

# Memorandum

*Flex your power!  
Be energy efficient!*

**To:** STEVE WYATT, P.E.  
Senior Transportation Engineer  
Design Branch II

**Date:** August 5, 2009

**File:** EA 05-0Q620K

**From:** ROGER D. BARNES, R.C.E., T.E.  
Transportation Engineer  
District 5 Traffic Operations Branch

**Subject:** Traffic Study – Los Berros Road to Traffic Way Median Barrier Project

This Technical Memorandum documents the effects on local area traffic and its interface with United States Route (US) 101 if all left turn movements were restricted from 05-SLO-101-Postmile (PM) 7.88 to 05-SLO-101-PM 12.52.

## **Introduction**

This State Highway Operation and Protection Program (SHOPP) project proposes to improve the traffic safety characteristics of US 101 in San Luis Obispo County beginning at PM 7.88 and ending with PM 12.52. This project would provide gap closures between two existing segments of median barrier, resulting in the median closure of all at-grade intersection and crossover locations within the project limits. This includes the El Campo Road (PM 11.83) and Laetitia Winery (PM 9.66) intersections and the three crossover locations at PM 9.13, PM 10.70, and PM 11.29.

## **Existing Facility**

US 101 is the principal north-south highway serving San Luis Obispo County. US 101 begins at Interstate 5 in Los Angeles and extends north to the Oregon Border, closely paralleling the coastline at times. It connects the Central Coast to the Bay Area to the north and Los Angeles metropolitan area to the south. US 101 bisects the City of San Luis Obispo and provides vital access to the Five Cities Area (Shell Beach, Pismo Beach, Grover Beach, Arroyo Grande, and Oceano) and the Nipomo Mesa. US 101 is an important multifunctional route that experiences its highest traffic volumes during weekday commute hours. Through the project limits, US 101 is a four-lane expressway. At-Grade intersections with US 101 are located at El Campo Road (PM 11.83) and Laetitia Winery (PM 9.66). US 101 median crossover locations exist at PM 9.13, PM 10.70, and PM 11.29.

El Campo Road is a two-lane arterial that extends southerly from an at-grade intersection with US 101 to Los Berros Road, Halcyon Road, and Woodland Hills Road. El Campo Road primarily serves residential traffic in the Nipomo Mesa area.

**Purpose and Need**

This project was initiated on September 02, 2007 by the District 5 Traffic Safety Branch. The purpose of this project is to address the potential for future cross-median collisions by providing gap closures between two existing segments of median barrier. With the construction of this project, median barrier will be present from the Santa Maria Way Under crossing (05-SB-101-84.32) to the Cuesta Forest Crossover (05-SLO-101-36.07). This proposed project would improve the facility by minimizing the potential for cross-median collisions in the narrower areas. The cross-median collision is one of the most serious types of collision that drivers experience. A cross-median collision is strictly defined as one in which and out-of-control vehicle crosses the median of a four or more lane road and strikes, or is struck by, a vehicle from the opposite direction. This project would also lessen the severity of over-embankment collisions in the wider median areas. The primary contributor to the severity of over-embankment collisions is the height of the slope of the embankment.

**Collision Data**

Collision Data for US 101 between Postmile 7.88 and 12.52 for the 36 month period from 08/01/2005 to 07/31/2008 is provided in Attachment A. Table 1 provides the following summary:

**TABLE 1 –Table B  
August 1, 2005 to July 31, 2008**

Location Postmile	Facility Type	Total No. of Collisions	Actual Rates			Average Rates		
			F*	F+I**	Total***	F*	F+I**	Total***
7.88 – 12.52 US 101	Segment	188	0.007	0.25	0.69	0.018	0.33	0.85
11.83 El Campo Rd	Intersection	21	0.000	0.18	0.35	0.006	0.13	0.30
9.66 Laetitia Winery	Intersection	7	0.11	0.00	0.05	0.20	0.03	0.08

\* Fatalities

\*\* Fatalities plus Injuries

\*\*\* All Reported Collisions

Note - Rates are in collisions per million vehicle mile

**Additional Considerations**

1. Intersection of US 101 and El Campo Road

A recent 3-Year Table B for the El Campo Road intersection show collision rates currently exceed the statewide average. In the first six months of 2008, this intersection experienced three more "correctable" broadside injury collisions (2/6/2008, 2/20/2008, 5/24/2008), a cross centerline collision (1/24/2008), and a southbound run-off-road collision (3/24/2008). This project would reduce the number of broadside collisions at the intersection of US 101 and El Campo Road. The collision diagram for this intersection may be found in Attachment A.

## 2. Correspondence - Busick Tract 1789 Environmental Impact Report (EIR) Comments

Local Agency correspondence from San Luis Obispo County (5/16/05), City of Arroyo Grande (3/9/04 & 4/28/05), and San Luis Obispo Council of Governments (3/15/04) regarding the Busick Tract Number 1789 Development identify the intersection of US 101 and El Campo Road as being “deficient” and “unsafe”. Full or partial closure of the intersection was suggested by the City of Arroyo Grande and County of San Luis Obispo as the appropriate solution. The correspondence is provided in Attachment B and summarized below.

- ✚ March 9, 2004 letter from City of Arroyo Grande (Rob Strong, Community Development Director) to County of San Luis Obispo (Julie Eliason, Environmental Division) regarding the Busick Tract Development. In this letter, Mr. Strong makes the following statements regarding the intersection of US 101 and El Campo Road:

*“Specifically, the traffic and circulation impacts of the project on the deficient and unsafe El Campo intersection with State Route 101 are not mitigated by a “fair share” contribution toward future improvement of the El Campo Interchange, nor is this major freeway modification part of the current County traffic impact fees.”*

*“The unsafe existing crossing of Highway 101 at El Campo Road should be considered for closure until a future interchange is constructed. It may be inconvenient for Nipomo and Falcon Ridge, but access to northbound 101 is unsafe at this crossing.”*

- ✚ March 15, 2004 letter from San Luis Obispo Council of Governments (James J. Worthley, Transportation Planner) to County of San Luis Obispo (Julie Eliason, Environmental Division) regarding the Busick Tract Development. In this letter, Mr. Worthley makes the following statement regarding the intersection of US 101 and El Campo Road:

*“Any new demands on this deficient crossing will further exacerbate an already bad situation. Caltrans has indicated that if it becomes a hazard, it may either eliminate all left turn movements (through a barrier) or close it entirely”*

- ✚ April 28, 2005 letter from City of Arroyo Grande (Steven Adams, City Manager) to County of San Luis Obispo (Julie Eliason, Environmental Division) regarding the Busick Tract Development. In this letter, Mr. Adams makes the following statement regarding the intersection of US 101 and El Campo Road:

*“On behalf of the City of Arroyo Grande, we would like to again express our concerns regarding the impacts of the Busick Tract project as proposed. The most serious impact is traffic circulation. The project would contribute trips to the El Campo Road intersection with State Route 101, which is currently unsafe and Level of Service “F”.”*

- ✚ May 16, 2005 letter from County of San Luis Obispo (Richard Marshall, Development Services Engineer) to County of San Luis Obispo (Julie Eliason, Environmental Specialist) regarding the Busick Tract Development. In this letter, Mr. Marshall makes the following statements regarding the intersection of US 101 and El Campo Road:

*“On page V-66, section TR/Impact 1 identifies traffic at the intersection of El Campo Road and Highway 101 as a Class 1 (significant and unavoidable) impact. This intersection is an at-grade crossing, and is already operating at Level of Service (LOS) F, as noted earlier in the report.”*

*“The specific intersection movement of greatest concern is left turns from El Campo Road to go northbound on the highway. A secondary concern would be left turns from northbound 101 to go onto El Campo Road. Both of these movements are highly constrained by having to wait for acceptable length gaps in the southbound traffic on the highway.”*

*“I would like to suggest an alternative which might mitigate the impact in a different way: eliminate the left-turning movements at this intersection. Those who wish to go north from El Campo could either go south on the highway and turn back at either the Laetitia Vineyard access or the Los Berros interchange, or they could go south on El Campo and use Los Berros Road to head back northerly. Similarly, those wishing to turn left onto El Campo from northbound 101 would be able to use alternate routes that are not substantially out of the way.”*

### 3. Correspondence – San Luis Obispo Council of Governments (SLOCOG) Board Meetings

San Luis Obispo County Supervisor Katcho Achadjian (Fourth District) has expressed concern for the safety of the motoring public at the intersection of US 101 & El Campo Road during several SLOCOG Board meetings held in 2007. The meeting minutes are provided in Attachment C and summarized below.

- ✚ Pages 6 and 7 of the SLOCOG March 7, 2007 Board meeting minutes provide the following account of a discussion that took place regarding the intersection of US 101 and El Campo Road:

**Board Member Achadjian:** *“Great report! I suggest that the locations of the accidents be provided so that member jurisdictions have that information to work on in their respective areas of responsibility. Thanks to Caltrans (referring to Mr. Krumholz) for the information/response regarding the safety concern I raised regarding El Campo Road in the south county. Congestion is happening because jobs and almost all businesses are located in San Luis Obispo. The morning peak hour is the busiest time on the road. Perhaps, in order to improve traffic, the work hours should be shifted. Let us see if we can get our staff off the road during rush hour.”*

- ✚ Pages 2 and 3 of the SLOCOG April 4, 2007 Board meeting minutes provide the following account of a discussion that took place regarding the intersection of US 101 and El Campo Road:

**Board Member Katcho Achadjian** asked if it would be possible for Caltrans to install one of those live video cameras somewhere on 101/El Campo Road (South County). He said any help on this matter would be great. **Mr. Krumholz** said he could look into a possibility of a video camera at that location. He noted that possibility depends on power availability, connections/conduits, etc. He indicated he would report back on this issue and that he would

like to continue to work with Board Member Achadjian on the issues of concern on that location. **Mr. De Carli** noted that SLOCOG staff in the past had raised a safety concern on that location.

- ✚ Page 2 of the SLOCOG June 6, 2007 Board meeting minutes provide the following account of a discussion that took place regarding the intersection of US 101 and El Campo Road:

**Board Member Achadjian** requested that Mr. Dan Woodson of the Nipomo Advisory Committee be included in that meeting. He also requested to bring the US 101/El Campo Road right turn issue to the table. **Mr. De Carli** said staff could ask Caltrans to evaluate the opportunities to address the El Campo/101 issue. He then read Caltrans' response to Board Member Achadjian's request (at the April meeting) to install a live video camera at the US 101 and El Campo Road intersection (Response #2 on page 5 of the Caltrans Report). He highlighted the last paragraph that says, *"At this time, we have no available funding or plans to install a live video camera at the intersection of US 101 and El Campo Road."* **Ms. Aileen Loe**, Caltrans District 5 Deputy District Director for Planning and Programming, made clear that the live video cameras that Caltrans uses are for traffic management, not for near-miss collisions.

#### 4. Correspondence - San Luis Obispo County request to address cross-traffic concerns

Correspondence from San Luis Obispo County Deputy Director of Public Works, Capital Projects, dated June 12, 2008 stated a desire to see at-grade intersections regulated to address cross-traffic concerns. In particular, right turn only ingress and egress were suggested as the appropriate solution at the El Campo Road and Laetitia Winery intersections. The correspondence is provided in Attachment C and summarized below.

- ✚ June 12, 2008 letter from County of San Luis Obispo (Dave Flynn, Deputy Director of Public Works, Capital Projects) to California Department of Transportation District 5 (Rich Krumholtz (sic), District Director) regarding the Us 101 and El Campo Road intersection. In this letter, Mr. Flynn makes the following statement regarding the intersection of US 101 and El Campo Road:

*"We understand your Traffic Safety branch that there is a minor project for improving the southbound shoulder at El Campo Road to accommodate right turn deceleration. While this is a positive operational improvement, it does not address cross-traffic concerns."*

*"In particular, right turn only ingress and egress may be the appropriate solution at El Campo Road and Laetitia Winery intersections."*

### **Traffic Counts**

Average Daily Traffic (ADT) and Peak Hour volumes were collected on US 101 at the following locations:

1. ADT volumes were collected at the Laetitia Winery cross-over from February 12, 2009 – February 25, 2009.

2. ADT volumes were collected at the El Campo Road from October 21, 2008 – October 27, 2008.
3. AM Peak Hour counts were taken at the intersection of US 101 and El Campo Road on October 9, 2008
4. PM Peak Hour counts were taken at the intersection of US 101 and El Campo Road on October 14, 2008

The traffic study for this project is based upon existing peak hour volumes obtained from the September 2008 Laetitia Agricultural Cluster Environmental Impact Report and the Brisco Road – Halcyon Road Interchange Modification Project traffic analysis. The peak hour volumes at the intersections of US 101/Laetitia Winery and US 101/El Campo Road were adjusted to maintain consistency with the ADT volumes collected in October 2008 and February 2009. The ADT and peak hour volumes are contained within Attachments D – H.

### **Diversion**

Closure of the El Campo Road and Laetitia Winery median access locations would result in the diversion of 942 ADT (122 AM peak hour, 77 PM peak hour). The El Campo median access accounts for 799 ADT (109 AM peak hour, 53 PM peak hour) with the Laetitia Winery median access accounting for the remaining 143 ADT (13 AM peak hour, 24 PM peak hour).

For a typical weekday (Tuesday, Wednesday, Thursday) scenario, the closure of the El Campo Road median access would result in the diversion of 799 ADT (109 AM peak hour, 53 PM peak hour). The predominant movement is the Eastbound left turn out of El Campo Road onto Northbound US 101. Seventy five percent (599 ADT, 82 AM peak hour, 40 PM peak hour) are expected to use adjacent State Highway facilities while the remaining twenty five percent (200 ADT, 27 AM peak hour, 13 PM peak hour) are expected to use the local street network since the origin/destination is assumed to be within the Five Cities area. Under a weekend scenario, the El Campo Road median closure would result in a diversion of 610 ADT (58 AM peak hour, 52 PM peak hour). Trip diversion is expected to occur at the following locations:

1. 200 ADT (27 AM peak hour, 13 PM peak hour) will be dispersed throughout the local street network since the origin/destination is assumed to be within the Five Cities area.
2. US 101 Northbound Ramps and Grand Avenue Intersection - 299 ADT (41 AM peak hour, 20 PM peak hour) will be diverted to the US 101 northbound on-ramp via the Grand Avenue westbound right turn movement.
3. US 101 Northbound Ramps and Brisco Road Intersection - 300 ADT (41 AM peak hour, 20 PM peak hour) will be diverted to the US 101 northbound on-ramp via the Brisco Road northbound left turn movement.
4. El Camino Real and Brisco Road Intersection - 300 ADT (41 AM peak hour, 20 PM peak hour) will be diverted through the intersection of El Camino Real and Brisco Road via the El Camino Real right turn movement.

5. US 101 Southbound Ramps/Halcyon Road and El Camino Real Intersection - 300 ADT (41 AM peak hour, 20 PM peak hour) will be diverted through the intersection of US 101 Southbound Ramps/Halcyon Road and El Camino Real via the Halcyon Road northbound left turn movement.

For a typical weekday (Tuesday, Wednesday, Thursday) scenario, the closure of the Laetitia Winery median crossover would result in the diversion of 143 ADT (13 AM peak hour, 24 PM peak hour). All diverted vehicles are expected to use adjacent state highway facilities to ingress/egress Laetitia Winery. Under a weekend scenario, the Laetitia Winery median closure would result in a diversion of 166 ADT (19 AM peak hour, 23 PM peak hour). Trip diversion is expected to occur at the following locations:

1. Thompson/Los Berros Road Interchange - 66 ADT (6 AM peak hour, 11 PM peak hour) will be diverted to the US 101 northbound on-ramp via the US 101 southbound off-ramp.
2. Grand Avenue Interchange - 77 ADT (7 AM peak hour, 13 PM peak hour) will be diverted to the US 101 southbound on-ramp via the US 101 northbound off-ramp.

### **Evaluation Criteria**

Traffic Operations were evaluated under existing conditions with and without the project in place. The California Department of Transportation (Caltrans) strives to achieve LOS C operations for state-maintained facilities, but accepts LOS D as a goal in more developed and congested areas. Consistent with the Willow Road (Sponsor - County of San Luis Obispo) and Brisco Road/Halcyon Road (Sponsor - City of Arroyo Grande) Interchange Projects, LOS D will serve as the evaluation standard for the intersection (signalized and unsignalized) operational analysis. The Evaluation Criteria for the above referenced projects may be found in Attachment I.

### **Level of Service Analysis**

The median closure of all at-grade intersection and crossover locations within the project limits would result in the diversion of 942 ADT (122 AM peak hour, 77 PM peak hour) to the local street network and adjacent state highway facilities.

The intersections of US 101/Laetitia Vineyard Drive and US 101/El Campo Road operate at LOS F in both the morning and evening peak hours. Vehicles entering and exiting the Laetitia Winery and El Campo Road experience long delays as they wait for an acceptable gap in the high-speed traffic on US 101.

To maintain consistency with the Brisco Road – Halcyon Road Interchange Modification Project (05-0A3700), the signalized intersection analysis was based upon electronic files obtained from the City of Arroyo Grande on January 22, 2008 and approved by the Project Development Team (PDT) on 01/25/2008. The only changes made to these files were the addition of the project trips as well as modifications to the report header and footer, thus all assumptions used are identical. The project would:

1. Improve the AM peak hour level of service (LOS) and vehicle delay at the intersection of US 101 and El Campo Road from LOS “F” (Delay = 399.5 sec/veh) to LOS “C” (Delay = 18.2 sec/veh).
2. Improve the AM peak hour level of service (LOS) and vehicle delay at the intersection of US 101 and Laetitia Winery from LOS “F” (Delay = 82.5 sec/veh) to LOS “D” (32.9 sec/veh).
3. Improve the PM peak hour LOS and vehicle delay at the intersection of US 101 and El Campo Road from “F” (Delay = 823.2 sec/veh) to LOS “D” (Delay = 32.7 sec/veh).
4. Improve the PM peak hour LOS and vehicle delay at the intersection of US 101 and Laetitia Winery from “F” (Delay = 133.6 sec/veh) to LOS “E” (41.2 sec/veh).

Vehicle trips diverted to adjacent locations as a result of this project would not have a significant impact on the State Highway System or Local Street Network. All locations would continue to operate at or above the Level of Service (LOS) D threshold. Tables 2 and 3 summarize the results of the LOS Analysis. The LOS calculation worksheets may be found in Attachments J & K.

**TABLE 2 – AM Peak Hour Level of Service (LOS)**

Facility	Control	Existing		Project	
		Delay (Sec/Veh)	LOS	Delay (Sec/Veh)	LOS
US 101 & El Campo Road Northbound Left Turn	Stop Control	16.3	C	CLOSED	CLOSED
Southbound Left Turn		22.2	C	CLOSED	CLOSED
Eastbound Approach		399.5	F	18.2	C
US 101 & Laetitia Winery Entrance Southbound Left Turn	Stop Control	29.5	D	CLOSED	CLOSED
Westbound Approach		82.5	F	32.9	D
US 101 SB Ramps & Los Berros Road Westbound Left Turn	Stop Control	8.6	A	8.6	A
Southbound Approach		20.0	C	20.8	C
US 101 NB Ramps & Thompson Road Eastbound Left Turn	Stop Control	8.4	A	8.5	A
Northbound Approach		28.9	D	30.4	D
El Camino Real & Brisco Road	Signal	24.5	C	24.5	C
US 101 NB Ramps & Brisco Road	Signal	27.6	C	29.4	C
West Branch Street & Brisco Road	Signal	15.2	B	15.5	B
US 101 SB Ramps & El Camino Real	Signal	23.8	C	24.5	C
US 101 SB Ramps & Grand Avenue	Signal	13.8	B	13.9	B
US 101 NB Ramps & Grand Avenue	Signal	20.5	C	20.8	C

**TABLE 3 – PM Peak Hour Level of Service (LOS)**

Facility	Control	Existing		Project	
		Delay (Sec/Veh)	LOS	Delay (Sec/Veh)	LOS
US 101 & El Campo Road Northbound Left Turn Southbound Left Turn Eastbound Approach	Stop Control	36.9 17.3 823.2	E C F	CLOSED CLOSED 32.7	CLOSED CLOSED D
US 101 & Laetitia Winery Entrance Southbound Left Turn Westbound Approach	Stop Control	34.5 133.6	D F	CLOSED 41.2	CLOSED E
US 101 SB Ramps & Los Berros Road Westbound Left Turn Southbound Approach	Stop Control	8.2 26.2	A D	8.2 28.3	A D
US 101 NB Ramps & Thompson Road Eastbound Left Turn Northbound Approach	Stop Control	7.6 18.4	A C	7.7 19.6	A C
El Camino Real & Brisco Road	Signal	36.3	D	36.3	D
US 101 NB Ramps & Brisco Road	Signal	28.9	C	28.9	C
West Branch Street & Brisco Road	Signal	16.4	B	16.5	B
US 101 SB Ramps & El Camino Real	Signal	22.1	C	22.5	C
US 101 SB Ramps & Grand Avenue	Signal	18.4	B	18.4	B
US 101 NB Ramps & Grand Avenue	Signal	15.8	B	16.3	B

**Emergency Passageways**

The use of passageways shall be kept to a minimum and carefully located to provide good stopping sight distance to and from the opening along the freeway. Emergency passageways may be appropriate for highway patrol vehicles, emergency service vehicles such as tow trucks, ambulances, fire fighting apparatus and maintenance equipment. The need for such openings and their locations shall be established by the District in cooperation with the local Department of Highway Patrol office, fire district and emergency services. California Highway Patrol's Coastal Division Commander, Captain W.E. Vail was briefed on the median barrier project and proposed closure of the median crossovers. Cmdr. Vail is supportive of the median crossover closures.

Design parameters for Emergency Passageways are provided in Section 405.5(2) of the California Department of Transportation Highway Design Manual (HDM) which states in part:

“By a combination of interchange ramps and emergency passageways, provisions for access to the opposite side of the freeway may be provided for law enforcement, emergency, and maintenance vehicles to avoid extreme out-of-direction travel. Access should not be more frequent than at three-mile intervals. See Chapter 7 of the Traffic Manual for additional information of the design of emergency passageways. Emergency passageways should be located where decision sight distance is available (see Table 201.7).”

## **Design Speed**

A vehicle speed survey was conducted on June 3, 2009 to establish specific minimum geometric design elements for this project. The survey is contained within Attachment L. The results of the survey indicate the following design speeds are applicable to this project:

1. US 101 Northbound at El Campo Road – Prevailing Speed is 72 miles per hour
2. US 101 Southbound at El Campo Road – Prevailing Speed is 70 miles per hour
3. US 101 Northbound at Laetitia Winery Entrance – Prevailing Speed is 75 miles per hour
4. US 101 Southbound at Laetitia Winery Entrance – Prevailing Speed is 73 miles per hour

## **Conclusion**

Based upon the technical information contained within the attached analysis, Traffic Operations has drawn the following conclusions:

1. The traffic operational analysis concludes that the median closure of all at-grade intersection and crossover locations within the project limits will not result in degradation to the state highway system or local street network. All state highway and local street facilities will continue to operate at an acceptable Level of Service.
2. This project would address the potential for future cross-median collisions by providing gap closures between two existing segments of Median Barrier.
3. This project would lessen the severity of over-embankment collisions in the wider median areas.
4. This project would reduce the number of broadside collisions at the intersection of Highway 101 and El Campo Road.
5. This project would address the documented concerns raised by SLOCOG, City of Arroyo Grande, San Luis Obispo County, and County Supervisor Katcho Achadjian.

## **Recommendation**

The recommendation is to restrict all left turn movements throughout the project limits. This would provide gap closures between two existing segments of Median Barrier, resulting in the median closure of all at-grade intersection and crossover locations within the project limits. This includes the El Campo Road (PM 11.83) and Laetitia Winery (PM 9.66) intersections and the three crossover locations at PM 9.13, PM 10.70, and PM 11.29.

Respectfully,

ORIGINAL SIGNATURE ON  
FILE

Roger D. Barnes, R.C.E., T.E.  
Transportation Engineer  
District 5 Traffic Operations Branch

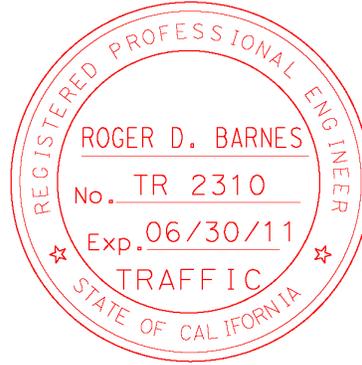
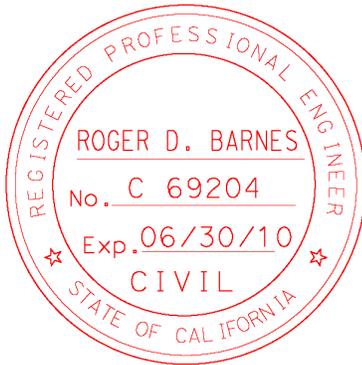
Enclosure – Attachments

c: File, P. McClintic

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

ORIGINAL SIGNATURE ON FILE  
Roger D. Barnes, R.C.E., T.E.

August 5, 2009  
Date



# Attachments

# Attachment A

## Accident History

-  Hwy 101 Accident Rate Calculation
-  El Campo Accident Rate Calculation
-  El Campo Accident Diagram

Location Description	Rate Group (RUS)	No. of Accidents / Significance									Pers Kld Inj	ADT Main X-St	Total MV+ or MVM	Accident Rates				
		Tot	Fat	Inj	F+I	Multi Veh	Wet	Dark	Fat	Actual F+I				Tot	Fat	F+I	Tot	
05 SLO 101 011.830 EL CAMPO RD 0001-0001 2005-08-01 2008-07-13 35 mo.	I 02 R	21	0	11	11	18	3	7	0	24	55.5 .5	60.39 +	0.000	.18	.35	0.006	.13	.30
05 SLO 101 007.880 - 05 SLO 101 012.520 0001-0002 2005-08-01 2008-07-13 35 mo.	4.551 MI H NA	188	2	67	69	98	30	67	2	101	55.5	272.37	0.007	.25	.69	0.018	.33	.85

Accident Rates expressed as: # of accidents / Million vehicle miles

+ denotes that Million Vehicles (MV) used in accident rates instead (for intersections and ramps).

For Ramps RUS only considers R(Rural) U(Urban)

# Intersection Rates

Location: **Laetitia Winery Highway 101 Cross-Over**

SLO 101 Postmile 9.66

Date Range: **08/01/2005 to 07/31/2008**

Enter Table B Data:	
7 Actual	Total Accidents
0 Actual	Fatal Accidents
3 Actual	F+I Accidents
55.5 ADT	mainline
0.1 ADT	X-Street
3 years	table b

Enter Rate Group Data:						
Area	Rate Group	Base Rate	ADT Factor	% Fatal	% Injured	% F + I
Rural	I 17	0.2	0	1.7	37.9	39.6

Don't touch
60.93 MVM converted to MV

Rates converted to Intersection location*	
0.11 acc/mv	Total Accidents Rate
0.000 acc/mv	Fatal Accidents Rate
0.05 acc/mv	F+I Accidents Rate
0.20 acc/mv	Average Total Accidents Rate
0.003 acc/mv	Average Fatal Accidents Rate
0.08 acc/mv	Average F+I Accidents Rate

\* Actual and Average accident rate has been adjusted to reflect intersection location



# Attachment B

## Local Agency Letters

### Busick Tract Number 1789

-  March 9, 2004 – City of Arroyo Grande
-  March 15, 2004 – SLOCOG
-  April 28, 2005 – City of Arroyo Grande
-  May 16, 2005 – County of SLO



COMMUNITY DEVELOPMENT



P.O. Box 550
214 East Branch Street
Arroyo Grande, CA 93421
Phone: (805) 473-5420
FAX: (805) 473-0386
E-Mail: agcity@arroyogrande.org

March 9, 2004

RECEIVED

MAR 10 2004

Planning & Bldg

Julie Eliason, Environmental Division
County Planning and Building Department
County Government Center, Room 310
San Luis Obispo, California 93408-2040

SUBJECT: Comment on DEIR SCH1994041043, Busick Tract No. 1789, ED90-061, S890Z3ZT, Arroyo Grande, CA

Dear County of San Luis Obispo Planning Commission & Board of Supervisors:

The City of Arroyo Grande appreciates the referral of the above project DEIR for public review and comment. The subject 47.5-acre site of this proposed 16-lot residential subdivision adjoins the City on the west, north and east while the south side abuts the Falcon Ridge Estates Residential Suburban tracts in the unincorporated fringe of southeast Arroyo Grande.

3.1

As discussed in the introduction and summary, the potentially significant environmental effects addressed in the DEIR include:

- Geologic, soils and seismic hazards
• Drainage and erosion
• Biological resources
• Visual resources
• Traffic and circulation
• Air quality

The City considers water resources as well as traffic and air quality as potentially significant cumulative impacts. The City's 2001 General Plan Program FEIR identified these impacts as Class I, requiring CEQA findings and a Statement of Overriding Considerations. While the project is relatively small, the City disagrees that the traffic and air quality impact issues are "insignificant" residual impacts. Nor do the recommended mitigation measures adequately address these basic concerns. The DEIR is also incomplete in its failure to evaluate potentially significant water resource impacts which are being litigated due to alleged regional overdraft of the groundwater basin.

3.2

3.3

Specifically, the traffic and circulation impacts of the project on the deficient and unsafe El Campo intersection with State Route 101 are not mitigated by a "fair share" contribution toward future improvement of the El Campo Interchange, nor is this major freeway modification part of the current County traffic impact fees. We fully agree that this project should proportionately contribute to future improvement of the interchange

3.4

Julie Eliason, Environmental Division  
County Planning And Building Department  
DEIR SCH 1994041043, Busick Tract No. 1789  
March 10, 2004  
Page 2

at El Campo Road as well as Los Berros Road and Valley Road. Additionally, however, we believe that any County projects in the Arroyo Grande Residential Suburban fringe areas should also pay City traffic and signalization impact mitigation fees for proportional environmental effects on the City street system such as Valley Road, Fair Oaks Avenue, Traffic Way and East Grand Avenue.

3.5

The unsafe existing crossing of Highway 101 at El Campo Road should be considered for closure until a future interchange is constructed. It may be inconvenient for Nipomo Mesa and Falcon Ridge, but access to northbound 101 is unsafe at this crossing.

3.6

One access alternative that should be reconsidered before the final EIR and project are resolved is the proposed road extension called Coast View Drive from Falcon Ridge Estates (Tract 1256), located south of the project site. The alternative primary access from the City of Arroyo Grande, by extension of Orchard Drive from Tract 2207, Vista Del Mar, could still provide for controlled secondary access at the southern end, but would avoid the adverse impacts of added traffic to the unsafe and deficient El Campo Road intersection with Highway 101.

3.7

It is the City's opinion that Mitigation Measures TR/mm-1 and TR/mm-3 do NOT reduce residual impacts to less than significant or "insignificant" and that the City and County should reconsider project access from Orchard Drive extension.

3.8

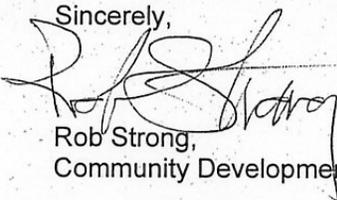
The enclosed memorandum dated March 2, 2004 from Victor Devens of City Public Works Department also raises several technical points regarding drainage/erosion, utilities and streets within the proposed tract which should be clarified before the EIR and project approval.

3.9

The City appreciates the opportunity to comment on County project referrals and hopes that the Final EIR response to comments can include these clarifications and corrections before the project is considered for approval.

3.10

Sincerely,



Rob Strong,  
Community Development Director

Encl:

cc: Planning Commission  
City Council

Mar-15-04 04:32P SLOCOG

805-781-5703

P.02

# San Luis Obispo Council of Governments



Ronald L. DeCarli - Executive Director

Regional Transportation Planning Agency  
Metropolitan Planning Organization  
Census Data Affiliate  
Service Authority for Freeways and Expressways

Arroyo Grande  
Atascadero  
Grover Beach  
Morro Bay  
Paso Robles  
Pismo Beach  
San Luis Obispo  
San Luis Obispo County

March 15, 2004

Julie Eliason, Environmental Division  
County Planning and Building Department  
County Government Center, Room 310  
San Luis Obispo, CA 93408-2040

**RE: Busick Tract Map Notice of Availability of Draft EIR; ED90-061, S89073ZT, SCH#1994041043**

Dear Ms. Eliason,

Thank you for the opportunity to provide comments on the Busick Tract Map draft EIR. I found the material to be comprehensive and well organized and would like to submit the following comments.

Page V-65 notes that El Campo Road Intersection with SR 101 currently operates at LOS F. While a Project Study Report (PSR) is completed for this intersection, it is unlikely to be constructed in the next 10 years. Limited availability and higher priority demands on regional funding, as well as local funding, will slow the completion of this improvement. Any new demands on this deficient crossing will further exacerbate an already bad situation. Caltrans has indicated that if it becomes a hazard, it may either eliminate all left turn movements (through a barrier) or close it entirely. Three of the four project alternatives in the PSR have alignments that are adjacent or through this property. Alternative 1 moves the interchange north of the existing location 250' - this would require purchase of a piece of lot 1. Alternatives 3 and 4 move the interchange north of the property and require a frontage road connection to the existing El Campo. Both would require purchases where the right of way is narrow along the highway for a frontage road.

