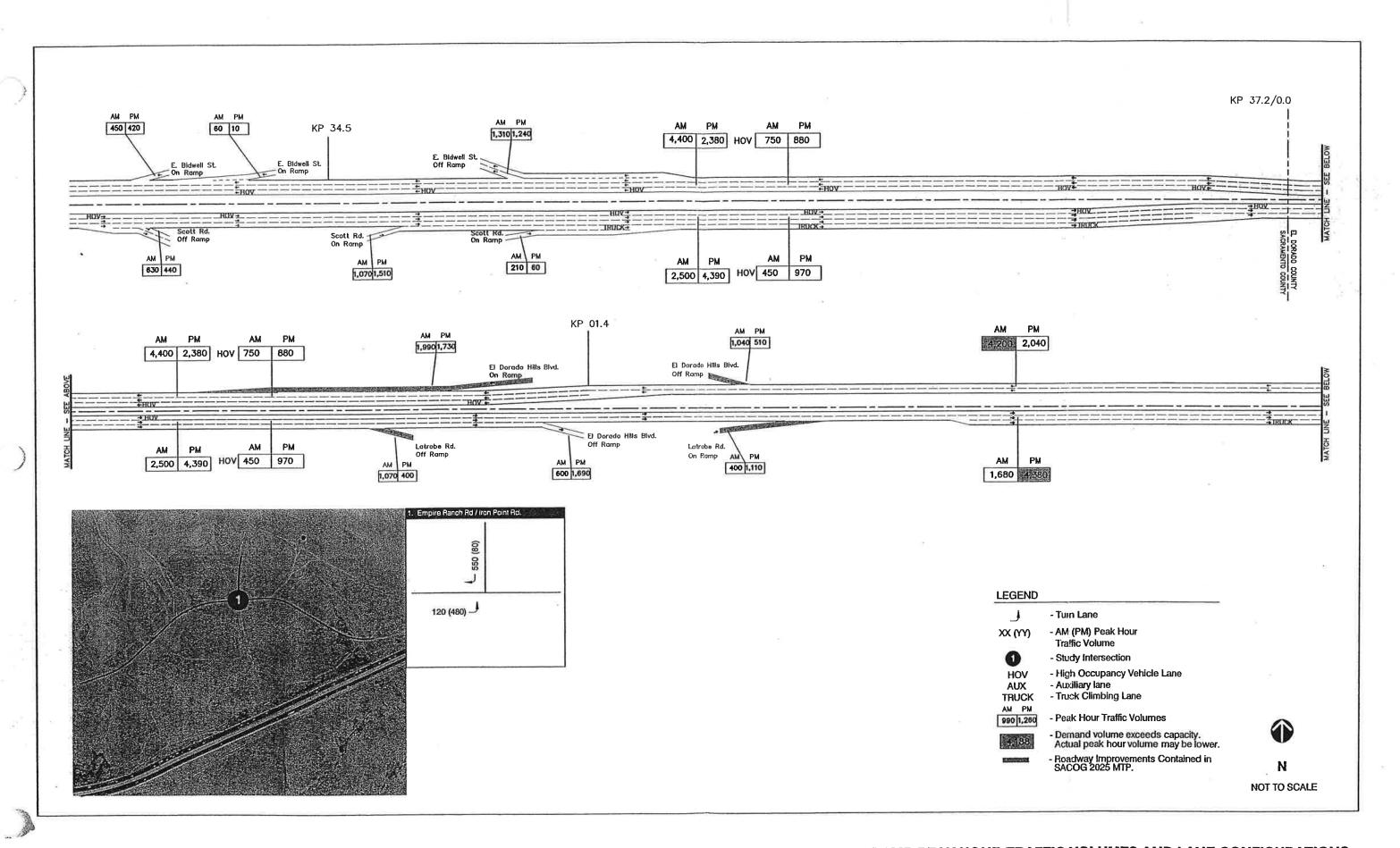
# 5.2 ALTERNATIVES

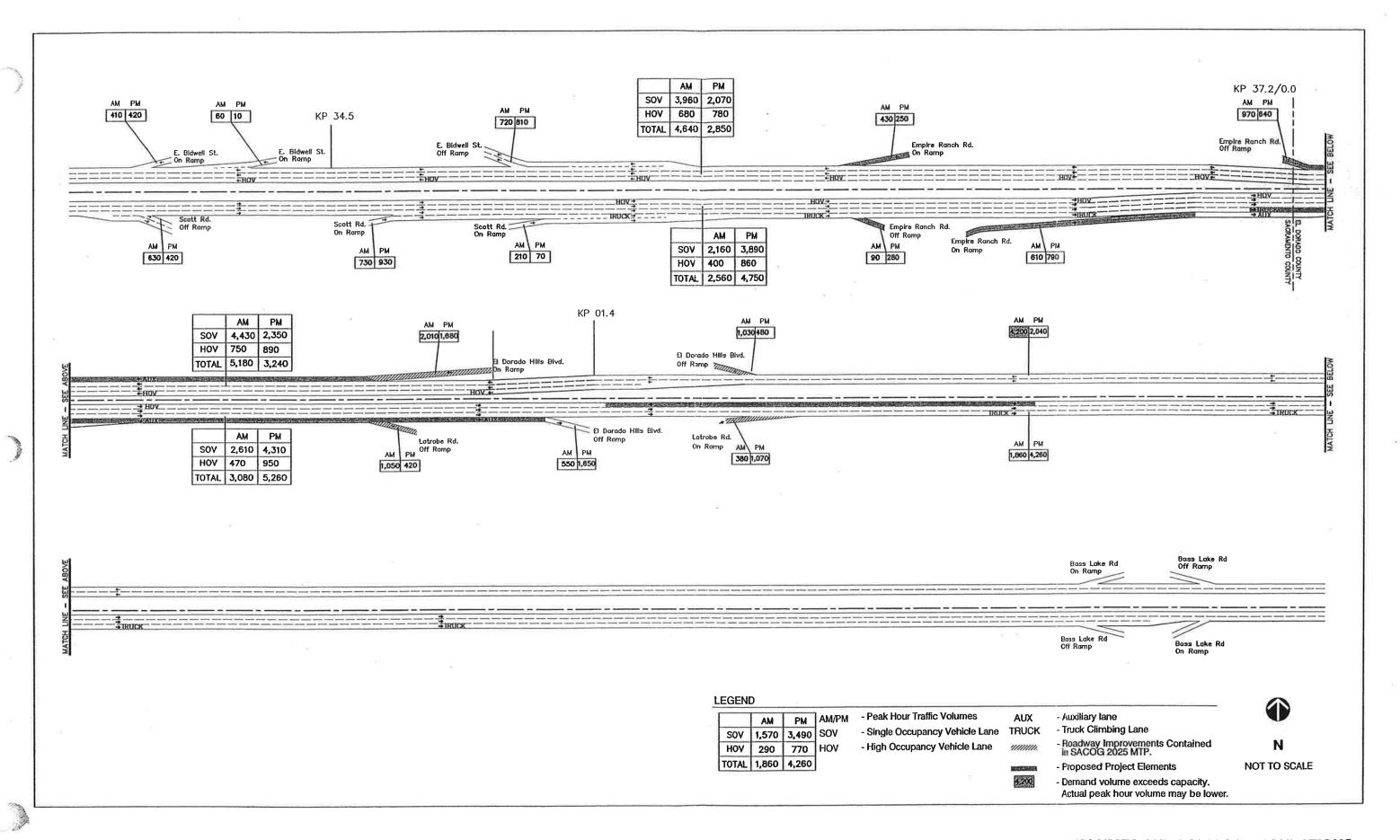
The 2006 traffic operations analysis was conducted for the freeway mainline, freeway ramp junctions, ramp terminal intersections, and ramp metering under the following alternatives.

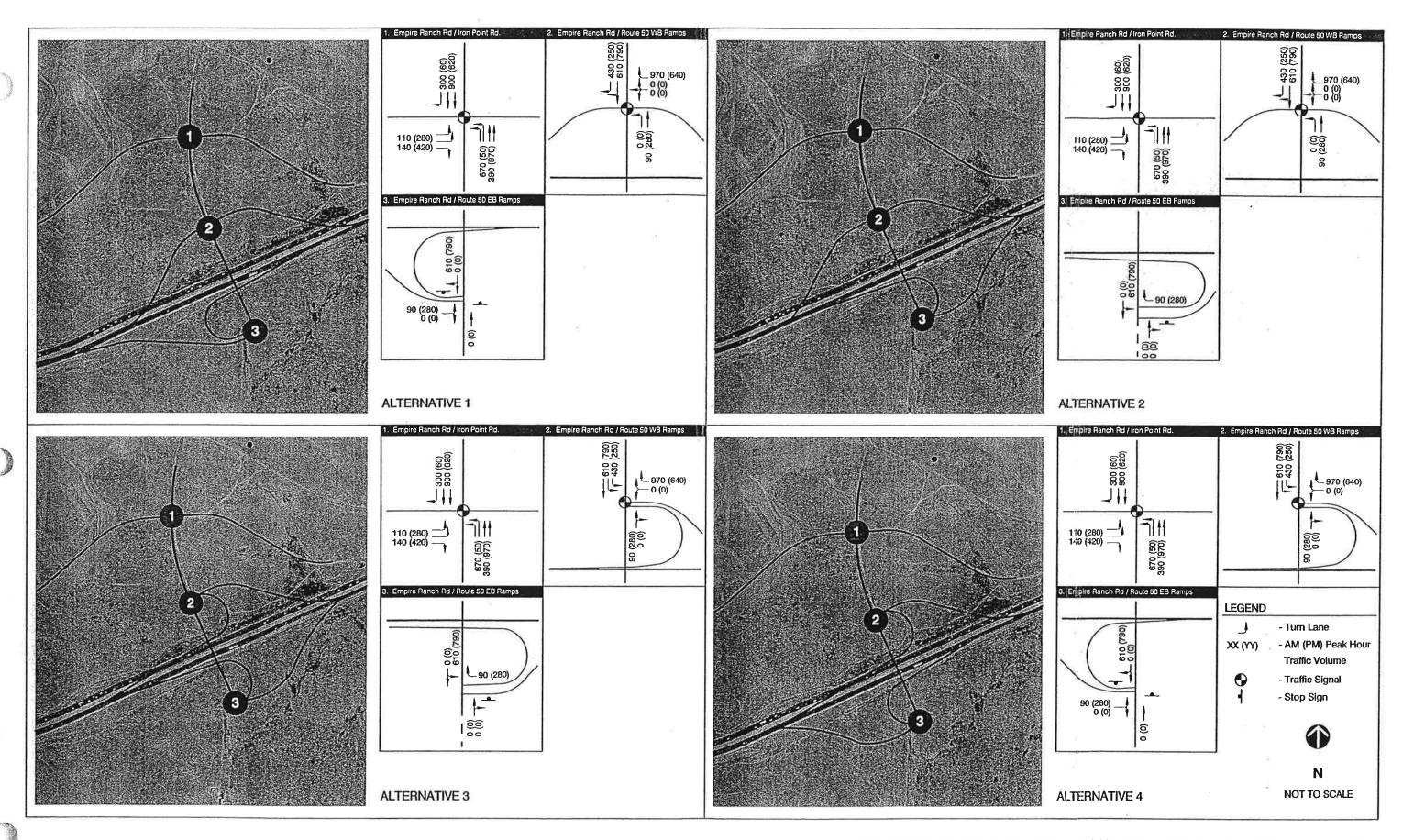
- No Build
- Alternative 1
- Alternative 2
- Alternative 3
- Alternative 4

Figures 5 through 7 display the peak-hour traffic volumes, lane configurations, and traffic controls under construction year conditions for these analysis alternatives.

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FEHR & PEERS TRANSPORTATION CONSULTANTS

PEERS
CONSTRUCTION YEAR (2006)
ALTERNATIVES 1 THROUGH 4 CONDITIONS

# 5.3 STUDY LOCATIONS

The same freeway facilities analyzed under existing conditions were analyzed under the No Build Alternative. A complete list of the freeway and arterial facilities analyzed under 2006 conditions for the four Build Alternatives is presented below.

### Freeway Mainline Sections

- Eastbound Route 50 East Bidwell Street/Scott Road to Empire Ranch Road
- Eastbound Route 50 Empire Ranch Road to El Dorado Hills Boulevard/Latrobe Road
- Westbound Route 50 El Dorado Hills Boulevard/Latrobe Road to Empire Ranch Road
- Westbound Route 50 Empire Ranch Road to East Bidwell Street/Scott Road

# Ramp Junctions

- Eastbound Route 50 off-ramp to Empire Ranch Road
- Eastbound Route 50 on-ramp from Empire Ranch Road
- Westbound Route 50 off-ramp to Empire Ranch Road (functions as part of a 980-meter long weaving section with the westbound on-ramp from El Dorado Hills Boulevard but was analyzed as ramp junction¹)
- Westbound Route 50 on-ramp from Empire Ranch Road

# Intersections

- Empire Ranch Road/Route 50 Eastbound Ramps
- Empire Ranch Road/Route 50 Westbound Ramps
- Empire Ranch Road/Iron Point Road

# Ramp Meters

- Westbound Route 50 on-ramp from Empire Ranch Road
- Eastbound Route 50 on-ramp from Empire Ranch Road

<sup>&</sup>lt;sup>1</sup> HCM 2000 states that weaving section longer than 750 meters are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".

# 5.4 TRAFFIC GROWTH AND TRAVEL PATTERNS COMPARISON

To evaluate the impact of the Empire Ranch Road interchange project on traffic growth and travel patterns within the study area, the total volumes on the Route 50 ramps at the East Bidwell Street/Scott Road, Empire Ranch Road, and El Dorado Hills Boulevard/Latrobe Road interchanges were compared between the 2006 No Build and Build Alternatives. The results are summarized in Table 9.

RAM	Table IP Volume Comparison – Consti No Build and Build	RUCTION YEAR (	,	ions	
		No Bu	ld	Build	7 1
	. L	Alternat	ive	Alternati	ives
F	Ramps	AM	PM	AM	PM
	East Bidwell Street	630	440	630	42
Eastbound Off-ramp	Empire Ranch Road	0	0	90	28
Lastbound On-ramp	El Dorado Hills Boulevard	1,670	2,090	1600	207
	Total	2,300	2,530	2,320	2,77
Eastbound On-ramp	East Bidwell Street	1,280	1,570	940	100
	Empire Ranch Road	0	0	610	79
	El Dorado Hills Boulevard	400	1,110	380	107
	Total	1,680	2,680	1,930	2,86
/// <del>// = 500 = 700 = 500</del>	East Bidwell Street	1,310	1,240	720	81
Westbound Off-ramp	Empire Ranch Road	0	0	970	64
westeeding on-rump	El Dorado Hills Boulevard	1,040	510	1030	48
	Total	2,350	1,750	2,720	1,93
	East Bidwell Street	510	430	470	43
Westbound On-ramp	Empire Ranch Road	0	0	430	25
Westbound On-ramp	El Dorado Hills Boulevard	1,990	1,730	2010	168
	Total	2,400	2,110	2,910	2,36
	East Bidwell Street	3,630	3,630	2,760	2,66
All Ramps	Empire Ranch Road	0	0	2,100	1,96
VII Kutiha	El Dorado Hills Boulevard	5,100	5,440	5,020	5,30
	Total	8,730	9,070	9,880	9,92

According to Table 9, approximately 25 percent of the ramp volume using the East Bidwell Street/Scott Road interchange would divert to the Empire Ranch Road interchange, and approximately two percent would divert from the El Dorado Hills Boulevard/Latrobe Road interchange. Overall, the Empire Ranch

Road interchange ramps are expected to carry approximately 21 percent of the total ramp volumes across the three interchanges under 2006 conditions.

In addition, the total volume of traffic at all three interchanges would increase by 1,150 vehicles during the a.m. peak hour and 850 vehicles during the p.m. peak hour under 2006 Build conditions when compared to 2006 No Build conditions. Therefore, construction of the Empire Ranch Road interchange project is expected to attract more traffic to Route 50 within the project area.

# 5.5 Freeway Mainline Operations

Freeway mainline analysis was conducted for the No Build and Build Alternatives under 2006 conditions. Traffic operations results for the study freeway segments are contained in Table 10 (see Appendix C for technical calculations).

Table 10 Freeway Mainline LOS – Construction <i>No Build and Build Altei</i>		ONDITIONS				
AM Peak PM Peak						
Freeway Mainline	V/C <sup>1</sup>	LOS 2	V/C <sup>1</sup>	LOS 2		
No Build	34					
Eastbound Route 50: East Bidwell St. to El Dorado Hills Blvd.	0.62	С	1110	2.26		
Eastbound Route 50: El Dorado Hills Blvd. to Bass Lake Road	0.42	В	1.09	1		
Westbound Route 50: Bass Lake Rd. to El Dorado Hills Blvd.	1105		0.51	С		
Westbound Route 50: El Dorado Hills Blvd. to East Bidwell St.	1.10	E	0.59	С		
Build (for all four alternatives)				-\ <u> </u>		
Eastbound Route 50: East Bidwell St. to Empire Ranch Rd.	0.36	В	0.64	D		
Eastbound Route 50: Empire Ranch Rd. to El Dorado Hills Blvd.	0.52	С	0.86	D		
Eastbound Route 50: El Dorado Hills Blvd. to Bass Lake Rd.	0.39	В	0.87	D		
Westbound Route 50: Bass Lake Rd. to El Dorado Hills Blvd.	1105	100	0.51	С		
Westbound Route 50: El Dorado Hills Blvd. to Empire Ranch Rd.	0.88		0.47	В		
Westbound Route 50: Empire Ranch Rd. to East Bidwell St.	0.99	E/R	0.52	С		

#### Notes:

Shading denotes that the expected LOS would be worse than the calculated LOS shown in the table due to downstream LOS F conditions propagating upstream.

Source: Fehr & Peers, 2003.

V/C is the volume to capacity ratio.

<sup>(2)</sup> LOS based on the El Dorado County General Plan.

Bold font with underscore indicates unacceptable operations.

Table 10 shows that under the 2006 No Build Alternative, Route 50 would continue to operate unacceptably at LOS F in the peak directions (i.e., westbound during the a.m. peak hour and eastbound during the p.m. peak hour) within the study area. The peak hour LOS F conditions would likely spread to additional hours and could adversely affect traffic operations on the major arterial roadways connecting to Route 50 such as El Dorado Hills Boulevard.

For the Build Alternatives, the results for the freeway mainline analysis are the same under all four alternatives. Unacceptable operations under build conditions would occur on westbound Route 50 from Bass Lake Road to East Bidwell Street. Insufficient mainline capacity would create bottlenecks at the segments listed below.

- Westbound Route 50 between Empire Ranch Road and East Bidwell Street
- Westbound Route 50 between Bass Lake Road and El Dorado Hills Boulevard

Congestion between Empire Ranch Road and East Bidwell Street (during the a.m. peak period) would cause mainline queuing that would extend upstream. The queuing may be severe enough to affect operations in the vicinity of the El Dorado Hills Boulevard interchange. Given that another bottleneck is projected to occur between Bass Lake Road and El Dorado Hills Boulevard, LOS F conditions on westbound Route 50 would likely extend at least from Bass Lake Road to Empire Ranch Road. It should be noted that this congestion and resultant queuing are improved compared to the "No Build" alternative due to a more balanced distribution of trips across three interchanges versus two interchanges under No Build conditions. For purposes of this study, a range of options was considered to evaluate potential operations improvements. Providing better a.m. peak hour LOS in the westbound direction would require one of the following improvements.

- Option 1. Greater utilization of the westbound HOV lane (only applies to the segment between Empire Ranch Road and East Bidwell Street for 2006 conditions)
- Option 2. Construction of continuous westbound auxiliary lanes between Bass Lake Road and East Bidwell Street
- Option 3. Construction of a third westbound mixed-flow lane between Bass Lake Road and East Bidwell Street.

The westbound Route 50 a.m. peak hour HOV utilization would need to increase from 15 to 20 percent to provide LOS D conditions for the segment between Empire Ranch Road and East Bidwell Street under Option 1 described above. Under Options 2 and 3, the a.m. peak hour LOS would improve as listed below.

- Westbound Route 50 between Bass Lake Road and El Dorado Hills Boulevard (Option 2 LOS D, Option 3 – LOS C)
- Westbound Route 50 between El Dorado Hills Boulevard to Empire Ranch Road (Option 2 LOS D, Option 3 LOS D)
- Westbound Route 50 between Empire Ranch Road and East Bidwell Street (Option 2 LOS D, Option 3 - LOS C)

Option 3 is consistent with the ultimate eight-lane mainline section recommended in the Caltrans Transportation Concept Report. Figures 8 and 9 display improvement Options 2 and 3, respectively, and the LOS comparison between "before" and "after" conditions.

# 5.6 Freeway Ramp Junction Operations

Traffic operations for the ramp junctions were analyzed under 2006 conditions for the four Build Alternatives, and the results are summarized in Table 11 (see Appendix C for technical calculations). The results of ramp junction analyses are the same for all Build Alternatives.

Table 11  Freeway Ramp Junction LOS – Construction Year (2006) Conditions  Build Alternatives								
AM Peak PM Pea								
Freeway Ramp Junction	Density 1	LOS 2	Density 1	LOS 2				
Build (for all four alternatives)								
Route 50 Eastbound Off-ramp to Empire Ranch Road	19	В	30	D				
Route 50 Eastbound On-ramp from Empire Ranch Road	13	В	23	С				
Route 50 Westbound Off-ramp to Empire Ranch Road	<u>&gt;43</u>	<u>F</u>	16	В				
Route 50 Westbound On-ramp from Empire Ranch Road	37	E	21	С				
Notes: (1) Density in passenger cars per mile per lane. (2) LOS calculations based on the HCM 2000 procedures.								

Source: Fehr & Peers, 2003.

The LOS F/E conditions for the Empire Ranch Road westbound ramps during the a.m. peak hour are due to the mainline capacity limits described above and are not associated with the interchange design itself. The ramp junction LOS would improve as listed below with any of the three options described above for the mainline (see Appendix D for technical calculations).

- Westbound off-ramp during the a.m. peak hour (Option 1 LOS F, Option 2 LOS F, Option 3 LOS D)
- Westbound on-ramp during the a.m. peak hour (Option 1 LOS E, Option 2 LOS D, Option 3 LOS C)

The LOS comparison between "before" and "after" conditions for ramp junctions under Options 2 and 3 are also shown in Figures 8 and 9.

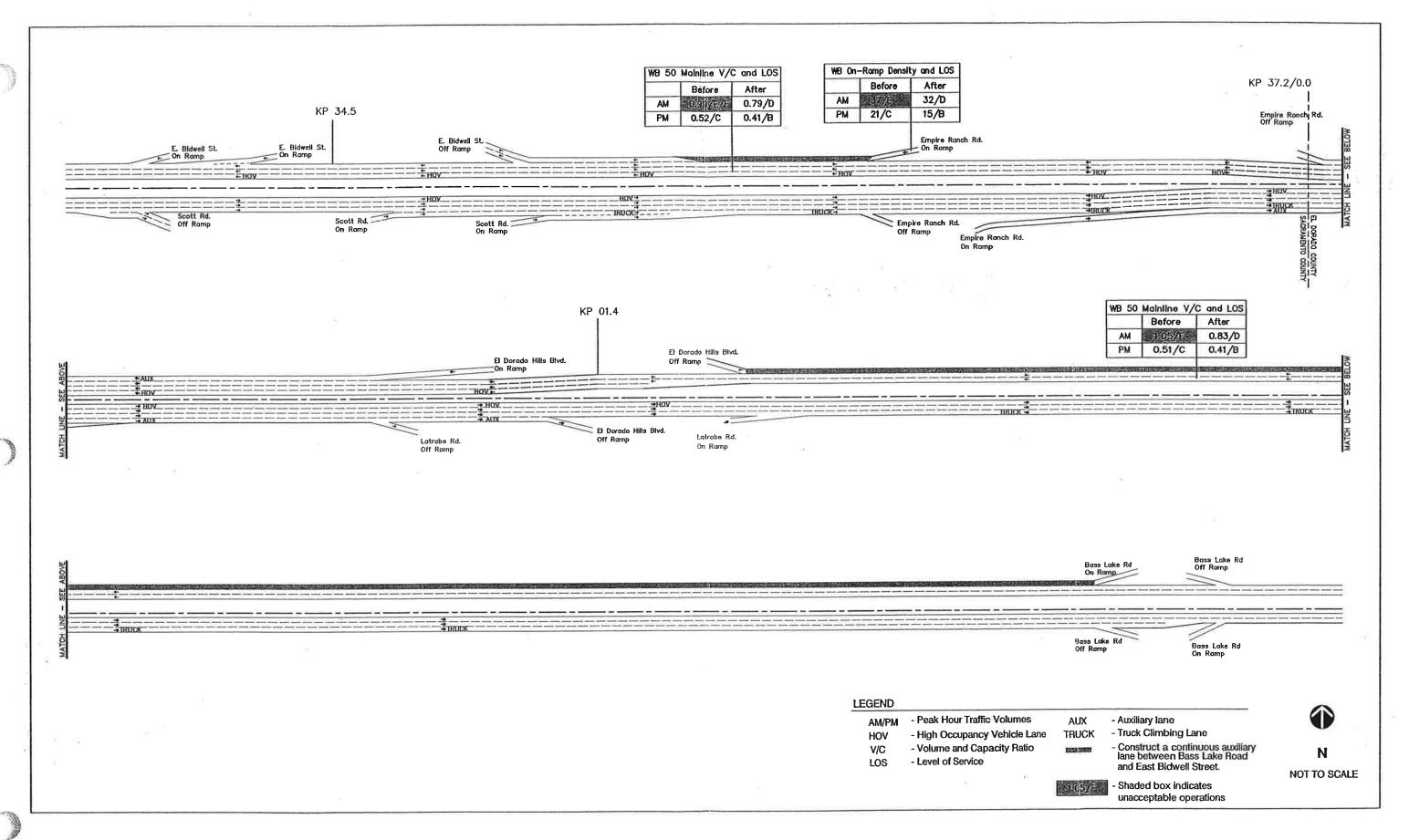
# 5.7 Intersection Operations

The study intersections were analyzed under 2006 conditions for both No Build and Build Alternatives. Under 2006 conditions, Iron Point Road east of Empire Ranch Road would not be connected with Saratoga Way and other local roadways, so no traffic was assumed to be carried on Iron Point Road between Empire Ranch Road and the county line. Therefore, the Iron Point Road/Empire Ranch Road intersection was analyzed as a "L" (two-way) unsignalized intersection under the No Build Alternative and a "T" (three-way) signalized intersection under the Build Alternatives. The results of the intersection operations analysis for the No Build and Build Alternatives are summarized in Table 12 (see Appendix C for technical calculations).

As shown in Table 12, the Empire Ranch Road/Iron Point Road intersection would operate acceptably at LOS C or better under both peak hours for the 2006 No Build Alternative. For the four Build Alternatives, all study intersections on Empire Ranch Road would operate acceptably at LOS C or better conditions during both peak hours.

Alternatives 3 and 4 include a Type L-7 configuration at the westbound ramps. In contrast to Alternatives 1 and 2, this configuration requires an additional signal timing phase for the loop on-ramp to serve southbound left-turning traffic heading westbound on Route 50 from Empire Ranch Road. Therefore, the westbound ramps would have higher delay under Alternatives 3 and 4 than Alternatives 1 and 2, although this intersection would still operate acceptably.

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Intersection LOS – C Bu	onstruction Year (20 <i>JILD Alternatives</i>	U6) Condit	rions		
Intersection Control AM Peak Hour PM F					
mersection	Condo	Delay 1	LOS 2	Delay 1	LOS 2
No Build					***************************************
Empire Ranch Road/Iron Point Road	Uncontrolled	0	A	0	A
Build - Alternative I		17			•
Empire Ranch Rd./Route 50 Eastbound Ramps	Side Street Stop	0	A	_0	A
Empire Ranch Rd./Route 50 Westbound Ramps	Traffic Signal	27	С	20	В
Empire Ranch Road/Iron Point Road	Traffic Signal	17	В	15	В
Build - Alternative 2	2.7			in the	
Empire Ranch Rd./Route 50 Eastbound Ramps	Side Street Stop	0	A	0	A
Empire Ranch Rd./Route 50 Westbound Ramps	Traffic Signal	27	С	20	В
Empire Ranch Road/Iron Point Road	Traffic Signal	17	В	15	В
Build - Alternative 3	*	***			-
Empire Ranch Rd./Route 50 Eastbound Ramps	Side Street Stop	0	A	0	A
Empire Ranch Rd./Route 50 Westbound Ramps	Traffic Signal	32	С	22	С
Empire Ranch Road/Iron Point Road	Traffic Signal	17	В	15	В
Build - Alternative 4			4		
Empire Ranch Rd./Route 50 Eastbound Ramps	Side Street Stop	0	A	0	A
Empire Ranch Rd./Route 50 Westbound Ramps	Traffic Signal	32	С	22	С
Empire Ranch Road/Iron Point Road	Traffic Signal	17	В	15	В

Maximum queue lengths and available vehicle storage for critical movements at the study intersections are shown in Table 13 (see Appendix C for technical calculations). As shown, adequate vehicle storage would be provided under all Build Alternatives for the critical movements at each study intersection.

Intersection Qu	Table 13 jeue Summary – Construct <i>Build Alternativ</i>		) Conditions	
		Available	Maximum (	Queue <sup>1</sup> (ft)
Intersection	Movement	Storage (ft)	AM	PM
Build - Alternative 1 & 2	- m	1		
For 's Post Post'	Westbound Right	750	375	275
Empire Ranch Road/	Northbound Through	945²	50	100
Westbound Route 50 Ramps	Southbound	700	300	500
E-min Panck Panck	Northbound Left	200	125	25
Empire Ranch Road/ Iron Point Road	Northbound Through	700	25	150
Iron Point Road	Eastbound Left	300	50	100
Build - Alternative 3 & 4				
	Westbound Right	500	325	225
Empire Ranch Road/	Northbound Through	1,020 <sup>2</sup>	100	175
Westbound Route 50 Ramps	Southbound Left	350	200	100
	Southbound Through	650	275	450
Empire Pench Pend/	Northbound Left	200	175	50
Empire Ranch Road/  Iron Point Road	Northbound Through	650	25	150
Hon Four Road	Eastbound Left	300	50	100

Notes:

Source: Fehr & Peers, 2003.

# 5.8 RAMP METER ANALYSIS

A ramp metering analysis was conducted for the Build Alternatives under 2006 conditions to determine the most restrictive metering rate for the eastbound and westbound Route 50 on-ramps that could be applied before vehicle queues exceed the available storage capacity at Empire Ranch Road. The ramp meter type for the Empire Ranch Road on-ramps was assumed to be one metered lane plus an HOV bypass.

<sup>&</sup>lt;sup>1</sup> The reported queue is the 95th percentile queue, which is typically used to size storage bays.

<sup>&</sup>lt;sup>2</sup> The available storage between the eastbound and westbound Route 50 ramp terminal intersections.

Table 14 summarizes the results of the ramp metering analysis under 2006 conditions (see Appendix C for technical calculations). The metered on-ramps would operate within the minimum and maximum metering rates (240 and 1,000 vehicles per hour per lane, respectively) with the available storage.

Table 14  Ramp Metering Operations – Construction Year (2006) Conditions  Build Alternatives						
		AM Po	eak Hour	PM P	eak Hour	
On-Ramp	Number of Lanes	Peak-Hour Volume (vph)	Minimum Metering Rate (vphpl)	Peak-Hour Volume (vph)	Minimum Metering Rate (vphpl)	
Empire Ranch Road Eastbound On-ramp	1 Metered Lane 1 HOV Bypass Lane	610	520	790	640	
Empire Ranch Road Westbound On-ramp	1 Metered Lane 1 HOV Bypass Lane	430	370	250	240	
	1 HOV Bypass Lane	430	370	250	240	

Source: Fehr & Peers, 2003.

# 6. DESIGN YEAR (2026) CONDITIONS ANALYSIS

The design year analysis presents the physical and operational characteristics of the roadway system under 2026 conditions.

