

Grand Avenue Fast Food Drive-in/Drive-Thru Restaurant FOCUSED TRAFFIC IMPACT ANALYSIS REPORT

Prepared for

City of San Marcos

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INTRODUCTION

This study analyzes the forecast traffic impact of the proposed Grand Avenue Fast Food Drive-In/Drive-Thru Restaurant in the City of San Marcos. The project is located on the southeast corner of the Grand Avenue/Via Vera Cruz intersection. **Exhibit 1** shows the regional project vicinity.

The Grand Avenue Fast Food Drive-In/Drive-Thru Restaurant site is currently paved and empty. The purpose of the focused traffic study would be to evaluate the circulation needs and related traffic impacts associated with the development of the Fast Food Restaurant. This focused traffic study will address only existing conditions and short-range traffic conditions, without and with completion of the proposed project. The study also analyzes traffic impacts at intersections and roadway segments that provide immediate access to the project.

As required by the City of San Marcos, this focused traffic impact study has been prepared in accordance with the City's General Plan Circulation Element and SANDAG/SANTEC/ITE traffic study guidelines.

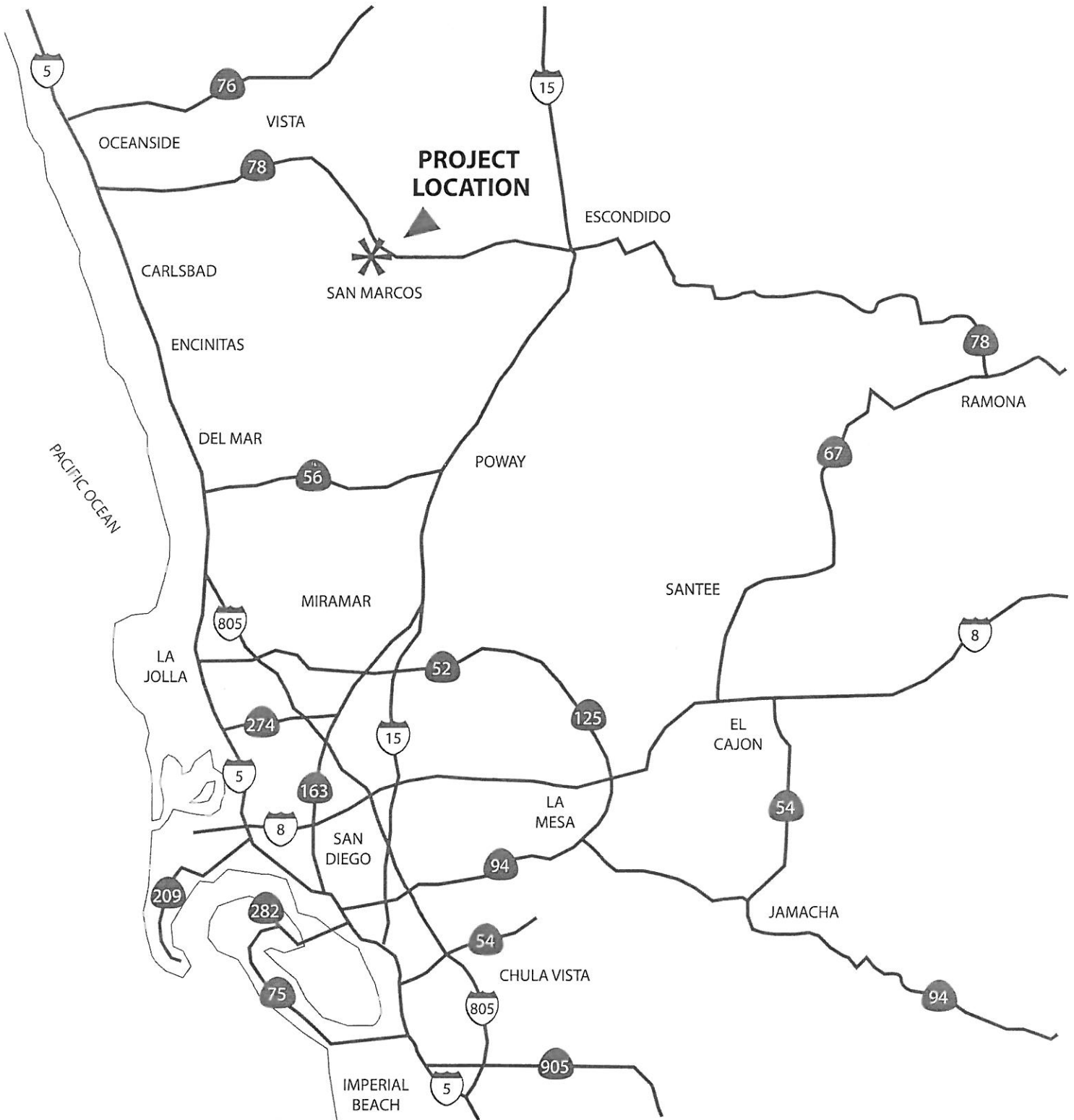
This traffic impact analysis includes the following study scenarios:

- Existing Conditions;
- Existing Plus Cumulative Projects;
- Existing Plus Cumulative Plus Proposed Project.

Project Description

The proposed Grand Avenue Fast Food Drive-In/Drive-Thru Restaurant consists of 1,795 square feet of restaurant with drive thru service, 899 square feet of outdoor seating, and 24 parking spaces. The project site plan is shown in **Exhibit 2**. Project access driveway operations will be evaluated based on project trip generation and trip distribution estimates and the proximity to other off-site intersections and driveways. The safety of left turn movements into and out of the site will be evaluated as well as its effect on circulation needs on-site. Project access will be provided at two project driveways, one on Grand Avenue and one on Via Vera Cruz. The project driveway on Grand Avenue will provide primary access to the project site and is proposed to allow left turns in and out. The project driveway on Via Vera Cruz will be restricted to right turns in and right turns out. The existing median barricade on Via Vera Cruz will need to be extended to ensure left turns in and out of the driveway are prohibited.

It should be noted that the project description and site plan referenced above reflects a nominal increase in floor area compared to the project evaluated in this traffic analysis. Based on the results of the analysis and the relative increase in floor area, it is our conclusion that any increase in the project impact would not be significant and would not trigger any new mitigation requirements.



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REGIONAL PROJECT VICINITY

EXHIBIT 1



EXHIBIT 2

Study Area

At the request of City of San Marcos staff, the project study area consists of the following existing intersections and roadway segments:

Intersections

1. Grand Avenue / Via Vera Cruz
2. Grand Avenue / Linda Vista Drive
3. Grand Avenue Project Driveway
4. Via Vera Cruz Project Driveway

Roadway Segments

1. Grand Avenue from Las Posas Road to Via Vera Cruz
2. Grand Avenue from Via Vera Cruz to Linda Vista Drive
3. Via Vera Cruz from Grand Avenue to Grand Plaza Signal

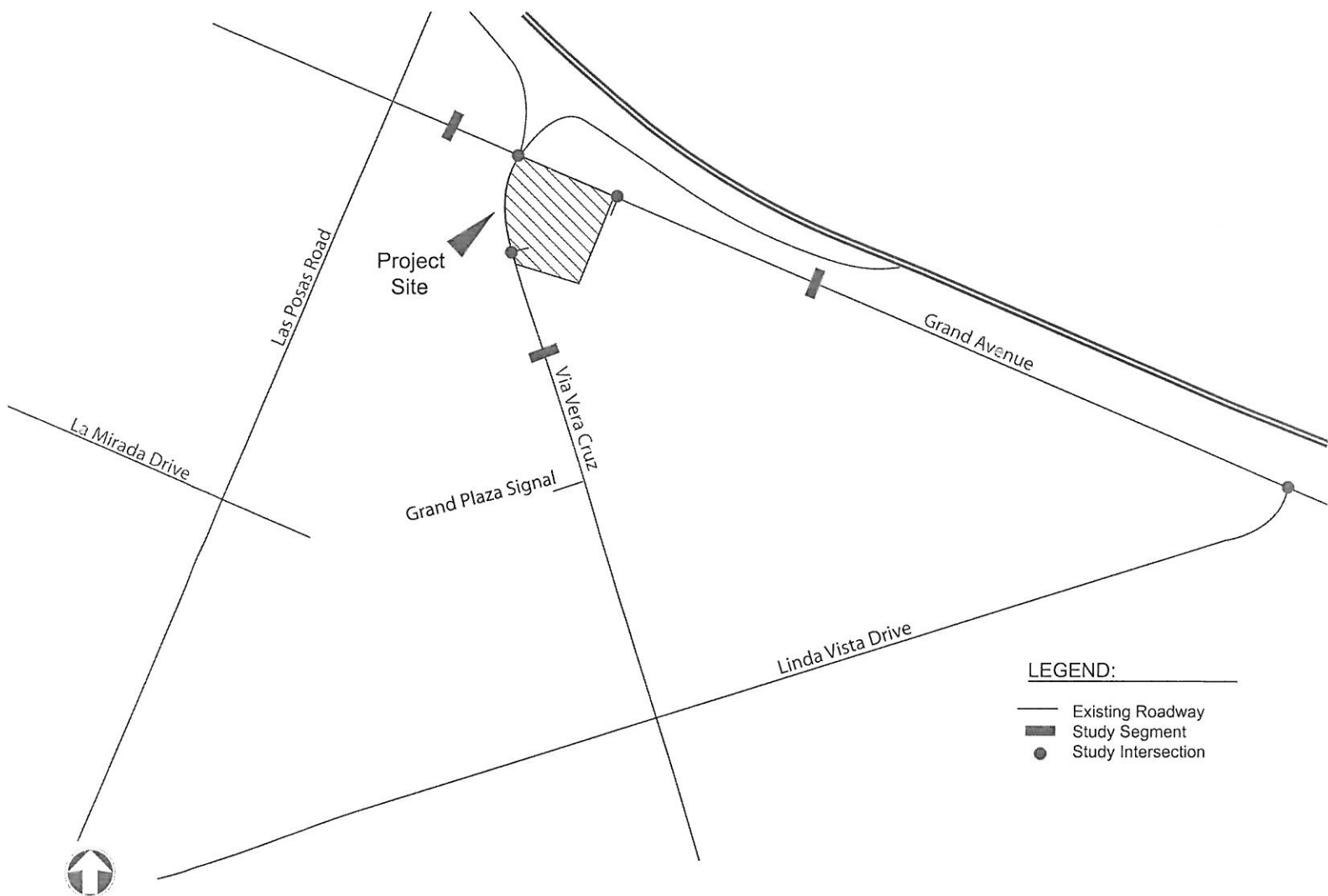
The project study area is shown graphically in **Exhibit 3**.

ANALYSIS METHODOLOGY

In accordance with SANTEC/ITE traffic study guidelines and City of San Marcos requirements, this study analyzes the followings study scenarios:

- **Existing Conditions** – Analysis of existing traffic count volumes, intersection geometry and existing roadway network.
- **Existing Plus Cumulative Conditions (No Project)** – Analysis of existing traffic volumes overlaid with traffic associated with approved or pending projects anticipated to be constructed by the project-opening year.
- **Existing Plus Cumulative Plus Project Conditions** – Analysis of existing traffic volumes overlaid with cumulative project traffic and traffic generated by the proposed project.

Analysis of all intersections and roadway segments in the project study area is based on the SANTEC/ITE traffic study guidelines, and is consistent with the City of San Marcos General Plan Circulation Element. As required, the 2000 Highway Capacity Manual (HCM) operation methodology for *Signalized and Unsignalized Intersections* was used to determine the operating Levels of Service (LOS) of the study intersections. The Traffix™ software package was used to evaluate the study intersections using the HCM methodology. The HCM methodology describes the operation of an intersection using a range of levels of service (LOS) from LOS A (free-flow conditions) to LOS F (severely congested conditions), based on corresponding delay per vehicle thresholds for signalized and unsignalized intersections shown in Table 1. The City of San Marcos considers LOS D or better to be acceptable intersection operating conditions during peak traffic periods.



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PROJECT STUDY AREA

EXHIBIT 3

Table 1
Level of Service & Delay Ranges

LOS	Delay (seconds/vehicle)	
	Signalized Intersections	Unsignalized Intersections
A	≤ 10.0	≤ 10.0
B	> 10.0 to ≤ 20.0	> 10.0 to ≤ 15.0
C	> 20.0 to ≤ 35.0	> 15.0 to ≤ 25.0
D	> 35.0 to ≤ 55.0	> 25.0 to ≤ 35.0
E	> 55.0 to ≤ 80.0	> 35.0 to ≤ 50.0
F	> 80.0	> 50.0

Source: 2000 Highway Capacity Manual.

A daily roadway segment analysis was conducted for all study area roadways, in accordance with the City of San Marcos General Plan Circulation Element and SANTEC/ITE guidelines. The roadway segment level of service criteria is included in Table 2. Excerpts from the SANTEC/ITE traffic impact study guidelines that summarize the capacity thresholds by roadway segment and level of service criteria are provided in Appendix A.

Table 2
Daily Level of Service Thresholds for Roadway Segments

Classification / Lanes	Level of Service				
	A	B	C	D	E
Prime Arterial / 7-8 ⁽¹⁾	29,200	40,800	58,300	64,200	70,000
Prime Arterial / 6	25,000	35,000	50,000	55,000	60,000
Major Arterial / 5 ⁽¹⁾	18,000	25,000	35,000	40,000	45,000
Major Arterial / 4	15,000	21,000	30,000	35,000	40,000
Secondary Arterial / 5 ⁽¹⁾	12,500	17,500	25,000	31,300	37,500
Secondary Arterial / 4	10,000	14,000	20,000	25,000	30,000
Secondary Arterial / 3 ⁽¹⁾	7,500	10,500	15,000	18,000	22,500
Collector / 2 + TWLTL ⁽²⁾	5,000	7,000	10,000	13,000	15,000
Collector / 2 ⁽³⁾	2,500	3,500	5,000	6,500	8,000

Source: SANTEC/ITE Guidelines for Traffic Impact Studies in the San Diego Region, 2000.

⁽¹⁾ Roadway classification with this lane configuration is not included in the City Circulation Element; LOS thresholds were calculated based on V/C ratios of the daily threshold volumes for the corresponding roadway classification.

⁽²⁾ TWLTL = Two-Way Left-Turn Lane (center lane)

⁽³⁾ With fronting commercial or residential property.

According to the City of San Marcos General Plan Circulation Element, the City's goal for acceptable service standards during daily periods is LOS D for all roadway segments.

EXISTING CONDITIONS

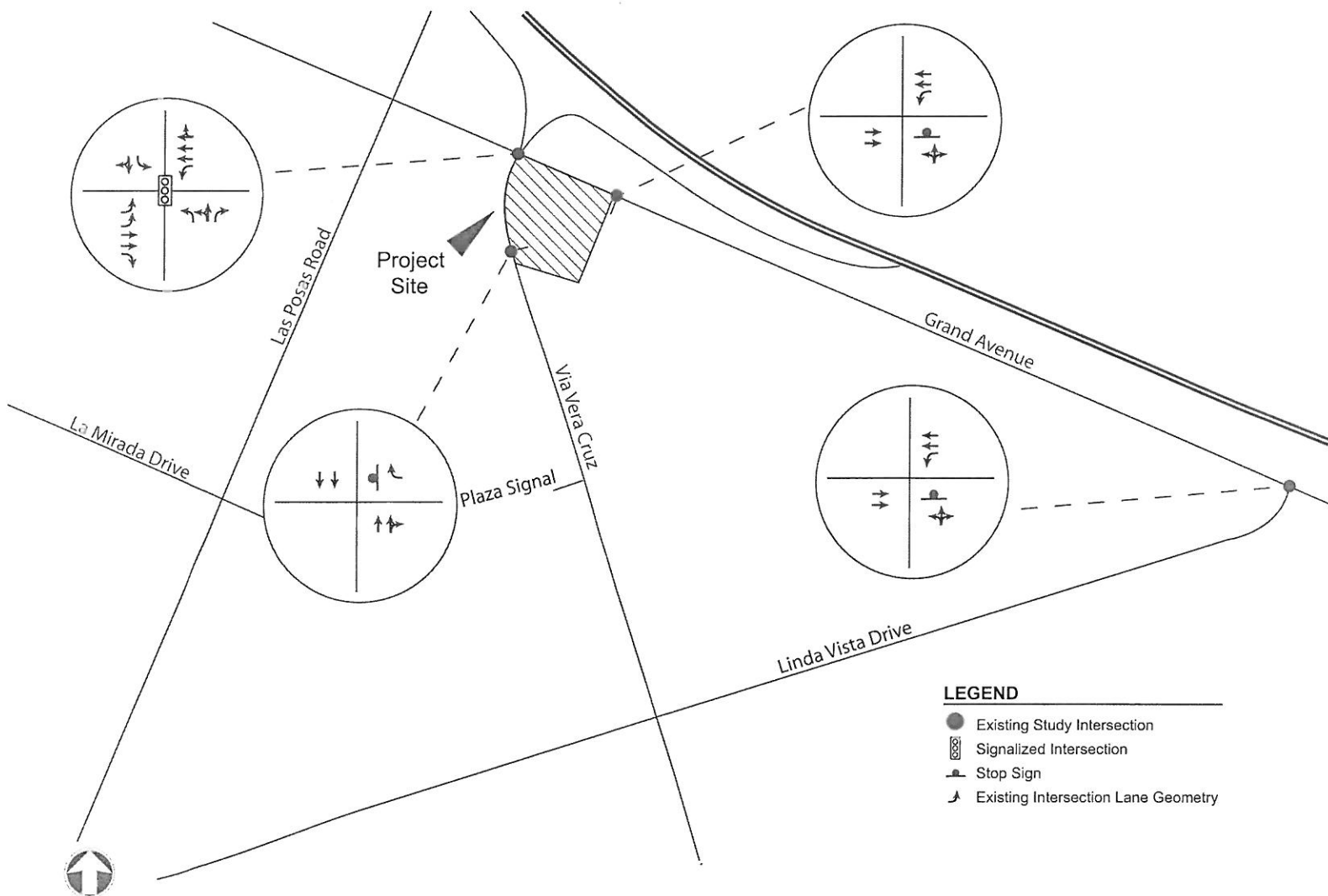
Existing Roadway Circulation System

A detailed field review was conducted to determine the existing intersection geometry, traffic control devices, signal phasing and other factors, which may affect intersection or roadway segment capacity. The existing intersection geometries are illustrated in **Exhibit 4**. The following is a detailed description of roadways in the study area.

Via Vera Cruz is currently a four-lane road extending north to south from Highway 78 down past Discovery Street. Via Vera Cruz is designated as a four-lane secondary arterial in the City of San Marcos General Plan Circulation Element. The road has a two-way left turn lane with sidewalks and bike lanes on both sides within the study area. The posted speed limit on Via Vera Cruz is 40 miles per hour.

Linda Vista Drive is currently constructed as a two-lane road in the study area and is generally oriented in an east-west alignment. There is a parking lane on both sides of the road, and the sidewalk is not continuous on either side. There are no bike lanes in the study area. The posted speed limit on Linda Vista Drive is 30 miles per hour.

Grand Avenue is constructed as a four-lane arterial oriented in an east-west direction from the San Marcos-Vista city limit to a few hundred yards east of Bent Avenue, near the limits of our study area. Grand Avenue is classified in the City of San Marcos General Plan Circulation Element as a four-lane Secondary Arterial from Rancho Santa Fe Road to San Marcos Boulevard. In the study area there is a continuous two-way left turn lane along the road and no bike lanes. The sidewalk on the south of the street is continuous and there is no sidewalk on the north side of the street. The posted speed limit on Grand Avenue is 45 miles per hour.



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EXISTING GEOMETRY

EXHIBIT 4

Existing Levels of Service

To determine the existing operation of the study intersections, peak hour intersection movement counts were collected on a typical weekday between the hours of 7:00 and 9:00 a.m. and between the hours of 4:00 and 6:00 p.m.

Exhibit 5 shows the existing a.m. and p.m. peak one-hour volumes at each of the study intersections and average daily traffic (ADT) volumes for this project. Detailed traffic count data is contained in Appendix B.

Table 3 summarizes the existing a.m. and p.m. peak hour intersection LOS of the study intersections based on the existing peak hour intersection volumes and existing intersection geometry. Detailed HCM calculation sheets are contained in Appendix C.

Table 3
Existing Peak Hour Intersection Conditions

Study Intersection	AM Peak Hour		PM Peak Hour	
	Delay ⁽¹⁾	LOS	Delay ⁽¹⁾	LOS
Grand Ave / Via Vera Cruz (Signalized)	24.8	C	31.5	C
Grand Ave / Linda Vista Drive (One-way Stop)	9.2	A	13.6	B
Grand Ave Project Driveway (One-way Stop)	8.8	A	14.5	B
Via Vera Cruz Project Driveway (One-way Stop)	11.8	B	15.3	C

⁽¹⁾ Seconds of delay per vehicle; reported as an average of all approaches for signalized intersections and as the controlled approach delay for the one-way stop intersections.