5.1

1. Would a reduction of the number of units or the elimination of secondary unit options significantly ease the burden on this crossing?
2. Could a dedication of right of way be exacted from the lots bordering on the freeway as well as the "tail" of lot 1 for a connection to El Campo Road consistent with the project alternatives defined in the PSR?

5.2

5.3

Page III-6. As noted on Page 51 (3f) of the RTP Policy Element, SLOCOG does "Encourage and coordinate with local jurisdictions to develop parallel and complimentary collectors, frontage roads or arterial routes adjacent to Route 101." While the City of Arroyo Grande has, in the past, denied primary access through the northern parcel onto Castillo Del Mar, this must be revisited. Development of Falcon Ridge Estates (to the south) was leap frogging over an adjacent parcel. Development of this tract provides a needed infill connection, and necessitates the direct road connection. Connecting these roads will provide driving options and reduce the impacts to the El Campo Road/SR 101 crossing.

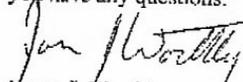
5.4

3. How will opportunities such as new or improved connectivity be encouraged or exacted?
4. What opportunities exist for the city to incorporate this development?

5.5

Thank you again for the opportunity to review this document. Please feel free to contact me at 788-2002 should you have any questions.

5.6

  
James J. Worthley  
Transportation Planner

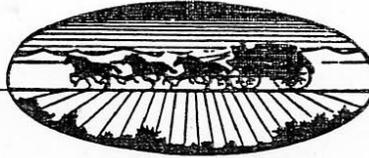
JE2001-2004 Overall Work Program\3100 RTP\3150 Local plans, projects, studies\South County\Busick Tract Map DEIR-County.doc

1150 Osos Street, Ste. 202, San Luis Obispo, CA 93401 ♦ Tel. (805) 781-4219 ♦ Fax. (805) 781-5703  
E-mail. [slocog@slocog.org](mailto:slocog@slocog.org) ♦ Internet. <http://www.slocog.org>

## **5. San Luis Obispo Council of Governments**

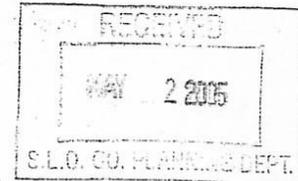
- 5.1 Comment noted. No revisions to the EIR are necessary.
- 5.2 Based on the traffic analysis report prepared for the proposed project, the northbound approach of El Campo Road to State Route 101 currently operates at LOS F during the AM peak hour. Build-out of the proposed project would not cause a reduction in the Level of Service on any other roads or intersections, therefore it is unlikely that a reduction in proposed or potential units would significantly ease the burden on the existing deficient intersection. No revisions to the EIR are necessary.
- 5.3 Approval of the proposed project would not preclude future right-of-way dedications associated with the proposed interchange improvements. No revisions to the EIR are necessary.
- 5.4 Refer to response to comments 1.3, 3.2, and 3.7.
- 5.5 At this time, there are no feasible options to connect Coast View Drive to Castillo Del Mar or provide a transportation link between the County and City on the project site. No revisions to the EIR are necessary.
- 5.6 The project parcel is not located within the City of Arroyo Grande Sphere of Influence, and the City is not considering annexation (personal communications, Kelly Heffernon; December 2, 2003). No revisions to the EIR are necessary.

*City of*  
**Arroyo Grande**  
CITY MANAGER'S OFFICE



P.O. Box 550  
214 East Branch Street  
Arroyo Grande, CA 93421  
Phone: (805) 473-5404  
FAX: (805) 473-0386  
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April 28, 2005



Ms. Julie Eliason, Environmental Division  
County Planning and Building Department  
County of San Luis Obispo  
Courthouse, County Government Center, Room 310  
San Luis Obispo, CA 93408-2040

SUBJECT: Recirculated Draft EIR, Busick Tract map  
ED 90-061, S8902321, SCH #1994041043

Dear Ms. Eliason,

On behalf of the City of Arroyo Grande, we would like to again express our concerns regarding the impacts of the Busick Tract project as proposed. The most serious impact is traffic circulation. The project would contribute trips to the El Campo Road intersection with State Route 101, which is currently unsafe and Level of Service "F". Traffic impact fees currently collected by the County do not include the potential construction of a much needed interchange or improvements to El Campo Road between 101 and Los Berros Road. Additionally, small contributions from residential suburban subdivisions will not be sufficient to mitigate the circulation deficiency. The recirculated DEIR correctly concludes that the traffic impacts of this project are Class I, significant, adverse and unavoidable, requiring findings and statement of overriding considerations for approval.

1.1

Other impacts, including inadequate public facilities and services such as fire protection are also adverse and only partially mitigated by measures outlined in the recirculated DEIR. While these are potentially Class II if mitigated, they are not resolved by fee payments alone. Neither the January 2004 Draft nor the March 2005 Recirculated DEIR address the lack of safe fire response time provided to the project area. The nearest CDF station in Nipomo is probably more than ten minutes away and even the City Fire Department may be more than six minutes. At minimum, the City fire impact fees should be collected, but the burden of City service to County development is inequitable.

1.2

1.3

1.4

Therefore, until necessary circulation, infrastructure and service improvements can be properly coordinated, the City does not believe there exists sufficient justification for a

1.5

statement of overriding considerations. Thank you for your inclusion and consideration of our concerns in the process.

Sincerely,



Steven Adams  
City Manager

cc. City Council

1.5 (cont'd)



# SAN LUIS OBISPO COUNTY DEPARTMENT OF PUBLIC WORKS

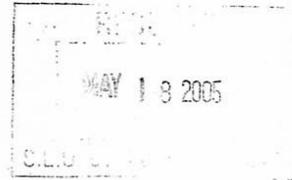
Noel King, Director

County Government Center, Room 207 • San Luis Obispo CA 93408 • (805) 781-5252

Fax (805) 781-1229

email address: [pwd@co.slo.ca.us](mailto:pwd@co.slo.ca.us)

May 16, 2005



## MEMORANDUM

**TO:** Julie Eliason, Environmental Specialist

**FROM:** Richard Marshall, Development Services Engineer *RM*

**SUBJECT:** Busick Tract 1789 – Re-Circulated Draft EIR

Thank you for the opportunity to review the Re-Circulated Draft EIR for the Busick Tract. I have the following comments:

On page V-66, section TR/Impact 1 identifies traffic at the intersection of El Campo Road and Highway 101 as a Class I (significant and unavoidable) impact. This intersection is an at-grade crossing, and is already operating at Level of Service (LOS) F, as noted earlier in the report. As such, the addition of project traffic to this facility constitutes a significant impact. 4.1

The specific intersection movement of greatest concern is left turns from El Campo Road to go northbound on the highway. A secondary concern would be left turns from northbound 101 to go onto El Campo Road. Both of these movements are highly constrained by having to wait for acceptable length gaps in the southbound traffic on the highway. While there is some long-term potential for modifying this location into a grade-separated interchange, it is not reasonably related to the impact of the proposed 16 lots of this tract to require this developer to construct such an improvement. Short of requiring construction by this applicant, there is no mechanism in place for collecting a proportional-share financial contribution. Thus, it has been concluded that there is no improvement or other measure which adequately mitigates the identified significant impact. 4.2

**Alternative mitigation to consider.** I would like to suggest an alternative which might mitigate the impact in a different way: eliminate the left-turning movements at this intersection. Those who wish to go north from El Campo could either go south on the highway and turn back at either the Laetitia Vineyard access or the Los Berros interchange, or they could go south on El Campo and use Los Berros Road to head back northerly. Similarly, those wishing to turn left onto El Campo from northbound 101 would 4.3

be able to use alternate routes that are not substantially out of the way.

**4.3 (cont'd)**

Re-routing traffic with such a turn-movement restriction could result in adverse impacts at other locations. The traffic consultant should evaluate this proposal to determine whether this would be the case. If there are no adverse impacts, then I suggest that a mitigation measure could be worded like this:

**4.4**

*Prior to recordation of the final map, the applicant shall modify the El Campo/Route 101 intersection to eliminate left-turn movements, under an encroachment permit from the California Department of Transportation.*

I have no other comments on the Draft EIR. Please call me at 781-5280 if you have questions or need additional information.

c: Rob Strong, City of Arroyo Grande  
James Kilmer, Caltrans District 5  
Higgins Associates

File: Tract 1789

L:\DEVELOP\MAY05\ELIASON-2.MMO.wpd.REM:CAH

# Attachment C

## SLOCOG Minutes

## SLO County Letter

 March 7, 2007 – SLOCOG

 April 4, 2007 – SLOCOG

 June 6, 2007 – SLOCOG

 June 12, 2008 – County of SLO

developed (March) that reduces costs, contains costs, and assures delivery in fiscal year 2007/2008; 3) Investigate options for local agencies or COGs to conduct advance development work on state highway projects that are initiated by the locals/region and report back in April. Included in this action: *Caltrans would be responsible for the culvert; Consultant hiring as part of the County taking over the project; and Signage.* Board Member Ferrara seconded, and the motion carried on a voice vote, with Board Member Romero voting “no” and Board Members Gibson, Ovitt, and Reiss absent.

**President Patterson** recessed the meeting at 10:14 a.m. and reconvened at 10:30 a.m.

**A-3 Draft 2006 Transportation System Performance Indicators Report:** **Mr. Mike Harmon** summarized the draft 2006 Transportation System Performance Indicators Report, highlighting its purpose and need - *Respond to Federal and State Mandates for development of RTP; Address State requirements for RTP; and Improve the Planning Process to address local and regional needs by assessing performance and modifying programs,* and noting the findings and recommended action for each performance indicator. He also noted the overall conclusions: 1) Traffic Congestion is increasing and funding inadequate to provide needed improvements; 2) Need to implement more aggressive and comprehensive demand management strategy; 3) Need to increase public transit, park-and-ride lots, vanpools, bicycling, & walking; and 4) Must address long-term transportation, housing, and land use issues. **Mr. Harmon** indicated that the staff recommendation is for the Board to accept the report.

**Board Member Ferrara** commented about the proposed action for the indicator - *Travel Time to Work* (Implement smart growth strategies and principles that help reduce vehicle miles of travel), noting that there are other forces at play that have nothing to do with smart growth principles. He inquired if the major employers in this county (i.e., the County, Cal Poly, Cuesta College, the City of San Luis Obispo, etc.) are operating vanpools; if not, he asked what the Board could do to encourage and ensure employers provide that service. **Mr. De Carli** indicated there are several vanpool programs operated by Cal Poly, Caltrans, and Regional Rideshare. What is needed is to expand those efforts throughout the county and be more aggressive. **Mr. Peter Rodgers** noted that in the last two years, SLOCOG funded the vanpool program with Ride-On. However, it has been a topic of debate at the advisory committee meetings because of what some committee members believe to be potential conflict of funding, funding both the fixed route and vanpools at the same time.

**Public Comments:** **Mr. Mark Shaffer**, Ride-On Transportation Director, brought to attention that Ride-On operates 25 vanpools throughout the county. He briefly discussed the vanpool costs and ridership and stressed that vanpools are not in competition with the fixed route service because transit is cheaper.

**Ms. Lisa Quinn**, Regional Rideshare Program Manager, noted that the Regional Rideshare Program is currently promoting the *Commute Plus Program* and is increasing the number of people participating in ridesharing by offering incentives (i.e., Lucky Buck Program; the County’s Pre-tax dollars Program).

**Board Member Ferrara** talked about an innovative approach to vanpooling, citing as an example a vanpooling started by a teacher, giving students a ride on shift basis. **Ms. Quinn** pointed out that Regional Rideshare’s new online database for commute match will be effective in matching people to do ridesharing and vanpooling. In working with the San Luis Coastal Unified School District, staff found that the district is looking at having their own vanpool fleet.

**President Patterson** commented that it is obvious that the results of the study are alarming. He then reminded the Board to be mindful that they still have other agenda items to address.

During the extensive discussion that occurred, the following comments were given:

- **Board Member Achadjian:** *“Great report! I suggest that the locations of the accidents be provided so that member jurisdictions have that information to work on in their respective areas of responsibility. Thanks to Caltrans (referring to Mr. Krumholz) for the information/response regarding the safety concern I raised regarding El Campo Road in the south county.*

*Congestion is happening because jobs and almost all businesses are located in San Luis Obispo. The morning peak hour is the busiest time on the road. Perhaps, in order to improve traffic, the work hours should be shifted. Let us see if we can get our staff off the road during rush hour.”* **Mr. De Carli** noted that improving traffic is part of the Regional Transportation Plan (RTP) adopted policies (employer outreach; encourage vanpooling, use of transit & flex work hours). However, there is no single solution to this issue. He further noted that SLOCOG, Caltrans and the County are currently doing “flex hours,” to help reduce employee commutes during peak hours. The different programs currently available can be expanded and improved. **Mr. Krumholz** said, *“The Report shows how closely Caltrans monitor the system. We are happy to provide the information regarding El Campo road. The information is indicative of what is going on in the whole Highway 101 system. On congestion, it takes a very comprehensive program to address the problem, a problem that seems to significantly grow everyday. Intelligent Transportation Systems (ITS) changeable message signs would provide a better detection system to alert motorists to accidents when they happen.*

- **President Patterson:** *“We cannot let this issue just go away. We need to keep the discussion going at the advisory committee level as well as the executive committee level. Include this issue in the next Executive Committee agenda.”*
- **Board Member Peters:** *“It is wonderful to get all those services (Passenger Rail, Commercial Airline, and Bike and Pedestrian Facilities), but we need to get those passengers to where they want to go after they get off the train/plane. Is ‘Travel Time to Work’ based on congestion or is it because people live far from their jobs?”* **Mr. Harmon** responded that it is based on the average speed – measure of the distance, not congestion.
- **Board Member Fred Strong:** *“Our planning practices need to change. I want to remind staff and Caltrans to keep an eye on an intersection in Paso Robles - Route 46 E and Airport Road – because a Water Park will soon be built at the corner of that intersection. The road improvement project for that intersection was just below the cutting line for funding. It needs to move forward as that intersection would become a safety issue (a lot of children will be crossing).*
- **Board Member O’Malley:** *“We all know there is a jobs/housing/shopping imbalance. We need to support each other to address issues. I have done my part relative to travel time; I am now retired and found I saved miles by commuting less. I suggest that maybe for employees, workload should be distributed, whereby they can telecommute and use the computers at home (especially those administrative-type of work). On the reduction of Park and Ride lots, the City of Atascadero is working on addressing the issue. We all need to be proactive. I would like to point out that the Transit Center in Atascadero is the City’s priority.”*
- **Board Member Lenthall:** *“Thank you Mr. Harmon for the report, it helps us out. Currently, the County has a \$100m Capital Improvement Program (referring to the San Luis Obispo Regional Airport). We are looking forward to increasing the ridership to the airport (ridership population).”*
- **Vice President Shoals:** *“Staff did a very good job! Let us all continue the efforts on improving transit and rail; start funding alternative modes of transportation.”*

**President Patterson** asked for any public comments. **Mr. Greening** thanked staff for an excellent report. He noted that vanpools and transit do not need to compete if each would do what each system does best. *“We deeply need options for single vehicle occupancy. Single occupant drivers need to pay their way and parking fees need to be built into the cost of driving. Economic incentives should go where they are needed.”* **Mr. Greening** brought to attention that the Hope Dance magazine has an article on modal shift, etc.

**Vice President Shoals** moved to accept the report and directed staff to bring this issue back to the Executive Committee for consideration of future action. The motion was seconded by Board Member Achadjian, and passed on a voice vote, in the absence of Board Members Gibson, Ovitt, and Reiss.

legislators lobbying for apportionment of funding for rail projects); and 3) Agenda Item D-11, Revised Draft California Association of Councils of Governments (CALCOG) Policies to Implement Propositions 1C and 84 Regional Growth Related Grants (which includes policies from the California State Association of Counties [CSAC] and the League of California Cities. **Mr. De Carli** noted the upcoming CALCOG 14<sup>th</sup> Annual Regional Issues Forum (April 12<sup>th</sup>-13<sup>th</sup>, Monterey, California) and the California Transportation Commission (CTC) meeting (April 25<sup>th</sup>-26<sup>th</sup>, San Luis Obispo, California), updating the Board on the CTC meeting activities and major agenda items. He highlighted the CTC approval of additional funding of \$710K to complete the Cottonwood Pass Climbing Lane on Highway 41, and briefly discussed the share of funding that the San Luis Obispo Region/SLOCOG will be receiving from Proposition 1A and Proposition 1B.

**Public Comments:** Referring to the last two lines on the bottom of page 2 of the Executive Director's Report that says, "The region will likely to receive a total of \$112 to \$120 million in Proposition 1B funding...", **Mr. Greening** stated that the citizens of this region will likely pay a little less than 1% of the statewide Bond repayment cost over the next 30 years if that responsibility is conservatively estimated at \$360m. He noted that the cost to the region would be approximately three times the estimated benefits and urged everyone to be more cautious in the future, if anything like Proposition 1B would come into the ballot again. He pointed out that it would be the youth of today who will be indentured to pay the debt in the next 30 years.

**President Patterson** called for any comments from the Board and further comments from the public; there were no comments.

**CALTRANS DISTRICT 5 DIRECTOR'S REPORT:** **Mr. Rich Krumholz**, Caltrans District 5 Director, said that as Mr. De Carli mentioned in the Executive Director's Report, Caltrans has began a major repaving project for Highway 46 between Cambria and Paso Robles. He indicated that Caltrans continues its commitment to be environmentally friendly by using rubberized asphalt on this project. **Mr. Krumholz** stated he is happy to report that the *Cottonwood Pass Climbing Lane project* on Highway 41 near the San Luis Obispo/Kern County line (a project that SLOCOG co-funded) will be going to construction, because the much needed additional funding of \$710k has been approved by the CTC. He thanked Mr. De Carli for the show of support during the CTC hearing where Mr. Krumholz made an appeal for the additional funding. **Mr. Krumholz** brought to attention Caltrans' continued emphasis on detection out on the state highway system. Caltrans now has live video streaming and it is now available at more locations – Pismo Beach (three cameras at various locations), Paso Robles, and Atascadero. Three more are coming on line - one at the 101/58 junction and two in San Luis Obispo (Broad Street/101 & 101/Grand). He encouraged everyone to visit Caltrans website and check out the live videos. He also reminded everyone to time their commute wisely in order to avoid traffic congestion and to slow down for the "cone zone."

**President Patterson** asked for any comments from the Board and the public. There were no public comments.

**Board Member Bruce Gibson** inquired about the improvements on Highway 41 in the Cottonwood Pass area. **Mr. Krumholz** said that a climbing lane/passing lane (about a mile in length; in the Kern County side, & administered by Caltrans District 6) is currently under construction. He noted that the Cottonwood project is going to extend that climbing lane project another mile.

(Board Member Fred Strong arrived at 8:45 a.m.)

**Board Member Katcho Achadjian** asked if it would be possible for Caltrans to install one of those live video cameras somewhere on 101/El Campo Road (South County). He said any help on this matter would be great. **Mr. Krumholz** said he could look into a possibility of a video camera at that location. He noted that possibility depends on power availability, connections/conduits, etc. He indicated he

would report back on this issue and that he would like to continue to work with Board Member Achadjian on the issues of concern on that location. **Mr. De Carli** noted that SLOCOG staff in the past had raised a safety concern on that location. At that time, Caltrans responded with a proposed "Minor B" project. However, after further evaluation, the project was found to have exceeded the *Minor B* project capital limit, so the project did not go through. Per Project Study Report (PSR) that was completed on this project, the cost of constructing an interchange at that location would be between \$20-60m. **Mr. De Carli** pointed out that a significant development on that area would help fund an interchange project.

#### **A. TRANSPORTATION ITEMS:**

**A-1 2007/08 Unmet Transit Needs – Findings:** **Mr. Tim Gillham** discussed the staff report, reviewing the *Unmet Transit Needs Criteria* and the unmet transit needs findings, and highlighting the requests found to be unmet transit needs that were evaluated for "reasonableness to meet" criteria – 1) *Expand weekend evening service on San Luis Obispo (SLO) Transit;* 2) *Expand weekly evening service on SLO Transit;* 3) *Extend South County Area Transit (SCAT) bus service to serve the Oceano Senior Center;* 4) *Provide shuttle service from Cambria to the North County;* and 5) *Increase RTA Route 12 coverage (early evening) at Cuesta College campus in SLO.* **Mr. Gillham** noted that the request to extend the SLO Transit Route 4 to serve the Del Rio/Prefumo Canyon Road stop was found to be operational in scope, not an unmet transit need. SLO Transit may consider a route change upon completion of the Irish Hills Commercial Center and/or pending the update on their Short Range Transit Plan (SRTTP). **Mr. Gillham** pointed out that the staff recommendation is to approve the Resolution finding there are no "unmet transit needs" that are "reasonable to meet" for the 2007/2008 fiscal year and to reschedule for further review Request #3 and #5 (as outlined above) to the June 2007 SLOCOG Board meeting.

Referring to Table A-1-7 (a table on agenda page A-1-17 that compares the projected cost-effectiveness performance of three different scenarios used in the evaluation of the request to provide shuttle service from Cambria to the North County), **Board Member Gibson** questioned if the nature or size of the vehicle being used (e.g., full size buses for RTA fixed route = 25 daily riders, versus - smaller shuttle = 15 daily riders) could influence ridership. He added that given the nature of this county and because smaller vehicles incur less cost, they could be programmed to run more frequently; thus, improving the overall transit system. **Mr. Peter Rodgers** noted that Cambria to the North County is a long distance to travel and that the operating costs on small vehicles are not much lower than those of the full size vehicles. He added that in their evaluation of this request, staff could not find anything (under the three scenarios outlined in the staff report) comparable with similar services (areas that connect fixed route with small vehicles). **Mr. De Carli** recommended continuing this issue for further analysis, noting that based on the current analysis, this service request would not result in adequate ridership level. He said staff could meet with RTA and Ride-On to further analyze the issue and see if they can come up with a different conclusion. **Board Member Harry Ovitt** noted that ridesharing is probably a better solution. **Board Member Gibson** remarked that if further analysis would be useful, he would support it.

**Board Member Fred Strong** recommended conducting a separate analysis on route loops (i.e., Paso Robles-Cambria-SLO-Paso Robles & Paso Robles-SLO-Cambria-Paso Robles), noting the possible positive effects on tourism and that it may reduce traffic congestion. **Mr. Rodgers** indicated staff did not look at more creative routes such as the one suggested by Board Member Strong; however, they could bring back a recommendation to that effect. **Mr. De Carli** said a more detailed analysis on the East/West connections could be done under the Short Range Transit Plan (SRTTP). It will be a more comprehensive detailed evaluation, which would be the basis on assessing how the issue can be addressed. **Board Member Janice Peters** stated she certainly supports looking at a loop that would go through Morro Bay to Cambria, saying it would benefit tourism. Noting that the other two items (Request #3 & #5) both do not meet the farebox ratio, **Board Member Peters** inquired if there would be further study to find ways for those two to meet the farebox ratio requirement. On Request #5 (*Increase RTA Route 12 coverage [early evening] at Cuesta College campus in SLO*), **Mr. De Carli** indicated there is a huge need; however, both

unrepresented communities into the planning and outreach. He added that he is pleased to see that the SLOCOG Board will confront the stupidity of the Governor's budget. **President Patterson** thanked Mr. Greening for his comments, saying, "Let us hope we can rise to the challenge." **Mr. Ronald De Carli** brought to attention that included in the agenda is an item on the Governor's budget, noting that staff has been working very hard in getting input from stakeholders on Community 2050 issues. He further noted that Consent Agenda Item E-14 deals with getting a Request for Proposals (RFPs) out to conduct a public opinion survey, one way to engage the public more.

**EXECUTIVE DIRECTOR'S REPORT:** **Mr. De Carli** discussed the Executive Director's Report, summarizing the following: State Transportation Programming, Regional Visioning, Projects under construction or going to bi; Projects being approved by the California Transportation Commission (CTC); Projects scheduled for CTC approval in July meeting; Arroyo Grande (AG) pursuing SR 227 relinquishment in AG Village for street design improvements; and a number of Upcoming issues in August. **Mr. De Carli** then brought to attention that staff recently received a letter from the Department of Housing and Community Development regarding the *Regional Housing Need Determination and Housing Element Update Schedule*. It details the state mandate for Councils of Governments (COGs) to start the Regional Housing Needs Allocation (RHNA) process and to develop a proposed methodology for distributing regional housing need numbers to each city and county beginning June 30, 2007. Staff will start that process and will give the Board an update on this issue in August.

**Board Member Katcho Achadjian** reminded the Board how the cities and the county had difficulty last time because of differences. He said he hopes that this time around member jurisdictions would be much smarter and will move together and be more united on this issue. He asked about the funding status of the project in the south county (i.e., Halcyon area). **Mr. De Carli** indicated that the funding for that (which will allow four auxiliary lanes in the south county) looks promising, adding that the CTC will likely vote on it by tomorrow (June 7<sup>th</sup>). **Board Member Achadjian** inquired about Caltrans' concern on the Tefft Street (Nipomo) project redesign. **Mr. Philip Chu** said he spoke with the County Engineering staff and was informed that they (the County) are resubmitting the Project Study Report (PSR) of that project to Caltrans. It is currently under review and SLOCOG staff will update the Board on this issue at a future meeting. **Mr. De Carli** noted staff would set up a meeting with Caltrans on this issue. **Board Member Achadjian** requested that Mr. Dan Woodson of the Nipomo Advisory Committee be included in that meeting. He also requested to bring the US 101/EI Campo Road right turn issue to the table. **Mr. De Carli** said staff could ask Caltrans to evaluate the opportunities to address the EI Campo/101 issue. He then read Caltrans' response to Board Member Achadjian's request (at the April meeting) to install a live video camera at the US 101 and EI Campo Road intersection (Response #2 on page 5 of the Caltrans Report). He highlighted the last paragraph that says, "At this time, we have no available funding or plans to install a live video camera at the intersection of US 101 and EI Campo Road." **Ms. Aileen Loe**, Caltrans District 5 Deputy District Director for Planning and Programming, made clear that the live video cameras that Caltrans uses are for traffic management, not for near-miss collisions.

**Board Member Tony Ferrara** brought to attention that the US 101/Brisco Road off ramp in Arroyo Grande is temporarily closed to traffic. The City of Arroyo Grande is monitoring the dispersion patterns at that interchange as part of exploring alternative solutions to congestion.

**Board Member Harry Ovitt** pointed out an issue that just started to surface relative to the Proposition 1B funds – low supply of aggregate materials. He noted that the Nacimiento Water project in particular is going to put a tremendous demand on aggregate materials; this County may not be able to keep up with the demand.

**CALTRANS DISTRICT 5 DIRECTOR'S REPORT:** **Ms. Aileen Loe**, Caltrans District 5 Deputy District Director for Planning and Programming, brought to attention that included in the agenda packet is the Caltrans Report, which covers the current Caltrans construction projects in the county as well as

**DEPARTMENT OF TRANSPORTATION**

50 HIGUERA STREET  
 SAN LUIS OBISPO, CA 93401-5415  
 PHONE (805) 549-3111  
 FAX (805) 549-3329  
 TDD (805) 549-3259  
<http://www.dot.gov/dist05>

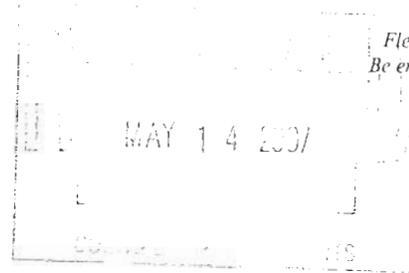
Copies to:

Comes

File

Staff

RDC  
 RM  
 DS JW  
 PC



May 7, 2007

Ronald L. De Carli, Executive Director  
 San Luis Obispo Council of Governments  
 1150 Osos Street, Suite 202  
 San Luis Obispo, CA 93401

Dear Mr. De Carli:

### RESPONSE TO QUESTIONS RAISED DURING APRIL 4, 2007 BOARD MEETING

This is in response to questions raised to the Department of Transportation (Caltrans) during the San Luis Obispo Council of Governments' board meeting held April 4, 2007.

- 1) SLOCOG staff requested an update on Caltrans' Minor B candidate shoulder-widening project located at the intersection of El Campo Road and US 101.

**Response:** This shoulder-widening project was initiated for southbound US 101 drivers turning west onto El Campo Road. Its purpose is to provide additional paved shoulder for deceleration. The estimated \$112,000 project is tentatively scheduled to start construction in Spring 2008.

- 2) Board Member Achadjian requested a live video camera at the intersection of US 101 and El Campo Road to better determine the number of near-miss collisions at that location.

**Response:** Caltrans has a well-developed accident surveillance and analysis system in place tracking actual collisions uniformly throughout the state. The live video cameras are not intended to monitor near-miss collisions.

Caltrans Transportation Management Centers use the live images from closed-circuit television cameras to verify reported incidents and dispatch the appropriate response. Additionally, Caltrans makes some live video available on the Caltrans web page so commuters can make informed decisions regarding congestion, such as when to take a trip on a certain freeway.

Currently, we have five live video cameras in San Luis Obispo County at the following locations:

- US 101 at Highway 46 East in Paso Robles
- US 101 at Curbaril Avenue in Atascadero
- US 101 at Highway 1 in Pismo Beach
- US 101 at Fourth Street in Pismo Beach
- US 101 at Mattie Road in Pismo Beach

Caltrans plans to activate the following camera locations later this year:

- US 101 at Highway 58 in Santa Margarita
- US 101 at Broad Street and Grand Avenue in San Luis Obispo

At this time, we have no available funding or plans to install a live video camera at the intersection of US 101 and El Campo Road.

3) Board Member O'Malley requested an update on the City of Atascadero's Signal/Roundabout Study at US 101 and Santa Barbara Road.

**Response:** The City's consultant, W-Trans of Santa Rosa, is conducting operational improvement studies on all eight interchanges on US 101 within the city limits. The City expects to send the Signal/Roundabout Study to Caltrans for review and comment within the next few weeks.

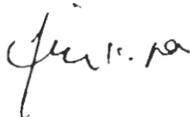
4) Board Member Romero asked Caltrans to expedite the Olive Street/Highway 1 right-turn channelization Project Study Report/Project Report.

**Response:** Caltrans is preparing a Project Initiation Document (PSR/PR) as a candidate for the 2008 State Transportation Improvement Program (STIP). The estimated \$800,000 project is located on southbound Highway 1 at Olive Street in the City of San Luis Obispo. The project proposes to increase the capacity of the southbound right-turn lane on Highway 1 (Santa Rosa Street) and Olive Street by lengthening the right-turn lane to extend to Montalban Street.

The project will require right of way acquisition, widening the existing roadway, utility relocation and construction of new curb, gutter, and sidewalk. The environmental document is expected to be a Categorical Exemption. If the project were funded in the 2008 STIP, construction would probably begin in late 2010 or early 2011. The long lead-time is due to the usual 18 to 24 months required to purchase right of way property.

We hope these responses have adequately answered your questions. If you have any further questions, please contact Cindy Utter at 805-549-3648 or [cindy\\_utter@dot.ca.gov](mailto:cindy_utter@dot.ca.gov).

Sincerely,



RICHARD KRUMHOLZ  
District Director



SAN LUIS OBISPO COUNTY  
**DEPARTMENT OF PUBLIC WORKS**

Paavo Ogren, Director

County Government Center, Room 207 • San Luis Obispo, CA 93408 • (805) 781-5252

Fax (805) 781-1229

email address: [pwd@co.slo.ca.us](mailto:pwd@co.slo.ca.us)

June 12, 2008

Mr. Rich Krumholtz, District Director  
Caltrans District 5  
50 Higuera Street  
San Luis Obispo, CA 93401

Subject: Median Access/At-Grade Intersections  
05-SLO-101; PM 7.9/12.1

Dear Mr. Krumholtz:

The Public Works Department would request that the median access points along Route 101 from El Campo Road to Los Berros Road interchange be evaluated for operations and safety. We would like to see an overall plan on what measures may be taken at these locations and have our agencies agree on the means to manage existing and future conditions on this stretch of highway.

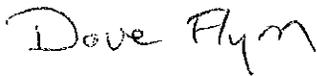
We understand from your Traffic Safety branch that there is a minor project for improving the southbound shoulder at El Campo Road to accommodate right turn deceleration. While this is a positive operational improvement, it does not address cross-traffic concerns. Traffic Safety also indicated that a median barrier project was under consideration south of Arroyo Grande. If that is to move forward, we would like to see how the at-grade intersections may be regulated. In particular, right turn only ingress and egress may be the appropriate solution at El Campo Road and Laetitia Winery intersections. For the latter, there is a development EIR currently in process and now is the time to provide clear direction regarding future access regulations that should be addressed in the EIR.

For the long term planning of the corridor, our office had participated in the development of the City's El Campo Road interchange PSR. If there General Plan Amendments approved in the North Mesa area, the County would likely tie the development to such a project with the City; to the extent practical from traffic impacts and serviceability of El Campo Road. The placement of an interchange

in this area should be at a location which best serves freeway operations and elimination of other median openings to the south of El Campo Road. Nearer Los Berros interchange, a frontage road or alternative local route for Laetitia Winery entrance will need to be developed.

We appreciate your attention to this matter and the guidance your staff can provide to the implementation of an overall plan. If you have any questions, please contact me at (805) 781-4463.