#### 6.1 PLANNED IMPROVEMENTS

As mentioned in Chapter 4, the following improvements as identified in the 2025 MTP were included in the 2026 analysis (refer to Chapter 7 for further discussion of these improvements):

- All roadway improvements assumed to be built by 2006 as described in Chapter 5.
- A new interchange on Route 50 at Silva Valley Parkway is scheduled for completion by Year 2008. This interchange would consist of one off-ramp and two on-ramps serving each direction of Route 50. These on- and off-ramps would be connected with the ramps at adjacent interchanges using auxiliary lanes (i.e., El Dorado Hills Boulevard/Latrobe Road interchange to the west and Bass Lake Road interchange to the east).
- HOV lanes on Route 50 between El Dorado Hills Boulevard/Latrobe Road and South Shingle Springs Road/Ponderosa Road are scheduled for completion by Year 2010.
- A four-lane roadway connection between Saratoga Way and Iron Point Road will be in place by 2018 per the 2025 MTP.

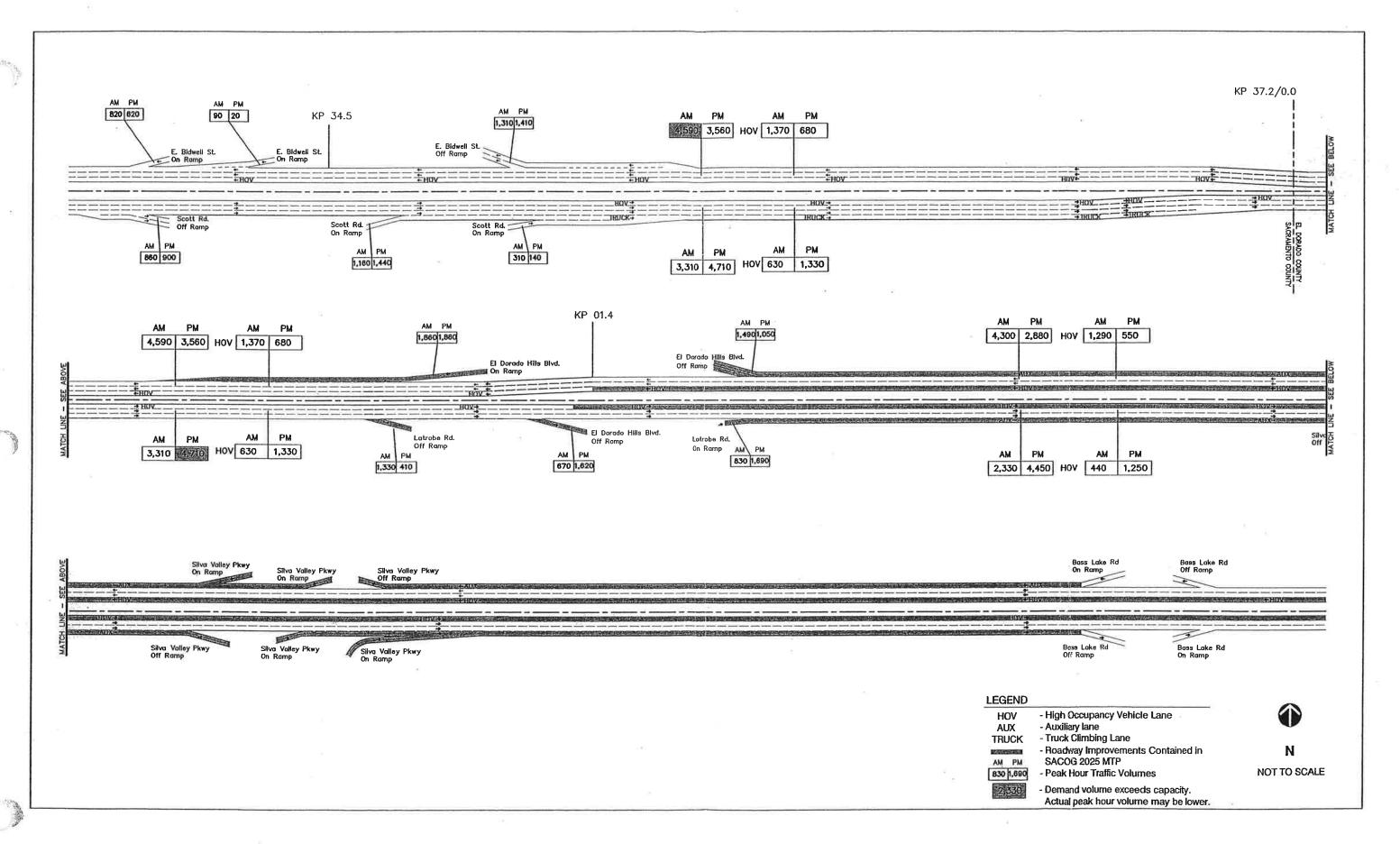
No other freeway mainline or ramp terminal intersection improvements were assumed under 2026 conditions beyond completion of the Empire Ranch Road interchange project.

# 6.2 ALTERNATIVES

The 2026 traffic operations analysis was conducted for the study freeway mainline, ramp junctions, and intersections under the following alternatives.

- No Build
- Alternative 1
- Alternative 2
- Alternative 3
- Alternative 4

Figures 10 through 13 display the peak-hour traffic volumes, lane configurations, and traffic controls under 2026 conditions for these alternatives.



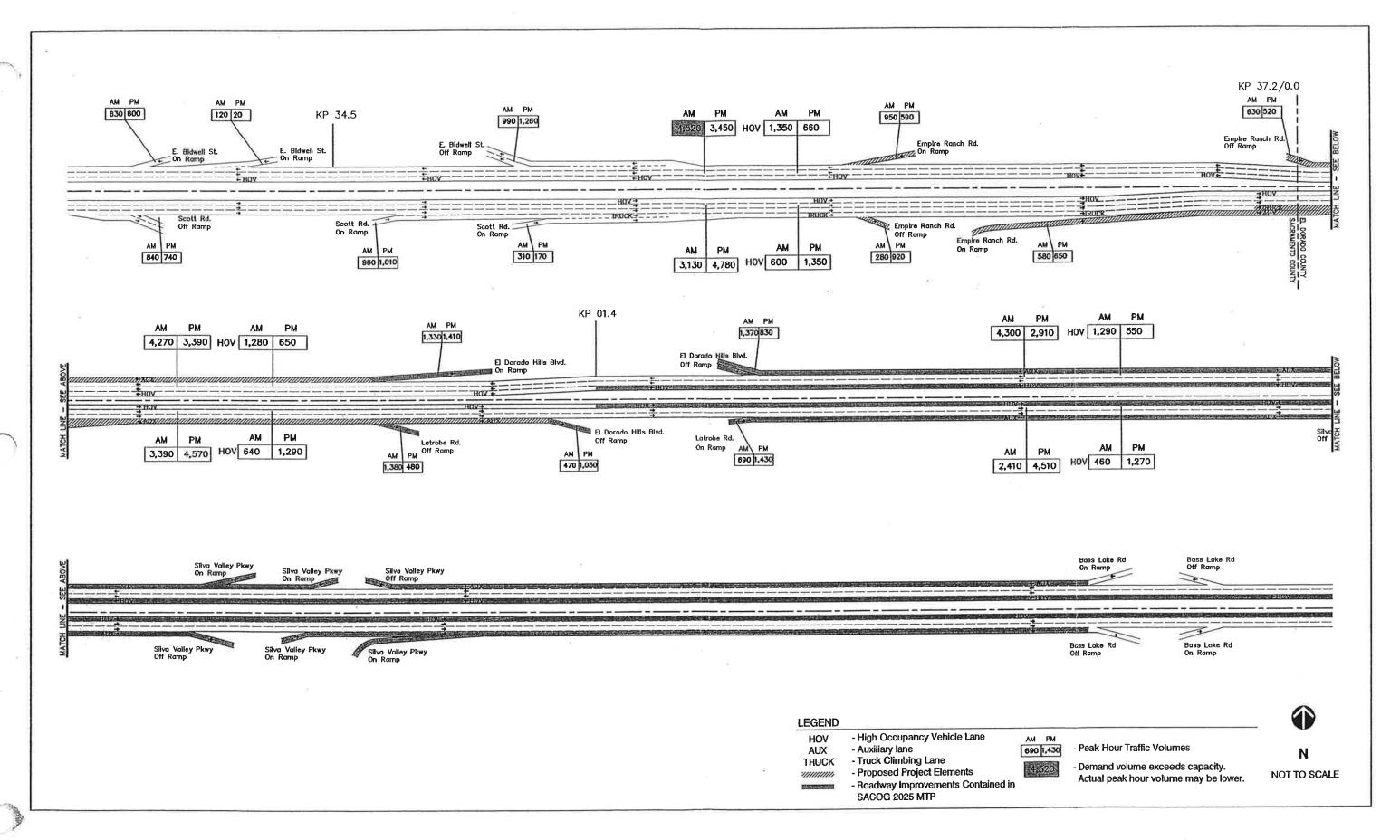
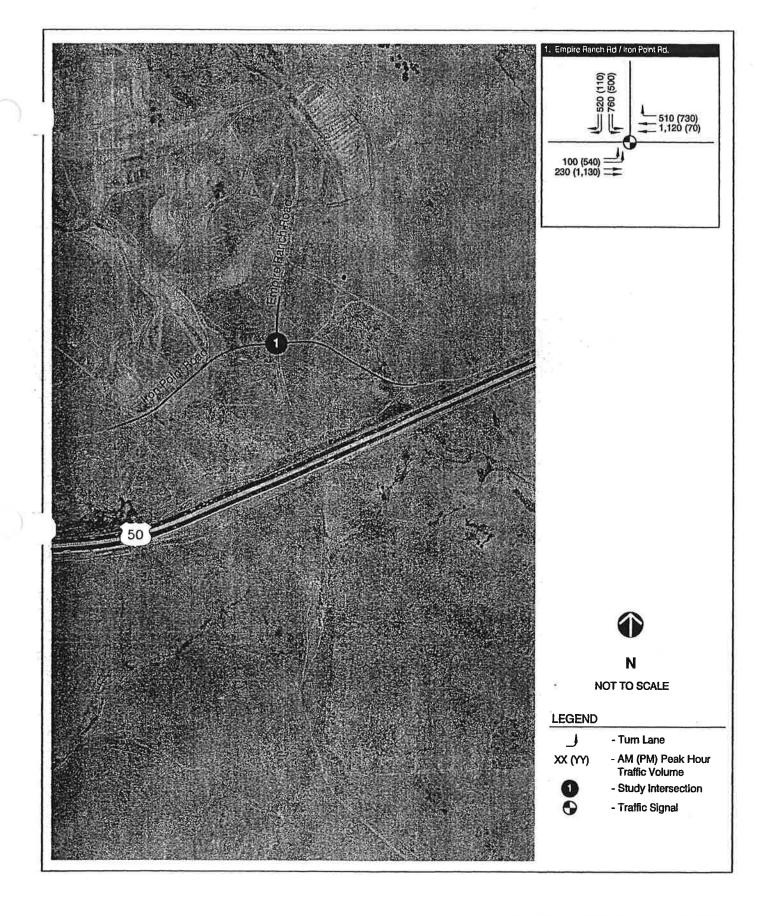
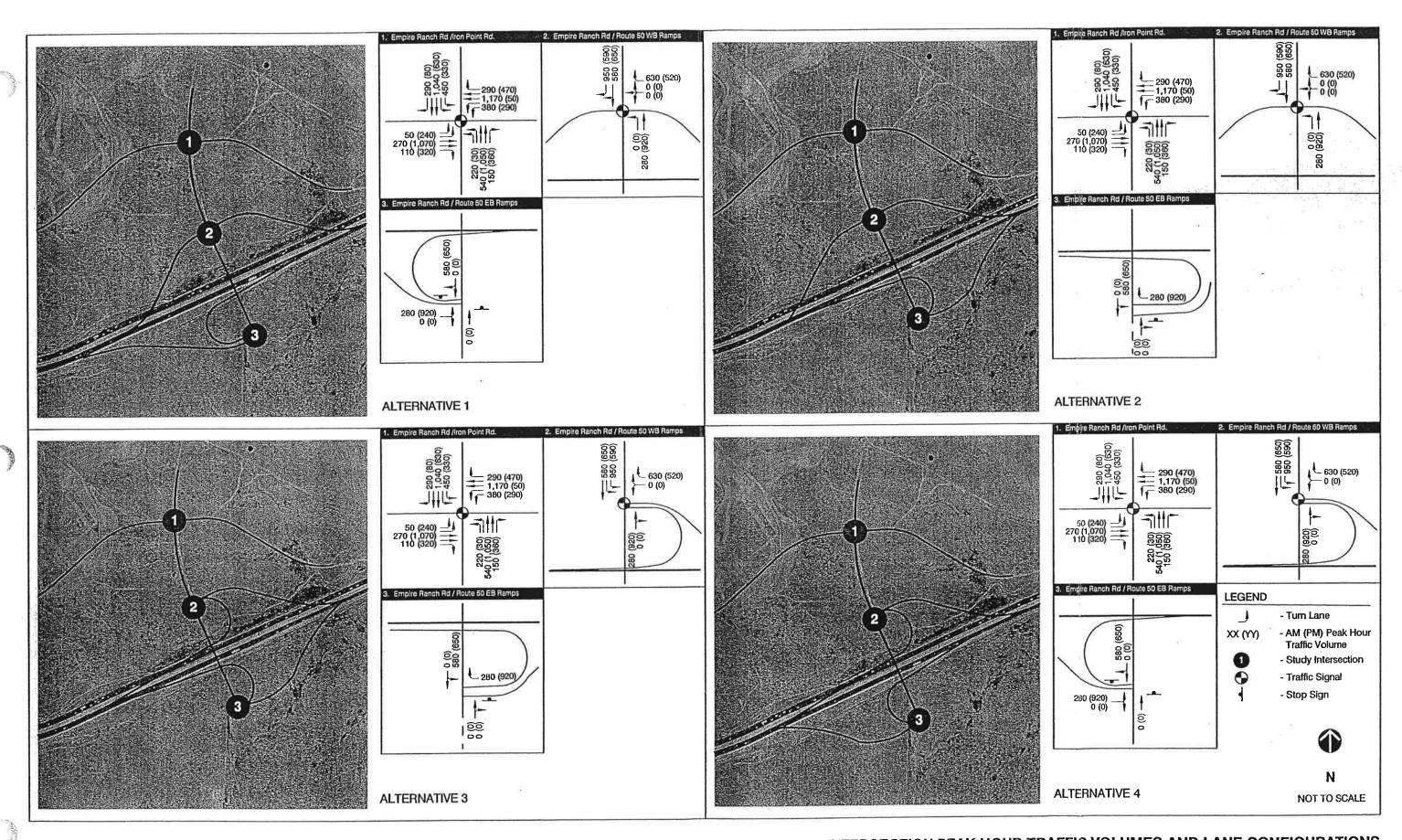


FIGURE 11



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INTERSECTION PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - DESIGN YEAR (2026) NO BUILD CONDITIONS



FEHR & PEERS TRANSPORTATION CONSULTANTS

INTERSECTION PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS
DESIGN YEAR (2026)
ALTERNATIVES 1 THROUGH 4 CONDITIONS

# **Study Locations**

The study segment of Route 50 changes slightly for the 2026 conditions analysis since the Silva Valley Parkway interchange is assumed to be in place by this time. The freeway mainline sections analyzed under No Build and Build Alternatives for 2026 conditions are listed below. All other freeway facilities (ramp junctions, ramp terminal intersections, and ramp meter) analyzed under 2006 conditions were also analyzed under 2026 conditions.

# Freeway Mainline Sections - 2026 No Build Conditions

- Eastbound Route 50 East Bidwell Street to El Dorado Hills Boulevard
- Eastbound Route 50 El Dorado Hills Boulevard to Silva Valley Parkway
- Westbound Route 50 Silva Valley Parkway to El Dorado Hills Boulevard
- Westbound Route 50 El Dorado Hills Boulevard to East Bidwell Street

### Freeway Mainline Sections - 2026 Build Alternatives 1 through 4

- Eastbound Route 50 East Bidwell Street to Empire Ranch Road
- Eastbound Route 50 Empire Ranch Road to El Dorado Hills Boulevard
- Eastbound Route 50 El Dorado Hills Boulevard to Silva Valley Parkway
- Westbound Route 50 Silva Valley Parkway to El Dorado Hills Boulevard
- Westbound Route 50 El Dorado Hills Boulevard to Empire Ranch Road
- Westbound Route 50 Empire Ranch Road to East Bidwell Street

### 6.3 TRAFFIC GROWTH AND TRAVEL PATTERNS COMPARISON

To evaluate the impact of the Empire Ranch Road interchange project on traffic growth and travel patterns within the study area, the total volumes on the Route 50 ramps at the East Bidwell Street/Scott Road, Empire Ranch Road, and El Dorado Hills Boulevard/Latrobe Road interchanges were compared between the 2026 No Build and Build Alternatives. The results are summarized in Table 15.

1	Table Ramp Volume Comparison – Dea No Build and Buili	SIGN YEAR (202				
		No Bui		Build		
F	Ramps	Alternat	ive	Alternat	matives	
		AM	PM	AM	PM	
	East Bidwell Street	860	900	840	740	
Eastbound Off-ramp	Empire Ranch Road	0	0	280	920	
Dastoodiid Off-famp	El Dorado Hills Boulevard	2,000	2,030	1,850	1,510	
	Total	2,860	2,930	2,970	3,170	
	East Bidwell Street	1,470	1,580	1,270	1,180	
Eastbound On-ramp	Empire Ranch Road	0	0	580	650	
Eastoound On-ramp	El Dorado Hills Boulevard	830	1,690	690	1,430	
	Total	2,300	3,270	2,540	3,260	
	East Bidwell Street	1,310	1,410	990	1,260	
Westbound Off-ramp	Empire Ranch Road	0	0	630	520	
westbound Off-famp	El Dorado Hills Boulevard	1,490	1,050	1,370	830	
	Total	2,800	2,460	2,990	2,610	
	East Bidwell Street	910	640	750	620	
Westbound On-ramp	Empire Ranch Road	0	0	950	590	
westbound On-ramp	El Dorado Hills Boulevard	1,860	1,860	1,330	1,410	
	Total	2,770	2,500	3,030	2,620	
	East Bidwell Street	4,550	4,530	3,850	3,800	
All Ramps	Empire Ranch Road	0	0	2,440	2,680	
An Kamps	El Dorado Hills Boulevard	6,180	6,630	5,240	5,180	
	Total	10,730	11,160	11,530	11,666	

Table 15 indicates that approximately 10 percent of the ramp volume using the East Bidwell Street would divert to the Empire Ranch Road interchange, and approximately 12 percent would divert from El Dorado Hills Boulevard to Empire Ranch Road interchange. Overall, the Empire Ranch Road interchange ramps are expected to carry approximately 22 percent of the total ramp volumes across the three interchanges. The addition of the Empire Ranch Road interchange would help to spread the distribution of trips among the interchanges so as not to overburden East Bidwell Street and El Dorado Hills Boulevard.

In addition, as shown in Table 15, the total volume of traffic at all three interchanges would increase by 800 vehicles during the a.m. peak hour and 500 vehicles during the p.m. peak hour under 2026 Build conditions when compared to 2026 No Build conditions. Therefore, construction of the Empire Ranch Road/Route 50 interchange project is expected to attract more traffic to Route 50 within the project area.

Table 15 also shows the 2026 traffic demand at the Empire Ranch Road eastbound on-ramp and westbound off-ramp would decrease compared to Year 2006 conditions. Drivers would use the connection between Saratoga Way and Iron Point Road (assumed to be in place by 2026) since it would provide a more direct connection between residential and commercial land uses in this area. Drivers would also use this connection as a bypass to avoid traffic congestion on Route 50 between El Dorado Hills and Folsom.

# **6.4 Freeway Mainline Operations**

Freeway mainline analysis was conducted for the No Build and Build Alternatives under 2026 conditions. Traffic operations results for the study freeway sections are contained in Table 16 (see Appendix D for technical calculations).

Table 16 Freeway Mainline LOS – Design Yeai <i>No Build and Build Alteri</i>		ITIONS		
T	AM P	eak	PM P	eak
Freeway Mainline	V/C 1	LOS 2	V/C 1	LOS 2
No Build				
Eastbound Route 50: East Bidwell St. to El Dorado Hills Blvd.	0.83	D	1.17	<u>F</u>
Eastbound Route 50: El Dorado Hills Blvd. to Silva Valley Pkwy.	0.46	В	0.88	D
Westbound Route 50: Silva Valley Pkwy. to El Dorado Hills Blvd.	0.85		0.57	С
Westbound Route 50: El Dorado Hills Blvd. to East Bidwell St.	1.14	E	0.89	D
Build (for all four alternatives)				
Eastbound Route 50: East Bidwell St. to Empire Ranch Rd,	0.52	C	0.79	D
Eastbound Route 50: Empire Ranch Rd. to El Dorado Hills Blvd.	0.67	C	0.91	E
Eastbound Route 50: El Dorado Hills Blvd. to Silva Valley Pkwy.	0.48	В	0.90	E
Westbound Route 50: Silva Valley Pkwy. to El Dorado Hills Blvd.	0.82	0	0.58	С
Westbound Route 50: El Dorado Hills Blvd. to Empire Ranch Rd.	285	D	0.67	С
Westbound Route 50: Empire Ranch Rd. to East Bidwell St.	1.13	E	0.86	D

#### Notes:

Shading denotes that the expected LOS would be worse than the calculated LOS shown in the table due to downstream LOS F conditions propagating upstream. Bold font with underscore indicates unacceptable operations.

Source: Fehr & Peers, 2003.

Table 16 shows that under the 2026 No Build Alternative, Route 50 would continue to operate unacceptably at LOS F in the peak directions (i.e., westbound during the a.m. peak hour and eastbound during the p.m. peak hour) between El Dorado Hills Boulevard/Latrobe Road and East Bidwell Street/Scott Road. The peak hour LOS F conditions would likely spread to additional hours and could adversely affect traffic operations on the major arterial roadways connecting to Route 50 such as El Dorado Hills Boulevard.

V/C is the volume to capacity ratio.

<sup>(2)</sup> LOS based on the El Dorado County General Plan.

For the Build Alternatives, the results for the freeway mainline analysis are the same under all four alternatives. Unacceptable operations would continue under build conditions in the peak directions. Specifically, insufficient mainline capacity would create bottlenecks at the segments listed below.

- Westbound Route 50 between Empire Ranch Road and East Bidwell Street AM peak
- Eastbound Route 50 between Empire Ranch Road and Silva Valley Parkway PM peak

Congestion between Empire Ranch Road and East Bidwell Street would cause mainline queuing that would extend upstream (with or without the Empire Ranch Road interchange constructed). The queuing may be severe enough to affect operations in the vicinity of the El Dorado Hills Boulevard interchange. Given that another bottleneck is projected to occur between El Dorado Hills Boulevard and Bass Lake Road, LOS F conditions on westbound Route 50 would likely extend from Bass Lake Road to Empire Ranch Road. A range of alternatives was considered to evaluate potential operational improvements Providing better peak hour LOS in the westbound direction would require one or more of the following improvements:

- Option 1 Greater utilization of the westbound HOV lane (only applies to the segment between Empire Ranch Road and East Bidwell Street for 2026 conditions)
- Option 2 Construction of a westbound auxiliary lane between the Empire Ranch Road on-ramp and the East Bidwell Street off-ramp
- Option 3 Construction of a westbound mixed-flow lane between the Empire Ranch Road off-ramp and the East Bidwell Street off-ramp

Under Option 1, the westbound Route 50 a.m. peak hour HOV utilization would need to increase from 23 to 34 percent to provide acceptable LOS D operations for the segment between Empire Ranch Road and East Bidwell Street under design year conditions. Under Options 2 and 3 above, the a.m. peak hour LOS would improve as listed below.

 Westbound Route 50 between Empire Ranch Road and East Bidwell Street (Option 2 - LOS D/E, Option 3 – LOS D/E)

Improving the peak hour LOS in the eastbound direction during the p.m. peak hour under 2026 conditions would require one of the following improvements.

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- Option 4 Greater utilization of the eastbound HOV lane between Empire Ranch Road and Silva Valley Parkway
- Option 5 Extension of the eastbound auxiliary lane to become a mixed-flow lane between Empire Ranch Road and Silva Valley Parkway

Under Option 4, the eastbound Route 50 p.m. peak hour HOV utilization would need to increase from 22 to 23 percent to provide LOS D conditions for the segment between Empire Ranch Road and Silva Valley Parkway under design year conditions. Under Option 5 above, the p.m. peak hour LOS would improve as listed below.

- Eastbound Route 50 between East Bidwell Street and Empire Ranch Road (Option 5 LOS D)
- Eastbound Route 50 between El Dorado Hills Boulevard and Silva Valley Parkway (Option 5 -LOS D)

Figures 14 and 15 illustrate mitigation Options 2 and 3, respectively, and indicate the "before" and "after" LOS for each mitigation under Design Build conditions.

### 6.5 FREEWAY RAMP JUNCTION OPERATIONS

Traffic operations for the ramp junctions were analyzed under Year 2026 conditions for the four Build Alternatives, and the results are summarized in Table 17 (see Appendix D for technical calculations). The results of ramp junction analyses are the same under all four Build Alternatives.

Table 17 shows that all ramp junctions at Empire Ranch Road would operate at LOS D or better under 2026 Build conditions during both peak hours except for the following locations:

- The eastbound off-ramp would operate at LOS E during the p.m. peak hour due to the high volume on the ramp.
- The westbound off-ramp would operate unacceptably at LOS F during the a.m. peak hour due to the capacity constraint on the westbound Route 50 mainline segment between El Dorado Hills Boulevard and Empire Ranch Road.
- The westbound on-ramp would operate unacceptably at LOS F during the a.m. peak hour due to the capacity constraint on the westbound Route 50 mainline segment at the Empire Ranch Road interchange.

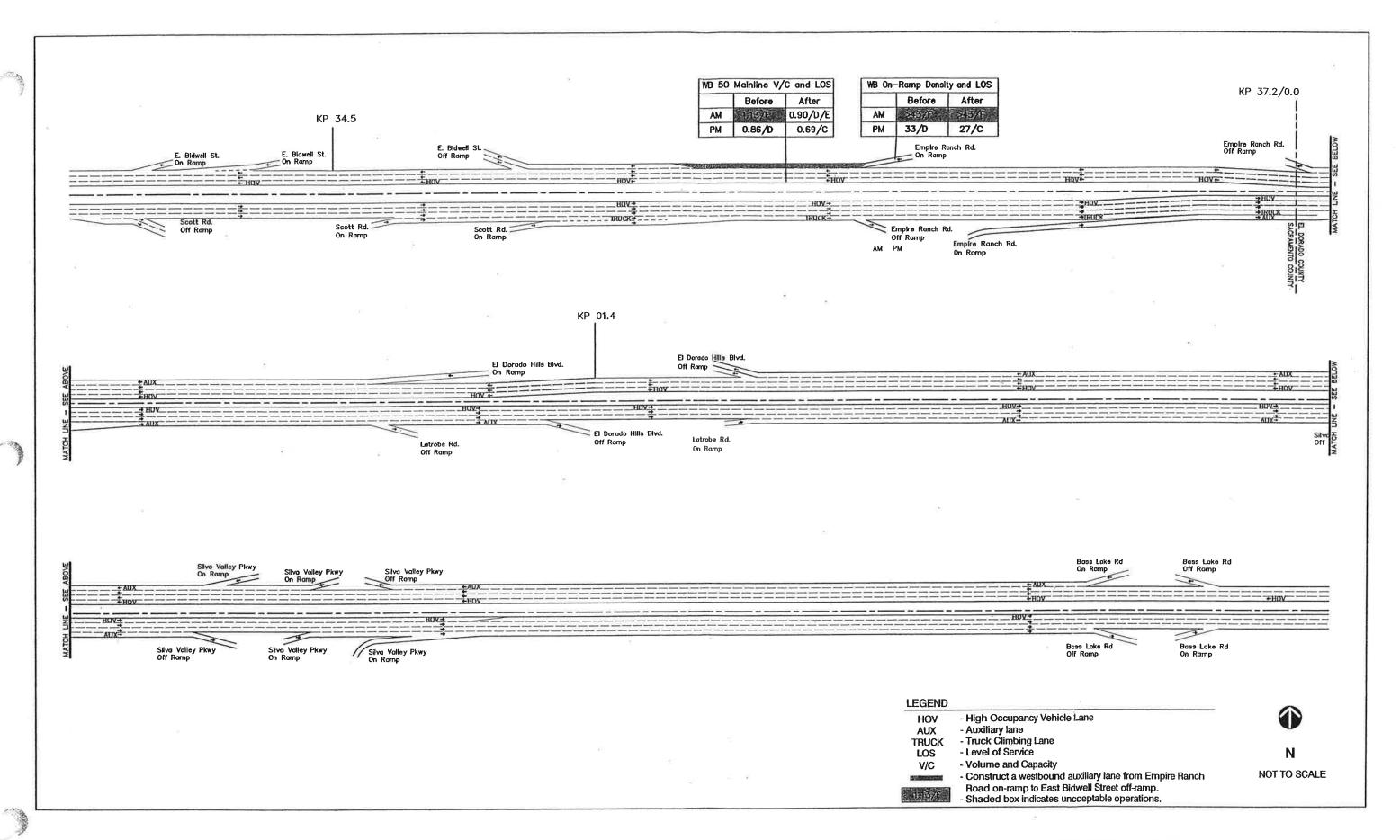


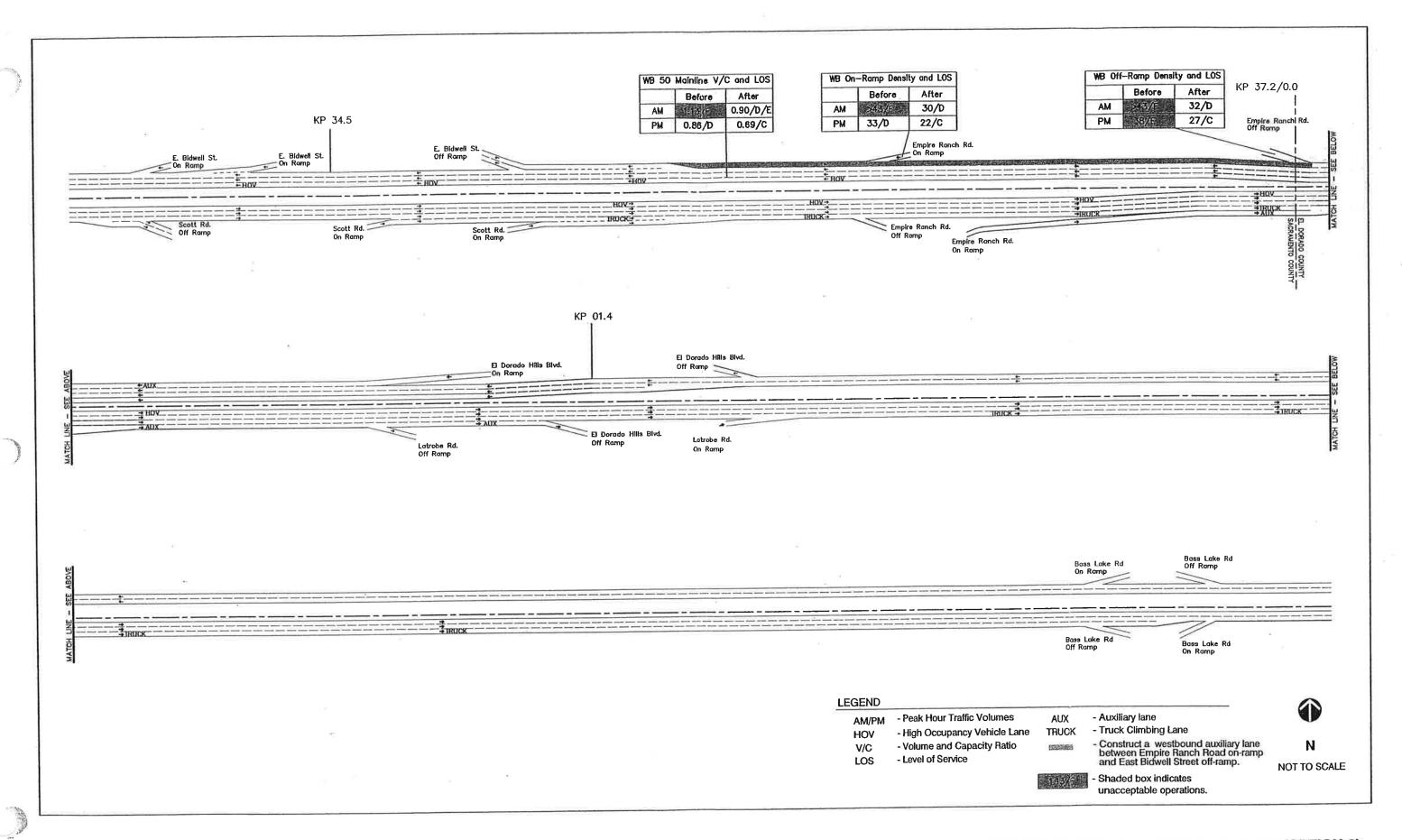
Table 17 Freeway Ramp Junction LOS – Design Build Alternation	, ,	NDITIONS		
	AM Pe	ak	PM Peak	
Freeway Ramp Junction	Density 1	LOS 2	Density 1	LOS 2
Build (for all four alternatives)		******		-
Route 50 Eastbound Off-ramp to Empire Ranch Road	25	С	36	E
Route 50 Eastbound On-ramp from Empire Ranch Road	17	В	24	С
Route 50 Westbound Off-ramp to Empire Ranch Road	<u>&gt;43</u>	<u>F</u>	38	E
Route 50 Westbound On-ramp from Empire Ranch Road	<u>&gt;43</u>	<u>F</u>	33	D
Notes:  (1) Density in passenger cars per mile per lane.  (2) LOS calculations based on the HCM 2000 procedures.  Bold font with underscore indicates unacceptable operations.				