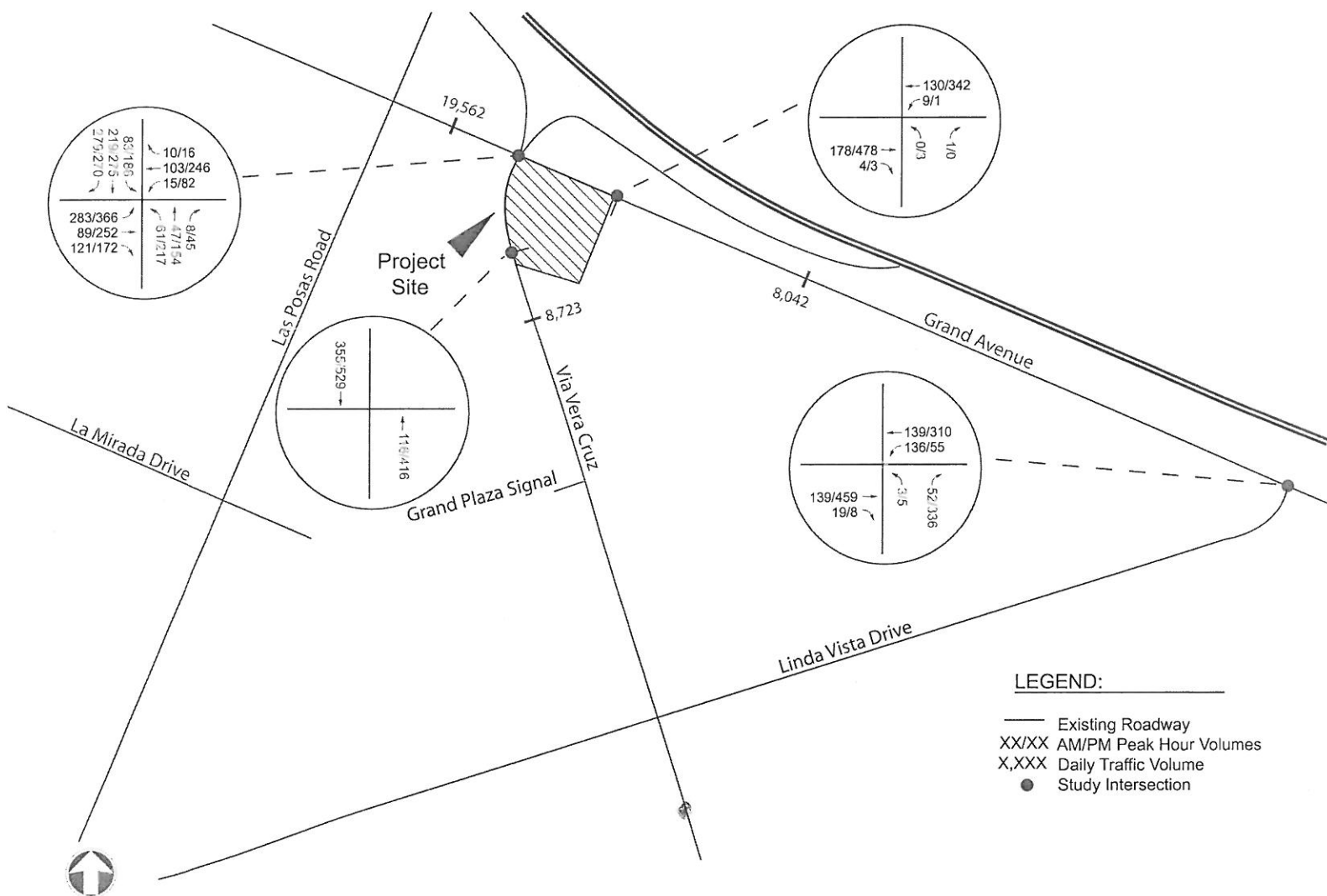
As shown in Table 3, all study intersections of are currently operating at an acceptable level of service (LOS D or better).

Daily roadway segment levels of service were evaluated based on the volume-to-capacity ratio calculations. The capacity of the roadway is an approximation of the daily volumes that can be carried by the roadway according to its functional classification. Table 4 presents the results of the existing conditions daily roadway segment level of service analysis.

Table 4
Existing Daily Roadway Segment Conditions

Roadway	Location	Class (# Lanes)	LOS E Capacity	Existing Conditions		
				ADT	V/C	LOS
Grand Ave	Las Posas Road to Via Vera Cruz	(4)	30,000	19,562	0.652	C
	Via Vera Cruz to Linda Vista Drive	(4)	30,000	8,042	0.268	A
Via Vera Cruz	Grand Avenue to Grand Plaza Signal	(4)	30,000	8,723	0.291	A

As shown in Table 4, all study segments are currently operating at an acceptable level of service (LOS D or better).



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EXISTING TRAFFIC VOLUMES

EXHIBIT 5

PROJECT TRIP GENERATION

To determine the trips forecast to be generated by the proposed project, SANDAG trip generation rates were utilized in accordance with the SANTEC/ITE guidelines. The SANDAG (*Not So*) *Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region* (April 2002) trip generation rates for the proposed land uses are provided in Appendix D. Table 5 presents the forecast trip generation for the proposed project.

Table 5
Project Trip Generation

Land Use	Units	Daily Trip Rate	AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out
Drive-In Fast Food	KSF	650	7%	50%	50%	7%	50%	50%
<i>Passby Trip Reduction</i>						40%		

Proposed Project Trips

Land Use	Intensity	Daily Trips	AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out
Drive-In Fast Food	2.61	1,697	119	60	60	119	60	60
<i>Passby Trips</i>						-48	-24	-24
Total New Trip Generation			119	60	60	72	37	37

Source: SANDAG (*Not So*) *Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region* (April 2002).

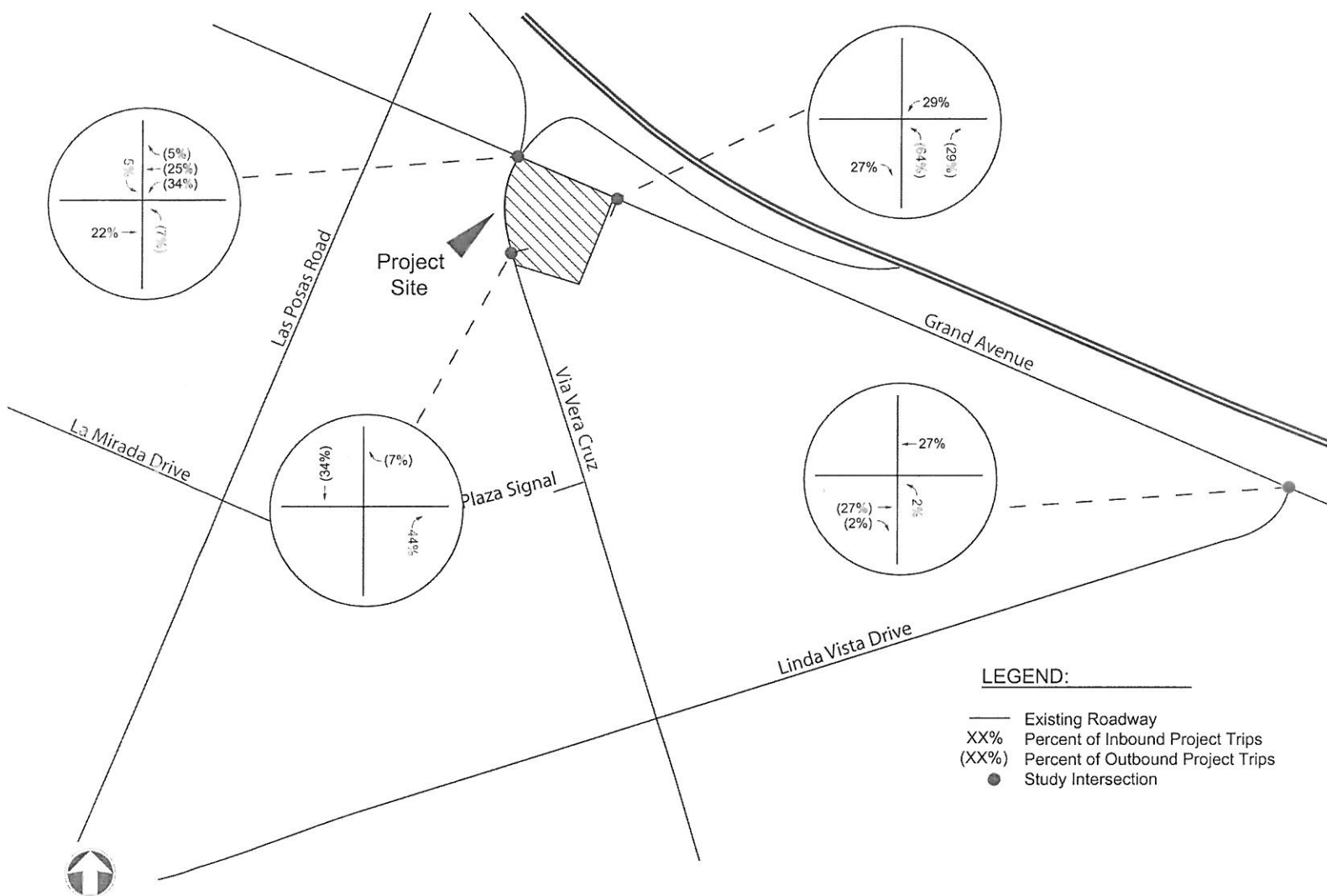
ksf = thousand square feet

As shown in Table 5, the proposed project will generate a total of 1,697 trips per day, with 119 trips occurring during the a.m. peak hour and 72 trips occurring during the p.m. peak hour.

PROJECT TRIP DISTRIBUTION AND TRIP ASSIGNMENT

Project traffic was manually distributed on the roadway network based on an understanding of existing and future traffic patterns in the project vicinity. **Exhibit 6** illustrates the project trip distribution based on the existing roadway network.

Based on the distribution of project traffic shown in Exhibit 6, project trips were assigned to the roadway network. The forecast daily and peak hour project trips are shown in **Exhibit 7**.



LEGEND:

- Existing Roadway
- XX% Percent of Inbound Project Trips
- (XX%) Percent of Outbound Project Trips
- Study Intersection



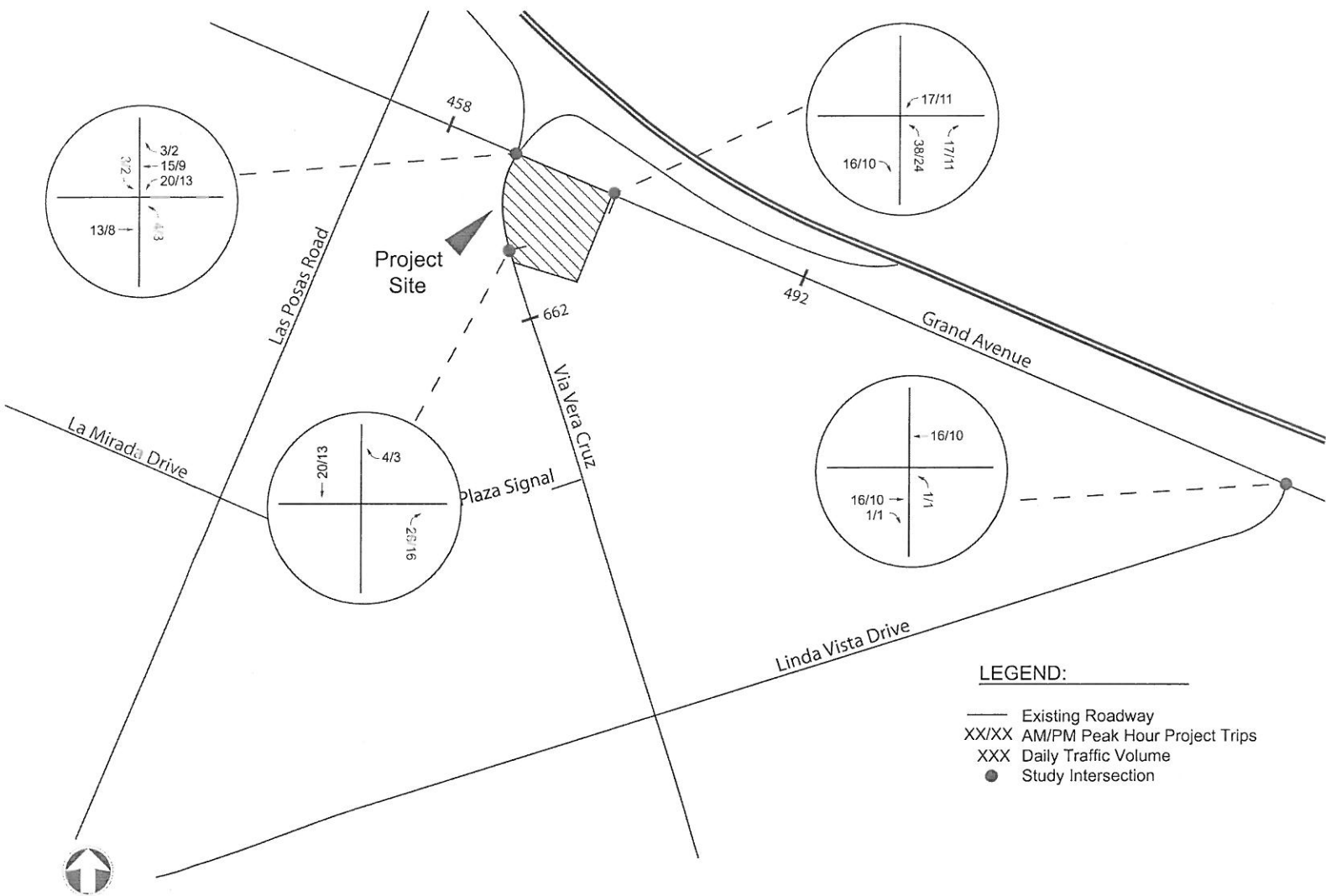
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PROJECT TRIP DISTRIBUTION

EXHIBIT 6



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PROJECT TRIP ASSIGNMENT

EXHIBIT 7

CUMULATIVE PROJECTS

To determine the existing plus cumulative conditions in the project study area, forecast project traffic associated with approved or pending projects was added to existing traffic volumes. This formed the base conditions upon which traffic generated by the proposed project was added. City of San Marcos staff provided a list of 15 projects to be included in the analysis. Cumulative project traffic data through the study area was based on information from traffic impact studies prepared for some of the cumulative projects.

Table 6 provides the list of cumulative projects and associated trip generation for each project. **Exhibit 8** shows the locations of the cumulative projects. **Exhibit 9** shows the peak hour and daily cumulative project trips.

The build-out year assumed for the completion of the proposed Drive-In/Drive-Thru Restaurant is 2014. It is assumed that several of the larger-scale cumulative projects will only be partially developed at that time. The land use intensities and resulting trip generation was adjusted accordingly for these projects.

As presented in Table 6, the cumulative projects are forecast to generate approximately 65,795 trips per day, which includes approximately 4,377 a.m. peak hour trips and approximately 6,389 p.m. peak hour trips.

Table 6
Cumulative Projects Trip Generation

Project		Land Use	Intensity	Unit	Daily Trips	AM Peak Hour			PM Peak Hour		
						Total	In	Out	Total	In	Out
1	Palomar Station	Multi-Family Residential	370	DU	2,220	178	36	142	200	140	60
		Neighborhood Commercial	44.0	TSF	5,280	211	127	84	528	264	264
		Restaurant	5.0	TSF	800	8	5	3	64	38	26
		Live/Work Retail Spaces	5.4	TSF	216	6	4	3	19	10	10
		SubTotal			8,516	403	171	232	811	452	359
		Mixed Use Reduction (10%)			-852	-40	-17	-23	-81	-45	-36
		Transit Oriented Reduction (5%)			-426	-20	-9	-12	-41	-23	-18
		Net Project Trips			7,239	343	145	197	690	384	305
2	Mission Pointe Retail Center (Remaining uses - CVS Pharmacy is constructed and occupied)	Supermarket	60	KSF	9,000	360	252	108	900	450	450
		Specialty Retail	9	KSF	360	11	7	4	32	16	16
		Office	9	KSF	180	25	22	3	23	5	18
		Subtotal			9,540	396	281	115	955	471	484
		Total Passby Trip Reduction			-3,636	-145	-102	-43	-363	-181	-182
		Net Project Trips			5,904	251	179	71	592	290	302
3	High Tech Middle School	Middle School	330	students	535	175	105	70	99	40	59
4	Palomar College Master Plan ⁽¹⁾	Junior College	1,615	students	2,470	248	198	50	198	109	89
5	CSUSM Master Plan ⁽²⁾	University	5,463	students	13,111	1,311	1,049	262	1,180	354	826
6	The Quad at CSUSM ⁽³⁾	Community Commercial	173.343	KSF	13,867	555	333	222	1,387	693	693
		Student Housing	199	DU	1,194	96	19	76	107	75	32
		Total Project Trips			15,061	650	352	298	1,494	769	726
7	Kaiser Permanente Master Plan ⁽⁴⁾	Medical Office	70.7	KSF	3,533	212	170	42	389	117	272
8	The Residences and the Shoppes at Creekside	Mixed Use Multi-Family Residential	98	DU	784	63	13	50	78	55	24
		Mixed use Commercial Retail	21	KSF	840	25	15	10	76	38	38
		Restaurant	6	KSF	960	77	38	38	77	46	31
		Subtotal			2,584	165	66	99	231	139	92
		Mixed Use Reduction (10%)			-258	-16	-7	-10	-23	-14	-9
		Net Project Trips			2,326	148	59	89	208	125	83

Table 6 (continued)
Cumulative Projects Trip Generation

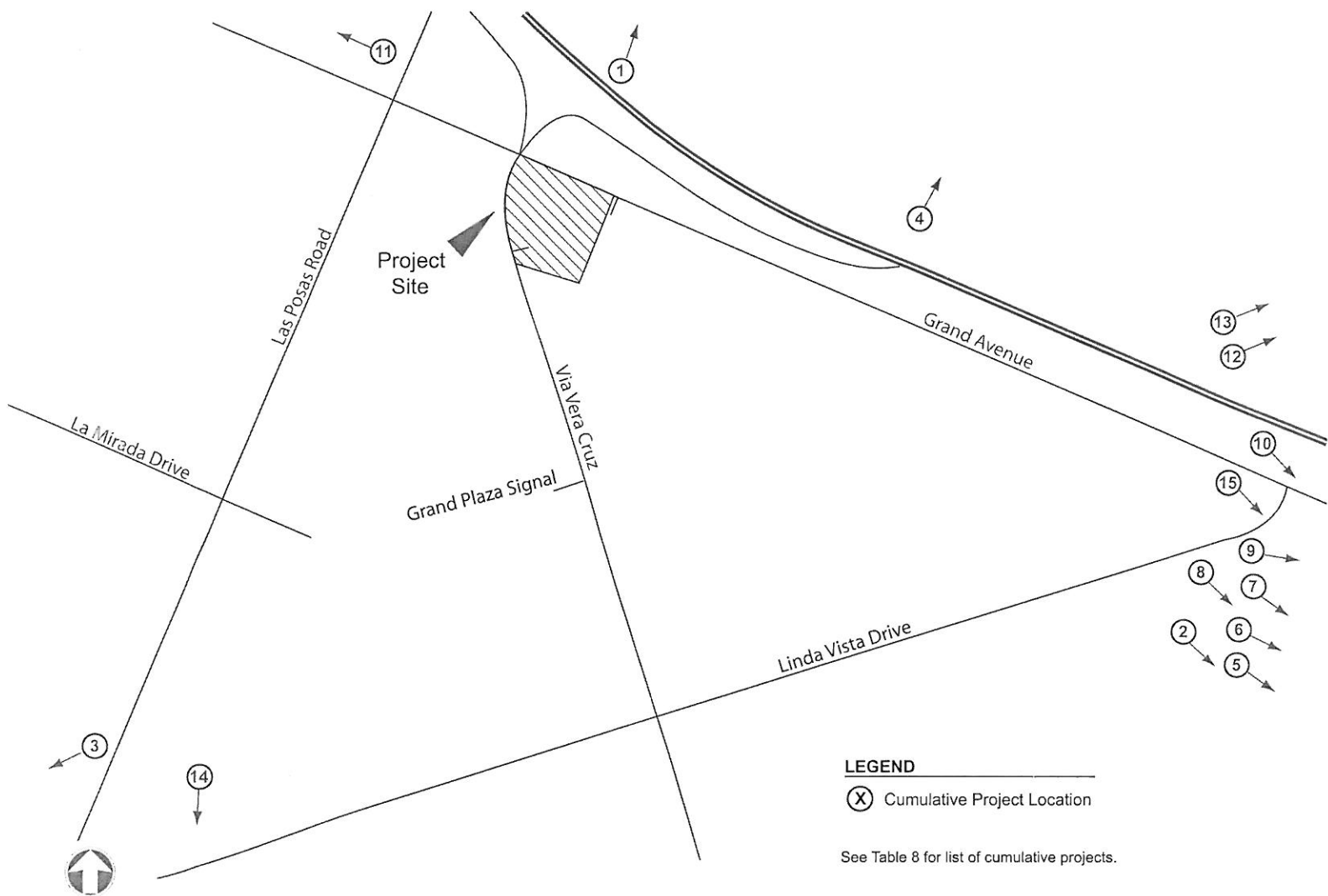
9	Civic Center Marketplace	Standard Office	120	KSF	2,400	336	302	34	312	62	250
		Community Commercial	48.4	KSF	3,874	155	93	62	387	194	194
		Subtotal			6,274	491	395	96	699	256	443
		Trip Reductions (Pass-By, Transit, Internal Capture)			-1,262	-72	-53	-20	-164	-74	-90
		Total Project Trips			5,012	419	342	76	535	182	353
10	Grand Avenue Hotel	Hotel	126	rooms	1,260	76	45	30	101	60	40
11	Pacific Industrial	Industrial Building	22.160	KSF	177	20	18	2	21	4	17
12	Westlake Village	Apartments	105	DU	630	50	10	40	57	40	17
13	Parkview Apartments	Apartments	81	DU	486	39	8	31	44	31	13
		Specialty Retail	4.5	KSF	180	5	3	2	16	8	8
		Total Project Trips			666	44	11	33	60	39	21
14	Main Street Plaza	Multi-Family DU	452	DU	2,712	217	43	174	244	171	73
		Community Commercial	59.68	KSF	4,774	191	115	76	477	239	239
		Standard Office	14	KSF	280	39	35	4	36	7	29
		Subtotal			7,766	447	193	254	758	417	341
		Mixed Use Reduction (10%)			-598	-51	-16	-35	-56	-36	-20
		Total Project Trips			7,168	396	178	218	702	381	321
15	East Gate	Apartments	42	DU	252	20	4	16	23	16	7
		Specialty Retail	11.285	KSF	451	14	8	6	41	21	20
		Total Project Trips			703	34	12	22	64	37	27
TOTAL		Total Project Trips			65,795	4,377	2,873	1,503	6,389	2,930	3,459

⁽¹⁾ The land use intensities shown in this table represent 50% of the planned increase in student enrollment at Palomar College.