Sincerely,



DAVE FLYNN

Deputy Director of Public Works, Capital Projects

c: Katcho Achadjian, Supervisor - District 4  
Paavo Ogren, Director  
Glen Priddy, Deputy Director  
Glenn Marshall, Development Services Engineer  
Dale Ramey, Transportation Planning and Projects  
Rob Strong, Director of Community Services - City of Arroyo Grande

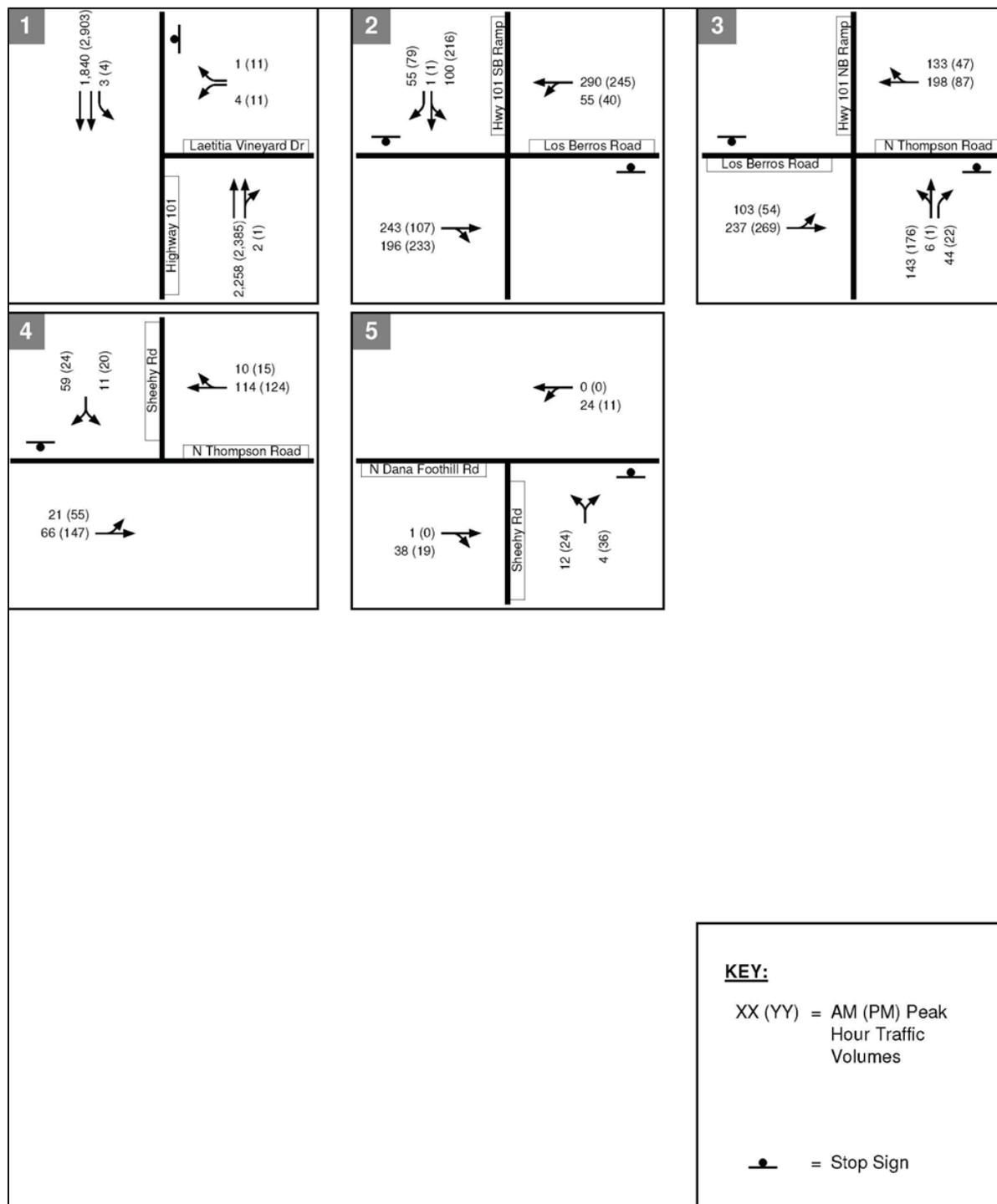
File: Caltrans - Route 101

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# Attachment D

## Peak Hour Volumes

-  Thompson/Los Berros – County of SLO
-  Laetitia Winery – County of SLO
-  El Campo Road – Caltrans
-  Grand Avenue – City of Arroyo Grande
-  Brisco/Halcyon – City of Arroyo Grande



Source: Fehr and Peers, 2007.

Existing Peak Hour Traffic Volumes, Lane Configurations, and Traffic Control  
**FIGURE V.H.-2**



CALIFORNIA DEPARTMENT OF TRANSPORTATION  
 INTERSECTION TURNING MOVEMENT COUNT SUMMARY  
 DISTRICT 5 - TRAFFIC OPERATIONS  
 PROJECT #: 05-0Q620K

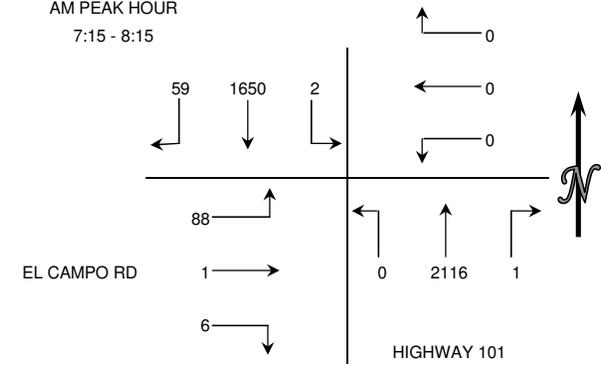


15 MIN COUNTS													
7:15 AM TO 8:15 AM													
PERIOD	1 SBLT	2 SBTH	3 SBRT	4 WBLT	5 WBTH	6 WBRT	7 NBLT	8 NBTH	9 NBRT	10 EBLT	11 EBTH	12 EBRT	TOTAL
7:00 - 7:15	0	454	7	0	0	0	0	436	0	8	0	1	906
7:15 - 7:30	2	414	13	0	0	0	0	521	0	25	0	3	978
7:30 - 7:45	0	458	16	0	0	0	0	585	1	18	0	2	1080
7:45 - 8:00	0	376	13	0	0	0	0	499	0	21	1	0	910
8:00 - 8:15	0	402	17	0	0	0	0	511	0	24	0	1	955
8:15 - 8:30	8	329	16	0	0	1	1	490	0	23	0	2	870
HOUR TOTALS													
TIME	1 SBLT	2 SBTH	3 SBRT	4 WBLT	5 WBTH	6 WBRT	7 NBLT	8 NBTH	9 NBRT	10 EBLT	11 EBTH	12 EBRT	TOTAL
7:00 - 8:00	2	1702	49	0	0	0	0	2041	1	72	1	6	3874
7:15 - 8:15	2	1650	59	0	0	0	0	2116	1	88	1	6	3923
7:30 - 8:30	8	1565	62	0	0	1	1	2085	1	86	1	5	3815

COUNT DATE: 10/14/2008

AM PEAK HOUR

7:15 - 8:15

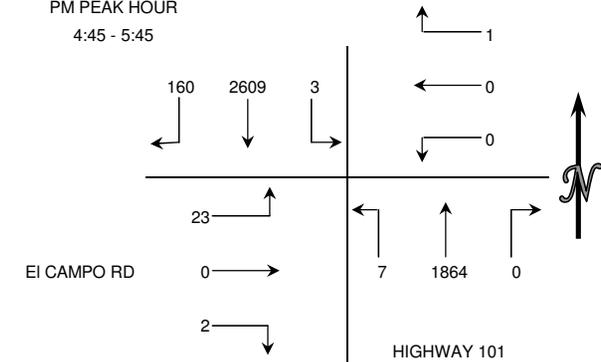


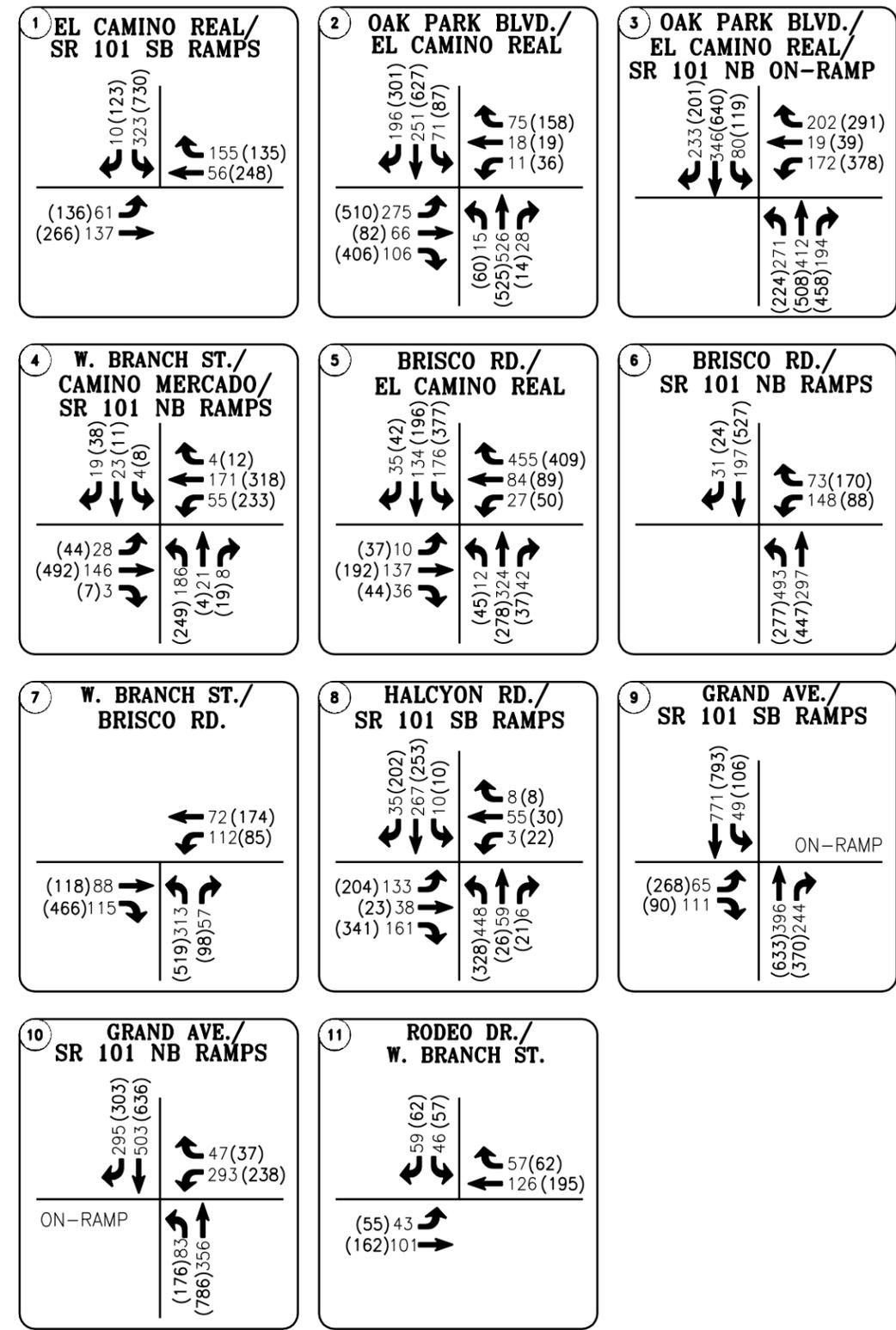
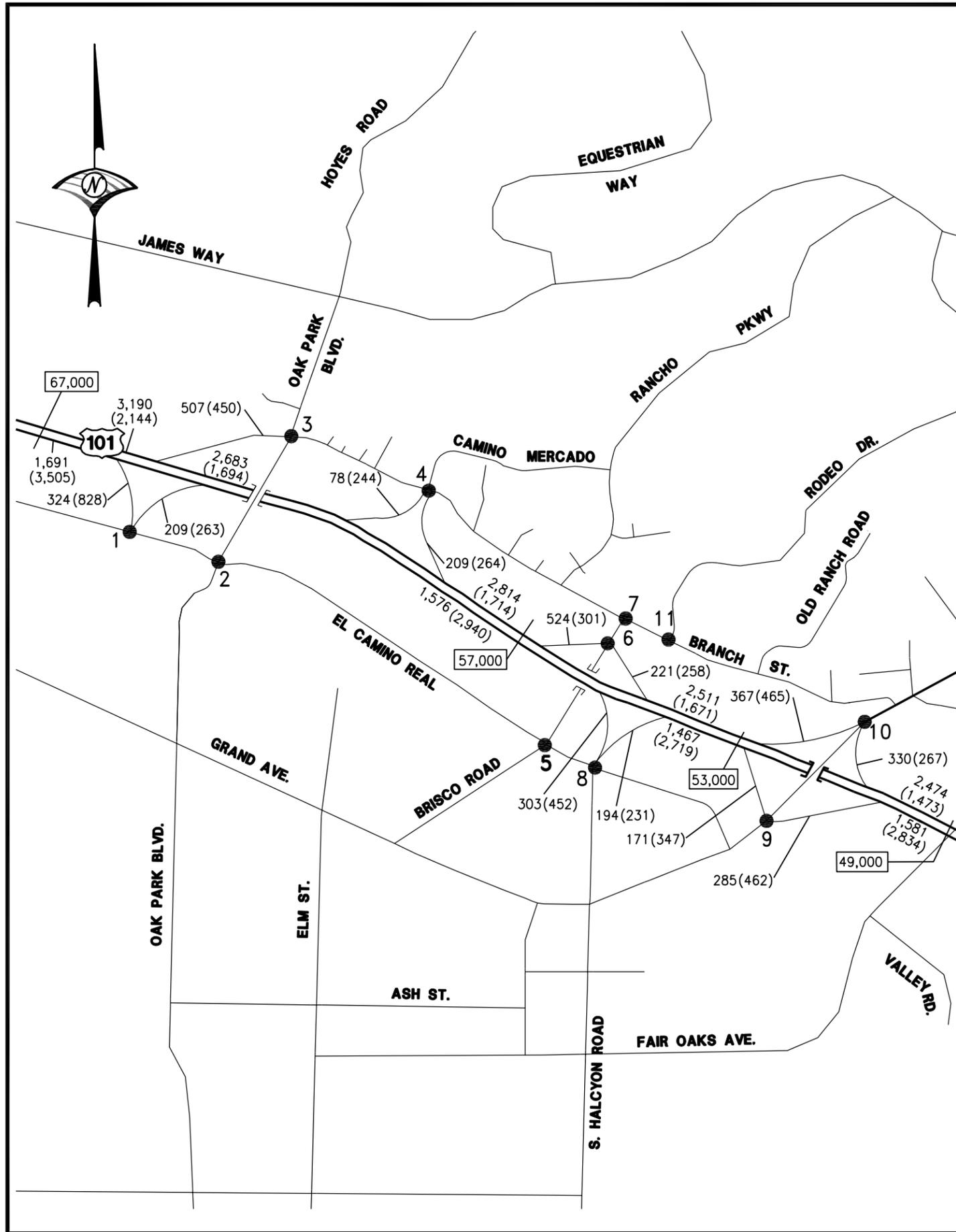
15 MIN COUNTS													
4:15 PM TO 5:45 PM													
PERIOD	1 SBLT	2 SBTH	3 SBRT	4 WBLT	5 WBTH	6 WBRT	7 NBLT	8 NBTH	9 NBRT	10 EBLT	11 EBTH	12 EBRT	TOTAL
4:15 - 4:30	1	622	37	1	0	0	1	438	0	4	0	0	1104
4:30 - 4:45	1	630	25	0	0	0	0	448	0	6	0	0	1110
4:45 - 5:00	1	619	46	0	0	0	3	426	0	9	0	0	1104
5:00 - 5:15	0	707	42	0	0	0	2	494	0	3	0	1	1249
5:15 - 5:30	0	674	41	0	0	0	2	472	0	4	0	0	1193
5:30 - 5:45	2	609	31	0	0	1	0	472	0	7	0	1	1123
HOUR TOTALS													
TIME	1 SBLT	2 SBTH	3 SBRT	4 WBLT	5 WBTH	6 WBRT	7 NBLT	8 NBTH	9 NBRT	10 EBLT	11 EBTH	12 EBRT	TOTAL
4:15 - 5:15	3	2578	150	1	0	0	6	1806	0	22	0	1	4567
4:30 - 5:30	2	2630	154	0	0	0	7	1840	0	22	0	1	4656
4:45 - 5:45	3	2609	160	0	0	1	7	1864	0	23	0	2	4669

COUNT DATE: 10/14/2008

PM PEAK HOUR

4:45 - 5:45





**LEGEND**  
 XX - 2005-2007 AM PEAK HOUR VOLUMES  
 (XX) - 2005-2007 PM PEAK HOUR VOLUMES  
 X,XXX - 2004 AVERAGE DAILY TRAFFIC (ADT) VOLUMES

FIGURE 1

SR 101 / BRISCO RD - HALCYON RD INTERCHANGE MODIFICATIONS PA&ED

**EXISTING  
TRAFFIC VOLUMES**



# Attachment E

## Laetitia Winery

### Median Cross-Over

-  Weekly Average Daily Counts
-  Weekday Average Daily Counts
-  Weekend Average Daily Counts

Project #: 05-0Q620K

Jurisdiction: California Department of Transportation

Location: Laetitia Winery: Highway 101 Cross-Over

Count Date: 02/12/2009 - 02/25/2009 (14 - Day ADT)

AM Period	NB	SB	EB	WB	PM Period	NB	SB	EB	WB			
00:00			0	0	0	0		2	6	2	6	12
00:15			0	0				2		2		
00:30			0	0				2		3		
00:45			0	0				2		2		
01:00			1	1	0	0	1	2	8	2	9	17
01:15			0	0				2		2		
01:30			0	0				2		2		
01:45			0	0				3		2		
02:00			0	0	0	0	0	2	9	3	9	18
02:15			0	0				2		2		
02:30			0	0				2		2		
02:45			0	0				1		2		
03:00			0	0	0	0	0	2	7	2	8	15
03:15			0	0				2		1		
03:30			0	0				3		3		
03:45			0	0				2		2		
04:00			0	0	0	0	0	2	9	1	7	16
04:15			0	0				3		2		
04:30			0	0				2		1		
04:45			0	0				2		1		
05:00			0	0	0	0	0	4	11	5	9	20
05:15			0	0				2		1		
05:30			0	0				1		1		
05:45			0	0				1		0		
06:00			0	0	0	0	0	1	5	0	2	7
06:15			0	0				0		1		
06:30			1	1				0		0		
06:45			1	1				0		0		
07:00			1	3	1	3	6	1	1	0	1	2
07:15			1		1			0		0		
07:30			0	0				0		0		
07:45			1		2			0		0		
08:00			1	3	2	5	8	0	0	0	0	0
08:15			1		1			0		0		
08:30			1		1			0		0		
08:45			2		1			0		0		
09:00			1	5	1	4	9	0	0	0	0	0
09:15			1		0			0		0		
09:30			1		1			0		0		
09:45			1		1			0		0		
10:00			0	3	1	3	6	0	0	0	0	0
10:15			1		2			0		0		
10:30			1		1			0		0		
10:45			1		1			0		0		
11:00			2	5	1	5	10	0	0	0	0	0
11:15			1		1			0		0		
11:30			2		2			0		0		
11:45			1		1			0		0		

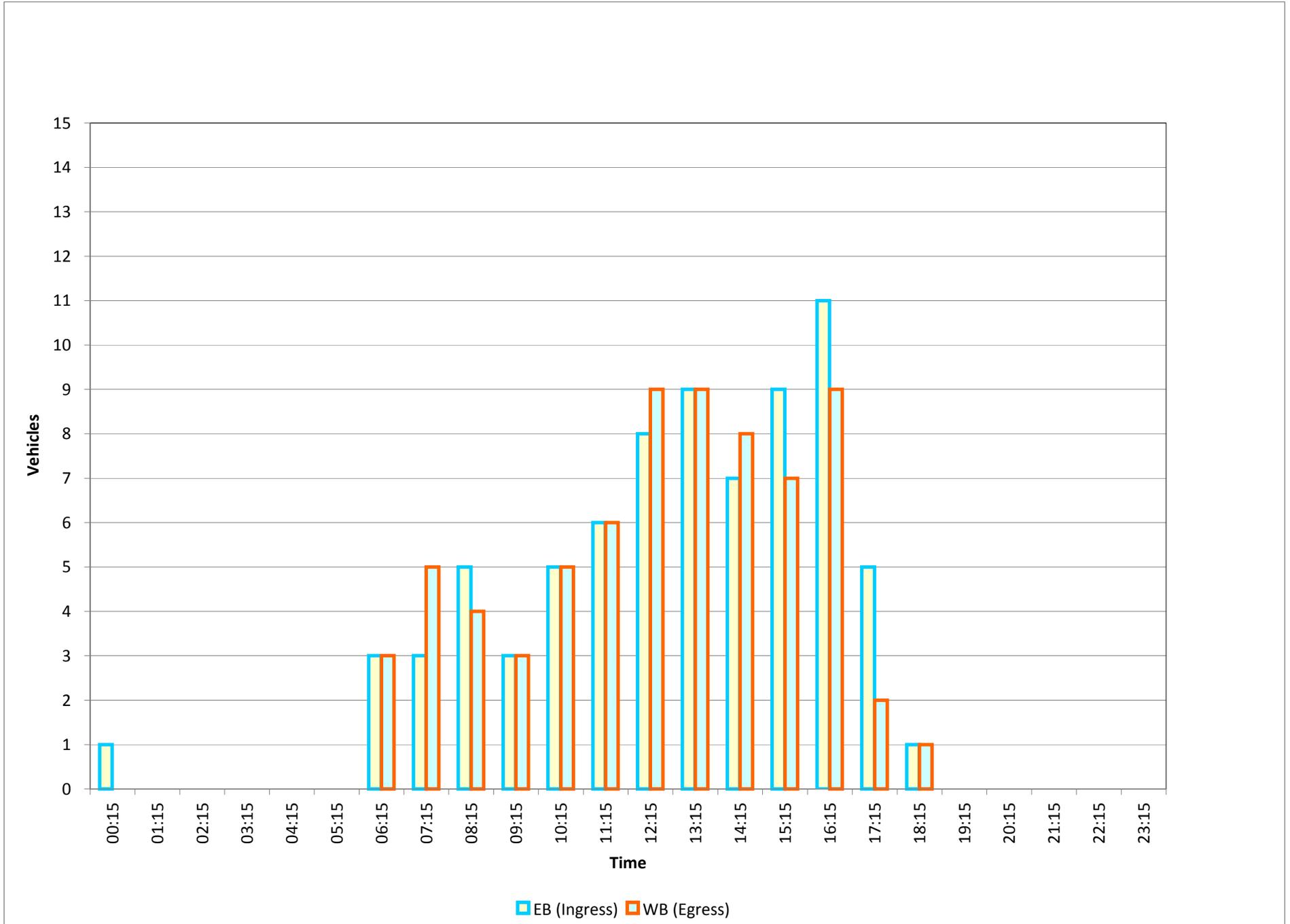
**Total Vol.** 20 20 **40** 56 51 **107**

**Daily Totals**

NB	SB	EB	WB
		76	71

**147**

Split %	AM			PM		
	50.0%	50.0%	27.2%	52.3%	47.7%	72.8%
<b>Peak Hour</b>	11:30	11:45	<b>11:45</b>	16:15	12:00	<b>16:15</b>
<b>Volume</b>	7	8	<b>15</b>	11	9	<b>20</b>
<b>P.H.F.</b>	0.88	0.67	<b>0.75</b>	0.69	0.75	<b>0.56</b>



Project #: 05-0Q620K

Jurisdiction: California Department of Transportation

Location: Laetitia Winery: Highway 101 Cross-Over

Count Date: 02/12/2009 - 02/25/2009 (Typical - ADT)

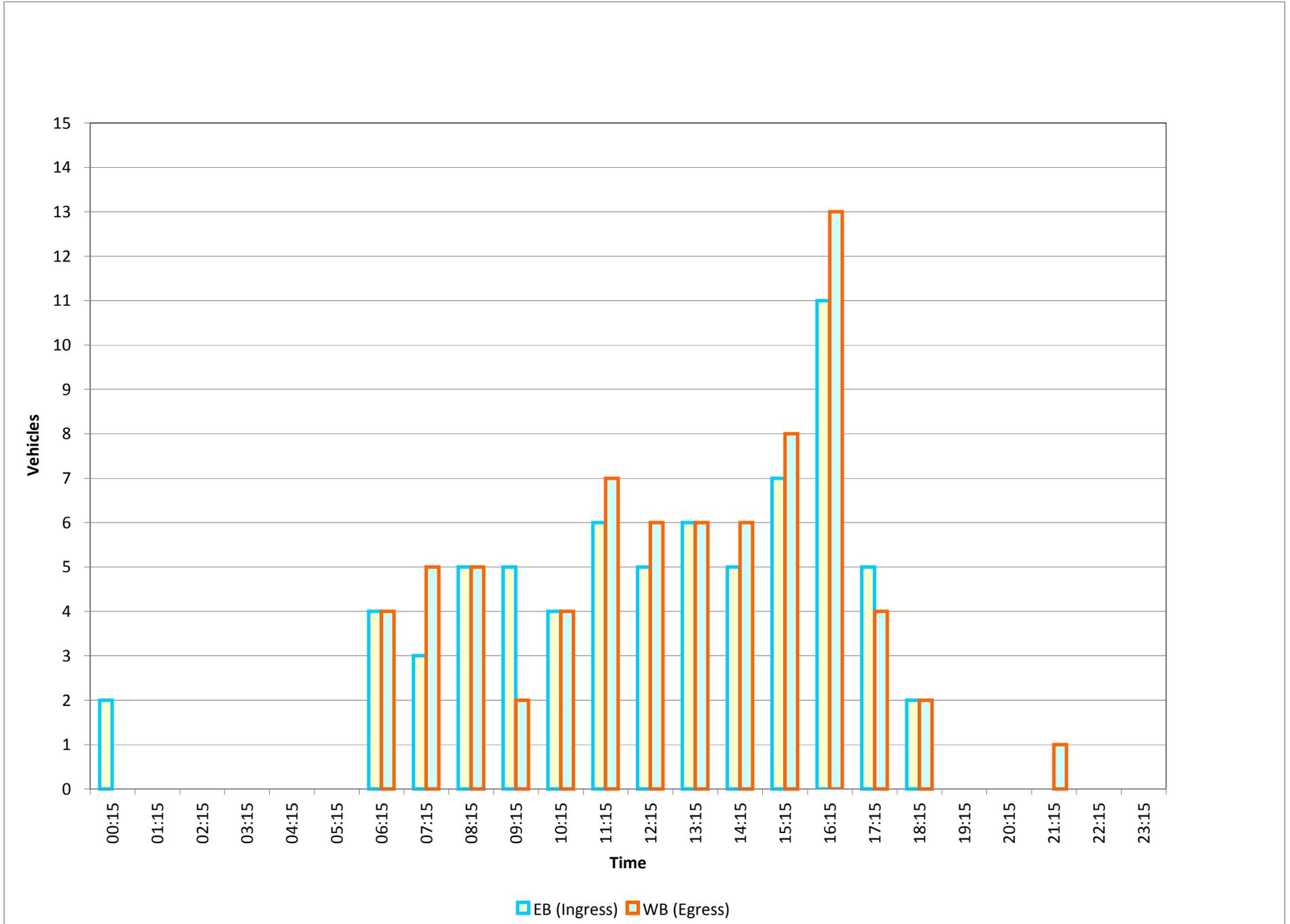
AM Period	NB	SB	EB	WB	PM Period	NB	SB	EB	WB			
00:00			0	0	0	0		2	6	2	7	13
00:15			0	0				1		1		
00:30			0	0				1		2		
00:45			0	0				2		2		
01:00		2	2	0	0	2		1	5	1	6	11
01:15		0	0	0				1		2		
01:30		0	0	0				2		1		
01:45		0	0	0				2		1		
02:00			0	0	0	0		1	6	2	6	12
02:15			0	0				1		2		
02:30			0	0				2		2		
02:45			0	0				1		1		
03:00			0	0	0	0		1	5	1	6	11
03:15			0	0				2		1		
03:30			0	0				3		4		
03:45			0	0				1		2		
04:00			0	0	0	0		1	7	1	8	15
04:15			0	0				2		2		
04:30			0	0				2		1		
04:45			0	0				2		2		
05:00			0	0	0	0		5	11	8	13	24
05:15			0	0				2		2		
05:30			0	0				1		1		
05:45			0	0				1		0		
06:00		0	0	0	0	0		1	5	1	4	9
06:15			0	1				0		1		
06:30			1	1				1		1		
06:45			1	1				0		0		
07:00		2	4	1	4	8		1	2	0	2	4
07:15		1		1				0		0		
07:30		0		1				0		0		
07:45		1		2				0		0		
08:00		1	3	1	5	8		0	0	0	0	0
08:15		1		1				0		0		
08:30		1		1				0		0		
08:45		2		2				0		0		
09:00		1	5	1	5	10		0	0	0	0	0
09:15		1		0				0		0		
09:30		1		0				0		0		
09:45		2		1				0		0		
10:00		1	5	1	2	7		0	0	1	1	1
10:15		2		2				0		0		
10:30		1		0				0		0		
10:45		0		1				0		0		
11:00		1	4	1	4	8		0	0	0	0	0
11:15		1		1				0		0		
11:30		2		2				0		0		
11:45		1		2				0		0		

**Total Vol.** 23 20 **43** 47 53 **100**

**Daily Totals**

NB	SB	EB	WB
		70	73
Combined			
<b>143</b>			

Split %	AM			PM		
	53.5%	46.5%	30.1%	47.0%	53.0%	69.9%
<b>Peak Hour</b>	09:30	11:15	<b>11:15</b>	16:15	16:15	<b>16:15</b>
<b>Volume</b>	6	7	<b>13</b>	11	13	<b>24</b>
<b>P.H.F.</b>	0.75	0.88	<b>0.81</b>	0.55	0.41	<b>0.46</b>



Project #: 05-0Q620K

Jurisdiction: California Department of Transportation

Location: Laetitia Winery: Highway 101 Cross-Over

Count Date: 02/12/2009 - 02/25/2009 (Weekend - ADT)