The LOS F conditions for the Empire Ranch Road westbound ramps during the a.m. peak hour are due to the mainline capacity limits described above and are not associated with the interchange design itself. Under Option 3 described above for the mainline segment (see Appendix E for technical calculations), operations at the westbound off-ramp would improve from LOS F to D during the a.m. peak hour and from LOS E to C during the p.m. peak hour. The westbound on-ramp would improve from LOS F to D during the a.m. peak hour under Option 3.

The eastbound off-ramp would improve to LOS D during the p.m. peak hour by extending the deceleration lane from 140 feet to 300 feet. Refer to Figures 14 and 15 for an illustration of the various mitigation options and the "before" and "after" LOS for each mitigation under Design Build conditions.

### 6.6 Intersection Operations

The study intersections were analyzed under 2026 conditions for the four Build Alternatives. The results of the intersection operations analysis for each project alternative are summarized in Table 18 (see Appendix D for technical calculations).



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RECOMMENDED ROADWAY IMPROVEMENTS FOR MITIGATION AND LOS COMPARISON (OPTION 3) - CONSTRUCTION YEAR (2006) BUILD CONDITIONS

		AM Pea	ak Hour	PM Pea	k Hour
Intersection	Control	Delay 1	LOS 2	Delay 1	LOS
No Build					
Empire Ranch Road/Iron Point Road	Signal	18	В	30	С
Build - Alternative 1					
Empire Ranch Rd./Route 50 Eastbound Ramps	Side-Street Stop	0	Α	0	A
Empire Ranch Rd./Route 50 Westbound Ramps	Signal	15	В	13	В
Empire Ranch Road/Iron Point Road	Signal	44	D	57	E
Build - Alternative 2					
Empire Ranch Rd./Route 50 Eastbound Ramps	Side-Street Stop	0	Α	0	A
Empire Ranch Rd./Route 50 Westbound Ramps	Signal	15	В	13	В
Empire Ranch Road/Iron Point Road	Signal	44	D	<u>57</u>	E
Build - Alternative 3					
Empire Ranch Rd./Route 50 Eastbound Ramps	Side-Street Stop	0	Α	0	A
Empire Ranch Rd./Route 50 Westbound Ramps	Signal	22	С	53	D
Empire Ranch Road/Iron Point Road	Signal	43	<u>D</u>	54	D
Build - Alternative 4					
Empire Ranch Rd./Route 50 Eastbound Ramps	Side- Street Stop	0	Α	0	A
Empire Ranch Rd./Route 50 Westbound Ramps	Signal	22	С	53	D
Empire Ranch Road/Iron Point Road	Signal	43	D	54	D

As shown in Table 18, the Empire Ranch Road/Iron Point Road intersection would operate acceptably during both the a.m. and p.m. peak hours under No Build Alternative.

For the Build Alternatives, the two ramp terminal intersections would operate acceptably at LOS D or better during both peak hours for all four alternatives. Alternatives 3 and 4 include a Type L-7 configuration at the westbound ramps. In contrast to Alternatives 1 and 2, this configuration requires an additional signal timing phase for the loop on-ramp to serve southbound left turning traffic heading westbound on Route 50 from Empire Ranch Road. Therefore, the westbound ramps would have higher delay under Alternatives 3 and 4 than Alternatives 1 and 2, although this intersection would still operate acceptably.

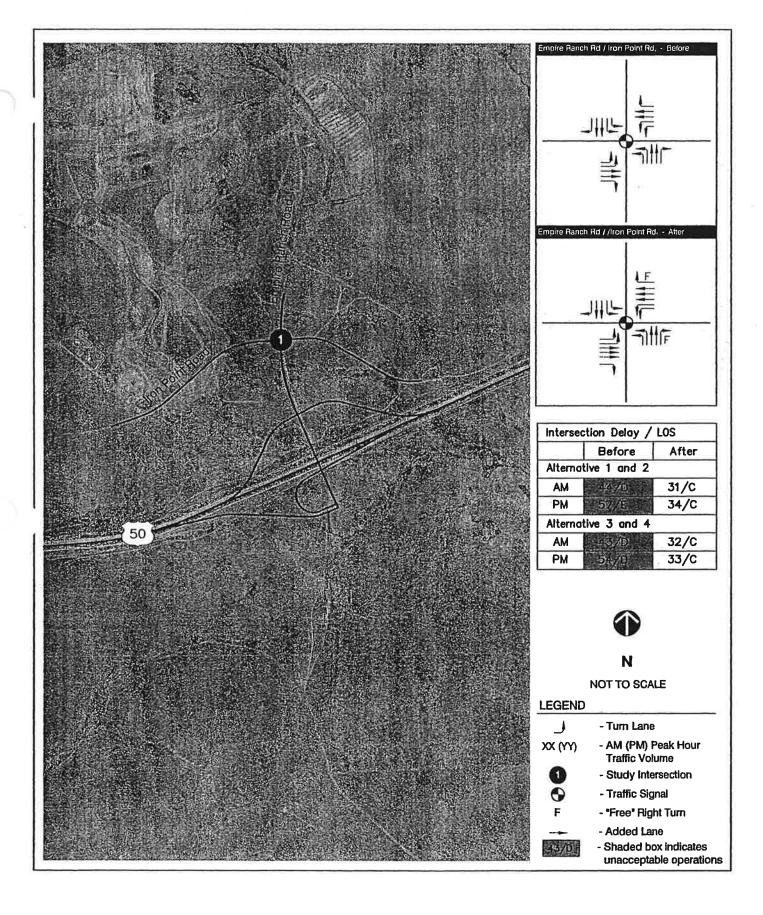
Unacceptable operations for the Build Alternatives would occur at the Iron Point Road/Empire Ranch Road intersection during both peak hours for all four alternatives. Although traffic volumes are the same among all four alternatives, the LOS differs as a result of the signal phasing at the westbound Route 50 ramps as mentioned previously.

- For Alternatives 1 and 2, LOS D and E conditions would occur during the a.m. and p.m. peak hours, respectively.
- For Alternatives 3 and 4, LOS D conditions would occur during both the a.m. and p.m. peak hours.

The following improvements are needed to provide acceptable LOS C at the Iron Point Road/Empire Ranch Road intersection during both peak hours.

- Provide a third through lane on Iron Point Road that extends a minimum of 1,000 feet in each direction (east and west) of Empire Ranch Road.
- Provide a "free" right-turn movement for the northbound and westbound approaches to the Iron
   Point Road/Empire Ranch Road intersection.

Refer to Figure 16 for an illustration of these improvements and the "before" and "after" LOS for each mitigation under 2026 Build conditions.



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RECOMMENDED INTERSECTION IMPROVEMENTS
AND LOS COMPARISON DESIGN YEAR (2026) BUILD CONDITIONS

Maximum queue lengths and available vehicle storage for critical movements at the study intersections are shown in Table 19 (see Appendix D for technical calculations).

Intersection	Table 19 Queue Summary – Design Build Alternativ		NDITIONS	11
		Available	Maximum (	Queue <sup>1</sup> (ft)
Intersection	Movement	Storage (ft)	AM	PM
No Build				
Empire Dench Bond/	Southbound Left	300	225	250
Empire Ranch Road/	Southbound Right	300	150	75
Iron Point Road	Eastbound Left	300	50	275
Build - Alternative 1 & 2			N H B	1000
Ei Derek Derek	Westbound Right	750	300	125
Empire Ranch Road/ Westbound Route 50 Ramps	Northbound Through	945³	125	575
	Southbound	700	75	75
	Northbound Left	200	125	25
	Northbound Through	700	225	600
Empire Ranch Road/	Northbound Right	250	100	250
Iron Point Road	Southbound Left	300	225	225
	Eastbound Left	300	50	150
	Westbound Left	300	175	225
Build - Alternative 3 & 4				
	Westbound Right	500	300	300
Empire Ranch Road/	Northbound Through	1,020 <sup>3</sup>	275	1,010
Westbound Route 50 Ramps	Southbound Left	375	150	375
	Southbound Through	650	50	300
	Northbound Left	200	150	25
æ	Northbound Through	650	175	500
Empire Ranch Road/	Northbound Right	250	50	150
Iron Point Road	Southbound Left	300	225	250
	Eastbound Left	300	50	150
	Westbound Left	300	175	225

Notes

As shown in Table 19, adequate vehicle storage would be provided for the critical movements at the Iron Point Road/Empire Ranch Road intersection under 2026 No Build conditions. For Build Alternatives 1 and 2, adequate vehicle storage would be provided for the critical movements at each study intersection.

<sup>(1)</sup> The reported queue is the 95th percentile queue, which is typically used to size storage bays.

<sup>(2)</sup> The available storage between the eastbound off-ramp exit point and the intersection stop line.

<sup>(3)</sup> The available storage between the eastbound and westbound Route 50 ramp terminal intersections. Source: Fehr & Peers, 2003.

Build Alternatives 3 and 4 include a Type L-7 configuration at the westbound ramps, which has high traffic volumes for the northbound through movement that would conflict with southbound left-turning traffic. Therefore, the maximum queue length for the northbound through and westbound right-turn movements would be longer for Alternatives 3 and 4 than for Alternatives 1 and 2. Table 19 shows that the 95<sup>th</sup> percentile queue for the northbound through movement during the p.m. peak hour is within the available storage under Build Alternatives 3 and 4 but the queue may extend up to the eastbound off-ramp intersection. However, these expected queues would not further extend from the eastbound off-ramp onto freeway mainline.

## 6.7 RAMP METER ANALYSIS

A ramp metering analysis was conducted for the Build Alternatives under 2026 conditions to determine the most restrictive metering rate that the eastbound and westbound Route 50 on-ramps from Empire Ranch Road could accommodate before the vehicle queue exceeds available storage capacity. The ramp meter type for Empire Ranch Road on-ramps was assumed to be one metered lane plus an HOV bypass.

Table 20 summarizes the results of the ramp metering analysis under 2026 conditions (see Appendix D for technical calculations). The metered on-ramps would operate within the minimum (240 vphpl) and maximum (1,000 vphpl) metering rates with the available storage assuming that Route 50 operates below capacity. Ramp queuing would be more extensive and may exceed available storage if Route 50 operates at LOS F.

Table 20 Ramp Metering Operations – Design Year (2026) Conditions  No Build and Build Alternatives							
AM Peak Hour PM Peak Hour							
			Minimum		Minimum		
		Peak-Hour	Metering Rate	Peak-Hour	Metering Rate		
On-Ramp	Number of Lanes	Volume (vph)	(vphpl)	Volume (vph)	(vphpl)		
Empire Ranch Road	1 Metered Lane	580	500	650	530		
Eastbound On-ramp	1 HOV Bypass Lane	360	300	630	550		
Empire Ranch Road	1 Metered Lane	950	920	500	470		
Westbound On-ramp	1 HOV Bypass Lane	950	820	590	470		
Notes:							
vphpl = vehicles per hour per land	<b>).</b>						
Source: Fehr & Peers, 2003.							

# UI ATION PERFORMANCE

hange project is intended to improve accessibilities to planned development in eastern Folsom 1El Dorado Hills and to reduce congestion at other nearby Route 50 interchanges. Therefore, is expected to provide circulation benefits because the area-wide benefits of a new interchange is the change in total travel distance and travel

mmarizes the percent change in Year 2026 vehic I miles of travel (VMT) and vehicle hours of ') at a local-area, sub-regional, and regional level — The boundaries for these areas are described

al-Area – includes the area bounded by Riley S (in Folsom) and Serrano Parkway (in El ado Hills) to the north, Route 50 to the south, Sill Valley Road to the east, and Oak Avenue tway to the west.

Regional – includes the area bounded by Nato — Street and Green Valley Road to the north, te Rock Road to the south, Silva Valley Road to — east, and Folsom Boulevard to the west.

onal – includes portions of El Dorado, Placer, S — ramento, Sutter, Yolo, and Yuba counties — the entire area covered in the 2002 ve — of the 2025 SACMET travel demand easting model).

Perce	NT CHANGE IN VMT AND	TABLE 21 WHT – DESIG I — BUILD ALTER	YEAR (2026) CON	NDITIONS
Measure	No Build	Bui 1	Alternative	Percent Difference
	Le	ocal-Area		
r	1,048,600	1.	<b>&gt;57,100</b>	0.81%
	28,860		8,770	-0.30%
	Sub	-Regional		
	2,457,200	2,	66,500	0.38%
	72,700		2,710	0%
	R	egional		
	65,666,100	65-	15,300	0.07%
A	1,842,650	1-8	41,980	-0.04%
iles of Travel urs of Travel ers, 2004.			_	

As shown, the proposed project will slightly increase the total VMT at the local-area level, while the total VHT reduces. This indicates that the project may result in travel routes with a slightly longer distance; however, the project will provide some timesaving since these routes will have quicker travel times.

The proposed project will result in a smaller reduction in total VHT on a regional scale compared to the local-area scale. The slight change in regional VMT indicates that the proposed project is only a small part of the regional network (i.e., the six-county area). However, the reduction in VHT is measurable even on a regional scale, suggesting that the relatively minor connection (compared to total regional lane miles) is being located in a significantly congested location.

# 7. ROUTE 50 CORRIDOR IMPROVEMENT ISSUES

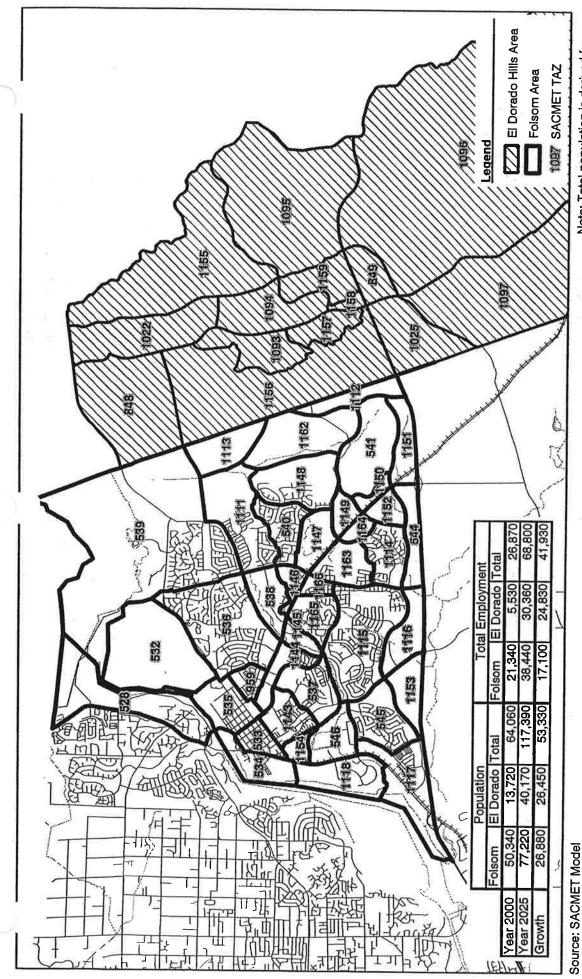
According to the *Metropolitan Transportation Plan (MTP) for 2025* (Sacramento Area Council of Governments, 2002), the population and employment of the Sacramento region is projected to increase substantially by 2025. Folsom and western El Dorado County will share in this growth. Figure 17 summarizes the projected population and employment growth for Folsom and the El Dorado Hills area of El Dorado County. As shown in the figure, Folsom will add 26,880 new residents and 17,100 new jobs between 2000 and 2025. This amount of growth represents a 53 percent increase in population and an 80 percent increase in employment. A similar level of growth is projected for the El Dorado Hills area, which will add 26,450 new people and 24,830 new jobs between 2000 and 2025. This amount of growth represents 193 percent and 449 percent increases in population and employment, respectively.

Accompanying this growth are planned improvements to Route 50 including the Empire Ranch Road interchange. The proposed Empire Ranch Road Interchange is one of four major projects along U.S. 50 near the Sacramento/El Dorado County line currently programmed to be constructed by 2010. These projects are listed below.

- Construct new Route 50 interchange at Empire Ranch Road
- Reconstruct the El Dorado Hills Boulevard Interchange
- Construct new Route 50 interchange at Silva Valley Parkway
- Extend HOV lanes from their current terminus at El Dorado Hills Boulevard/Latrobe Road to Shingle Springs/Ponderosa Road interchange

Figure 18 shows the relative timing of these projects based on SACOG's 2025 MTP as it relates to improvements to Route 50 mainline. The phasing shown is not consistent with the proposed phasing of the Empire Ranch Road interchange project. Rather, the intent of Figure 18 is to call attention to the potential difficulty in phasing of these projects during the long construction period from 2006 to 2010. Each interchange project includes auxiliary lanes that may extend the full length of Route 50 in both directions between East Bidwell Street and Bass Lake Road. The timing of these improvements is intended to match with the planned population and employment growth but may introduce implementation and construction challenges for Caltrans, the City of Folsom, and El Dorado County. Without a coordinated construction schedule, mainline Route 50 could be disrupted almost continually between about 2005 and 2010.

April 28, 2004



Note: Total population is derived from an average of 2.63 persons per household.

FEHR & PEERS Transportation Consultants

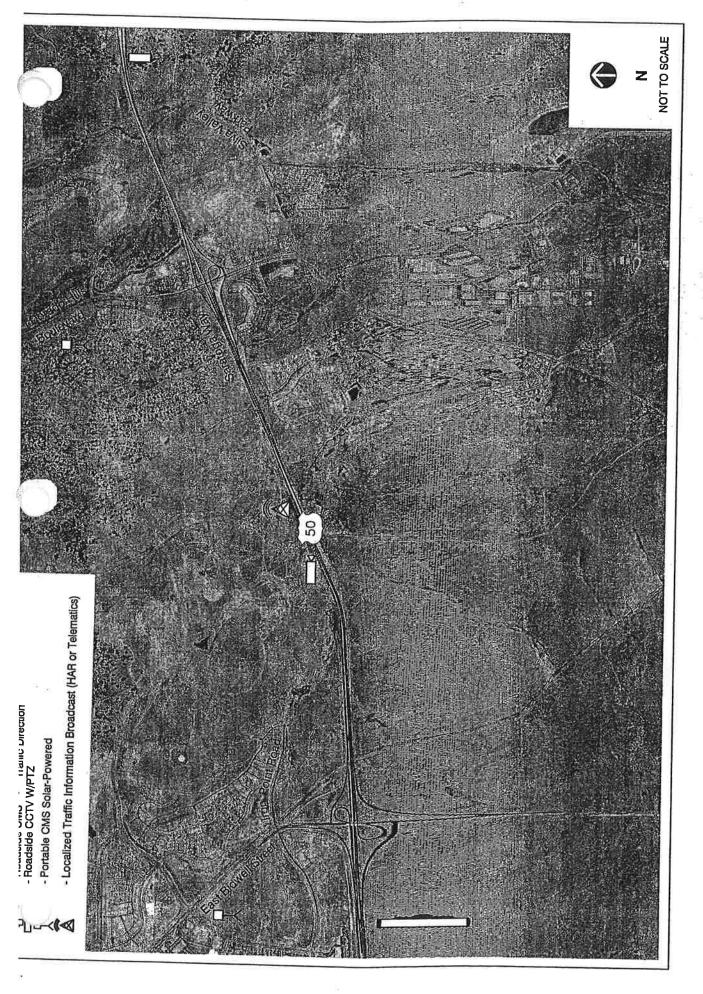
BASE YEAR 2000 AND 2025 POPULATION AND EMPLOYMENT IN STUDY AREA As previously specified, the proposed interchange project includes three elements: Element 1 includes the Empire Ranch Road interchange, Element 2 includes the auxiliary lanes between Empire Ranch Road and El Dorado Hills Boulevard/Latrobe Road, and Element 3 includes median widening to the Bass Lake Grade Truck Climbing Lane. The intent of Elements 2 and 3 are to mitigate impacts to the traffic operations on Route 50 due to the construction of the interchange. The likely order of construction based on current funding is Element 3, then 2, then 1. Interchange construction should also consider the need for alternative routes into El Dorado Hills when reconstruction of the El Dorado Hills Boulevard/Latrobe Road interchange begins. At a minimum, the planned improvement projects listed above should not be advanced through the final steps of the project development process as independent projects. Instead, the segment of Route 50 between Bass Lake Road and East Bidwell Street should be considered an integrated system when developing final construction phasing plans.

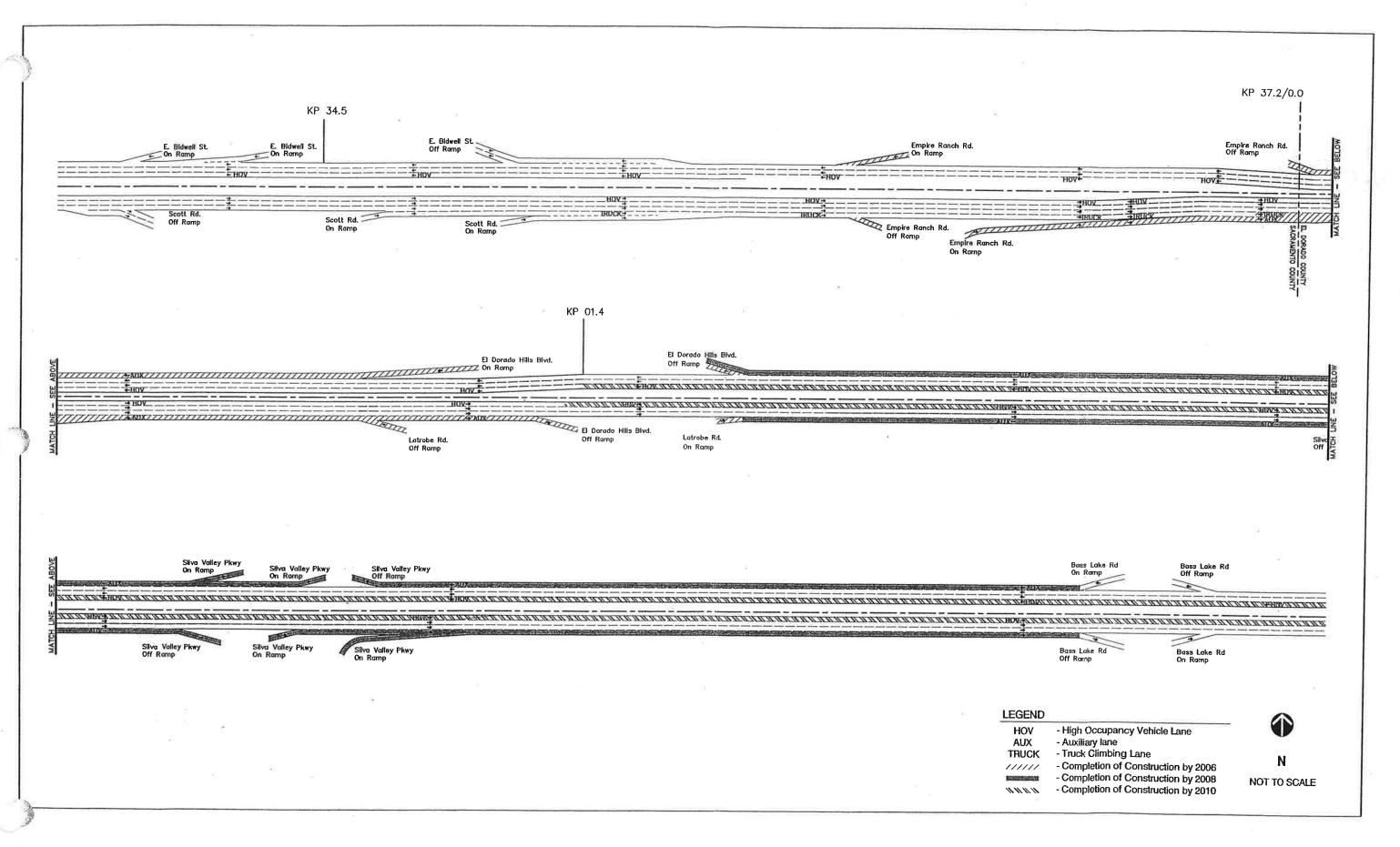
Even with a closely coordinated construction schedule, the high traffic demand in the study corridor and lack of alternative routes could cause potential congestion and safety issues on Route 50 in the near term. The steep and rolling terrain severely limits visibility in this area and construction activity would exacerbate these conditions. In addition, congestion on Route 50 would likely prohibit traffic merging onto the mainline from ramps and cause queues back onto arterials such as East Bidwell Street and El Dorado Hills Boulevard/Latrobe Road. To address these potential congestion and safety issues, other mitigation measures besides alternative routes need to be considered.

Caltrans should consider Intelligent Transportation System (ITS) improvements that would provide effective options to relieve congestion and improve safety by providing appropriate and timely information to drivers. In general, ITS improvements are expected to improve the mobility of Route 50 in the study area in the following aspects. An illustrative example of the ITS improvements is shown in Figure 19 and described below.

- ITS field elements will monitor traffic and provide real-time information to transportation
  officials. This information will enable them to effectively manage traffic, clear incidents, and
  inform drivers of potential delays.
- Real-time traffic information and video images of ramps and arterials in the project area can be
  posted on websites such as the Highway 50 Corridor site. This will enable drivers to assess traffic
  conditions and determine the best course of action before leaving their home or offices.

April 28, 2004





- Traffic delay information can be posted on permanent or temporary changeable message signs located in advanced of key alternate routes (e.g., Iron Point Road) or Route 50 ramps. This is designed to provide adequate advanced notice in the event that traffic diversion is necessary.
- Traffic information can also be broadcast on local Highway Advisory Radio to provide in-vehicle information throughout the subject area. By 2006, information may also be broadcast using images to vehicles equipped with navigation systems.
- ITS improvement in the future may also take advantage of E911 capability to be available on cellular telephone network. This GPS-based service is expected to improve incident detection and response time.

Appendix A Travel Demand Forecasts Technical Memorandum



## MEMORANDUM

DATE: June 3, 2003

TO: Tim Fleming, Mark Thomas & Co., Inc.

FROM: Jason Isaac and Billy Park, Fehr & Peers Associates, Inc.

RE: Travel Demand Forecasts for the U.S. 50/Empire Ranch Road Interchange

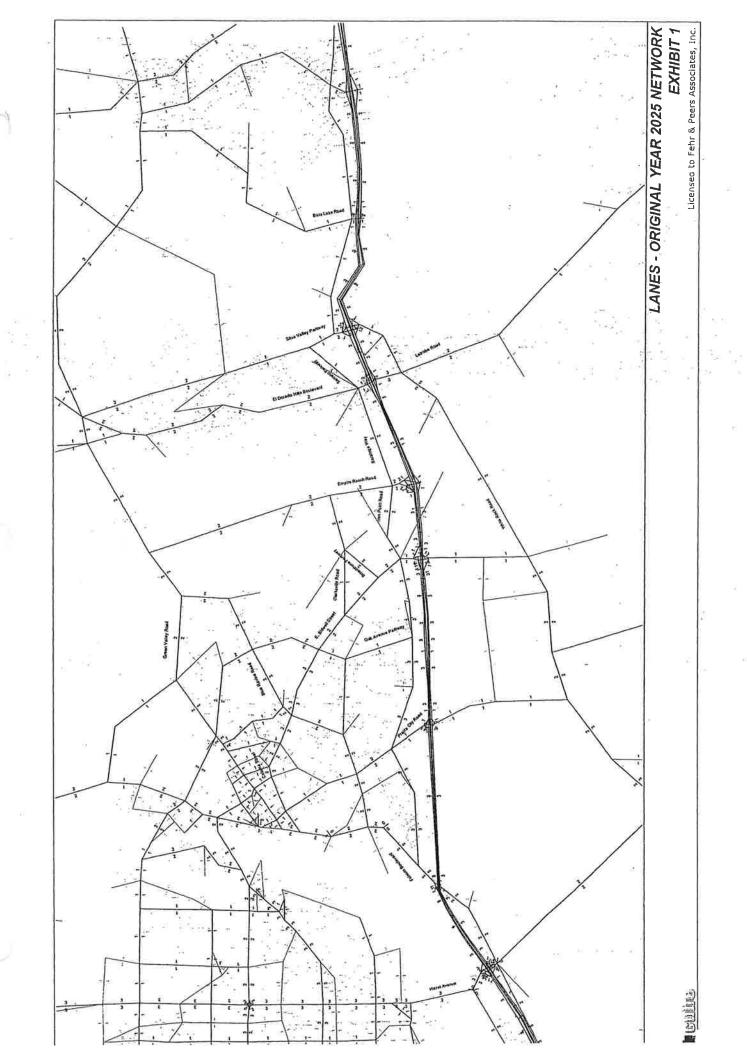
Fehr & Peers has completed the draft travel demand forecasts for the U.S. 50/Empire Ranch Road Interchange Project Report (PR). This memorandum contains the forecasts and a brief description of how the forecasts were developed.