⁽²⁾ Projected enrollment increase at CSU San Marcos by the cumulative project year is approximately 5,463 students.

⁽³⁾ The Quad at CSUSM project is the first phase of the University District SP, and the trips generated by the Quad at CSUSM project represent approximately 15% of the total trip generation of the University District SP.

⁽⁴⁾ Ultimately, the Kaiser Permanente Master Plan will include an additional 230,000 square-feet of medical office space and expansion of the existing hospital by an additional 460,000 square-feet. The 70,667 square-feet of medical office shown in this table represents the final phase of the current expansion before the future planned expansion.



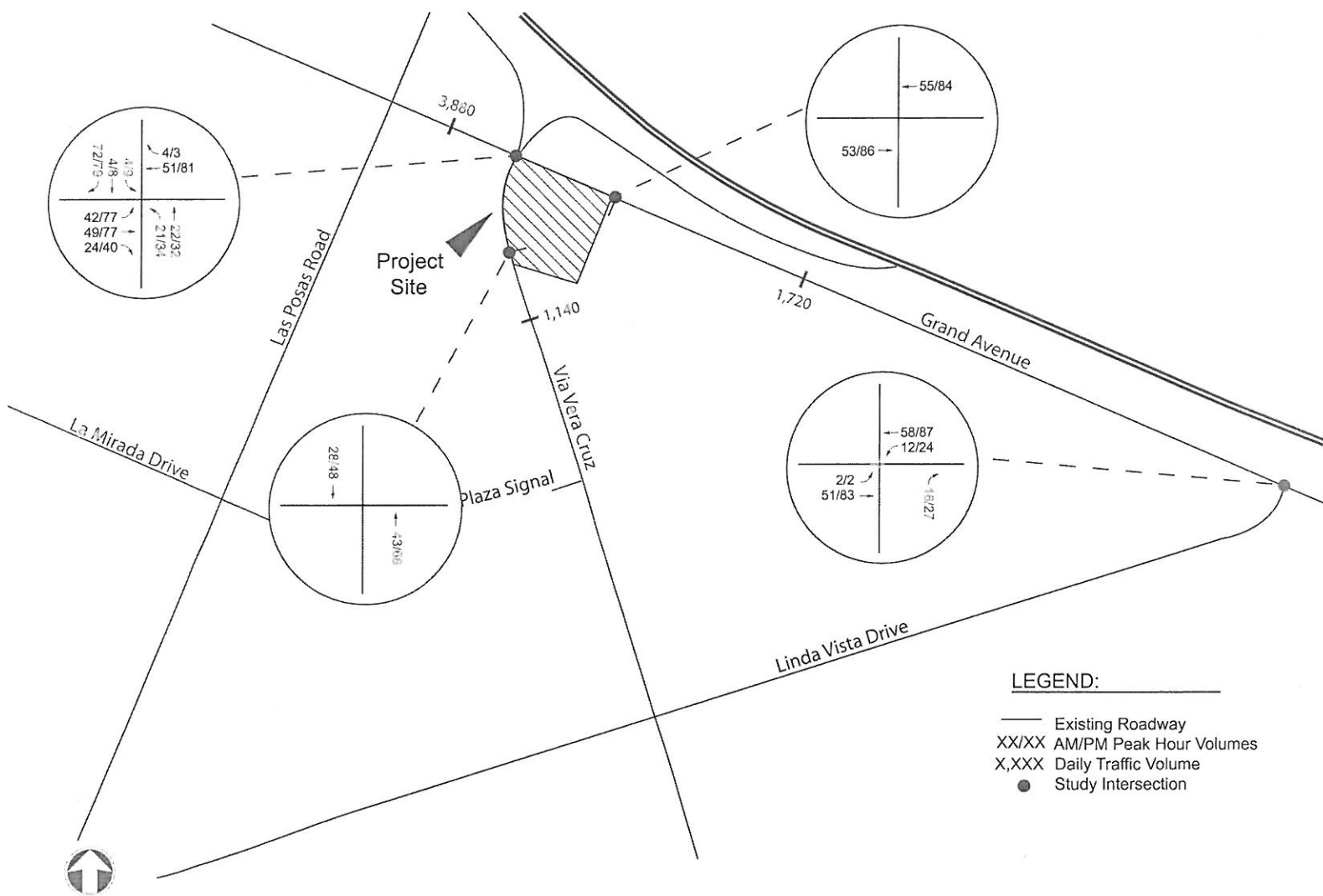
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CUMULATIVE PROJECT LOCATIONS

EXHIBIT 8



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CUMULATIVE PROJECT TRIPS

EXHIBIT 9

EXISTING PLUS CUMULATIVE CONDITIONS – WITHOUT AND WITH PROJECT

The existing plus cumulative conditions assumes the existing roadway configurations will be unchanged by the year 2014.

Exhibit 10 shows the existing plus cumulative without project daily and a.m. and p.m. peak hour traffic volumes. To determine the existing plus cumulative operating conditions with the proposed project, the forecast project-generated trips were added to the existing plus cumulative traffic volumes. **Exhibit 11** shows the existing plus cumulative with project daily and a.m. and p.m. peak hour traffic volumes.

Table 7 summarizes the existing plus cumulative peak hour intersection LOS without and with the proposed project. Detailed HCM calculation sheets are contained in Appendix E and F for the without and with project scenarios, respectively.

Table 7
Existing Plus Cumulative Peak Hour Intersection LOS
Without and With Project

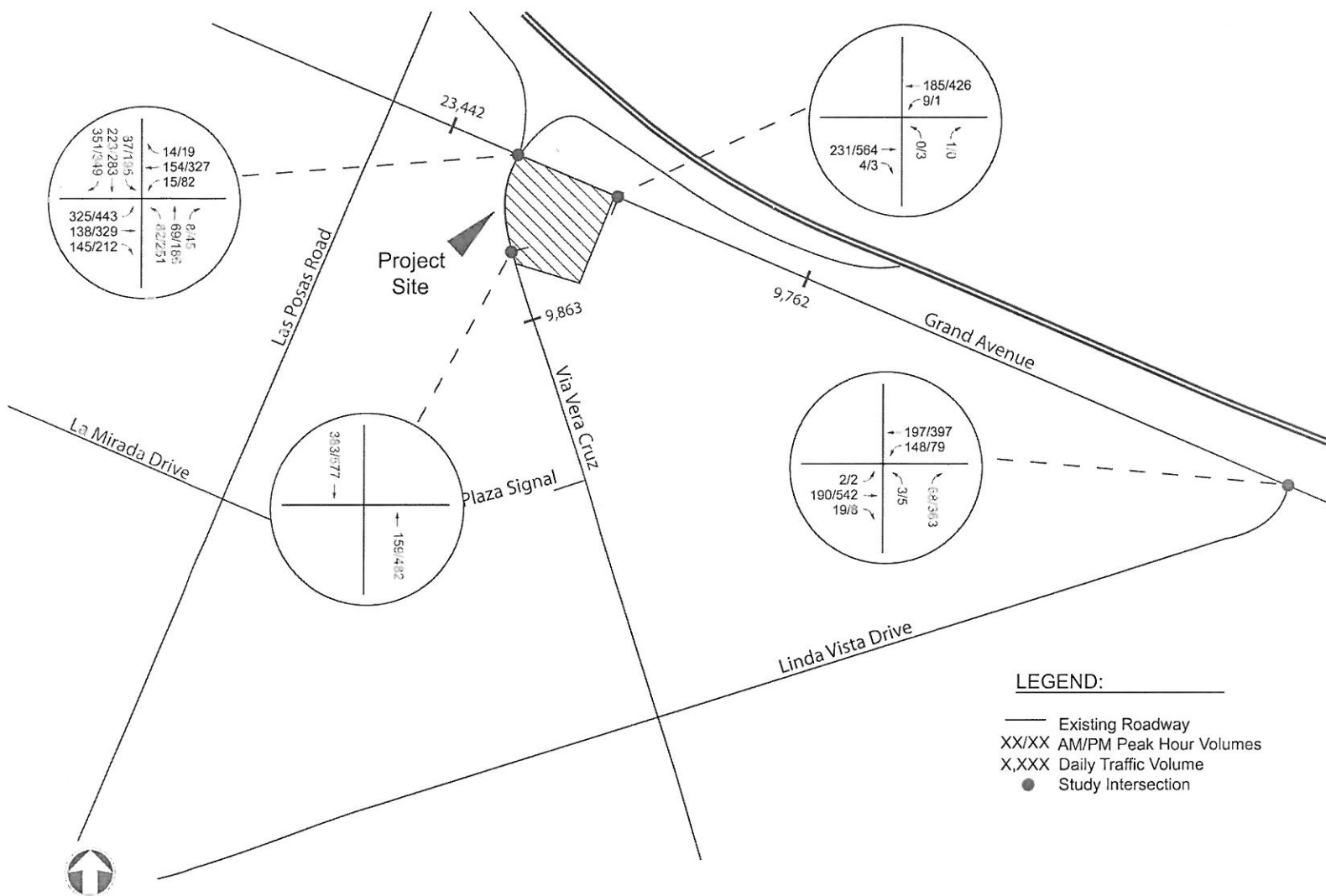
Study Intersection	Without Project				With Project				Change in Delay	
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour			
	Delay ⁽¹⁾	LOS	Delay ⁽¹⁾	LOS	Delay ⁽¹⁾	LOS	Delay ⁽¹⁾	LOS	AM	PM
Grand Ave / Via Vera Cruz (S) ⁽²⁾	26.9	C	33.9	C	27.9	C	34.4	C	1.0	0.5
Grand Ave / Linda Vista Drive (OWS)	9.5	A	15.4	C	9.7	A	15.7	C	0.2	0.3
Grand Ave Project Driveway (OWS)	9.0	A	16.6	C	11.2	B	17.8	C	2.2	1.2
Via Vera Cruz Project Driveway (OWS)	11.9	B	15.9	C	12.2	B	16.3	C	0.3	0.4

Note: Deficient intersection operation shown in **bold**. Change in delay shown in **bold** indicates a significant project impact.

(1) Seconds of delay per vehicle; reported as an average of all approaches for signalized intersections and as the controlled approach delay for the one-way stop intersections.

(2) (S) = signalized intersection; (OWS) = one-way stop intersection

As shown in Table 7, all study intersections are forecast to operate at acceptable levels of service (LOS D or better) during the a.m. peak hour and the p.m. peak hour under existing plus cumulative conditions without and with the proposed project.



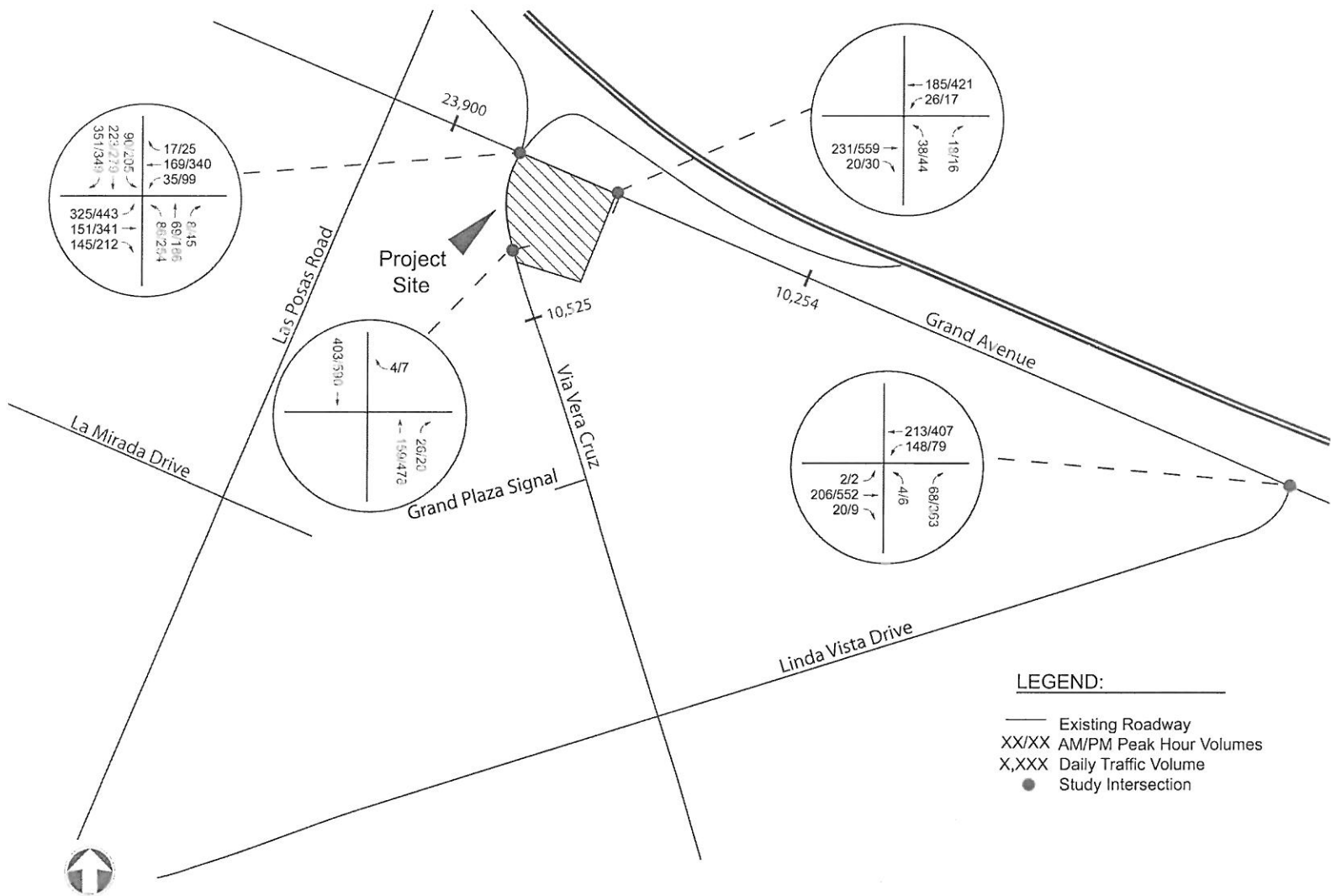
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EXISTING PLUS CUMULATIVE TRAFFIC VOLUMES

EXHIBIT 10



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EXISTING PLUS CUMULATIVE PLUS PROJECT TRAFFIC VOLUMES

EXHIBIT 11

Table 8 presents the results of the existing plus cumulative conditions daily roadway segment analysis, without and with the proposed project. As shown in Table 8, all study segments are forecast to operate at an acceptable LOS under existing plus cumulative conditions without and with the proposed project. Therefore, no significant impacts are identified and no mitigation measures are required.

Table 8
Existing Plus Cumulative Daily Roadway Segment LOS
Without and With Project

Roadway	Location	Class (# Lanes)	LOS E Capacity	Without Project			With Project			Change in V/C
				ADT	V/C	LOS	ADT	V/C	LOS	
Grand Avenue	Las Posas Road to Via Vera Cruz	Secondary Arterial (4)	30,000	23,442	0.781	D	23,900	0.797	D	0.015
	Via Vera Cruz to Linda Vista Drive	Secondary Arterial (4)	30,000	9,762	0.325	A	10,254	0.342	B	0.016
Via Vera Cruz	Grand Avenue to Grand Plaza Signal	Secondary Arterial (4)	30,000	9,863	0.329	A	10,525	0.351	B	0.022

CALTRANS ILV ANALYSIS

In accordance with Caltrans requirements the Intersecting Lane Vehicles (ILV) analysis method was performed for the SR-78 Eastbound Off and On-Ramp intersection on Grand Avenue at Via Vera Cruz. Caltrans requires freeway ramp intersections to be evaluated using the ILV methodology for evaluating intersection performance. This methodology considers the signal phasing, critical volumes and intersection capacity. The thresholds for intersection performance are summarized in Table 9.

Table 9
ILV Methodology Performance Criteria

Total Critical Volume Through Intersection	Classification	Description
Less than 1,200	Stable Flow	Stable flow with slight, but acceptable delay.
1,200 to 1,500	Unstable Flow	Unstable flow with considerable delays possible.
Greater than 1,500	Capacity	Stop and go operation with severe delay and heavy congestion.

Source: Caltrans Highway Design Manual (HDM), Topic 406, page 400-33.

The results of the Caltrans ILV analysis under existing conditions are summarized in Table 10. ILV calculation worksheets are provided in Appendix G.

**Table 10
ILV Analysis Summary**

Intersection	Existing Conditions			
	AM Peak		PM Peak	
	Flow	Operations	Flow	Operations
Grand Ave. / SR-78 EB Ramps - Via Vera Cruz	732	Stable	945	Stable
	Existing Plus Cumulative Without Project			
Grand Ave. / SR-78 EB Ramps - Via Vera Cruz	869	Stable	1189	Stable
	Existing Plus Cumulative With Project			
Grand Ave. / SR-78 EB Ramps - Via Vera Cruz.	877	Stable	1192	Stable

Table 10 shows that the study ramp intersection currently operate under the ILV capacity of 1,500 vehicles per hour and within the stable range.

Table 10 presents the results of the Caltrans ILV analysis under Existing Plus Cumulative conditions without and with the proposed project. ILV calculation worksheets are provided in Appendices G.

As shown in Table 10, the study ramp intersection is projected to operate below the ILV capacity of 1,500 vehicles per hour and within the stable range under Existing Plus Cumulative conditions without and with the proposed project:

ON-SITE CIRCULATION AND PARKING

The project is served by two driveways and both accommodate inbound and outbound traffic movements. One driveway is located on Grand Avenue and is shared with Shadowridge Veterinary Hospital located immediately east of the project site. The second driveway is located on Via Vera Cruz.

The project site would be served by a one-way circulation system that operates in a counter clockwise direction. This is consistent with and facilitates the counter clockwise operation of the drive-through lane. The project is served by angle parking located along the south and/or north side of the primary circulation aisle that surround the restaurant pad and drive-through lane. There are 10 standard parking stalls assigned to "drive-in" use along the north side of north circulation aisle and another six "drive-in" stalls along the north side of the south circulation aisle. Two of these spaces are accessible parking spaces. An additional eight standard parking spaces located along the south side of the south circulation aisle that are intended for use by employees. In summary, the site plan provides a total of 24 parking spaces. "Drive-in" spaces will be used by customers who will dine within the vehicle or at the outdoor seating.

In general, one-way circulation systems can increase the distance needed to travel on-site while entering and exiting. In this case for example, a vehicle entering from Grand Avenue that is destined to the drive-thru service will need to travel completely around the restaurant to enter the drive-thru lane. However, given the constraints of the site and the unique operating characteristics

of this specific restaurant, the proposed one-way circulation system is the best solution for circulation and parking.

In response to the City's interest in the future operations at the north driveway onto westbound Grand Avenue, RBF reviewed current conditions and the projected traffic conditions at this driveway. Under existing conditions, field observations during the more critical evening peak hour revealed that the traffic queues at the westbound approach did not block the ability for vehicles turning left to safely negotiate the left turn. Today, sufficient gaps in eastbound and westbound traffic were available for vehicles turning left onto westbound Grand Avenue and the Level of Service for the left turn movement is LOS B. Conditions in the near term future without and with the project show a reduction in the service level to Level of Service C with the increase in traffic due to background traffic growth and the project traffic increases.

An analysis of projected 2030 traffic conditions on Grand Avenue determined that the outbound left turn movement would operate at LOS E with long delays as drivers wait for a safe gap in traffic. As traffic volumes continue to increase on Grand Avenue in the future, the left turn movement out of the driveway will become harder to negotiate since the minimum safe gap in traffic is influenced by both eastbound and westbound traffic flows. As adequate gaps in traffic on Grand Avenue become harder to find, frustrated drivers will begin to make unsafe maneuvers as they attempt to negotiate the left turn. Due to safety concerns in the future, we recommend that the outbound left turn movement should be either prohibited or restricted. The left turn out movement could be prohibited by a raised median island that only allows left turns into the project site from westbound Grand Avenue. An alternative raised median design could allow left turns only for motorists that want to access the westbound left turn bay on Grand Avenue to travel south on Via Vera Cruz. Since the left turn out movement would be sheltered from most of the westbound traffic on Grand Avenue, traffic operations for this movement would improve to acceptable levels during peak periods.

Prohibiting or restricting the left turn movement will also improve the ability for the outbound right turn to be made without excessive delays while waiting behind a vehicle trying to turn left. The prohibited left turn movement traffic will need to use the Via Vera Cruz driveway to in turn access the eastbound SR-78 on ramp or westbound Grand Avenue. An analysis of the re-directed traffic indicates that the Grand Avenue/Via Vera Cruz intersection would still operate at LOS D or better during peak periods.

Research on vehicle queuing needs for fast food restaurant drive-through lanes shows that typical queuing can range from 5 to 13 vehicles during the day. The recommended vehicle storage is usually based on the 85th percentile maximum queue which is 12 vehicles. Typically, a minimum of three vehicle storage is required between the pick-up window and the menu board and order speaker. The proposed site plan provides sufficient storage for 13 vehicles and storage for four vehicles between the pick-up window and the menu board.

In terms of the required parking, the City's' zoning ordinance is not clear cut for this type of restaurant that is a combination of a "drive-in" and "drive-through" restaurant. For a "drive-in" facility, the City requires 1 space for every 4 seats plus 1 for every employee working on the largest

shift. The site plan shows eight tables that seat four persons at each. This translates to eight parking spaces plus eight spaces for the maximum number of employees on duty or a total of 16 spaces. For a drive-through restaurant facility, the City requires a minimum of 20 spaces plus one for each employee working on the largest shift. This calculates to 28 parking spaces ($20 + 8 = 28$).