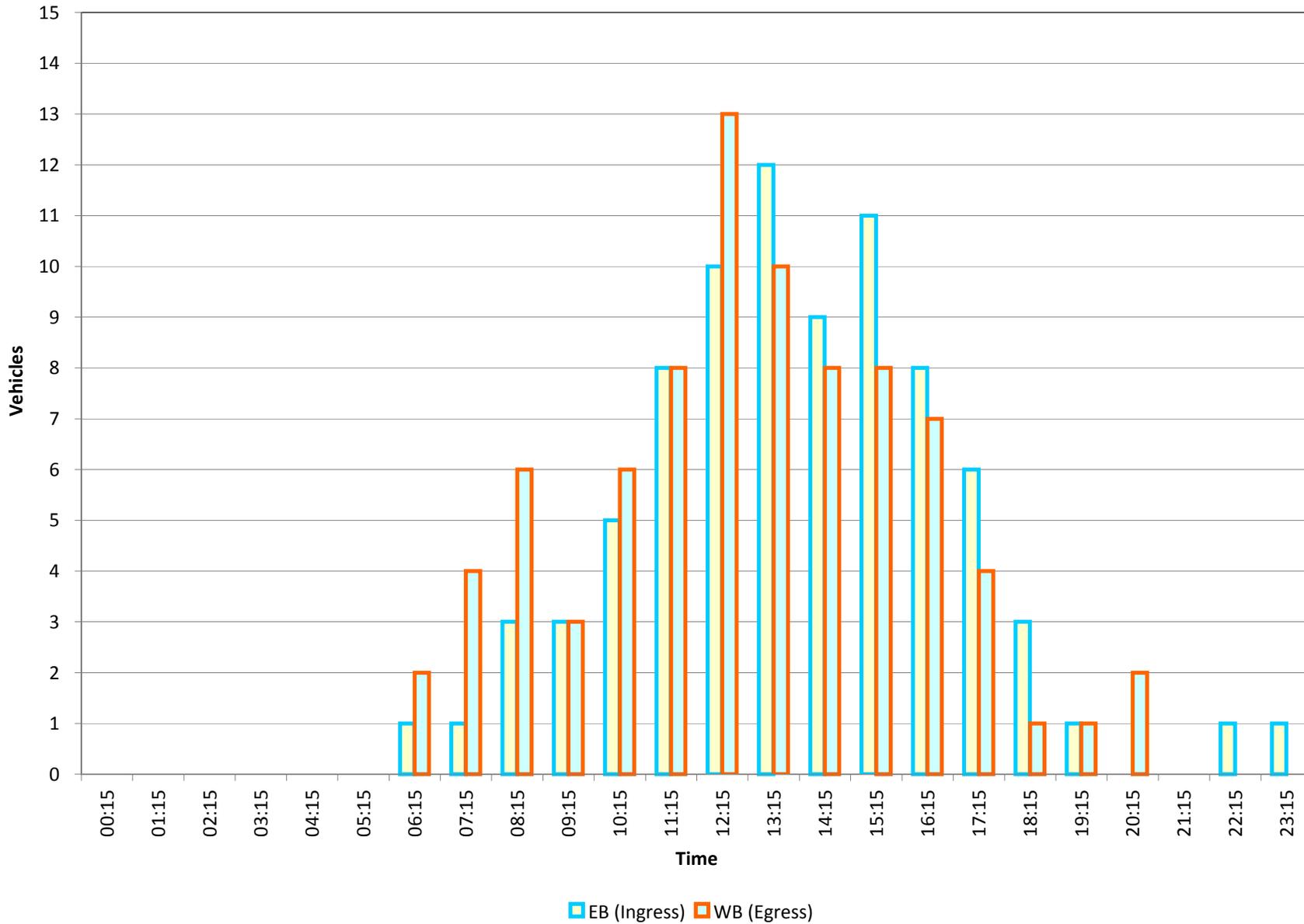
AM Period	NB	SB	EB	WB	PM Period	NB	SB	EB	WB				
00:00			0	1	0	0	1	12:00	2	8	2	8	16
00:15			0		0			12:15	2		3		
00:30			0		0			12:30	2		4		
00:45			0		0			12:45	3		3		
01:00			0	0	0	0	0	13:00	3	10	3	13	23
01:15			0		0			13:15	3		2		
01:30			0		0			13:30	2		2		
01:45			0		0			13:45	4		2		
02:00			0	0	0	0	0	14:00	3	12	4	10	22
02:15			0		0			14:15	2		2		
02:30			0		0			14:30	2		1		
02:45			0		0			14:45	2		3		
03:00			0	0	0	0	0	15:00	3	9	2	8	17
03:15			0		0			15:15	3		1		
03:30			0		0			15:30	3		3		
03:45			0		0			15:45	2		2		
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04:15			0		0			16:15	3		2		
04:30			0		0			16:30	2		2		
04:45			0		0			16:45	1		1		
05:00			0	0	0	0	0	17:00	2	8	2	7	15
05:15			0		0			17:15	2		0		
05:30			0		0			17:30	1		2		
05:45			0		0			17:45	2		1		
06:00			0	0	0	0	0	18:00	1	6	1	4	10
06:15			0		0			18:15	1		1		
06:30			0		1			18:30	0		0		
06:45			0		0			18:45	1		0		
07:00			1	1	1	2	3	19:00	1	3	0	1	4
07:15			0		0			19:15	0		0		
07:30			0		0			19:30	1		0		
07:45			0		2			19:45	0		1		
08:00			1	1	2	4	5	20:00	0	1	0	1	2
08:15			0		2			20:15	0		0		
08:30			1		2			20:30	0		1		
08:45			1		1			20:45	0		0		
09:00			1	3	1	6	9	21:00	0	0	1	2	2
09:15			1		0			21:15	0		0		
09:30			1		1			21:30	0		0		
09:45			1		1			21:45	0		0		
10:00			0	3	1	3	6	22:00	0	0	0	0	0
10:15			0		2			22:15	0		0		
10:30			1		2			22:30	0		0		
10:45			2		1			22:45	0		0		
11:00			2	5	1	6	11	23:00	1	1	0	0	1
11:15			2		2			23:15	1		0		
11:30			2		2			23:30	0		0		
11:45			2		2			23:45	0		0		

**Total Vol.** 14 21 **35** 69 62 **131**

**Daily Totals**

NB	SB	EB	WB
		83	83
Combined			
166			

Split %	AM			PM		
	40.0%	60.0%	21.1%	52.7%	47.3%	78.9%
<b>Peak Hour</b>	10:45	11:45	<b>11:45</b>	13:00	12:15	<b>12:15</b>
<b>Volume</b>	8	11	<b>19</b>	12	13	<b>23</b>
<b>P.H.F.</b>	1.00	0.69	<b>0.79</b>	0.75	0.81	<b>0.96</b>



# Attachment F

## El Campo Road

### Median Cross-Over

-  Weekly Average Daily Counts
-  Typical Average Daily Counts
-  Weekend Average Daily Counts

Project #: 05-0Q620K

Jurisdiction: California Department of Transportation

Location: El Campo Road: Highway 101 Cross-Over

Count Date: 10/21/2008 - 10/27/2008 (7 - Day ADT)

AM Period	NB	SB	EB	WB	PM Period	NB	SB	EB	WB				
00:00			1	0	12:00			11	1				
00:15			1	0	12:15			12	1				
00:30			0	0	12:30			12	1				
00:45			1	3	0	3	12:45	11	46	1	4	50	
01:00			0	0	13:00			13	1				
01:15			0	0	13:15			8	1				
01:30			1	0	13:30			12	1				
01:45			1	2	0	2	13:45	11	44	1	4	48	
02:00			0	0	14:00			11	1				
02:15			0	0	14:15			11	1				
02:30			0	0	14:30			10	1				
02:45			1	1	0	1	14:45	13	45	1	4	49	
03:00			0	0	15:00			11	1				
03:15			0	0	15:15			11	1				
03:30			1	0	15:30			9	1				
03:45			1	2	0	2	15:45	9	40	1	4	44	
04:00			1	0	16:00			8	1				
04:15			1	0	16:15			8	1				
04:30			1	0	16:30			10	1				
04:45			3	6	0	6	16:45	7	33	1	4	37	
05:00			4	0	17:00			8	1				
05:15			5	0	17:15			9	1				
05:30			8	0	17:30			7	1				
05:45			6	23	0	23	17:45	10	34	1	4	38	
06:00			7	0	18:00			8	1				
06:15			9	0	18:15			9	1				
06:30			14	0	18:30			9	1				
06:45			13	43	0	43	18:45	8	34	0	3	37	
07:00			10	0	19:00			7	0				
07:15			17	0	19:15			6	1				
07:30			18	0	19:30			3	0				
07:45			18	63	1	1	64	19:45	4	20	0	1	21
08:00			20	0	20:00			3	0				
08:15			25	0	20:15			4	0				
08:30			20	0	20:30			3	0				
08:45			19	84	0	0	84	20:45	3	13	0	0	13
09:00			10	0	21:00			3	0				
09:15			14	0	21:15			2	0				
09:30			15	0	21:30			3	0				
09:45			14	53	0	0	53	21:45	3	11	0	0	11
10:00			11	0	22:00			3	0				
10:15			11	0	22:15			2	0				
10:30			13	0	22:30			2	0				
10:45			16	51	0	0	51	22:45	2	9	0	0	9
11:00			10	0	23:00			2	0				
11:15			11	1	23:15			1	0				
11:30			11	0	23:30			2	0				
11:45			13	45	1	2	47	23:45	1	6	0	0	6

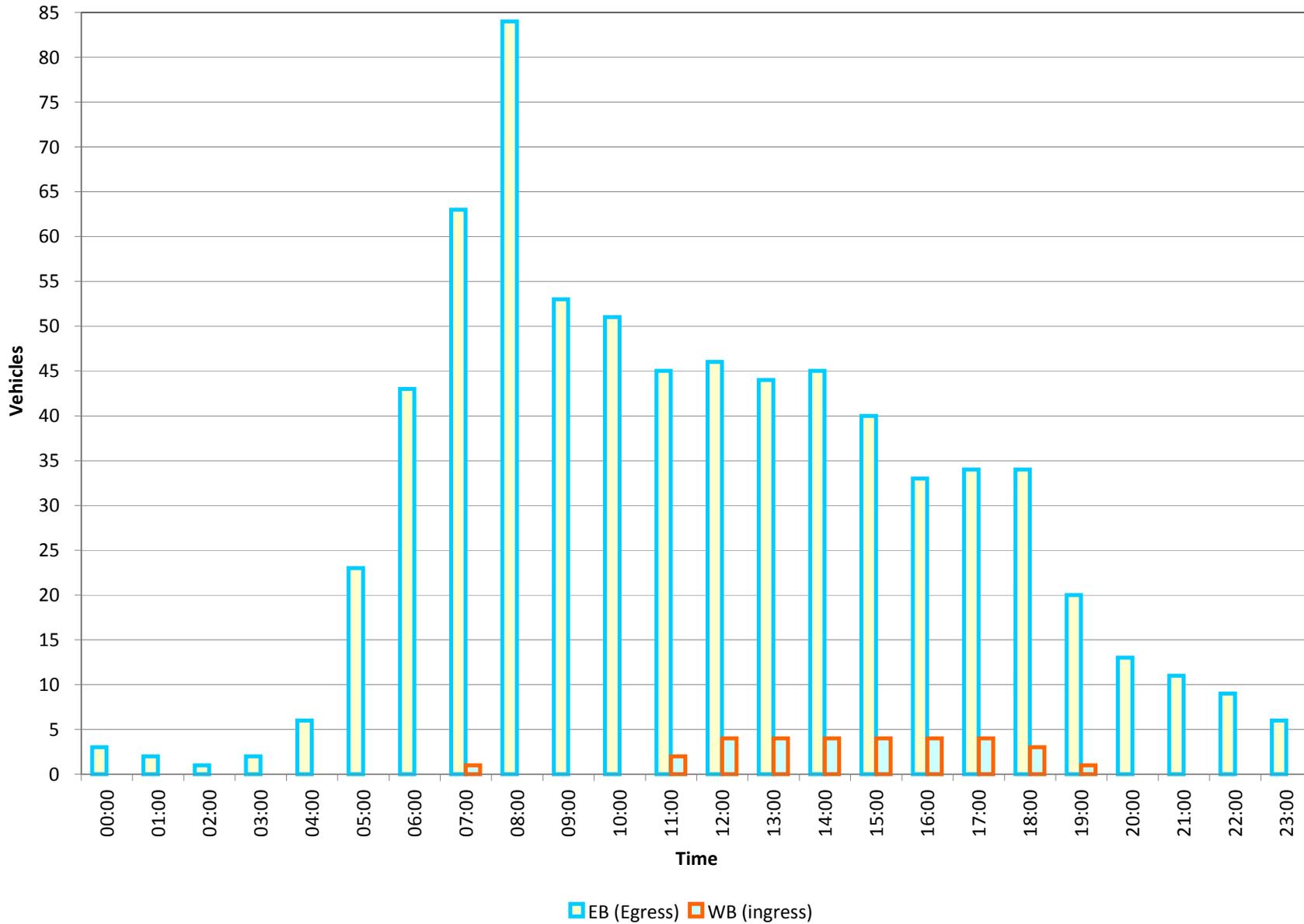
**Total Vol.** 376 3 **379** 335 28 **363**

**Daily Totals**

NB	SB	EB	WB
		711	31
Combined			

**742**

Split %	AM			PM		
	99.2%	0.8%	51.1%	92.3%	7.7%	48.9%
<b>Peak Hour</b>	08:00	11:45	<b>07:45</b>	12:15	12:00	<b>12:15</b>
<b>Volume</b>	84	4	<b>84</b>	48	4	<b>52</b>
<b>P.H.F.</b>	0.84	1.00	<b>0.84</b>	0.92	1.00	<b>0.93</b>



Project #: 05-0Q620K

Jurisdiction: California Department of Transportation

Location: El Campo Road: Highway 101 Cross-Over

Count Date: 10/21/2008 - 10/27/2008 (Typical - Day ADT)

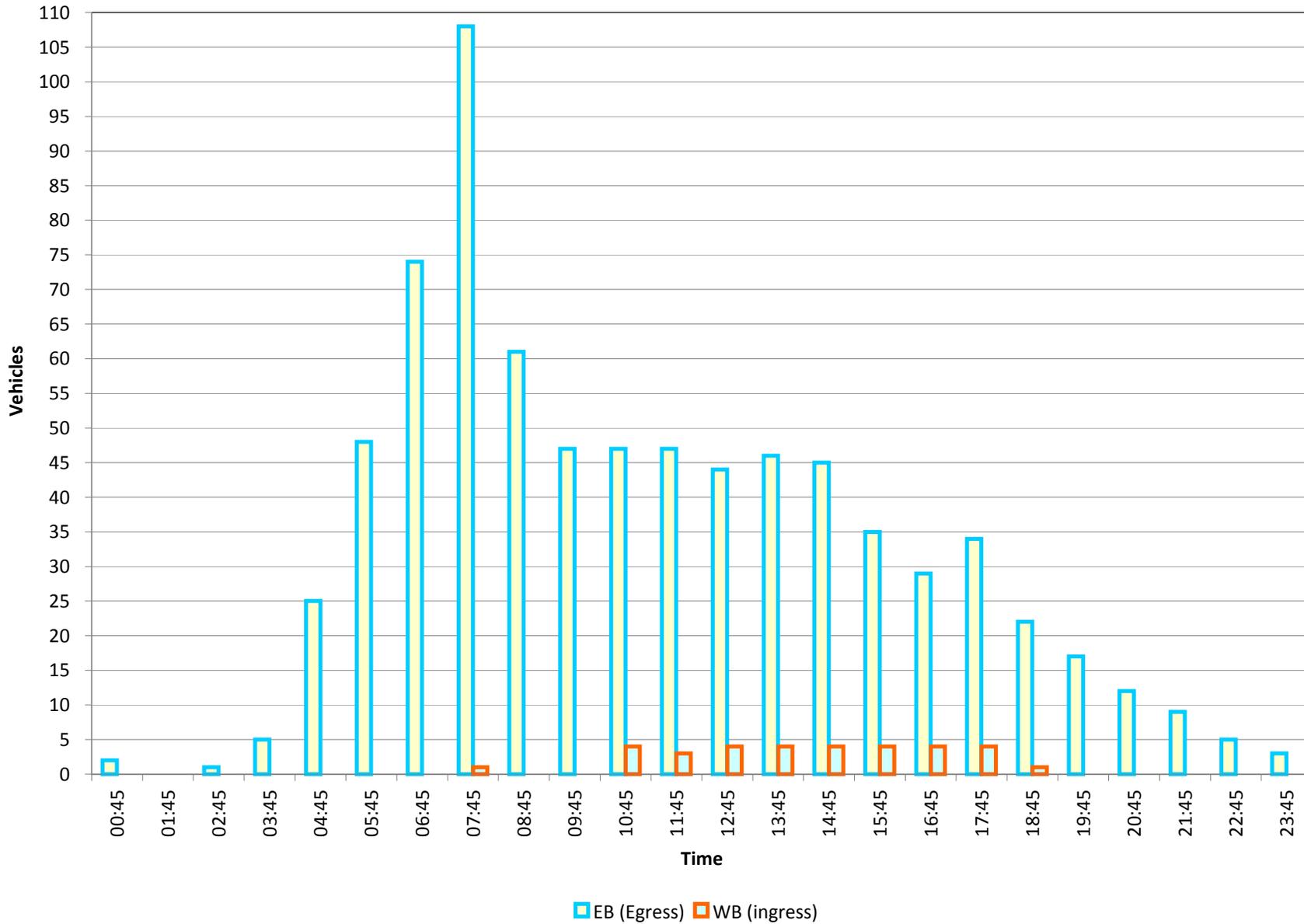
AM Period	NB	SB	EB	WB	PM Period	NB	SB	EB	WB			
00:00			0	0	12:00			12	1			
00:15			1	0	12:15			10	1			
00:30			0	3	0	0	3	11	47	1	3	50
00:45			2	0	12:45			14	1			
01:00			0	0	13:00			14	1			
01:15			0	0	13:15			5	1			
01:30			0	2	0	0	2	11	44	1	4	48
01:45			0	0	13:45			12	1			
02:00			0	0	14:00			14	1			
02:15			0	0	14:15			10	1			
02:30			0	0	0	0	0	10	46	1	4	50
02:45			1	0	14:45			13	1			
03:00			0	0	15:00			12	1			
03:15			0	0	15:15			12	1			
03:30			0	1	0	0	1	8	45	1	4	49
03:45			1	0	15:45			10	1			
04:00			1	0	16:00			11	1			
04:15			1	0	16:15			6	1			
04:30			2	5	0	0	5	8	35	1	4	39
04:45			4	0	16:45			5	1			
05:00			4	0	17:00			6	1			
05:15			8	0	17:15			10	1			
05:30			9	25	0	0	25	8	29	1	4	33
05:45			7	0	17:45			10	1			
06:00			8	0	18:00			7	1			
06:15			14	0	18:15			8	1			
06:30			19	48	0	0	48	9	34	1	4	38
06:45			17	0	18:45			9	0			
07:00			12	0	19:00			6	0			
07:15			20	0	19:15			5	1			
07:30			25	74	0	0	74	2	22	0	1	23
07:45			23	1	19:45			4	0			
08:00			26	0	20:00			4	0			
08:15			33	0	20:15			5	0			
08:30			26	108	0	1	109	4	17	0	0	17
08:45			20	0	20:45			2	0			
09:00			9	0	21:00			4	0			
09:15			15	0	21:15			2	0			
09:30			17	61	0	0	61	4	12	0	0	12
09:45			12	0	21:45			3	0			
10:00			12	0	22:00			3	0			
10:15			9	0	22:15			2	0			
10:30			14	47	0	0	47	1	9	0	0	9
10:45			14	1	22:45			1	0			
11:00			11	1	23:00			2	0			
11:15			9	1	23:15			1	0			
11:30			13	47	1	4	51	1	5	0	0	5
11:45			14	0	23:45			2	0			

**Total Vol.** 421 5 **426** 345 28 **373**

**Daily Totals**

NB	SB	EB	WB
		766	33
Combined			
<b>799</b>			

Split %	AM			PM		
	98.8%	1.2%	53.3%	92.5%	7.5%	46.7%
<b>Peak Hour</b>	07:45	10:45	<b>07:45</b>	12:15	12:00	<b>12:15</b>
<b>Volume</b>	108	4	<b>109</b>	49	4	<b>53</b>
<b>P.H.F.</b>	0.82	1.00	<b>0.83</b>	0.88	1.00	<b>0.88</b>



Project #: 05-0Q620K

Jurisdiction: California Department of Transportation

Location: El Campo Road: Highway 101 Cross-Over

Count Date: 10/21/2008 - 10/27/2008 (Weekend ADT)

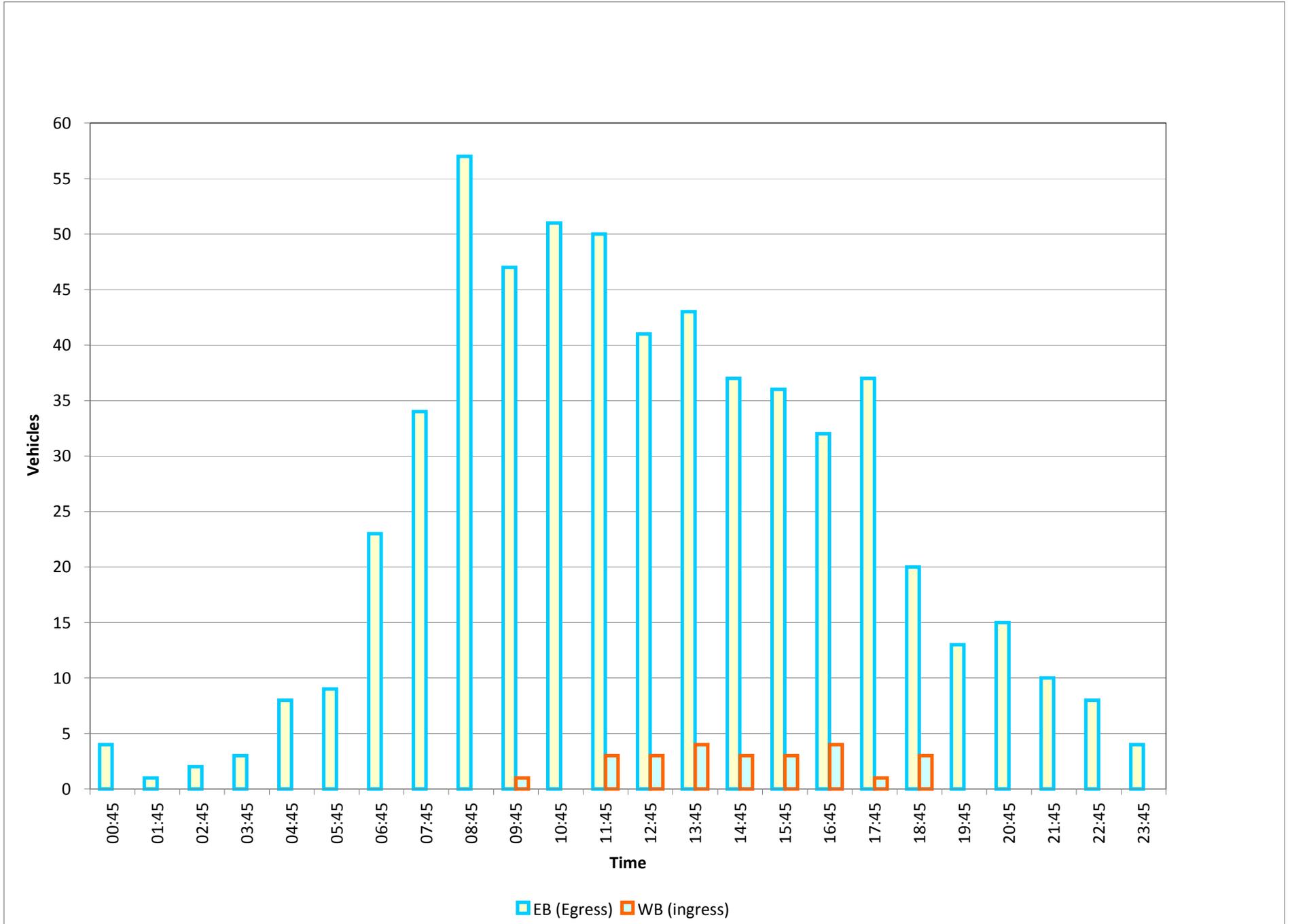
AM Period	NB	SB	EB	WB	PM Period	NB	SB	EB	WB				
00:00			0	0	12:00			11	0				
00:15			2	0	12:15			14	1				
00:30			1	4	0	4	12:30	13	50	1	3	53	
00:45			3	0	12:45			8	1				
01:00			0	0	13:00			13	1				
01:15			0	0	13:15			9	1				
01:30			1	4	0	4	13:30	11	41	0	3	44	
01:45			0	0	13:45			12	1				
02:00			0	0	14:00			8	1				
02:15			1	0	14:15			12	1				
02:30			0	1	0	1	14:30	11	43	1	4	47	
02:45			0	0	14:45			10	0				
03:00			0	0	15:00			10	1				
03:15			0	0	15:15			8	1				
03:30			2	2	0	0	2	15:30	9	37	1	3	40
03:45			2	0	15:45			8	0				
04:00			0	0	16:00			7	1				
04:15			0	0	16:15			9	1				
04:30			1	3	0	0	3	16:30	12	36	1	3	39
04:45			2	0	16:45			7	1				
05:00			1	0	17:00			9	1				
05:15			1	0	17:15			8	1				
05:30			4	8	0	0	8	17:30	8	32	1	4	36
05:45			2	0	17:45			10	1				
06:00			2	0	18:00			8	0				
06:15			1	0	18:15			10	0				
06:30			4	9	0	0	9	18:30	9	37	0	1	38
06:45			5	0	18:45			6	1				
07:00			4	0	19:00			5	1				
07:15			9	0	19:15			6	0				
07:30			5	23	0	0	23	19:30	3	20	1	3	23
07:45			9	0	19:45			4	0				
08:00			6	0	20:00			3	0				
08:15			9	0	20:15			5	0				
08:30			10	34	0	0	34	20:30	1	13	0	0	13
08:45			17	0	20:45			4	0				
09:00			12	0	21:00			3	0				
09:15			15	0	21:15			3	0				
09:30			13	57	0	0	57	21:30	5	15	0	0	15
09:45			11	0	21:45			2	0				
10:00			10	1	22:00			3	0				
10:15			14	0	22:15			3	0				
10:30			12	47	0	1	48	22:30	2	10	0	0	10
10:45			21	0	22:45			2	0				
11:00			9	0	23:00			1	0				
11:15			13	0	23:15			1	0				
11:30			8	51	0	0	51	23:30	4	8	0	0	8
11:45			12	1	23:45			1	0				

**Total Vol.** 243 1 **244** 342 24 **366**

**Daily Totals**

NB	SB	EB	WB
		585	25
Combined			
610			

Split %	AM			PM		
	99.6%	0.4%	40.0%	93.4%	6.6%	60.0%
<b>Peak Hour</b>	08:45	11:45	<b>10:00</b>	12:15	12:15	<b>12:15</b>
<b>Volume</b>	57	3	<b>58</b>	48	4	<b>52</b>
<b>P.H.F.</b>	0.84	0.75	<b>0.69</b>	0.86	1.00	<b>0.87</b>



# Attachment G

## El Campo Road

### West of Hwy 101

-  Weekly Average Daily Counts
-  Typical Average Daily Counts
-  Weekend Average Daily Counts

Project #: 05-0Q620K

Jurisdiction: California Department of Transportation

Location: El Campo Road

Count Date: 10/21/2008 - 10/27/2008 (7 - Day ADT)

AM Period	NB	SB	EB	WB	PM Period	NB	SB	EB	WB			
00:00			0	2	12:00			10	21			
00:15			1	4	12:15			11	43	24	84	127
00:30			0	1	12:30			11	22			
00:45			1	1	12:45			11	20			
01:00			0	1	13:00			12	24			
01:15			0	1	13:15			7	41	22	88	129
01:30			1	1	13:30			11	19			
01:45			0	1	13:45			10	22			
02:00			0	1	14:00			10	22			
02:15			0	1	14:15			10	41	20	83	124
02:30			0	1	14:30			10	26			
02:45			1	0	14:45			12	27			
03:00			0	1	15:00			10	25			
03:15			0	1	15:15			10	42	31	109	151
03:30			1	0	15:30			8	31			
03:45			1	0	15:45			8	27			
04:00			1	1	16:00			8	32			
04:15			0	3	16:15			7	31	30	120	151
04:30			1	0	16:30			9	34			
04:45			3	0	16:45			6	29			
05:00			3	1	17:00			7	35			
05:15			5	12	17:15			9	31	35	133	164
05:30			7	2	17:30			6	27			
05:45			6	3	17:45			9	25			
06:00			6	5	18:00			7	21			
06:15			8	27	18:15			8	30	23	96	126
06:30			13	4	18:30			8	19			
06:45			12	11	18:45			8	20			
07:00			9	9	19:00			6	18			
07:15			16	50	19:15			5	27	16	73	100
07:30			16	13	19:30			3	18			
07:45			17	18	19:45			3	17			
08:00			19	11	20:00			3	13			
08:15			23	75	20:15			4	13	10	58	71
08:30			18	13	20:30			2	9			
08:45			18	17	20:45			3	12			
09:00			9	16	21:00			3	10			
09:15			13	58	21:15			2	10	10	41	51
09:30			14	14	21:30			3	8			
09:45			13	15	21:45			3	7			
10:00			10	13	22:00			3	7			
10:15			11	48	22:15			2	11	6	28	39
10:30			12	16	22:30			2	5			
10:45			15	15	22:45			2	4			
11:00			10	16	23:00			1	5			
11:15			10	47	23:15			1	6	2	16	22
11:30			10	18	23:30			2	4			
11:45			12	21	23:45			1	3			

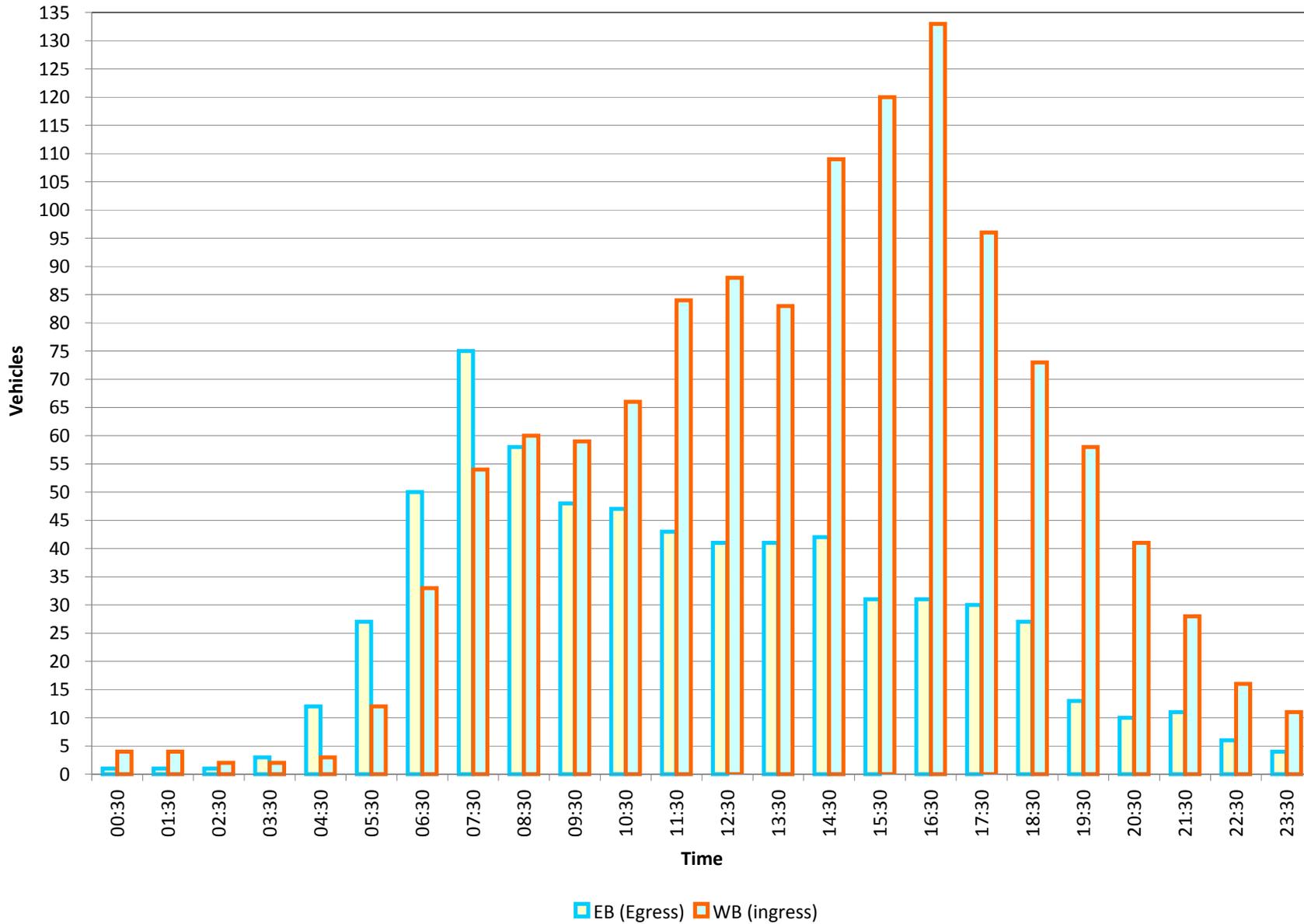
**Total Vol.** 327 310 **637** 326 929 **1255**

**Daily Totals**

NB	SB	EB	WB
		653	1239

**1892**

Split %	AM			PM		
	51.3%	48.7%	33.7%	26.0%	74.0%	66.3%
<b>Peak Hour</b>	08:00	11:45	<b>11:45</b>	12:15	16:30	<b>16:30</b>
<b>Volume</b>	78	88	<b>132</b>	45	133	<b>164</b>
<b>P.H.F.</b>	0.85	0.92	<b>0.94</b>	0.94	0.95	<b>0.93</b>



Project #: 05-0Q620K

Jurisdiction: California Department of Transportation

Location: El Campo Road

Count Date: 10/21/2008 - 10/27/2008 (Typical ADT)

AM Period	NB	SB	EB	WB	PM Period	NB	SB	EB	WB
00:00			0	1	12:00			11	25
00:15			1	3	12:15			9	45
00:30			0	1	12:30			10	19
00:45			1	0	12:45			13	20
01:00			0	0	13:00			13	25
01:15			0	1	13:15			4	40
01:30			0	1	13:30			10	19
01:45			0	1	13:45			11	23
02:00			0	1	14:00			13	19
02:15			0	0	14:15			10	44
02:30			0	1	14:30			9	21
02:45			1	0	14:45			12	32
03:00			0	1	15:00			11	24
03:15			0	1	15:15			11	43
03:30			0	0	15:30			7	35
03:45			1	0	15:45			9	34
04:00			1	1	16:00			10	36
04:15			1	3	16:15			6	32
04:30			1	0	16:30			7	35
04:45			3	0	16:45			5	33
05:00			4	0	17:00			5	42
05:15			8	16	17:15			10	27
05:30			8	2	17:30			8	34
05:45			7	2	17:45			9	31
06:00			8	3	18:00			7	21
06:15			13	36	18:15			8	32
06:30			18	6	18:30			8	21
06:45			15	19	18:45			9	20
07:00			11	10	19:00			6	16
07:15			19	63	19:15			5	28
07:30			23	16	19:30			2	17
07:45			22	24	19:45			4	19
08:00			24	12	20:00			3	13
08:15			31	100	20:15			4	13
08:30			24	16	20:30			3	12
08:45			19	20	20:45			2	12
09:00			9	17	21:00			4	9
09:15			14	66	21:15			2	11
09:30			16	17	21:30			4	10
09:45			11	14	21:45			3	7
10:00			11	11	22:00			2	7
10:15			8	46	22:15			2	11
10:30			13	14	22:30			1	3
10:45			13	19	22:45			1	2
11:00			10	17	23:00			1	6
11:15			8	44	23:15			1	4
11:30			12	19	23:30			1	2
11:45			13	15	23:45			1	2