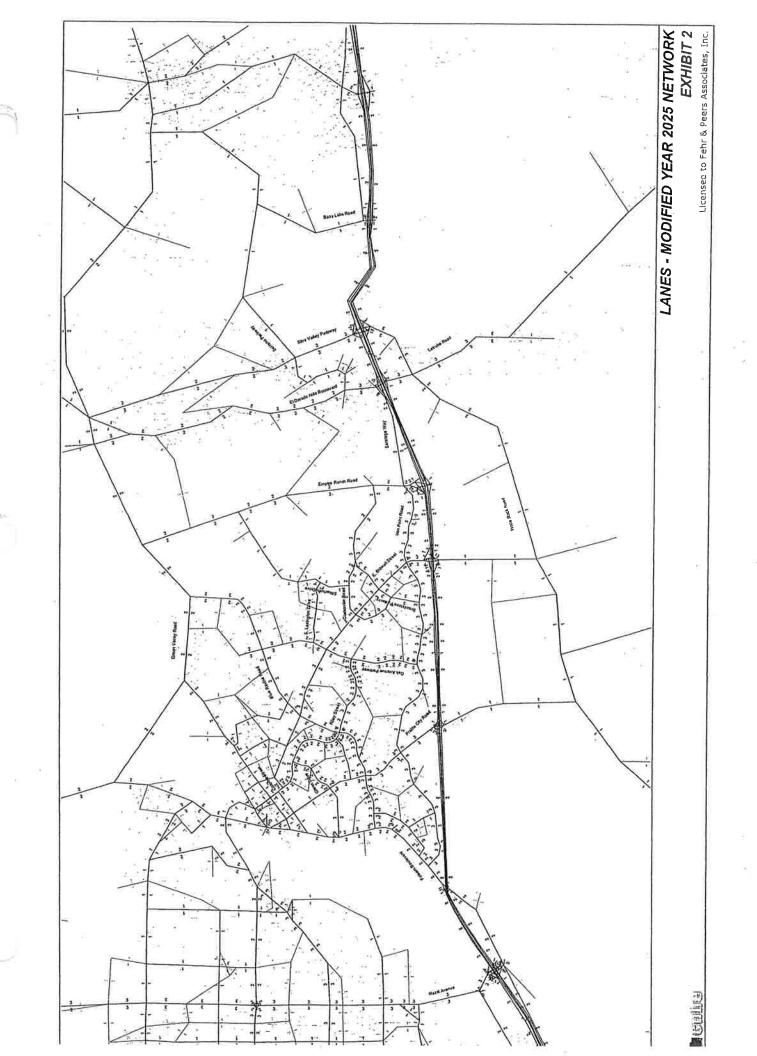
## **Travel Demand Model Modifications**

The travel demand forecasts were developed by Fehr & Peers using a modified version of the regional SACMET travel demand model. We obtained the latest version of the SACMET model used to prepare the 2002 Metropolitan Transportation Plan (MTP). Specific modifications made to the model are highlighted below.

- Refined the roadway network within study area to better match existing and planned roadway alignments.
- Changes the 2025 roadway network to be consistent with Tier 1 roadway improvements contained in the MTP. These improvements are likely to be funded with expected revenues.
- Split traffic analysis zones (TAZs) within the study area and correct land use estimates to improve trip distribution and assignment.

Exhibit 1 shows the original 2025 SACMET MTP network. Exhibit 2 shows the modified network. Specific changes are listed below in Table 1.







2025 SACME	Table 1 ET Roadway Netwo	ale Changes	
2023 GIGIVIE		er of Lanes in Both D	iractions
Roadway Segment	MTP or City of Folsom	Original SACMET	Modified SACMET
U.S. 50 – Sunrise Avenue to El Dorado		6 Mixed-Flow	4 Mixed-Flow
Hills Boulevard	None	2 HOV	2 HOV
White Rock Road - Hazel Avenue to		18x 3	
Sacramento/El Dorado Co. Line	None	4 Lanes	2 Lanes
White Rock Road - Latrobe Road to U.S.			-
50	4 Lanes	2 Lanes	6 Lanes (1)
White Rock Road - U.S. 50 Over-crossing	4 Lanes	2 Lanes	6 Lanes (1)
Hazel Avenue Extension – Folsom			o zareo
Boulevard to White Rock Road	None	4 Lanes	None
Latrobe Road – White Rock Road to			110110
Golden Foothill Parkway	6 Lanes	4 Lanes	6 Lanes
El Dorado Hills Boulevard – Park Drive to			- Janies
Serrano Parkway	6 Lanes	2 Lanes	6 Lanes
Folsom Dam Road – Folsom-Auburn			o Laries
Road to East Natoma Street	Closure	4 Lanes	None
New Bridge – Folsom-Auburn Road to		4 Lanes in different	110110
East Natoma Street	4 Lanes	location	4 Lanes
Folsom Boulevard – Sutter Street to			, mario
Natoma Street	4 Lanes	2 Lanes	4 Lanes
Oak Avenue Parkway Extension - East			
Natoma Street to Willow Creek Drive	None	4 Lanes	None
Riley Street – Coloma Street to Blue Ravine			
Road	4 Lanes	None	4 Lanes
Riley Street – Blue Ravine Road to Oak			
Avenue Parkway	4 Lanes	2 Lanes	4 Lanes
Prairie City Road – Glenn Drive to Blue			
Ravine Road	4 Lanes	2 Lanes	4 Lanes
Prairie City Road – Blue Ravine Road to			
U.S 50	6 Lanes	2 or 4 Lanes	6 Lanes
Glenn Drive – Folsom Boulevard to Riley			
Street	4 Lanes	None	4 Lanes
Blue Ravine Road – Folsom Boulevard to			
Riley Street	6 Lanes	4 Lanes	6 Lanes
Natoma Station Drive - Folsom Boulevard			
o Blue Ravine Road	4 Lanes	None	4 Lanes
Orange Blossom – Natoma Station Drive			
o Iron Point Road	2 Lanes	None	2 Lanes
E. Bidwell Street – Blue Ravine Road to			
Oak Avenue Parkway	4 Lanes	6 Lanes	4 Lanes
E. Bidwell Street – Clarksville Road to U.S	11		



	Table 1 (continued)		
2025 SACMI	ET Roadway Netwo		
T.		er of Lanes in Both D	irections
(*)	MTP or	Original	Modified
Roadway Segment	City of Folsom	SACMET	SACMET
Oak Avenue Parkway - E. Bidwell Street		E ST	3.51
to Iron Point Road	4 Lanes	2 Lanes	4 Lanes
Broadstone Parkway - E. Bidwell Street to		n 2	
Golf Links Drive	6 Lanes	4 Lanes	6 Lanes
Broadstone Parkway - E. Bidwell Street to			
Iron Point Road	6 Lanes	None	6 Lanes
Clarksville Road (north of E. Bidwell St.) -	· · · · · · · · · · · · · · · · · · ·		
E. Bidwell Street to Broadstone Parkway	4 Lanes	2 Lanes	4 Lanes
Clarksville Road (south of E. Bidwell St.) -	9.1		
E. Bidwell Street to Broadstone Parkway	4 Lanes	None	4 Lanes
Silberhorn Drive - Clarksville Road to			
Empire Ranch Road	2 Lanes	None	2 Lanes
S. Lexington Drive - Oak Avenue Parkway			
to Silberhorn Drive	2 Lanes	None	2 Lanes
Iron Point Road - E. Bidwell Street to			
Empire Ranch Road	6 Lanes	4 Lanes	6 Lanes
Francisco Drive – El Dorado Hills			
Boulevard to Green Valley Road	4 Lanes	2 Lanes	4 Lanes
El Dorado Hills Boulevard - Francisco			
Drive to Green Valley Road	2 Lanes	4 Lanes	2 Lanes
Silva Valley Parkway Harvard Way to			
U.S. 50	4 Lanes	2 Lanes	4 Lanes
Note: (1) El Dorado County General Plan	41		

The TAZ splits are shown in Exhibit 3 while the corresponding land use allocations are summarized in Tables 2 and 3 below. The base year land use estimates were verified based on a review of detailed aerial photography and field visits. Adjustments were made to the base year estimates to better match existing conditions from these reviews. After adjustment, the base year SACMET household estimates were increased from 10,063 to 16,221 for the affected TAZs while retail and non-retail employment did not change substantially.

### **Draft 2025 Travel Demand Forecasts**

For 2025 conditions, we developed preliminary unadjusted travel demand forecasts for selected roadways in the study area. The resulting a.m. and p.m. peak hour roadway segment volumes are shown in Exhibit 4 and 5, respectively. Exhibits 6 and 7 focus on the a.m. and p.m. peak hour traffic forecasts at the proposed Empire Ranch Road Interchange. The travel demand model changes and preliminary traffic volume forecasts need to be reviewed and approved by the PDT prior to developing the detailed interchange forecasts and conducting the traffic operations analysis.





Table 2. Base Year Land Use Spilts by TAZ

Original	Modified		EMPLO	EMPLOYMENT	ENROLLMENT	MENT	ALITO TERMINAL TIME	TINAL TIME	PARKING	DAVIS	COMPOSITE	1 E E E		EMPLOYMENT	YMENT	
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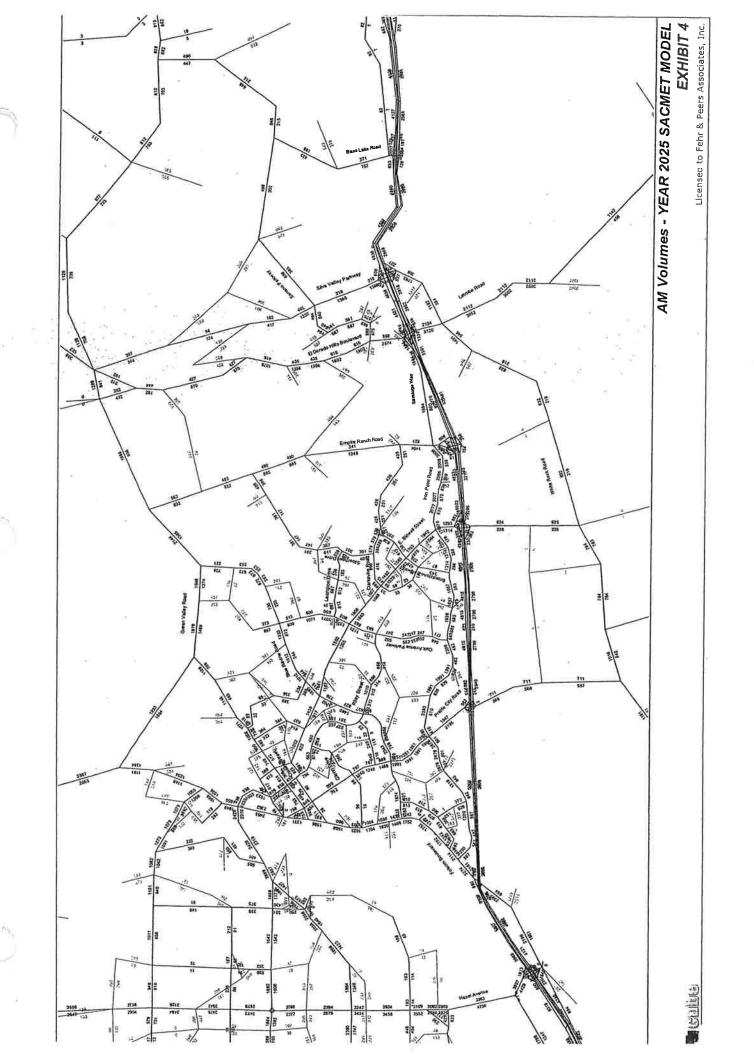
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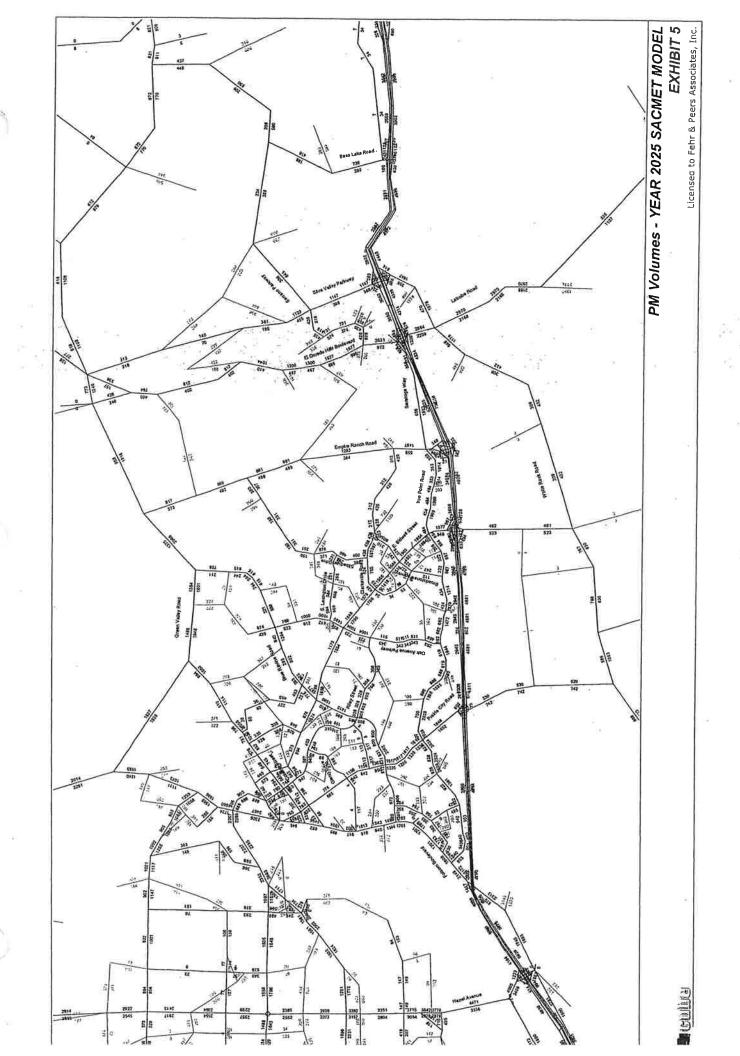
Table 3. Year 2025 Land Use Splits by TAZ

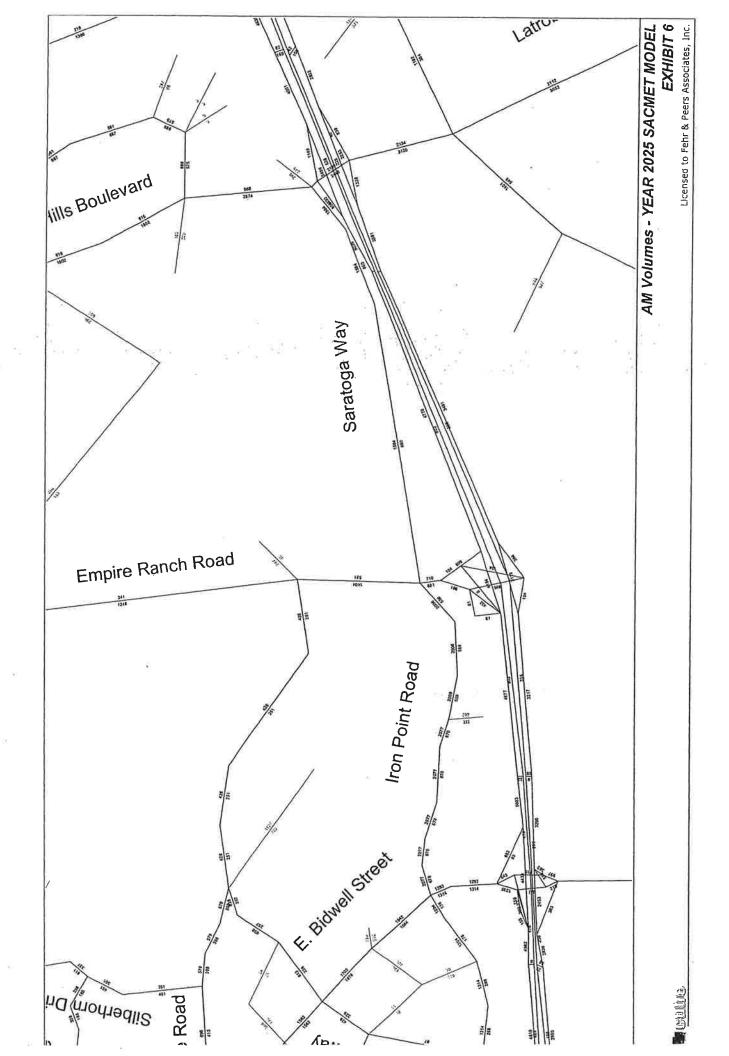
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	Field Count + Incromental Growth	3,028		2,298	0	1,000							000		3 5	25
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	Field Count + Incremental Growth	545	1,500	1,447	0	Ö						N.	1,200	47	0	200
	75	546	512	099	0	0	100	1001	6	0		-	413	47	0	200
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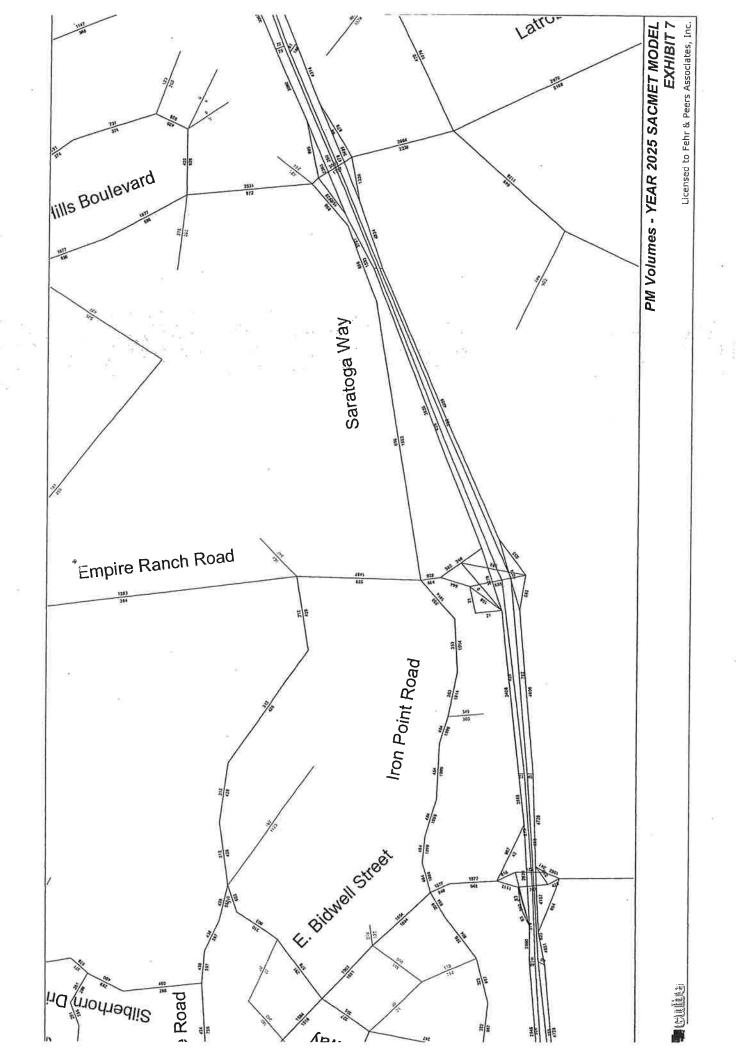
Table 3 (Continued). Year 2025 Land Use Splits by TAZ

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		Field Count + Incremental Grawth	4,237		637	0	2,100							190	45		372
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		1158			428	0	1,000			0	0	A STATE	12	2			
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Column		1113		40	181		006		1001	0	C	11 11 12 18		2	0 0	150	o.
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450   480   480   6   50   100   1																	
100   100	1114		2307	95	480	0	200	100	bot	0	0	0		952	S	1001	8
1		Field Count + Incramental Growth		450	480	0	200							250	90	100	98
1		1114		20	36	0	350	1001	100	0	0	8	•	0	0	45	6
1		1183	1,371	49	237	0	150	100	100	0	o	•		26	09	55	15
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25	1115		2,786	38	183	0	906	1001	95	0	0	ď		2			
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5.275         2.113         1.2840         1.1164         6.136         577         1.443           4.3         4.0         0			18 X 37	SAN SIN LA		のでは、大学のでは、	05.	N. I. I.	2	T. C. S.	A NA	THE STATE OF THE S		STATE OF STA		TO SECURE	22 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
5.276         2.1131         1.138         1.118         1.443           3.276         2.1132         1.188         1.188         1.1188           4.3         4.0         0         0         0         0												N. T.	1				200
43 40 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	THE PERSON NAMED IN COLUMN	SACKET Total	20,763	5,275	21,133	12,880	11,168	18						6,198	16	1,443	12.915
ance 6.156 43 40 0 0 0 0	Harris Andrews	Modified Total St. Co. T. T. S.	198 SZ 100 ST 100	A 50 50 50 18 18	1 2 CM	189 VO 12,880	188	5						A 181 181 181 181 181 181 181 181 181 18	26	77	Section Sec
		Difference	8,158	43	40	0	0							0	o		

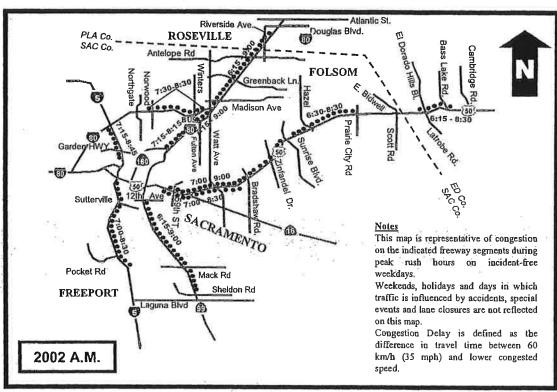


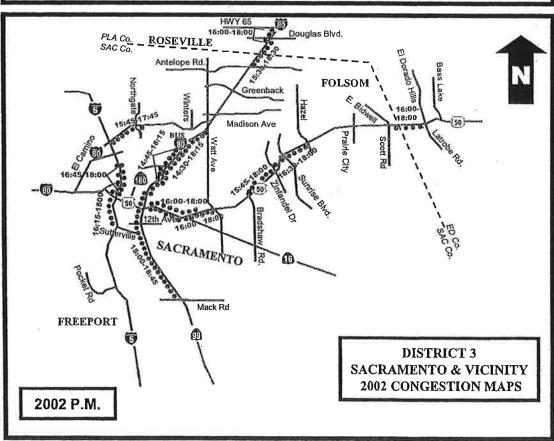






Appendix B Existing Conditions





Appendix C Construction Year (2006) Conditions

11/6/2003 SOEB\_OFF\_AM, txt

HCS2000: Ramps and Ramp Junctions Release 4.1c

Fax: Phone: E-mail:

An Fehr. & Peers Associates, Inc. 8/12/2003 AM Peak Hour US 50 / Eastbound Empire Ranch Rd, Off-ramp Ounction:

Oursediction:

Analysis Year:

2006 With Project w/o Saratoga
Description: US 50/Empire Ranch Road Interchan Diverge Analyst: A Agency/Co.: F F Date performed: 8 Analysis time pariod: 8 Preeway/dir or travel: 0 Analysis

Freeway Data

Diverge 3 70,0 2170 Type of analysis Number of lanes in freeway Free-flow speed on freeway Volume on freeway

ndr dqv

Adjacent Ramp Data (if one exists) Right 1 35.0 90 off Ramp Side of freeway
Number of lanes in ramp
Free-Flow speed on ramp
Volume out ramp
Length of first accel/decel lane
Length of second accel/decel lane Data

다 다 다 다

Conversion to pc/h Under Base Does adjacent ramp exist?
Volume on adjacent ramp
Position of adjacent ramp
Type of adjacent ramp
Distance to adjacent ramp

Conditions:

ЧQ

õ

Mgh > 40 40 # 를 Adjacent Ramp Lavel \* 草 Grade 4.00 0.10 1.5 1.2 0.980 90. 0.90 Ramp #ij Freeway 4 0 Grade 6.00 0.30 3.0 6.0 0.926 2170 0.90 603 Trucks and buses PCE, ET
Recreational vehicle PCE, ER
Heavy vehicle adjustment, fftv
Driver population factor, ff Volume, V (vph)
Peak-hour factor, PHF
Peak 15-min volume, v15
Trucks and buses
Recreational vehicles
Terrain type:
Grade Junction Components

50EB_OFF_AM. txt				11/6/2003
Flow rate, vp		2604	102	hqpq
Areas	Estimati	Estimation of V12 Diverge	Je Je	*
	L = 0.00	(Equation 25-8 or 25-9)	or 25-9)	
	P = 0,690	Using Equation	ín	
	V = V + (V - V) $12  R  F  R$	v } P = 1829 R FD	hc/h	
Checks	Ď	Capacity		
» ".	Actual 2604	Maximum 7200	LOS E	٤٦
, > L	1829	4400	No	
4 > 1 CR	2502	7200	No	
•	102	2000	Ñ	
3	evel of Service	Level of Service Determination (if not F)	if not F)	
Density, $D=4.252+0.0086~v-0.009~L$ Level of service for ramp-freeway junction areas of influence	D = 4.252 R or ramp-freeway	D = 4.252 + 0.0086 v - 0.009 R 12 mp-freeway junction areas of i		18.7 pc/mi/ln B
Estimation	Speed	ם.		
Intermediate speed variable,	variable,	A A	0.437	
Space mean speed in ramp influence area,	n ramp influenc	e area, S	58 mph	
Space mean speed in outer lanes,	n outer lanes,	II (	76.8 mph	
Space mean speed for all vehicles,	or all vehicles	co,	62.4 mph	

11/6/2003 50EB\_ONL\_AM. txt

HCS2000: Ramps and Ramp Junctions Release 4 1c

Analyst:

An Expers Associates, Inc.

Date performed:

An Feak Hour

An Eak Hour

An Eak Hour

Junction:

Durisdiction:

2006 With Project W/o Saratoga

Description: US 50/Empire Ranch Road Interchan Fax: Merge Analysis Phone: E-mail:

dqm Vgh Merge 3 70.0 2080 Right 1 35.0 610 1500 On Ramp Freeway Type of analysis
Number of lanes in freeway
Free-flow speed on freeway
Volume on freeway Data

Adjacent Ramp Data (if one exists) side of freeway
Number of lanes in ramp
Free-flow speed on ramp
Volume on ramp
Tempth of first accel/decel lane
Length of second accel/decel lane

mph tr ft

чф £ Š Does adjacent xamp exist?
Volume on adjacent Ramp
Position of adjacent Ramp
Type of adjacent Ramp
Distance to adjacent Ramp

\_\_Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Remp	Adjacent
Volume, V (vph)	2080	019	Ramp
Peak-hour factor, PHF	06.0	06.0	117
Peak 15-min volume, v15	578	169	;
Trucks and buses	4	7	> 0
Recreational vehicles		• =	Pa
Terrain type:		Grade	Level
Grade	-3.00	-2.00	1
Length			·i
Trucks and buses PCE, ET			
Recreational vehicle PCE, ER	17	1.2	
Heavy vehicle adjustment, fHV		0.980	
Driver population factor, fp		100	

Flow rate, vp				
-		2357	169	ффф
	Estimation	Estimation of V12 Merge		
건설 고	0.00	(Equation 25-2 or 25-3) Using Equation 1	or 25-3}	ï
FM	= v (P ) = F FM	1460 pc/h		
Checks	Cape	Capacity		
Þ	Actual 3048	Maximum 7200	LOS F? No	
R12	2151	4600	No	
Level	l of Service D	of Service Determination (if not F)	if not F)	
5.475 +	0.00734 v + C	+ 0.0078 v - 0.	0,00627 L = 1	12.5
R Level of service for a	R :amp-freeway j	R 12 A service for ramp-freeway junction areas of influence		æ
Estimation	Speed			
Intermediate speed variable,	riable,	ii E	0.250	
Space mean speed in ramp influence area,	ump influence	ν,	63.0 mph	
Space mean speed in outer lanes,	ter lanes,	  ≼'Ω'	68.6 mph	
Space mean speed for a	speed for all vehicles,	II ⊃ ka	64.6 mph	

SOWB\_OFF\_AM. Ext

11/6/2003

50WB\_OFF\_AM.txt Flow rate, vp

11/6/2003 pcph

1142

5382 Estimation of V12 Diverge

Areas

# HCS2000: Ramps and Ramp Junctions Release 4,1c

Analysis   AL	Phone: E-mail:	Fax:		ž	
## Diverge   Preeway   2	AL Febr Febr (120-12) 8/12/12 (120-12) 10/12 (120-12) 10/12 (120-12) 10/12 (130-12) 10/12 (130-1		Inc. troga		
Right   15.0 mph   15.0 vph   1	alysis lanes in speed on freeway	Ramp	**		
Adjacent Ramp Data (if one exists)  No vph  rision to pc/h Under Base  4570 970  0.90  1269 269  4 4 4 4  0.00  1269 269  1260 269  1269	f freeway of lanes in ramp low speed on ramp on ramp of first accel/decel l of second accel/decel		i tra	વ વ	
No   Vph	Adjacen	Ramp Data (if			
Freeway Ramp Adjacent 4570 970 870 870 6.90 1269 269 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	Does adjacent ramp exist? Volume on adjacent ramp Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp	No	₹ . #		
Freeway Ramp Adjacent A570 970 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Conversion	pc/h Under			
# 4570 970 Admip    0.90   0.90     1269   269     4   0     6   0     7   0     8   0     9   0     9   0     1   0		Freeway	Катр	Adjacent	
				-	цф > * * *

196	P = 1.000					
	C	Using Equation	ation 0			
	> "	+ (v - v ) P = F R FD	5382 pc/h			
Checks		Capacity				
> ii	Actual 5382		Maximum 4800	LOS F Yes	53	
	5382	44	4400	Yes		
7 = 7 · V	4240	48	4800	No		
, «	1142	20	2000	ů,		
	Level of Service Determination (if not F)	e Determina	tion (if not	E F)		
Density, $D=4.252+0.0086~v-0.009~L$ Density, $R$ R any-freeway junction areas of influence	D = 4.252 R For ramp-freewa	D = 4.252 + 0.0086 v R mp-freeway junction a	12 areas of inf		37.0	pc/mi/ln
Estimation	Speed	ed	î			ŧí
Intermediate speed variable,	l variable,		D = 0.531			
Space mean speed in ramp influence area,	in ramp influen	cė area,	ស ស ព ស	чdш		
Space mean speed in outer lanes,	in outer lanes,		S = N/A	чdш		
Space mean speed for all vehicles,	for all vehicle	, st	S = 55.1	nph		

SOWB\_OND\_AM. txt

11/6/2003

HCS2000: Ramps and Ramp Junctions Release 4.1c

Fax:

Phone: E-mail:

AL Fehr & Peers Associates, Inc. 07/31/2003 AM Peak Hour US 50/Westbound Empire Ranch Road On-ramp (D) Agency/Co.: Fehr & Peers Associates, Inc.
Date performed: 07/31/2003
Analysis the period: 08 50/Mestheour
Freeway/dir or travel: US 50/Mestheourd
Juncialction: Empire Ranch Road On-ramp (D)
Analysis Year.
Analysis Year.
2006 With Project w/o Saratoga
Description: US 50/Empire Ranch Road Interchan Merge Analysis,

nph vph Right 1 35,0 430 590 Merge 2 70.0 3600 On Ramp Freeway Side of freeway

Number of lanes in ramp

Free-flow speed on ramp

Volume on ramp

Length of first accel/decel lane

Length of second accel/decel lane Type of analysis
Number of lanes in freeway
Free-flow speed on freeway
Volume on freeway Data

\_Adjacent Ramp Data (if one exists)

чф Adjacent Ramp Level Чрh \* 결 Grade -4.00 0.10 1.5 1.2 0.980 Ramp \* E \_Conversion to pc/h Under Base Š Freeway Grade -6.00 0.10 1.5 1.2 0.980 3600 0.90 1000 4 Trucks and buses PCE, ET Recreational vehicle PCE, ER Heavy vehicle adjustment, fHV Driver population factor, fP Does adjacent ramp exist?
Volume on adjacent Ramp
Position of adjacent Ramp
Type of adjacent Ramp
Distance to adjacent Ramp Volume, V (vph)
Peak-lour factor, PHF
Peak l5-min volume, v15
Trucks and buses
Recreational vehicles
Terrain type:
Grade Junction Components Conditions

	50WB_OND_AM, EXE				11/6/2003
	Flow rate, vp		4080	487	hcph
	Areas	Estimation	Estimation of V12 Merge		
	'J	0.00	(Equation 25-2 or 25-3)	r 25-3)	
	X A	1.000	Using Equation	0	
	V = 12	- (P) -	4080 pc/h		
	270040	Capacity	τζ		
	Checks		Ĩ		
	\$ \$	Actual 4567	Maximum 4800	LOS F? No	
	v v R12	4567	4600	No	
	Level	Level of Service Determination (if not F)	ermination (i	f not F)	
	Density, D = 5.475 + 0.00734 v		+ 0.0078 v - 0.0	- 0.00627 L = 37.2	2
	R 12 A Level of service for ramp-freeway junction areas of influence	R amp-freeway jun	12 ction areas o	A f influence E	
	Estimation	Speed			
	Intermediate speed variable,	iable,	п	0,655	
3	Space mean speed in ramp influence area,	mp influence ar	M W	51.7 mph	
8	Space mean speed in outer lanes,	ter lanes,	 4	N/A mph	
	Space mean speed for all vehicles,	11 vehicles,	II	51.7 mph	