Therefore, the required parking ranges from 16 to 28 spaces for a drive-in and drive-thru establishment, respectively. As a comparison, the City reviewed several other Sonic Drive-Ins in other cities, and found that similar size facilities fell within this range and required less parking spaces than what is proposed for the subject site. Because of the unique operation of the restaurant as a drive-in and drive-through and the project proposes 24 parking spaces which is on the high end of the parking supply range, the City has determined that the proposed spaces would provide adequate parking for the site.

A comparison of the parking space and aisle design dimensions shown on the site plan to the City of San Marcos development standards for off-street parking resulted in the following findings:

- The project proposes 12-foot wide stalls in order to accommodate the individual menu boards at each drive-in stall and to ensure there is adequate space for the car-hop to deliver the meal to the car window. This exceeds the City's minimum requirement of 9'.
- The stall depth shown on the plan is 18'-0" while the City's requirement is 21'-10" for 60 degree parking. This is 3'-10" short on each side of the aisle. The site plan will be revised to accommodate the longer stalls, including parking overhang into landscaping per the parking ordinance.
- The aisle width shown on the plan is 24' as compared to the City's requirement of 18' for a one-way aisle with 60 degree parking. The added width of 6' essentially provides an extra 3' on each side of the aisle thereby increasing the effective stall depth from 18' to 21' plus parking overhang. Driveway aisle widths will be adjusted to accommodate the longer parking stalls.

SIGNIFICANT IMPACTS AND MITIGATION

A project-related significant impact is forecast to occur if:

1. The addition of project-generated traffic results in a change from an acceptable (LOS D or better) to a deficient (LOS E or worse) level of service at an intersection or along a roadway segment; OR
2. At a location operating at a deficient level of service (D, E, or F) with the project, the addition of project traffic results in an increase in delay of greater than 2.0 seconds at an intersection or an increase in v/c ratio of greater than 0.02 on a roadway segment.

The analysis results under existing plus cumulative conditions show that the addition of project-

generated traffic to the study intersections does not result in any significant impacts. Therefore, no mitigation measures are required.

The results of the daily roadway segment analysis showed that the addition of project-generated traffic to the study segments does not result in any significant impacts under existing plus cumulative conditions. Therefore, no mitigation measures are required.

SUMMARY AND CONCLUSIONS

This study analyzed the forecast traffic impact of the proposed Grand Avenue Fast Food Drive-In/Drive-Thru Restaurant in the City of San Marcos. The project is located on the southeast corner of the Grand Avenue/Via Vera Cruz intersection. The Grand Avenue Fast Food Drive-In/Drive-Thru Restaurant site is currently paved and empty. This focused traffic study evaluated the circulation needs and related traffic impacts associated with the development of the Fast Food Restaurant. This study included only short-range traffic conditions at completion of the proposed project and analyzed traffic impacts at intersections and roadway segments that provide immediate access to the project.

The proposed Grand Avenue Fast Food Drive-In/Drive-Thru Restaurant consists of 1,795 square feet of restaurant with drive thru service, 899 square feet of outdoor seating, and 24 parking spaces. Project access will be provided at two project driveways, one on Grand Avenue and one on Via Vera Cruz. The project driveway on Grand Avenue will provide primary access to the project site and is proposed to allow left turns in and out as well as right turns. The project driveway on Via Vera Cruz will only allow right turns in and right turns out. The proposed project will generate a total of 1,697 trips per day, with 119 trips occurring during the a.m. peak hour and 72 trips occurring during the p.m. peak hour. It should be reiterated that a revised site plan was submitted that increased the floor area somewhat and that the corresponding trip generation would be slightly higher than stated herein. Based on the results of the analysis and the relative increase in floor area, it is our conclusion that any increase in the project impact would not be significant and would not trigger any new mitigation requirements.

The results of the analysis under existing conditions showed that all study intersections and study segments are currently operating at acceptable levels of service (LOS D or better). The addition of project-generated traffic does not result in any significant impacts, and mitigation measures were not required.

The existing plus cumulative conditions analysis identified 15 approved or pending projects that would increase traffic within the project study area. The addition of trips generated by these cumulative projects were added to existing traffic volumes to form the base conditions to which traffic generated by the proposed project was added.

The results of the existing plus cumulative conditions analysis showed that all study intersections, including the project driveways, are forecast to operate at acceptable levels of service (LOS D or better) during the a.m. and p.m. peak hour without and with the proposed project. The addition of

project-generated traffic does not result in any significant impacts at the study intersections, and mitigation measures were not required.

The results of the existing plus cumulative conditions roadway segment analysis showed that all study segments are forecast to operate at acceptable levels of service (LOS D or better) without and with the proposed project. The addition of project-generated traffic does not result in any significant impacts, and mitigation measures were not required.

The results of on-site circulation and parking analysis concluded that the proposed parking will be adequate. While it was determined that the total parking stall length plus the aisle width does not meet the minimum requirement according to the City's code, the site plan will be revised to accommodate the required drive aisle width along with longer parking stalls in accordance with the City's Parking Ordinance.

In response to the City's interest in the future operations at the north driveway onto westbound Grand Avenue, RBF reviewed current conditions and the projected traffic conditions at this driveway. Under existing conditions, field observations during the more critical evening peak hour revealed that the traffic queues at the westbound approach did not block the ability for vehicles turning left to safely negotiate the left turn. Today, sufficient gaps in eastbound and westbound traffic were available for vehicles turning left onto westbound Grand Avenue and the Level of Service for the left turn movement is LOS B. Conditions in the near term future without and with the project show a reduction in the service level to Level of Service C with the increase in traffic due to background traffic growth and the project traffic increases.

An analysis of projected 2030 traffic conditions on Grand Avenue determined that the outbound left turn movement would operate at LOS E with long delays as drivers wait for a safe gap in traffic. As traffic volumes continue to increase on Grand Avenue in the future, the left turn movement out of the driveway will become harder to negotiate since the minimum safe gap in traffic is influenced by both eastbound and westbound traffic flows. As adequate gaps in traffic on Grand Avenue become harder to find, frustrated drivers will begin to make unsafe maneuvers as they attempt to negotiate the left turn. Due to safety concerns in the future, we recommend that the outbound left turn movement should be either prohibited or restricted. The left turn out movement could be prohibited by a raised median island that only allows left turns into the project site from westbound Grand Avenue. An alternative raised median design could allow left turns only for motorists that want to access the westbound left turn bay on Grand Avenue to travel south on Via Vera Cruz. Since the left turn out movement would be sheltered from most of the westbound traffic on Grand Avenue, traffic operations for this movement would improve to acceptable levels during peak periods.

Prohibiting or restricting the left turn movement will also improve the ability for the outbound right turn to be made without excessive delays while waiting behind a vehicle trying to turn left. The prohibited left turn movement traffic will need to use the Via Vera Cruz driveway to in turn access the eastbound SR-78 on ramp or westbound Grand Avenue. An analysis of the re-directed traffic indicates that the Grand Avenue/Via Vera Cruz intersection would still operate at LOS D or better during peak periods.

APPENDIX A

SANTEC//ITE Roadway Segment Capacity and LOS Criteria

Table D-2
Roadway Classifications, Levels of Service (LOS)
and Average Daily Traffic (ADT)

STREET CLASSIFICATION	LANES	CROSS SECTIONS* (APPROX.)	LEVEL OF SERVICE W/ADT**				
			A	B	C	D	E
Expressway	6 lanes	102-160/122-200	30,000	42,000	60,000	70,000	80,000
Prime Arterial	6 lanes	102-108/122-128	25,000	35,000	50,000	55,000	60,000
Major Arterial	6 lanes	102/122	20,000	28,000	40,000	45,000	50,000
Major Arterial	4 lanes	78-82/98-102	15,000	21,000	30,000	35,000	40,000
Secondary Arterial/ Collector	4 lanes	64-72/84-92	10,000	14,000	20,000	25,000	30,000
Collector (no center lane) (continuous left- turn lane)	4 lanes 2 lanes	64/84 50/70	5,000	7,000	10,000	13,000	15,000
Collector (no fronting property)	2 lanes	40/60	4,000	5,500	7,500	9,000	10,000
Collector (commercial- industrial fronting)	2 lanes	50/70	2,500	3,500	5,000	6,500	8,000
Collector (multi-family)	2 lanes	40/60	2,500	3,500	5,000	6,500	8,000
Sub-Collector (single-family)	2 lanes	36/56	---	---	2,200	---	---

LEGEND:

- * Curb to curb width (feet)/right of way width (feet): based upon the City of San Diego Street Design Manual and other jurisdictions within the San Diego region.
- ** Approximate recommended ADT based upon the City of San Diego Street Design Manual.

Notes:

1. The volumes and the average daily level of service listed above are only intended as a general planning guideline.
2. Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.

APPENDIX B
Traffic Count Sheets

Counts Unlimited Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of San Marcos
N/S: Project Driveway
EW: Grand Avenue
Weather: Sunny

File Name : SNMDWGRAM
Site Code : 00000001
Start Date : 7/31/2012
Page No : 1

Groups Printed- Total Volume

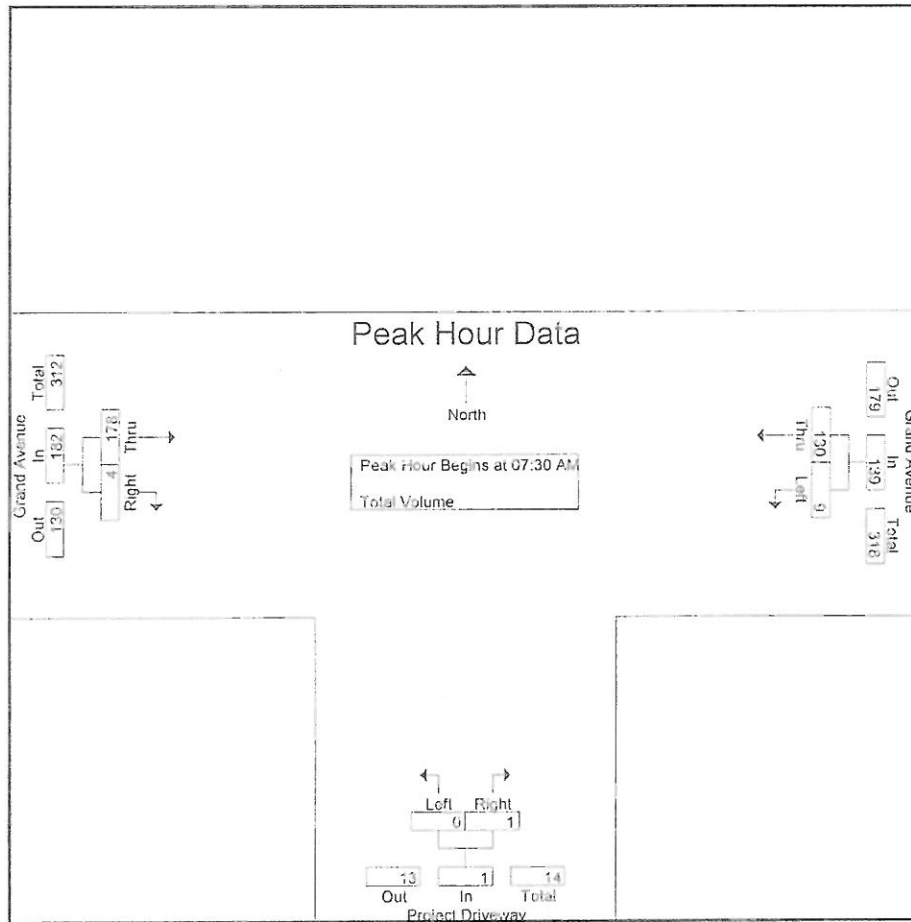
Start Time	Grand Avenue Westbound			Project Driveway Northbound			Grand Avenue Eastbound			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
07:00 AM	0	25	25	0	0	0	21	1	22	47
07:15 AM	0	35	35	0	0	0	44	0	44	79
07:30 AM	8	36	44	0	1	1	35	2	37	82
07:45 AM	0	32	32	0	0	0	52	1	53	85
Total	8	128	136	0	1	1	152	4	156	293
08:00 AM	0	27	27	0	0	0	46	1	47	74
08:15 AM	1	35	36	0	0	0	45	0	45	81
08:30 AM	0	36	36	0	0	0	25	3	28	64
08:45 AM	0	35	35	0	0	0	61	0	61	96
Total	1	133	134	0	0	0	177	4	181	315
Grand Total	9	261	270	0	1	1	329	8	337	608
Apprch %	3.3	96.7		0	100		97.6	2.4		
Total %	1.5	42.9	44.4	0	0.2	0.2	54.1	1.3	55.4	

	Grand Avenue Westbound			Project Driveway Northbound			Grand Avenue Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	8	36	44	0	1	1	35	2	37	82
07:45 AM	0	32	32	0	0	0	52	1	53	85
08:00 AM	0	27	27	0	0	0	46	1	47	74
08:15 AM	1	35	36	0	0	0	45	0	45	81
Total Volume	9	130	139	0	1	1	178	4	182	322
% App. Total	6.5	93.5		0	100		97.8	2.2		
PHF	.281	.903	.790	.000	.250	.250	.856	.500	.858	.947

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City of San Marcos
N/S: Project Driveway
E/W: Grand Avenue
Weather: Sunny

File Name : SNMDWGRAM
Site Code : 00000001
Start Date : 7/31/2012
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM			07:00 AM			07:30 AM		
+0 mins.	8	36	44	0	0	0	35	2	37
+15 mins.	0	32	32	0	0	0	52	1	53
+30 mins.	0	27	27	0	1	1	46	1	47
+45 mins.	1	35	36	0	0	0	45	0	45
Total Volume	9	130	139	0	1	1	178	4	182
% App. Total	6.5	93.5		0	100		97.8	2.2	
PHF	.281	.903	.790	.000	.250	.250	.856	.500	.858

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City of San Marcos
N/S: Project Driveway
E/W: Grand Avenue
Weather: Sunny

File Name : SNMDWGRPM
Site Code : 00000001
Start Date : 7/31/2012
Page No : 1

Groups Printed- Total Volume

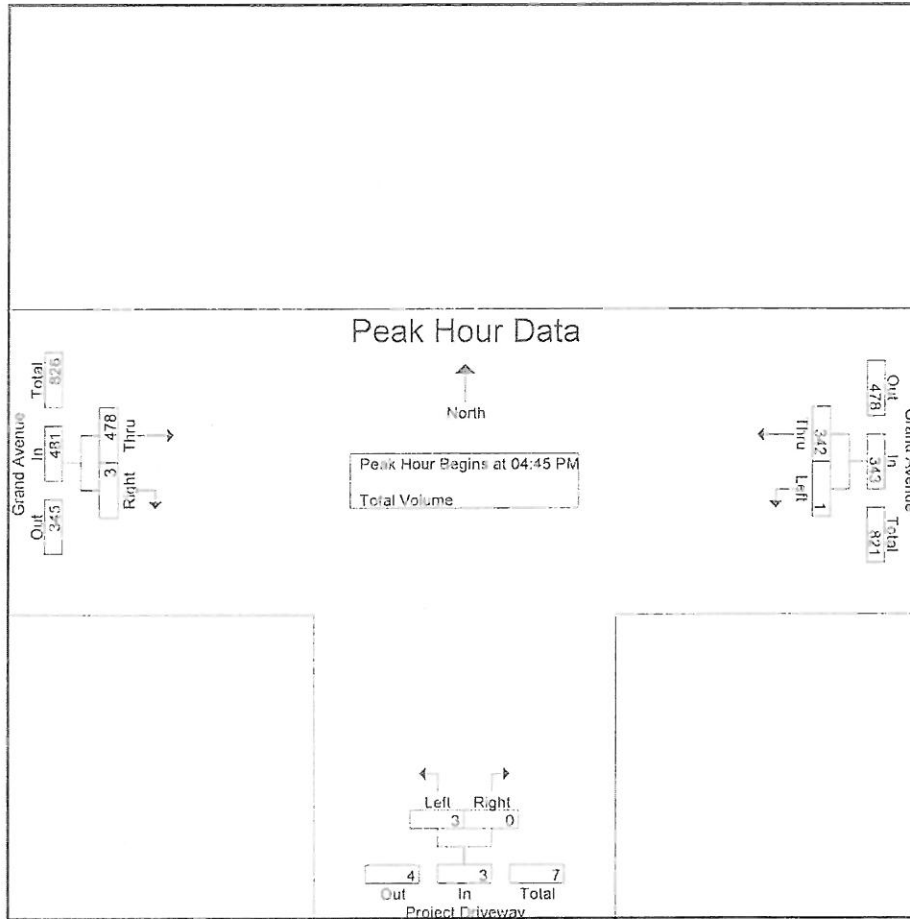
Start Time	Grand Avenue Westbound			Project Driveway Northbound			Grand Avenue Eastbound			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
04:00 PM	0	89	89	0	1	1	119	0	119	209
04:15 PM	0	89	89	1	0	1	102	0	102	192
04:30 PM	1	78	79	0	0	0	107	1	108	187
04:45 PM	0	87	87	2	0	2	109	0	109	198
Total	1	343	344	3	1	4	437	1	438	786
05:00 PM	1	93	94	1	0	1	110	1	111	206
05:15 PM	0	87	87	0	0	0	131	1	132	219
05:30 PM	0	75	75	0	0	0	128	1	129	204
05:45 PM	0	64	64	1	0	1	125	1	126	191
Total	1	319	320	2	0	2	494	4	498	820
Grand Total	2	662	664	5	1	6	931	5	936	1606
Apprch %	0.3	99.7		83.3	16.7		99.5	0.5		
Total %	0.1	41.2	41.3	0.3	0.1	0.4	58	0.3	58.3	

Start Time	Grand Avenue Westbound			Project Driveway Northbound			Grand Avenue Eastbound			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	0	87	87	2	0	2	109	0	109	198
05:00 PM	1	93	94	1	0	1	110	1	111	206
05:15 PM	0	87	87	0	0	0	131	1	132	219
05:30 PM	0	75	75	0	0	0	128	1	129	204
Total Volume	1	342	343	3	0	3	478	3	481	827
% App. Total	0.3	99.7		100	0		99.4	0.6		
PHF	250	919	912	375	000	375	912	750	911	944

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City of San Marcos
N/S: Project Driveway
E/W: Grand Avenue
Weather: Sunny

File Name : SNMDWGRPM
Site Code : 00000001
Start Date : 7/31/2012
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Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM			04:00 PM			05:00 PM		
+0 mins.	0	89	89	0	1	1	110	1	111
+15 mins.	1	78	79	1	0	1	131	1	132
+30 mins.	0	87	87	0	0	0	128	1	129
+45 mins.	1	93	94	2	0	2	125	1	126
Total Volume	2	347	349	3	1	4	494	4	498
% App. Total	0.6	99.4		75	25		99.2	0.8	
PHF	.500	.933	.928	.375	.250	.500	.943	1.000	.943

Counts Unlimited Inc.
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City of San Marcos
N/S: Linda Vista Drive
E/W: Grand Avenue
Weather: Sunny

File Name : SNMLVGRAM
Site Code : 00000001
Start Date : 7/31/2012
Page No : 1

Groups Printed- Total Volume

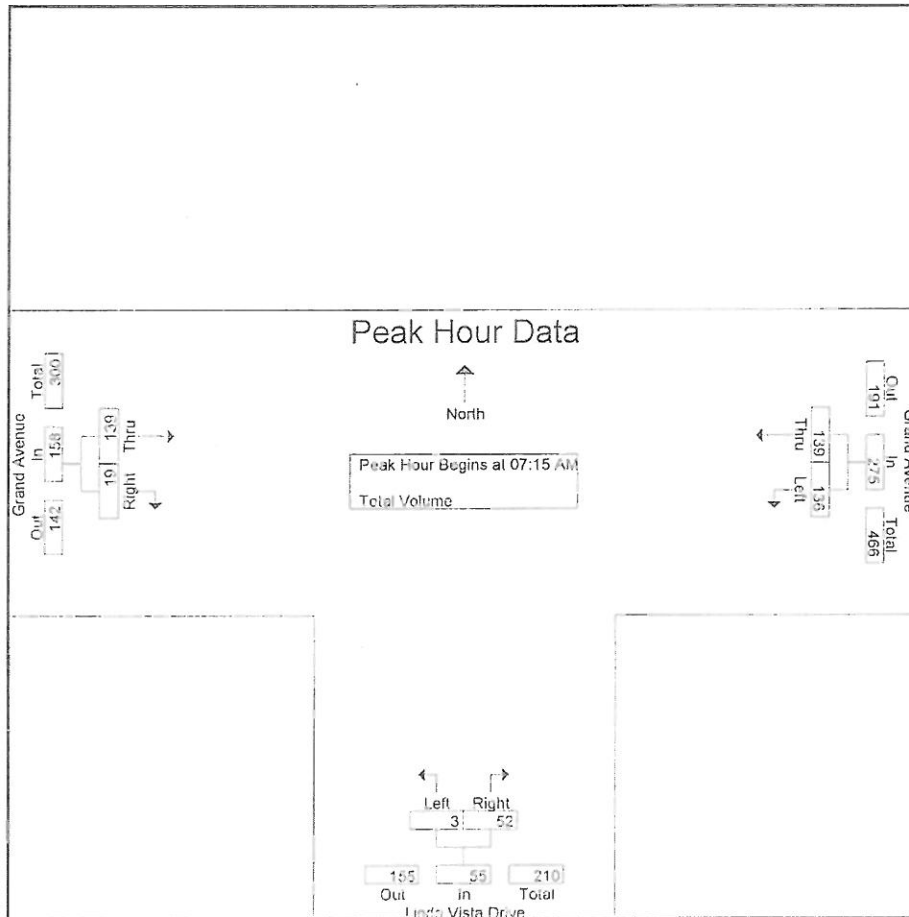
	Grand Avenue Westbound			Linda Vista Drive Northbound			Grand Avenue Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
07:00 AM	24	19	43	3	28	31	17	7	24	98
07:15 AM	28	32	60	2	15	17	33	4	37	114
07:30 AM	31	39	70	0	16	16	38	4	42	128
07:45 AM	48	28	76	0	10	10	37	6	43	129
Total	131	118	249	5	69	74	125	21	146	469
08:00 AM	29	40	69	1	11	12	31	5	36	117
08:15 AM	26	35	61	0	11	11	39	2	41	113
08:30 AM	22	27	49	0	14	14	21	1	22	85
08:45 AM	23	37	60	0	12	12	50	6	56	128
Total	100	139	239	1	48	49	141	14	155	443
Grand Total	231	257	488	6	117	123	266	35	301	912
Apprch %	47.3	52.7		4.9	95.1		88.4	11.6		
Total %	25.3	28.2	53.5	0.7	12.8	13.5	29.2	3.8	33	