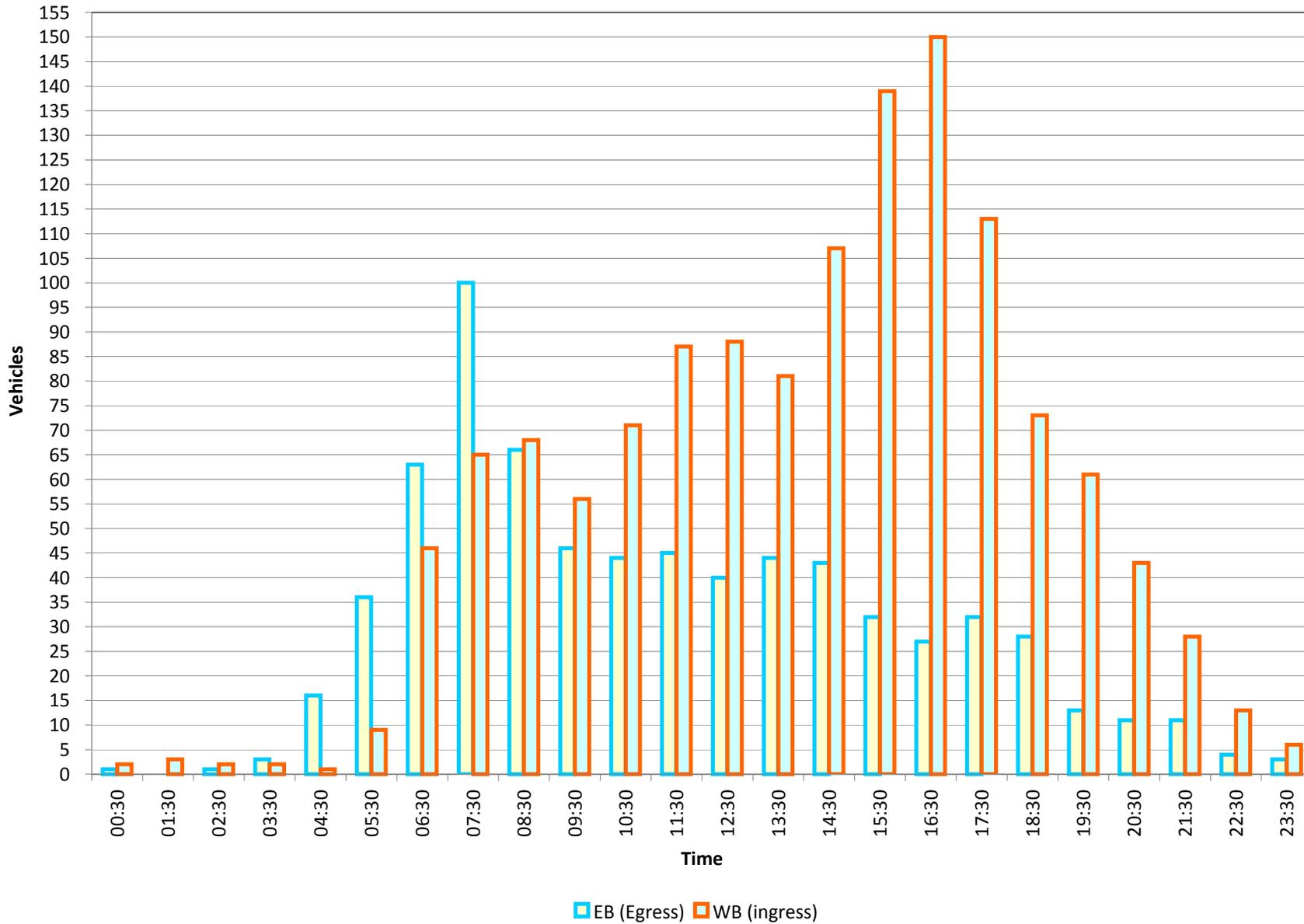
**Total Vol.** 379 331 **710** 330 983 **1313**

**Daily Totals**

NB	SB	EB	WB
		709	1314

**2023**

Split %	AM			PM		
	53.4%	46.6%	35.1%	25.1%	74.9%	64.9%
<b>Peak Hour</b>	07:45	11:30	<b>07:45</b>	12:15	16:30	<b>17:00</b>
<b>Volume</b>	101	87	<b>166</b>	45	150	<b>179</b>
<b>P.H.F.</b>	0.81	0.78	<b>0.90</b>	0.87	0.89	<b>0.90</b>



Project #: 05-0Q620K

Jurisdiction: California Department of Transportation

Location: El Campo Road

Count Date: 10/21/2008 - 10/27/2008 (Weekend - Day ADT)

AM Period	NB	SB	EB	WB	PM Period	NB	SB	EB	WB			
00:00			0	4	12:00			11	14			
00:15			2	3	12:15			12	21			
00:30			1	4	2	13	17	12	46	21	81	127
00:45			3	3	12:45			7	24			
01:00			0	3	13:00			12	24			
01:15			0	3	13:15			8	19			
01:30			1	4	1	10	14	10	37	19	86	123
01:45			0	1	13:45			12	22			
02:00			1	1	14:00			7	24			
02:15			1	1	14:15			11	20			
02:30			1	3	2	5	8	10	40	34	100	140
02:45			0	1	14:45			9	17			
03:00			0	1	15:00			9	18			
03:15			0	1	15:15			7	28			
03:30			2	2	1	4	6	8	33	23	86	119
03:45			1	1	15:45			7	17			
04:00			0	0	16:00			7	19			
04:15			0	0	16:15			8	24			
04:30			1	2	0	1	3	11	33	30	90	123
04:45			2	1	16:45			7	20			
05:00			1	1	17:00			8	23			
05:15			1	3	17:15			7	24			
05:30			3	7	1	6	13	7	29	17	84	113
05:45			2	3	17:45			9	18			
06:00			2	4	18:00			7	16			
06:15			1	1	18:15			10	16			
06:30			4	9	2	10	19	8	34	14	64	98
06:45			5	4	18:45			6	21			
07:00			4	4	19:00			4	20			
07:15			9	4	19:15			5	12			
07:30			5	23	5	17	40	3	18	17	70	88
07:45			9	6	19:45			3	8			
08:00			5	3	20:00			2	11			
08:15			8	5	20:15			5	6			
08:30			9	31	6	20	51	1	11	6	31	42
08:45			16	11	20:45			4	14			
09:00			11	10	21:00			3	10			
09:15			14	10	21:15			2	8			
09:30			12	53	10	41	94	5	14	7	39	53
09:45			11	13	21:45			2	6			
10:00			9	18	22:00			3	7			
10:15			13	15	22:15			3	8			
10:30			11	44	16	62	106	2	10	5	26	36
10:45			20	14	22:45			1	3			
11:00			9	13	23:00			1	4			
11:15			12	13	23:15			1	1			
11:30			7	48	16	56	104	4	7	3	11	18
11:45			11	25	23:45			1	4			

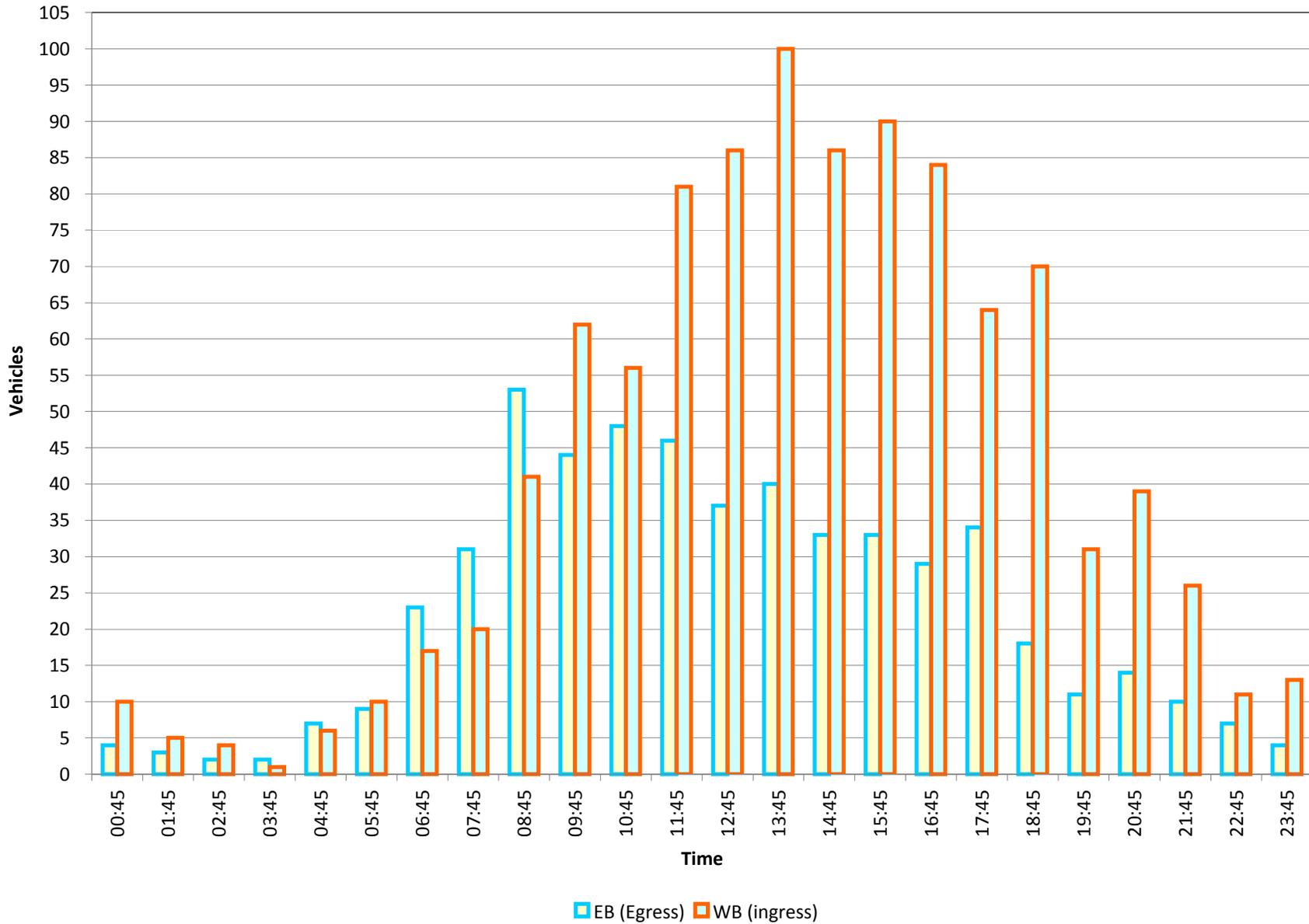
**Total Vol.** 230 245 **475** 312 768 **1080**

**Daily Totals**

NB	SB	EB	WB
542	1013		

**1555**

Split %	AM			PM		
	48.4%	51.6%	30.5%	28.9%	71.1%	69.5%
<b>Peak Hour</b>	08:45	11:45	<b>11:45</b>	12:15	13:45	<b>13:45</b>
<b>Volume</b>	53	81	<b>127</b>	43	100	<b>140</b>
<b>P.H.F.</b>	0.83	0.81	<b>0.88</b>	0.90	0.74	<b>0.80</b>



# Attachment H

## Ramp ADT

-  Thompson Rd./Los Berros Rd. Interchange
-  Grand Avenue Interchange
-  Brisco Rd./Halcyon Rd. Interchange

**2008**  
**Ramp Volumes**  
**On the**  
**California State Freeway System**

**District 5**

**(Includes Counties: Monterey, San Benito,  
San Luis Obispo, Santa Barbara,  
Santa Cruz )**

**Compiled by the**  
**Division of Traffic Operations**

**Of the**

**State of California**  
**Business, Transportation and Housing Agency**  
**Department of Transportation**

**Prepared in cooperation with the**  
**U.S. Department of Transportation**  
**Federal Highway Administration**

**June 2009**

14:21:38

PRINT FILE FOR RAMP AADT

## 05-SLO-101

P P	POST MILE	P S DESCRIPTION	1999 AADT	2000 AADT	2001 AADT	2002 AADT	2003 AADT	2004 AADT	2005 AADT	2006 AADT	2007 AADT	2008 AADT
	000.670	101/166 SB ON	5100			5500			6310			7200
	000.680	101/166 NB OFF	5300			5400			6120			6700
	000.980	101/166 SB OFF	750			1050			860			1100
	001.002	101/166 NB ON	900			750			930			900
	004.720	ROBBINS SB ON	5100			5900				5600		5500
	004.730	ROBBINS NB OFF	5400			6100				5900		5500
	004.980	ROBBINS NB ON	5250			5800				5700		5800
	005.000	ROBBINS SB OFF	4700			5750				5900		5800
	007.600	LOS BERROS NB OFF	2350			2500				2400		
	007.640	LOS BERROS SB ON	2300			2600				2400		
	008.060	LOS BERROS NB ON Q	1800			2050				2400		
	008.255	LOS BERROS SB OFF	1500			2000				2200		
	012.420	BRIDGE SB ON	3200							3200		
	012.430	BRIDGE NB OFF	3600			3900				3600		
	012.930	VALLEY SB OFF	2800			2700				3000		
	013.060	RTE 101/227 NB OFF	3250			3300			3200			2500
	013.100	RTE 101/227 SB ON	4800			5150			5230			3700
	013.314	RTE 101/227 NB ON	6050			6800			6500			5700
	013.320	RTE 101/227 SB OFF	3550			3150			3470			2800
	013.560	BRISCO SB ON	2650			3200			3280			2900
	013.640	BRISCO NB OFF	2000			3000			2980			2700
	013.680	BRISCO SB OFF	4300			5200			5140			4800

14:21:38

PRINT FILE FOR RAMP AADT

## 05-SLO-101

P P	POST MILE	P S DESCRIPTION	1999 AADT	2000 AADT	2001 AADT	2002 AADT	2003 AADT	2004 AADT	2005 AADT	2006 AADT	2007 AADT	2008 AADT
	013.920	BRISCO NB ON	3900			4100			4100			4000
	014.181	NBOFF TO W BRANCH/CAMNO		3250			3200		3110			
	014.304	NBON FR W.BRANCH/CAMINO		1450			2600		3120			
	014.730	OAK PARK NB ON		6350			6500		6520			
	014.776	SBON FR EL CAMINO REAL		2200			2400		2190			
	015.045	SBOFF TO EL CAMINO REAL		6650			7000		6980			
	015.360	4TH ST SB ON RAMP				2800						
	015.370	4TH ST NB OFF RAMP				4750			5030			
	015.508	FOURTH ST (SO) SB OFF RAMP							3380			
	015.760	4TH ST NB ON RAMP				6900			7000			
	015.860	4TH ST SB OFF RAMP				2350			2270			
	016.020	PISMO OH NB ON				3850			3090			
	016.110	PISMO OH SB OFF				7100			8220			
	016.320	VILLA CRK NB OFF		6350			6900			6600		
	016.330	VILLA CRK SB ON		9350			10000			9700		
	016.720	HINDS SB OFF		600			800			730		
	016.790	NB OFF TO WADSWORTH		1700			1900					
	017.160	101/1 SEP NB ON		1900			2150			2200		
	017.240	101/1 SEP SB OFF		2650			1300			2900		
	017.620	N PISMO SEP NB OFF		2350			2900			2500		
	017.660	N PISMO SEP SB OFF		1520			3000			1300		
	017.880	N PISMO SEP NB ON		1800			2100			2200		

# Attachment I

## Evaluation Criteria

-  Final Willow Road Traffic Study – P5
-  Willow Road Extension SEIR – PV.B.6
-  City of Arroyo Grande – LOS Policy
-  Brisco Road Memo – 05/12/2008

Table 3 Unsignalized Intersection Level of Service Definitions		
Level of Service	Unsignalized Intersection	Average Control Delay (sec / veh)
A	No delay for stop-controlled approaches.	0 - 10
B	Operations with minor delay.	> 10 – 15
C	Operations with moderate delays.	> 15 – 25
D	Operations with some delays.	>25 - 35
E	Operations with high delays, and long queues.	> 35 – 50
F	Operation with extreme congestion, with very high delays and long queues unacceptable to most drivers.	> 50

Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

### Evaluation Criteria

Traffic operations were evaluated under existing (Year 2003) conditions and Year 2030 traffic conditions with and without the project alternatives in place. San Luis Obispo County has identified LOS D as the criterion for acceptable operations. The California Department of Transportation (Caltrans) strives to achieve LOS C operations for state-maintained facilities, but accepts LOS D as a goal in more developed and congested areas, which will include Nipomo by 2030. Therefore, LOS D will serve as the evaluation standard for the freeway ramp junction and intersection (signalized and unsignalized) operations.

**Table V.B-2: Peak Hour LOS for Existing Project Area Ramp Junctionures and Intersections**

<b>Ramp Junctionure or Intersection</b>	<b>Existing (AM/PM)</b>
<b>Study Area Ramp Junctionures</b>	
SB Off-ramp at Los Berros Rd	C/D
SB On-ramp from Los Berros Rd	C/D
NB Off-ramp at Los Berros Rd	C/C
NB On-ramp from Los Berros Rd	C/C
SB Off-ramp at Tefft St	C/D
SB On-ramp from Tefft St	C/D
NB Off-ramp from Tefft St	C/C
NB On-ramp from Tefft St	C/C
<b>Study Area Intersections</b>	
SB US 101 Ramps/Los Berros Rd	B/C
NB US 101 Ramps/Los Berros Rd	C/C
SB US 101 Ramps/Tefft St	<b>E/E</b>
NB US 101 Ramps/Tefft St	C/C
Willow Rd/Pomeroy Rd	A/B
Willow Rd/Hetrick Ave	A/A

Note: LOS shown in **Bold** denotes unacceptable service.

## 2. Thresholds of Significance

Significance criteria for evaluating project impacts on traffic conditions derive from the CEQA Guidelines Appendix G and the County of San Luis Obispo Initial Study Checklist. The project would have a significant impact if any of the following conditions occur.

- The project causes traffic conditions to exceed, either individually or cumulatively, level of service D<sup>1</sup>;
- The project causes an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system;
- The project increases vehicle trips to the local or area-wide circulation system;
- The project results in inadequate emergency access;
- The project substantially increases hazards due to a design feature or incompatible uses;
- The project conflicts with adopted policies, plan, or programs supporting alternative transportation;
- The project results in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;

<sup>1</sup> San Luis Obispo County and Caltrans have both established LOS C as a Countywide target on all County- and State-maintained roads and highways. However, LOS D is accepted in more developed and congested areas, which will include Nipomo by 2030.

## CIRCULATION ELEMENT

### OBJECTIVES AND POLICIES

#### *Streets and Highways Standards*

**CT1. Plan and develop a coordinated and efficient, functional classification system of local streets and highways throughout the community that designates the purpose and physical characteristics of the roadway, composed of the five categories.**

- CT1-1 State Freeway 101, 4 to 6 lane with interchange access: Caltrans design standards or as mutually approved. Typically 120' or more.
- CT1-2 Major Arterial Street – 4 lane with or without median; City controlled access, on-street parking optional; include bike lanes, sidewalks, transit turnouts and other design features: 80' – 104' r of w.
- CT1-3 State Highway 227 or Minor Arterial Streets – 2 to 4 lanes with or without median/turn lane: State or City controlled access, on-street parking optional; includes bike lanes, sidewalks, some transit and other design features: 64' – 104' r of w.
- CT1-4 Collector Streets – 2 lanes with or without turn lane, controlled access, on-street parking optional; includes bike lanes, sidewalks, some transit and other design features: 84' r of w.
- CT 1-5 Local Streets – 2 lanes, access and on-street parking; includes some bike lanes, sidewalks on one or both sides, other design variables in hillside, cul-de-sac, or other special conditions: 42' – 60' r of w.
- CT1-6 All street standards shall be reviewed and revised as determined appropriate including optional features such as landscaped medians, curb bulbouts and parkways and/or street trees and similar design amenities when approved by the City. Alternative local street standards for neo-traditional subdivisions or Planned Developments/Specific Plans will also be considered.

#### *Level of Service*

**CT2. Attain and maintain Level of Service (LOS)'C' or better on all streets and controlled intersections.**

- CT2-1 Where deficiencies exist, mitigate to an LOS 'D' at a minimum and plan improvement to achieve LOS 'C' (Los 'E' or 'F' unacceptable = significant adverse impact unless Statement of Overriding Considerations or CEQA Findings approved). The design and funding for such planned improvements shall be sufficiently definite to enable construction within a reasonable period of time.
- CT2-2 The City should conduct periodic traffic counts, monitor selected streets and model arterial and collector street network to determine where LOS 'C' is not attained and provide a current baseline for development project impact analyses.

- CT2-3    Require that General Plan Amendments, Rezoning Applications or development projects involving 20 or more estimated peak hour trip additions provide traffic studies according to City LOS policy, including subsequent amendments and refinements.
  - CT2-3.1    Traffic studies shall include roadway capacity, safety and design analysis using Highway Capacity Manual methodology.
  - CT2-3.2    Traffic studies shall describe possible mitigation measures available to attain LOS 'C' or better and project-related methods of funding.
  - CT2-3.3    Public Works Director should meet with applicants prior to application to discuss study scope, probable impacts and mitigation.
- CT2-4    The City should periodically review LOS policy and actual system performance to identify model deficiencies and consider Capital Improvement Programs, mitigation measures and/or policy revision and refinement.

# Technical Memorandum



**To:** City of Arroyo Grande – Don Spagnolo, Steve Adams  
**Cc:** Wood Rodgers – Mark Rayback, Keith Hallsten  
**From:** Wood Rodgers – Ravi Narayanan, P.E., Bikramjit Kahlon, E.I.T.  
**Date:** 05/12/2008  
**File:** J:\Jobs\8094-ArroyoGrande\BriscoHalcyon\101PR\Traffic\Docs\Reports\8094-SR101BriscoHalcyon\_Traffic\rcstg&Ops\_05122008.doc  
**Job No.:** 8094.001  
**RE:** SR 101/Brisco Rd/Halcyon Rd I/C Modifications, 05-0A370, 05-SLO-101, KP 21.2/23.5 (PM 13.1/14.6)  
Project Approval & Environmental Determination (PA&ED) Phase  
“Alternative 3A” Traffic Operations Analysis

**Draft**

## INTRODUCTION & BACKGROUND

In 2001, the City of Arroyo Grande completed a *Project Study Report (Project Development Support)* [PSR(PDS)] to develop and study alternatives to improve the operation of the Brisco Road – Halcyon Road interchange on State Route 101 (SR 101) in the central portion of the city. The approved PSR(PDS) identified five “build” alternatives, and recommended that three “build” alternatives and the “no-build” alternative be carried forward for further evaluation. The current effort was initiated in 2005 as part of the *Project Approval & Environmental Determination* (PA&ED) phase intended to further refine the project alternatives, complete environmental analysis for the interchange improvements, and to obtain Caltrans District 5 (and SLOCOG) approval of a *Project Report* (PR) to define a project for design and construction. Wood Rodgers prepared a technical memorandum titled *SR 101/Brisco Rd/Halcyon Rd I/C Modifications Traffic Forecasting and Operations Analysis* (dated 08/08/2005) in order to quantify traffic operations for the four project alternatives (the “no-build” and “build” alternatives 1, 2 and 3). Per City request, three supplemental technical memorandums (Wood Rodgers, dated 06/04/2007, 11/19/2007, and 12/21/2007) were completed to evaluate additional alternatives/options and phasing concepts. A “summary memorandum” (Wood Rodgers, dated 11/21/2007) was also completed to help assist in the Council and PDT selection of a “preferred” alternative and a phasing strategy for the project. Subsequent to discussions between City, Caltrans and SLOCOG staff, it was agreed that an “operational improvement” project (essentially a first phase of Alternative 1, whereby the Brisco ramps are kept open) be further refined as an interim solution to alleviate some of the existing operational issues on Brisco Road at the undercrossing. To that end, Wood Rodgers completed *Synchro/SimTraffic* analysis that quantified current operational deficiencies at the intersections adjacent to the Brisco Road Undercrossing, and reviewed the analysis files with Caltrans Traffic Operations staff. Caltrans staff indicated formal approval of the “existing conditions operational analysis” at the project discussion meeting held on 01/25/08.

City staff subsequently directed that Alternative 3 (as described in the 08/08/2005 memorandum) be taken up for further consideration. Several variants of the Alternative 3 concept were explored at meetings with City staff held on 03/04/2008 and 04/28/2008. A variation of Alternative 3 – now referred to as “**Alternative 3A**” – was developed through this process. This memorandum has been prepared to document cumulative (year 2030) operational analysis for the newly proposed Alternative 3A.

## "ALTERNATIVE 3A" DESCRIPTION

"Alternative 3A" is a variant of Alternative 3 as originally proposed in the PSR(PDS). **Appendix Exhibit 1** illustrates "Alternative 3A" concept, which includes the following design features:

- Closure of SR 101 northbound on- and off-ramps at Brisco Road and removal of the traffic signal equipment at the ramp intersection.
- Lengthening the Brisco Road Undercrossing to accommodate four lanes on Brisco Road. (*Note:* This feature may not be implemented during the first phase of construction for Alternative 3A. This analysis includes an estimate of the required schedule for the widening of Brisco Road.)
- Closure and removal of the SR 101 northbound on-ramp from East Grand Avenue.
- Realignment of West Branch Street to intersect East Grand Avenue at the current location of the SR 101 northbound on-ramp. West Branch Street, to the east of the proposed realignment, would be reconstructed so that access to adjacent properties is maintained. The existing West Branch Street approach to East Grand Avenue will be terminated as a cul-de-sac.
- Construction of a new SR 101 northbound hook on- and off-ramps to intersect with West Branch Street across from Old Ranch Road, and implementation of appropriate intersection control (traffic signal or roundabout).
- East Grand Avenue / SR 101 Northbound Off-Ramp intersection modifications – "Pork chop" islands (at both the SR 101 northbound off-ramp approach and West Branch Street approach) will be constructed to permit only left- and right-turn traffic movements from the SR 101 northbound off-ramp and southbound West Branch Street. The eastbound left-turn movement from Grand Avenue to W. Branch Street will be retained. The pork chop configuration will prevent through traffic movements between the northbound off-ramp and West Branch Street. The Grand Avenue eastbound approach stop bar will be moved approximately 150 feet west to provide space for safe left turns from the off-ramp to westbound Grand Avenue. An exclusive right-turn lane will be provided on the westbound Grand Avenue approach for vehicles turning onto W. Branch Street. The single left-turn lane on the SR 101 northbound off-ramp will be retained for vehicles turning onto westbound East Grand Avenue.
- Relocation of the southbound SR 101 on-ramp at East Grand Avenue to opposite the existing SR 101 southbound off-ramp, and associated traffic signal phasing modifications.
- Lengthening the SR 101 southbound off-ramp to Halcyon Road.
- Construction of an auxiliary lane on SR 101 between the Halcyon Road southbound on-ramp and the East Grand Avenue southbound off-ramp and construction of a retaining wall adjacent to this auxiliary lane. *Note:* This auxiliary lane is being constructed as a separate SLOCOG project, so may not be considered a part of Alternative 3A.

Under "Alternative 3A", the following optional features are also evaluated in this memorandum:

Schedule for lengthening the Brisco Road Undercrossing – The potential for deferring the widening of Brisco Road by lengthening the Brisco Road Undercrossing to a later stage of the project is evaluated. Restriping Brisco Road under the existing undercrossing to accommodate two southbound (westbound) lanes and one northbound (eastbound) lane is considered as an interim improvement until more than three lanes are required, making the structure modification necessary.

Control Configuration for West Branch Street/Old Ranch Road intersection – This intersection is evaluated for operations as a traffic signal-controlled intersection versus a roundabout intersection.

Old Ranch Road Closure – The impacts of terminating Old Ranch Road near its connection to West Branch Street are evaluated. The southerly segment of Old Ranch Road would terminate as a *cul-de-sac* just east of West Branch Street to provide driveway access to the proposed Sports and Fitness

Center located southeast of the West Branch Street/Old Ranch Road intersection. The northerly segment of Old Ranch Road would connect to Vernon Street.

## “YEAR 2030 ALTERNATIVE 3A” OPERATIONS

**Appendix Figure 1** illustrates the cumulative “Year 2030” traffic volume forecasts for Alternative 3A. The City of Arroyo Grande completed a “before/after” test study in May-June 2007, to determine traffic redistribution due to a temporary closure of the SR 101 northbound on/off ramps at Brisco Road. The Alternative 1 traffic forecasts adjusted based on findings from the City’s “before/after” study were included in the 11/19/2007 memorandum. The “Alternative 3A” forecasts included in this memorandum are revisions to the “Alternative 3” forecasts (as reported in the 08/08/2005 memorandum); with further adjustments based on the findings of the City’s “before/after” study.

### INTERSECTION OPERATIONS

Year 2030 “Alternative 3A” intersection operations were quantified using the year 2030 traffic volumes shown in Appendix Figure 1, and Alternative 3A improvements illustrated in Appendix Exhibit 1. Table 1 presents the resulting intersection levels of service (LOS).

**Table 1. Year 2030 “Alternative 3A” Conditions: Intersection Levels of Service**

#	Intersection	Control Type	AM Peak Hour		PM Peak Hour	
			Delay <sup>1</sup>	LOS	Delay <sup>1</sup>	LOS
4	West Branch St / Camino Mercado / SR 101 NB Ramps	Signal	40.2	D	61.4 <sup>2</sup>	E <sup>2</sup>
5	Brisco Rd / El Camino Real	Signal	21.2	B	46.7	D
6	Brisco Rd / SR 101 NB Ramps	Does not Exist				
7	Brisco Rd / West Branch St	Signal	17.2	B	18.8	B
8	Halcyon Rd / El Camino Real / SR 101 SB Ramps	Signal	42.1	D	40.4	D
9	Grand Ave / SR 101 SB Ramps	Signal	13.4	B	26.1	C
10	Grand Ave / SR 101 NB Off-Ramp / West Branch Street	Signal	30.6	C	33.1	C
12	West Branch St / Old Ranch Rd / SR 101 NB Ramps	Signal	27.0	C	31.5	C
		Roundabout <sup>3</sup>	7.6	A	23.2	C

*Notes:*

1. “Average” control delays (in seconds/vehicle) are indicated for signal-controlled intersections and Rodel-software based roundabout control delays. V/C ratios are indicated for Synchro based and HCM-2000 based roundabout capacity calculations.
2. Mitigation strategies for LOS “E” conditions at this intersection are discussed in the memorandum text.
3. Results are based on Rodel software used in conjunction with the FHWA roundabout design guidelines.

As shown in Table 1, all study intersections are projected to operate at acceptable LOS conditions in year 2030, except the Camino Mercado/West Branch Street/SR 101 northbound on-off ramps intersection, which is projected to operate at LOS “E” in the afternoon peak hour. Furthermore, the Grand Avenue eastbound left turn lane from Grand Avenue to West Branch Street is projected to experience queues that exceed available capacity under AM and PM peak hour conditions in 2030. The projected LOS “E” condition at the Camino Mercado/West Branch Street intersection is similar to the projected “Alternative 1” operations (indicated in the 11/19/2007 memorandum) at this intersection in 2030. The potential mitigation strategies for the Camino Mercado/West Branch Street/SR 101 Northbound Ramps intersection include the following:

- Providing two entrance lanes to the SR 101 northbound on-ramp from Camino Mercado (i.e. dual northbound left-turn lanes from West Branch Street), provided the on-ramp can be designed to be acceptable to Caltrans (that is, any design standard exceptions are approvable).
- Other design/control modification at the West Branch Street/Camino Mercado/SR 101 northbound ramps intersection. These could include additional through/turn lanes on the north-south approaches, signal timing adjustments, etc.
- Relaxation of Caltrans/City's minimum LOS standards for the West Branch Street/Camino Mercado/SR 101 northbound ramps intersection by accepting projected LOS "E" operating conditions at this intersection.

### **TRAFFIC SIGNAL VS. ROUNDABOUT AT WEST BRANCH STREET / OLD RANCH ROAD / SR 101 NORTHBOUND RAMPS INTERSECTION**

As indicated in Table 1, the West Branch Street / Old Ranch Road / SR 101 Northbound Ramps intersection was evaluated under two different intersection control scenarios – traffic signal and roundabout.

Traffic Signal – A preliminary analysis using *California MUTCD*-based peak hour volume signal warrant #3 criteria indicates that a traffic signal would be warranted at the West Branch Street / Old Ranch Road / SR 101 Northbound Ramps intersection. As shown in Table 1, a traffic signal is projected to provide acceptable intersection LOS operations in year 2030, with minor modifications (i.e., addition of left-turn lanes). However, long queues (>700 feet) are projected during the peak hour periods for the westbound (northbound) West Branch Street left-turn traffic movement. The provision of dual left-turn lanes for this movement could reduce the maximum queue lengths to approximately 200 feet during the peak hour periods. However, dual left-turn lanes would require provision of two receiving lanes on the SR 101 northbound on-ramp, which may not be acceptable to Caltrans, so a single northbound left turn lane is retained.