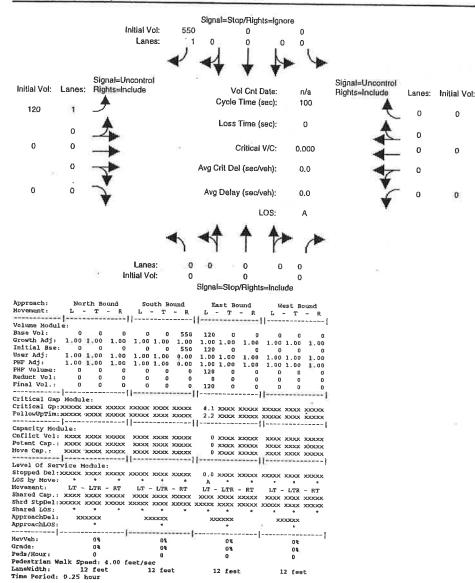
Level Of Service Computation Report 2000 HCM Unsignalized (Base Volume Alternative) 2006 No Project AM - Without Saratoga

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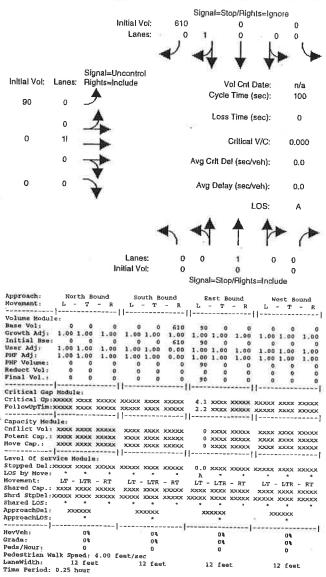
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## Intersection #1: Empire Ranch Road/Iron Point Road



Level Of Service Computation Report 2000 HCM Unsignalized (Base Volume Alternative) 2006 AM - Alt 1&4 Without Saratoga

## Intersection #1: Empire Ranch Road/Route 50 Eastbound Ramps



12 feet

12 feet

Signal=Uncontrol Rights=Include	Lanes:	Initial Vol:
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4	0	0
•	0	
*	0	0

# Level Of Service Computation Report 2000 HCM Unsignalized (Base Volume Alternative) 2006 PM - Alt 1&4 Without Saratoga

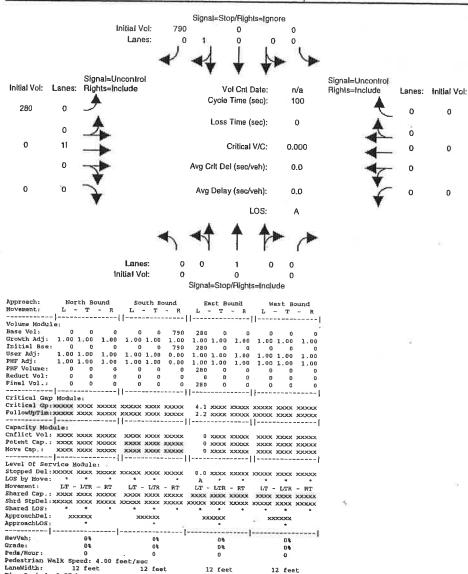
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## Intersection #1: Empire Ranch Road/Route 50 Eastbound Ramps

12 feet



12 feet

Time Period: 0.25 hour

Empire Ranch Interchange Construction Year 2006 - Without Saratoga - ALT 182 - AM Queues 3: Iron Point Road & Empire Ranch Road

CONTRACTOR		THE RESIDENCE OF THE PARTY OF T		THE PERSON NAMED IN COLUMN	Section of the sectio	ののではない 日本の日本の日本の日本の	No. of Particular Control of the Particular	Section of the Control of the Contro			The second second second second
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HCM Signalized Intersection Capacity Analysis
3: Iron Point Road & Empire Ranch Road Construction Year 2006 • Without Saratoga • ALT 182 • AM

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ot) mm) or, PHF		大学の おいり 一十分	2800	10185	AND SAME AND A SAME	10 (G	
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10000000000000000000000000000000000000	Skarly and the	the state of the s	STATE OF STREET	0.00	A CHE LEVEL	200 BES	200
Approach LOS	۵	¥		8		8	9
alest of president		Section of the passess	216151-1000	W. W. W.	Special (close)	Manage Na	- 80
HCM Average Control Delay	17.3	HCM Level of Service	eoivie		8		м
CALVOI ME TO CADA CONTRACTOR							100
Actuated Cycle Length (8)		Sum of lost time (s)	(8)		12.0		1

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Queues 3: Iron Point Road & Empire Ranch Road

Empire Ranch Interchange Construction Year 2006 - Without Saratoga - ALT 182 - PM

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				Acres and		100000		STATE OF		Sec.		
1111	53	. 180	40			300	200	200			1100	
100	689	1877	188	620		11000			1%		使用器	
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Harry A.	56 10	100	m25	100			200	0.00		Ž.	10000	
スト	2	į						100			ama	
	373	161	236				86					
1	311	1	80	F		<b>東次語</b>	300					
4.4	(hqv		(H)	OH 28 48	(%)	Medi	0	7. S. E.	Ime %	1119	200	
	-Tow (	105	h 95th (	1)350	p Block Time (%)	Dies	E) HB	110	¥ 1		0.08	
7	quo.	100	engt		Bloc		y Len	11.17	Bay Block 1			
	Lane Group Flow (vph	1 1 C	Quene	Jan (chill)	50th Up	100	Turn Bay I	30,00	95th Ba	distant	Melios 0 sveli	

HCM Signalized Intersection Capacity Analysis

3: Iron Point Road & Empire Ranch Road Construction Year 2006 - Without Seratoga - ALT 182 - PM

ころうによることは たららた	The second secon	_				\$			44
HOW THE PARTY OF T	1000 - 10	** 1900 F	Steel tone	0051	SERVICE SERVIC	SERVICE SE	STOCK STOCKS	COMMERCE	Tremen
Total Lost time (s)	4.0	4.0			и .	4.0	The second second		40
tanajoin Fastor Serie	THE PERSON NAMED IN	10 (6) (1) (1)	1000	100000000000000000000000000000000000000	16.35	100 E S 100	SHARRAN	STATE OF STA	SPECIFICAL SPECIFICAT
E	1.00	0.85			99	1.00	Carried States	1	280 00
PH'S LOTE OF THE SEASON		STORY OF THE		NAMED OF THE	0.015	SERVICE SERVIC	SAN CONTRACTOR	Sec. P.	8
Satd. Flow (prot)	3433	1583	The second second		3433	3539		35	3539 158
An Permitted	-2005	2000	MILLOON CONTRACTOR	IV SOUGHT IN	150000	822	1000000	STATE OF	Į.
Satd. Flow (perm)	3433	1583			3433	3539	No. of Contrast	35	3530 45
Voltame (viril)	1386	220-1	2016	OF OWNERS	277.0	MUCOS.	NESS ASSESSED	W. Premilies	BOAR ESTA
Peak-hour factor, PHF	0.90 0.90		0.90	0.90 0.90		080	080	000	
Gramme Earlos (vors).	2001	13 2833	RESERVED CONTRACTOR	麗	HOUSE.	SEATTING STREET	H	- 26	H
Adj. Flow (vph)	311 0	373	0		56	1078	es:		690
CRITICATE DE L'ANTIGNE DE L'ANT	Section 2015	(1) (S. 1) (S. 1)	S. S. Sales P.		9	1874768	STATE AND DESCRIPTION	Ĕ	COO COO
Turn Type		custom		15	1		A STATE OF THE PARTY OF THE PAR		31
character.	2000	SACH CORP.	C. C	ACCOUNT OF THE PARTY OF	TO THE PERSON NAMED IN	Contract of the Contract of th	Charles Services	-	Геш
	Constitution of the same	A	1	-	N. D. S.	200			
School Green Green	Section Constitution	Section 2	CONTRACTOR CO.	TO STATE OF THE PARTY OF THE PA	100	STONES.	SATIS-SECTION	000	No.
Effective Green, g (s)	22.7	22.7	1	A COLUMN TO SERVICE STATE OF THE PERSON SERVICE STATE STATE OF THE PERSON SERVICE STATE	4.1	40.2	100 M		N,
Adhorited thought and	100000000000000000000000000000000000000	SHID COM	2		STATISTICS.	STATE STATE	Sentiment of the last	- Common of	14 2.14
Clearance Time (s)	4.0	4.0		PERSONAL PROPERTY.	O V	ZOK.	No. of the last		W 52
Vendia Exteres (Sares)	New Hall Street	RECORDING S	ALC: NO.	THE PERSON NAMED IN COLUMN NAM	A. C.	R	STATE		4.0
lone Gm Can (unb)	07.4		D. Control of the last	direct district	SINC N	AND THE STREET	TO STATE OF THE PARTY OF THE PA	STANCE OF STREET	
carle dip cap (vpii)		243	-		1/6	2181	A STATE OF THE PARTY OF THE PAR	18	1823 81
Na Della Control Control	THE PARTY OF THE P				TANK TO SERVICE	116.15		500	Sec. 13.5
V/S Hallo Perm	The Name of Street, or other Persons	c0.24				THE COLUMN	ALEXANDER OF		0.0
Mentanipas	10 C C C C C C C C C C C C C C C C C C C		10 M		0.4		CONTRACTOR OF THE PARTY OF THE	0.75	250000000000000000000000000000000000000
Uniform Delay, d1	22.6	26.8			36.6	8.5		-	11.7 9
STORIGHT OF THE PROPERTY OF TH	The Day		はながらる	2. 大田田大丁	Sept. 15	A Section	1.04C		Seal From
incremental Delay, d2		12.3			1.0	0.7		0	ı.
		3 TO 4 ST		EX.		16000	The State of the S	C - 12.2	3
Level of Service	ပ	۵			٥	A			8
Appropriate matery (9), and			10(6)		10000	10/4	The Assessment	40.00	Separate Special
Approach LOS	ပ			A		A			B
markater summan	100 CO. 100 CO.	ACC. SARING	100		A THE PARTY OF		and the state of	William Co.	The second
HCM Average Control Delay	belay	15.3	HCM	HCM Level of Service	arvice		a	A 6 2 Pen A	
HCM/Volumeiro capacinaram	SALAMENT SOLD	10180 PM	A	WEST CO.	THE PERSON	ALC: N	TOTAL PROPERTY.	STATISTICS.	The Contract of
Actuated Cycle Length (s)	(5)	80.0	Sim	Sum of last time (s)	Winscours.	Control of the Contro			
(1)									

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Graphe Ranch Interchange
3: Iron Point Road & Empire Ranch Road Construction Year 2006 - Without Saratoga - ALT 3&4 - AM

村 日本 一年 日 八年 日		信息を行うない。	The state of the s	COLOR DESIGNATION OF THE PERSON OF THE PERSO		では は できる に でき に でき		一	STATE OF THE PERSON NAMED IN COLUMN NAMED IN C		
		No. of Contracts		CONTRACTOR STATE		200000000000000000000000000000000000000		CONTRACTOR OF	The state of the s	The Walter	
5.50	300	TOTAL PROPERTY.	192	Contract of the last		No reference many	200	Name of the other	5%		land.
	1000	* 274G	304	1000 E					25%		Parties of
***	433	1400 W	m20	-4333						なるな	alie di la
į,	744	20 11	161	No. of the last			200	1	. 4%		hicker
+	140	. 166	116				640	9			100 m
	122	Ą	48			200	300	91.7			3000
	ne Group Flow (vph)	and the state of t	sue Length 95th (ft)	0.00 to 45 518 (b)	1 Up Block Time (%)	The state of the state of	n Bay Length (ft)		n Bay Block Time %	TO SEE PROPERTY.	Andria (Albini) dese

HCM Signalized Intersection Capacity Analysis

3: Iron Point Road & Empire Ranch Road Construction Year 2006 - Without Saratoga - ALT 3&4 - AM

1.00 (	Lane Configurations										
4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0	2	*	VC.			×		1		ŀ	и
4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.	(Bearing Street)	RESUMES	Statement States	* 38C) 3	DESCRIPTION OF THE PERSON OF T			MEDINAMENT		t	- 12
1583 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	Total Lost time (s)	4.0	40		No. of Concession, Name of Street, or other party of the Concession, Name of Street, or other pa						100
1583 3433 3539 3539 3539 1500 1000 1583 3433 3539 3539 3539 3539 3539 3539 353	Canadom Espisore in	100 C	CANADA SE		CHANGE SHEET	COMPANIE OF	7	The second	National Property	0.4	1
1583 3433 3539 3539 1700 1700 1700 1700 1700 1700 1700 170	Fr	1.00	0.85	200000	NAME OF TAXABLE	100	50.00				М.
1583 3539 3539 3539 3539 3539 3539 3539 3	arteriolisassa managemente	SEC. 0.15.	TOTAL STREET		The same	STATES OF	2000	SAN CONTRACTOR	CONTRACTOR OF	20.	~
1583 3433 3539 5539 5539 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Satd. Flow (prot)	3433	1583		100000000000000000000000000000000000000	24433	2520				ж.
1563 3433 3539 3539 0.50 0.90 0.90 0.90 0.90 0.90 0.90 0 140 0 0 0 744 433 0 0 0 1000  custom Prot 5 18 616 35.8 4.0 4.0 4.0 4.0 4.0 206 33.2 27.0 2.4 17.0 8.6 4.1 0.1 13  16.8 HCM Level of Service B	<b>FILE STATE OF STATE </b>	200 B 100	STATE SECTIONS	100		8	B	No. of Concession,	-	5556	- 1
0.50 0.90 0.90 0.90 0.90 0.90 0.90 0.90	Satd, Flow (perm)	3433	1583			9	В.	CHANGE OF			窗.
0.80 0.90 0.90 0.90 0.90 0.90 0.90 0.90	NOTIFIED STATE OF THE PARTY OF	THE PARTY NAMED IN	STATISTICS OF THE PARTY OF THE	SAN SPACES	CONTRACTOR OF THE PERSON	2000	- 8	-		533	
10.4 1.20 0.30 0.30 0.30 0.30 0.30 0.30 0.30 0		000	8	100			2				li ili
Custom Prot 4 453 0 0 1000  Custom Prot 5 0 1000  10.4 21.8 61.6 35.8  4.0 4.0 4.0 4.0 4.0  20.6 935 2725 1584  co.09  16.8 HCM Level of Service B		080	0.30	08.0			0.30			06.0	0
Custom Prot (100 o 0 0 0 0 1000 o 100	1100	Na organi		1000		100	401	(1) WORK		3.0	
20 Custom Prot From From Prot A 4 4 218 61.6 35.8 35.8 4.0 4.0 4.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5		122		0	0		1	0		000	1
10.4 21.8 61.6 35.8 4.0 4.0 4.0 4.0 2.1 206 935 2725 1584 c0.09 17.4 17.0 33.2 27.0 2.4 17.0 8.6 4.1 0.1 1.9 D A B B A B B B B B B B B B B B B B B B	Made and a supplemental and a su	35	17.		A Separate		100	Sections	E	000000	-
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10.4 21.8 61.6 35.8 4.0 4.0 4.0 4.0 206 885 2725 1584 50.09 17.0 2.4 17.0 8.6 4.1 0.1 1.8 D A B B B B 16.8 HCM Level of Service B	ROLL STUDY POR US	がぬける		Control of the Control	20 Mar.	STATE	-89	STATE OF STREET	SOME	-	
10.4 21.8 61.6 35.8 4.0 4.0 4.0 4.0 4.0 206 4.0 4.0 4.0 206 935 2725 1594 c0.09 6.0 27.0 2.4 17.0 8.6 4.1 0.1 1.9 D A B B B 16.8 HCM Level of Service B	Permitted Phases		4		10000		Ø.				<b>72</b>
10.4 21.8 61.6 35.8  4.0 4.0 4.0 4.0  206 935 2725 1584  50.09  33.2 2770 2.4 17.0  8.6 4.1 0.1 1.9  D A B A B  16.8 HCM Level of Service B	Soften (Soften Balletin)	A STATE OF THE PARTY OF THE PAR	STREET, STREET	3000	A STATE OF	10	A STATE				- 1
4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0	Effective Green, g (s)	10.4	10.4				616				22.0
4.0 4.0 4.0 4.0 4.0 4.0  2.06 935 2725 1584 7  2.03 27.0 2.4 17.0 1  8.6 4.1 0.1 1.9  D A B B A B  16.8 HCM Level of Service B	Autolice aye lactice see	THE STATE OF	125/10/11/20				8	A	Name and Address of the Owner, where	0.0	25
206 935 2725 1584 20.03 23.2 27.0 2.4 17.0 1 2.9 2.4 17.0 1 2.9 2.4 17.0 1 2.9 2.4 17.0 1 2.9 2.4 17.0 1 2.9 2.4 17.0 1 2.9 2.4 17.0 1 2.9 2.4 17.0 1 2.9 2.4 17.0 1 2.9 2.4 17.0 1 2.9 2.4 17.0 1 2.9 2.0 2.4 17.0 1 2.9 2.0 2.4 17.0 1 2.9 2.0 2.4 17.0 1 2.9 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0	Clearance Time (s)	4.0	4.0	1	The second second	40	i i				21
206 935 2725 1584  c0.09  33.2 27.0 2.4 17.0 1  8.6 4.1 0.1 1.3 1.3  D B A B  16.8 HCM Level of Service B	Vegicle Extension(s)	18 (0)8	Apr. 1	100	-	Transmission of	ACCRESSION N	STATE		4.0	- 1
20.09 20.09 20.09 20.09 20.00	Lane Gro Cap (voh)	446	206	Control of the Contro	9	200	2010	Security Sec	2000		361
27.0 2.4 17.0  33.2 27.0 2.4 17.0  8.6 4.1 0.1 1.9  D B A B B  16.8 HCM Level of Service B	VISHAIGPERT	STOTO STORES	THE REAL PROPERTY.	Management	The same of the sa	222	57.72			284	708
33.2 27.0 2.4 17.0 33.2 27.0 2.4 17.0 8.6 6.1 0.1 1.3 D B A B B D A B B B 16.8 HCM Level of Service B	v/s Ratio Perm		800		Distraction.	THE PURCE			9	1000	86
33.2 27.0 2.4 17.0 8.6 6.3 6.3 6.1 1.9 D B A B D A B B 16.8 HCM Level of Service B	World Figure 1	WATER TOWN	Season of the last	COUNTY BEAUTY	SCHOOL SECTION	THE PERSON	MINISTRACIO	-			0
8.6 4.1 0.1 1.9  8.6 4.1 0.1 1.9  D	Uniform Delay, d1	24.4	000				1000	1 KC			
8.6 4.1 0.1  D B A  16.8 HCM Level of Sarvice B  80.0 String floret time (a) (20.0)	Discount of the Party of the Pa	ANALYSIS OF THE PERSON	200	Section 2		67.0	2.4			2.0	15,1
25.5 D D B A B 16.8 HCM Level of Sarvice B 30.0 Sum of local time (a)	Increase the Colors of									11.5	66
D A B 16.8 HCM Level of Service B 80.0 Sum of lost time (a)	Defer Street Detay, uz	0,0	ı	1		4.1				1,9	1
16.8 HCM Level of Sarvice B Sum of lost time (a)	Hald and the second	THE PARTY OF THE P		Ž				おりませる	100 X 200	1818	100
16.8 HCM Level of Service B	Level of Service					8				8	1
D A B  16.8 HCM Level of Service B  80.0 Sum of lost time (s)	Charles and the State of the St		THE REAL PROPERTY.		William .		11.55	1	100 M	100	80
16.8 HCM Level of Service	Approach LOS		۵		·¥		8			æ	
16.8 HCM Level of Service	THE STATE STATE OF				Division in	N A N B	4		100	I	в
80.0 Sum of last time (s)	HCM Average Control D	elay	16.8	오	M Level of	Sarvice		a			
80.0 Sum of lost time (e)	Holy, Volume to July all	Wifelite		San Park	No. of Concession, Name of Street, or other Persons and Street, or other P	200 Sept 176 Sept 1	(CONTRACTOR	THE RESERVE	Moderno	-	- 8
	Actuated Cycle Length (	(8)	80.0	J.	of lost tire	(0)	No. of Concession, Name of Street, or other Persons and Street, or other P	THE PERSON NAMED IN			100

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CAMP OF STREET		Mary Street Company		1				Contraction of the contraction		STATES STATES SENTEN	6.46
31916	53	28.	40			S-120-00-00	200	NS-A-COLOR		The Parties	See and the see
100	689	A466	188			College on		77.21.21.20	1%	*	B. stores
455	1078	-10	145	15104 639		2000					30,440
(9)	26	170	m28				200	122.23		A	nicon.
1	373		236	- N W			640	H 4127)		The state of	Summer
1,110	311	a dos	80			200	300				Tige III III
of the	ane Group Flow (vph)	CAPATO PARAGO	Queue Length 95th (ft)	The other transfer of the	Jp Block Time (%)	Sliph Temperature	n Bay Length (ft)	STATE STATES	5th Bay Block Time %	Patrally (Cap.	And the second

HCM Signalized Intersection Capacity Analysis
3: Iron Point Road & Empire Ranch Road Construction Year 2006 - Without Saratoga - ALT 344 - PM

The configurations   The con												
Protection   Pro	Shangan M.	14.00 m	Section 198	-	(1.00 m)	State .	MES	700	245	100		ě
e (e) 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0	Lane Configurations	F.	R					*	No.		4	ä
1,00	Ideal Flowing Williams	1010	35 - Sec. 25	1000	0000		OCO.	THOU	13/0/61	1006	SECON	
1,00	Form Lost time (s)	4.0	4.0	-		8 3	4.0	4.0		8 .	4.0	4
ot) 3433 1583 3433 3539 3539 mm) 3433 1583 3433 3539 3539 mm) 3433 1583 3433 3539 3539 mm) 3433 1583 3433 3539 3539 ptr, PHF 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.9	Ent.	100	MACHINE STATE	127		9	1.25	0.00		學多	950	0
1583   1583   3433   3539	STOPEGIACHER BESTER	1.00	CO.O.	APPROXIMENT OF	-	1		00.		1000	1.00	
March   Marc	Satd. Flow (prot)	3433	1583		NAME OF TAXABLE PARTY.	ij						
1583   1583   1583   3539	SERVICE STREET, SOURCE STREET	200000000000000000000000000000000000000	THE STATE OF		STATISTICS.	SCOTO SECTION		8555		1	3539	22
Carry   Carr	Satd. Flow (perm)	3433	1583				10					
101, PHF   0.90   0.80   0.80   0.80   0.9	The second secon	Section Section	COC.	Contract Name	GARNING CO.	2	- 1	8303			3539	22
311	Sook hour footor Dide	84			鼯		œ.	0.4			923	
311 0 373 0 0 0 56 1078 0 0 689	CANCEL STREET, LTII	ď	8	0.30				0.90	0.90		06'0	0.90
Prof. custom   Prof.	Adi Flow (vmh)	ae .		1	Service .	12		THE STATE			200	
Prof. custom   Prof.     Sas	Spirit Spirit (1911)	- 93	1		9		1	1078	0	0	689	5
Frot   Custom   Prot	LIM TIME		N. 18.		N.	1000	365	10.0	27 Cc	T. CIL	180	
ses         4         51         5         5         5         5         5         6         7         4.1         49.3         41.2<	uii iybe	Prot	custom				Prot			V-0.00		Pen
1, 2, 2, 7   4, 4, 1, 49, 3   4, 1, 2, 22, 7   4, 1, 49, 3   4, 1, 2, 22, 7   4, 1, 49, 3   4, 1, 2, 22, 7   4, 1, 49, 3   4, 1, 2, 22, 1, 3, 4, 2, 3, 4, 2, 3, 4, 2, 3, 4, 2, 3, 4, 2, 3, 4, 2, 3, 4, 2, 3, 4, 2, 3, 4, 2, 3, 4, 2, 3, 4, 2, 3, 2, 3, 3, 4, 2, 3, 3, 4, 2, 3, 3, 4, 2, 3, 3, 4, 2, 3, 3, 4, 2, 3, 3, 4, 2, 3, 3, 4, 2, 3, 3, 4, 2, 3, 3, 4, 2, 3, 3, 4, 2, 3, 3, 4, 2, 3, 3, 4, 2, 3, 3, 4, 2, 3, 3, 4, 2, 3, 3, 4, 2, 3, 3, 4, 2, 3, 3, 4, 2, 3, 3, 4, 2, 3, 3, 4, 2, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4,	RUIGERIG LEGENTRIN		- N.				-6-	100		1000	177	B
10   10   10   10   10   10   10   10	ermitted Phases		4									ı
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(vph) 874 449 476 2181 1823  (vph) 874 449 176 2181 1823  (vph) 874 176 2181 1823  (vph) 874 176 2181 1823  (vph) 874 177 1823  (vph) 874 176 2181  (vph) 874	mecuve Green, g (s)	22.7	22.7					49.3			412	14
(Vpl) 874 449 176 2181 1823 (Vpl) 874 875 117 (Vpl) 875 875 875 117 (Vpl) 875 875 875 875 875 87	CONTRACTOR OF THE PROPERTY OF	0.48						390	S. Marie		SEZ SE	E
(vph) 974 449 176 2181 1823	Jearance IIme (s)	4.0	4.0				4.0	4.0			4.0	4
(Vph) 974 449 176 2181 1823  -0.24  -0.24  -0.24  -0.25  -	Charles Captaloral of a	S. Call					2.10	\$ P		201105	20.00	
CO.24   SE.6   SE.6   SE.7   11,7	ane Grip Cap (vpn)	874	449				1111	181			1823	ă
d1   22.6   26.8   36.6   8.5   11.7		CASE .		The section			30. AG	0.00	20.00	26	OSTERIOR DE	ı
11.7   22.6   26.8   36.6   8.5   11.7     11.7   11.7   11.7     11.7   11.7     11.7   11.7     11.7   11.7     11.7   11.7     11.7   11.7     11.7   11.7     11.7   11.7     11.7   11.7     11.7   11.7     11.7	73 Hallo Perm	SUSPENSION OF THE PERSON OF TH	c0.24									0.03
11.7   11.7	Inform Dolou 44	Service Co.	がある。	12 8 8 L	Sec. CX			3.45		8		2
Sept. display   12.3   12.3   12.5	minorin Delay, 01	52.6	26.8			ຕ	9.6	8.5			11.7	6
e C D 0.8  C D A A  Control Delay 15.1 HCM Level of Service B  Control (s) 80.0 Sum of lost time (s) 8.0	ROHIGERION CROWNERS	Witte St.	C. Talker		10.68 CH	2	600	B. 22.00			TIONS.	
e C D D A  C A A  Control Delay 15.1 HCM Level of Service B  Collegin (s) 80.0 Sum of lost time (s) R.0	Acienteniai Delay, 02	2.0	12.3				1.0	0.8			9.0	0
C D D A A A A A A A A A A A A A A A A A	Handage Colonial				1.00		0.0	1	An America		1000	
Control Delay 15.1 HCM Level of Service B CSERSE (Wildlife 15.1 BCM Level of Service B Length (s) 80.0 Sum of lost time (s) 8.0	BVBI OI SBIVICE		٥				۵	A			8	
Control Delay 15.1 HCM Level of Service B CSTR III reference B Length (s) 80.0 Sum of lost time (s) 8.0	COLUMN STATEMENT		1500000	N. T. C. S.	0.000	X		100				
HCM Level of Service Sum of lost time (s)			0	•	٧			ď			8	
HCM Level of Service Sum of lost time (s)				Towns.		0.00	No. Las	200	135.62	0.00		Ĭ
Sum of lost time (s)	CM Average Control Di	elay	12.1	오	M Level o	of Service	99		8			
Sum of lost time (s)	WINDOW DOUGOODS	aratic States	To far		27		1888		66867598			200
	ctuated Cycle Length (s	6	80.0	Sun	n of lost	ma (e)			0.0			

4/27/2004

Synchro 5 Report Page 1

FEHRPESAL7-FF51

Synchro 5 Report Page 2

4/27/2004

FEHRPESAL7-FF51

	ETERING	ANALIO	T		-	-	-	ļ	
Location:	US 50/Emp	ire Ranch R	load		Projected I	Peak Hour V	olume	610	-
Ramp:	Empire Rar	nch Road to	EB US 50		Projected I	Peak Period	Volume:	1190	
Scenario:	2006 With	Project Wit	hout Sarato	a Way Co	nnection - A	M PEAK	Volume.	1190	
HOV Bypa	ss (%):		J 14		Storage Le	nath (m):		180	
	olume (veh/h	r):	525		Storage Le	nath (ft):		600	
Metering R	ate (veh/hr):	i	520		Storage La		1	1284	
Discharge	Rate (veh/15	min):	130			Storage (ve	h):	20	
	Estimated	Projected	Metered		Accum-	Total		Total	Metered
Time	Arrival	15-Minute	15-Minute	Excess	ulated	Delay	Vehicles	Hourly	Hourly
Period	_Distribution		min flows	Demand	Vehicles	(veh-hr)	Delayed	Volume	Volume
7:00-7:15	12%	142	122	0	0	0.00	0		Toldino
7:15-7:30	12%	143	123	0	0	0.00	0		
7:30-7:45	12%	147	126	0	0	0.00	0		
7:45-8:00	14%	165	142	12	12	2.98	142	597	513
8:00-8:15	12%	143	123	0	- 5	1.22	123	598	514
8:15-8:30	12%	142	122	0	0	0.00	0	597	513
8:30-8:45	13%	153	132	2	2	0.40	132	603	519
8:45-9:00	13%	156	134	4	6	1.44	134	594	511
Total Delay			6						
	les Delayed	(veh):	531		Maximum	Queue (veh	):	12	
Average De			0.01		Maximum C	Queue (m):		107	
Average De	elay (min):		0.68		Maximum C	Queue (ft):		351	
Location:	US 50/Emp	ire Banch B	oad		Dunington d	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -		50000000000000000000000000000000000000	
Ramp:	Empire Ran				Projected P	eak Hour V	olume:	790	
Scenario:				a Way Cor	nection - P	M PEAK	Volume.	1460	
HOV Bypas			14		Storage Ler	nath (m):		:180	
	lume (veh/hr	):	679		Storage Ler			600	
	ate (veh/hr):		640		Storage Lar			1	
Discharge F	Rate (veh/15	min):	160		Maximum 9		h):	20	
	Estimated	Projected	Metered		Accum-	Total		Total	Metered
Time	Arrival	15-Minute	15-Minute	Excess	ulated	Delay	Vehicles	Hourly	Hourly
Period	Distribution	Volumes	min flows	Demand	Vehicles	(veh-hr)	Delayed	Volume	Volume
	14%	198	170	10	10	2.57	170,		
4:15-4:30	12%	169	145	0	0	0.00	0		
4:30-4:45	13%	188	162	2	2	0.42	162		
4:45-5:00	13%	194	167	7	9	2.13	167	749	644
5:00-5:15	13%	194	167	7	15	3.84	167	745	641
5:15-5:30	12%	176	151	0	7	1.68	151	752	647
5:30-5:45	12%	174	150	0	0	0.00	0	738	635
5:45-6:00	12%	168	144	0	0	0.00	0	712	612
Total Delay			11	1	8				
	les Delayed (	veh):	817		Maximum (	Queue (veh)	:	15	
Average De			0.01		Maximum Q			138	
Verane De	lay (min):		0.78		Maximum Q			454	

Appendix D
Construction Year (2006) With Improvements Conditions

SOWB\_OFF\_AM\_Improve3.txt

11/7/2003

HCS2000: Ramps and Ramp Junctions Release 4.1c

Ounction:
Suriadiction:
Suriadiction:
Suriadiction:
2006 With Project w/o Saratoga with Improvement #2
Description: US 50/Empire Ranch Road Interchan AL: k Peers Associates, Inc. 8 1.2/2003
AM Peak Hour
US 50 / Westbound
Empire Ranch Rd. Off-ramp Fax: Diverge Analyst:
Agency/(co.:
F Date performed:
Analysis time period: A Freeway/dir or travel: U Analysis