	Grand Avenue Westbound			Linda Vista Drive Northbound			Grand Avenue Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	28	32	60	2	15	17	33	4	37	114
07:30 AM	31	39	70	0	16	16	38	4	42	128
07:45 AM	48	28	76	0	10	10	37	6	43	129
08:00 AM	29	40	69	1	11	12	31	5	36	117
Total Volume	136	139	275	3	52	55	139	19	158	488
% App. Total	49.5	50.5		5.5	94.5		88	12		
PHF	708	869	905	375	813	809	914	792	919	946

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City of San Marcos
N/S: Linda Vista Drive
E/W: Grand Avenue
Weather: Sunny

File Name : SNMLVGRAM
Site Code : 00000001
Start Date : 7/31/2012
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM			07:00 AM			07:30 AM		
+0 mins.	31	39	70	3	28	31	38	4	42
+15 mins.	48	28	76	2	15	17	37	6	43
+30 mins.	29	40	69	0	16	16	31	5	36
+45 mins.	26	35	61	0	10	10	39	2	41
Total Volume	134	142	276	5	69	74	145	17	162
% App. Total	48.6	51.4		6.8	93.2		89.5	10.5	
PHF	698	888	908	417	616	597	929	708	942

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City of San Marcos
N/S: Linda Vista Drive
E/W: Grand Avenue
Weather: Sunny

File Name : SNMLVGRPM
Site Code : 00000001
Start Date : 7/31/2012
Page No : 1

Groups Printed- Total Volume

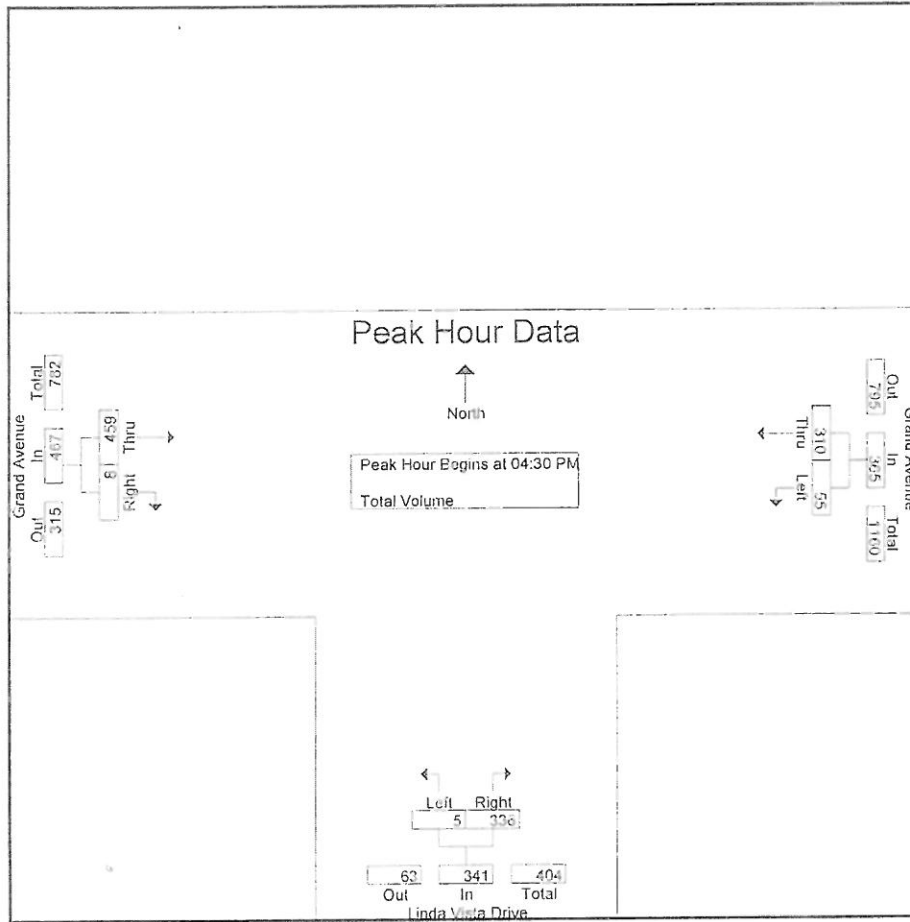
Start Time	Grand Avenue Westbound			Linda Vista Drive Northbound			Grand Avenue Eastbound			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
04:00 PM	18	105	123	4	68	72	127	6	133	328
04:15 PM	17	83	100	4	57	61	86	4	90	251
04:30 PM	13	66	79	3	100	103	110	2	112	294
04:45 PM	15	91	106	0	78	78	106	2	108	292
Total	63	345	408	11	303	314	429	14	443	1165
05:00 PM	17	72	89	2	82	84	117	3	120	293
05:15 PM	10	81	91	0	76	76	126	1	127	294
05:30 PM	10	81	91	0	57	57	133	0	133	281
05:45 PM	13	59	72	1	46	47	103	0	108	227
Total	50	293	343	3	261	264	459	4	467	1095
Grand Total	113	638	751	14	564	578	913	18	931	2260
Apprch %	15	85		2.4	97.6		98.1	1.9		
Total %	5	28.2	33.2	0.6	25	25.6	40.4	0.8	41.2	

	Grand Avenue Westbound			Linda Vista Drive Northbound			Grand Avenue Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	13	66	79	3	100	103	110	2	112	294
04:45 PM	15	91	106	0	78	78	106	2	108	292
05:00 PM	17	72	89	2	82	84	117	3	120	293
05:15 PM	10	81	91	0	76	76	126	1	127	294
Total Volume	55	310	365	5	336	341	459	8	467	1173
% App. Total	15.1	84.9		1.5	98.5		98.3	1.7		
PHF	.809	.852	.861	.417	.840	.828	.911	.667	.919	.997

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City of San Marcos
N/S: Linda Vista Drive
E/W: Grand Avenue
Weather: Sunny

File Name : SNMLVGRPM
Site Code : 00000001
Start Date : 7/31/2012
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM			04:30 PM			04:45 PM		
+0 mins.	18	105	123	3	100	103	106	2	108
+15 mins.	17	83	100	0	78	78	117	3	120
+30 mins.	13	66	79	2	82	84	126	1	127
+45 mins.	15	91	106	0	76	76	133	0	133
Total Volume	63	345	408	5	336	341	482	6	488
% App. Total	15.4	84.5		1.5	98.5		98.8	1.2	
PHF	.875	.821	.829	.417	.840	.828	.906	.500	.917

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City of San Marcos
N/S: Via Vera Cruz/SR-78 EB Ramps
E/W: Grand Avenue
Weather: Sunny

File Name : SNMVCGRAM
Site Code : 00000001
Start Date : 7/31/2012
Page No : 1

Groups Printed- Total Volume

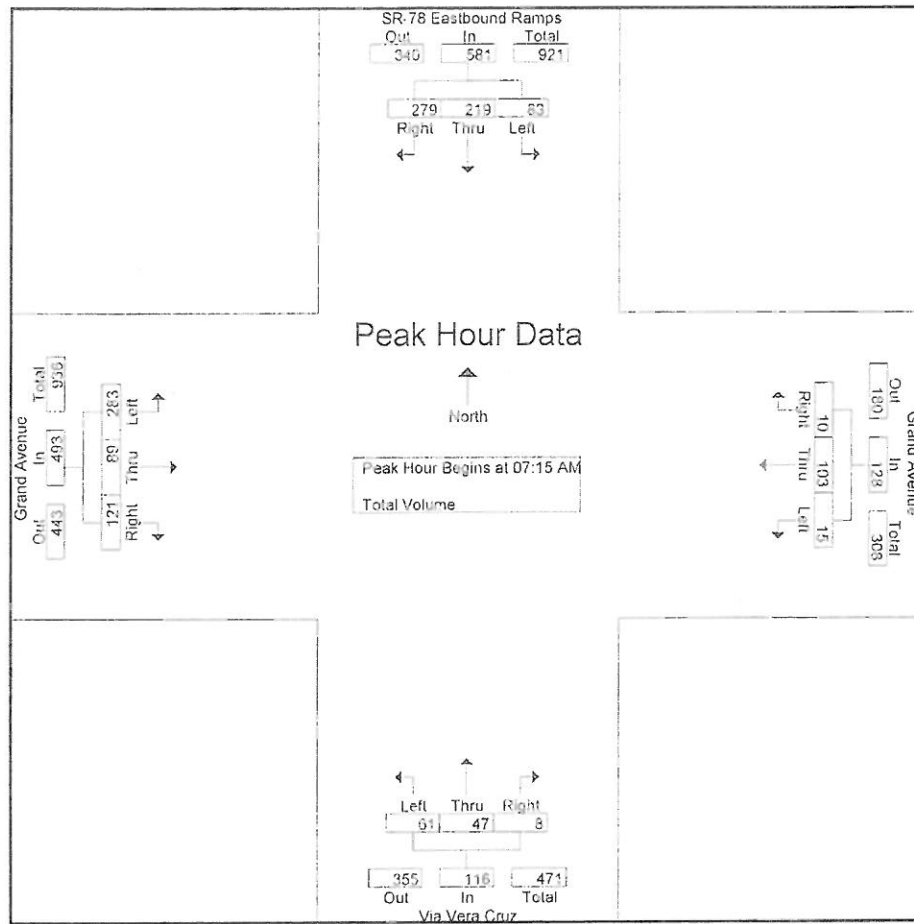
	SR-78 Eastbound Ramps Southbound				Grand Avenue Westbound				Via Vera Cruz Northbound				Grand Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	9	36	65	110	6	15	5	26	13	8	0	21	57	15	23	95	252
07:15 AM	19	36	72	127	4	27	5	36	10	9	3	22	72	19	20	111	296
07:30 AM	20	51	65	136	5	26	4	35	13	13	2	28	71	18	31	120	319
07:45 AM	30	83	68	181	5	24	0	29	21	7	1	29	75	25	40	140	379
Total	78	206	270	554	20	92	14	126	57	37	6	100	275	77	114	466	1246
08:00 AM	14	49	74	137	1	26	1	28	17	18	2	37	65	27	30	122	324
08:15 AM	21	38	66	125	2	34	0	36	10	10	2	22	60	20	30	110	293
08:30 AM	4	53	56	113	6	29	1	36	30	6	5	41	74	17	28	119	309
08:45 AM	24	57	56	137	2	34	1	37	25	10	6	41	65	32	17	114	329
Total	63	197	252	512	11	123	3	137	82	44	15	141	264	96	105	465	1255
Grand Total	141	403	522	1066	31	215	17	263	139	81	21	241	539	173	219	931	2501
Apprch %	13.2	37.8	49		11.8	81.7	6.5		57.7	33.6	6.7		57.9	18.6	23.5		
Total %	5.6	16.1	20.9	42.6	1.2	8.6	0.7	10.5	5.6	3.2	0.8	9.6	21.6	6.9	8.8	37.2	

	SR-78 Eastbound Ramps Southbound				Grand Avenue Westbound				Via Vera Cruz Northbound				Grand Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	19	36	72	127	4	27	5	36	10	9	3	22	72	19	20	111	296
07:30 AM	20	51	65	136	5	26	4	35	13	13	2	28	71	18	31	120	319
07:45 AM	30	83	68	181	5	24	0	29	21	7	1	29	75	25	40	140	379
08:00 AM	14	49	74	137	1	26	1	28	17	18	2	37	65	27	30	122	324
Total Volume	83	219	279	581	15	103	10	128	61	47	8	116	263	89	121	493	1318
% App. Total	14.3	37.7	48		11.7	80.5	7.8		52.6	40.5	6.9		57.4	18.1	24.5		
PHF	.692	.660	.943	.802	.750	.954	.500	.889	.726	.653	.667	.784	.943	.824	.756	.880	.669

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City of San Marcos
N/S: Via Vera Cruz/SR-78 EB Ramps
E/W: Grand Avenue
Weather: Sunny

File Name : SNMVCGRAM
Site Code : 00000001
Start Date : 7/31/2012
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				08:00 AM				08:00 AM				07:15 AM			
+0 mins.	19	36	72	127	1	26	1	28	17	18	2	37	72	19	20	111
+15 mins.	20	51	65	136	2	34	0	36	10	10	2	22	71	18	31	120
+30 mins.	30	83	68	181	6	29	1	36	30	6	5	41	75	25	40	140
+45 mins.	14	49	74	137	2	34	1	37	25	10	6	41	65	27	30	122
Total Volume	83	219	279	581	11	123	3	137	82	44	15	141	283	89	121	493
% App Total	14.3	37.7	48		8	89.8	2.2		58.2	31.2	10.6		57.4	18.1	24.5	
PHF	692	660	943	802	458	904	750	926	583	611	625	860	943	824	756	880

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City of San Marcos
N/S: Via Vera Cruz/SR-78 EB Ramps
E/W: Grand Avenue
Weather: Sunny

File Name : SNMVCGRPM
Site Code : 00000001
Start Date : 7/31/2012
Page No : 1

Groups Printed- Total Volume

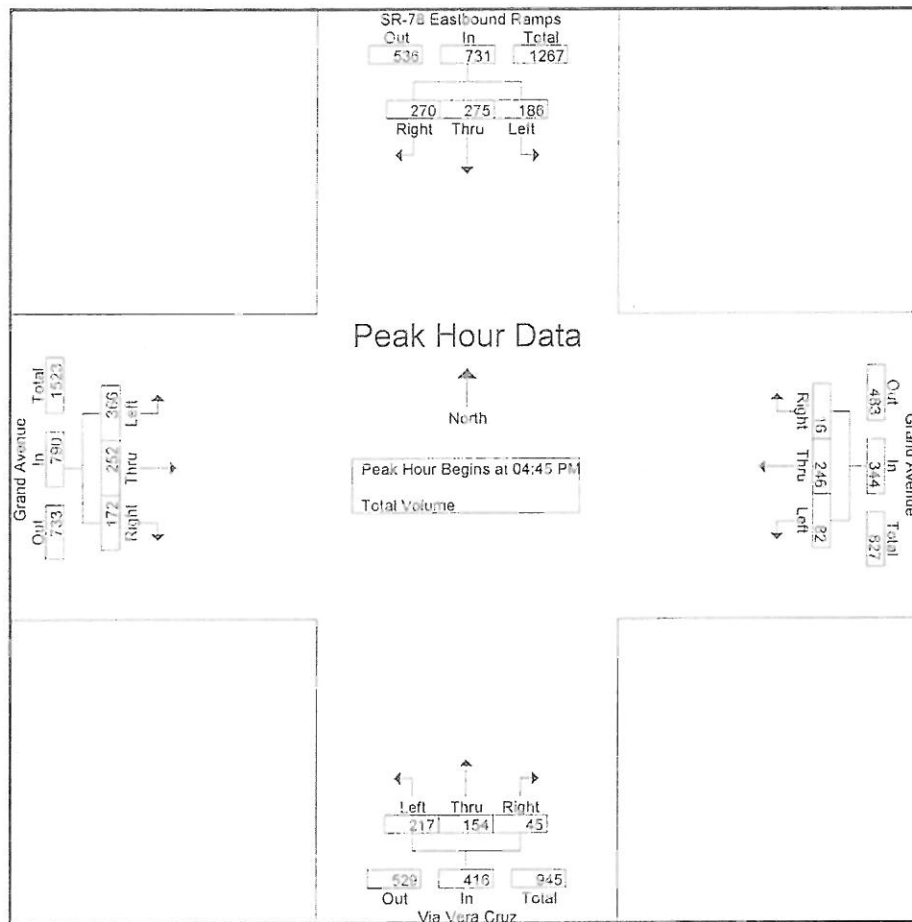
Start Time	SR-78 Eastbound Ramps Southbound				Grand Avenue Westbound				Via Vera Cruz Northbound				Grand Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	27	36	41	104	20	68	3	91	52	33	11	96	98	79	40	217	508
04:15 PM	28	51	53	142	20	65	4	89	37	33	9	79	91	63	45	199	509
04:30 PM	41	56	48	145	10	64	3	77	73	25	18	116	95	51	41	187	525
04:45 PM	32	78	65	175	21	61	11	93	39	34	17	90	90	62	44	196	554
Total	128	231	207	566	71	258	21	350	201	125	55	381	374	255	170	799	2096
05:00 PM	34	57	62	153	14	70	3	87	74	57	9	140	101	69	41	211	591
05:15 PM	59	66	72	197	27	62	1	90	43	32	8	83	112	63	47	222	592
05:30 PM	61	74	71	206	20	53	1	74	61	31	11	103	63	58	40	161	544
05:45 PM	65	75	79	219	12	52	0	64	34	22	11	67	59	48	36	143	493
Total	219	272	284	775	73	237	5	315	212	142	39	393	335	238	164	737	2220
Grand Total	347	503	491	1341	144	495	26	665	413	267	94	774	709	493	334	1536	4316
Approch %	25.9	37.5	36.6		21.7	74.4	3.9		53.4	34.5	12.1		46.2	32.1	21.7		
Total %	8	11.7	11.4	31.1	3.3	11.5	0.6	15.4	9.6	6.2	2.2	17.9	16.4	11.4	7.7	35.6	

	SR-78 Eastbound Ramps Southbound				Grand Avenue Westbound				Via Vera Cruz Northbound				Grand Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	32	78	65	175	21	61	11	93	39	34	17	90	90	62	44	196	554
05:00 PM	34	57	62	153	14	70	3	87	74	57	9	140	101	69	41	211	591
05:15 PM	59	66	72	197	27	62	1	90	43	32	8	83	112	63	47	222	592
05:30 PM	61	74	71	206	20	53	1	74	61	31	11	103	63	58	40	161	544
Total Volume	186	275	270	731	82	246	16	344	217	154	45	416	366	252	172	790	2281
% App. Total	25.4	37.6	36.9		23.8	71.5	4.7		52.2	37	10.8		46.3	31.9	21.8		
PHF	762	881	938	887	759	879	364	925	733	675	682	743	817	913	915	890	963

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City of San Marcos
N/S: Via Vera Cruz/SR-78 EB Ramps
E/W: Grand Avenue
Weather: Sunny

File Name : SNMVCGRPM
Site Code : 00000001
Start Date : 7/31/2012
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				04:00 PM				04:30 PM				04:30 PM			
+0 mins.	34	57	62	153	20	68	3	91	73	25	18	116	95	51	41	187
+15 mins.	59	66	72	197	20	65	4	89	39	34	17	90	90	62	44	196
+30 mins.	61	74	71	206	10	64	3	77	74	57	9	140	101	69	41	211
+45 mins.	65	75	79	219	21	61	11	93	43	32	8	83	112	63	47	222
Total Volume	219	272	284	775	71	258	21	350	229	148	52	429	398	245	173	816
% App. Total	28.3	35.1	36.6		20.3	73.7	6		53.4	34.5	12.1		48.8	30	21.2	
PHF	.842	.907	.899	.885	.845	.949	.477	.941	.774	.649	.722	.766	.888	.888	.920	.919

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City of San Marcos
Grand Avenue
B/ Los Posas - Via Vera Cruz
24 Hour Directional Volume Count

SNMGRLPVC
Site Code: 122-12231
Date Start: 01-Aug-12
Date End: 01-Aug-12

Start Time	01-Aug- 12 Wed	Eastbound		Hour Totals		Westbound		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		15	217			20	157				
12:15		14	203			11	170				
12:30		9	221			19	154				
12:45		11	213	49	854	20	185	70	666	119	1520
01:00		4	214			30	172				
01:15		11	201			17	162				
01:30		6	197			28	150				
01:45		10	203	31	815	31	149	106	633	137	1448
02:00		4	210			18	156				
02:15		7	216			11	171				
02:30		9	211			8	153				
02:45		10	168	30	805	6	152	43	632	73	1437
03:00		14	186			10	188				
03:15		4	202			8	184				
03:30		5	217			13	157				
03:45		6	191	29	796	14	155	45	684	74	1480
04:00		12	176			28	184				
04:15		12	181			6	171				
04:30		13	180			3	170				
04:45		18	199	55	736	14	151	51	676	106	1412
05:00		19	198			11	213				
05:15		18	227			20	157				
05:30		35	187			24	186				
05:45		54	188	126	800	61	202	116	758	242	1558
06:00		64	180			77	140				
06:15		87	177			55	109				
06:30		94	149			63	120				
06:45		122	155	367	661	104	127	299	496	666	1157
07:00		106	156			110	118				
07:15		108	131			109	96				
07:30		101	136			106	112				
07:45		132	130	447	553	128	102	453	428	900	981
08:00		132	107			139	102				
08:15		112	102			137	98				
08:30		146	108			104	100				
08:45		131	111	521	428	126	108	506	408	1027	836
09:00		121	120			106	71				
09:15		137	68			127	69				
09:30		137	69			110	60				
09:45		143	73	533	330	119	57	462	257	1000	587
10:00		135	57			105	63				
10:15		170	26			112	40				
10:30		141	34			95	40				
10:45		132	30	578	147	112	31	424	174	1002	321
11:00		163	18			135	25				
11:15		173	20			131	21				
11:30		194	18			160	16				
11:45		214	13	744	69	159	19	585	81	1329	150
Total		3515	6994	3515	6994	3160	5893	3160	5893	6675	12887
Combined Total		10509		10509		9053		9053		19562	
AM Peak Vol.		11:00 744				11:00 585					
P.H.F.		0.869				0.914					
PM Peak Vol.			12:00 854				05:00 758				
P.H.F.			0.966				0.890				
Percentage		33.4%	66.6%			34.9%	65.1%				
ADT/AADT		ADT 19,562	AADT 19,562								