Roundabout – The projected 2030 PM peak hour circulating flow is close to the HCM-2000 based allowable maximum of 1,200 vehicles per hour for an urban single-lane roundabout. Therefore, large diameters and entrance angles would be needed for efficient roundabout operation. The *Rodel* software was used in this roundabout feasibility evaluation. *Rodel* is a recognized British roundabout analysis software (also widely accepted in the US) that provides interactive feedback on roundabout operations based on user-inputted geometric characteristics. *Rodel* uses roundabout capacity thresholds calibrated based on field-measured "at capacity" conditions for roundabouts operational in Britain. HCM-2000 (and *Synchro* software) analysis methods (which use theoretical upper and lower bound volume/capacity ratios, dependent on intersection approach flows and circulating flows) are not considered accurate for evaluation of multi-lane roundabouts and/or roundabouts with circulating flows exceeding 1,200 vehicles per hour. As indicated in Table 1, preliminary evaluation using the *Rodel* software indicates that peak hour LOS "D" or better roundabout operations can be achieved at the West Branch Street/Old Ranch Road/SR 101 Northbound Ramps intersection in 2030 if the following geometrics can be provided:

- Single-lane roundabout with a minimum inscribed circular diameter (D) of 120 feet.
- Entrance width (E) of 20 feet for westbound (northbound) West Branch Street approach and 16 feet for all other approaches.
- Flare length (L') of 180 feet for westbound (northbound) West Branch Street approach and 80 feet for all other approaches.
- Street half-width section (i.e. lane width, V) of 11 feet.
- Entry radius (R) of 65-feet on all approaches
- Entry angle (phi) of 25 degrees.

Table 2 summarizes the characteristics of a traffic signal versus a roundabout at this location.

**Table 2. Traffic Signal vs. Roundabout at West Branch Street/Old Ranch Road Intersection**

Evaluation Criterion	Traffic Signal	Roundabout
Construction Cost (approximate)	\$400,000-\$500,000	\$200,000-\$400,000
Right-of-way Acquisition Cost (approximate)	Minimal	\$200,000-\$300,000
Operations/Maintenance Cost (approximate)	\$10,000 per year	Minimal
Traffic Operational Capacity	High	Average
Vehicular Traffic Safety (Potential to avoid serious right-angle collisions)	Average	High
Bicycle/Pedestrian Safety	Average	Low
Driver Familiarity	High	Low to Average
Accessibility (for the blind, handicapped, etc.)	High	Low to Average
Potential for Loss of On-site Parking	Average	High
Emergency Response Times	Unaffected	Affected
Pedestrian Walk Times	Average	High
“Traffic Calming” Ability	Minimal	Average to High
Aesthetic Appeal	Low to Average	High
Sustainability (Potential to not become “throw away”)	High	Low to Average

Based on the above comparisons, it is our recommendation that a traffic signal be regarded as the preferred control option for the West Branch Street/Old Ranch Road/SR 101 northbound ramps intersection.

## FREEWAY MAINLINE OPERATIONS

Table 3 summarizes freeway mainline operations for “Alternative 3A” in year 2030 with the existing four-lane freeway mainline cross-section as well as the planned future six-lane cross-section.

**Table 3. Freeway Mainline Traffic Operations for Alternative 3A in 2030**

SR 101 Mainline Segment	Direction	AM Peak Hour				PM Peak Hour			
		4-Lane Mainline		6-Lane Mainline		4-Lane Mainline		6-Lane Mainline	
		Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Just South of Grand Ave I/C	Southbound	21.2	C	13.8	B	Ovrfl	F	24.9	C
	Northbound	<b>35.7</b>	<b>E</b>	21.6	C	19.3	C	12.6	B
B/w Grand Ave I/C & Halcyon Rd I/C	Southbound	19.7	C	12.8	B	Ovrfl	F	24.2	C
B/w Branch St I/C & Camino Mercado I/C	Northbound	34.9	D	21.3	C	20.3	C	13.2	B
B/w Brisco – Halcyon Rd. & Oak Park Blvd. I/C	Southbound	21.1	C	13.7	B	Ovrfl	F	25.7	C
	Northbound	-	-	-	-	-	-	-	-
Just North of Oak Park Blvd. I/C	Southbound	23.1	C	15.1	B	Ovrfl	F	32.8	D
	Northbound	<b>42.8</b>	<b>E</b>	23.6	C	23.3	C	15.2	B

*Notes: pc/mi/ln = passenger cars per mile per lane B/w = between Ovrfl = Density Overflow conditions (density > 45 pc/mi/ln)*

As shown in Table 3, the northbound SR 101 freeway mainline segment between the West Branch Street on-ramp and the off-ramp to Camino Mercado is projected to operate at peak hour LOS “D” or better in 2030 with the existing four-lane mainline section. The remaining SR 101 mainline directional segments are all projected to operate at peak hour period LOS “E” or worse with the existing four-lane cross-section. With the planned future six-lane mainline cross-section, all study mainline segments are projected to operate at LOS “D” or better in all peak hours in 2030.

## FREEWAY MAINLINE-RAMP JUNCTION OPERATIONS

Table 4 summarizes freeway mainline-ramp junction operations for “Alternative 3A” in year 2030 with the existing four-lane freeway mainline cross-section as well as the planned future six-lane mainline section.

**Table 4. Ramp Junction Traffic Operations for Alternative 3A in 2030**

SR 101 Mainline-Ramp Junction	Junction Type	AM Peak Hour				PM Peak Hour			
		4-Lane Mainline		6-Lane Mainline		4-Lane Mainline		6-Lane Mainline	
		Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
<i>SR 101 / East Grand Avenue / West Branch Street / Old Ranch Road I/C</i>									
SR 101 SB On-Ramp	Merge	27.5	C	18.9	B	<b>42.7</b>	<b>F</b>	29.1	D
SR 101 NB Off-Ramp to Grand Ave	Diverge	<b>40.2</b>	<b>E</b>	28.8	D	25.2	C	20.6	C
SR 101 NB Off-Ramp to West Branch St	Diverge	34.5	D	24.8	C	21.1	C	16.6	B
SR 101 NB On-Ramp from West Branch St	Merge	<b>37.3</b>	<b>E</b>	26.2	C	25.0	C	19.4	B
SR 101 SB Off-Ramp	Diverge	25.6	C	22.2	C	<b>44.5</b>	<b>F</b>	28.8	D
<i>SR 101 / Brisco Rd – Halcyon Rd I/C</i>									
SR 101 SB On-Ramp	Merge	24.7	C	17.6	B	<b>41.7</b>	<b>F</b>	27.8	C
SR 101 NB Off-Ramp	Diverge	-	-	-	-	-	-	-	-
SR 101 NB On-Ramp	Merge	-	-	-	-	-	-	-	-
SR 101 SB Off-Ramp	Diverge	27.1	C	21.0	C	<b>46.8</b>	<b>F</b>	32.4	D
<i>SR 101 Northbound Ramps to/from West Branch Street/Camino Mercado</i>									
SR 101 NB Off-Ramp	Diverge	<b>39.7</b>	<b>E</b>	28.1	D	26.3	C	26.3	C
SR 101 NB On-Ramp	Merge	<b>40.7</b>	<b>E</b>	28.3	D	28.0	D	21.0	C
<i>Notes: pc/mi/ln = passenger cars per mile per lane</i>									

As shown in Table 4, the mainline-ramp (diverge) junction at the SR 101 northbound off-ramp to West Branch Street is projected to operate at LOS “D” or better conditions with the existing four-lane mainline section. All other study ramp junctions are projected to operate at LOS “E” or worse in one or both peak hours in year 2030 with the existing four-lane mainline cross-section. With the planned future six-lane mainline section, all study ramp junctions are projected to provide LOS “D” or better operations. With a four-lane mainline, the provision of a northbound auxiliary lane between the Old Ranch Road on-ramp and the Camino Mercado off-ramp would improve ramp junction operations to LOS “D”. However, this improvement may require widening the Brisco Road Undercrossing structure.

## FREEWAY MAINLINE WEAVING OPERATIONS

Freeway mainline weaving operations analysis was completed using the Leisch methodology outlined in the Caltrans *Highway Design Manual*. The results of the weaving segment analysis are shown in Table 5.

**Table 5. SR 101 Mainline Weaving Segment Operations for Alternative 3A in 2030**

SR 101 Mainline Weaving Segment between	Weaving Distance	Vw (pcph)		LOS	
		AM	PM	AM	PM
W. Branch St NB On-Ramp & Camino Mercado NB Off-Ramp	960 m (3,149 ft)	901	1,001	ORW	ORW
El Camino Real SB On-Ramp & Halcyon Rd SB Off-Ramp	1,320 m (4,330 ft)	704	990	ORW	ORW
Halcyon Rd SB On-Ramp & Grand Ave SB Off-Ramp	275 m (900 ft.)	529	826	B	C
<i>Note: pcph = Passenger Cars Per Hour, ORW = Out of Realm of Weaving</i>					

As shown in Table 5, all study weaving segments on SR 101 are projected to operate at LOS “C” or better conditions in 2030 with the existing four-lane mainline section plus auxiliary lanes (in the southbound direction).

### **TIMING FOR BRISCO ROAD UNDERCROSSING LENGTHENING IMPROVEMENTS**

Consistent with the findings of the 08/08/2005 memorandum for Alternatives 1 and 3, the Brisco Road intersections with El Camino Real and West Branch Street are projected to provide acceptable peak hour LOS “D” or better operations through year 2030 under “Alternative 3A” with re-striping of Brisco Road under the existing undercrossing to provide two southbound (westbound) lanes, and one northbound (eastbound) lane (plus a 100-foot northbound left-right shared pocket at West Branch Street). Although these critical intersections provide acceptable Year 2030 LOS operations with such re-striping, queue spillbacks were anticipated between closely-spaced adjacent intersections. Lengthening the existing undercrossing to provide at least four lanes on Brisco Road is necessary to accommodate the projected queues on the southbound and northbound Brisco Road approaches to El Camino Real and Branch Street, respectively. Therefore, the reconstruction of the existing Brisco Road undercrossing is included as a “year 2030” feature under Alternatives 1, 3, and 3A. A phasing analysis was performed in order to evaluate how many years the existing undercrossing would provide adequate operations (queuing) before structure reconstruction is necessary.

The closure of the Brisco Road on- and off-ramps (in the first phase of Alternative 3A) will decrease traffic demands and queuing on Brisco Road under the undercrossing. Under project opening day (year 2010) conditions, the Brisco Road intersections are projected to operate acceptably from an LOS standpoint and the existing three-lane section under the undercrossing is not projected to experience queue spillovers. Therefore, on project opening day (year 2010) it is recommended (and assumed) that the Brisco Road Undercrossing is not lengthened. The Brisco Road intersections at the undercrossing are projected to operate acceptably from an LOS standpoint under Year 2030 “Alternative 3A” conditions. However, the queuing/stacking issues on Brisco Road are projected to reoccur at the undercrossing well before year 2030. A re-stripped Brisco Road with two southbound lanes and one northbound lane, without physical widening, is projected to experience queues that exceed storage capacity under year 2030 conditions. The available queue storage length between El Camino Real and West Branch Street is approximately 270 feet (from stop bar to end of curb return). Based on a review of traffic operations (using *SimTraffic 7* software), the critical southbound left-turn movement is projected to experience queues under the undercrossing that would exceed available storage capacity by approximately year 2020. Therefore, it appears that the widening of Brisco Road to four lanes by reconstruction of the undercrossing would be needed by approximately year 2020 to provide adequate queue storage capacities on Brisco Road, and avoid spillbacks through adjacent intersections.

### **OLD RANCH ROAD CLOSURE**

A preliminary analysis of the impacts of closing and realigning Old Ranch Road was also completed. This concept would terminate Old Ranch Road near its connection to West Branch Street as a *cul-de-sac* providing driveway access to/from the proposed Sports and Fitness Center located southeast of the West Branch Street/Old Branch Street intersection. The northerly segment of Old Ranch Road would be realigned to connect to Vernon Street. This concept is anticipated to cause only minor redistribution of Old Ranch Road traffic volumes (less than 50 peak hour vehicles) to adjacent streets and intersections in the local vicinity. Based on a preliminary review, no significant change to the study intersections, roadways, freeway mainline, and/or freeway ramp junctions LOS operations are projected due to the closure/realignment of Old Ranch Road. Furthermore, the closure of Old Ranch Road is not anticipated to increase the feasibility of the roundabout option at the West Branch Street/Old Ranch Road/SR 101 northbound ramps intersection.

**COMPARISON OF “ALTERNATIVE 1” WITH “ALTERNATIVE 3A”**

Alternative 1 and Alternative 3A are compared in Table 6:

**Table 6. “Alternative 1” and “Alternative 3A” - Pros and Cons**

Alternative	Pros	Cons
<b>Alternative 1</b>	<ul style="list-style-type: none"> <li>• Provides acceptable LOS operations through year 2030</li> <li>• Improves SR 101 mainline, ramp junction and weaving operations</li> <li>• Alleviates traffic demands and queuing issues on Brisco Road undercrossing</li> <li>• Alternative is implementable in phases.</li> <li>• Caltrans mandatory design exceptions are not necessary.</li> <li>• Favored by Caltrans</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of local residents’ freeway access with net loss of two ramps (closure of Brisco Rd on &amp; off ramps)</li> <li>• No compensation is provided to offset loss of ramps (i.e. no new ramp is constructed)</li> <li>• City may need to accept year 2030 LOS “E” operations at Camino Mercado/W. Branch intersection</li> <li>• May cause additional congestion on local streets and frontage roads.</li> <li>• May force residents’ use of circuitous routes and increase their travel times.</li> <li>• May adversely impact City businesses and the local economy.</li> <li>• Not favored by the City.</li> </ul>
<b>Alternative 3A</b>	<ul style="list-style-type: none"> <li>• Provides acceptable LOS operations through year 2030</li> <li>• Slightly improves mainline and weaving operations</li> <li>• Alternative is implementable in phases.</li> <li>• Compensates for loss of Brisco off-ramp with construction of a new off-ramp to Old Ranch Road</li> <li>• Partially compensates for loss of two on-ramps with construction of one new on-ramp at Old Ranch Road</li> <li>• Preserves City residents’ and businesses freeway access opportunities</li> <li>• Minimal impact on City businesses and the local economy.</li> <li>• Favored by the City</li> </ul>	<ul style="list-style-type: none"> <li>• Net loss of one on-ramp</li> <li>• May not significantly improve freeway mainline, ramp junction or weaving operations</li> <li>• City may still need to accept year 2030 LOS “E” operations at Camino Mercado/W. Branch intersection</li> <li>• Additional congestion on local streets and frontage roads still likely</li> <li>• Caltrans mandatory design exceptions are involved.</li> </ul>

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

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Ravi K. Narayanan, P.E., T.E

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May 12, 2008

Date



# Attachment J

## HCM LOS Analysis

### Signalized Intersections

-  Existing Conditions – AM Peak Hour
-  Existing Conditions – PM Peak Hour
-  Project Conditions – AM Peak Hour
-  Project Conditions – PM Peak Hour

HCM Signalized Intersection Capacity Analysis  
 1: El Camino Real & Brisco Road

EA: 05-0Q620K  
 7/17/2009

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	137	36	27	84	455	12	324	42	176	134	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.8	4.8		4.8	4.8	4.8		4.0	4.0		3.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	0.88		1.00	1.00		1.00	
Frt	1.00	0.97		1.00	1.00	0.85		1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00		0.98	
Satd. Flow (prot)	1770	1805		1770	1863	2787		1859	1583		1792	
Flt Permitted	0.70	1.00		0.48	1.00	1.00		1.00	1.00		0.98	
Satd. Flow (perm)	1300	1805		887	1863	2787		1859	1583		1792	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	11	149	39	29	91	495	13	352	46	191	146	38
RTOR Reduction (vph)	0	13	0	0	0	420	0	0	29	0	5	0
Lane Group Flow (vph)	11	175	0	29	91	75	0	365	17	0	370	0
Turn Type	Perm			Perm		Perm	Split		Perm	Split		
Protected Phases		4			8		1	1		2	2	
Permitted Phases	4			8		8			1			
Actuated Green, G (s)	12.2	12.2		12.2	12.2	12.2		29.0	29.0		26.5	
Effective Green, g (s)	12.2	12.2		12.2	12.2	12.2		29.0	29.0		26.5	
Actuated g/C Ratio	0.15	0.15		0.15	0.15	0.15		0.36	0.36		0.33	
Clearance Time (s)	4.8	4.8		4.8	4.8	4.8		4.0	4.0		3.5	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5		2.5	2.5		2.5	
Lane Grp Cap (vph)	198	275		135	284	425		674	574		594	
v/s Ratio Prot		c0.10			0.05			c0.20			c0.21	
v/s Ratio Perm	0.01			0.03		0.03			0.01			
v/c Ratio	0.06	0.64		0.21	0.32	0.18		0.54	0.03		0.62	
Uniform Delay, d1	29.0	31.8		29.7	30.2	29.5		20.2	16.4		22.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		0.33	
Incremental Delay, d2	0.1	4.2		0.6	0.5	0.1		3.1	0.1		4.3	
Delay (s)	29.1	36.0		30.3	30.7	29.7		23.3	16.5		11.7	
Level of Service	C	D		C	C	C		C	B		B	
Approach Delay (s)		35.6			29.9			22.6			11.7	

HCM Signalized Intersection Capacity Analysis  
 1: El Camino Real & Brisco Road

EA: 05-0Q620K  
 7/17/2009

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	D			C			C			B		
<b>Intersection Summary</b>												
HCM Average Control Delay	24.5			HCM Level of Service			C					
HCM Volume to Capacity ratio	0.59											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)			12.3					
Intersection Capacity Utilization	64.0%			ICU Level of Service			C					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 2: US 101 NB Ramps & Brisco Road

EA: 05-0Q620K  
 7/17/2009

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	148	0	73	493	297	0	0	197	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					3.5	3.5	3.5	3.5			4.4	
Lane Util. Factor					1.00	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.98	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1770	1583	1770	1863			1828	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1770	1583	1770	1863			1828	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	103%	103%	103%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	0	0	0	161	0	79	536	323	0	0	214	34
RTOR Reduction (vph)	0	0	0	0	0	69	0	0	0	0	7	0
Lane Group Flow (vph)	0	0	0	0	161	10	536	323	0	0	241	0
Turn Type				Split		Perm	Split					
Protected Phases				5	5		6	6			4	3
Permitted Phases						5						
Actuated Green, G (s)					10.1	10.1	27.7	27.7			30.8	
Effective Green, g (s)					10.1	10.1	27.7	27.7			27.3	
Actuated g/C Ratio					0.13	0.13	0.35	0.35			0.34	
Clearance Time (s)					3.5	3.5	3.5	3.5				
Vehicle Extension (s)					3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)					223	200	613	645			624	
v/s Ratio Prot					c0.09		c0.30	0.17			c0.13	
v/s Ratio Perm						0.01						
v/c Ratio					0.72	0.05	0.87	0.50			0.39	
Uniform Delay, d1					33.6	30.7	24.5	20.7			20.0	
Progression Factor					1.00	1.00	0.93	0.99			0.38	
Incremental Delay, d2					10.9	0.1	11.6	0.5			1.7	
Delay (s)					44.5	30.8	34.4	21.0			9.2	
Level of Service					D	C	C	C			A	
Approach Delay (s)		0.0			40.0			29.4			9.2	

HCM Signalized Intersection Capacity Analysis  
 2: US 101 NB Ramps & Brisco Road

EA: 05-0Q620K  
 7/17/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	A			D			C			A		

Intersection Summary			
HCM Average Control Delay	27.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.8
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 3: West Branch Street & Brisco Road

EA: 05-0Q620K

7/17/2009

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↙	↑	↙	↗
Volume (vph)	88	115	112	72	313	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.4	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	1863	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	96	125	122	78	340	62
RTOR Reduction (vph)	0	101	0	0	0	30
Lane Group Flow (vph)	96	24	122	78	340	32
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	6 5	
Permitted Phases		4				6 5
Actuated Green, G (s)	15.6	15.6	11.7	31.7	41.3	41.3
Effective Green, g (s)	15.6	15.6	11.7	31.7	41.3	41.3
Actuated g/C Ratio	0.20	0.20	0.15	0.40	0.52	0.52
Clearance Time (s)	4.4	4.4	3.5	3.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	363	309	259	738	914	817
v/s Ratio Prot	c0.05		c0.07	0.04	c0.19	
v/s Ratio Perm		0.02				0.02
v/c Ratio	0.26	0.08	0.47	0.11	0.37	0.04
Uniform Delay, d1	27.3	26.3	31.3	15.2	11.6	9.6
Progression Factor	1.00	1.00	1.00	1.00	0.13	0.00
Incremental Delay, d2	1.8	0.5	6.0	0.1	0.2	0.0
Delay (s)	29.1	26.8	37.3	15.3	1.8	0.0
Level of Service	C	C	D	B	A	A
Approach Delay (s)	27.8			28.7	1.5	

HCM Signalized Intersection Capacity Analysis  
 3: West Branch Street & Brisco Road

EA: 05-0Q620K  
 7/17/2009



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS	C		C		A	
<b>Intersection Summary</b>						
HCM Average Control Delay	15.2		HCM Level of Service		B	
HCM Volume to Capacity ratio	0.36					
Actuated Cycle Length (s)	80.0		Sum of lost time (s)		11.4	
Intersection Capacity Utilization	36.9%		ICU Level of Service		A	
Analysis Period (min)	15					

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 4: El Camino Real & US 101 SB Ramps

EA: 05-0Q620K  
 7/17/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBT	NBR	NBR2	SBL	SBT	SBR
Lane Configurations													
Volume (vph)	129	37	156	3	53	8	435	0	57	6	10	259	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.1		3.5	4.1		4.1	4.1				3.5	3.5
Lane Util. Factor	1.00	1.00		1.00	1.00		0.95	0.95				1.00	1.00
Frt	1.00	0.88		1.00	0.98		1.00	0.96				1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.96				1.00	1.00
Satd. Flow (prot)	1770	1636		1770	1826		1681	1640				1859	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	0.96				1.00	1.00
Satd. Flow (perm)	1770	1636		1770	1826		1681	1640				1859	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%
Adj. Flow (vph)	144	41	175	3	59	9	487	0	64	7	11	290	38
RTOR Reduction (vph)	0	134	0	0	8	0	0	1	0	0	0	0	28
Lane Group Flow (vph)	144	82	0	3	60	0	282	275	0	0	0	301	10
Turn Type	Prot			Prot			Split				Split		Perm
Protected Phases	1	6		5	2		4	4			3	3	
Permitted Phases													3
Actuated Green, G (s)	7.5	14.1		0.7	7.3		15.4	15.4				15.1	15.1
Effective Green, g (s)	7.5	14.1		0.7	7.3		15.4	15.4				15.1	15.1
Actuated g/C Ratio	0.12	0.23		0.01	0.12		0.25	0.25				0.25	0.25
Clearance Time (s)	3.5	4.1		3.5	4.1		4.1	4.1				3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0				3.0	3.0
Lane Grp Cap (vph)	219	381		20	220		428	417				464	395
v/s Ratio Prot	c0.08	c0.05		0.00	0.03		c0.17	0.17				c0.16	
v/s Ratio Perm													0.01
v/c Ratio	0.66	0.21		0.15	0.27		0.66	0.66				0.65	0.03
Uniform Delay, d1	25.3	18.7		29.6	24.2		20.2	20.2				20.3	17.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00				1.00	1.00
Incremental Delay, d2	6.9	0.3		3.5	0.7		3.6	3.7				3.1	0.0
Delay (s)	32.2	19.0		33.1	24.9		23.8	23.9				23.4	17.2
Level of Service	C	B		C	C		C	C				C	B
Approach Delay (s)		24.3			25.2			23.9				22.7	

HCM Signalized Intersection Capacity Analysis  
 4: El Camino Real & US 101 SB Ramps

EA: 05-0Q620K  
 7/17/2009

															
Movement	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBT	NBR	NBR2	SBL	SBT	SBR		
Approach LOS		C			C			C				C			
<b>Intersection Summary</b>															
HCM Average Control Delay			23.8											HCM Level of Service	C
HCM Volume to Capacity ratio			0.55												
Actuated Cycle Length (s)			60.5											Sum of lost time (s)	11.1
Intersection Capacity Utilization			53.2%											ICU Level of Service	A
Analysis Period (min)			15												
c Critical Lane Group															

HCM Signalized Intersection Capacity Analysis  
5: Grand Ave & US 101 SB Ramps

EA: 05-0Q620K  
7/17/2009

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	384	237	48	749	0	0	0	0	63	0	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.1		3.5	4.2					3.7		3.7
Lane Util. Factor		0.95		1.00	0.95					1.00		1.00
Frt		0.94		1.00	1.00					1.00		0.85
Flt Protected		1.00		0.95	1.00					0.95		1.00
Satd. Flow (prot)		3337		1770	3539					1770		1583
Flt Permitted		1.00		0.95	1.00					0.95		1.00
Satd. Flow (perm)		3337		1770	3539					1770		1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.92	0.92	0.92	0.92	0.92	0.92	0.75	0.75	0.75
Growth Factor (vph)	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%
Adj. Flow (vph)	0	408	252	54	839	0	0	0	0	87	0	148
RTOR Reduction (vph)	0	95	0	0	0	0	0	0	0	0	0	112
Lane Group Flow (vph)	0	565	0	54	839	0	0	0	0	87	0	36
Turn Type				Prot						Prot		custom
Protected Phases		2		1	6					3		
Permitted Phases												3
Actuated Green, G (s)		44.9		19.5	67.8					24.3		24.3
Effective Green, g (s)		44.9		19.5	67.8					24.3		24.3
Actuated g/C Ratio		0.45		0.20	0.68					0.24		0.24
Clearance Time (s)		4.1		3.5	4.2					3.7		3.7
Vehicle Extension (s)		3.0		3.0	3.0					3.0		3.0
Lane Grp Cap (vph)		1498		345	2399					430		385
v/s Ratio Prot		c0.17		0.03	c0.24					c0.05		
v/s Ratio Perm												0.02
v/c Ratio		0.38		0.16	0.35					0.20		0.09
Uniform Delay, d1		18.3		33.4	6.8					30.1		29.3
Progression Factor		1.00		0.84	0.54					1.00		1.00
Incremental Delay, d2		0.7		0.8	0.3					1.1		0.5
Delay (s)		19.0		29.0	4.0					31.2		29.8
Level of Service		B		C	A					C		C
Approach Delay (s)		19.0			5.5			0.0			30.3	

HCM Signalized Intersection Capacity Analysis  
 5: Grand Ave & US 101 SB Ramps

EA: 05-0Q620K  
 7/17/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	B			A			A			C		

Intersection Summary			
HCM Average Control Delay	13.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.8
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
6: Grand Avenue & US 101 NB Ramps

EA: 05-0Q620K  
7/17/2009

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Volume (vph)	81	346	0	0	488	286	284	0	46	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.1			4.1			3.7	3.7			
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00			
Frt	1.00	1.00			0.94			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (prot)	1770	3539			3343			1770	1583			
Flt Permitted	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (perm)	1770	3539			3343			1770	1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%
Adj. Flow (vph)	91	387	0	0	546	320	318	0	52	0	0	0
RTOR Reduction (vph)	0	0	0	0	81	0	0	0	34	0	0	0
Lane Group Flow (vph)	91	387	0	0	785	0	0	318	18	0	0	0
Turn Type	Prot					Split			Perm			
Protected Phases	5	2					8	8				
Permitted Phases					6				8			
Actuated Green, G (s)	10.0	57.9			44.4			34.3	34.3			
Effective Green, g (s)	10.0	57.9			44.4			34.3	34.3			
Actuated g/C Ratio	0.10	0.58			0.44			0.34	0.34			
Clearance Time (s)	3.5	4.1			4.1			3.7	3.7			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	177	2049			1484			607	543			
v/s Ratio Prot	c0.05	0.11						c0.18				
v/s Ratio Perm					c0.23				0.01			
v/c Ratio	0.51	0.19			0.53			0.52	0.03			
Uniform Delay, d1	42.7	10.0			20.2			26.3	21.8			
Progression Factor	0.93	0.53			1.00			1.00	1.00			
Incremental Delay, d2	2.4	0.2			1.4			3.2	0.1			
Delay (s)	42.1	5.5			21.6			29.5	21.9			
Level of Service	D	A			C			C	C			
Approach Delay (s)		12.4			21.6			28.5			0.0	

HCM Signalized Intersection Capacity Analysis  
 6: Grand Avenue & US 101 NB Ramps

EA: 05-0Q620K  
 7/17/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	B			C			C			A		

Intersection Summary			
HCM Average Control Delay	20.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.3
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 1: El Camino Real & Brisco Road

EA: 05-0Q620K  
 7/16/2009

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	192	44	50	89	409	45	278	37	377	196	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.8	4.8		4.8	4.8	4.8		4.0	4.0		3.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	0.88		1.00	1.00		1.00	
Frt	1.00	0.97		1.00	1.00	0.85		1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00		0.97	
Satd. Flow (prot)	1770	1811		1770	1863	2787		1850	1583		1791	
Flt Permitted	0.69	1.00		0.34	1.00	1.00		0.99	1.00		0.97	
Satd. Flow (perm)	1293	1811		633	1863	2787		1850	1583		1791	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	40	209	48	54	97	445	49	302	40	419	218	47
RTOR Reduction (vph)	0	11	0	0	0	366	0	0	29	0	3	0
Lane Group Flow (vph)	40	246	0	54	97	79	0	351	11	0	681	0
Turn Type	Perm			Perm		Perm	Split		Perm	Split		
Protected Phases		4			8		1	1		2	2	
Permitted Phases	4			8		8			1			
Actuated Green, G (s)	14.2	14.2		14.2	14.2	14.2		21.8	21.8		31.7	
Effective Green, g (s)	14.2	14.2		14.2	14.2	14.2		21.8	21.8		31.7	
Actuated g/C Ratio	0.18	0.18		0.18	0.18	0.18		0.27	0.27		0.40	
Clearance Time (s)	4.8	4.8		4.8	4.8	4.8		4.0	4.0		3.5	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5		2.5	2.5		2.5	
Lane Grp Cap (vph)	230	321		112	331	495		504	431		710	
v/s Ratio Prot		c0.14			0.05			c0.19			c0.38	
v/s Ratio Perm	0.03			0.09		0.03			0.01			
v/c Ratio	0.17	0.77		0.48	0.29	0.16		0.70	0.03		0.96	
Uniform Delay, d1	27.9	31.3		29.6	28.5	27.8		26.1	21.3		23.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.3	10.1		2.4	0.4	0.1		7.8	0.1		20.1	
Delay (s)	28.2	41.4		32.0	28.9	28.0		33.9	21.4		43.7	
Level of Service	C	D		C	C	C		C	C		D	
Approach Delay (s)		39.6			28.5			32.6			43.7	

HCM Signalized Intersection Capacity Analysis  
 1: El Camino Real & Brisco Road

EA: 05-0Q620K  
 7/16/2009

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Approach LOS		D			C			C			D		
<b>Intersection Summary</b>													
HCM Average Control Delay			36.3									HCM Level of Service	D
HCM Volume to Capacity ratio			0.83										
Actuated Cycle Length (s)			80.0									Sum of lost time (s)	12.3
Intersection Capacity Utilization			81.6%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis  
2: US 101 NB Ramps & Brisco Road

EA: 05-0Q620K  
7/16/2009

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	88	0	170	277	447	0	0	527	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					3.5	3.5	3.5	3.5			4.4	
Lane Util. Factor					1.00	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.99	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1770	1583	1770	1863			1852	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1770	1583	1770	1863			1852	
Peak-hour factor, PHF	0.92	0.92	0.92	0.87	0.87	0.87	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	103%	103%	103%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	0	0	0	101	0	195	301	486	0	0	573	26
RTOR Reduction (vph)	0	0	0	0	0	176	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	101	19	301	486	0	0	597	0
Turn Type				Split		Perm	Split					
Protected Phases				5	5		6	6			4	3
Permitted Phases						5						
Actuated Green, G (s)					7.7	7.7	25.5	25.5			36.3	
Effective Green, g (s)					7.7	7.7	25.5	25.5			36.3	
Actuated g/C Ratio					0.10	0.10	0.32	0.32			0.45	
Clearance Time (s)					3.5	3.5	3.5	3.5				
Vehicle Extension (s)					3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)					170	152	564	594			840	
v/s Ratio Prot					c0.06		0.17	c0.26			c0.32	
v/s Ratio Perm						0.01						
v/c Ratio					0.59	0.12	0.53	0.82			0.71	
Uniform Delay, d1					34.7	33.1	22.4	25.1			17.6	
Progression Factor					1.00	1.00	1.28	1.26			0.74	
Incremental Delay, d2					5.5	0.4	0.8	7.3			4.0	
Delay (s)					40.1	33.4	29.4	39.0			17.0	
Level of Service					D	C	C	D			B	
Approach Delay (s)		0.0			35.7			35.3			17.0	

HCM Signalized Intersection Capacity Analysis  
 2: US 101 NB Ramps & Brisco Road

EA: 05-0Q620K  
 7/16/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	A			D			D			B		

Intersection Summary			
HCM Average Control Delay	28.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.4
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 3: West Branch Street & Brisco Road