Ph ft ft ft ndm dqr Diverge Right 35.0 970 1500 Off Ramp Freeway Side of freeway
Number of lanes in ramp
Free-Flow speed on ramp
Volume on ramp
Length of first accel/decel lane
Length of second accel/decel lane Type of analysis Number of lanes in freeway Free-flow speed on freeway Volume on freeway

Vph Ę, Does adjacent ramp exist?
Volume on adjacent ramp
Position of adjacent ramp
Type of adjacent ramp
Distance to adjacent ramp

Conversion to pc/h Under Base

Conditions

Adjacent Ramp Data (if one exists)

ď 計略 Adjacent Ramp Level Rolling 0.00 2.5 2.0 0.943 1.00 Rolling 0.00 2.5 2.0 0.943 Freeway 4570 0.90 1269 4 Volume, V (vph)
Peak-thour factor, PHF
Peak 15-min volume, v15
Trucks and buses
Regrestional vehicles
Terrain type:
Grade
Length
Trucks and buses PCE, ET
Regrestional vehicle PCE, ER
Heavy vehicle adjustment, fFV
Driver population factor, fF Junction Components

			1111		•
		5382	1142		pcph
Areas	Estimation	Estimation of V12 Diverge	Je		
1	0.00	(Equation 25-8 or 25-9)	or 25-9)		
4 4 1	1,000	Using Equation	0		
, L	R + (4 -	v ) P ≈ 5382 R FD	pc/h		
Checks	Cape	Capacity			2
> B	Actual 5382	Maximum 4800	LOS	LOS F? Yes	
	5382	4400	Yes		
7 = 7 × V FO = 10	4240	4800	No		
4	1142	2000	NO		
Level	l of Service D	of Service Determination (1f not F)	if not F)		
Density, $D=4.252+0.0086~v-0.009~L$ . Level of service for ramp-freeway junction areas of influence	D = 4.252 + 0.0086 v R ramp-freeway junction a	0.0086 v - 0. 12 unction areas	0.009 L = D Is of influenc	37.0 F	pc/mi/ln
Estimation	Speed				
Intermediate speed variable,	riable,		= 0.531		
Space mean speed in ramp influence area,	amp influence	v <sub>a</sub>	55 mph	ď	
Space mean speed in outer lanes,	uter lanes,	* 'S'	N/A mph		
A Loode need oned?	for all sectors	٠,			

50WB\_OND\_AM\_Improve3.txt

11/7/2003

HCS2000: Ramps and Ramp Junctions Release 4.1c

Phone: E-mail:

Fax:

Merge Analysis

Analyst:
Agent & Peers Associates, Inc.
Bate performed:
07/31/2003
Analysis time period:
Freeway/dir or travel:
07/31/2003
Baptise Banch Road On-ramp (D)
Junction:
Description: 2006 With Project w/o Saratoga with Improvement #2
Description: US 50/Empire Ranch Road Interchan

Freeway

Merga 2 70.0 3600 Type of analysis
Number of lanes in freeway
Free-flow speed on freeway
Volume on freeway Data

Adv Adv

On Ramp

Right 1 35.0 430 1500 Side of freeway

Number of lanes in ramp

Free-flow speed on ramp

Volume on ramp

Length of first accel/decel lane

Length of second accel/decel lane Data

Ft Ph

Adjacent Ramp Data (if one exists)

Чďу لد 44 8 Does adjacent ramp exist?
Volume on adjacent Ramp
Position of adjacent Ramp
Type of adjacent Ramp
Distance to adjacent Ramp

\_Conversion to pc/h Under Base Conditions Adjacent Ramp Level ar 넡 Grade -4.00 0.10 1.5 1.2 0.980 430 0.90 119 4 Ramp \* <u>:</u>Ę Freeway Grade -6.00 0.10 1.5 1.2 0.980 3600 0.90 1000 Length
Trucks and buses PCE, ET
Recreational vehicle PCE, ER
Heavy vehicle adjustment, fHV
Driver population factor, fP Volume, V (vph)
Peak-hour factor, PHF
Peak 15-min volume, v15
Trucks and buses
Recreational vehicles Junction Components Terrain type: Grade

Flow rate, vp		4080	487	<b>h</b> dod
Areas	Estimation	Estimation of V12 Merge		
1   1	0.00	(Equation 25-2	or 25-3)	
7 4	1.000 U	Using Equation	0	
ш	v (P ) = ·	4080 pc/h		
Checks	Capacity	ity		
> 1	Actual 4567	Maximum 4800	LOS F?	Ŀ.
rO r12	4567	4600	No	
Level o	of Service De	Level of Service Determination (if not F)	(if not F)	
Density, $D = 5.475 + 0.00734 \text{ v}$ pc/mi/ln		+ 0.0078 v - 0.	- 0.00627 L =	31.5
R 12 A Level of service for ramp-freeway junction areas of influence	R mp-freeway ju	12 inction areas	A of influence	Ω
Estimation,	Speed			
Intermediate speed variable,	ıble,		= 0.591	
Space mean speed in ramp influence area,	influence a	ທິດ	= 53.4 mph	
Space mean speed in outer lanes,	er lanes,	×ω °	N/A mph	
Charles moon accompany to 11, 200	and to be done	۰,		

11/7/2003 SOWB\_OFF\_AM\_Improve4.txt

HCS2000: Ramps and Ramp Junctions Release 4.1c

Fax: Phone: E-mail:

\_biverge Analysis

Analyst:
Agenty/Co.:
Rehr & Peers Associates, Inc.
8/12/2003
Analysis time pariod:
Resk Hour
Freeway/dir or travel:
The Analysis time pariod:
Resk Hour
Freeway/dir or travel:
Repire Ranch Rd, Off-ramp
Analysis Year:
2006 With Project w/o Saratoga With Improvement #3
Description: US 50/Empire Ranch Road Interchan

Freeway

Diverge 3 70.0 4570 \_Off Ramp Type of analysis Number of lanes in freeway Free-flow speed on freeway Volume on freeway

mph dqv

Right 1 35.0 970 140 Side of freeway
Number of lanes in ramp
Free-Flow speed on ramp
Volume on ramp
Length of first accel/decel lane
Length of second accel/decel lane Data

aph Vph ft ft

Adjacent Ramp Data (if one exists)

ddy £ Does adjacent ramp exist?
Volume on adjacent ramp
Position of adjacent ramp
Type of adjacent ramp
Distance to adjacent ramp

\_Conversion to pc/h Under Base Conditions Adjacent Ramp Level Rolling 5 0.00 5 2.5 2.0 0.943 970 0.90 269 も見 Rolling 0.00 % 2.5 2.0 0.943 Freeway 4570 0.90 1269 Length
Trucks and buses FCE, ET
Recreational vehicle FCE, ER
Heavy vehicle adjustment, fFV
Driver population factor, fP Volume, V (vph)
Peak-thour factor, PHF
Peak 15-min volume, v15
Trucks and buses
Recreational vehicles
Terrain type:
Grade Junction Components

		5382	1142		bcbh
Areas	Estimatio	Estimation of V12 Diverge	8 E		
= 1	0.00	(Equation 25-8 or 25-9)	8 or 25-9		
) Σ 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0.573	Using Equation	r,		
7	v + (v ,	v ) P = 3571 R FD	pc/h		
Checks	Сар	Capacity			
> 1	Actual 5382	Maximum 7200	=	LOS F? No	12
	3571	4400		No	
A	4240	7200		No	
4	1142	2000		No	
Level	of Service	of Service Determination (if not F)	(if not B	(6	
Density, $D=4.252+0.0086~v-0.009~L$ = $R$ = 12 Develof service for ramo-freeway dunction areas of influence	D = 4.252 + 0.0086 v R Imp-freeway lunction :	0.0086 v - (	1 0.009 L	= 33.7	pc/mi/ln
1000	Speed				ř.
Intermediate speed variable,	able,	Α .	= 0.531		
Space mean speed in ramp influence area,	p influence	U)	153	чđш	
Space mean speed in outer lanes,	er lanes,	* v,	= 73.6	Mph	
		5			

50WB\_OND\_AM\_Improve4.txt

11/7/2003

HCS2000: Ramps and Ramp Junctions Release 4.1c

Phone:

E-mail:

Analysis

Analyst:

Analyst:

Analyst:

Analyst:

Analyst:

Analyst:

Analysis

Analysis time period:

Analysis Year:

2006 With Project w/o Saratoga With Improvement #3

Description: US 50/Empire Ranch Road Interchan

	Freeway		2	
Data	1			
Type of analysis Number of lanes in freeway Free-flow speed on freeway Volume on freeway		Merge 3 70.0 3600	ngm hqv	
Data	On Ramp			
side of freeway Number of lanes in ramp Free-flow speed on ramp Volume on ramp Length of first accel/decel lane Length of second accel/decel lane		Right 1 35.0 430 590	мрh Vph ft ft	
Adjacent Ramp Data (if one exists	Ramp Data	(if one	exists)	

vph ft		Adjacent	Kamp		*	• di	o de	Level	de	mt				
		Ramp	430	0.90	119	4	0	Grade	-4.00	0.10	1,5	1,2	0.980	1.00
No	h Under Base	Frевway	3600	0.90	1000	*	0	Grade	_	0.10 mi	1,5	1,2	0.980	1.00
Does adjacent ramp exist? Volume on adjacent Ramp Posttion of adjacent Ramp Type of adjacent Ramp Distance to adjacent Ramp	Conditions Conversion to pc/h Under Base	Junction Components	Volume, V (vph)	Peak-hour factor, PHF	Peak 15-min volume, v15	Trucks and buses	Recreational vehicles	Terrain type:	Grade	Length	Trucks and buses PCE, ET			Driver population factor, fp

					2007///17
Flow rate, vp		4080	487		pcph
Areas	Estimati	Estimation of V12 Merge	ø		
н"	00.00	(Equation 25-2 or 25-3)	2 or 25-3)		
* p., f	0.594	Using Equation	1		
* > <sup>[</sup>	A (P ) 2 F FM	= 2424 pc/b			
Checks	Ca	Capacity			
> <sup>6</sup>	Actual 4567	Maximum 7200		LOS F? No	
ro R12	2911	4600	z	No	
Lev	el of Service	Level of Service Determination (if not	(if not F)		8
Density, $D = 5.475 + pc/mi/ln$	5,475 + 0.00734 v + 0.0078 v		- 0.00627 L	= 24.3	
	R ramp-freeway	$R$ $$12$$ $\lambda$ service for ramp-freeway junction areas of influence	A s of influe	o ace	
Estimation	Speed	יט		•	
Intermediate speed variable,	ariable,	×	= 0.351		
Space mean speed in ramp influence area,	ramp influenc	t)	= 60.2 I	чďш	
Space mean speed in outer lanes,	outer lanes,	m	= 65.8	прһ	
Space mean speed for all vehicles,	all vehicles	o w	= 62.1	Moh	

CV

Appendix E Design Year (2026) Conditions

505B\_OFF\_AM. txt

10/28/2003

SOEB\_OFF\_AM, txt Flow rate, vp

10/28/2003 pcph

317

3816 Estimation of V12 Diverge

Areas

HCS2000: Ramps and Ramp Junctions Release 4.1c

Adjacent Ramp Level nph Agv щрћ Угрћ £t νph ft Adjacent Ramp Data (if one exists) 280 0.90 78 AL Fehr & Peers Associates, Inc. 8/12/2003 AM Peak Hour US 50 / Eastbound Empire Ranch Rd. Off-ramp Ramp Diverge Right 单型 3 70.0 3180 1 35.0 280 140 \_Conversion to pc/h Under Base Fax: Junction: Empire Ranch Rd. Off-ran Jurisdiction: 2026 With Project Description: US 50/Empire Ranch Road Interchan Š Freeway Grade 6.00 3.0 6.0 6.0 1.00 3180 0.90 883 Freeway Off Ramp Diverge Side of freeway in ramp Number of lanes in ramp Volume on ramp Volume on ramp Length of first accel/decel lane length of second accel/decel lane Langth
Trucks and buses PCE, ET
Recreational vehicle PCE, ER
Heary vehicle adjustment, fHV
Driver population factor, fP Does adjacent ramp exist?
Volume on adjacent ramp
Position of adjacent ramp
Type of adjacent ramp
Distance to adjacent ramp Type of analysis Number of lanes in freeway Free-flow speed on freeway Volume on freeway Analyst: A Agency (Co.; E Date performed: B Analysis time period; A Freeway/dir or travel: C Volume, V (vph)
Peak-hour factor, PHF
Peak 15-min volume, v15
Trucks and buses
Recreational vehicles
Terrain type:
Grade Junction Components Conditions Analysis Phone: E-mail: Data Data

	2				
	P = 0.650	Using Equation	tion 5		
	+ (V	v ) P = 2. R FD	2591 pc/h		
Checks	2	Capacity			
> + 't	Actual 3816		Maximum 7200	LOS F? No	
1 2	2591	4400		No	
V = V = V	3499	7200		No	
	317	2000		No	
	Level of Service Determination (if not F)	Determinati	on (if not	٣)	
Density,	D = 4.252	D = 4.252 + 0.0086  v R 12	1 60000 -	= 25.3	pc/mi/ln
Level of service for ramp-freeway junction areas of influence Speed	for ramp-freeway	junction ar	eas of infli	uence C	
Estimation					
Intermediate speed variable,	d variable,		$D_{-} = 0.457$		
Space mean speed in ramp influence area,	in ramp influenc	e area,	S = 57	чди	
Space mean speed in outer lanes,	in outer lanes,		S = 75.9	чдш	91
TO COLOR DE	For all vehicles	54	0 0 0 0	1	

.

50EB\_ONL\_AM.txt | 10/28/2003

MCS2000: Ramps and Ramp Junctions Release 4.1c

Phone:
E-mail:
Manalysis

Analysis

Type of analysis

Type of analysis

Number of lanes in freeway

Free-flow speed on freeway

Volume on freeway

On Ramp

Freeway

Agh Vph

Data

Side of freeway

Number of lanes in ramp

Polume on ramp

Volume on ramp

Jaso

Langth of first accel/decel lane
Length of second accel/decel lane

Adjacent Ramp Data (if one exists)

mph tr ft ft Does adjacent ramp exist?

Volume on adjacent Ramp
Position of adjacent Ramp
Type of adjacent Ramp
Distance to adjacent Ramp

Conditions Conversion to pc/h Under Base

4dy

Flow rate, vp		3287	657	hqua q
Areas	Estimation	Estimation of V12 Merge		
" <sub>[3</sub>	0.00 (E	(Equation 25-2 or 25-3)	or 25-3)	
[ ] [ ]	0.619 Us	Using Equation	1	
FM V = V 12 ;	(P) =	2036 pc/h		
Checks	Capacity	1ty -		
>	Actual 3944	Maximum 7200	LOS F7 No	
, , R12	2693	4600	No	
Level	of Service De	Level of Service Determination (if not F)	if not F)	
Density, $D = 5.475 + 0.00734 \text{ v}$ pc/mi/ln	+	0.0078 v - 0.	- 0.00627 L = 1	16.8
R 12 A Level of service for ramp-freeway junction areas of influence	R np-freeway ju	12 nction areas	A of influence B	
Estimation	Speed			
Intermediate speed variable,	ıble,		= 0.274	
Space mean speed in ramp influence area,	influence a	rea, S =	62.3 mph	
Space mean speed in outer lanes,	er lanes,	" (S	67.3 mph	
Space mean speed for all vehicles.	vehicles.		= 62 8 mmh	

c

SOWB\_OFF\_AM. txt

10/28/2003

50WB\_OFF\_AM. txt Flow rate, vp

10/28/2003 pcph

742

Estimation of V12 Diverge

Areas

HCS2000: Ramps and Ramp Junctions Release 4.1c

好 Adjacent Ramp νph ddi ddy 다 다 다 다 다 다 £t Adjacent Ramp Data (if one exists) Rolling 0.00 0.00 2.5 2.0 0.943 Ramp 'Al.
Pehr.&. Peers Associates, Inc.
8/12/203
AM Peak Hou.
Son Y Westbound
Empire Ranch Rd, Off-ramp Diverge 3 70.0 4420 Right 1 35,0 630 140 \_Conversion to pc/h Under Base Fect Agency/Co.: Fehr.& Peers Associates,
Date performed: 8/12/2003
Analysis time period: AM Peek Hour
Pressay/dir or travel: US 50 / Westbound
Junction: Empire Ranch Rd, Off-ram
Analysis Year: 2026 With Project
Description: US 50/Empire Ranch Road Interchan Rolling 0.00 2.5 2.0 0.943 õ Freeway 4420 0.90 1228 Freeway Off Remp Diverge Side of freeway in ramp Number of lanes in ramp Volume on ramp Length of first accel/decal lane length of second accel/decal lane length of second accel/decal lane Length
Trucks and buses PCE, FT
Recreational vehicle PCE, ER
Haavy vahicle adjustment, fHV
Driver population factor, fP Does adjacent ramp exist?
Volume on adjacent ramp
Position of adjacent ramp
Type of adjacent ramp
Distance to adjacent ramp Type of analysis Number of lanes in freeway Free-flow speed on freeway Volume on freeway Volume, V (vph)
Peak-bour factor, PHF
Peak 15-indn volume, v15
Trucks and buses
Recreational vehicles
Terrain type:
Grade Junction Components Conditions Analysis Data Data

	1	Using Equation 0		
	V = V + (V - V ) P 12 R F R F	) P = 5206 pc/h R FD		
Checks	Cape	Capacity		
> F	Actual 5206	Maximum 4800	LOS F? Yes	
	5206	4400	Yes	
> "	4464	4800	No	
	742	2000	No	
1	Level of Service I	Level of Service Determination (if not F)	E F)	
Density, Level of service f	D = 4,252 + 0,0086 v R for ramp-freeway junction a	_ 0.009 2 reas of in	L = 47.8 D nfluence F	pc/mi/ln
Estimation	Speed			
Intermediate speed variable,	I variable,	D = 0.495	ю	
Space mean speed in ramp influence area,	in ramp influence	01	nph	
Space mean speed in outer lanes,	n outer lanes,	S = N/A	ндш	
Space mean speed f	Space mean speed for all vehicles.	S = 56.1	- Com	

SOWB\_OND\_AM.txt

10/28/2003

# MCS2000: Ramps and Ramp Junctions Release 4,1c

	z			· 6	Adjacent Ramp vph v v v v tevel mi
\$6		dqv dqv	որն Նրն ք է ք է	vph ft	8. 2. FE
Inc.	(a)		one exists)		Reumpo 9 50 0 .90 0 .90 0 .90 1 .10 1 .00 1 .00 1 .00
Fax: e Associates,	id load On-ramp ect Interchan way		71 1 35.0 590 590	No No Ider Base	Freeway 1053 0.90 0.90 0.93 0.03 0.10 0.10 0.15 1.5 1.5 0.980
Merge AL Fehr & Peexs Ass 607/31/2803 AN Peek Hour	avel: US 50/Westbound Empire Ranch Road 2026 With Project 50/Empire Ranch Road Inte	иау нау Оп Катр	scel lane decel lane Adjacent Ramp Data	xist? No amp Ramp p. Ramp Conversion to pc/h Under Base	ER THY TP TP
: period:	👸 📗	Hei a	Side of freeway Number of lanes in ramp Free-flow speed on ramp Volume on ramp Length of first accel/decel Length of second accel/decel	Does adjacent ramp exist? Volume on adjacent Ramp Position of adjacent Ramp Type of adjacent Ramp Distance to adjacent Ramp Conditions	Junction Components Volume, V (Vph) Peak-hour factor, FHF Peak Linnin volume, v15 Trucks and buses Recreational vehicles Terrain type: Grade Grade Trucks and buses PCE, ET Recreational vehicle PCE, Heavy vehicle adjustment, Driver population factor,

SOWB_OF	SOWB_OND_AM.txt				10/28/2003
Flow ra	Flow rate, vp		4295 10	1077	pcph
Areas		Estimation of V12 Merge	V12 Merge		
	1   3	0.00 (Equa	(Equation 25-2 or 3	or 25-3)	
	Х II 3	1.000 Using	Using Equation 0		
	FM V = V 12 F	(P ) = 4295 FM	pc/h		
Checks		Capacity			
>'	,	Actual 5372	Maximum 4800	LOS F? Yes	
, > <u>r</u>	R12	5372	4600	Xes	(8)
	Level of	Level of Service Determination (if not F)	nination (if r	10t F)	
Density,	, D = 5.475 + 0.00734 v	734 v + 0.0078 v	8 v - 0.00627 L	7 L = 43.2	
Level o	R 12 A Level of service for ramp-freeway junction areas of influence	R -freeway junct:	12 ion areas of i	A nfluence F	
Estimation	ion	Speed			
Interme	Intermediate speed variable,	le,	M = 1.119	19	**
Space II	Space mean speed in ramp influence area,	influence area	5 = 38.7	7 mph	
Space m	Space mean speed in outer lanes,	lanes,	S = N/A	A mph	
Space m	Space mean speed for all vehicles,	vehicles,	S = 38.7	7 mph	

\*

Empire Ranch Interchange 3: Iron Point Road & Empire Ranch Road

Design Year 2026 No Project - AM Peak Hour

Empire Ranch Interchange 3: Iron Point Road & Empire Ranch Road

Design Year 2026 No Project - AM Peak Hour HCM Signalized Intersection Capacity Analysis

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ane Group Flow (vph)	111	256	1244	453	844	520
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um Bay Length (ft)	200				200	
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Clearance Time (s) 4.0	4.0		ì	4.0	
Vehicle Extension (s) *** *** 310 s 3 3 6	<b>1000000000000000000000000000000000000</b>	HOP TO SE	43.0h 27.536	TO PERSON NAMED IN COLUMN	3.EX 13.16
Lane Grp Cap (vph) 180	1913	1472	658	1080	1
8	CONDAIN OUT THE STATE OF	Every Celiab	大学 はない	The state of the state of	THE PARTY OF
	NAME OF STREET		0.29	c0.25	0.1
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HCM Average Control Delay	18.4	HCM Leve	HCM Level of Service	8	
HGM Volumethe Capacity Falls					
Actuated Cycle Length (s) 55.3	55.3	Sum of lost time (s)	t time (s)	12.0	

N:Projects/1032/1792\_US50\_Empire\_Ranch\_Interchange\SYNCHRO 5.0\2026 Design Year\NOSๆสม่อณีเลกิสสัสห์ LOS.syf FEHRPESAL7-FF51

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Empire Ranch Interchange 3: Iron Point Road & Empire Ranch Road

Design Year 2026 No Project - PM Peak Hour

Queues

Tum Bay Langth (1) 200 200

Sub Bay Block Time % 28% 2% 19%

Color (Color) III.

Color Shown is maximum after two cycles.

98

730 556 759 #625 #244 42% 35%

Cuerte Group Flow (vph) 800 1256
Cuerte Length 95th (ff) #274 173
(ff) (ff) #1274 173

23

The sales 78 . 730

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Design Year 2026 No Project - PM Peak Hour HCM Signalized Intersection Capacity Analysis Empire Ranch Interchange 3: Iron Point Road & Empire Ranch Road

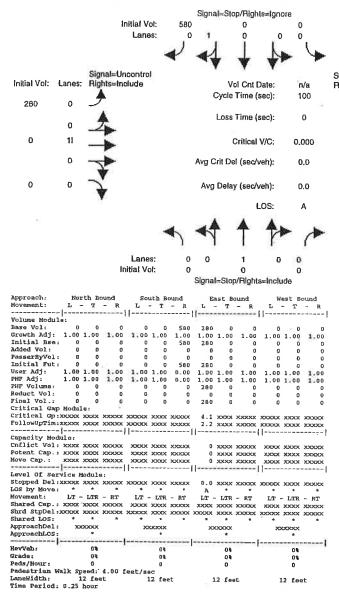
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FEHRPESAL7-FF51

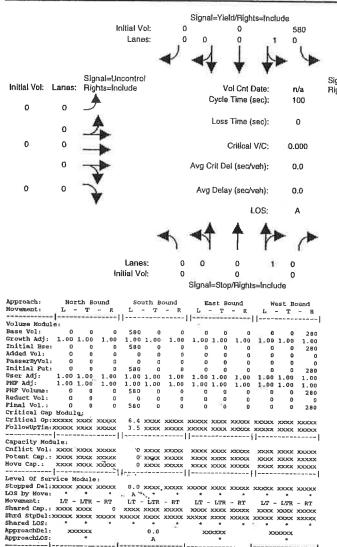
### Level Of Service Computation Report 2000 HCM Unsignalized (Future Volume Alternative) 2026 AM - Alt 184

### Intersection #1: Empire Ranch Road/Route 50 Eastbound Ramps



### Level Of Service Computation Report 2000 HCM Unsignalized (Future Volume Alternative) 2026 AM - Alt 283

### Intersection #1: Empire Ranch Road/Route 50 Eastbound Ramps



0.8 0.8 0% 0%

12 feet

0% 0%

12 feet

gnal=Uncontrol ghts=Include	Lanes:	Initial Vol:
*	1	280
1	0	
4	0	0
•	0	
¥	0	0

HevVeh:

Peds/Hour

0%

03

Pedestrian Walk Speed: 4.00 feet/soc LaneWidth: 12 feet 12 feet Time Period: 0.25 hour

3: Iron Point Road & Empire Ranch Road

Empire Ranch Interchange Design Year 2026 - Atternatives 1&2 - AM Peak Hour

4 600 133 500 1156 290 59 (65, 38, 142, 342, 713 5 224 m82 #218 #491 183 Queue shown is maximum after two cycles.

Hattippic xill i XVIII in a company of the state of th 250 300 422 1300 258 244 600 18 364 050 165 #540 109 m#125 222 500 200 300 300 1 88 9 300 115 1 300 38 99/14 p. Slock Time (%)
Turn Bay Length (ft) 3
Uff 16/85/20 p. line
95th Bay Block Time % Internal Enveroge (III) 50th Up Block Time (%) Queue Length 95th (ft) Lane Group Flow (vph)

Empire Ranch Interchange Design Year 2026 - Alternatives 1&2 - AM Peak Hour 0.73 0.19 0.84 1.00 4.0 4.0 4.0 5.10.0 097 085 0.85 1.00 1.00 1.00 695 1.00 1.583 3367 3471 0.90 0.90 600 847 0.05 0.37 0.35 0.19 0.74 1.00 1.00 1.00 1.00 1.00 1.00 3.0 3.0 3.0 3.0 3.0 3.0 (1.5 3.0 ) 40.7 53.8 HCM Signalized Intersection Capacity Analysis 3: Iron Point Road & Empire Ranch Road 4.0 21.8 0.04 0.24 0.32 r 3.0 3.7 | Automotive | Aut 4.0 0.86 0.85 1653 1653 1653 1653 1653 110 t Udrahiyo Protected Phases Farmingdi Hages Actuated Green, G (s) Effective George, G (s) 'ehicle Extension (s) 

1156 2 4% 2

4%

3.0

8 8 8

0.85 1.00 1.00

0.17 0.33 6.0 3.0 3.0 3.0 8.45 157

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15.6

4.0 4.0 1.00 0.85 1.00 0.85 1.04 1.10 3471 1.583 1.41 1.583 1.41 1.583 1.41 1.583 1.41 1.583 1.41 1.583 1.41 1.583 1.41 1.583 1.41 1.583

0.90 200

1553 0.90

4.0 1.00 3433 3433 3433

0.85 1553

Synchro 5 Report Page 2

91.5% ICU Lavel of Service E

1.00

HCM Volume to Capacity ratio resasters (Volume to Capacity (18) Intersection Capacity Utilization Conference (18)

Approach Delay (s)

Synchro 5 Report Page 1

FEHRPESAL7-FF51 4/27/2004

FEHRPESAL7-FF51

3: Iron Point Road & Empire Ranch Road

Ť.

Empire Ranch Interchange Design Year 2026 - Attematives 1&2 - PM Peak Hour

250 300 200 522 33 1167 400 367 700 88 302 38 188 289 384 38 444 m17 m#591 m244 #219 244 5 300 500 200 322 56 E F128 015 #219 31 Lane Group Flow (vph) 267 1189. 356 322 Clared contribition 68 145. 136 178 Clause Length 95th (t) 137 #619 295 #219 300 300 5% Heronii Heleisine 50th Up Block Time (%) 95th 15 Block Time (%) 95th Bay Block Time % um Bay Length (ft)

Queue shown is maximum after two cycles.
25th of contribution of the two cycles.
Queue shown is maximum after two cycles.
Volunts shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 3: Iron Point Road & Empire Ranch Road

Empire Ranch Interchange Design Year 2026 - Atternatives 1&2 - PM Peak Hour

1.00 0.85 3471 1583 630 90 0.90 0.90 700 89 3433 3471 158 44.2 1.3 06.0 0.85 1.00 0.85 1.00 1553 3433 1553 3433 47.9 0.90 0.90 0.90 1167 200 367 1167 400 367 Prot 13.0 4 6 8 4 Truck Average Control Delay 57.2 HCM Level of Service E

GOT Votame in Carpolly, 789 110.0 Sum of lost time (s) 12.0

[Distriction Carpolly Williamon Service Critical Lane Group vo+mq 45.2 25.0 695 0.21 51.6 37.4 122 1111 4.0 35.2 0.14 4.0 4.0 3.0 n 0.9 37.5 38.2 0.65 4.0 607 0.23 33.2 33.4 5.01 11.7 0.0 11.7 25.2 811 4.0 306 10.0 4.0 20.6 35.8 39.8 4.0 4.0 HCM Average Control Delay 6. 8 8 Effective Green, 9 (s) Actual Streen, 9 (s) Actual Street (s) Clearance Time (s) ane Grp Cap (vph) Progressica Effector Incremental Delay, c orm Delay, d1 evel of Service v/s Ratio Perm Approach LOS

Synchro 5 Report Page 1

FEHRPESAL7-FF51

4/27/2004

FEHRPESAL7-FF51

3: Iron Point Road & Empire Ranch Road Queues

Empire Ranch Interchange Design Year 2026 - Attematives 3&4 - AM Peak Hour

Queue shown is maximum after two cycles.

\*\*Etinger.ceriile when is action and the cycles.