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City of San Marcos
Grand Avenue
B/ Via Vera Cruz - Linda Vista Drive
24 Hour Directional Volume Count

SNMGRVCLV
Site Code: 122-12231
Date Start: 31-Jul-12
Date End: 31-Jul-12

Start Time	31-Jul-12 Tue	Eastbound		Hour Totals		Westbound		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		3	99			2	94				
12:15		5	70			0	103				
12:30		1	92			3	86				
12:45		2	85	11	346	2	100	7	383	18	729
01:00		1	83			2	117				
01:15		1	75			2	78				
01:30		1	73			1	84				
01:45		3	69	6	300	1	95	6	374	12	674
02:00		3	67			1	77				
02:15		0	63			2	78				
02:30		0	80			0	80				
02:45		0	76	3	286	1	93	4	328	7	614
03:00		1	76			3	72				
03:15		0	81			0	88				
03:30		1	104			0	92				
03:45		1	95	3	356	2	84	5	336	8	692
04:00		1	107			0	101				
04:15		2	110			0	95				
04:30		0	94			4	69				
04:45		3	114	6	425	7	89	11	354	17	779
05:00		3	114			1	89				
05:15		3	129			5	70				
05:30		6	115			3	82				
05:45		13	150	25	508	14	61	23	302	48	810
06:00		19	70			19	63				
06:15		24	67			10	52				
06:30		22	55			18	55				
06:45		25	59	90	251	19	46	66	216	156	467
07:00		30	67			24	53				
07:15		34	59			33	43				
07:30		37	46			37	57				
07:45		47	46	148	218	33	46	127	199	275	417
08:00		42	45			37	48				
08:15		46	38			40	42				
08:30		20	31			32	42				
08:45		42	27	150	141	33	48	142	180	292	321
09:00		49	18			34	36				
09:15		50	30			49	30				
09:30		57	18			45	35				
09:45		48	8	204	74	47	14	175	115	379	189
10:00		55	15			39	9				
10:15		47	6			55	11				
10:30		64	5			52	4				
10:45		44	10	210	36	68	13	214	37	424	73
11:00		62	6			61	7				
11:15		74	8			85	3				
11:30		95	1			70	5				
11:45		79	4	310	19	78	3	294	18	604	37
Total		1166	2960	1166	2960	1074	2842	1074	2842	2240	5802
Combined Total		4125		4126		3916		3916		8042	
AM Peak	11:00					11:00					
Vol.	310					294					
P.H.F.	0.816					0.865					
PM Peak		05:00					00:15				
Vol.		508					406				
P.H.F.		0.847					0.868				
Percentage		28.3%	71.7%			27.4%	72.6%				
ADT/AADT		ADT 8,042	AADT 8,042								

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City of San Marcos
Via Vera Cruz
B/ Grand Avenue - Grand Plaza Signal
24 Hour Directional Volume Count

SNMVCGRGP
Site Code: 122-12231
Date Start: 31-Jul-12
Date End: 31-Jul-12

Start Time	31-Jul-12 Tue	Northbound		Hour Totals		Southbound		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		19	80			3	112				
12:15		11	78			3	92				
12:30		5	74			3	89				
12:45		12	77	47	309	4	99	13	392	60	701
01:00		18	71			6	98				
01:15		11	74			5	91				
01:30		32	79			3	95				
01:45		26	76	87	300	4	86	18	370	105	670
02:00		17	77			4	96				
02:15		5	82			3	80				
02:30		3	97			3	105				
02:45		3	94	28	350	1	82	11	363	39	713
03:00		3	89			2	86				
03:15		0	86			1	76				
03:30		1	89			0	73				
03:45		1	93	5	357	4	79	7	314	12	671
04:00		1	81			1	72				
04:15		0	82			4	85				
04:30		0	108			4	78				
04:45		1	93	2	364	23	103	32	338	34	702
05:00		4	122			13	98				
05:15		3	95			14	90				
05:30		3	87			14	101				
05:45		8	76	23	380	35	99	76	388	99	768
06:00		9	64			24	69				
06:15		9	65			29	77				
06:30		9	72			36	68				
06:45		15	41	42	242	63	73	152	287	194	529
07:00		20	59			42	62				
07:15		16	50			47	58				
07:30		26	39			55	48				
07:45		30	41	92	189	85	44	229	212	321	401
08:00		33	42			74	53				
08:15		18	42			66	53				
08:30		28	55			52	39				
08:45		42	52	121	191	62	29	254	174	375	365
09:00		36	42			63	39				
09:15		39	35			63	37				
09:30		40	29			51	32				
09:45		39	27	154	133	64	19	241	127	395	260
10:00		43	39			64	18				
10:15		52	27			69	9				
10:30		42	21			68	3				
10:45		47	11	184	98	94	6	295	36	479	134
11:00		68	15			74	12				
11:15		49	11			84	13				
11:30		77	7			80	8				
11:45		90	7	284	40	95	6	333	39	617	79
Total		1069	2953	1069	2953	1661	3040	1661	3040	2730	5993
Combined Total		4022		4022		4701		4701		8723	
AM Peak	11:00					11:00					
Vol.		284				333					
P.H.F.		0.789				0.876					
PM Peak			04:30				12:00				
Vol.			418				392				
P.H.F.			0.857				0.875				
Percentage		26.6%	73.4%			35.3%	64.7%				
ADT/AADT		ADT 8,723	AADT 8,723								

APPENDIX C

Existing Conditions HCM Intersection Analysis Worksheets

ex am Thu Dec 13, 2012 15:16:53 Page 1 1

Existing AM Peak

Scenario Report

Scenario: ex am
 Command: ex am
 Volume: ex am
 Geometry: Default Geometry
 Impact Fee: Default Impact Fee
 Trip Generation: none
 Trip Distribution: none
 Paths: Default Path
 Routes: Default Route
 Configuration: ex am

ex am Thu Dec 13, 2012 15:16:52 Page 2 1

Existing AM Peak

Impact Analysis Report
 Level Of Service

Intersection	LOS	Vol	Del	Vol	Change
					in
# 5 SR-78 / Via Vera Cruz	C	24.8	0.481	C	24.8 0.481 + 0.000 D/V
# 6 Grand Avenue Project Driveway	A	6.6	0.007	A	6.6 0.007 + 0.000 D/V
# 7 Grand Avenue / Linda Vista	A	9.2	0.101	A	9.2 0.101 + 0.000 D/V
# 8 Via Vera Cruz Project Driveway	B	11.8	0.415	B	11.8 0.415 + 0.000 D/V

Existing AM Peak

Level of Service Computation Report

2000 HCM Operations Method (Future Volume Alternative)

Intersection #5 SR 78 / Via Vera Cruz

Cycle (sec): 100 Critical Vol./Cap. (X): 0.481
 Loss Time (sec): 0 Average Delay (sec/veh): 24.8
 Original Cycle: 44 Level of Service: C

Street Name: Via Vera Cruz SR-78
 Approach: North Bound South Bound East Bound West Bound
 Movement: L T R L T R L T R L T R

Control: Protected Protected Protected Protected Protected Protected
 Rights: Include Include Include Include Include Include

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 Y+P: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0
 Lanes: 1 1 0 0 1 1 0 0 1 0 2 0 2 0 1 1 0 2 1 0

Volume Module:
 Base Vol: 61 47 8 83 219 279 293 89 121 15 103 10
 Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Initial Bce: 61 47 8 83 219 279 293 89 121 15 103 10
 Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 PasserbyVol: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 Initial Fut: 61 47 8 83 219 279 293 89 121 15 103 10
 User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 PHF Adj: 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87
 PHF Volume: 70 54 9 96 252 321 326 102 139 17 119 12
 Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Final Volume: 70 54 9 96 252 321 326 102 139 17 119 12

Saturation Flow Module:
 Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
 Adjustment: 0.97 0.97 0.85 0.95 0.92 0.92 0.92 0.95 0.65 0.65 0.95 0.90
 Lanes: 1.13 0.87 1.00 1.00 0.44 0.56 2.00 2.00 1.00 1.00 2.73 0.27
 Final Sat.: 2093 1609 1615 1905 765 975 3502 3610 1615 1805 4667 453

Capacity Analysis Module:
 Vol/Sat: 0.03 0.03 0.01 0.05 0.33 0.33 0.09 0.03 0.09 0.01 0.03 0.03
 Crit Moves: ***
 Green/Cycle: 0.07 0.29 0.29 0.46 0.66 0.68 0.19 0.22 0.22 0.02 0.05 0.05
 Volume/Cap: 0.48 0.11 0.02 0.11 0.48 0.48 0.48 0.13 0.39 0.39 0.48 0.48
 Delay/Veh: 46.2 25.9 25.2 15.4 7.7 7.7 36.4 31.3 33.9 51.6 47.4 47.4
 User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 AdjDel/Veh: 46.2 25.9 25.2 15.4 7.7 7.7 36.4 31.3 33.9 51.6 47.4 47.4
 LOS by Move: D C C B A A A D C C C D D D
 HCM2kAvqQ: 3 1 0 2 8 8 5 1 4 1 2 2

Note: Queue reported is the number of cars per lane.

Traffic 8.0.0715 (c) 2008 Bowling Assoc. Licensed to RBF CONSULTING, IRVINE

Existing AM Peak

Level of Service Computation Report

2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #5 Grand Avenue Project Driveway

Average Delay (sec/veh): 0.2 Worst Case Level of Service: A [8.6]

Street Name: Project Driveway Grand Avenue
 Approach: North Bound South Bound East Bound West Bound
 Movement: L T R L T R L T R L T R

Control: Stop Sign Stop Sign Stop Sign Stop Sign
 Rights: Include Include Include Include

Lanes: 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Volume Module:
 Base Vol: 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Initial Bce: 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 Added Vol: 0
 PasserbyVol: 0
 Initial Fut: 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
 PHF Volume: 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 Reduced Vol: 0
 Final Volume: 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Critical Gap Module:
 Critical Gap: 6.9 6.9 6.9 6.9 6.9 6.9 6.9 6.9 6.9 6.9 6.9 6.9 6.9 6.9 6.9 6.9 6.9 6.9
 FollowUpTime: 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3

Capacity Module:
 Conflict Vol: 96
 Potential Cap: 948 948 948 948 948 948 948 948 948 948 948 948 948 948 948 948 948 948
 Move Cap: 948 948 948 948 948 948 948 948 948 948 948 948 948 948 948 948 948 948
 Volume/Cap: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

Level of Service Module:
 2Way95thQ: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
 Control Del: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
 LOS by Move: A
 Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
 Shared Cap: 948 948 948 948 948 948 948 948 948 948 948 948 948 948 948 948 948 948
 Shared Queue: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
 Shared Del: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
 Shared LOS: 8.8 8.8 8.8 8.8 8.8 8.8 8.8 8.8 8.8 8.8 8.8 8.8 8.8 8.8 8.8 8.8 8.8 8.8
 ApproachDel: A
 ApproachLOS: A

Note: Queue reported is the number of cars per lane.

Traffic 8.0.0715 (c) 2008 Bowling Assoc. Licensed to RBF CONSULTING, IRVINE

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Existing PM Peak

Scenario Report

Scenario: ex pm
 Command: ex pm
 Volume: ex pm
 Geometry: Default Geometry
 Impact Fee: Default Impact Fee
 Trip Generation: none
 Trip Distribution: none
 Paths: Default Path
 Routes: Default Route
 Configuration: ex pm

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Existing PM Peak

Impact Analysis Report
Level Of Service

Intersection	Base		Future		Change In
	LOS Veh C	Del/V C	LOS Veh C	Del/V C	
# 5 SR-76 / Via Vera Cruz	C 31.5	0.587	C 31.5	0.587	+ 0.000 D/V
# 6 Grand Avenue Project Driveway	B 14.5	0.008	B 14.5	0.008	+ 0.000 D/V
# 7 Grand Avenue / Linda Vista	B 13.6	0.436	B 13.6	0.436	+ 0.000 D/V
# 8 Via Vera Cruz Project Driveway	C 15.3	0.619	C 15.3	0.619	+ 0.000 D/V

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Existing PM Peak

Level of Service Computation Report
 2000 HCM Unsignalized Method (Future Volume Alternative)

 Intersection #7 Grand Avenue / Linda Vista

 Average Delay (sec/veh): 4.3 Worst Case Level of Service: B (13.6)

 Approach: North Bound South Bound East Bound West Bound
 Movement: L - T - R L - T - R L - T - R L - T - R

Control: Stop Sign Stop Sign Uncontrolled Uncontrolled
 Rights: Include Include Include Include

Lanes: 0 0 1 0 0 0 0 0 0 0 0 0 0 0 1 0 2 0 0

Volume Module:

Base Vol: 5 0 136 0 0 0 0 0 459 8 55 310 0
 Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Initial Bse: 5 0 736 0 0 0 0 459 8 55 310 0
 Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
 PasserbyVol: 0 0 0 0 0 0 0 0 0 0 0 0
 Initial Fut: 5 0 336 0 0 0 0 459 8 55 310 0
 User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 PHF Volume: 5 0 337 0 0 0 0 460 8 55 311 0
 Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
 FinalVolume: 5 0 337 0 0 0 0 460 8 55 311 0

Critical Gap Module:

Critical Gap: 6.8 6.5 6.9 xxxxx xxxx xxxxx xxxxx xxxxx 4.1 xxxx xxxxx
 FollowUpTime: 3.5 4.0 3.3 xxxxx xxxx xxxxx xxxxx xxxxx 2.2 xxxx xxxxx

Capacity Module:

Conflict Vol: 730 886 234 xxxxx xxxxx xxxxx xxxxx xxxxx 468 xxxx xxxxx
 Potent Cap.: 362 286 774 xxxxx xxxxx xxxxx xxxxx xxxxx 1104 xxxx xxxxx
 Move Cap.: 348 272 774 xxxxx xxxxx xxxxx xxxxx xxxxx 1104 xxxx xxxxx
 Volume/Cap: 0.01 0.00 0.44 xxxxx xxxxx xxxxx xxxxx xxxxx 0.05 xxxx xxxxx

Level of Service Module:

TwoWay95thQ: xxxx xxxx xxxxx xxxxx xxxxx xxxxx xxxxx 0.2 xxxx xxxxx
 Control Del:xxxxx xxxx xxxxx xxxxx xxxxx xxxxx 8.4 xxxx xxxxx
 LOS by Move: * * * * * * * * * * * * * * * *
 Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
 Shared Cap.: xxx 760 xxxxx xxxxx xxxxx xxxxx xxxxx 1104 xxxx xxxxx
 SharedQueue:xxxxx 2.3 xxxxx xxxxx xxxxx xxxxx xxxxx 1104 xxxx xxxxx
 Shrd ConDel:xxxxx 13.6 xxxxx xxxxx xxxxx xxxxx xxxxx 1104 xxxx xxxxx
 Shared LOS: * B * * * * * * * * * * * * * * * *
 ApproachDel: 13.6 xxxxxx xxxxxx xxxxxx
 ApproachLOS: B B B B B B B B B B B B B B B B

Note: Queue reported is the number of cars per lane.

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Existing PM Peak

Level of Service Computation Report
 2000 HCM Unsignalized Method (Future Volume Alternative)

 Intersection #8 Via Vera Cruz Project Drivevey

 Average Delay (sec/veh): 13.1 Worst Case Level of Service: C (15.3)

 Approach: North Bound South Bound East Bound West Bound
 Movement: L - T - R L - T - R L - T - R L - T - R

Control: Stop Sign Stop Sign Uncontrolled Uncontrolled
 Rights: Include Include Include Include

Lanes: 0 0 1 1 0 0 0 2 0 0 0 0 0 0 0 0 0 0 1

Volume Module:

Base Vol: 0 416 0 0 529 0 0 529 0 0 0 0 0 0 0 0
 Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Initial Bse: 0 416 0 0 529 0 0 529 0 0 0 0 0 0 0 0
 Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 PasserbyVol: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 Initial Fut: 0 416 0 0 529 0 0 529 0 0 0 0 0 0 0 0
 User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
 PHF Volume: 0 438 0 0 557 0 0 557 0 0 0 0 0 0 0 0
 Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 FinalVolume: 0 438 0 0 557 0 0 557 0 0 0 0 0 0 0 0

Critical Gap Module:

Critical Gap:xxxxx 6.5 6.2 xxxxx 6.5 xxxxx xxxxx xxxxx xxxxx xxxxx
 FollowUpTime:xxxxx 4.0 3.3 xxxxx 4.0 xxxxx xxxxx xxxxx xxxxx xxxxx

Capacity Module:

Conflict Vol: xxx 0 0 xxx 0 xxx 0 xxx xxxxx xxxxx xxxxx xxxxx
 Potent Cap.: xxx 900 1091 xxx 900 xxxxx xxxxx xxxxx xxxxx xxxxx
 Move Cap.: xxx 900 1091 xxx 900 xxxxx xxxxx xxxxx xxxxx xxxxx
 Volume/Cap: xxx 0.49 0.00 xxx 0.62 xxxxx xxxxx xxxxx xxxxx xxxxx

Level of Service Module:

TwoWay95thQ: xxx 1.0 xxxxx xxx 4.1 xxxxx xxxxx xxxxx xxxxx
 Control Del:xxxxx 10.3 xxxxx xxxxx 15.3 xxxxx xxxxx xxxxx
 LOS by Move: * B * * * * * * * * * * * * * * * *
 Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
 Shared Cap.: xxx xxx 900 xxx xxxxx xxxxx xxxxx xxxxx xxxxx
 SharedQueue:xxxxx xxx 1.0 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
 Shrd ConDel:xxxxx xxx 10.3 xxxxx xxxxx xxxxx xxxxx xxxxx
 Shared LOS: * B * * * * * * * * * * * * * * * *
 ApproachDel: 10.3 B 15.3 C xxxxxx xxxxxx
 ApproachLOS: B B C C C C C C C C C C C C C C

Note: Queue reported is the number of cars per lane.

APPENDIX D

SANDAG Trip Generation Rate

(NOT SO)

BRIEF GUIDE OF VEHICULAR TRAFFIC GENERATION RATES FOR THE SAN DIEGO REGION

APRIL 2002



401 B Street, Suite 800
San Diego, California 92101
(619) 595-6300 • Fax (619) 595-6308

NOTE: This listing only represents a *guide* of average, or estimated, traffic generation (driveway) rates and some very general trip data for land uses (emphasis on acreage and building square footage) in the San Diego region. These rates (both local and national) are subject to change as future documentation becomes available, or as regional sources are updated. For more specific information regarding traffic data and trip rates, please refer to the San Diego Traffic Generators manual. *Always check with local jurisdictions for their preferred or applicable rates.*