EA: 05-0Q620K

7/16/2009

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↙	↑	↘	↗
Volume (vph)	118	466	85	174	519	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.4	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	1863	1770	1583
Peak-hour factor, PHF	0.86	0.86	0.90	0.90	0.92	0.92
Growth Factor (vph)	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	137	542	94	193	564	107
RTOR Reduction (vph)	0	397	0	0	0	58
Lane Group Flow (vph)	137	145	94	193	564	49
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	6 5	
Permitted Phases		4				6 5
Actuated Green, G (s)	21.4	21.4	10.5	36.3	36.7	36.7
Effective Green, g (s)	21.4	21.4	10.5	36.3	36.7	36.7
Actuated g/C Ratio	0.27	0.27	0.13	0.45	0.46	0.46
Clearance Time (s)	4.4	4.4	3.5	3.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	498	423	232	845	812	726
v/s Ratio Prot	0.07		c0.05	0.10	c0.32	
v/s Ratio Perm		c0.09				0.03
v/c Ratio	0.28	0.34	0.41	0.23	0.69	0.07
Uniform Delay, d1	23.2	23.6	31.9	13.3	17.2	12.1
Progression Factor	1.00	1.00	1.00	1.00	0.25	0.00
Incremental Delay, d2	1.4	2.2	5.2	0.1	1.8	0.0
Delay (s)	24.5	25.8	37.1	13.5	6.1	0.1
Level of Service	C	C	D	B	A	A
Approach Delay (s)	25.6			21.2	5.2	

HCM Signalized Intersection Capacity Analysis  
 3: West Branch Street & Brisco Road

EA: 05-0Q620K  
 7/16/2009



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS	C		C		A	
<b>Intersection Summary</b>						
HCM Average Control Delay	16.4		HCM Level of Service		B	
HCM Volume to Capacity ratio	0.54					
Actuated Cycle Length (s)	80.0		Sum of lost time (s)		11.4	
Intersection Capacity Utilization	46.8%		ICU Level of Service		A	
Analysis Period (min)	15					

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 4: El Camino Real & US 101 SB Ramps

EA: 05-0Q620K  
 7/16/2009

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBT	NBR	NBR2	SBL	SBT	SBR
Lane Configurations													
Volume (vph)	198	22	331	21	29	8	318	0	25	20	10	246	196
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.1		3.5	4.1		4.1	4.1				3.5	3.5
Lane Util. Factor	1.00	1.00		1.00	1.00		0.95	0.95				1.00	1.00
Frt	1.00	0.86		1.00	0.97		1.00	0.96				1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.96				1.00	1.00
Satd. Flow (prot)	1770	1601		1770	1801		1681	1641				1859	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	0.96				1.00	1.00
Satd. Flow (perm)	1770	1601		1770	1801		1681	1641				1859	1583
Peak-hour factor, PHF	0.86	0.86	0.86	0.76	0.76	0.76	0.81	0.81	0.81	0.81	0.92	0.92	0.92
Growth Factor (vph)	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%
Adj. Flow (vph)	237	26	396	28	39	11	404	0	32	25	11	275	219
RTOR Reduction (vph)	0	295	0	0	10	0	0	5	0	0	0	0	166
Lane Group Flow (vph)	237	127	0	28	40	0	234	222	0	0	0	286	53
Turn Type	Prot			Prot			Split				Split		Perm
Protected Phases	1	6		5	2		4	4			3	3	
Permitted Phases													3
Actuated Green, G (s)	13.0	15.2		1.8	4.0		13.2	13.2				14.1	14.1
Effective Green, g (s)	13.0	15.2		1.8	4.0		13.2	13.2				14.1	14.1
Actuated g/C Ratio	0.22	0.26		0.03	0.07		0.22	0.22				0.24	0.24
Clearance Time (s)	3.5	4.1		3.5	4.1		4.1	4.1				3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0				3.0	3.0
Lane Grp Cap (vph)	387	409		54	121		373	364				441	375
v/s Ratio Prot	c0.13	c0.08		c0.02	0.02		c0.14	0.13				c0.15	
v/s Ratio Perm													0.03
v/c Ratio	0.61	0.31		0.52	0.33		0.63	0.61				0.65	0.14
Uniform Delay, d1	21.0	17.9		28.4	26.5		20.9	20.8				20.5	17.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00				1.00	1.00
Incremental Delay, d2	2.9	0.4		8.2	1.6		3.3	2.9				3.3	0.2
Delay (s)	23.8	18.4		36.6	28.1		24.2	23.7				23.7	18.1
Level of Service	C	B		D	C		C	C				C	B
Approach Delay (s)		20.3			31.1			24.0				21.3	

HCM Signalized Intersection Capacity Analysis  
 4: El Camino Real & US 101 SB Ramps

EA: 05-0Q620K  
 7/16/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBT	NBR	NBR2	SBL	SBT	SBR
Approach LOS	C			C			C			C			

Intersection Summary			
HCM Average Control Delay	22.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	59.5	Sum of lost time (s)	18.7
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 5: Grand Avenue & US 101 SB Ramps

EA: 05-0Q620K  
 7/16/2009

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	615	359	103	770	0	0	0	0	260	0	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.1		3.5	4.2					3.7		3.7
Lane Util. Factor		0.95		1.00	0.95					1.00		1.00
Frt		0.94		1.00	1.00					1.00		0.85
Flt Protected		1.00		0.95	1.00					0.95		1.00
Satd. Flow (prot)		3344		1770	3539					1770		1583
Flt Permitted		1.00		0.95	1.00					0.95		1.00
Satd. Flow (perm)		3344		1770	3539					1770		1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.92	0.92	0.92	0.92	0.92	0.92	0.75	0.75	0.75
Growth Factor (vph)	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%
Adj. Flow (vph)	0	653	381	115	862	0	0	0	0	357	0	119
RTOR Reduction (vph)	0	120	0	0	0	0	0	0	0	0	0	90
Lane Group Flow (vph)	0	914	0	115	862	0	0	0	0	357	0	29
Turn Type				Prot						Prot		custom
Protected Phases		2		1	6					3		
Permitted Phases												3
Actuated Green, G (s)		24.9		16.5	44.8					17.3		17.3
Effective Green, g (s)		24.9		16.5	44.8					17.3		17.3
Actuated g/C Ratio		0.36		0.24	0.64					0.25		0.25
Clearance Time (s)		4.1		3.5	4.2					3.7		3.7
Vehicle Extension (s)		3.0		3.0	3.0					3.0		3.0
Lane Grp Cap (vph)		1190		417	2265					437		391
v/s Ratio Prot		c0.27		0.06	c0.24					c0.20		
v/s Ratio Perm												0.02
v/c Ratio		0.77		0.28	0.38					0.82		0.08
Uniform Delay, d1		20.0		21.9	6.0					24.9		20.2
Progression Factor		1.00		0.65	0.23					1.00		1.00
Incremental Delay, d2		4.8		1.1	0.3					15.5		0.4
Delay (s)		24.8		15.2	1.7					40.3		20.6
Level of Service		C		B	A					D		C
Approach Delay (s)		24.8			3.3			0.0			35.4	

HCM Signalized Intersection Capacity Analysis  
 5: Grand Avenue & US 101 SB Ramps

EA: 05-0Q620K  
 7/16/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			A			A			D	

Intersection Summary			
HCM Average Control Delay	18.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	7.8
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
6: Grand Avenue & US 101 NB Ramps

EA: 05-0Q620K  
7/16/2009

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Volume (vph)	171	763	0	0	617	294	231	0	36	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.1			4.1			3.7	3.7			
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00			
Frt	1.00	1.00			0.95			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (prot)	1593	3185			3031			1593	1425			
Flt Permitted	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (perm)	1593	3185			3031			1593	1425			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%
Adj. Flow (vph)	191	854	0	0	691	329	259	0	40	0	0	0
RTOR Reduction (vph)	0	0	0	0	82	0	0	0	31	0	0	0
Lane Group Flow (vph)	191	854	0	0	938	0	0	259	9	0	0	0
Turn Type	Prot					Split		Perm				
Protected Phases	5	2					8	8				
Permitted Phases					6				8			
Actuated Green, G (s)	13.5	45.9			28.9			16.3	16.3			
Effective Green, g (s)	13.5	45.9			28.9			16.3	16.3			
Actuated g/C Ratio	0.19	0.66			0.41			0.23	0.23			
Clearance Time (s)	3.5	4.1			4.1			3.7	3.7			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	307	2088			1251			371	332			
v/s Ratio Prot	c0.12	0.27						c0.16				
v/s Ratio Perm					c0.31				0.01			
v/c Ratio	0.62	0.41			0.75			0.70	0.03			
Uniform Delay, d1	25.9	5.7			17.5			24.6	20.7			
Progression Factor	0.74	0.18			1.00			1.00	1.00			
Incremental Delay, d2	2.4	0.4			4.2			10.4	0.2			
Delay (s)	21.7	1.4			21.6			35.0	20.9			
Level of Service	C	A			C			D	C			
Approach Delay (s)		5.1			21.6			33.1			0.0	

HCM Signalized Intersection Capacity Analysis  
 6: Grand Avenue & US 101 NB Ramps

EA: 05-0Q620K  
 7/16/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	A			C			C			A		

Intersection Summary			
HCM Average Control Delay	15.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	11.3
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 1: El Camino Real & Brisco Road

EA: 05-0Q620K  
 7/23/2009

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	137	36	27	84	496	12	324	42	176	134	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.8	4.8		4.8	4.8	4.8		4.0	4.0		3.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	0.88		1.00	1.00		1.00	
Frt	1.00	0.97		1.00	1.00	0.85		1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00		0.98	
Satd. Flow (prot)	1770	1805		1770	1863	2787		1859	1583		1792	
Flt Permitted	0.70	1.00		0.48	1.00	1.00		1.00	1.00		0.98	
Satd. Flow (perm)	1300	1805		887	1863	2787		1859	1583		1792	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	11	149	39	29	91	539	13	352	46	191	146	38
RTOR Reduction (vph)	0	13	0	0	0	457	0	0	29	0	5	0
Lane Group Flow (vph)	11	175	0	29	91	82	0	365	17	0	370	0
Turn Type	Perm			Perm		Perm	Split		Perm	Split		
Protected Phases		4			8		1	1		2	2	
Permitted Phases	4			8		8			1			
Actuated Green, G (s)	12.2	12.2		12.2	12.2	12.2		29.0	29.0		26.5	
Effective Green, g (s)	12.2	12.2		12.2	12.2	12.2		29.0	29.0		26.5	
Actuated g/C Ratio	0.15	0.15		0.15	0.15	0.15		0.36	0.36		0.33	
Clearance Time (s)	4.8	4.8		4.8	4.8	4.8		4.0	4.0		3.5	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5		2.5	2.5		2.5	
Lane Grp Cap (vph)	198	275		135	284	425		674	574		594	
v/s Ratio Prot		c0.10			0.05			c0.20			c0.21	
v/s Ratio Perm	0.01			0.03		0.03			0.01			
v/c Ratio	0.06	0.64		0.21	0.32	0.19		0.54	0.03		0.62	
Uniform Delay, d1	29.0	31.8		29.7	30.2	29.6		20.2	16.4		22.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		0.31	
Incremental Delay, d2	0.1	4.2		0.6	0.5	0.2		3.1	0.1		4.3	
Delay (s)	29.1	36.0		30.3	30.7	29.8		23.3	16.5		11.3	
Level of Service	C	D		C	C	C		C	B		B	
Approach Delay (s)		35.6			29.9			22.6			11.3	

HCM Signalized Intersection Capacity Analysis  
 1: El Camino Real & Brisco Road

EA: 05-0Q620K  
 7/23/2009

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	D			C			C			B		
<b>Intersection Summary</b>												
HCM Average Control Delay	24.5			HCM Level of Service			C					
HCM Volume to Capacity ratio	0.59											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)			12.3					
Intersection Capacity Utilization	64.0%			ICU Level of Service			C					
Analysis Period (min)	15											
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 2: US 101 NB Ramps & Brisco Road

EA: 05-0Q620K

7/23/2009

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	148	0	73	534	297	0	0	197	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					3.5	3.5	3.5	3.5			4.4	
Lane Util. Factor					1.00	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.98	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1770	1583	1770	1863			1828	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1770	1583	1770	1863			1828	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	103%	103%	103%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	0	0	0	161	0	79	580	323	0	0	214	34
RTOR Reduction (vph)	0	0	0	0	0	69	0	0	0	0	7	0
Lane Group Flow (vph)	0	0	0	0	161	10	580	323	0	0	241	0
Turn Type				Split		Perm	Split					
Protected Phases				5	5		6	6			4	3
Permitted Phases						5						
Actuated Green, G (s)					10.0	10.0	28.6	28.6			30.0	
Effective Green, g (s)					10.0	10.0	28.6	28.6			26.5	
Actuated g/C Ratio					0.12	0.12	0.36	0.36			0.33	
Clearance Time (s)					3.5	3.5	3.5	3.5				
Vehicle Extension (s)					3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)					221	198	633	666			606	
v/s Ratio Prot					c0.09		c0.33	0.17			c0.13	
v/s Ratio Perm						0.01						
v/c Ratio					0.73	0.05	0.92	0.48			0.40	
Uniform Delay, d1					33.7	30.8	24.6	20.0			20.6	
Progression Factor					1.00	1.00	0.92	0.99			0.38	
Incremental Delay, d2					11.4	0.1	16.0	0.5			1.8	
Delay (s)					45.1	30.9	38.5	20.2			9.6	
Level of Service					D	C	D	C			A	
Approach Delay (s)		0.0			40.4			32.0			9.6	

HCM Signalized Intersection Capacity Analysis  
 2: US 101 NB Ramps & Brisco Road

EA: 05-0Q620K  
 7/23/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	A			D			C			A		

Intersection Summary			
HCM Average Control Delay	29.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.8
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 3: West Branch Street & Brisco Road

EA: 05-0Q620K

7/23/2009

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Volume (vph)	88	115	112	72	313	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.4	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	1863	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	96	125	122	78	340	62
RTOR Reduction (vph)	0	101	0	0	0	29
Lane Group Flow (vph)	96	24	122	78	340	33
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	6 5	
Permitted Phases		4				6 5
Actuated Green, G (s)	15.6	15.6	10.9	30.9	42.1	42.1
Effective Green, g (s)	15.6	15.6	10.9	30.9	42.1	42.1
Actuated g/C Ratio	0.20	0.20	0.14	0.39	0.53	0.53
Clearance Time (s)	4.4	4.4	3.5	3.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	363	309	241	720	931	833
v/s Ratio Prot	c0.05		c0.07	0.04	c0.19	
v/s Ratio Perm		0.02				0.02
v/c Ratio	0.26	0.08	0.51	0.11	0.37	0.04
Uniform Delay, d1	27.3	26.3	32.1	15.7	11.1	9.2
Progression Factor	1.00	1.00	1.00	1.00	0.13	0.00
Incremental Delay, d2	1.8	0.5	7.4	0.1	0.2	0.0
Delay (s)	29.1	26.8	39.5	15.8	1.7	0.0
Level of Service	C	C	D	B	A	A
Approach Delay (s)	27.8			30.2	1.4	

HCM Signalized Intersection Capacity Analysis  
 3: West Branch Street & Brisco Road

EA: 05-0Q620K  
 7/23/2009



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS	C		C		A	
<b>Intersection Summary</b>						
HCM Average Control Delay	15.5		HCM Level of Service		B	
HCM Volume to Capacity ratio	0.36					
Actuated Cycle Length (s)	80.0		Sum of lost time (s)		11.4	
Intersection Capacity Utilization	36.9%		ICU Level of Service		A	
Analysis Period (min)	15					

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 4: El Camino Real & US 101 SB Ramps

EA: 05-0Q620K  
 7/23/2009

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBT	NBR	NBR2	SBL	SBT	SBR
Lane Configurations													
Volume (vph)	129	37	156	3	53	8	476	0	57	6	10	259	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.1		3.5	4.1		4.1	4.1				3.5	3.5
Lane Util. Factor	1.00	1.00		1.00	1.00		0.95	0.95				1.00	1.00
Frt	1.00	0.88		1.00	0.98		1.00	0.96				1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.96				1.00	1.00
Satd. Flow (prot)	1770	1636		1770	1826		1681	1644				1859	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	0.96				1.00	1.00
Satd. Flow (perm)	1770	1636		1770	1826		1681	1644				1859	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%
Adj. Flow (vph)	144	41	175	3	59	9	533	0	64	7	11	290	38
RTOR Reduction (vph)	0	135	0	0	8	0	0	1	0	0	0	0	28
Lane Group Flow (vph)	144	81	0	3	60	0	304	299	0	0	0	301	10
Turn Type	Prot			Prot			Split				Split		Perm
Protected Phases	1	6		5	2		4	4			3	3	
Permitted Phases													3
Actuated Green, G (s)	7.5	14.1		0.7	7.3		16.2	16.2				15.1	15.1
Effective Green, g (s)	7.5	14.1		0.7	7.3		16.2	16.2				15.1	15.1
Actuated g/C Ratio	0.12	0.23		0.01	0.12		0.26	0.26				0.25	0.25
Clearance Time (s)	3.5	4.1		3.5	4.1		4.1	4.1				3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0				3.0	3.0
Lane Grp Cap (vph)	217	376		20	217		444	434				458	390
v/s Ratio Prot	c0.08	c0.05		0.00	0.03		0.18	c0.18				c0.16	
v/s Ratio Perm													0.01
v/c Ratio	0.66	0.22		0.15	0.28		0.68	0.69				0.66	0.03
Uniform Delay, d1	25.7	19.1		30.0	24.6		20.3	20.3				20.8	17.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00				1.00	1.00
Incremental Delay, d2	7.4	0.3		3.5	0.7		4.3	4.5				3.4	0.0
Delay (s)	33.1	19.4		33.5	25.3		24.6	24.8				24.2	17.5
Level of Service	C	B		C	C		C	C				C	B
Approach Delay (s)		24.9			25.6			24.7				23.4	

HCM Signalized Intersection Capacity Analysis  
 4: El Camino Real & US 101 SB Ramps

EA: 05-0Q620K  
 7/23/2009

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBT	NBR	NBR2	SBL	SBT	SBR
Approach LOS	C			C			C			C			
<b>Intersection Summary</b>													
HCM Average Control Delay	24.5			HCM Level of Service			C						
HCM Volume to Capacity ratio	0.56												
Actuated Cycle Length (s)	61.3			Sum of lost time (s)			11.1						
Intersection Capacity Utilization	54.4%			ICU Level of Service			A						
Analysis Period (min)	15												
c	Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
5: Grand Ave & US 101 SB Ramps

EA: 05-0Q620K  
7/23/2009

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Volume (vph)	0	384	237	55	749	0	0	0	0	63	0	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.1		3.5	4.2					3.7		3.7
Lane Util. Factor		0.95		1.00	0.95					1.00		1.00
Frt		0.94		1.00	1.00					1.00		0.85
Flt Protected		1.00		0.95	1.00					0.95		1.00
Satd. Flow (prot)		3337		1770	3539					1770		1583
Flt Permitted		1.00		0.95	1.00					0.95		1.00
Satd. Flow (perm)		3337		1770	3539					1770		1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.92	0.92	0.92	0.92	0.92	0.92	0.75	0.75	0.75
Growth Factor (vph)	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%
Adj. Flow (vph)	0	408	252	62	839	0	0	0	0	87	0	148
RTOR Reduction (vph)	0	95	0	0	0	0	0	0	0	0	0	112
Lane Group Flow (vph)	0	565	0	62	839	0	0	0	0	87	0	36
Turn Type				Prot						Prot		custom
Protected Phases		2		1	6					3		
Permitted Phases												3
Actuated Green, G (s)		44.9		19.5	67.8					24.3		24.3
Effective Green, g (s)		44.9		19.5	67.8					24.3		24.3
Actuated g/C Ratio		0.45		0.20	0.68					0.24		0.24
Clearance Time (s)		4.1		3.5	4.2					3.7		3.7
Vehicle Extension (s)		3.0		3.0	3.0					3.0		3.0
Lane Grp Cap (vph)		1498		345	2399					430		385
v/s Ratio Prot		c0.17		0.04	c0.24					c0.05		
v/s Ratio Perm												0.02
v/c Ratio		0.38		0.18	0.35					0.20		0.09
Uniform Delay, d1		18.3		33.6	6.8					30.1		29.3
Progression Factor		1.00		0.86	0.57					1.00		1.00
Incremental Delay, d2		0.7		1.0	0.3					1.1		0.5
Delay (s)		19.0		29.8	4.2					31.2		29.8
Level of Service		B		C	A					C		C
Approach Delay (s)		19.0			6.0			0.0			30.3	

HCM Signalized Intersection Capacity Analysis  
 5: Grand Ave & US 101 SB Ramps

EA: 05-0Q620K  
 7/23/2009

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	B			A			A			C		
<b>Intersection Summary</b>												
HCM Average Control Delay	13.9			HCM Level of Service			B					
HCM Volume to Capacity ratio	0.32											
Actuated Cycle Length (s)	100.0			Sum of lost time (s)			7.8					
Intersection Capacity Utilization	56.0%			ICU Level of Service			B					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
6: Grand Avenue & US 101 NB Ramps

EA: 05-0Q620K  
7/23/2009

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	81	346	0	0	488	327	291	0	46	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.1			4.1			3.7	3.7			
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00			
Frt	1.00	1.00			0.94			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (prot)	1770	3539			3326			1770	1583			
Flt Permitted	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (perm)	1770	3539			3326			1770	1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%
Adj. Flow (vph)	91	387	0	0	546	366	326	0	52	0	0	0
RTOR Reduction (vph)	0	0	0	0	111	0	0	0	34	0	0	0
Lane Group Flow (vph)	91	387	0	0	801	0	0	326	18	0	0	0
Turn Type	Prot					Split		Perm				
Protected Phases	5	2					8	8				
Permitted Phases					6				8			
Actuated Green, G (s)	10.0	57.9			44.4			34.3	34.3			
Effective Green, g (s)	10.0	57.9			44.4			34.3	34.3			
Actuated g/C Ratio	0.10	0.58			0.44			0.34	0.34			
Clearance Time (s)	3.5	4.1			4.1			3.7	3.7			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	177	2049			1477			607	543			
v/s Ratio Prot	c0.05	0.11						c0.18				
v/s Ratio Perm					c0.24				0.01			
v/c Ratio	0.51	0.19			0.54			0.54	0.03			
Uniform Delay, d1	42.7	10.0			20.4			26.5	21.8			
Progression Factor	0.93	0.53			1.00			1.00	1.00			
Incremental Delay, d2	2.4	0.2			1.4			3.4	0.1			
Delay (s)	42.1	5.5			21.8			29.8	21.9			
Level of Service	D	A			C			C	C			
Approach Delay (s)		12.4			21.8			28.8			0.0	

HCM Signalized Intersection Capacity Analysis  
 6: Grand Avenue & US 101 NB Ramps

EA: 05-0Q620K  
 7/23/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	B			C			C			A		

Intersection Summary			
HCM Average Control Delay	20.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.3
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 1: El Camino Real & Brisco Road

EA: 05-0Q620K  
 7/23/2009

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	192	44	50	89	429	45	278	37	377	196	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.8	4.8		4.8	4.8	4.8		4.0	4.0		3.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	0.88		1.00	1.00		1.00	
Fr <sub>t</sub>	1.00	0.97		1.00	1.00	0.85		1.00	0.85		0.99	
Fl <sub>t</sub> Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00		0.97	
Satd. Flow (prot)	1770	1811		1770	1863	2787		1850	1583		1791	
Fl <sub>t</sub> Permitted	0.69	1.00		0.34	1.00	1.00		0.99	1.00		0.97	
Satd. Flow (perm)	1293	1811		633	1863	2787		1850	1583		1791	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	40	209	48	54	97	466	49	302	40	419	218	47
RTOR Reduction (vph)	0	11	0	0	0	383	0	0	29	0	3	0
Lane Group Flow (vph)	40	246	0	54	97	83	0	351	11	0	681	0
Turn Type	Perm			Perm		Perm	Split		Perm	Split		
Protected Phases		4			8		1	1		2	2	
Permitted Phases	4			8		8			1			
Actuated Green, G (s)	14.2	14.2		14.2	14.2	14.2		21.8	21.8		31.7	
Effective Green, g (s)	14.2	14.2		14.2	14.2	14.2		21.8	21.8		31.7	
Actuated g/C Ratio	0.18	0.18		0.18	0.18	0.18		0.27	0.27		0.40	
Clearance Time (s)	4.8	4.8		4.8	4.8	4.8		4.0	4.0		3.5	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5		2.5	2.5		2.5	
Lane Grp Cap (vph)	230	321		112	331	495		504	431		710	
v/s Ratio Prot		c0.14			0.05			c0.19			c0.38	
v/s Ratio Perm	0.03			0.09		0.03			0.01			
v/c Ratio	0.17	0.77		0.48	0.29	0.17		0.70	0.03		0.96	
Uniform Delay, d <sub>1</sub>	27.9	31.3		29.6	28.5	27.9		26.1	21.3		23.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d <sub>2</sub>	0.3	10.1		2.4	0.4	0.1		7.8	0.1		20.0	
Delay (s)	28.2	41.4		32.0	28.9	28.0		33.9	21.4		43.6	
Level of Service	C	D		C	C	C		C	C		D	
Approach Delay (s)		39.6			28.5			32.6			43.6	

HCM Signalized Intersection Capacity Analysis  
 1: El Camino Real & Brisco Road

EA: 05-0Q620K  
 7/23/2009

Movement												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		D			C			C			D	
<b>Intersection Summary</b>												
HCM Average Control Delay			36.2				HCM Level of Service					D
HCM Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			80.0				Sum of lost time (s)				12.3	
Intersection Capacity Utilization			81.6%				ICU Level of Service					D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 2: US 101 NB Ramps & Brisco Road

EA: 05-0Q620K  
 7/23/2009

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	88	0	170	297	447	0	0	527	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					3.5	3.5	3.5	3.5			4.4	
Lane Util. Factor					1.00	1.00	1.00	1.00			1.00	
Fr <sub>t</sub>					1.00	0.85	1.00	1.00			0.99	
Fl <sub>t</sub> Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1770	1583	1770	1863			1852	
Fl <sub>t</sub> Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1770	1583	1770	1863			1852	
Peak-hour factor, PHF	0.92	0.92	0.92	0.87	0.87	0.87	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	103%	103%	103%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	0	0	0	101	0	195	323	486	0	0	573	26
RTOR Reduction (vph)	0	0	0	0	0	176	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	101	19	323	486	0	0	597	0
Turn Type				Split		Perm	Split					
Protected Phases				5	5		6	6			4	3
Permitted Phases						5						
Actuated Green, G (s)					7.6	7.6	25.7	25.7			36.2	
Effective Green, g (s)					7.6	7.6	25.7	25.7			36.2	
Actuated g/C Ratio					0.10	0.10	0.32	0.32			0.45	
Clearance Time (s)					3.5	3.5	3.5	3.5				
Vehicle Extension (s)					3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)					168	150	569	598			838	
v/s Ratio Prot					c0.06		0.18	c0.26			c0.32	
v/s Ratio Perm						0.01						
v/c Ratio					0.60	0.12	0.57	0.81			0.71	
Uniform Delay, d <sub>1</sub>					34.7	33.1	22.5	24.9			17.7	
Progression Factor					1.00	1.00	1.27	1.26			0.74	
Incremental Delay, d <sub>2</sub>					5.9	0.4	1.1	7.0			4.0	
Delay (s)					40.7	33.5	29.7	38.4			17.1	
Level of Service					D	C	C	D			B	
Approach Delay (s)		0.0			36.0			34.9			17.1	

HCM Signalized Intersection Capacity Analysis  
 2: US 101 NB Ramps & Brisco Road

EA: 05-0Q620K  
 7/23/2009

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			D			C			B	
<b>Intersection Summary</b>												
HCM Average Control Delay			28.9				HCM Level of Service					C
HCM Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			80.0				Sum of lost time (s)					11.4
Intersection Capacity Utilization			60.9%				ICU Level of Service					B
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 3: West Branch Street & Brisco Road

EA: 05-0Q620K  
 7/23/2009

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↙	↑	↖	↗
Volume (vph)	118	466	85	174	519	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.4	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	1863	1770	1583
Peak-hour factor, PHF	0.86	0.86	0.90	0.90	0.92	0.92
Growth Factor (vph)	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	137	542	94	193	564	107
RTOR Reduction (vph)	0	398	0	0	0	58
Lane Group Flow (vph)	137	144	94	193	564	49
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	6 5	
Permitted Phases		4				6 5
Actuated Green, G (s)	21.3	21.3	10.5	36.2	36.8	36.8
Effective Green, g (s)	21.3	21.3	10.5	36.2	36.8	36.8
Actuated g/C Ratio	0.27	0.27	0.13	0.45	0.46	0.46
Clearance Time (s)	4.4	4.4	3.5	3.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	496	421	232	843	814	728
v/s Ratio Prot	0.07		c0.05	0.10	c0.32	
v/s Ratio Perm		c0.09				0.03
v/c Ratio	0.28	0.34	0.41	0.23	0.69	0.07
Uniform Delay, d1	23.2	23.7	31.9	13.4	17.1	12.0
Progression Factor	1.00	1.00	1.00	1.00	0.25	0.00
Incremental Delay, d2	1.4	2.2	5.2	0.1	1.8	0.0
Delay (s)	24.6	25.9	37.1	13.5	6.1	0.1
Level of Service	C	C	D	B	A	A
Approach Delay (s)	25.7			21.2	5.1	

HCM Signalized Intersection Capacity Analysis  
 3: West Branch Street & Brisco Road

EA: 05-0Q620K  
 7/23/2009



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS	C		C		A	

Intersection Summary			
HCM Average Control Delay	16.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.4
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 4: El Camino Real & US 101 SB Ramps

EA: 05-0Q620K  
 7/23/2009

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBT	NBR	NBR2	SBL	SBT	SBR
Lane Configurations													
Volume (vph)	198	22	331	21	29	8	338	0	25	20	10	246	196
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.1		3.5	4.1		4.1	4.1				3.5	3.5
Lane Util. Factor	1.00	1.00		1.00	1.00		0.95	0.95				1.00	1.00
Frt	1.00	0.86		1.00	0.97		1.00	0.96				1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.96				1.00	1.00
Satd. Flow (prot)	1770	1601		1770	1801		1681	1644				1859	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	0.96				1.00	1.00
Satd. Flow (perm)	1770	1601		1770	1801		1681	1644				1859	1583
Peak-hour factor, PHF	0.86	0.86	0.86	0.76	0.76	0.76	0.81	0.81	0.81	0.81	0.92	0.92	0.92
Growth Factor (vph)	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%
Adj. Flow (vph)	237	26	396	28	39	11	430	0	32	25	11	275	219
RTOR Reduction (vph)	0	296	0	0	10	0	0	5	0	0	0	0	166
Lane Group Flow (vph)	237	126	0	28	40	0	245	237	0	0	0	286	53
Turn Type	Prot			Prot			Split				Split		Perm
Protected Phases	1	6		5	2		4	4			3	3	
Permitted Phases													3
Actuated Green, G (s)	13.0	15.2		1.8	4.0		13.6	13.6				14.1	14.1
Effective Green, g (s)	13.0	15.2		1.8	4.0		13.6	13.6				14.1	14.1
Actuated g/C Ratio	0.22	0.25		0.03	0.07		0.23	0.23				0.24	0.24
Clearance Time (s)	3.5	4.1		3.5	4.1		4.1	4.1				3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0				3.0	3.0
Lane Grp Cap (vph)	384	406		53	120		382	373				438	373
v/s Ratio Prot	c0.13	c0.08		c0.02	0.02		c0.15	0.14				c0.15	
v/s Ratio Perm													0.03
v/c Ratio	0.62	0.31		0.53	0.33		0.64	0.64				0.65	0.14
Uniform Delay, d1	21.2	18.1		28.6	26.7		20.9	20.9				20.7	18.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00				1.00	1.00
Incremental Delay, d2	2.9	0.4		9.2	1.6		3.7	3.5				3.5	0.2
Delay (s)	24.1	18.6		37.8	28.3		24.6	24.5				24.2	18.3
Level of Service	C	B		D	C		C	C				C	B
Approach Delay (s)		20.6			31.7			24.5				21.6	

HCM Signalized Intersection Capacity Analysis  
 4: El Camino Real & US 101 SB Ramps

EA: 05-0Q620K  
 7/23/2009

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBT	NBR	NBR2	SBL	SBT	SBR
Approach LOS		C			C			C				C	
<b>Intersection Summary</b>													
HCM Average Control Delay			22.5				HCM Level of Service						C
HCM Volume to Capacity ratio			0.66										
Actuated Cycle Length (s)			59.9				Sum of lost time (s)			18.7			
Intersection Capacity Utilization			57.4%				ICU Level of Service			B			
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis  
 5: Grand Avenue & US 101 SB Ramps