Queue shown is maximum after two cycles. deject by upstreams a fall for

HCM Signalized Intersection Capacity Analysis 3: Iron Point Road & Empire Ranch Road

Empire Ranch Interchange Design Year 2026 - Atternatives 3&4 - AM Peak Hour

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Section of the sectio 0.98 0.43 0.91 1.00 1.00 0.04 c0.15 c0.33 0.40 21.0 0.22 0.74 1.00 0.30 0.93 0.74 0.54 0.08 1 Sur officture (e) 3.0 43.3 28.5 22.6 40.7 53.8 11.4 4.0 21.8 28.8 15.2 33.0 1.00 0.02 0.08 0.07 c0.13 c0.37 45.5 1.00 1.00 1.00 0.96 91.5% 0.37 0.35 0.24 HCM Volume to Capacity ratio Autrated Sales Sale 3.0 0.04 21.0 Future Phases
Protected Phases
Pstallie Phases
Adjusted Green, G (s) Progression Factor

4/27/2004

Synchro 5 Report Page 1

FEHRPESAL7-FF51

4/27/2004

FEHRPESAL7-FF51

Queues 3: Iron Point Road & Empire Ranch Road

Empire Ranch Interchange Design Year 2026 - Atternatives 3&4 - PM Peak Hour

ane Group Flow (vph) 267 1 04 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	1189 284 1189 284 1181 227	322	Contract of						1	
137	. 88 88	322	1	SHIP III	181	MER	一世紀のない	200		12/4/2
137	麗 麗	STATE OF STA	28	470	33	1167	360	367	700	F
137	4			10.00	March 1975	37.5	SELECTION OF STREET	STITE ST	NATIONAL PROPERTY.	16.28
SUBSTITUTE SECTION		#219	31	390	m13 m#492 m146	492	m146	#231	244	5
Ale Time /0/1			56,3288	が と と と と と と と と と と と と と と と と と と と	がある。	62153	2000	10000	25.7	Separate Property of the Parket Property of t
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altrais (time) (age 4 -	A CONTRACTOR OF THE PARTY OF TH		1215.35 V	STATE OF	<b>新</b>	Section 2	11000	WASHING THE	2000000	1
Length (ft) 300	300	300	9	500	200	100 May 100 Ma	250	300	A STATE	200
ACTURATION SERVICES	STATE OF STREET	S. S. S. S. S. S.	W. S. W.		THE SERVICE SHAPE	1000	1000	STEELS STORY	SANCE AND	
h Bay Block Time % 4	#1%					30%		N.C. CARLOS	NAME OF THE OWNER, OWNE	T CONT
CENTRALIA CONTRACTOR			Save C	STATE OF	0.60066	(British			Section 1	
Similar	S. Contained Ships	and the copy	The second	STATE SALE	2000	The second	No. of Concession,		The second	
extensional and annual and	A districts Hearth	THE COLON	į,				West of	2000		10000
Queue shown is maximum after two cycles.	r two cycles.		The state of the s		The same of	2		2000	Section 2	
decarille followed avoien	Sedimenty, m	<b>REUBINIS</b>	<b>Betada</b>	To the se	APPENDENCE OF	Sec. Con	2000	1	Sec. Sec.	No.
Queue shown is maximum after two cycles.	r two cycles.						- Charles	CONTRACTOR OF THE PERSON OF TH	Composition	100
TO STATISTICAL PARTY	de la metere	d Bylinst	reeministry	TRIBER	THE PERSON	NAME OF	SHEE	Section 2	SECOND .	ESSE S

44.2 64.8 648 659 0.40 0.59 3.0 3.0 48.9 910 1 0.20 0.01 Empire Ranch Interchange Design Year 2026 - Alternatives 3&4 - PM Peak Hour 1.00 1.00 25.9 9.7 2% 4% 2 Suinclibes in Service E HCM Signalized Intersection Capacity Analysis 3: Iron Point Road & Empire Ranch Road 0.99 0.99 98.1% HCM Volume to Capacity ratio
Patente Comments of the Capacity Utilization
Cofficer Capacity Utilization
Cofficer Capacity Utilization Approach Delay (s)

> FEHRPESAL7-FF51 4/27/2004

Synchro 5 Report Page 1

Synchro 5 Report Page 2

FEHRPESAL7-FF51 4/27/2004

I LAMII III		ANALYS		-	-	-	1	-	
Location:	US 50/Emp	ire Ranch F	Road		Projected F	i Peak Hour V	olume.	580	ļ
Ramp:		nch Road to				Peak Period		1130	
Scenario:		Project - Al			i rejectou i	T CHICA	Toldino.	1130	
HOV Bypas			14		Storage Le	ngth (m):		J 180	
	olume (veh/h		499		Storage Le			600	
	ate (veh/hr):		500		Storage La	nes:		7.7.7.1	/
Discharge I	Rate (veh/15	min):	125		Maximum	Storage (ve	h):	20	
	Estimated	Projected	Metered		Accum-	Total		Total	Metered
Time	Arrival	15-Minute	15-Minute	Excess	ulated	Delay	Vehicles	Hourly	Hourly
Period	Distribution		min flows	Demand	Vehicles	(veh-hr)	Delayed	Volume	Volume
7:00-7:15	12%.	134	115	0	0	0.00	0		
7:15-7:30	12%	135	116	0	0	0.00	0		
7:30-7:45	12%	140	120	0	0	0.00	0		
7:45-8:00	114%	157	135	10	10	2.51	135	566	487
8:00-8:15	12%		116	0	1	0.28	116	567	488
8:15-8:30	12%	135	116	0	0	0.00	0	567	488
8:30-8:45	13%	- 145	125	0	0	0.00	0	572	492
8:45-9:00	13%	148	127	2	2	0.57	127	563	484
Total Delay	(veh-hr):		3						
Total Vehic	les Delayed	(veh):	378		Maximum	Queue (veh	):	10	
Average De			0.01		Maximum C		i i	90	
Average De	lay (min):		0.53		Maximum C			296	
Location:		ire Ranch R				eak Hour Vo		650	
Ramp:		ch Road to			Projected P	eak Period '	√olume:	1200	
Scenario:	2026 With I	Project - PM	PEAK						
HOV Bypas	e (%)·		14		Storage Ler			CONTRACT STREET	
	lume (veh/hi	.).	559		Storage Ler			180	
	te (veh/hr):	<i>)</i> .	580		Storage Lar			600	
	late (veh/15	min):	133	20	Maximum S	ies. Storage (vel	h):	20	
	Estimated	Projected	Matarad						
Time	Arrival	15-Minute	Metered 15-Minute	Excess	Accum-	Total	17-11	Total	Metered
Period	Distribution	Volumes	min flows		ulated	Delay	Vehicles	Hourly	Hourly
4:00-4:15	14%	162	139	Demand	Vehicles	(veh-hr)	Delayed	Volume	Volume
4:15-4:30	12%	139		7	7	1.71	139		
4:30-4:45	13%	155	120	0	0	0.00	0		
4:45-5:00	13%	160	133	1 -	1	0.20	133		
5:00-5:15	13%	160	138	5	6	1.48	138	616	530
5:15-5:30	12%		138	5	- 11	2.75	138	614	528
5:30-5:45	12%	145	125	0	3	0.80	125	620	533
		143	123	0	0	0.00	0	608	523
5:45-6:00	12%	138	119	0	0	0.00	0	586	504
Total Delay			7						
	Delever	(voh).	673		Maximum C	ueue (veh)		11	
Total Vehicle		Verij.	070		muximum C	INCHO I FCIII			
Fotal Vehicl Average De Average De	lay (hr):	venj.	0.01		Maximum Q			99	

Appendix F
Design Year (2026) With Improvements Conditions

50WB\_OND\_AM\_Improve#3.txt

12/17/2003

HCS2000: Ramps and Ramp Junctions Release 4.1c

Fax: Phone: E-mail;

Analysis

Analyst:
Agency/Co.:
Analysts time period:
Analysts time period:
Analysts time period:
AM Feak Mour
Sounction:
Durisdiction:
Analysts Year:
Description:
Dougland:
Analysts Year:
Description:
AM Peak Mour
Sounce Ranch Road On-ramp (D)
Analysts Year:
Analysts Yea

Merge 2 70.0 3790 Freeway Type of analysis Number of lanes in freeway Free-flow speed on freeway Volume on freeway Data

Agh Agy

Right 1 35.0 950 1500 On Ramp Side of freeway in ramp Number of lanes in ramp Volume on ramp Volume on ramp accel/decel lane langth of first accel/decel lane langth of second accel/decel lane Data

Adjacent Ramp Data (if one exists)

aph Yph ft ft

vрh £ 8 Does adjacent ramp exist?
Volume on adjacent Ramp
Position of adjacent Ramp
Type of adjacent Ramp
Distance to adjacent Ramp

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	. R	Ramp	Adjacent	
Volume, V (vph)	3790	6	0	Ramp	į
Peak-hour factor, PHF	0.90	c	06.0		114
Peak 15-min volume, v15	1053	2,6	14		;
Trucks and buses	4	ı 4			> 14
Recreational vehicles	0	۰.			p elf
Terrain type:	Grade	G	ade	Level	
Grade	-6.00		* 00		
Length	0.10	C	10		
Trucks and buses PCE, ET	1.5			•	1
	1.2	-	171		
Heavy vehicle adjustment, friv	0.980	o	980		
Driver population factor, fP	1.00	F	1.00		

50WB_OND_AM_Improve#3.txt				12/17/2003
Flow rate, vp	4295	1077		pcph
Areas	Estimation of V12 Merge	Merge		
L = 0.00 EQ = 1.000	_	(Equation 25-2 or 25-3)		
¥ 7 7 × 7 × 7 × 1 × 1 × 1 × 1 × 1 × 1 × 1	н			
Checks	Capacity			
Actus 2 5372	Ţ.	Maximum 4800	LOS F? Yes	
v R12		4600	Yes	
Level of Serv	ice Determina	Level of Service Determination (if not F)	_	
Density, $D = 5.475 + 0.00734 \text{ v}$	v 8700,0 +	- 0.00627 L	37.5	
R service for ramp-free	R 12 way junction a:	A areas of influ	ence F	
Estimation	Speed	s:		
Intermediate speed variable,		M = 1.056		
Space mean speed in ramp influence area,	ence area,	S = 40,4	щрh	
Space mean speed in outer lanes,	'n	S = N/A	mph	
Space mean speed for all vehicles,	les,	S = 40.4	щрh	

SOWB\_OFF\_AM\_Improve#4.txt

12/17/2003

HCS2000: Ramps and Ramp Junctions Release 4.1c

Analyst:
Angency(co.: Febr. & Peers Associates, Inc.
Date performed: 8/12/2001
Analysts time period: AM Peak Hour
Streewsy(dir or travel: US 50 / Westbound
Junction:
Junisdiction:
Analysis Year:
2026 With Project With Improvement Option 3
Description: US 50/Empire Ranch Road Interchan Fax: Diverge Analysis

ft th ngh Vgh чф Adjacent Ramp Data (if one exists) Diverge 3 70.0 4420 Right 1 35.0 630 140 N<sub>o</sub> Off Ramp Freeway Side of freeway
Number of lanes in ramp
Free-Flow speed on ramp
Volume on ramp
Length of first accel/decel lane
Length of second accel/decel lane Type of analysis Number of lanes in freeway Free-flow speed on freeway Volume on freeway Data

££ Does adjacent ramp exist?
Volume on adjacent ramp
Position of adjacent ramp
Type of adjacent ramp
Distance to adjacent ramp

\_Conversion to pc/h Under Base Conditions

Adjacent	Ramp vph Vph *	Level % mi
		а. Н Н
Ramp	630 0.90 175	Rolling 0.00 0.00 2.5 2.0 0.943
Freeway	4420 0.90 1228 0	Rolling % 0.00 mi 2.5 2.0 2.0 1.00 1.00 1.00
Junction Components	Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recretional vehicles	Terrain type: Grade Grade Grade Trucks and buses PCE, ET Recreational vehicle PCE, ER Heavy vehicle adjustment, EHV Driver population factor, fP

Areas		5206	742	4400
Areas	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			i,
	Estimation	Estimation of V12 Diverge	ge.	
H	00.00	(Equation 25-8 or 25-9)	or 25-9}	
<b>Δ</b>	965.0	Using Equation	'n	
12	2 x + (v - v ) 2 R F R	) P = 3401 . FD	pc/h	
Checks	Capa	Capacity		
> " , p	Actual 5206	Maximum 7200	LOS F? No	
	3401	4400	No	
2	4464	7200	No	
	742	2000	No	
Leve	Level of Service Determination (if not F)	etermination (	if not F)	
Density,	D = 4,252 + 0.0086 v	ı	0.009 L = 32.2	2 pc/mi/ln
Level of service for ramp-freeway junction areas of influence	ramp-freeway j	unction areas	of influence D	
Estimation	paads			
Intermediate speed variable,	ariable,	" <u> </u>	0.495	
Space mean speed in ramp influence area,	ramp influence :	va	56 mph	
Space mean speed in outer lanes,	outer lanes,	# ഷ ഗ	73.7	
		0		

50WB\_OND\_AM\_Improve#4.txt

11/11/2003

HCS2000: Ramps and Ramp Junctions Release 4.1c

Phone:

B-mail:

Malysis

Analyst:
Analysts:
Analyst:
Ana

Data		
Type of analysis Number of lanes in freeway Free-flow speed on freeway Volume on freeway	Merge 3 70.0 3790	ngh Agv Agv
DataOn Ramp		Se
Side of freeway Number of lanes in ramp Free-flow speed on ramp Volume on ramp Length of first accel/decel lane Length of second accel/decel lane	Right 1 35.0 950 590	mph Vph ft ft
Adjacent Ramp Data (if	a (if one exists)	sts)
Does adjacent ramp exist?	No	

Does adjacent ramp exist?	No	•	
Position of adjacent Ramp		uďa	
Type of adjacent Ramp			
Distance to adjacent Ramp		ft	
Conversion	Conversion to pc/h Under Base		
Conditions			ä
Junction Components	Freeway	Ramp A	Adjacent
Volume, V (vph)	3790	086	Ramp
Peak-hour factor, PHF	0.90	0.90	
Peak 15-min volume, v15	1053	264	٥
Trucks and buses	4	4	· #
Recreational vehicles	0	0	a de
Terrain type:	Grade	Grade	Level
Grade	-6.00 %	-4.00 %	×
Length	0.10 mt	0.10 mi	É
Trucks and buses PCE, ET		10.1	
	1.2	1.2	
Heavy vehicle adjustment, fhv	0.980	0,980	
Driver population factor, fP	1.00	1.00	

50WB_OND_AM_IMDIOVE#4.txt	rove#4.txt		,	11/11/2003
Flow race, vp		4295	1077	рсру
Areas	Estimation	Estimation of V12 Merge		
	00'00 =	(Equation 25-2 or 25-3)	ır 25-3)	
	. 0.594	Using Equation	1	
	rm v = v (P ) = 12 F FM	2551 pc/h	\``	
Checks	Capa	Capacity		
\$ <sup>6</sup>	Actual 5372	Maximum 7200	LOS F? No	
* 12 × 12	3628	4600	o N	
	Level of Service Determination (if not F)	etermination (i	f not F)	
Density, D = 5.4 pc/mi/ln	5.475 + 0.00734 v + 0	+ 0.0078 v - 0.0	- 0.00627 L = 2	29.6
R Level of service	R 12 A Level of service for ramp-freeway junction areas of influence	12 unction areas o	A f influence D	
Estimation	Speed			
Intermediate speed variable,	ed variable,	н	0.426	
Space mean speed	Space mean speed in ramp influence area,	w w t	58.1 mph	
Space mean spead	Space mean speed in outer lanes,	н	65.5 mph	
Space mean speed	Space mean speed for all vehicles,	If	60,3 mph	

.

50EB\_OFF\_AM\_Improve#1.txt

11/11/2003

SOEB\_OFF\_AM\_Improve#1.txt

Flow rate, vp

Areas

11/11/2003 pcph

317

Estimation of V12 Diverge

(Equation 25-8 or 25-9)

pc/h

Ŋ

Using Equation

L = 0.00 (Equation 25-8 o EQ P = 0.650 Using Equation FD V (v = v) P = 2591 12 R F R FD

Capacity

Checks

HCS2000: Ramps and Ramp Junctions Release 4.1c

mph Vph Ft than Adjacent Ramp Data (if one exists) Ounction: Empire Ranch Rd. Off-ramp Jurisdiction: 2026 With Project With Improvement Analysis Year: 2026 With Project With Improvement Description: US 50/Empire Ranch Road Interchan AL Fehr & Pears Associates, Inc. Diverge 8/12/2003 AM Peak Hour US 50 / Eastbound Empire Ranch Rd. Off-ramp Right 1 35.0 280 300 3 70.0 3180 Fax: Freeway Off Ramp Diverge Side of freeway in ramp Number of lanes in ramp Volume on ramp length of first accel/decal lane length of second accel/decel lane Type of analysis Number of lanes in freeway Free-flow speed on freeway Volume on freeway Agency/Co.:
Date performed:
Analysis time period:
Freeway/dir or travel: Analysis Analyst: Data

= 23.8 Density, D=4.252+0.0086~v-0.009~L=23  $R \qquad 12 \qquad D$  Level of service for ramp-freeway junction areas of influence C mph щph прh No No Ñ Level of Service Determination (if not F) 5 = 62.1 4400 7200 2000 Space mean speed in ramp influence area, Speed Space mean speed for all vehicles, 2591 Space mean speed in outer lanes, 3499 317 Intermediate speed variable,  $\begin{aligned} & \overset{V}{\text{Fi}} & \overset{V}{\text{F}} \\ & \overset{V}{\text{Fi}} & \overset{F}{\text{F}} \\ & 12 \\ & 12 \\ & V & = V \\ & V & = V \end{aligned}$ 

LOS F? No

Actual 3816

Adjacent Ramp

Ramp

Freeway

Junction Components

Conditions

3180 0.90 883

Volume, V (vph)
Peak-lour factor, PHF
Peak 15-min volume, v15
Trucks and buses
Recreational vehicles
Terrain type:
Grade

\_Conversion to pc/h Under Base

vph ££

õ

Does adjacent ramp exist? Volume on adjacent ramp Position of adjacent ramp Type of adjacent ramp bistance to adjacent ramp

Level

Grade 4.00 0.10 1.5 1.2 0.980

Grade 6.00 0.30 3.0 6.0 0.926

Length
Trucks and buses PCE, ET
Recreational vehicle PCE, ER
Heavy vehicle adjustment, fHV
Driver population factor, fF

Queues 3: Iron Point Road & Empire Ranch Road

Empire Ranch Interchange Design Year 2026 - Atternatives 1&2 Mitigation - AM

258 244 600 133 500 1156 290 1 1 54 cd 10 112 373 E. 0 m#113 167 m0 #218 392 88 500 200 Lane Group Flow (vph) 56 300, 110 422 1300 2. Programmer of the pr

Collabett in the columbers outstroops in studies that it is maximum after two cycles.

Volume shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 3: Iron Point Road & Empire Ranch Road

Empire Ranch Interchange Design Year 2026 - Altematives 1&2 Mitigation - AM

Control Cont													
Heat   Color   Heat	Mostprican	101	181	-after	111	1100	A VEGRAL	- Heart	しかはない	46265	120	200	100
Section   Sect	Lane Configurations	K.	***	R.	R	444	K	KK	¥¥	ľ	Ä	Y	,
4,0   4,0	denseriown von all a sea	0.000	<b>MBOO</b>	11900	2000	20000	1900	1		THE PERSONS		T-LIVE STATE OF THE PARTY OF TH	STORY
1.00 0.85 1.00 1.00 0.85 1.00 1.00 0.85 1.00 1.00 0.85 1.00 1.00 0.85 1.00 1.00 0.85 1.00 1.00 0.85 1.00 1.00 0.85 1.00 1.00 0.85 1.00 1.00 0.85 1.00 1.00 0.85 1.00 1.00 0.85 1.00 1.00 0.85 1.00 1.00 0.85 1.00 1.00 0.85 1.00 1.00 0.85 1.00 1.00 0.85 1.00 1.00 0.85 1.00 0.90 0.90 0.90 0.90 0.90 0.90 0.90	Total Lost time (s)	4.0	4.0	0.4	4.0	4.0	40	40		0			N.
1,00 0.85 1.00 1.00 0.85 1.00 1.00 0.85 1.00 1.00     1,00 0.85 1.50 1.00 1.00 0.85 1.00 1.00 0.85 1.00 1.00     1,00 0.85 1.55 3367 5.08 1.58 3367 3.47 1.55 3.43 3.47 1     1,00 0.80 0.90 0.90 0.90 0.90 0.90 0.90 0.		11:00	OB		20197.5		2000	<b>多年</b> 00	20.05 S	ESTATES	2000	SAEGES	C.+ 10
5085   1553   3367   5085   1583   3367   3471   1553   3453   3471		1.00			1.80	1.00	0.85	1 00	1 00	0.85	00	00	D O
5085         1553         3367         5085         1583         3367         3471         1553         3433         3471           5085         1553         3367         5085         1583         3367         3471         1553         3433         3471           0.30<	53	4800	1000	500 E	<b>MOISTER</b>	<b>EKADOM</b>	NATIONAL PROPERTY.	10.05	- 88	MANAGE	E COLOR	2000	20.00
Solution	77 E V S	3433	5085	1553	3367	5085	1583	3367		1553	3493	27.75	503
5085   1553   3367   5085   1583   3367   3471   1553   3433   3471   1553   3471   1553   3471   1553   3471   1553   3471   1553   3471   1553   3471   1553   3471   1571		5800	28		Selection of	100	MEDOS	SERVING.	STATE OF THE PARTY.	SCANIE S	STATISTICS.	THE PARTY OF	200
0.50 0.50 0.50 0.90 0.90 0.90 0.90 0.90	Satd. Flow (perm)	3433	5085	1553	3367	8	1583	3967	2471	1559	00/0	27.70	
0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	Journa, spila		200	1333	R TROP	SASS TANK	Septiment of the septim	STOSUS STATE	The street	KSALAN	200		200
10.4 18.4 19.6 25.0 90.0 8.0 28.0 90.0 13.5 500 1156  2% 4% 4% 2% 2% 2% 4% 4% 2% 2% 4%  4 5 3 8 10.2 2.0 10.0 10.0 10.0 10.0 10.0 10.0	Peak-hour factor, PHF	0.90	0.90	0.90	06.0	08.0	06.0	000	000	000			
300 110 422 1300 258 244 600 133 500 1156 2% 4% 4% 4% 2% 4% 4% 2% 4% 4% 4% 2% 4% 4% 4% 155 50 156 50	Showing established	10000	100	5009gg	100	STOCKED STOCKED	RHOEKS		SCHOOL STATE	SCONORS SCONORS	20000	0.30	0.30
2% 4% 4% 2% 2% 4% 4% 4% 2% 4% 4% 4% 2% 4% 4% 4% 2% 4% 4% 4% 2% 4% 4% 4% 2% 4% 4% 4% 2% 4% 4% 4% 2% 4% 4% 4% 2% 4% 4% 2% 4% 4% 2% 4% 4% 2% 4% 4% 2% 4% 4% 2% 4% 4% 2% 4% 4% 2% 4% 4% 2% 4% 4% 2% 4% 4% 2% 4% 4% 4% 2% 4% 4% 4% 2% 4% 4% 4% 2% 4% 4% 4% 2% 4% 4% 2% 4% 4% 4% 2% 4% 4% 4% 2% 4% 4% 4% 4% 2% 2% 2% 4% 4% 4% 4% 4% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2% 2%	Adj. Flow (vph)	26	300	110	а.	1300	258		600	120	Tool of		
2%         4%         4%         2%         4%         4%         2%         4%           4         5         3         8         175         7         175 <td>AND GOOD FIRM (TABLE</td> <td>1000</td> <td>1000</td> <td></td> <td>SECOND .</td> <td>MISSESSES.</td> <td>STATE OF</td> <td>STATE OF</td> <td>STATE OF STATE OF STA</td> <td>3</td> <td>- 64</td> <td>001</td> <td>280</td>	AND GOOD FIRM (TABLE	1000	1000		SECOND .	MISSESSES.	STATE OF	STATE OF	STATE OF STA	3	- 64	001	280
10.4   18.4   19.6   25.0   90.0   8.0   28.0   90.0   16.0   36.0   10.4   18.4   19.6   25.0   90.0   8.0   28.0   90.0   16.0   36.0   10.4   18.4   19.6   25.0   90.0   8.0   28.0   90.0   16.0   36.	leavy Vehicles (%)	5%		4%	4%	5%	2%	4%	γ,	40/	88	10/	000
4 5 3 8 6 5 2 7 1 6 6 10.4 10.4 10.4 10.4 10.4 10.4 10.4 10.4	Um Types	T Pinte		ine soe	Scrints	100	発売のより	SELECTION OF STREET	A CONTRACTOR		6/10	0/4	6/2
104 184 1956 2550 90.0 8.0 28.0 90.0 16.0 96.0 0.12 0.20 0.22 0.28 1.00 0.99 0.31 1.00 0.18 0.40 0.12 0.40 0.29 0.31 1.00 0.18 0.40 0.19 0.40 0.19 0.40 0.40 0.40 0.40 0.40 0.40 0.40 0.4	rotected Phases	7		5	3	a .			,		-		S I
10.4 18.4 19.6 25.0 90.0 8.0 28.0 90.0 16.0 36.0 0.0 2.0 36.0 36.0 36.0 36.0 36.0 36.0 36.0 36	emilled Reasons	2.7	100	ALC: NO	No. of the	SUPERIOR S	ERSE	Selfenting.	No. of London	BOOK THE	- 164	Distriction	, Marane
0.12 0.20 0.22 0.28 1.00 0.09 0.31 1.00 0.18 0.40 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 5.6 0.03 c.0.13 c.0.26 c.0.07 0.17 0.15 c.0.33 0.51 0.35 0.58 0.92 0.16 0.82 0.55 0.09 0.82 0.83 1.00 1.00 1.00 1.00 1.00 0.76 0.55 1.00 1.00 1.00 38.2 31.3 32.6 41.5 0.2 44.4 16.1 0.1 44.1 30.3 37.0 34.2 34.2 21.0 2.0 31.8 0.82 0.77% ICU Level of Sarvices	Actuated Green, G (s)	5,0	10.4	18.4	19.6	25.0	0.06	8.0	98	0.00	22 '	000	BACK S
0.12 0.20 0.22 0.28 1.00 0.09 0.31 1.00 0.18 0.40 0.00 0.31 1.00 0.18 0.40 0.00 0.31 1.00 0.18 0.40 0.00 0.31 1.00 0.18 0.40 0.40 0.30 0.30 0.30 0.30 0.30 0.30	dibelive chach anger	18.0	200	38.62	200	100 E	SATION			SOUNDS.	2000	35000	-
3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	Actuated g/C Ratio		0.12	0.20	0.22	0.28	100	21		200		0,00	
3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	llearance ill melrassere	0.0	STATE OF	N. C. C. C.	REAL PROPERTY.	10.50	- 22	THE PARTY	ALEKS PRINS	- 15	0.10	0.40	0.46
0.06 0.03 co.13 co.26 co.07 0.17 0.15 co.33 co.56 0.03 co.13 co.26 co.07 0.17 0.15 co.33 co.51 0.35 0.58 0.92 0.16 0.82 0.56 0.09 0.82 0.83 1.00 1.00 1.00 1.00 1.00 0.76 0.55 1.00 1.00 1.00 1.00 88.2 31.3 32.6 41.5 0.2 44.4 16.1 0.1 44.1 30.3 37.0 34.2 24.5 1.00 1.01 44.1 30.3 37.0 34.2 24.0 1.01 0.1 44.1 30.3 31.8 co.38 0.77% ICU Level of Sandrea	/ehicle Extension (s)	3.0	3.0	3.0	30	3.0		30	3.0		S C	200	000
0.06 0.03 c0.13 c0.26	BATHLONG SECTION THESE	1 (4)	MERRING	HOTTER	Services.	190		STOCKS OF STREET	- Constant	A-Mary	0.0	3.0	0,0
0.51 0.35 0.58 0.92 0.16 0.82 0.56 0.09 0.82 0.83 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.5	/s Ratio Prot	0.02	0.06		9	20		100	1000	10.23	95		
0.51 0.35 0.58 0.92 0.16 0.82 0.56 0.09 0.82 0.83 1.00 1.00 1.00 1.00 0.76 0.55 1.00 1.00 1.00 1.00 382 0.83 31.3 32.6 41.5 0.2 44.4 16.1 0.1 44.1 30.3 37.0 34.2 31.3 2.6 41.5 0.2 44.4 16.1 0.1 44.1 30.3 37.0 34.2 31.0 21.0 31.8 37.0 34.2 31.0 21.0 31.8 37.0 34.2 31.0 31.0 31.8 37.0 34.2 31.0 31.0 31.8 37.0 34.2 31.0 31.0 31.8 37.0 34.2 31.0 31.0 31.8 37.0 34.0 34.0 34.0 34.0 34.0 34.0 34.0 34	A Hatte Permi	NAME OF TAXABLE PARTY.	0000000	. 22.	- 96	Marketon .	100	- 80	11.0	- 10	. 1	CO.33	0.02
1.00 1.00 1.00 1.00 1.00 0.76 0.55 1.00 1.00 1.00 382 1.00 1.00 1.00 0.76 0.55 1.00 1.00 1.00 382 31.3 32.6 41.5 0.2 44.4 16.1 0.1 44.1 30.3 37.0 34.2 21.0 31.8 0.7%   ICU Level of Sandrea	/c Ratio	0.29	0.51	0.35	0.58	000	8	38	0.00	82			
1.00 1.00 1.00 1.00 1.00 0.76 0.55 1.00 1.00 1.00 1.00 1.00 0.76 0.55 1.00 1.00 1.00 1.00 1.00 1.00 1.00	Informiberated Trans	WASH IN	2552	ZER	KARKE		SECTION.	20.0	00'0		0.82	0.83	0.40
38.2 31.3 32.6 41.5 0.2 44.4 16.1 0.1 44.1 37.0 34.2 21.0 21.0 44.1 16.1 0.1 44.1 37.0 34.2 21.0 21.0 21.0 21.0 21.0 21.0 21.0 21	rogression Factor	1.00	00	100	00			32.0	01.0		NATURE.	28.8	
38.2 31.3 32.6 41.5 0.2 44.4 16.1 0.1 44.1 37.0 37.0 34.2 21.0 21.0 0.8	POWER THE THE PARTY OF THE	ASSESSED OF		No.		THE COLUMN	200	0.70	0.00	30.1	00.1	1.00	8
37.0 34.2 21.0 0.1 44.1 37.0 34.2 21.0 21.0 0.8 2 0.8	Jelay (s)	41.7	38.2	31.3	32.6	415	0.0	THOUSE OF	O. O.	NO.		E BINE	100
37.0 34.2 21.0  21.0  0.82	avel til Sersice of	20162		No.	PRODUCE SERVICE	THE REAL PROPERTY.	September 1	THE REAL PROPERTY.	10.1		44.1	30.3	16.7
0.82 BSML sea to Serves 0.82 Same of the time (8) 80.7% ICU Level of Service	pproach Defay (s)		37.0			34.9	N. C.		210				
0.82		To the Co	(d.		100		* 1		200			31.8	
0.82	DESCRIPTION OF THE PARTY.	Section 1	44	3		ALTERNATION OF THE PERSONS NAMED IN COLUMN TWO IS NOT THE PERSON OF THE	1,400,00	STATE OF	Section (in	O CONTRACTOR	l		
0.82 97.8 80.7%	GM Average Bottmol D	elet	1	(S)/2	2011	1000	0		ie ir	-84		t r	
80.7%	ICM Volume to Capacit	y ratio		0.82	-	National Property lies	Citizen and Citizen	The same of the sa					
80.7%	ottialisti (alto la magitio)	5		STATE OF	6	monitor	ATTENDED.	200		Section 1	STATE OF THE PARTY OF	Total Control	1
	itersection Capacity Uti	Potion		1000		THE PERSON AND PERSON AND PERSON NAMED IN COLUMN TWO IS NOT THE PERSON		No.					

4/27/2004

Synchro 5 Report Page 1

FEHRPESAL7-FF51

4/27/2004

FEHRPESAL7-FF51

Queues 3: Iron Point Road & Empire Ranch Road

Empire Ranch Interchange Design Year 2026 - Attématives 1&2 Mitigation - PM

Late Group Flow (vph) 267 1189 · 356 322 56 522 33 1167 400 367 700 36 or other control of the c t

| Unit | Color | Color

Path britishin will the secret straight in the many beliefner.

Queue shown is maximum after two cycles.