LAND USE	TRIP CATEGORIES (PRIMARY-DIVERTED-PASS-BY)*	ESTIMATED WEEKDAY VEHICLE TRIP GENERATION RATE (DRIVEWAY)	HIGHEST PEAK HOUR % (plus IN:OUT ratio) Between 5:00-9:30 A.M. Between 3:00-6:30 P.M.		TRIP LENGTH (MI/HR)
AGRICULTURE (Open Space)	[20:16:2]	5/acre**			12.5
AIRPORT	[78:20:2]	60/acre, 100/flight, 70/1000 sq. ft.*** 6/acre, 2/flight, 6/1000 sq. ft.*** 100/acre**	5% (5:4) 9% (7:3)	4% (5:5) 15% (5:5)	12.5
AUTOMOBILE					2.8
Car Wash		800/acre, 600/acre**	4% (5:5)	9% (5:5)	
Automatic Self-serve		100/wash stall**	4% (5:5)	9% (5:5)	
Gasoline	[21:51:28]	150/vehicle fueling space** 155/vehicle fueling space** 150/vehicle fueling space, 800/station** 50/1000 sq. ft., 300/acre, 60/service stall** 20/1000 sq. ft., 400/acre, 20/service stall** 60/1000 sq. ft.,** 40/service stall** 25/1000 sq. ft., 30/service stall**	7% (5:5) 8% (5:5) 7% (5:5) 5% (7:3) 8% (7:3) 4% 7% (5:4) 7% (5:4)	5% (5:5) 9% (5:5) 9% (5:5) 5% (4:6) 11% (4:6) 10% (5:5) 11% (5:5)	
with Food Mart - with Food Mart & Car Wash Quick Service Station Design Sales (Dealer & Retail) Auto Repair Center Auto Parts Dealer Quick Lube Tire Store					
CEMETERY		5/acre*			5.1
- CHURCH (or Synagogue)	[64:25:11]	5/1000 sq. ft., 30/acre** (quadruple rates for Sunday, or days of assembly)	5% (6:4)	8% (5:5)	
COMMERCIAL/RETAIL					6.2
Super Regional Shopping Center (More than 80 acres, more than 800,000 sq. ft., w/usually 3+ major stores)	[54:55:13]	35/1000 sq. ft., 400/acre*	4% (7:3)	10% (5:5)	
Regional Shopping Center (40-80 acres, 400,000-800,000 sq. ft., w/usually 2+ major stores)	[47:31:23]	60/1000 sq. ft., 700/acre**	4% (6:4)	10% (5:5)	3.4
Community Shopping Center (15-40 acres, 125,000-400,000 sq. ft., w/usually 1 major store, detached restaurants, grocery and drugstore)		120/1000 sq. ft., 1200/acre**	4% (6:4)	10% (5:5)	
Neighborhood Shopping Center (Less than 15 acres, less than 125,000 sq. ft., w/usually grocery & drugstore, cleaners, beauty & barber shop, & fast food services)	[45:40:15]	40/1000 sq. ft., 400/acre*	3% (6:4)	9% (5:5)	4.3
Commercial Strips		50/1000 sq. ft.,** 40/1000 sq. ft.,** 150/1000 sq. ft., 2000/acre** 90/1000 sq. ft.,** 500/1000 sq. ft.,** 700/1000 sq. ft.,** 850/1000 sq. ft., 550/vehicle fueling space** 60/1000 sq. ft., 600/acre** 60/1000 sq. ft., 600/acre** 60/1000 sq. ft., 100/acre** 30/1000 sq. ft., 150/acre** 40/1000 sq. ft.,** 60/1000 sq. ft., 600/acre** 40/1000 sq. ft., 50/acre** 110/1000 sq. ft., 2000/acre* (commercial only) 5/dwelling unit, 200/acre* (residential only)	3% (6:4) 3% (7:3) 4% (7:3) 4% (6:4) 3% (5:5) 3% (5:5) 3% (5:5) 3% (7:3) 3% (6:4) 4% (7:3) 7% (6:4) 5% (6:4) 3% (6:4) 3% (5:4) 3% (6:4) 9% (3:7)	10% (5:5) 10% (5:5) 10% (5:5) 2% (5:5) 7% (5:5) 9% (5:5) 9% (5:5) 9% (5:5) 9% (5:5) 9% (5:5) 8% (5:5) 9% (5:5) 10% (5:5) 9% (5:5) 12% (5:4)	
- Specialty Retail Strip Commercial Electronics Superstore Factory Outlet Supermarket Drugstore Convenience Market (15-16 hours) Convenience Market (24 hours) Convenience Market (w/gasoline pumps) Discount Club Discount Store Furniture Store Lumber Store Home Improvement Superstore Hardware/Paint Store Garden Nursery Mixed Use Commercial (w/supermarket)/Residential					
EDUCATION					3.8
University (4 years)	[91:9:0]	3.4/student, 100/acre*	10% (8:2)	9% (3:7)	6.0
Junior College (2 years)	[92:7:1]	1.2/student, 24/1000 sq. ft., 120/acre**	12% (8:2)	9% (4:4)	4.8
High School	[75:19:6]	1.3/student, 15/1000 sq. ft., 60/acre**	20% (7:3)	10% (4:6)	5.0
Middle/Junior High	[63:23:15]	1.4/student, 12/1000 sq. ft., 50/acre**	30% (6:4)	9% (4:6)	5.4
Elementary	[57:25:10]	1.6/student, 14/1000 sq. ft., 80/acre**	32% (6:4)	9% (4:6)	5.7
- Day Care	[29:52:14]	5/child, 80/1000 sq. ft.**	17% (5:5)	18% (5:5)	3.4
FINANCIAL	[35:42:23]	150/1000 sq. ft., 1000/acre** 200/1000 sq. ft., 1500/acre** 250 (125 oneway)/lane** 60/1000 sq. ft., 400/acre** 100 (50 oneway)/lane**	4% (7:3) 5% (6:4) 3% (5:5) 2% 4%	8% (4:6) 10% (5:5) 13% (5:5) 5% 15%	8.3
HOSPITAL	[73:28:2]	10/bed, 25/1000 sq. ft., 250/acre*	8% (7:3) 7% (6:4)	10% (4:6) 7% (4:6)	8.0
INDUSTRIAL					11.7
Industrial/Business Park (commercial included)	[79:15:2]	15/1000 sq. ft., 200/acre** 6/1000 sq. ft., 90/acre** 10/1000 sq. ft., 120/acre** 4/1000 sq. ft., 50/acre** 3/1000 sq. ft., 60/acre** 2/1000 sq. ft., 0.2/week, 30/acre*	12% (8:2) 11% (8:1) 14% (8:2) 15% (8:1) 13% (7:2) 16% (8:1)	15% (3:8) 12% (5:5) 15% (5:7) 20% (5:8) 15% (5:6) 14% (7:9)	
Industrial Park (no commercial) Industrial Plant (military site) Manufacturing/Assembly Warehousing Storage Science Research & Development Landfill & Recycling Center	[92:5:3]	8/1000 sq. ft., 80/acre** 3/1000 sq. ft., 30/acre** 2/1000 sq. ft., 0.2/week, 30/acre*	11% (5:5) 13% (7:2) 16% (8:1) 11% (5:5)	15% (5:6) 15% (5:6) 10% (4:6)	

(OVER)

MEMBER AGENCIES: Cities of Carlsbad, Chula Vista, Coronado, Del Mar, El Cajon, Escondido, Imperial Beach, La Mesa, Lemon Grove, National City, Oceanside, Poway, San Diego, San Marcos, Sanic, Solana Beach, Vista and County of San Diego
ADVISORY/LIAISON MEMBERS: California Department of Transportation, County Water Authority, U.S. Department of Defense, U.S. Marine Corps District and Twickenham California

LAND USE	TRIP CATEGORIES (PRIMARY/DIVERTED/PASS-BY)*	ESTIMATED WEEKDAY VEHICLE TRIP GENERATION RATE (DRIVEWAY)	HIGHEST PEAK HOUR % (plus IN-OUT ratio) Between 8:00-9:30 A.M. Between 3:00-6:30 P.M.		TRIP LENGTH (Miles)†
LIBRARY [44:44:12]		50/1000 sq. ft., 400/acre**	2% (7:3)	10% (15:5)	3.9
LODGING [58:38:4]					7.6
Hotel (w/convention facilities/restaurant)		10/occupied room, 300/acre	8% (6:4)	8% (6:4)	
Small		2/occupied room, 100/acre*	5% (4:6)	9% (6:4)	
Resort Hotel		6/occupied room, 100/acre*	5% (6:4)	7% (4:6)	
Business Hotel		7/occupied room**	5% (4:6)	9% (6:4)	
MILITARY [52:10:2]		2.5/military & civilian personnel*	8% (9:1)	10% (12:8)	11.2
OFFICE [77:19:4]					6.9
Standard Commercial Office (less than 100,000 sq. ft.)		20/1000 sq. ft., 300/acre*	14% (9:1)	13% (12:8)	
Large (high-rise) Commercial Office (more than 100,000 sq. ft., 6+ stories)		17/1000 sq. ft., 600/acre*	13% (9:1)	14% (12:6)	10.0
Office Park (400,000+ sq. ft.)		12/1000 sq. ft., 200/acre**	12% (9:1)	13% (12:8)	
Single Tenant Office		14/1000 sq. ft., 150/acre*	15% (9:1)	15% (12:8)	8.8
Corporate Headquarters		7/1000 sq. ft., 110/acre*	17% (9:1)	16% (11:8)	
Government (Civil Center)		30/1000 sq. ft.**	9% (9:1)	12% (10:7)	8.0
Post Office					
- Central/Walk-in Only		50/1000 sq. ft.**	5%	7%	
- Community (not including mail drop lines)		200/1000 sq. ft., 1300/acre*	6% (6:4)	9% (5:5)	
Community (news & display)		300/1000 sq. ft., 2000/acre*	7% (5:5)	10% (5:5)	
Mail Drop Lane only		1000 (750 one-way)/lane*	7% (5:5)	12% (5:5)	
Department of Motor Vehicles		180/1000 sq. ft., 900/acre**	6% (6:4)	10% (4:6)	
Medical Center		50/1000 sq. ft., 500/acre*	6% (6:4)	11% (13:7)	6.4
PARKS [66:26:6]					5.4
City (developed w/playing fields and sports facilities)		50/acre*	13% (5:5)	9% (5:5)	
Regional (developed)		20/acre*			
Neighborhood/County (undeveloped)		5/acre (add for specific sport uses, 6/picnic site**)			
State (average 1000 acres)		1/acre, 10/picnic site**			
Amusement (Theme)		80/acre, 130/acre (summer only)**		6% (6:4)	
San Diego Zoo		115/acre*			
Sea World		60/acre*			
RECREATION [62:39:5]					9.3
Beach, Ocean or Bay		600/1000 ft. shoreline, 60/acre*			
Beach, Lake (fresh water)		60/1000 ft. shoreline, 6/acre*			
Bowling Center		30/1000 sq. ft., 300/acre, 30/acre**	7% (7:3)	11% (4:6)	
Competition		4/carnegie**	4%	2%	
Golf Course		7/acre, 40/acre, 100/acre**	7% (8:2)	9% (3:7)	
Driving Range only		70/acre, 14/sec. box*	3% (7:3)	9% (5:5)	
Marinas		4/berth, 20/acre**	2% (3:7)	7% (6:4)	
Multi-purpose (miniature golf, video arcade, batting cage, etc.)		90/acre	2%	0%	
Racquetball/Health Club		30/1000 sq. ft., 300/acre, 40/sport*	4% (6:4)	9% (8:4)	
Tennis Courts		16/acre, 30/court**	5%	11% (5:5)	
Sports Facilities					
Outdoor Stadium		50/acre, 0.2/seat*			
Indoor Arena		30/acre, 0.1/seat*			
Racetrack		40/acre, 0.6/seat*			
Theater (multiple w/multiple)		80/1000 sq. ft., 1.8/seat, 350/seat**	10%	8% (6:4)	6.1
RESIDENTIAL [88:11:3]					7.9
Estate, Urban or Rural (average 1-2 DU/acre)		12/dwelling unit**	8% (3:7)	10% (7:3)	
Single Family Detached (average 3-6 DU/acre)		10/dwelling unit**	8% (3:7)	10% (7:5)	
Condominiums (for any multi-family & 20 DU/acre)		8/dwelling unit**	8% (2:8)	10% (7:3)	
Apartment (for any multi-family units more than 20 DU/acre)		6/dwelling unit**	9% (2:4)	8% (12:2)	
Military Housing (off base, multi-family) (less than 6 DU/acre)		5/dwelling unit	7% (9:1)	9% (6:4)	
(6-20 DU/acre)		6/dwelling unit	7% (3:7)	9% (6:4)	
Mobile Home					
Family		5/dwelling unit, 40/acre*	8% (5:7)	11% (6:4)	
Adults Only		3/dwelling unit, 20/acre*	9% (3:7)	10% (6:4)	
Retirement Community		4/dwelling unit**	5% (4:0)	7% (6:4)	
Congregate Care Facility		2.5/dwelling unit**	4% (6:4)	6% (5:5)	
RESTAURANT* [51:31:12]					4.7
Quickly		100/1000 sq. ft., 2/seat, 500/acre**	1% (6:4)	8% (7:3)	
Slowdown, high turnover		150/1000 sq. ft., 6/seat, 1000/acre**	8% (5:5)	8% (6:4)	
Fast Food (w/drive-through)		600/1000 sq. ft., 20/seat, 5000/acre**	7% (5:5)	7% (5:5)	
Fast Food (without drive-through)		700/1000 sq. ft.**	5% (5:4)	7% (5:5)	
Delicatessen (7am-4pm)		150/1000 sq. ft., 11/seat*	9% (9:4)	3% (3:7)	
TRANSPORTATION					
Bus Depot		25/1000 sq. ft.**			
Truck Terminal		10/1000 sq. ft., 7/Bay, 80/acre**	8% (4:0)	8% (5:5)	
Waterport/Cruise Terminal		170/berth, 12/acre**			
Transit Station (light rail w/parking)		300/acre, 2"/parking space (4/occupied)**	14% (7:3)	15% (12:7)	
Park & Ride Lot		400/acre (600/paved acre), 5/parking space (5/occupied)**	14% (7:3)	15% (12:7)	

* Primary source: San Diego Traffic Generators

** Other sources: (1) Trip Generation Report (RIR Edition) Trip Generation Rates (other agencies and publications); (2) SAN/CAQ & CALTRANS studies; reports and estimates.

† Trip category percentages are daily from local household surveys, often cannot be applied to very specific land uses, and do not include non-resident effects.

††† SAN/CAQ Analysis of Trip Diaries, revised September, 1990.

††††† SAN/CAQ and trip diary between origin and primary destination.

DIVERTED - linked trip showing one or more stops along the way to a primary destination where distance compared to direct distance is 1 mile.

PASS-BY - unlinked or diverted < 1 mile.

* Trip lengths are average weighted for all trips to and from general land use site. (All trips system-wide average length = 6.5 miles)

* Fitted curve equation: $Ln(T) = 0.502 Ln(d) + 0.845$ $T = total trips, d = 1,000 sq. ft.$

* Fitted curve equation: $Ln(T) = 0.758 Ln(d) + 3.550$

* Fitted curve equation: $T = -0.165 Ln(d) + 12.88$ $T = trips/DU, d = density (DU/acre), DU = dwelling unit$

* Suggested 15-25% (unlinked or diverted < 1 mile) percentages for trip rate reductions only.

During PM peak period based on combination of local data review and other sources**.

COMMERCIAL/RETAIL

Regional Shopping Center

Community

Neighborhood

Specialty Retail (Shop Commercial/office)

Supermarket

Convenience Market

Department Store

FINANCIAL

Bank

AUTOMOBILE

Gasoline Station

RESTAURANT

Quickly

Slowdown high turnover

Fast Food

* Trip Reductions - in order to help promote regional "smart growth" policies, and acknowledge San Diego's expanding metropolitan system, consider vehicle trip rate reductions (with proper documentation and necessary adjustments for peak periods). The following are some examples:

(1) A 6% daily trip reduction for land uses with transit access or near transit stations accessible within 1/4 mile.

(2) Up to 10% daily trip reduction for mixed-use developments where residential and commercial uses are combined (demonstrate mode shift of walking trips to replace vehicular trips).

APPENDIX E

Existing Plus Cumulative Conditions Without Project HCM Intersection Analysis Worksheets

exc am Thu Aug 16, 2012 14:59:53 Page 1-1

Existing + Cumulative AM Peak

Scenario Report

Scenario: exc am

Command: exc am

Volume: exc am

Geometry: Default Geometry

Impact Fee: Default Impact Fee

Trip Generation: none

Trip Distribution: none

Paths: Default Path

Routes: Default Route

Configuration: exc am

exc am Thu Aug 16, 2012 14:59:54 Page 2-1

Existing + Cumulative AM Peak

Impact Analysis Report

Level Of Service

Intersection

Base Del/ V/ C

LOS Veh C

Future Del/ V/ C

Change in

5 SR-78 / Via Vera Cruz

C 24.8 0.481

C 26.9 0.574 + 2.081 D/V

6 Grand Avenue Project Driveway

A 8.8 0.000

A 9.0 0.000 + 0.159 D/V

7 Grand Avenue / Linda Vista

A 9.2 0.000

A 9.5 0.000 + 0.273 D/V

8 Via Vera Cruz Project Driveway

B 11.6 0.000

B 11.9 0.000 + 0.349 D/V

exc am Existing + Cumulative AM Peak
Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)
Intersection #7 Grand Avenue / Linda Vista
Average Delay (sec/veh): 3.0 Worst Case Level Of Service: A [9.5]
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
Control: Stop Sign Stop Sign Uncontrolled Uncontrolled
Rights: Include Include Include Include

Lanes:	0	0	1	0	0	0	0	0	0	0	0	0	1	0	2	0	0
Volume Module:																	
Base Vol:	3	0	52	0	0	0	0	0	139	19	136	139	0				
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Initial Bsc:	3	0	52	0	0	0	0	0	139	19	136	139	0				
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0	0				
Cumulative:	0	0	16	0	0	0	0	0	2	51	0	12	58				
Initial Fut:	3	0	68	0	0	0	0	0	2	150	19	148	197				
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
PBF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95				
PBF Volume:	3	0	72	0	0	0	0	0	2	201	20	156	208				
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0	0				
Final Volume:	3	0	72	0	0	0	0	0	2	201	20	156	208				

Critical Gap Module:																	
Critical Gap:	6.8	6.5	6.9	xxxx	xxxx	xxxx	xxxx	4.1	xxxx	xxxx	4.1	xxxx	xxxx				
FollowUpTime:	3.5	4.0	3.3	xxxx	xxxx	xxxx	xxxx	2.2	xxxx	xxxx	2.2	xxxx	xxxx				
Capacity Module:																	
Conflict Vol:	632	736	110	xxxx	xxxx	xxxx	xxxx	208	xxxx	xxxx	221	xxxx	xxxx				
Potent Cap:	417	349	928	xxxx	xxxx	xxxx	xxxx	1375	xxxx	xxxx	1360	xxxx	xxxx				
Move Cap:	380	308	928	xxxx	xxxx	xxxx	xxxx	1375	xxxx	xxxx	1360	xxxx	xxxx				
Volume/Cap:	0.01	0.00	0.08	xxxx	xxxx	xxxx	xxxx	0.00	xxxx	xxxx	0.12	xxxx	xxxx				

Level Of Service Module:																	
2Way95thQ:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.0	xxxx	xxxx	0.4	xxxx	xxxx				
Control Del:xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	7.6	xxxx	xxxx	8.0	xxxx	xxxx				
LOS by Move:	*	*	*	*	*	*	*	*	*	*	*	*	*				
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT				
Shared Cap:	xxxx	875	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx				
Shared Queue:xxxx	0.3	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.0	xxxx	xxxx	xxxx	xxxx	xxxx				
Shrd Condel:xxxx	9.5	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	7.6	xxxx	xxxx	xxxx	xxxx	xxxx				
Shared LOS:	A	*	*	*	*	*	*	A	*	*	*	*	*				
ApproachDel:	9.5	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx				
ApproachLOS:	A	*	*	*	*	*	*	A	*	*	*	*	*				

Note: Queue reported is the number of cars per lane.

exc am Existing + Cumulative AM Peak
Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)
Intersection #8 Via Vera Cruz Project Driveway
Average Delay (sec/veh): 11.2 Worst Case Level Of Service: B [11.9]
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
Control: Stop Sign Stop Sign Uncontrolled Uncontrolled
Rights: Include Include Include Include

Lanes:	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	1
Volume Module:																	
Base Vol:	0	116	0	0	355	0	0	0	0	0	0	0	0	0	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bsc:	0	116	0	0	355	0	0	0	0	0	0	0	0	0	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cumulative:	0	43	0	0	28	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	159	0	0	383	0	0	0	0	0	0	0	0	0	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PBF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PBF Volume:	0	159	0	0	383	0	0	0	0	0	0	0	0	0	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Final Volume:	0	159	0	0	383	0	0	0	0	0	0	0	0	0	0	0	0

Critical Gap Module:																	
Critical Gap:	6.5	6.2	xxxx	xxxx	xxxx	xxxx	xxxx	6.5	xxxx	xxxx	xxxx	xxxx	xxxx				
FollowUpTime:	4.0	3.3	xxxx	xxxx	xxxx	xxxx	xxxx	4.0	xxxx	xxxx	xxxx	xxxx	xxxx				
Capacity Module:																	
Conflict Vol:	xxxx	0	xxxx	xxxx	xxxx	xxxx	xxxx	0	xxxx	xxxx	xxxx	xxxx	xxxx				
Potent Cap:	xxxx	900	900	xxxx	xxxx	xxxx	xxxx	900	xxxx	xxxx	xxxx	xxxx	xxxx				
Move Cap:	xxxx	900	900	xxxx	xxxx	xxxx	xxxx	900	xxxx	xxxx	xxxx	xxxx	xxxx				
Volume/Cap:	xxxx	0.18	0.00	xxxx	xxxx	xxxx	xxxx	0.43	xxxx	xxxx	xxxx	xxxx	xxxx				

Level Of Service Module:																	
2Way95thQ:	xxxx	6.3	xxxx	xxxx	xxxx	xxxx	xxxx	2.1	xxxx	xxxx	xxxx	xxxx	xxxx				
Control Del:xxxx	xxxx	9.4	xxxx	xxxx	xxxx	xxxx	xxxx	11.9	xxxx	xxxx	xxxx	xxxx	xxxx				
LOS by Move:	*	A	*	*	*	*	*	*	*	*	*	*	*				
Movement:	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT	LT - LTR - RT				
Shared Cap:	xxxx	900	900	xxxx	xxxx	xxxx	xxxx	900	xxxx	xxxx	xxxx	xxxx	xxxx				
Shared Queue:xxxx	0.3	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.3	xxxx	xxxx	xxxx	xxxx	xxxx				
Shrd Condel:xxxx	9.4	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	9.4	xxxx	xxxx	xxxx	xxxx	xxxx				
Shared LOS:	*	A	*	*	*	*	*	*	*	*	*	*	*				
ApproachDel:	9.4	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	11.9	xxxx	xxxx	xxxx	xxxx	xxxx				
ApproachLOS:	A	*	*	*	*	*	*	A	*	*	*	*	*				

Note: Queue reported is the number of cars per lane.

exc pm Thu Aug 16, 2012 15:05:18 Page 1-1

Existing + Cumulative PM Peak

Scenario Report

Scenario: exc pm
 Command: exc pm
 Volume: exc pm
 Geometry: Default Geometry
 Impact Fee: Default Impact Fee
 Trip Generation: none
 Trip Distribution: none
 Paths: Default Path
 Routes: Default Route
 Configuration: exc pm

exc pm Thu Aug 16, 2012 15:05:18 Page 2-1

Existing + Cumulative PM Peak

Impact Analysis Report
 Level Of Service

Intersection	Base LOS Veh C	Base Del/ V/ C	Future LOS Veh C	Future Del/ V/ C	Change in
# 5 SR-78 / Via Vera Cruz	C 31.5	0.587	C 33.2	0.701	+ 2.357 D/V
# 6 Grand Avenue Project Driveway	B 14.5	0.000	C 16.6	0.000	+ 2.103 D/V
# 7 Grand Avenue / Linda Vista	B 13.6	0.000	C 15.4	0.000	+ 1.863 D/V
# 8 Via Vera Cruz Project Driveway	B 14.5	0.000	C 15.9	0.000	+ 1.316 D/V