EA: 05-0Q620K  
 7/23/2009

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	615	359	116	770	0	0	0	0	260	0	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.1		3.5	4.2					3.7		3.7
Lane Util. Factor		0.95		1.00	0.95					1.00		1.00
Frt		0.94		1.00	1.00					1.00		0.85
Flt Protected		1.00		0.95	1.00					0.95		1.00
Satd. Flow (prot)		3344		1770	3539					1770		1583
Flt Permitted		1.00		0.95	1.00					0.95		1.00
Satd. Flow (perm)		3344		1770	3539					1770		1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.92	0.92	0.92	0.92	0.92	0.92	0.75	0.75	0.75
Growth Factor (vph)	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%
Adj. Flow (vph)	0	653	381	130	862	0	0	0	0	357	0	119
RTOR Reduction (vph)	0	120	0	0	0	0	0	0	0	0	0	90
Lane Group Flow (vph)	0	914	0	130	862	0	0	0	0	357	0	29
Turn Type				Prot						Prot		custom
Protected Phases		2		1	6					3		
Permitted Phases												3
Actuated Green, G (s)		24.9		16.5	44.8					17.3		17.3
Effective Green, g (s)		24.9		16.5	44.8					17.3		17.3
Actuated g/C Ratio		0.36		0.24	0.64					0.25		0.25
Clearance Time (s)		4.1		3.5	4.2					3.7		3.7
Vehicle Extension (s)		3.0		3.0	3.0					3.0		3.0
Lane Grp Cap (vph)		1190		417	2265					437		391
v/s Ratio Prot		c0.27		0.07	c0.24					c0.20		
v/s Ratio Perm												0.02
v/c Ratio		0.77		0.31	0.38					0.82		0.08
Uniform Delay, d1		20.0		22.1	6.0					24.9		20.2
Progression Factor		1.00		0.67	0.24					1.00		1.00
Incremental Delay, d2		4.8		1.3	0.3					15.5		0.4
Delay (s)		24.8		16.0	1.8					40.3		20.6
Level of Service		C		B	A					D		C
Approach Delay (s)		24.8			3.6			0.0			35.4	

HCM Signalized Intersection Capacity Analysis  
 5: Grand Avenue & US 101 SB Ramps

EA: 05-0Q620K  
 7/23/2009

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Approach LOS		C			A			A			D		
<b>Intersection Summary</b>													
HCM Average Control Delay			18.4									HCM Level of Service	B
HCM Volume to Capacity ratio			0.65										
Actuated Cycle Length (s)			70.0									Sum of lost time (s)	7.8
Intersection Capacity Utilization			67.4%									ICU Level of Service	C
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis  
6: Grand Avenue & US 101 NB Ramps

EA: 05-0Q620K  
7/23/2009

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	171	763	0	0	617	314	244	0	36	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.1			4.1			3.7	3.7			
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00			
Fr <sub>t</sub>	1.00	1.00			0.95			1.00	0.85			
Fl <sub>t</sub> Protected	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (prot)	1593	3185			3024			1593	1425			
Fl <sub>t</sub> Permitted	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (perm)	1593	3185			3024			1593	1425			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%
Adj. Flow (vph)	191	854	0	0	691	352	273	0	40	0	0	0
RTOR Reduction (vph)	0	0	0	0	92	0	0	0	31	0	0	0
Lane Group Flow (vph)	191	854	0	0	951	0	0	273	9	0	0	0
Turn Type	Prot			Split				Perm				
Protected Phases	5	2					8	8				
Permitted Phases					6				8			
Actuated Green, G (s)	13.5	45.9			28.9			16.3	16.3			
Effective Green, g (s)	13.5	45.9			28.9			16.3	16.3			
Actuated g/C Ratio	0.19	0.66			0.41			0.23	0.23			
Clearance Time (s)	3.5	4.1			4.1			3.7	3.7			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	307	2088			1248			371	332			
v/s Ratio Prot	c0.12	0.27						c0.17				
v/s Ratio Perm					c0.31				0.01			
v/c Ratio	0.62	0.41			0.76			0.74	0.03			
Uniform Delay, d <sub>1</sub>	25.9	5.7			17.6			24.9	20.7			
Progression Factor	0.74	0.18			1.00			1.00	1.00			
Incremental Delay, d <sub>2</sub>	2.4	0.4			4.4			12.3	0.2			
Delay (s)	21.7	1.4			22.0			37.1	20.9			
Level of Service	C	A			C			D	C			
Approach Delay (s)		5.1			22.0			35.0		0.0		

HCM Signalized Intersection Capacity Analysis  
 6: Grand Avenue & US 101 NB Ramps

EA: 05-0Q620K  
 7/23/2009

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Approach LOS		A			C			D			A		
<b>Intersection Summary</b>													
HCM Average Control Delay			16.3									HCM Level of Service	B
HCM Volume to Capacity ratio			0.72										
Actuated Cycle Length (s)			70.0									Sum of lost time (s)	11.3
Intersection Capacity Utilization			67.4%									ICU Level of Service	C
Analysis Period (min)			15										
c Critical Lane Group													

# Attachment K

## HCM LOS Analysis

### Unsignalized Intersections

-  Existing Conditions – AM Peak Hour
-  Existing Conditions – PM Peak Hour
-  Project Conditions – AM Peak Hour
-  Project Conditions – PM Peak Hour

## TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	RDB	Intersection	Hwy 101 & El Campo Road
Agency/Co.	Caltrans	Jurisdiction	Caltrans
Date Performed	10/15/2008	Analysis Year	2008
Analysis Time Period	AM Peak Hour		

Project Description <i>Hwy 101 &amp; El Campo Road - Existing</i>	
East/West Street: <i>El Campo Road</i>	North/South Street: <i>Highway 101</i>
Intersection Orientation: <i>North-South</i>	Study Period (hrs): <i>0.25</i>

Vehicle Volumes and Adjustments						
Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	0	2116	1	3	1650	58
Peak-Hour Factor, PHF	1.00	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	0	2351	1	3	1833	64
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	<i>Two Way Left Turn Lane</i>					
RT Channelized			0			0
Lanes	1	2	0	1	2	1
Configuration	L	T	TR	L	T	R
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	88	1	6	0	0	1
Peak-Hour Factor, PHF	0.85	0.85	0.85	1.00	1.00	0.85
Hourly Flow Rate, HFR (veh/h)	103	1	7	0	0	1
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		2			2	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	0	3		1			111	
C (m) (veh/h)	319	212					72	
v/c	0.00	0.01					1.54	
95% queue length	0.00	0.04					9.33	
Control Delay (s/veh)	16.3	22.2					399.5	
LOS	C	C					F	
Approach Delay (s/veh)	--	--					399.5	
Approach LOS	--	--					F	

## TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	Roger D. Barnes	Intersection	Hwy 101 & Laetitia Winery Ent.
Agency/Co.	Caltrans	Jurisdiction	Caltrans
Date Performed	5/4/2009	Analysis Year	Existing Conditions
Analysis Time Period	AM Peak Hour		

Project Description	
East/West Street: <i>Laetitia Winery Entrance</i>	North/South Street: <i>Highway 101</i>
Intersection Orientation: <i>North-South</i>	Study Period (hrs): <i>0.25</i>

Vehicle Volumes and Adjustments						
Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		2258	7	6	2165	
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR (veh/h)	0	2656	8	7	2547	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	<i>Raised curb</i>					
RT Channelized			0			0
Lanes	0	2	0	1	2	0
Configuration		T	TR	L	T	
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				7		6
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR (veh/h)	0	0	0	8	0	7
Percent Heavy Vehicles	0	0	0	2	0	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	1	0	1
Configuration				L		R

Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L	L		R			
v (veh/h)		7	8		7			
C (m) (veh/h)		154	37		144			
v/c		0.05	0.22		0.05			
95% queue length		0.14	0.69		0.15			
Control Delay (s/veh)		29.5	127.4		31.3			
LOS		D	F		D			
Approach Delay (s/veh)	--	--	82.5					
Approach LOS	--	--	F					

## TWO-WAY STOP CONTROL SUMMARY

### General Information

Analyst	Roger D. Barnes
Agency/Co.	Caltrans
Date Performed	5/4/2009
Analysis Time Period	AM Peak Hour

### Site Information

Intersection	Hwy 101 SB Ramps/Los Berros Rd
Jurisdiction	Caltrans
Analysis Year	Existing Conditions

Project Description *0Q620K - AM Peak Hour - Existing Conditions*

East/West Street: *Los Berros Road*

North/South Street: *Highway 101 SB Ramps*

Intersection Orientation: *East-West*

Study Period (hrs): *0.25*

### Vehicle Volumes and Adjustments

Major Street Movement	Eastbound			Westbound		
	1 L	2 T	3 R	4 L	5 T	6 R
Volume (veh/h)		243	196	55	290	
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR (veh/h)	0	285	230	64	341	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	<i>Undivided</i>					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	

Minor Street Movement	Northbound			Southbound		
	7 L	8 T	9 R	10 L	11 T	12 R
Volume (veh/h)				100	1	55
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR (veh/h)	0	0	0	117	1	64
Percent Heavy Vehicles	0	0	0	2	2	2
Percent Grade (%)	0			0		
Flared Approach		N			Y	
Storage		0			1	
RT Channelized			0			0
Lanes	0	0	0	0	1	0
Configuration					LTR	

### Delay, Queue Length, and Level of Service

Approach Movement	Eastbound	Westbound	Northbound			Southbound		
	1	4	7	8	9	10	11	12
Lane Configuration		LT					LTR	
v (veh/h)		64					182	
C (m) (veh/h)		1051					420	
v/c		0.06					0.43	
95% queue length		0.19					2.14	
Control Delay (s/veh)		8.6					20.0	
LOS		A					C	
Approach Delay (s/veh)	--	--					20.0	
Approach LOS	--	--					C	

## TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	Roger D. Barnes	Intersection	Hwy 101 NB Ramps/Thompson Rd
Agency/Co.	Caltrans	Jurisdiction	Caltrans
Date Performed	5/4/2009	Analysis Year	Existing Conditions
Analysis Time Period	AM Peak Hour		

Project Description <i>0Q620K - AM Peak Hour - Existing Conditions</i>	
East/West Street: <i>Thompson Road</i>	North/South Street: <i>Highway 101 NB Ramps</i>
Intersection Orientation: <i>East-West</i>	Study Period (hrs): <i>0.25</i>

Vehicle Volumes and Adjustments						
Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	103	237			198	133
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR (veh/h)	121	278	0	0	232	156
Percent Heavy Vehicles	2	--	--	0	--	--
Median Type	<i>Undivided</i>					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	<i>LT</i>					<i>TR</i>
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	143	6	44			
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR (veh/h)	168	7	51	0	0	0
Percent Heavy Vehicles	2	2	2	0	0	0
Percent Grade (%)		0			0	
Flared Approach		Y			N	
Storage		1			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		<i>LTR</i>				

Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	<i>LT</i>			<i>LTR</i>				
v (veh/h)	121			226				
C (m) (veh/h)	1170			370				
v/c	0.10			0.61				
95% queue length	0.35			3.87				
Control Delay (s/veh)	8.4			28.9				
LOS	A			D				
Approach Delay (s/veh)	--	--	28.9					
Approach LOS	--	--	D					

## TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	<i>RDB</i>	Intersection	<i>Hwy 101 &amp; El Campo Road</i>
Agency/Co.	<i>Caltrans</i>	Jurisdiction	<i>Caltrans</i>
Date Performed	<i>10/15/2008</i>	Analysis Year	<i>2008</i>
Analysis Time Period	<i>PM Peak Hour</i>		

Project Description <i>Hwy 101 &amp; El Campo Road - Existing</i>	
East/West Street: <i>El Campo Road</i>	North/South Street: <i>Highway 101</i>
Intersection Orientation: <i>North-South</i>	Study Period (hrs): <i>0.25</i>

Vehicle Volumes and Adjustments						
Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	<i>7</i>	<i>1864</i>	<i>0</i>	<i>3</i>	<i>2609</i>	<i>160</i>
Peak-Hour Factor, PHF	<i>0.94</i>	<i>0.94</i>	<i>1.00</i>	<i>0.93</i>	<i>0.93</i>	<i>0.93</i>
Hourly Flow Rate, HFR (veh/h)	<i>7</i>	<i>1982</i>	<i>0</i>	<i>3</i>	<i>2805</i>	<i>172</i>
Percent Heavy Vehicles	<i>0</i>	--	--	<i>0</i>	--	--
Median Type	<i>Two Way Left Turn Lane</i>					
RT Channelized			<i>0</i>			<i>0</i>
Lanes	<i>1</i>	<i>2</i>	<i>0</i>	<i>1</i>	<i>2</i>	<i>1</i>
Configuration	<i>L</i>	<i>T</i>	<i>TR</i>	<i>L</i>	<i>T</i>	<i>R</i>
Upstream Signal		<i>0</i>			<i>0</i>	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	<i>23</i>	<i>0</i>	<i>2</i>	<i>0</i>	<i>0</i>	<i>1</i>
Peak-Hour Factor, PHF	<i>0.69</i>	<i>1.00</i>	<i>0.69</i>	<i>1.00</i>	<i>1.00</i>	<i>0.25</i>
Hourly Flow Rate, HFR (veh/h)	<i>33</i>	<i>0</i>	<i>2</i>	<i>0</i>	<i>0</i>	<i>4</i>
Percent Heavy Vehicles	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
Percent Grade (%)		<i>0</i>			<i>0</i>	
Flared Approach		<i>Y</i>			<i>Y</i>	
Storage		<i>2</i>			<i>2</i>	
RT Channelized			<i>0</i>			<i>0</i>
Lanes	<i>0</i>	<i>1</i>	<i>0</i>	<i>0</i>	<i>1</i>	<i>0</i>
Configuration		<i>LTR</i>			<i>LTR</i>	

Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	<i>L</i>	<i>L</i>		<i>LTR</i>			<i>LTR</i>	
v (veh/h)	<i>7</i>	<i>3</i>		<i>4</i>			<i>35</i>	
C (m) (veh/h)	<i>120</i>	<i>295</i>					<i>19</i>	
v/c	<i>0.06</i>	<i>0.01</i>					<i>1.84</i>	
95% queue length	<i>0.18</i>	<i>0.03</i>					<i>4.76</i>	
Control Delay (s/veh)	<i>36.9</i>	<i>17.3</i>					<i>823.2</i>	
LOS	<i>E</i>	<i>C</i>					<i>F</i>	
Approach Delay (s/veh)	--	--					<i>823.2</i>	
Approach LOS	--	--					<i>F</i>	

## TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	Roger D. Barnes	Intersection	Hwy 101 & Laetitia Winery Ent.
Agency/Co.	Caltrans	Jurisdiction	Caltrans
Date Performed	5/4/2009	Analysis Year	Existing Conditions
Analysis Time Period	PM Peak Hour		

Project Description: <i>OQ620K - PM Peak Hour - Existing Conditions</i>	
East/West Street: <i>Laetitia Winery Entrance</i>	North/South Street: <i>Highway 101</i>
Intersection Orientation: <i>North-South</i>	Study Period (hrs): <i>0.25</i>

Vehicle Volumes and Adjustments						
Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		2385	13	11	2903	
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR (veh/h)	0	2805	15	12	3415	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	<i>Raised curb</i>					
RT Channelized			0			0
Lanes	0	2	0	1	2	0
Configuration		T	TR	L	T	
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				13		11
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR (veh/h)	0	0	0	15	0	12
Percent Heavy Vehicles	0	0	0	2	0	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	1	0	1
Configuration				L		R

Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L	L		R			
v (veh/h)		12	15		12			
C (m) (veh/h)		134	30		128			
v/c		0.09	0.50		0.09			
95% queue length		0.29	1.61		0.30			
Control Delay (s/veh)		34.5	211.6		36.0			
LOS		D	F		E			
Approach Delay (s/veh)	--	--	133.6					
Approach LOS	--	--	F					

## TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	Roger D. Barnes	Intersection	Hwy 101 SB Ramps/Los Berros Rd
Agency/Co.	Caltrans	Jurisdiction	Caltrans
Date Performed	5/4/2009	Analysis Year	Existing Conditions
Analysis Time Period	PM Peak Hour		

Project Description <i>0Q620K - PM Peak Hour - Existing Conditions</i>	
East/West Street: <i>Los Berros Road</i>	North/South Street: <i>Highway 101 SB Ramps</i>
Intersection Orientation: <i>East-West</i>	Study Period (hrs): <i>0.25</i>

Vehicle Volumes and Adjustments						
Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		107	233	40	245	
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR (veh/h)	0	125	274	47	288	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	<i>Undivided</i>					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			<i>TR</i>	<i>LT</i>		
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				216	1	79
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR (veh/h)	0	0	0	254	1	92
Percent Heavy Vehicles	0	0	0	2	2	2
Percent Grade (%)	0			0		
Flared Approach		<i>N</i>			<i>Y</i>	
Storage		0			1	
RT Channelized			0			0
Lanes	0	0	0	0	1	0
Configuration					<i>LTR</i>	

Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		<i>LT</i>					<i>LTR</i>	
v (veh/h)		47					347	
C (m) (veh/h)		1160					506	
v/c		0.04					0.69	
95% queue length		0.13					5.19	
Control Delay (s/veh)		8.2					26.2	
LOS		<i>A</i>					<i>D</i>	
Approach Delay (s/veh)	--	--					26.2	
Approach LOS	--	--					<i>D</i>	

## TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	Roger D. Barnes	Intersection	Hwy 101 NB Ramps/Thompson Rd
Agency/Co.	Caltrans	Jurisdiction	Caltrans
Date Performed	5/4/2009	Analysis Year	Existing Conditions
Analysis Time Period	PM Peak Hour		

Project Description <i>0Q620K - PM Peak Hour - Existing Conditions</i>	
East/West Street: <i>Thompson Road</i>	North/South Street: <i>Highway 101 NB Ramps</i>
Intersection Orientation: <i>East-West</i>	Study Period (hrs): <i>0.25</i>

Vehicle Volumes and Adjustments						
Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	54	269			87	47
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR (veh/h)	63	316	0	0	102	55
Percent Heavy Vehicles	2	--	--	0	--	--
Median Type	<i>Undivided</i>					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	<i>LT</i>					<i>TR</i>
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	176	1	22			
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR (veh/h)	207	1	25	0	0	0
Percent Heavy Vehicles	2	2	2	0	0	0
Percent Grade (%)		0			0	
Flared Approach		Y			N	
Storage		1			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		<i>LTR</i>				

Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	<i>LT</i>			<i>LTR</i>				
v (veh/h)	63			233				
C (m) (veh/h)	1423			498				
v/c	0.04			0.47				
95% queue length	0.14			2.46				
Control Delay (s/veh)	7.6			18.4				
LOS	A			C				
Approach Delay (s/veh)	--	--	18.4					
Approach LOS	--	--	C					

## TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	<i>RDB</i>	Intersection	<i>Hwy 101 &amp; El Campo Road</i>
Agency/Co.	<i>Caltrans</i>	Jurisdiction	<i>Caltrans</i>
Date Performed	<i>10/15/2008</i>	Analysis Year	<i>2008</i>
Analysis Time Period	<i>AM Peak Hour</i>		

Project Description <i>Hwy 101 &amp; El Campo Road - Existing + Project</i>	
East/West Street: <i>El Campo Road</i>	North/South Street: <i>Highway 101</i>
Intersection Orientation: <i>North-South</i>	Study Period (hrs): <i>0.25</i>

Vehicle Volumes and Adjustments						
Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		<i>2116</i>	<i>1</i>		<i>1650</i>	<i>58</i>
Peak-Hour Factor, PHF	<i>1.00</i>	<i>0.90</i>	<i>0.90</i>	<i>1.00</i>	<i>0.90</i>	<i>0.90</i>
Hourly Flow Rate, HFR (veh/h)	<i>0</i>	<i>2351</i>	<i>1</i>	<i>0</i>	<i>1833</i>	<i>64</i>
Percent Heavy Vehicles	<i>0</i>	--	--	<i>0</i>	--	--
Median Type	<i>Two Way Left Turn Lane</i>					
RT Channelized			<i>0</i>			<i>0</i>
Lanes	<i>0</i>	<i>2</i>	<i>0</i>	<i>0</i>	<i>2</i>	<i>1</i>
Configuration		<i>T</i>	<i>TR</i>		<i>T</i>	<i>R</i>
Upstream Signal		<i>0</i>			<i>0</i>	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)			<i>6</i>			<i>1</i>
Peak-Hour Factor, PHF	<i>1.00</i>	<i>1.00</i>	<i>0.85</i>	<i>1.00</i>	<i>1.00</i>	<i>0.85</i>
Hourly Flow Rate, HFR (veh/h)	<i>0</i>	<i>0</i>	<i>7</i>	<i>0</i>	<i>0</i>	<i>1</i>
Percent Heavy Vehicles	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
Percent Grade (%)		<i>0</i>			<i>0</i>	
Flared Approach		<i>Y</i>			<i>Y</i>	
Storage		<i>2</i>			<i>2</i>	
RT Channelized			<i>0</i>			<i>0</i>
Lanes	<i>0</i>	<i>0</i>	<i>1</i>	<i>0</i>	<i>0</i>	<i>1</i>
Configuration			<i>R</i>			<i>R</i>

Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration					<i>R</i>			<i>R</i>
v (veh/h)					<i>1</i>			<i>7</i>
C (m) (veh/h)					<i>187</i>			<i>279</i>
v/c					<i>0.01</i>			<i>0.03</i>
95% queue length					<i>0.02</i>			<i>0.08</i>
Control Delay (s/veh)					<i>24.4</i>			<i>18.2</i>
LOS					<i>C</i>			<i>C</i>
Approach Delay (s/veh)	--	--	<i>24.4</i>			<i>18.2</i>		
Approach LOS	--	--	<i>C</i>			<i>C</i>		

## TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	Roger D. Barnes	Intersection	Hwy 101 & Laetitia Winery Ent.
Agency/Co.	Caltrans	Jurisdiction	Caltrans
Date Performed	5/4/2009	Analysis Year	Existing + Project Conditions
Analysis Time Period	AM Peak Hour		

Project Description	
East/West Street: <i>Laetitia Winery Entrance</i>	North/South Street: <i>Highway 101</i>
Intersection Orientation: <i>North-South</i>	Study Period (hrs): <i>0.25</i>

Vehicle Volumes and Adjustments						
Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		2258	13		2165	
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR (veh/h)	0	2656	15	0	2547	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	<i>Raised curb</i>					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		T	TR		T	
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						13
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	15
Percent Heavy Vehicles	0	0	0	0	0	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	1
Configuration						R

Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration					R			
v (veh/h)					15			
C (m) (veh/h)					144			
v/c					0.10			
95% queue length					0.34			
Control Delay (s/veh)					32.9			
LOS					D			
Approach Delay (s/veh)	--	--	32.9					
Approach LOS	--	--	D					

## TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	Roger D. Barnes	Intersection	Hwy 101 SB Ramps/Los Berros Rd
Agency/Co.	Caltrans	Jurisdiction	Caltrans
Date Performed	5/4/2009	Analysis Year	Existing + Project Conditions
Analysis Time Period	AM Peak Hour		

Project Description <i>0Q620K - AM Peak Hour: Existing + Project Conditions</i>	
East/West Street: <i>Los Berros Road</i>	North/South Street: <i>Highway 101 SB Ramps</i>
Intersection Orientation: <i>East-West</i>	Study Period (hrs): <i>0.25</i>

Vehicle Volumes and Adjustments						
Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		243	196	55	290	
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR (veh/h)	0	285	230	64	341	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	<i>Undivided</i>					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			<i>TR</i>	<i>LT</i>		
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				106	1	55
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR (veh/h)	0	0	0	124	1	64
Percent Heavy Vehicles	0	0	0	2	2	2
Percent Grade (%)	0			0		
Flared Approach		<i>N</i>			<i>Y</i>	
Storage		0			1	
RT Channelized			0			0
Lanes	0	0	0	0	1	0
Configuration					<i>LTR</i>	

Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		<i>LT</i>					<i>LTR</i>	
v (veh/h)		64					189	
C (m) (veh/h)		1051					414	
v/c		0.06					0.46	
95% queue length		0.19					2.33	
Control Delay (s/veh)		8.6					20.8	
LOS		<i>A</i>					<i>C</i>	
Approach Delay (s/veh)	--	--					20.8	
Approach LOS	--	--					<i>C</i>	

## TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	Roger D. Barnes	Intersection	Hwy 101 NB Ramps/Thompson Rd
Agency/Co.	Caltrans	Jurisdiction	Caltrans
Date Performed	5/4/2009	Analysis Year	
Analysis Time Period	AM Peak Hour		

Project Description <i>0Q620K - AM Peak Hour - Existing + Project Conditions</i>	
East/West Street: <i>Thompson Road</i>	North/South Street: <i>Highway 101 NB Ramps</i>
Intersection Orientation: <i>East-West</i>	Study Period (hrs): <i>0.25</i>

Vehicle Volumes and Adjustments						
Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	109	237			198	133
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR (veh/h)	128	278	0	0	232	156
Percent Heavy Vehicles	2	--	--	0	--	--
Median Type	<i>Undivided</i>					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	<i>LT</i>					<i>TR</i>
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	143	6	44			
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR (veh/h)	168	7	51	0	0	0
Percent Heavy Vehicles	2	2	2	0	0	0
Percent Grade (%)		0			0	
Flared Approach		Y			N	
Storage		1			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		<i>LTR</i>				

Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	<i>LT</i>			<i>LTR</i>				
v (veh/h)	128			226				
C (m) (veh/h)	1170			360				
v/c	0.11			0.63				
95% queue length	0.37			4.07				
Control Delay (s/veh)	8.5			30.4				
LOS	A			D				
Approach Delay (s/veh)	--	--	30.4					
Approach LOS	--	--	D					

## TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	RDB	Intersection	Hwy 101 & El Campo Road
Agency/Co.	Caltrans	Jurisdiction	Caltrans
Date Performed	10/15/2008	Analysis Year	2008
Analysis Time Period	PM Peak Hour		

Project Description	
East/West Street: <i>El Campo Road</i>	North/South Street: <i>Highway 101</i>
Intersection Orientation: <i>North-South</i>	Study Period (hrs): <i>0.25</i>

Vehicle Volumes and Adjustments						
Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		1864	0		2609	160
Peak-Hour Factor, PHF	1.00	0.94	0.94	1.00	0.93	0.93
Hourly Flow Rate, HFR (veh/h)	0	1982	0	0	2805	172
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	<i>Two Way Left Turn Lane</i>					
RT Channelized			0			0
Lanes	0	2	0	0	2	1
Configuration		T	TR		T	R
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)			2			1
Peak-Hour Factor, PHF	1.00	1.00	0.69	1.00	1.00	0.25
Hourly Flow Rate, HFR (veh/h)	0	0	2	0	0	4
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		2			2	
RT Channelized			0			0
Lanes	0	0	1	0	0	1
Configuration			R			R

Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration					R			R
v (veh/h)					4			2
C (m) (veh/h)					248			132
v/c					0.02			0.02
95% queue length					0.05			0.05
Control Delay (s/veh)					19.8			32.7
LOS					C			D
Approach Delay (s/veh)	--	--	19.8			32.7		
Approach LOS	--	--	C			D		

## TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	Roger D. Barnes	Intersection	Hwy 101 & Laetitia Winery Ent.
Agency/Co.	Caltrans	Jurisdiction	Caltrans
Date Performed	5/4/2009	Analysis Year	Existing + Project Conditions
Analysis Time Period	PM Peak Hour		

Project Description: <i>OQ620K - PM Peak Hour - Existing + Project Conditions</i>	
East/West Street: <i>Laetitia Winery Entrance</i>	North/South Street: <i>Highway 101</i>
Intersection Orientation: <i>North-South</i>	Study Period (hrs): <i>0.25</i>

Vehicle Volumes and Adjustments						
Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		2385	24		2903	
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR (veh/h)	0	2805	28	0	3415	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	<i>Raised curb</i>					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		T	TR		T	
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						24
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	28
Percent Heavy Vehicles	0	0	0	0	0	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	1
Configuration						R

Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration					R			
v (veh/h)					28			
C (m) (veh/h)					127			
v/c					0.22			
95% queue length					0.80			
Control Delay (s/veh)					41.2			
LOS					E			
Approach Delay (s/veh)	--	--	41.2					
Approach LOS	--	--	E					

## TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	Roger D. Barnes	Intersection	Hwy 101 SB Ramps/Los Berros Rd
Agency/Co.	Caltrans	Jurisdiction	Caltrans
Date Performed	5/4/2009	Analysis Year	Existing + Project Conditions
Analysis Time Period	PM Peak Hour		

Project Description <i>0Q620K - PM Peak Hour - Existing + Project Conditions</i>	
East/West Street: <i>Los Berros Road</i>	North/South Street: <i>Highway 101 SB Ramps</i>
Intersection Orientation: <i>East-West</i>	Study Period (hrs): <i>0.25</i>

Vehicle Volumes and Adjustments						
Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		107	233	40	245	
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR (veh/h)	0	125	274	47	288	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	<i>Undivided</i>					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			<i>TR</i>	<i>LT</i>		
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				227	1	79
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR (veh/h)	0	0	0	267	1	92
Percent Heavy Vehicles	0	0	0	2	2	2
Percent Grade (%)	0			0		
Flared Approach		<i>N</i>			<i>Y</i>	
Storage		0			1	
RT Channelized			0			0
Lanes	0	0	0	0	1	0
Configuration					<i>LTR</i>	

Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		<i>LT</i>					<i>LTR</i>	
v (veh/h)		47					360	
C (m) (veh/h)		1160					502	
v/c		0.04					0.72	
95% queue length		0.13					5.75	
Control Delay (s/veh)		8.2					28.3	
LOS		<i>A</i>					<i>D</i>	
Approach Delay (s/veh)	--	--					28.3	
Approach LOS	--	--					<i>D</i>	

## TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	Roger D. Barnes	Intersection	Hwy 101 NB Ramps/Thompson Rd
Agency/Co.	Caltrans	Jurisdiction	Caltrans
Date Performed	5/4/2009	Analysis Year	Existing + Project Conditions
Analysis Time Period	PM Peak Hour		

Project Description <i>0Q620K - PM Peak Hour - Existing + Project Conditions</i>	
East/West Street: <i>Thompson Road</i>	North/South Street: <i>Highway 101 NB Ramps</i>
Intersection Orientation: <i>East-West</i>	Study Period (hrs): <i>0.25</i>

Vehicle Volumes and Adjustments						
Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	65	269			87	47
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR (veh/h)	76	316	0	0	102	55
Percent Heavy Vehicles	2	--	--	0	--	--
Median Type	<i>Undivided</i>					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	<i>LT</i>					<i>TR</i>
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	176	1	22			
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR (veh/h)	207	1	25	0	0	0
Percent Heavy Vehicles	2	2	2	0	0	0
Percent Grade (%)		0			0	
Flared Approach		<i>Y</i>			<i>N</i>	
Storage		1			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		<i>LTR</i>				

Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	<i>LT</i>			<i>LTR</i>				
v (veh/h)	76			233				
C (m) (veh/h)	1423			476				
v/c	0.05			0.49				
95% queue length	0.17			2.65				
Control Delay (s/veh)	7.7			19.6				
LOS	<i>A</i>			<i>C</i>				
Approach Delay (s/veh)	--	--	19.6					
Approach LOS	--	--	<i>C</i>					

# Attachment L

## Speed Survey

 El Campo Road

 Laetitia Winery

# LASER SURVEY SUMMARY

<El Campo A=SB>

<clear>

POSTED SPEED LIMIT: <65 mph>

SURVEY STARTED: <2009/06/03 11:19>

FILENAME: 09060311.R19

MIN SPEED ALLOWED <5> MAX SPEED ALLOWED <110>

TIME 11:15

VEH. 50

AVG. 66.9

TOTAL VEHICLES = 50

MINIMUM SPEED = 55

MAXIMUM SPEED = 77

AVERAGE SPEED = 66.86

50th PERCENTILE = 67

85th PERCENTILE = 72

TEN MILE PACE = 64 to 73

**END OF REPORT**

# LASER SURVEY SUMMARY

<El Campo A=SB>

<clear>

POSTED SPEED LIMIT: <65 mph>

SURVEY STARTED: <2009/06/03 11:19>

FILENAME: 09060311.A19

MIN SPEED ALLOWED <5> MAX SPEED ALLOWED <110>

TIME 11:15  
VEH. 50  
AVG. 65.4

TOTAL VEHICLES = 50

MINIMUM SPEED = 52

MAXIMUM SPEED = 75

AVERAGE SPEED = 65.38

50th PERCENTILE = 65

85th PERCENTILE = 70

TEN MILE PACE = 61 to 70

**END OF REPORT**

# LASER SURVEY SUMMARY

<Laetitia Winery NB>

<clear>

POSTED SPEED LIMIT: <65 mph>

SURVEY STARTED: <2009/06/03 11:09>

FILENAME: 09060311.A09

MIN SPEED ALLOWED <5> MAX SPEED ALLOWED <110>

TIME 11:00 11:15

VEH. 44 6

AVG. 69.4 72.7

TOTAL VEHICLES = 50

MINIMUM SPEED = 61

MAXIMUM SPEED = 81

AVERAGE SPEED = 69.80

50th PERCENTILE = 69

85th PERCENTILE = 75

TEN MILE PACE = 63 to 72

**END OF REPORT**

# LASER SURVEY SUMMARY

<Laetitia Winery SB>

<clear>

POSTED SPEED LIMIT: <65 mph>

SURVEY STARTED: <2009/06/03 11:03>

FILENAME: 09060311.R03

MIN SPEED ALLOWED <5> MAX SPEED ALLOWED <110>

TIME 11:00

VEH. 50

AVG. 68.4

TOTAL VEHICLES = 50

MINIMUM SPEED = 59

MAXIMUM SPEED = 82

AVERAGE SPEED = 68.40

50th PERCENTILE = 69

85th PERCENTILE = 73

TEN MILE PACE = 63 to 72

**END OF REPORT**