Ask the forest instrument of the secret in the sec

HCM Signalized intersection Capacity Analysis 3: Iron Point Road & Empire Ranch Road

Empire Ranch Interchange Design Year 2026 - Alternatives 1&2 Mitigation - PM

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•		-	0.00	4.0	21160	0.85	BOSETS	1583	00000	1583	Sealer Sealer	080	100	80	The Same	VO-mo	Contract of	S	STATE OF THE PARTY	58.6	908		Base	1101	200	0.04	9698	5.8	Side.	0.0	THE STATE OF	۲		1	1	
+	NAME OF THE	\$	4900	1. 14	900	и -	0011	3471	2003	3471	SELECTION.	06.0	Separate Separate	700	10.		Section Co.	1	100	37.4	SCHAPS.	0.4	1015115	1442	620		0.5	19.3	1000	1.2	50.0	U	2	•	1000	
j.	127	F. F.	D0618 008	4.0	0.00	1.00	350 DX	3433	SCIENCE SERVICE	3433	P. Parks	08.0	SCA STATE	367	2,62	Prot	2542		2000	10.0	<b>SONIEN</b>	4.0	200		100		8E0 8E0	39.8	NA STATE	36.3	TO THE	E	0			語多
L	NEEDS	<b>8</b> _	1,000	4.0	0,10	0.85	SET DO	1553	<b>BOOK</b>	1553	STATE OF THE PERSON NAMED IN	06.0	STORES.	400	200 H	Free	STATES.	Free	ES.		E0011			1553		0.26	0.28	0.0	A COCCU	2.0	· Constitution	۲	Participal in		c	
-	(AB)	*	20000	4.0	0.15	1.00	1000	3471	SOCIETY OF	8 .	STREET	06.0	THE STATES	1167	26.5		2.75		CONTRACTOR OF THE PROPERTY OF	31.4	2000	4.0	2005		10.0	A COLUMN	3.0 M. O. 28	28.7		10.0		Service Comments	S C			
_	. sep	¥-		- 4	65		1000	3367		3367	32		200 S	33	498	Prot	100		25(0)(SAII)	4.0	10000	4.0	鼦	150	0		22		ш.	- 8		CARGO CO	No.		doe	
,	1,000 kg			4.0	100	0.85	1000	1583	100 V	1583	変化なる機	0.90	225	522	200	Free		Free	MESON SERVICE	90.0	00			1583	髓	0.33			000	0.0		4		EMINIS	l of Service	
	3,46	\$	1900	4.0	ш		W2.1		539			0.90	Need of	56	2.0				20000	11.4	2 6	4.0	10.5	644	Seller.			7.45	,	- Contraction		2007	0		HCM Level of	
•		-	11900E	4.0			GO.		80	3367	21.73	0.90	3.45	322	*	Prot			P1 1 2 2 2 (5) 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	9.0	1000	4.0	Selection .	337	Sector	- 1		40.3	37.0	Proposition of	L L	HANNER			유	187
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FEHRPESAL7-FF51

Synchro 5 Report Page 1

FEHRPESAL7-FF51 4/27/2004

3: Iron Point Road & Empire Ranch Road

Empire Ranch Interchange Design Year 2026 • Atternatives 3&4 Mitigation • AM

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HCM Signalized Intersection Capacity Analysis 3: Iron Point Road & Empire Ranch Road

Empire Ranch Interchange Design Year 2026 - Attematives 3&4 Mitigation - AM

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8.0 28.0 90.0 16.0 36.0 41.

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Citical Ratio Sign rogression Factor

4/27/2004

Synchro 5 Report Page 1

FEHRPESAL7-FF51

4/27/2004

FEHRPESAL7-FF51

Queues 3: Iron Point Road & Empire Ranch Road

Empire Ranch Interchange Design Year 2026 - Atematives 3&4 Mitigation - PM

7 400 367 700 89 0 754 478 24 m0 #219 223 45 700 89 250 300 200 22 33 1167 4 6 23 3357 0 m13 m367 522 356 322 218 2417 329 #196 Account of the second of the s 267 1189. 93 350 137 #385 1 Queue Length 95th (ft) 95th Bay Block Time % ane Group Flow (vph)

HCM Signalized Intersection Capacity Analysis 3: Iron Point Road & Empire Ranch Road

Empire Ranch Interchange Design Year 2026 - Attematives 3&4 Mitigation - PM

ļ

1 1553 3433 3471 1583 49.2 68.8 4.0 1552 Sum of lost time (s) • HCM Level of Service 7,14. 1,175 1,115 48.3 31 1,15 13 444 74 1850 1850 1850 4.0 4.0 4.0 32.7 110.0 19.6 28.8 4.8 9.26 4.0 4.0 612 1331 t Actuated Cycle Length (s)
Meissetze Caprelletter
c Critical Lane Group Effective Green, g (s) Admate, etc Felio incremental Delay, d2 Lane Grp Cap (vph) Clearance Time (s) //s Ratio Perm

4/27/2004

Synchro 5 Report Page 1

FEHRPESAL7-FF51

Synchro 5 Report Page 2

FEHRPESAL7-FF51 4/27/2004

# Right of Way Data Sheet / Utility Information Sheet

Attachment G

### RIGHT OF WAY DATA SHEET

To: Mr. Clark Peri

Project Manager, Special Funded Projects Department of Transportation, District 3 Date: January 27, 2006

03-Sac/ED-50 EA 1C9500

Proj. Desc.: Route 50/Empire

Ranch Road Interchange

### Subject: Right of Way Data Sheet - Project Element 1 (Interchange), Alternative 1

Limiting Conditions and Assumptions: Partial acquisition from four parcels will be required to construct this project. Two parcels on the north side of Route 50 are owned by a development interest that is cooperating with the City for construction of this interchange. A portion of these parcels are subject to an irrevocable offer of dedication. The necessary right of way on these parcels outside of the IOD's will be dedicated by the development interest. The right of way on the south side of Route 50, which consists of grazing land, will need to be acquired for the interchange.

Property owners were contracted for the purposes of obtaining a right of entry for environmental field studies. The estimator determined the use of the subject parcels solely by observation of the subject parcels.

## 1. Right of Way Cost Estimate: Contingency at 25%

Contingency at 25%				
4 4	Current Value			Escalated
	(Future Use)	Rate/Ye	ar	<u>Values</u>
Acquisition (including excess lands,	\$ 6,766,800	5%		\$ 7,460,400
damages, goodwill and easement				190
acquisition)		25		
Utility Relocation (Project Cost)	\$ 29,000	5%		\$ 32,000
- ,	\$ 29,000			\$ 32,000
Clearance and/or Demolition	0	N/A		0
Relocation Assistance (RAP)	0	N/A		0 *
Environmental Mitigation	0	N/A		0
Title & Escrow Fees	\$ 4,000	N/A		\$ 4,000
Hazardous Waste Clean-up	0	N/A	¥	0
Total R/W Costs (Current Value)	\$ 6,799,800		SAY\$	6,800,000
Total R/W Costs (Escalated to 2008)	41			\$ 7,496,400
	187	::	7	Φ <b>7.</b> 40.6.000
Construction Contract IVI 1 (	Φ.Δ	=	Say	\$ 7,496,000
Construction Contract Work (unescalated)	\$ 0			

2. Anticipated Year of Right of Way Certification: January 2008

Parcel	Data:
Parcel	Data

9 32	Type  X  A  2  B  2  C  D  Total 4	Dual Appr.  B C D	Utilities None U4-1 U4-2 U4-3_2 U4-4 U5-7 U5-8 U5-9_2	RR Involvement  None X.  C&M Agrmt  Svc Contract  Lic/RE/Clauses  Misc R/W Work  None X.  RAP Displ  Const. Perm.  Condemnation
Areas	R/W <u>9.48 HA</u>	(23.4 Ac) No. E	xcess Pcls <u>0</u> Excess	Easements $0$
3.	Are there any Yes <u>No</u>	items of construction (If yes, explain)	contract work?	e; a
4.	Provide a genuse major imp	eral description of the provements, critical or	right of way and exces sensitive parcels, etc.).	s land required (zoning,
*	for grazing pu off ramps. Th	rposes and would acc e right of way acquisi	ne south side of Route 5 commodate the intercha tion on the north side o te Empire Ranch develor	nge eastbound on and f Route 50 was planned
5.		ect on assessed valuat gnificant No	ion? (If yes, explain)	25
6.	Are utility fac  Yes No	ilities or rights of way (If yes, attach Utility		8 8 8 8
7.	Are railroad fa Yes <u>No</u>	acilities or rights of wa (If yes, attach Railro	ay affected? ad Information Sheet)	è
8.	found? Yes <i>None I</i>	<u>Evident</u>	tes with hazardous was	te and/or material ume 1, Section 101.011)
10.	(If yes, provid No. of	lacements required? e the following inform single family multi-family	Yes <u>No</u> nation) No. of business/nonpr No. of farms	ofit

- 11. Are there material sites (imported borrow) and/or disposal sites required? Yes <u>No</u> (If yes, explain)
- 12. Are there potential relinquishments and/or vacations (abandonments)? Yes <u>No</u> (If yes, explain)
- 13. Are there any existing and/or potential Airspace sites? Yes <u>No</u> (If yes, explain)
- 14. Are there off-site environmental mitigation sites required? Yes <u>No</u> (If yes, explain)
- 15. Are there off-site park & ride sites required? Yes <u>No</u> (If yes, explain)
- 16. Indicate the anticipated Right of Way schedule and lead time requirements.

  (Discuss if District proposes less time than PMCS lead time and/or if significant pressures for project advancement are anticipated.)

Right of Way lead time is calculated at 16 months after environmental clearance to Right of Way Certification. All utility relocations are expected to be performed prior to or during construction.

17. Is it anticipated that any Right of Way work would be performed by Caltrans staff? Yes <u>No</u> (If no, discuss)

The City of Folsom will be the lead agency for right of way acquisition, with Caltrans providing oversight.

Evaluation prepared by:

Signed

Name: David E. Melis, Mark Thomas & Co. Inc.

01-31-06

Date

I have personally reviewed this Right of Way Data Sheet. It is my opinion that the probable Highest and Best Use, estimated values, escalation rates, and assumptions are reasonable and proper, subject to the limiting conditions set forth, and find this Data Sheet to be complete.

3

LINDY K. LEE

Chief, North Region Right of Way

Date

### RIGHT OF WAY DATA SHEET

To: Mr. Clark Peri

Project Manager, Special Funded Projects

Department of Transportation, District 3

Date: January 27, 2006

03-Sac/ED-50

EA 1C9500

Proj. Desc.: Route 50/Empire

Ranch Road Interchange

### Subject: Right of Way Data Sheet - Project Element 2 (Auxiliary Lanes), Alternative 2

Limiting Conditions and Assumptions: Partial acquisition from seven parcels will be required to construct the auxiliary lanes by widening to the outside of the existing lanes of Route 50 between the proposed Empire Ranch Road interchange in the City of Folsom and the existing interchange at El Dorado Hills Blvd/Latrobe Road in El Dorado County.

Right of way acquisition will consist of sliver takes adjacent to the existing right of way on either side of Route 50.

Property owners were contracted for the purposes of obtaining a right of entry for environmental field studies. The estimator determined the use of the subject parcels solely by observation of the subject parcels.

# 1. Right of Way Cost Estimate: Contingency at 25%

* ¥	Current Value (Future Use)		Escalated Values
Ai-iti (i11:11-			
Acquisition (including excess lands,	\$ 549,600	5%	\$ 606,000
damages, goodwill and easement			
acquisition)			
Utility Relocation (Project Cost)	\$ 146,000	5%	\$ 161,000
Clearance and/or Demolition	0	N/A	0
Relocation Assistance (RAP)	0	N/A	.0
Environmental Mitigation	0	N/A	0
Title & Escrow Fees	\$ 7,000	N/A	\$ 7,000
Hazardous Waste Clean-up	0	N/A	0
9			
Total R/W Costs (Current Value)	\$ 702,600	SAY \$	5 703,000
T-4-1D/W C-4- (E1-4 14 2000)			A 774 000
Total R/W Costs (Escalated to 2008)			\$ 774,000
		Corr	¢ 774 000
Construction Contract William 1 1 1	Φ.Δ	Say	\$ 774,000
Construction Contract Work (unescalated)	\$ 0	( <u>**</u> =	

2. Anticipated Year of Right of Way Certification: January 2008

]	Parcel	Data:		
		Type Dual Ap X A B 7 C D D Total 7	pr. Utilities None U4-1 U4-2 U4-3_2 U4-4 U5-7 U5-8 _ U5-9_2	RR Involvement  None X.  C&M Agrmt  Svc Contract  Lic/RE/Clauses  Misc R/W Work  None X.  RAP Displ  Const. Perm.  Condemnation
A	Areas:	R/W 3.40 HA (8.4 Ac)	No. Excess Pcls <u>0</u>	Excess 0 Easements 0
3	3.	Are there any items of c Yes <u>No</u> (If yes, e	construction contract work? xplain)	
4	4.	•	ption of the right of way as s, critical or sensitive parce	nd excess land required (zoning, els, etc.).
	ē	The right of way acquist the existing highway rig	-	ute 50 is vacant land adjacent to
5	5.	Is there an effect on asse Yes <u>Not Significant</u>	essed valuation? No (If yes, expla	in)
6	5.	Are utility facilities or r.  Yes No (If yes, a	ights of way affected? ttach Utility Information S	heet)
17	7	Are railroad facilities or Yes <u>No</u> (If yes, a	rights of way affected? ttach Railroad Information	Sheet)
8	3. <sub>1</sub>	found? Yes <i>None Evident</i>	identified sites with hazard	lous waste and/or material ook Volume 1, Section 101.011)
1	10.	Are RAP displacements (If yes, provide the followard No. of single fan No. of multi-fan	owing information) nily No. of busine	<u>No</u> ess/nonprofit

Are there material sites (imported borrow) and/or disposal sites required?

11.

Yes

<u>No</u>

(If yes, explain)

- 12. Are there potential relinquishments and/or vacations (abandonments)? Yes <u>No</u> (If yes, explain)
- 13. Are there any existing and/or potential Airspace sites? Yes <u>No</u> (If yes, explain)
- 14. Are there off-site environmental mitigation sites required? Yes <u>No</u> (If yes, explain)
- 15. Are there off-site park & ride sites required? Yes <u>No</u> (If yes, explain)
- 16. Indicate the anticipated Right of Way schedule and lead time requirements.

  (Discuss if District proposes less time than PMCS lead time and/or if significant pressures for project advancement are anticipated.)

Right of Way lead time is calculated at 16 months after environmental clearance to Right of Way Certification. All utility relocations are expected to be performed prior to or during construction.

17. Is it anticipated that any Right of Way work would be performed by Caltrans staff? Yes No (If no, discuss)

The City of Folsom will be the lead agency for right of way acquisition, with Caltrans providing oversight. The City will need to enter into a memorandum of understanding with El Dorado County for the acquisition of right of way within El Dorado County.

Evaluation prepared by:

Signed Davil & Melia

01-31-06

Name: David E. Melis, Mark Thomas & Co. Inc.

Date

I have personally reviewed this Right of Way Data Sheet. It is my opinion that the probable Highest and Best Use, estimated values, escalation rates, and assumptions are reasonable and proper, subject to the limiting conditions set forth, and find this Data Sheet to be complete.

LINDY K. LEE

Date

Chief, North Region Right of Way

# **Utility Information**

Date: January 30, 2006 03-Sac-50 KP 36.1/37.2 03-ED-50 KP 0/3.1 EA 1C9500

Empire Ranch Road/Route 50 Interchange Draft Project Report

Viable Alternatives for Project Element 1 (Empire Ranch Road Interchange) and Project

Element 2 (Auxiliary Lanes between Empire Ranch Road and El Dorado Hills Blvd).

#### Introduction

The project proposes to construct a new interchange on Route 50 between East Bidwell/Scott Road in Folsom and El Dorado Hills Blvd/Latrobe Road in El Dorado County. The project will also construct auxiliary lanes between the new interchange and the existing interchange at El Dorado Hills Blvd by widening to the outside of the existing lanes of Route 50.

## Utilities within the project area

In general, the existing overhead poles along the south side of Route 50 will be impacted by the widening of eastbound Route 50 for the construction of the auxiliary lane. The construction of the interchange on Route 50 at Empire Ranch Road will also impact a number of overhead utility poles.

## Impacts to existing utilities

Based on preliminary research, it appears the only utilities impacted by the proposed improvements are the existing utility poles within the state right of way on the south side of the freeway between the truck climbing lane and El Dorado Hills Blvd. It is estimated that 23 poles will be relocated as part of the proposed project (the interchange and the eastbound auxiliary lane). Attached is the *Utility Information Sheet* for the proposed project.

#### Costs for relocation

Costs were determined based on other similar projects and conversations with Tadj Ratajczak of Caltrans District 3. The project cost for utility relocations within the state right of way will be 50% of the relocation costs, based on the Master Agreement.

Unit costs for utility relocations are as follows:

- \$9,000 each for telephone or electrical only pole relocations.
- \$13,500 each for telephone and electrical pole relocations.

Estimated Costs =  $8 \times \$9,000 = \$72,000$ Estimated Costs =  $15 \times \$13,500 = \$202,500$ 

Project Costs = 50% x (\$72,000 + \$202,500) = \$137,250

Contingency (25%) = \$34,312

Grand Total = \$171,562

**SAY \$175,000** 

A 5% escalation rate has been assumed.

## UTILITY INFORMATION SHEET

Date: January 30, 2006
03-Sac-50 KP 36.1/37.2
03-ED-50 KP 0.0/3.1
EA 1C9500
Empire Ranch Road/Route 50 Interchange –
Draft Project Report
Viable Alternatives for Project Element 1
(Empire Ranch Road Interchange) and Project
Element 2 (Auxiliary Lanes btwn Empire Ranch
Road and El Dorado Hills Blvd)

4	T T('1') TY 1 ('	m ' ( M )
1	Littlity Relocation	【レセヘ1ムハト 【 'ヘペト】・
1.	Utility Relocation	11 101001 00811.

\$175,000

Escalation Rate: 5%

2. Utility involvement:

Involvement = PG&E electric SBC telephone

3. Name of utility companies involved in project:

Pacific Gas & Electric (PG&E) SBC (Formerly Pacific Bell Telephone)

4. Type of facilities and agreements required:

Electric: Notice & Agreement possible Telephone: Notice & Agreement possible

Pole relocations due to improvement conflicts are as follows:

- 5 poles at proposed Empire Ranch Road interchange (PG&E)
- 3 poles at proposed eastbound auxiliary lane.
   (SBC)
- 15 joint poles at proposed eastbound auxiliary lane. (PG&E, SBC)

5. Additional information concerning utility involvements on this project:

Assume that poles are within state right of way and that the project share for relocation costs will be 50%.

PREPARED BY:

Signature)

01-30-06

(Signature)

Name: David E. Melis

Date: 01/30/06

Organization: Mark Thomas & Company, Inc.

## RIGHT OF WAY DATA SHEET

To: Mr. Clark Peri

Project Manager, Special Funded Projects Department of Transportation, District 3 Date: January 27, 2006

03-Sac/ED-50 EA 1C9500

Proj. Desc.: Route 50/Empire Ranch Road Interchange

## Subject: Right of Way Data Sheet - Project Element 1 (Interchange), Alternative 2

Limiting Conditions and Assumptions: Partial acquisition from four parcels will be required to construct this project. Two parcels on the north side of Route 50 are owned by a development interest that is cooperating with the City for construction of this interchange. A portion of these parcels are subject to an irrevocable offer of dedication. The necessary right of way on these parcels outside of the IOD's will be dedicated by the development interest. The right of way on the south side of Route 50, which consists of grazing land, will need to be acquired for the interchange.

Property owners were contracted for the purposes of obtaining a right of entry for environmental field studies. The estimator determined the use of the subject parcels solely by observation of the subject parcels.

# 1. Right of Way Cost Estimate: Contingency at 25%

Contingency at 2570				
	Current Value (Future Use)			Escalated Values
Acquisition (including excess lands,	\$ 6,910,800	5%		\$ 7,619,200
damages, goodwill and easement	, ,			
acquisition)				.15
Utility Relocation (Project Cost)	\$ 29,000	5%		\$ 32,000
Clearance and/or Demolition	0	N/A		0
Relocation Assistance (RAP)	0	N/A	Si	0
Environmental Mitigation	0	N/A	-5	0 **
Title & Escrow Fees	\$ 4,000	N/A		\$ 4,000
Hazardous Waste Clean-up	0	N/A	72	0
Total R/W Costs (Current Value)	\$ 6,943,800	e.	SAY \$	6,944,000
Total R/W Costs (Escalated to 2008)	(24)		12	\$ 7,655,200
150			Say	\$ 7,655,000
Construction Contract Work (unescalated)	\$ 0		کښي	Ψ 7,033,000

2. Anticipated Year of Right of Way Certification: January 2008

Parce	el Data:			
8	Type  X  A 2  B 2  C  D  Total 4	Dual Appr.  B C D	Utilities None U4-1 U4-2 U4-3_2_ U4-4 U5-7 U5-8 U5-9_2_	RR Involvement None X. C&M Agrmt Svc Contract Lic/RE/Clauses  Misc R/W Work None X. RAP Displ Const. Perm. Condemnation
Areas	:: R/W <u>10.64 H</u>	A (26.3 Ac) No	o. Excess Pcls <u>0</u> Exc	cess <u>0</u> Easements <u>0</u>
3.	Are there any items of construction contract work? Yes <u>No</u> (If yes, explain)			
4.	Provide a general description of the right of way and excess land required (zoning, use major improvements, critical or sensitive parcels, etc.).			
	for grazing pa off ramps. Th	urposes and would he right of way acqu	accommodate the interc	e 50 is vacant land zoned change eastbound on and e of Route 50 was planned elopment.
5.		fect on assessed val ignificant No		145
6.	Are utility fac <u>Yes</u> No	cilities or rights of v (If yes, attach Uti	way affected? lity Information Sheet)	Al and the second secon
7.	Are railroad f Yes <u>No</u>	acilities or rights of (If yes, attach Rai	f way affected? Iroad Information Shee	t)
8.	Were any pre found?	viously unidentified	d sites with hazardous v	vaste and/or material

(If yes, attach memorandum per Procedural Handbook Volume 1, Section 101.011)

No. of farms\_

<u>No</u>

No. of business/nonprofit\_

Yes

10.

None Evident

Are RAP displacements required?

(If yes, provide the following information)

No. of single family No. of

No. of multi-family\_\_\_\_

- 11. Are there material sites (imported borrow) and/or disposal sites required? Yes <u>No</u> (If yes, explain)
- 12. Are there potential relinquishments and/or vacations (abandonments)? Yes <u>No</u> (If yes, explain)
- 13. Are there any existing and/or potential Airspace sites? Yes <u>No</u> (If yes, explain)
- 14. Are there off-site environmental mitigation sites required? Yes <u>No</u> (If yes, explain)
- 15. Are there off-site park & ride sites required? Yes <u>No</u> (If yes, explain)
- 16. Indicate the anticipated Right of Way schedule and lead time requirements.

  (Discuss if District proposes less time than PMCS lead time and/or if significant pressures for project advancement are anticipated.)

Right of Way lead time is calculated at 16 months after environmental clearance to Right of Way Certification. All utility relocations are expected to be performed prior to or during construction.

17. Is it anticipated that any Right of Way work would be performed by Caltrans staff? Yes <u>No</u> (If no, discuss)

The City of Folsom will be the lead agency for right of way acquisition, with Caltrans providing oversight.

Evaluation prepared by:

Signed

Name: David E. Melis, Mark Thomas & Co. Inc.

01-31-06

Date

I have personally reviewed this Right of Way Data Sheet. It is my opinion that the probable Highest and Best Use, estimated values, escalation rates, and assumptions are reasonable and proper, subject to the limiting conditions set forth, and find this Data Sheet to be complete.

LINDY K. LEE

Chief, North Region Right of Way

Date

### RIGHT OF WAY DATA SHEET

To: Mr. Clark Peri

Project Manager, Special Funded Projects Department of Transportation, District 3 Date: January 27, 2006

03-Sac/ED-50 EA 1C9500

Proj. Desc.: Route 50/Empire Ranch Road Interchange

Subject: Right of Way Data Sheet - Project Element 1 (Interchange), Alternative 3

Limiting Conditions and Assumptions: Partial acquisition from four parcels will be required to construct this project. Two parcels on the north side of Route 50 are owned by a development interest that is cooperating with the City for construction of this interchange. A portion of these parcels are subject to an irrevocable offer of dedication. The necessary right of way on these parcels outside of the IOD's will be dedicated by the development interest. The right of way on the south side of Route 50, which consists of grazing land, will need to be acquired for the interchange.

Property owners were contracted for the purposes of obtaining a right of entry for environmental field studies. The estimator determined the use of the subject parcels solely by observation of the subject parcels.

# 1. Right of Way Cost Estimate: Contingency at 25%

contingency at 2070			
97 Ex	Current Value (Future Use)		Escalated Values
Acquisition (including excess lands,	\$ 6,910,800	5%	\$ 7,619,200
damages, goodwill and easement acquisition)		*	, ,
Utility Relocation (Project Cost)	\$ 29,000	5%	\$ 32,000
Clearance and/or Demolition	0	N/A	0
Relocation Assistance (RAP)	0	N/A	0
Environmental Mitigation	0	N/A	0
Title & Escrow Fees	\$ 4,000	N/A	\$ 4,000
Hazardous Waste Clean-up	0	N/A	0
Total R/W Costs (Current Value)	\$ 6,943,800	SAY	\$ 6,944,000
Total R/W Costs (Escalated to 2008)	0		\$ 7,655,200
		Say	\$ 7,655,000
Construction Contract Work (unescalated)	\$ 0		s = <sup>6</sup>

2. Anticipated Year of Right of Way Certification: January 2008

1 440	or Data.			
	*			
	Type	Dual Appr.	Utilities	RR Involvement
2	X		None	None X.
	A_2_		U4-1	C&M Agrmt
ě	B_2_	B	U4-2	Svc Contract
	C	C	U4-3 2	Lic/RE/Clauses
	D	D	U4-4	
		5	U5-7	Misc R/W Work

U5-9 2 RAP Displ
Const. Perm.
Condemnation

None

Areas: R/W 10.64 HA (26.3 Ac) No. Excess Pcls 0 Excess 0 Easements 0.

3. Are there any items of construction contract work? Yes <u>No</u> (If yes, explain)

Parcel Data:

Total 4

4. Provide a general description of the right of way and excess land required (zoning, use major improvements, critical or sensitive parcels, etc.).

The right of way acquisition from the south side of Route 50 is vacant land zoned for grazing purposes and would accommodate the interchange eastbound on and off ramps. The right of way acquisition on the north side of Route 50 was planned for as part of the master plan for the Empire Ranch development.

- 5. Is there an effect on assessed valuation?
  Yes Not Significant No (If yes, explain)
- 6. Are utility facilities or rights of way affected?

  Yes No (If yes, attach Utility Information Sheet)
- 7. Are railroad facilities or rights of way affected?

  Yes <u>No</u> (If yes, attach Railroad Information Sheet)
- Were any previously unidentified sites with hazardous waste and/or material found?
  Yes None Evident

Yes <u>None Evident</u> (If yes, attach memorandum per Procedural Handbook Volume 1, Section 101.011)

10. Are RAP displacements required? Yes <u>No</u>
(If yes, provide the following information)

No. of single family\_\_\_ No. of business/nonprofit\_\_\_\_
No. of multi-family No. of farms

- 11. Are there material sites (imported borrow) and/or disposal sites required? No (If yes, explain) Yes
- 12. Are there potential relinquishments and/or vacations (abandonments)? (If yes, explain) Yes No
- Are there any existing and/or potential Airspace sites? 13. (If yes, explain) No
- Are there off-site environmental mitigation sites required? 14. Yes No (If yes, explain)
- 15. Are there off-site park & ride sites required? Yes No (If yes, explain)
- 16. Indicate the anticipated Right of Way schedule and lead time requirements. (Discuss if District proposes less time than PMCS lead time and/or if significant pressures for project advancement are anticipated.)

Right of Way lead time is calculated at 16 months after environmental clearance to Right of Way Certification. All utility relocations are expected to be performed prior to or during construction.

Is it anticipated that any Right of Way work would be performed by Caltrans staff? 17. Yes No (If no, discuss)

The City of Folsom will be the lead agency for right of way acquisition, with Caltrans providing oversight.

Evaluation prepared by:

Name: David E. Melis, Mark Thomas & Co. Inc.

01-31-06

I have personally reviewed this Right of Way Data Sheet. It is my opinion that the probable Highest and Best Use, estimated values, escalation rates, and assumptions are reasonable and proper, subject to the limiting conditions set forth, and find this Data Sheet to be complete.

LINDY K. LEE

Chief, North Region Right of Way

Date

### RIGHT OF WAY DATA SHEET

To: Mr. Clark Peri

Project Manager, Special Funded Projects

Department of Transportation, District 3

Date: January 27, 2006

03-Sac/ED-50

EA 1C9500 Proj. Desc.: Route 50/Empire

Ranch Road Interchange

## Subject: Right of Way Data Sheet - Project Element 1 (Interchange), Alternative 4

Limiting Conditions and Assumptions: Partial acquisition from four parcels will be required to construct this project. Two parcels on the north side of Route 50 are owned by a development interest that is cooperating with the City for construction of this interchange. A portion of these parcels are subject to an irrevocable offer of dedication. The necessary right of way on these parcels outside of the IOD's will be dedicated by the development interest. The right of way on the south side of Route 50, which consists of grazing land, will need to be acquired for the interchange.

Property owners were contracted for the purposes of obtaining a right of entry for environmental field studies. The estimator determined the use of the subject parcels solely by observation of the subject parcels.

#### 1. Right of Way Cost Estimate: Contingency at 25%

Contingency at 25%			
	Current Value	<b>Escalation</b>	Escalated
	(Future Use)	Rate/Year	<u>Values</u>
Acquisition (including excess lands,	\$ 6,766,800	5%	\$ 7,460,400
damages, goodwill and easement		OF .	
acquisition)			e .
Utility Relocation (Project Cost)	\$ 29,000	5%	\$ 32,000
Clearance and/or Demolition	0	N/A	0
Relocation Assistance (RAP)	0	N/A	0
Environmental Mitigation	0	N/A	0
Title & Escrow Fees	\$ 4,000	N/A	\$ 4,000
Hazardous Waste Clean-up	0 (9)	N/A	0
			(9.5
Total R/W Costs (Current Value)	\$ 6,799,800	SAY \$ 6,800,	000
Ţ	4		
Total R/W Costs (Escalated to 2008)			\$ 7,496,400
9	4		
38C 		Say	\$ 7,496,000
Construction Contract Work (unescalated)	\$ 0	•	,

Anticipated Year of Right of Way Certification: January 2008

Attachment G

Parce	Data:
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i a	Type X A 2 B 2 C D Total 4	Dual Appr.  B C D	Utilities None U4-1 U4-2 U4-3_2 U4-4 U5-7 U5-8 U5-9_2	RR Involvement  None X.  C&M Agrmt  Svc Contract  Lic/RE/Clauses  Misc R/W Work  None X.  RAP Displ  Const. Perm.  Condemnation
Areas:	R/W 9.48 HA	(23.4 Ac) No. E	xcess Pcls 0 Excess	Easements 0.
3	Are there any Yes <u>No</u>	items of construction (If yes, explain)	contract work?	9
4.			right of way and exces sensitive parcels, etc.).	s land required (zoning,
	for grazing pi off ramps. Th	urposes and would acc se right of way acquisi	ne south side of Route 5 commodate the intercha tion on the north side o e Empire Ranch develo	nge eastbound on and f Route 50 was planned
5.		ect on assessed valuat gnificant No	ion? (If yes, explain)	*
6.	Are utility face Yes No	ilities or rights of way (If yes, attach Utility		
7.	Are railroad fa Yes <u>No</u>	acilities or rights of wa (If yes, attach Railro	ay affected? ad Information Sheet)	6
8.	found? Yes <i>None I</i>	<u>Evident</u>	tes with hazardous was	te and/or material ume 1, Section 101.011)
10.	(If yes, provid No. of	lacements required? le the following inforn single family multi-family	Yes <u>No</u> nation) No. of business/nonpo	rofit

- 11. Are there material sites (imported borrow) and/or disposal sites required? (If yes, explain) Yes No
- 12. Are there potential relinquishments and/or vacations (abandonments)? Yes No (If yes, explain)
- 13. Are there any existing and/or potential Airspace sites? Yes No (If yes, explain)
- 14. Are there off-site environmental mitigation sites required? Yes No (If yes, explain)
- 15. Are there off-site park & ride sites required? Yes (If yes, explain) No
- 16. Indicate the anticipated Right of Way schedule and lead time requirements. (Discuss if District proposes less time than PMCS lead time and/or if significant pressures for project advancement are anticipated.)

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17. Is it anticipated that any Right of Way work would be performed by Caltrans staff? Yes (If no, discuss) No

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Evaluation prepared by:

Name: David E. Melis, Mark Thomas & Co. Inc.

I have personally reviewed this Right of Way Data Sheet. It is my opinion that the probable Highest and Best Use, estimated values, escalation rates, and assumptions are reasonable and proper, subject to the limiting conditions set forth, and find this Data Sheet to be complete.

3

LINDY K. LEE

Chief, North Region Right of Way

Date