APPENDIX F

Existing Plus Cumulative Conditions With Project HCM Intersection Analysis Worksheets

exc + p am Thu Dec 13, 2012 15:22:54 Page 1-1

Existing + Cumulative + Project AM Peak

Scenario: Scenario Report

exc + p am

Command: exc + p am

Volume: exc + p am

Geometry: Default Geometry

Impact Fee: Default Impact Fee

Trip Generation: am new

Trip Distribution: opening year

Paths: Default Path

Routes: Default Route

Configuration: exc + p am

exc + p am Thu Dec 13, 2012 15:22:55 Page 2-1

Existing + Cumulative + Project AM Peak

Impact Analysis Report
Level Of Service

Intersection	Base		Future		Change in
	LOS Veh	Del / V/ C	LOS Veh	Del / V/ C	
# 5 SR-78 / Via Vera Cruz	C 24.9	0.483	C 28.0	0.581	+ 3.106 D/V
# 6 Grand Avenue Project Driveway	A 8.8	0.007	B 11.2	0.071	+ 2.350 D/V
# 7 Grand Avenue / Linda Vista	A 9.2	0.101	A 9.7	0.117	+ 0.453 D/V
# 8 Via Vera Cruz Project Driveway	B 11.6	0.415	B 12.5	0.471	+ 0.704 D/V

Existing + Cumulative + Project AM Peak

Level of Service Computation Report

2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #7 Grand Avenue / Linda Vista

Average Delay (sec/veh): 2.9 Worst Case Level of Service: A [9.7]

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Control: Stop Sign Stop Sign Uncontrolled Uncontrolled

Rights: Include Include Include Include

Lanes: 0 0 1 0 0 0 0 0 0 0 0 1 0 1 0 2 0 0

Volume Module:

Base Vol: 3 0 52 0 0 0 0 0 139 19 136 139 0

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bsc: 3 0 52 0 0 0 0 0 139 19 136 139 0

Added Vol: 1 0 0 0 0 0 0 0 16 1 0 16 0

Cumulative: 0 0 16 0 0 0 0 0 2 51 0 12 58 0

Initial Fut: 4 0 68 0 0 0 0 0 2 206 20 148 213 0

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95

PHF Volume: 4 0 72 0 0 0 0 0 2 218 21 156 225 0

Reduce Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0

Final Volume: 4 0 72 0 0 0 0 0 2 218 21 156 225 0

Critical Gap Module:

Critical Gap: 6.8 6.5 6.9 xxxxx xxxx xxxxx 4.1 xxxx xxxxx 4.1 xxxx xxxxx

FollowUpTime: 3.5 4.0 3.3 xxxxx xxxx xxxxx 2.2 xxxx xxxxx 2.2 xxxx xxxxx

Capacity Module:

Conflict Vol: 668 771 119 xxxx xxxx xxxxx 225 xxxx xxxxx 219 xxxx xxxxx

Potential Cap.: 402 333 916 xxxx xxxx xxxxx 1355 xxxx xxxxx 1340 xxxx xxxxx

Move Cap.: 365 294 916 xxxx xxxx xxxxx 1355 xxxx xxxxx 1340 xxxx xxxxx

Volume/Cap: 0.01 0.00 0.08 xxxx xxxx xxxxx 0.00 xxxx xxxxx 0.12 xxxx xxxxx

Level of Service Module:

2Way5thQ: xxxx xxxx xxxxx xxxxx xxxx xxxxx 0.0 xxxx xxxxx 0.4 xxxx xxxxx

Control Del:xxxxx xxxx xxxxx xxxxx xxxxx 7.7 xxxx xxxxx 8.0 xxxx xxxxx

LOS by Move: * * * * * A * * * * * A * * * * *

Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT

Shared Cap.: xxxx 845 xxxxx xxxxx xxxxx xxxxx 0.0 xxxx xxxxx 0.0 xxxx xxxxx

Shared Queue:xxxxx 0.3 xxxxx xxxxx xxxxx xxxxx 0.0 xxxxx xxxxx 0.0 xxxxx xxxxx

Shrd Control:xxxxx 9.7 xxxxx xxxxx xxxxx xxxxx 7.7 xxxxx xxxxx 7.7 xxxxx xxxxx

Shared LOS: * A * * * * * A * * * * * A * * * * *

ApproachDel: 9.7 xxxxxx xxxxxx xxxxxx xxxxxx

ApproachLOS: A A A A A A A A A A

Note: Queue reported is the number of cars per lane.

Existing + Cumulative + Project AM Peak

Level of Service Computation Report

2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #8 Via Vera Cruz Project Drive

Average Delay (sec/veh): 11.5 Worst Case Level of Service: D [12.5]

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Control: Stop Sign Stop Sign Uncontrolled Uncontrolled

Rights: Include Include Include Include

Lanes: 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 1

Volume Module:

Base Vol: 0 116 0 0 355 0 0 0 0 0 0 0 0 0 0 0 0

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bsc: 0 116 0 0 355 0 0 0 0 0 0 0 0 0 0 0 0

Added Vol: 0 0 26 0 20 0 0 0 0 0 0 0 0 0 0 0 0

Cumulative: 0 43 0 0 28 0 0 0 0 0 0 0 0 0 0 0 0

Initial Fut: 0 159 26 0 403 0 0 0 0 0 0 0 0 0 0 0 0

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95

PHF Volume: 0 167 27 0 424 0 0 0 0 0 0 0 0 0 0 0 0

Reduce Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Final Volume: 0 167 27 0 424 0 0 0 0 0 0 0 0 0 0 0 0

Critical Gap Module:

Critical Gap: 6.5 6.2 xxxxx 6.5 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx

FollowUpTime: 4.0 3.3 xxxxx 4.0 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx

Capacity Module:

Conflict Vol: xxxxx 4 0 xxxxx 0 xxxxx xxxxx xxxxx xxxxx xxxxx

Potential Cap.: xxxxx 895 1091 xxxxx 900 xxxxx xxxxx xxxxx xxxxx xxxxx

Move Cap.: xxxxx 895 1091 xxxxx 900 xxxxx xxxxx xxxxx xxxxx xxxxx

Volume/Cap: xxxxx 0.19 0.03 xxxxx 0.47 xxxxx xxxxx xxxxx xxxxx xxxxx

Level of Service Module:

2Way5thQ: xxxxx 6.3 xxxxx xxxxx 2.5 xxxxx xxxxx xxxxx xxxxx xxxxx

Control Del:xxxxx 9.4 xxxxx xxxxx 12.5 xxxxx xxxxx xxxxx xxxxx

LOS by Move: * A * * * * * B * * * * *

Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT

Shared Cap.: xxxxx xxxxx 937 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx

Shared Queue:xxxxx xxxxx 0.4 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx

Shrd Control:xxxxx xxxxx 9.4 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx

Shared LOS: * A * * * * * A * * * * *

ApproachDel: 9.4 A 12.5 xxxxxx xxxxxx

ApproachLOS: A B B B B B B B B B

Note: Queue reported is the number of cars per lane.

exc + p pm Thu Dec 13, 2012 15:25:41 Page 1-1
Existing + Cumulative + Project PM Peak

Scenario Report

exc + p pm

exc + p pm

exc + p pm

Default Geometry

Default Impact Fee

pm new

opening year

Default Path

Default Route

exc + p pm

Scenario:

Command:

Volume:

Geometry:

Impact Fee:

Trip Generation:

Trip Distribution:

Paths:

Routes:

Configuration:

exc + p pm Thu Dec 13, 2012 15:25:42 Page 2-1
Existing + Cumulative + Project PM Peak

Impact Analysis Report
Level of Service

Intersection

Base

Del/ V/

LOS Veh C

C 31.6 0.588

C 34.5 0.704

C 17.8 0.160

C 15.7 0.504

C 17.4 0.690

C 15.3 0.619

Change

in

C 2.932 D/V

C 3.295 D/V

C 2.163 D/V

C 2.133 D/V

#

5

SR-78 / Via Vera Cruz

#

6

Grand Avenue Project Driveway

#

7

Grand Avenue / Linda Vista

#

8

Via Vera Cruz Project Driveway

Existing + Cumulative + Project PM Peak														
Level of Service Computation Report														
2000 HCM Operations Method (Future Volume Alternative)														
Intersection #5 SR 76 / Via Vera Cruz														
Cycle (sec):	100	Critical Vol./Cap.(X):			0.704									
Loss Time (sec):	0	Average Delay (sec/vch):			34.5									
Optimal Cycle:	77	Level of Service:			C									
SR 76														
Via Vera Cruz														
Approach: North Bound South Bound East Bound West Bound														
Movement: L T R L T R L T R L T R L T R														
Control:	Protected	Protected	Protected	Protected	Protected	Protected	Protected	Protected	Protected	Protected	Protected	Protected	Protected	Protected
Rights:	Include	Include	Include	Include	Include	Include	Include	Include	Include	Include	Include	Include	Include	Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0														
VPR: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0														
Lanes: 1 1 0 0 1 1 0 0 1 0 2 0 2 0 1 1 0 2 1 0														
Volume Module:														
Base Vol:	226	156	45	186	275	270	366	252	172	82	237	14		
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Initial Bse:	226	156	45	186	275	270	366	252	172	82	237	14		
Added Vol:	3	0	0	2	0	0	0	8	0	13	9	2		
Cumulative/:	34	32	0	17	4	79	77	81	40	4	85	7		
Initial Fut:	263	166	45	205	279	349	443	341	212	99	311	23		
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
PRF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96		
PRF Volume:	273	195	47	213	290	362	460	354	220	103	344	24		
Reduced Vol:	0	0	0	0	0	0	0	0	0	0	0	0		
Reduced Vol:	273	195	47	213	290	362	460	354	220	103	344	24		
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
MLP Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Final Volume:	273	195	47	213	290	362	460	354	220	103	344	24		
Saturation Flow Module:														
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Adjustment:	0.97	0.97	0.85	0.95	0.92	0.92	0.92	0.95	0.85	0.95	0.90	0.90		
Lanes:	1.17	0.83	1.00	1.00	0.44	0.56	2.00	3.00	1.00	1.00	2.81	0.19		
Final Sat:	2154	1540	1615	1805	774	963	3502	3610	1615	1805	4201	334		
Capacity Analysis Module:														
Vol/Sat:	0.13	0.13	0.03	0.12	0.37	0.37	0.23	0.10	0.14	0.06	0.07	0.07		
Crit Moves:	***	***	***	***	***	***	***	***	***	***	***	***		
Green/Cycle:	0.18	0.37	0.37	0.34	0.53	0.53	0.19	0.20	0.20	0.08	0.10	0.10		
Volume/Cap:	0.70	0.34	0.70	0.70	0.70	0.70	0.70	0.48	0.67	0.67	0.70	0.70		
Delay/Veh:	41.9	23.0	20.6	24.8	20.0	20.0	41.6	35.7	42.0	55.4	47.8	47.8		
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
AdjDel/Veh:	41.9	23.0	20.6	24.8	20.0	20.0	41.6	35.7	42.0	55.4	47.8	47.8		
LOS by Move:	D	C	C	C	C	C	D	D	D	E	D	D		
HC2kAvgD:	5	5	1	5	16	16	7	5	6	4	5	5		
Note: Queue reported is the number of cars per lane.														

Existing + Cumulative + Project PM Peak

Level of Service Computation Report

2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #6 Grand Avenue Project Driveway

Average Delay (sec/vch): 1.1 Worst Case Level of Service: C(17.8)

Street Name: Project Driveway Grand Avenue

Approach: North Bound South Bound East Bound West Bound

Movement: L T R L T R L T R L T R L T R L T R

Control: Stop Sign Stop Sign Stop Sign Stop Sign Stop Sign Stop Sign Stop Sign Stop Sign Stop Sign Stop Sign Stop Sign Stop Sign Stop Sign Stop Sign Stop Sign

Rights: Include Include Include Include Include Include Include Include Include Include Include Include Include Include Include Include

Lanes: 0 0 1 0 0 0 0 0 0 0 0 0 0 0 1 0 1 0 2 0 0

Volume Module:

Base Vol: 3 0 0 0 0 0 0 0 0 0 478 3 1 342 0

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 3 0 0 0 0 0 0 0 0 0 478 3 1 342 0

Added Vol: 24 0 11 0 0 0 0 0 0 0 0 10 0 0 0

Passesby/cu: 17 0 5 0 0 0 0 0 0 0 81 17 5 79 0

Initial Fut: 44 0 16 0 0 0 0 0 0 0 559 30 17 421 0

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PRF Adj: 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94

PRF Volume: 47 0 17 0 0 0 0 0 0 0 592 32 18 446 0

Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Final Volume: 47 0 17 0 0 0 0 0 0 0 592 32 18 446 0

Critical Gap Module:

Critical Gap: 6.8 6.5 6.9 xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx 4.1 xxxxxx xxxxxx

FollowUpGap: 3.5 4.0 3.3 xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx 2.2 xxxxxx xxxxxx

Capacity Module:

Conflict Vol: 867 1090 312 xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx 624 xxxxxx xxxxxx

Potent Cap: 296 217 690 xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx 967 xxxxxx xxxxxx

Move Cap: 292 213 690 xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx 967 xxxxxx xxxxxx

Volume/Cap: 0.16 0.00 0.02 xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx 0.02 xxxxxx xxxxxx

Level of Service Module:

2Way95thQ: xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx 0.1 xxxxxx xxxxxx

Control Del:xxxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx 3.8 xxxxxx xxxxxx

LOS by Move: * * * * * * * * * * * * * * A * * *

Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT

Shared Cap: xxxxxx 345 xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx

Shared Queue:xxxxxxx 0.7 xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx

Shared Condel:xxxxxxx 17.6 xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx

Shared LOS: * * * * * * * * * * * * * * * * * *

ApproachDel: 17.8 xxxxxxxx xxxxxxxx xxxxxxxx xxxxxxxx

ApproachLOS: C C C C C C C C C C C C C C C C

Note: Queue reported is the number of cars per lane.

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Existing + Cumulative + Project PM Peak

Level of Service Computation Report

2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #7 Grand Avenue / Linda Vista

Average Delay (sec/veh): 4.6 Worst Case Level of Service: C (15.7)

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Control: Stop Sign Stop Sign Stop Sign Stop Sign

Rights: Include Uncontrolled Include Uncontrolled

Lanes: 0 0 1 0 0 0 0 0 0 0 1 0 1 0 1 0 1 0 2 0 0

Volume Module:

Base Vol: 5 0 336 0 0 0 0 0 459 8 55 310 0

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Eze: 5 0 336 0 0 0 0 459 8 55 310 0

Added Vol: 1 0 0 0 0 0 0 0 1 0 10 0 0

cumulative: 0 0 27 0 0 0 0 2 83 0 24 87 0

Initial Fut: 6 0 363 0 0 0 0 2 552 9 79 407 0

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Volume: 6 0 364 0 0 0 0 2 554 9 79 408 0

Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0

FinalVolume: 6 0 364 0 0 0 0 2 554 9 79 408 0

Critical Gap Module:

Critical Gap: 6.8 6.5 6.9 xxxxx xxxxx xxxxx 4.1 xxxxx xxxxx 4.1 xxxxx xxxxx

FollowUpTime: 3.5 4.0 3.3 xxxxx xxxxx xxxxx 2.2 xxxxx xxxxx 2.2 xxxxx xxxxx

Capacity Module:

Conflict Vol: 925 1129 281 xxxxx xxxxx xxxxx 408 xxxxx xxxxx 563 xxxxx xxxxx

Potential Cap: 722 206 722 xxxxx xxxxx xxxxx 1161 xxxxx xxxxx 1019 xxxxx xxxxx

Move Cap: 255 189 722 xxxxx xxxxx xxxxx 1161 xxxxx xxxxx 1019 xxxxx xxxxx

Volume/Cap: 0.02 0.00 0.50 xxxxx xxxxx xxxxx 0.00 xxxxx xxxxx 0.08 xxxxx xxxxx

Level of Service Module:

2Way95thQ: xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx 0.0 xxxxx xxxxx 0.3 xxxxx xxxxx

Control Del: xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx 8.1 xxxxx xxxxx 8.8 xxxxx xxxxx

LOS by Move: * * * * * A * * * * * A * * * * *

Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT

Shared Cap: xxxxx 701 xxxxx xxxxx xxxxx xxxxx 0.0 xxxxx xxxxx 0.0 xxxxx xxxxx

SharedQueue: xxxxx 3.1 xxxxx xxxxx xxxxx xxxxx 0.0 xxxxx xxxxx 0.0 xxxxx xxxxx

Shrd Condel: xxxxx 15.7 xxxxx xxxxx xxxxx xxxxx 8.1 xxxxx xxxxx 8.1 xxxxx xxxxx

Shared LOS: * C * * * * * A * * * * * A * * * * *

ApproachDel: 15.7 xxxxxx xxxxxx xxxxxx

ApproachLOS: C C C C C

Note: Queue reported is the number of cars per lane.

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Existing + Cumulative + Project PM Peak

Level of Service Computation Report

2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #8 Via Vera Cruz Project Driveway

Average Delay (sec/veh): 14.2 Worst Case Level of Service: C (17.4)

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Control: Stop Sign Stop Sign Stop Sign Stop Sign

Rights: Include Uncontrolled Include Uncontrolled

Lanes: 0 0 1 1 0 0 0 2 0 0 0 0 0 0 0 0 1

Volume Module:

Base Vol: 0 416 0 0 529 0 0 529 0 0 0 0 0 0 0 0

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Eze: 0 416 0 0 529 0 0 529 0 0 0 0 0 0 0 0

Added Vol: 0 0 16 0 13 0 0 0 0 0 0 0 0 0 0 0

cumulative: 0 62 4 0 48 0 0 48 0 0 0 0 0 0 0 0

Initial Fut: 0 478 20 0 590 0 0 590 0 0 0 0 0 0 0 0

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95

PHF Volume: 0 503 21 0 621 0 0 621 0 0 0 0 0 0 0 0

Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

FinalVolume: 0 503 21 0 621 0 0 621 0 0 0 0 0 0 0 0

Critical Gap Module:

Critical Gap: 6.5 6.2 xxxxx 6.5 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx

FollowUpTime: 4.0 3.3 xxxxx 4.0 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx

Capacity Module:

Conflict Vol: xxxxx 7 0 xxxxx 0 xxxxx xxxxx xxxxx xxxxx xxxxx

Potential Cap: xxxxx 892 1091 xxxxx 900 xxxxx xxxxx xxxxx xxxxx xxxxx

Move Cap: xxxxx 892 1091 xxxxx 900 xxxxx xxxxx xxxxx xxxxx xxxxx

Volume/Cap: xxxxx 0.56 0.02 xxxxx 0.69 xxxxx xxxxx xxxxx xxxxx

Level of Service Module:

2Way95thQ: xxxxx 1.2 xxxxx xxxxx 5.2 xxxxx xxxxx xxxxx xxxxx

Control Del: xxxxx 10.6 xxxxx xxxxx 17.4 xxxxx xxxxx xxxxx xxxxx

LOS by Move: * B * * * * * C * * * * * C * * * * *

Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT

Shared Cap: xxxxx xxxxx 904 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx

SharedQueue: xxxxx xxxxx 1.3 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx

Shrd Condel: xxxxx xxxxx 10.7 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx

Shared LOS: * * B * * * * * * * * * * * * * * *

ApproachDel: 10.7 17.4 xxxxxx xxxxxx

ApproachLOS: B C C C C

Note: Queue reported is the number of cars per lane.

APPENDIX G

Caltrans ILV Analysis Worksheets



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JOB GRAND AVE. FAST FOOD RESTAURANT TIA

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

EXISTING CONDITIONS - AM PEAK HOUR

CRITICAL LANE VOLUMES

PHASE 1 15 → ↗ ← 15 15

PHASE 2 127 → ↗
126 → ↗
46 →
45 →
121 → ↘ 127

PHASE 3 10
27 ← ↗ 37
← 38
← 38 38

PHASE 4 498
276 ↘
219 ↘ 83
498

PHASE 5 54
54 ↗
52 ↗
8 ↗ 54
732

GRAND AVE
SUNSET BLVD
VIA VENTURA BLVD
GRAND AVE



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JOB GRAND AVE. FAST FOOD RESTAURANT TIA

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

EXISTING CONDITIONS - PM PEAK HOUR

CRITICAL LANE VOLUMES

PHASE 1

82 →
82 →

← 82

82

PHASE 2

101 →
101 →
101 →
101 →
101 →

101

PHASE 3

25 →
25 →
71 →

16
71 ← 87
← 67
← 88

87

PHASE 4

489
270
219
83

489

PHASE 5

0 →
186
185
45
31
154

186

945



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JOB GRAND AVE. FAST FOOD RESTAURANT TIA

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

EXISTING PLUS CUMULATIVE W/O PROJECT
AM PEAK HOUR

CRITICAL LANE VOLUMES

PHASE 1

15 →
15 →

← 15

15

PHASE 2

147 →
148 →
69 →
69 →
145 →

148

PHASE 3

○ →
○ →
○ →

14
42 ← 56
← 56
← 56

56

PHASE 4

357
223
574
87

574

PHASE 5

○ →

6
59
76
75
8

76

869



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JOB GRAND AVE FAST FOOD RESTAURANT TIA

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

EXISTING PLUS CUMULATIVE WITH PROJECT
AM PEAK HOUR

CRITICAL LANE VOLUMES

PHASE 1

35 →
35 →

← 35

35

PHASE 2

128 →
127 →
76 →
75 →
128 →

128

PHASE 3

0 →
0 →
17 ↘

17
← 62
← 62
← 62

62

PHASE 4

357
223
574
90

574

PHASE 5

0 →

78
76
80

78

877



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JOB GRAND AVE FAST FOOD RESTAURANT TIA

SHEET NO. _____ OF _____

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____

EXISTING PLUS CUMULATIVE WITH PROJECT
PM PEAK HOUR

CRITICAL LANE VOLUMES

PHASE 1

99 →
99 →

← 99

99

PHASE 2

123 →
122 →
123 →
123 →
123 →

123

PHASE 3

48 →
47 →
89 ↘

25
96 ← 121
← 122
← 122

122

PHASE 4

34.9
209
628
209

628

PHASE 5

0 ↘
220
220
186
45

220

1,192